

Intangible Infrastructure: Building on the foundations

THEME

Credit Suisse Research Institute

New Perspectives:
Thought Leadership
from Credit Suisse
Research and World-
Leading Experts



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To many, the theme of 'infrastructure' signifies roads and railways. However, in this report we examine a likely structural shift in investment priorities towards the *'intangible infrastructure'* of an economy, that being the knowledge-driven areas such as education, healthcare and technology, which diversify growth and improve efficiency. If *tangible* investments were the driver of the last cycle, we believe *intangible* qualities will be crucial to secure progress in the next.

The prevailing global financial crisis makes this all the more relevant. First, it can be argued that gaps in the intangible infrastructure in some economies and markets go some way to explain their recent fragility. They have proved too one-dimensional. Second, recent public statements, whether of an incoming US President or the Chinese government's fiscal support for a slowing economy, have seen increased priorities attached to the likes of education and healthcare.

To help analyse the theme, we have created the CS Intangible Infrastructure indices through which we rank countries and chart their development on five related pillars: (1) education, (2) healthcare, (3) financial development, (4) technological investment and (5) the penetration of business services. Education emerges as the key driver. These indices highlight the gaps that notably exist within the new economic 'super-powers', such as the 'BRICs'.

We also present the CS Intangible Infrastructure 20, a focus list based on these pillars: Yapi Kredi Bank, ICBC, BBVA, HDFC Bank, Mindray Medical, Sun Pharmaceutical, Amil, TEVA, Tencent, Sina, Microsoft, Cisco, Raffles Education, Educomp, New Oriental, K12, Infosys, Accenture, TNT and SGS.

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Source: Credit Suisse research, *Credit Suisse Standard Securities research

This report has been prepared and coordinated with the input of Mary Curtis. Mary has 15 years of experience as an equity strategist in the investment banking industry. She has also worked on previous Credit Suisse New Perspectives themed research, as detailed below. We thank her once again for her invaluable contribution.

We would also like to thank Richard E. Neff, Partner and Chair, IP & Technology Group at Greenberg Glusker in Los Angeles, for his insights on intellectual property, as detailed within the report.

Previous Credit Suisse *New Perspectives* reports:

Water, 7 June 2007—Garthwaite, Curtis, Kersley, Balter, et al.

Higher Agricultural Prices: Opportunities and Risks, 6 November 2007—Garthwaite, Curtis, Moskow, Mills, et al.

Embracing China's Consumption Boom, 3 March 2008—Chan, Tao, Xiao Jia Zhi.

Africa—The Commodity Warrant, 14 April 2008—Kersley, Curtis, Gray, Flannery, et al.

Obesity and Investment Implications, 26 June 2008—Arnold, Rochon, et al.

The Credit Suisse Research Institute

This report coincides with the launch of the Credit Suisse Research Institute.

The Credit Suisse Research Institute identifies and provides insights on global themes and trends. Its first research report focuses on intangible infrastructure and its role in sustainable growth.

The objective of the Credit Suisse Research Institute is to provide our clients with leading edge advice by leveraging internal and external expertise, thus reinforcing our integrated global bank approach. The Institute conducts research on new fundamental topics, working with some of the world's leading experts, academics and institutions and Credit Suisse's global network of 400 analysts, and makes this available throughout the Bank for the business units to create innovative products, solutions and services for Credit Suisse's clients.

Clients increasingly require global reach, local expertise and competitive products and services from the financial services industry. The Institute's investigations are conducted with the goal to furnish clients across divisions and regions with an in-depth analysis of fundamental social, economic, scientific, environmental and demographic trends that are expected to impact global markets in the future.

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This report on Intangible Infrastructure exemplifies this new approach and continues our series of *New Perspectives* thematic research. In this publication, we integrate the work of over 60 Credit Suisse analysts, analysts from our South African joint venture Credit Suisse Standard Securities, and external experts from across the globe to assess the impact on growth of the five key intangible infrastructure factors. This is the first time that the effect of the factors we have identified is being measured and quantified in a comprehensive way across sectors and regions. We look at both the status quo and the potential for further investment in these areas.

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Executive summary

This report focuses on what we believe will be a shift in investment priorities at the national and corporate level towards the underlying 'Intangible Infrastructure' within an economy, particularly within the emerging world. That is to say the knowledge-driven areas such as education, healthcare and technology that help diversify growth and improve competitiveness rather than simply the 'tangible' roads and railways that provide the initial platform for growth. The latter was the driver of the last cycle; we believe the former will be crucial in securing progress in the next. This is underscored by the prevailing global financial crisis and economic downturn, since the extent and design of intangible infrastructure goes some way to explaining the current fragility of various economies. Moreover, the planned fiscal responses to the crisis in both the developed world, where we have a new US president, and in the developing world, with China's recent package, echo this theme.

We have pursued this theme at a top-down and bottom-up level. We have used the input of our macro-economists and strategists to test the hypothesis and, importantly, seek to quantify the relevance of these intangible factors. To do so, we have created the **CS Intangible Infrastructure indices**, which allow us to rank countries and chart their development around five related pillars: **(1) education, (2) healthcare, (3) the development of the financial system, (4) technological investment and (5) the penetration of business services**. They highlight the gaps that exist within the infrastructure of the new economic 'super-powers', such as Brazil, Russia, India and China (the BRICs). Education emerges as a key driver of growth and an area that has been relatively neglected by some emerging markets. We believe there is significant potential for growth in the sector and, indeed, is in keeping with recent stated government priorities.

At a bottom-up level, we have drawn from the breadth of our global research coverage to focus on investable stock opportunities. Our global analysts have given their perspective on companies that offer the greatest growth potential as investment in the five pillars of intangible infrastructure becomes a more obvious feature. Clearly, in many cases we are balancing the cyclical pressures on profitability that many companies are dealing with, alongside the structural opportunity we envisage. However, in the report, our analysts cross-reference more than 250 companies that command attention.

To drill down, we present the '*CS Intangible Infrastructure 20*', a focus list of our covered stocks offering the best growth within each pillar. We provide more detail in the body of the report, but the nature of the list makes an important point. While the theme typically leads one to think about the emerging world, there is a key relevance for stocks in developed markets as well. First, they possess unique expertise that may be exported to assist with the investment we are expecting. Second, the intangible infrastructure in the developed world still offers scope for improvement, with further globalisation, outsourcing and more general technological investment presenting opportunities.

Stock picks: The Credit Suisse Intangible Infrastructure 20

We are highlighting 20 stocks that (a) are part of the intangible infrastructure theme, (b) we forecast to deliver above average growth over the medium term and (c) are Outperform or Neutral rated by Credit Suisse analysts.

The 20 stocks are presented in Figure 1 below.

Figure 1: Credit Suisse Intangible Infrastructure 20

	Ticker	Stock	Base	Sector	Notes	Rating	Analyst	Mkt Cap (US\$mn)	FY1 PE	3 Yr CAGR
1	YKBNK.IS	Yapi Kredi Bank	Turkey	Banks	A play on Turkish convergence.	Outperform	Akin Tuzun	5,305	5.8x	42%
2	1398.HK	ICBC	China	Banks	The largest bank in China with the strongest deposit franchise.	Neutral	Sherry Lin	163,772	9.4x	17%
3	BBVA.MC	BBVA	Spain	Banks	Exposure to Latin American banking.	Outperform	Santiago Lopez Diaz	38,738	5.5x	4%
4	HDBK.BO	HDFC Bank	India	Banks	The second-largest private sector bank in India.	Neutral	Aditya Singhanian	7,893	18.0x	29%
5	MR.N	Mindray Medical	China	Healthcare	Medical devices boosted by Chinese government spending.	Outperform	Jinsong Du	1,980	14.8x	46%
6	SUN.BO	Sun Pharmaceutical	India	Healthcare	Dominant position in chronic therapeutic areas.	Outperform	Neelkanth Mishra	4,569	10.5x	9%
7	AMIL3	Amil	Brazil	Healthcare	Managed care in Brazil.	Outperform	Luiz Otavio Campos	1,299	7.1x	12%
8	TEVA	TEVA	Israel	Healthcare	One of the world's largest generic drug manufacturers.	Outperform	Marc Goodman	36,117	15.3x	15%
9	0700.HK	Tencent Holdings	China	Tech	Instant Messaging in China.	Outperform	Wallace Cheung	9,849	26.0x	42%
10	SINA.OQ	Sina Corporation	China	Tech	The largest Chinese Internet portal in terms of traffic and revenue.	Outperform	Wallace Cheung	1,670	21.2x	35%
11	MSFT	Microsoft	US	Tech	Dominant position in the global software market.	Outperform	Philip Winslow	185,680	10.0x	4%
12	CSCO	Cisco Systems	US	Tech	Networking and communications technologies.	Neutral	Paul Silverstein	98,777	12.5x	0%
13	RLSE.SI	Raffles Education	Singapore	Education	The largest private education service provider in Asia-Pacific.	Outperform	Su Tye Chua	675	9.2x	39%
14	EDSO.BO	Educomp	India	Education	A leader across segments in K-12 education industry in India.	Outperform	Sunil Tirumalai	788	29.1x	82%
15	EDU.N	New Oriental	China	Education	Focused on overseas test preparation and English language training.	Outperform	Marisa Ho	1,905	27.9x	44%
16	LRN	K12	US	Education	A niche market in virtual public schooling.	Outperform	Kelly Flynn	538	41.0x	86%
17	INFY.BO	Infosys Technologies	India	Business Services	Well established offshore IT services model.	Outperform	Bhuvnesh Singh	14,377	12.3x	16%
18	ACN	Accenture	US	Business Services	Outsourcing and specialised consulting.	Outperform	Bryan Keane	21,816	11.0x	NA
19	TNT.AS	TNT	Netherlands	Business Services	Benefiting from the long-term trend towards greater global trade.	Outperform	Peter Hyde	7,543	8.2x	3%
20	SGSN.VX	SGS	Switzerland	Business Services	Regulations on quality, safety and environmental standards are proliferating.	Outperform	Patrick Jnglin	6,481	13.5x	14%

Source: Credit Suisse estimates and research

Overview

Intangible Infrastructure: building on the foundations

Global investment in physical infrastructure has been one of the most enduring investment themes over recent years—power generation, construction and transportation to name a few. This has specifically been a prime driver of growth in the emerging markets and served as an earnings boost for the companies in the developed world who have served these markets, particularly in the capital equipment and commodity space. However, we believe that from here the term '*infrastructure*' should be considered in a two-dimensional sense.

Roads, railways and power stations clearly form the bedrock for the development of an economy and in that respect represent essential '*tangible*' infrastructure. However, this alone is not sufficient to sustain growth beyond its initial phases. In fact, in the current climate, we have begun to see the impact on growth in a number of emerging economies that have rested too heavily on such factors, as credit has become less freely available and specifically commodity prices have weakened. Elsewhere, some emerging economies were already reaching a level of maturity that required a shift in investment patterns in order to make the transition from a primary or low-cost manufacturing base to a more tertiary and higher value added-based economy.

To achieve broad and sustainable growth, we believe that infrastructure of a more '*intangible*' nature needs to be present or developed, as we explore below. We look for features, perhaps more service sector-oriented and socio-economic in their nature, that lead to a deepening of the growth potential of a country, widening in its base and, importantly, insulating it to some degree from the severity of shocks of the nature we are currently experiencing. Our analysis still shows the newfound 'economic super powers', such as the BRICs, continue to lack much of this architecture.

That is not to say that the physical theme is over in every instance: it still remains a huge story in the Middle East and, indeed, we believe China, with its under-leveraged fiscal position, will seek to increase public spending in this arena to offset the current downturn during 2009/10. However, in these cases, we expect an important complementary role will be played by investment in intangible infrastructure. In other regions, investment in intangible infrastructure may well become a more dominant theme. While we expect this will largely be an emerging market theme, there are opportunities for companies in the developed world that have the expertise to export to these countries keen to acquire it.

What is intangible infrastructure?

In this report, we have defined intangible infrastructure as follows: *the set of factors that develop human capability and permit the easy and efficient growth of business activity*. These factors can be essentially political, legal or socio-economic in nature. Examples of political factors include the degree of political stability or the strength of the institutional framework. Legal factors include the rule of law, tax policies and intellectual and physical property rights protection. Examples of socio-economic factors include research and development capabilities, business processes or training and education.

For the purposes of this report, we have considered five specific components of intangible infrastructure: education, healthcare, finance, business services and technology. This may not be every element of the story but probably reflect the most relevant aspects from an investment perspective.

1) Education

We focus on education as it is a key determinant of human capability. The value of education is intrinsic in almost all levels of economic output. As we illustrate in Figure 3, and discuss in more detail later, the correlation between educational attainment and GDP per capita is particularly strong. We can also track the historical precedents of economies such as the early 'Asian tigers', whose emphasis on investing in education paved the way for their success. Government commitment or otherwise to education can be shown to have a significant impact on the nature of growth that economies then display as much as the GDP level itself. It is important to be conscious of the examples of best practice among the prevailing suppliers of private education in the developed world, as they will potentially influence its development, directly or indirectly, in the emerging world. This could be at any point of the education chain, from primary to as advanced as universities and business schools.

2) Healthcare

With considerations such as life expectancy and related demographic trends, healthcare is another key factor in determining the average individual's output. Through time and across borders, there are very few exceptions to the rule that better healthcare fosters an environment of higher economic activity. Despite this fact, it has not been a priority in many of the markets we currently view as high growth, such as China. This looks set to change.

3) Finance

The financial sector is central to determining the 'easy and efficient growth of business activity'. There has rarely been a time when this point has been more relevant than today. This sector is a prime example of the power of intangible factors. Just as the financial system itself is an 'intangible' intermediary for growth, the intangibles of regulation, standards and, of course, intervention drive the evolution of financial systems. They are decisive in determining why some countries have strong financial and resilient sectors and others weak ones. At one end of the scale, lack of access to credit is just as inhibiting to growth as, at the other end of the scale, severe economic difficulties can be founded and exacerbated by under-regulated and overstretched financial institutions. This was well illustrated by the emerging markets crisis in the mid/late 1990s as well as the prevailing credit crunch in the developed markets.

4) Technology

The technology sector, perhaps more than any other, permeates and influences many aspects of nation building as its implementation represents not only a stand-alone category but also has the potential to significantly impact the other categories within our definition of intangible infrastructure. Ostensibly, we are interested in the more intangible elements of technology—for instance, software solutions or system processing capabilities. In practice, it is impossible to disaggregate software from hardware and hence, we look at aspects of both in our discussion. 'Virtualisation', which is the use of software to allow hardware to run multiple operating system images at the same time, is a good example of the type of technological advances we are seeking to identify. As a means of increasing capabilities without incurring the expense of upgrading physical infrastructure, virtualisation, in theory, can foster more profitable growth and maximise economic value-add. While again hardware may be at the heart of its application, communication by its nature is an intangible necessity and we consider its role here. More generally, the ability to access the most recent technology presents an opportunity for emerging economies to fast-forward their development relative to their developed peers.

5) Business services

This sector forms an important support structure for economic growth, enabling companies to function in a more efficient and competitive way. Specialist services like IT, logistics or recruitment, which can in theory be done in-house, in practice allow companies to concentrate more on core businesses while depending on trusted experts for other activities. Typically, we have found that the greater the penetration of business services, the higher the GDP per capita. It is a theme of relevance in the developed as well as developing world but with a different emphasis. It is an area where the developed world can clearly export its best practice in terms of infrastructure in some areas, such as payment and employment services, while benefiting from the outsourcing expertise of developing country companies, such as Infosys and Satyam in India. Indeed, if the emerging world is to trade with the developed world, it has to operate by the same standards—standards set and typically measured by developed companies. There is little point in re-inventing the wheel here when the developed world possesses companies that are expert in outsourcing or provide the best IT services globally. However, in the developing world itself, this form of intangible infrastructure still has scope for growth in its own right as secular themes of outsourcing, labour deregulation and global trade remain.

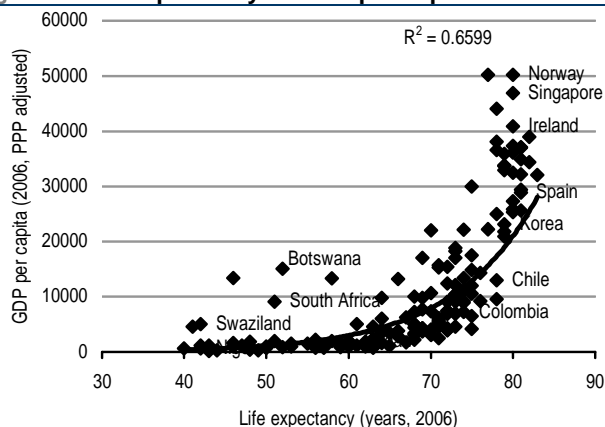
Theory and practice

While we have sought to pigeon-hole the nature of intangible infrastructure in these five categories, in reality, it is far more complicated than that. It is, of course, heavily inter-related and inter-dependent. It is not impossible, but it is highly unlikely that any country with a high degree of technology penetration would not also have a fairly comprehensive education system. In the same way, financial systems would struggle in the absence of a legal framework and advances in technology might falter without property rights to support the R&D. The absence of one element may make a country more reliant on acquiring an aspect of another; for example, a lack of educational infrastructure might lead to a need for more business services—and so on.

Intangible infrastructure is inter-dependent and inter-linked

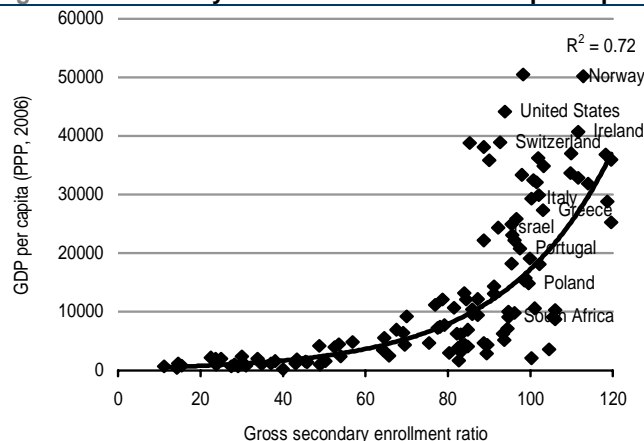
Strictly speaking, it is the law, regulation and structure of the sectors we have set out that comprise their 'intangible' qualities. In practice, since 'intangible' implies immeasurable, it is only through obvious penetration or attainment standards that we can gauge the development and growth potential of the overall intangible infrastructure. For instance, the potential (and actual) productivity of the workforce is probably well correlated with tangible measures of education and health, such as secondary school enrolment and life expectancy statistics. The strong fit between these two respective measures and GDP per capita suggests this is indeed the case.

Figure 2: Life expectancy vs GDP per capita



Source: IMF, Credit Suisse research

Figure 3: Secondary school enrolment vs GDP per capita



Source: UNESCO, Credit Suisse research

Adding support to the case for 'intangible infrastructure' are the broad trends in demographics, economics, society and geo-politics that point toward the rising importance of intangible factors as well as the significant body of academic literature on economics and development.

Nobel prize-winning work by Robert Solow has helped to structure ideas on the role that technology and human capital play in generating economic growth. In turn, this has paved the way for theories that map out the means by which developing countries could 'catch-up' with wealthier ones. The ability of a country to catch up with other better-off ones is to an extent largely a function of factors like technology 'spill-over' to these countries, and the extent to which these can be absorbed and adapted to by the workforce.

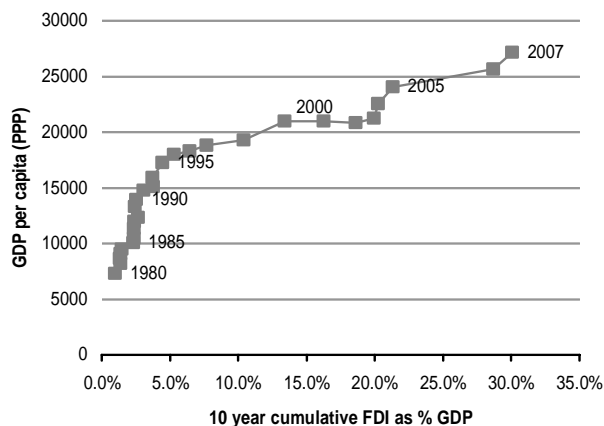
This 'spill-over' can come in the form of the explicit export of expertise from one country to another through the likes of FDI or training programmes or implicitly through the straightforward reproduction of designs and processes. Indeed, within this report we can highlight specific technologies and companies that are currently doing just that: whether it be the likes of virtualisation software providers or, say, the business services providers of legal and regulatory advice.

Two clear beneficiaries of the 'spill-over' effect have been Israel and Korea. Twenty years ago both were clearly categorised as emerging markets (with GDP per capita of US\$2,369 for Korea and US\$6,793 for Israel in 1985, according to IMF data). Since then, gross foreign direct investment in Korea has averaged 0.6% of GDP per annum and in Israel 2.0% of GDP pa. Added to a strong focus on education, this has facilitated significant convergence in GDP per capita to the levels associated with developed markets.

The 'spill-over' effect

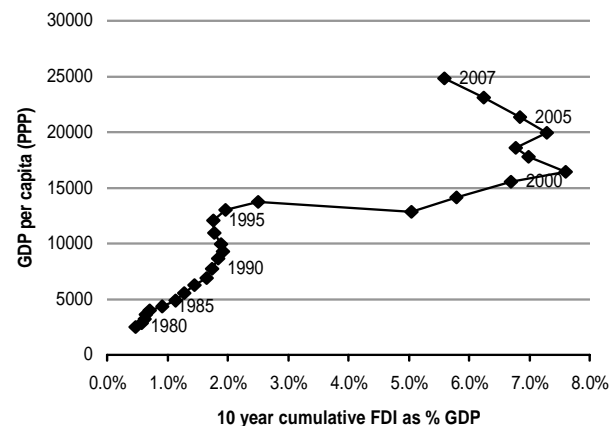
Korea and Israel illustrate the 'spill-over' effect

Figure 4: Israel: gross FDI and GDP per capita



Source: IMF, IFS, Credit Suisse research

Figure 5: Korea: gross FDI and GDP per capita



Source: IMF, IFS, Credit Suisse research

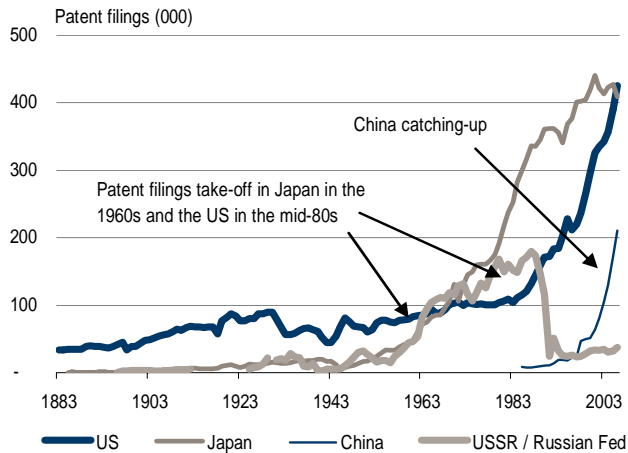
The notion of 'catch-up' is also borne out by the data on patent filings from the World Intellectual Property Organisation (WIPO). In Figure 6–Figure 9, we show the number of annual patent filings for the US, Japan, Brazil, Russia, India and China in total and the split between resident and non-resident filings. We make four observations:

Patent filings: an 'intangible' metric?

- 1) The inflexion point in growth of patent filings in the US (mid-1980s) and Japan (the early 1960s) coincides with a boom in their rate of productivity growth;
- 2) The growth rate in patent filings in China (21% in 2006) and more recently Russia (17% in 2006), India (40% in 2005) and Brazil (20% in 2006) is incredibly strong. This suggests their own rate of productivity growth is likely to be strong and that these countries are catching up remarkably quickly with developed markets, on the back of more open economic policy and the trend towards globalisation.

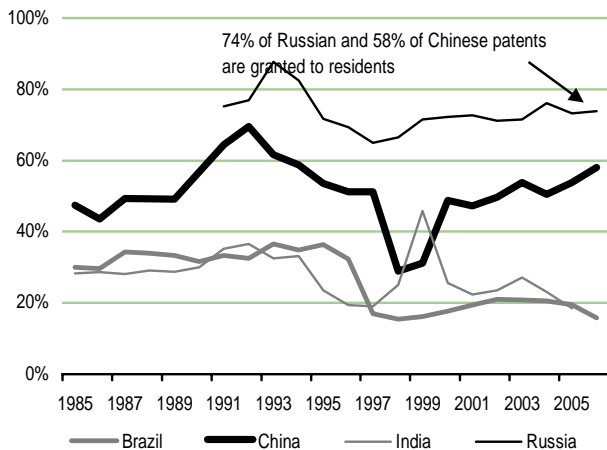
- 3) These trends are not simply driven by developed market companies filing old patents in new countries. Over half the patent filings in Russia and China are entered by residents rather than non-residents.
- 4) Perhaps not surprisingly, the upswing in patent filings has corresponded with better stock market performance.

Figure 6: Trends in patent filings: US, Japan, China and Russia



Source: WIPO, Credit Suisse research

Figure 8: Trends in patent filings: Resident filings as % total filings

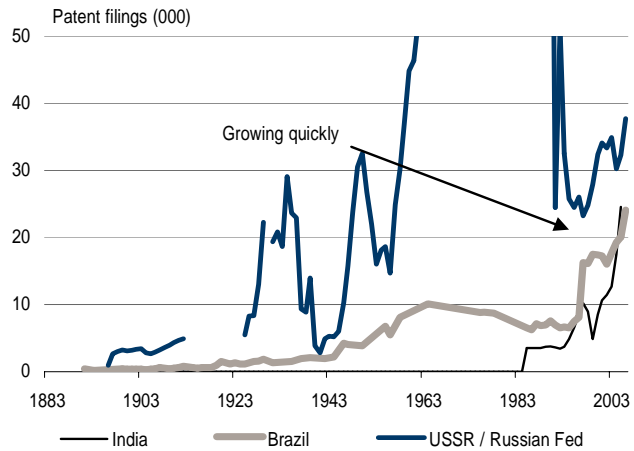


Source: WIPO, Credit Suisse research

Other economists, such as Robert Lucas and Robert Barro, have focused on education as a key driver of growth and used it to explain differences in the growth rates between countries, since when it has been routinely included by researchers in models studying growth from various perspectives. We find simple examples that illustrate such thinking below.

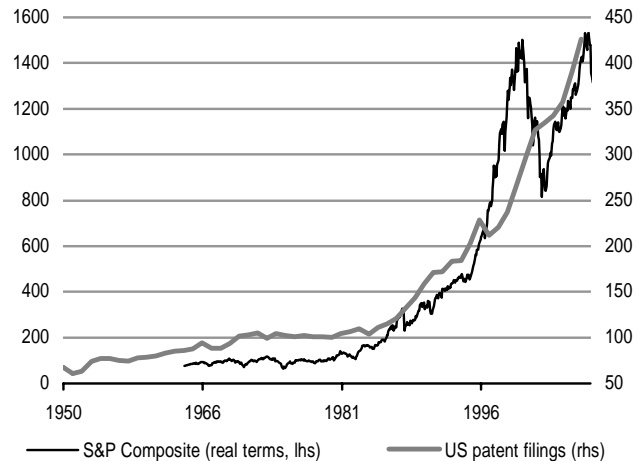
In Figure 10 and Figure 11, we can track close relationships between high school completion in the US and university education in Japan with GDP per capita. The differing experience among still emerging and 'emerged' markets and economies can also be linked to educational attainment and government commitment to education.

Figure 7: Trends in patent filings: Russia, Brazil and India



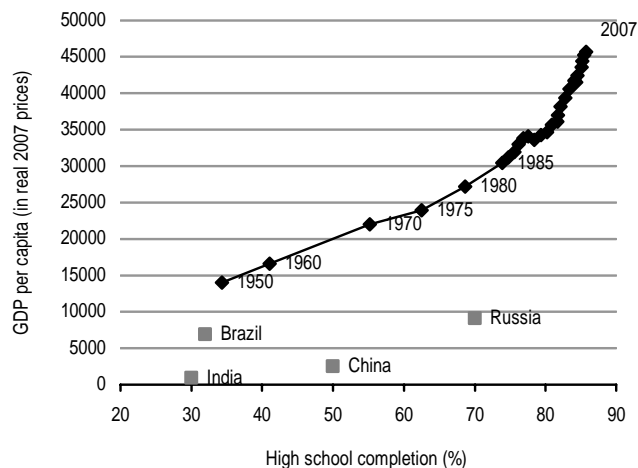
Source: WIPO, Credit Suisse research

Figure 9: US patent filings and S&P performance



Source: WIPO, S&P, Credit Suisse research

Educational impact: a key 'measurable'

Figure 10: US GDP per capita vs high school completion rates

Source: U.S. Department of Commerce, © Datastream International Limited ALL RIGHTS RESERVED, UNESCO, Credit Suisse research

Differences in the Latin American and Asian growth experiences of the last 30 years can partly be explained by differences in the extent and quality of education. In 1970, 16.8% of the Latin American population over 15 years of age and 15.7% of the equivalent Asian population had completed secondary education. By 2000, the Asian emphasis on education meant that this had increased to 44.4% of over 15 year olds compared to just 35.8% in the case of Latin America. Real GDP growth averaged 8.1% and 3.5% for Asia and Latin America, respectively, between 1970 and 2000.

Figure 12: Asia vs Latin America: education and growth

	Asia (ex Japan)	Latin America
% of over 15 year-old population that has completed secondary education		
1970	15.7%	16.8%
1980	26.9%	23.3%
1990	37.4%	29.6%
2000	44.4%	35.8%
Avg real GDP growth (1970 – 2000)	8.1%	3.5%

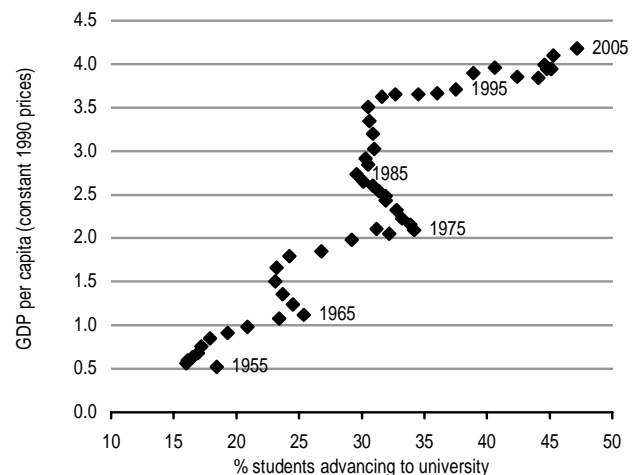
Source: Barro-Lee data, IMF, Credit Suisse research

If we compare current figures for the larger emerging markets it suggests there is plenty of scope for growth if they are able to emulate the success of developed markets, such as the US and Japan. The high school completion rate in China is roughly equivalent to that of the US in 1965; India and Brazil have levels similar to that of the US pre-1950; Russia is comparable with the US around 1980. A point that also emerges from our sector analysts' views later is that a combination of greater educational attainment and investment in the latest technology can significantly shorten the 'catch-up' process.

Stability not democracy

We would note that the caricatured notion of a 'fair society' is not necessarily a prerequisite for intangible infrastructure to function.

In the political-economy field, a good deal of the academic literature that links income and economic growth to 'intangibles' has focused on democracy. At a broad level, the relationship between democracy and development is a close one, although the causality of this relationship is increasingly questioned within the academic literature. What is instead the emerging consensus is that institutions and intangible factors like the rule of law matter more for economic development than democracy itself.

Figure 11: Japan GDP per capita vs % of students advancing to university

Source: Japan Ministry of Education, © Datastream International Limited ALL RIGHTS RESERVED, Credit Suisse research

Asia left LatAm behind, with education a key differentiator

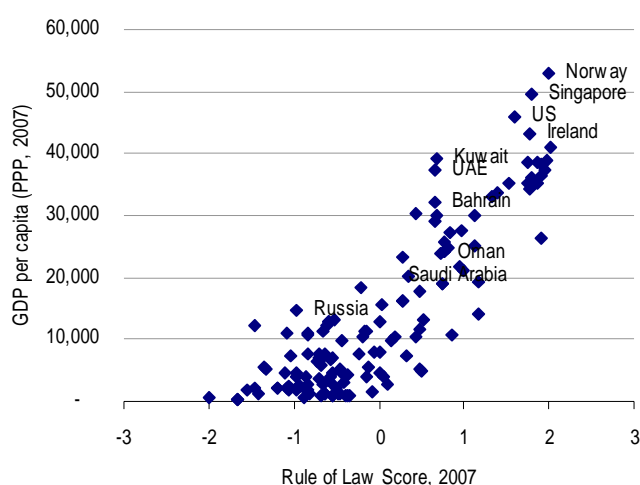
Plenty of scope for education-led growth in BRIC countries

It doesn't have to be 'fair'

Asia is a good example here. The 'Sinatra' doctrine ('do it my way') of the highly globalised Asian states, like Hong Kong and Singapore and of course China, has seen highly successful economies built not in a democratic environment but in the context of centralised control structures. The example of the wider Asian region also shows that the existence of a functioning democracy is not a necessary factor in economic development. However, what does appear to be key is some form of 'order' or institutional structure that can drive change through an economy.

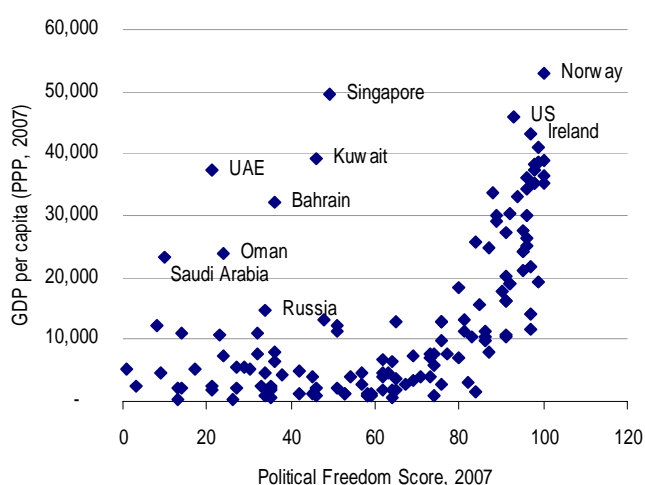
Our own findings suggest that institutions, or at least the quality of institutions, drive the distribution of resources in an economy, and the way incentives and contracts are set up. Decent institutions encourage trust, investment in human capital and help to lower the friction of doing business. A simple illustration of the point is to compare the fit of GDP per capita with (a) World Bank data that scores the Rule of Law in each country and (b) Freedom House data on the scope of political freedom. The data clearly shows that the Rule of Law (R-squared of 0.67 with GDP) is far more important as a determinant of economic success than political freedom (R-squared of 0.28 with GDP).

Figure 13: Rule of Law Score vs GDP per capita (PPP)



Source: World Bank, IMF, Credit Suisse research

Figure 14: Political Freedom Score vs GDP per capita (PPP)



Source: Freedom House, IMF, Credit Suisse research

Why is it relevant now?

While the elements of intangible infrastructure are perhaps compelling drivers of long-term growth, the key is why is it important now. We see a series of factors why such expenditure is likely to grow strongly in the emerging world in the years ahead, factors that have in many ways been underscored in their significance by this year's market turmoil.

(1) Government priorities

However important we believe this topic is, more importantly, we can now see that various governments in the emerging economies recognise the merits of achieving greater stability and more economic breadth and that, in order for this to be self-sustaining, it will require significant investment in intangible infrastructure.

- In China, the 17th CPC National Congress (October 2007) called for 'accelerating the transformation of our mode of economic development' from, among other things, 'relying heavily on the increased consumption of material resources to relying mainly on advances in science and technology, improvements in the quality of the workforce and innovation in management'. In line with this, as the global economic slowdown takes hold, it seems likely to us that China will seek to complement government expenditure on physical infrastructure with expenditure on intangible infrastructure. Indeed, the recently announced US\$586bn fiscal stimulus package earmarked a portion of the new funds specifically for upgrades to the healthcare system.

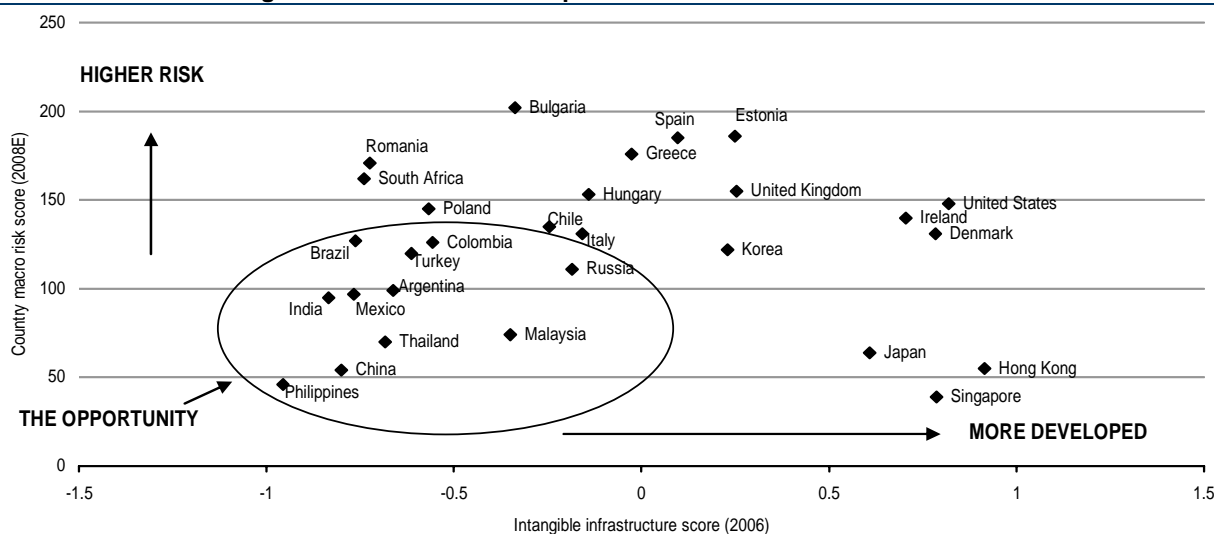
- In Brazil, President Lula has aimed to sustain economic growth through a comprehensive spending programme (known as PAC, announced in 2007). This is engineered to reduce inequalities through a programme of physical infrastructure expenditure (on low-cost housing and transport), but also includes better healthcare. 'PAC da Saúde', launched in December 2007, foresees investments of R\$89bn (US\$44bn) in the healthcare sector until 2011.
- In February this year, in his key policy speech at Krasnoyarsk, President Medvedev outlined his long-term plans for Russia, highlighting that economic modernisation would require support for the rule of law, a campaign against corruption, protection of property rights, and investment in human capital.
- Saudi Arabia prioritised education in the latest budget, setting aside more than a quarter of 2008 expenditure for the development of human resources and scientific and technological research. We calculate Saudi education expenditure is budgeted to increase by 52% this year compared to last, in real terms.

(2) Financial strength and flexibility

Given most of these fine words were offered before the financial crisis this year, how relevant are they now? Most of the larger emerging markets (particularly those in Asia and Latin America) have, in fact, relatively sound financial and balance of payments positions. This implies less long-term damage to the real economy, and a faster recovery than may well be the case for markets that are suffering the combination of high external indebtedness, poor current account and fiscal positions, and high levels of domestic credit. As we illustrate below, Asia and much of Latin America, as well as Russia, look better placed to weather the prevailing economic storm than most of the rest of the world.

Clearly, some elements of the emerging markets continue to be very vulnerable to the credit crunch (Bulgaria, Estonia, South Africa and Hungary). In Figure 15, we have combined a country risk score (on the basis of current account position, external debt ratios, loans to deposits and commodity exposure—see Appendix 2 for the full results) with an aggregate score to summarise the extent of intangible infrastructure development (read on for further details). The chart highlights that many of the key emerging markets (including Brazil, Russia, India and China) offer a combination of low macro risk and low intangible infrastructure development, suggesting both ability and scope to grow the latter.

Figure 15: Macro risk vs Intangible Infrastructure development

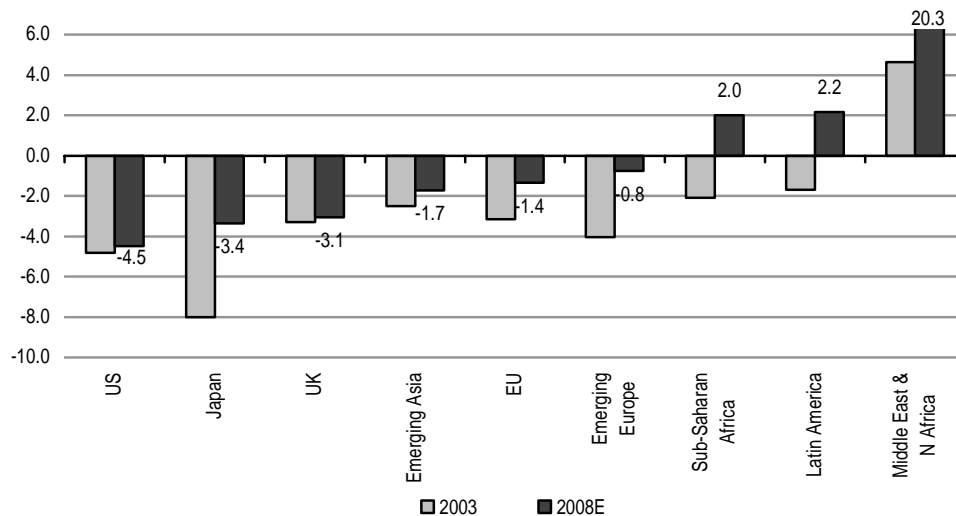


Source: Credit Suisse research

Underpinning the financial resilience in many of these economies are strong fiscal positions. This provides much of the scope for emerging market governments to invest in elements of intangible infrastructure. In many cases, this reflects the boom in government revenues from record highs in commodity prices (as in the Middle East, Latin America, Russia, Nigeria and other African commodity goods producers), but also the higher tax receipts collected in the strong growth environment of the last five years (such as in China, Brazil and India). As we illustrate in Figure 16, the strongest fiscal positions are clearly concentrated in the emerging markets and are generally much improved on five years ago.

Fiscal balances underpin the financial strength

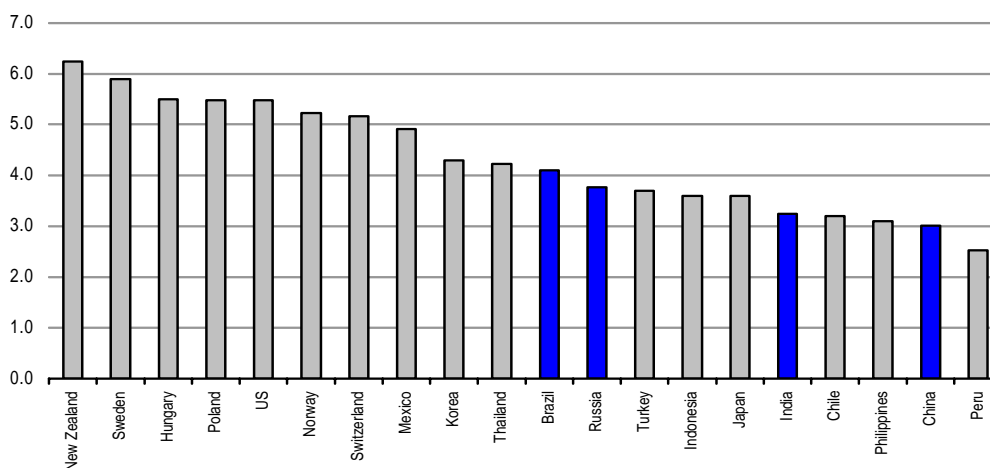
Figure 16: Fiscal balances as % GDP: 2003 vs 2008E



Source: IMF, Credit Suisse research

Indeed, key to our thesis, these healthier fiscal positions are available at a time when the gap between developed and developing market spend on education and healthcare, for instance, is still considerable, in many instances. China's public sector expenditure on education in 2006 was just 3.0% of GDP compared to 5.5% in the US. Our statistical work later shows education and health as major missing pieces of the jigsaw when you compare the new economic superpowers among the BRICs with the old economic superpowers, such as the US, Europe and Japan.

Figure 17: Public sector expenditure on education as % GDP (2006)

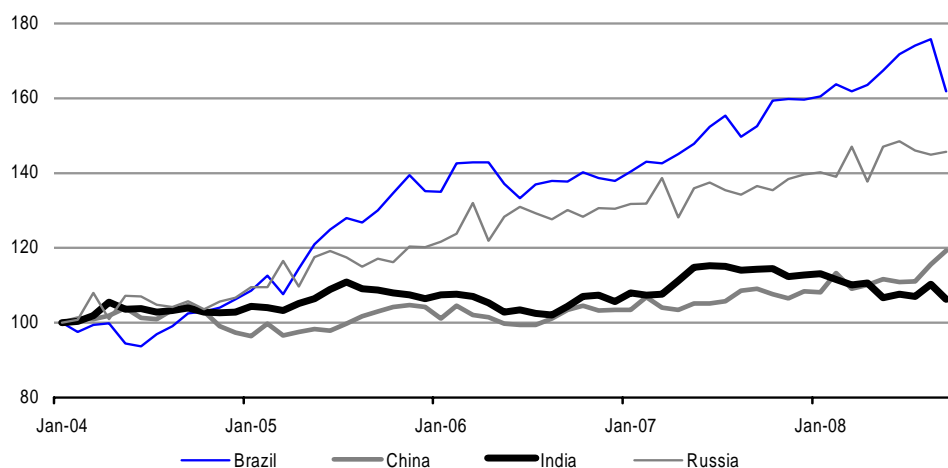


Source: UNESCO, ChinaDaily.com, OECD, CIA, Credit Suisse research

(3) Competitiveness

Notwithstanding recent foreign exchange movements, there has been appreciation of many key emerging market exchange rates over the past five years, posing issues of competitiveness. Take China, as an example. Over the last five years, real wages have risen by 73% and the real effective exchange rate has appreciated by 17%. This has been key to raising China's average standard of living and GDP per capita (from US\$1,270 in 2003 to US\$2,969 in 2008E), but it also threatens China's growth potential as the relative low-cost manufacturer for the rest of the world. All other things being equal, offsetting these higher prices and sustaining growth requires a rise in productivity to increase output and/or the degree of value-add. In addition, productivity, in the form of a better qualified and more efficient workforce is, in turn, a function of 'intangible infrastructure'.

Figure 18: Real effective exchange rates: Brazil, China, India and Russia



Source: BIS, Credit Suisse research

There is plenty of evidence that competitiveness is being eroded in key markets:

- The Shenzhen Bureau of Trade and Industry in China calculated (in March this year) that 119 industrial enterprises (with US\$1.27bn worth of industrial output) were planning to shift production elsewhere to offset rising costs and exchange rate appreciation.
- At the start of September, Tokyo-based HOYA Corporation announced it was shutting down its Chinese subsidiary to transfer its lens-unit manufacturing operations to the Philippines and Vietnam.
- In Q108, China's textile exports to the US fell 10% compared to Q107. Meanwhile, textile shipments from Vietnam to the US increased by nearly 30% in Q108.
- In India, apparel exports are down some 14% in rupee terms in the current fiscal year, the steepest fall in the last five years. In absolute terms, that comes to 400–450 million fewer garments in the current year than in 2005–06. Roughly 680,000 workers have lost their jobs.

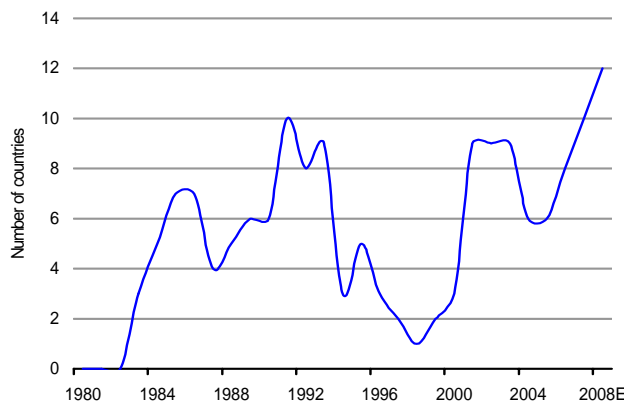
(4) Affordability

Of course, the moves in real exchange rates are in part mirrored in the improvement in living standards through higher wages. Many large emerging markets are now poised to make the next 'structural' step in their socio-economic development, from 'basic needs' type societies to more sophisticated consumption-based societies.

In the last three years, there has been a marked acceleration in the number of emerging markets and the number of people that have tipped over the US\$5,000 per head threshold (on a PPP basis). This is the level at which we can observe a step-up in consumer demand from purely basic needs to more broad-based consumption of goods and services, such as better healthcare and education and more sophisticated financial services and consumer technology. As we illustrate in Figure 19 and Figure 20, 12 countries, accounting for nearly 1.5 billion people, exceeded GDP per capita of US\$5,000 (PPP adjusted) in the last three years.

Consumer 'tipping point'

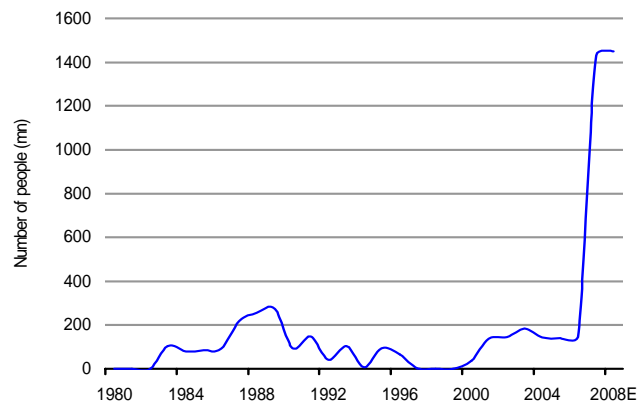
Figure 19: Number of countries exceeding US\$5,000 per head (PPP adjusted*) in the last three years



* We use PPP adjusted data to avoid highlighting simply the effects of a weak dollar on current GDP per capita numbers.

Source: IMF, Credit Suisse research

Figure 20: Number of people exceeding US\$5,000 per head (PPP adjusted*) in the last three years



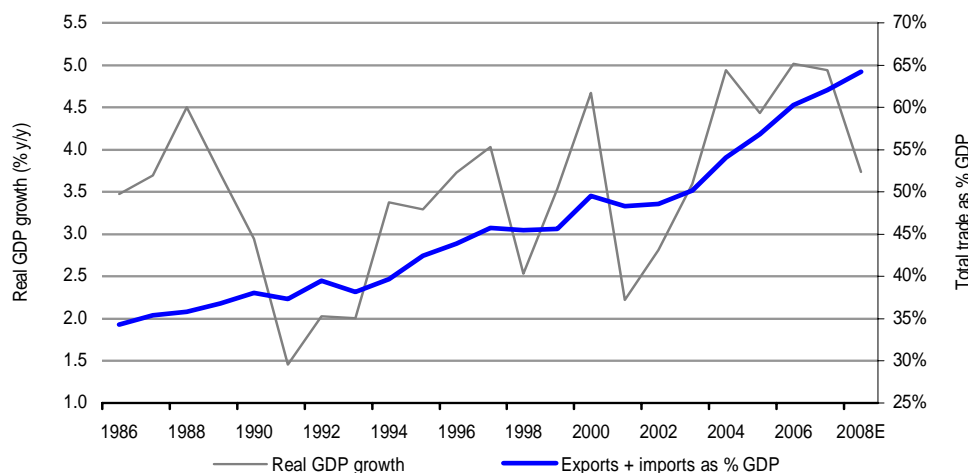
Source: IMF, Credit Suisse research

Even incorporating some fairly pessimistic global growth rates for the next few years, the positive trend in emerging market growth looks set to continue. We expect a further 13 countries (including Indonesia) with a projected total population of 345 million people to cross the US\$5,000 per capita threshold (in PPP terms) in the next five years.

(5) Globalisation and access to capital

Globalisation, which we define as the growing interdependence and integration of markets, economies and societies, has helped accelerate the flow of services and information. By extension, much of globalisation rests on the spread of 'intangible' factors, like international institutions, the patenting of ideas, financial innovation and the diffusion of cultural trends. In this respect, intangible factors like education, investment in research, healthcare, technology and efficient and transparent financial institutions will play an increasingly critical role going forward.

This broad high-level notion does however resonate with the here and now. In many respects, the credit crisis, preceded by high commodity prices, heightens the focus on costs, efficiency and global best practice. In light of this, the trend towards globalisation should continue as companies and consumers seek to minimise their own costs. Global exports to GDP, shown in Figure 21, illustrate the structural aspect of this trend. If anything, previous downturns in global growth have triggered a subsequent step-up in the degree of world trade.

Figure 21: Global real GDP growth vs total global trade as % GDP

Source: IMF, Credit Suisse research

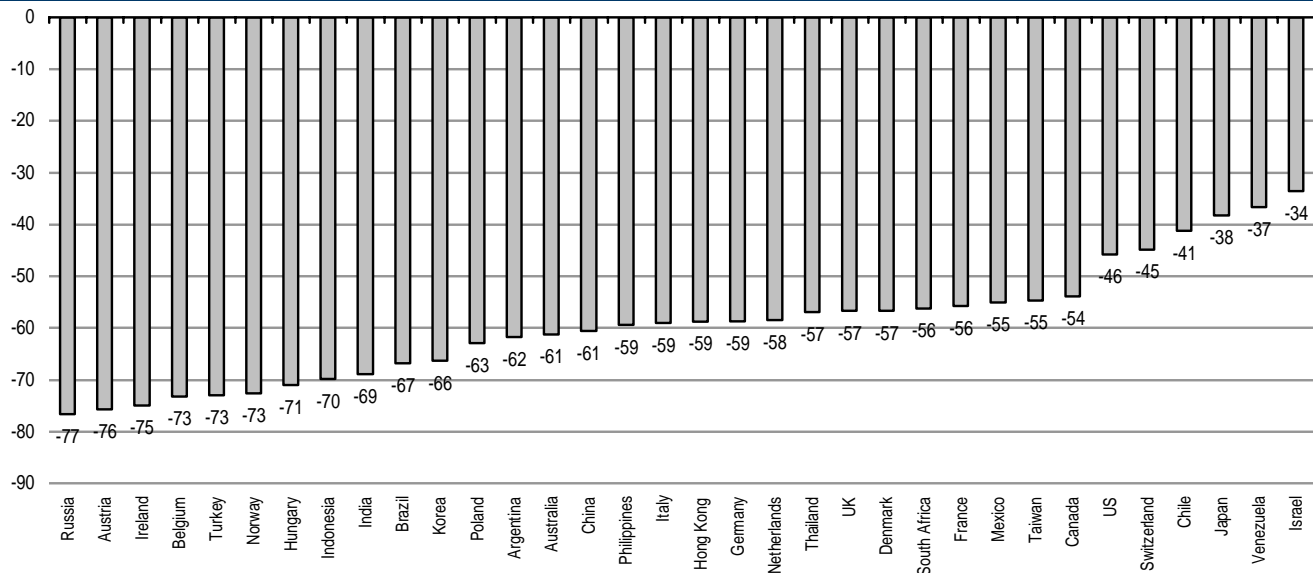
In our view, a specific fallout from the current crisis will be the scrutiny of counterparty risk and the required transparency to assess it. The downside in mis-priced counterparty risk has been shown to be huge. The lesson from this is that in a competitive global marketplace, trading partners require common standards, strong regulation and cohesive financial systems. Those economies seeking to capitalise on another leg-up in the growth in world trade will have to be able to meet a high hurdle rate in terms of standards and the associated transparency, let alone be able to access capital to fund such growth.

Counterparty risk: downside very significant

With the latter in mind, we would highlight the empirical evidence pointing to strong intangible infrastructure as associated with lower cost of capital. Compare two large commodity producers, Canada with Russia, for example: the former is running small current account and fiscal surpluses; the latter has accrued substantial surpluses on the current and fiscal accounts. However, real short-term interest rates in Russia are roughly some 100bps above those of Canada. We would argue that this difference in capital costs lies, partly, in the relative development of the respective intangible infrastructure. More specifically, Russia is forced to pay a premium for capital because property rights are less well defined, the judicial process is more onerous, general education levels are lower, tax enforcement and collection is inferior. Now more than ever, it is literally a matter of national economic importance to reduce capital costs and help mitigate the extent of the economic downturn.

(6) Managing the cycle

Despite all the arguments that suggest that banks and economies in emerging markets were relatively insulated from the US sub-prime market and the global credit crunch, it is hard to tell that this is the case from a cursory glance at stock market performance. Any decoupling theories were blown out of the water with such a synchronised slowdown in the developed world.

Figure 22: Market performance YTD (% change in US\$ terms)

Source: MSCI, © Datastream International Limited ALL RIGHTS RESERVED, Credit Suisse research

These sharp falls in stock markets and similar performance in commodity prices have been a sharp reminder of the boom-bust scenario that so often characterises the growth cycle of primary goods producers or economies largely dependant on the external sector. Suffice it to say, we believe it is less likely that this degree of volatility would persist if these markets transformed themselves into broader, deeper economies with a more mature and independent growth engine in domestic consumption. The evolution to such a model requires considerable investment in intangible infrastructure to foster and develop a cross-section of entrepreneurs and a more mature consumer.

[Back to boom/bust?](#)

Measuring the immeasurable

In order to statistically gauge the degree and effect on growth of intangible infrastructure, we have created the *Credit Suisse Intangible Infrastructure Index* as a means to rank countries and perhaps more importantly track their improvements going forward. In keeping with the five pillars of the report, the index is split into the categories of education, technology, healthcare, financial services and business services. We have constructed a Credit Suisse Intangible Infrastructure Sub-Index for each category and a composite Credit Suisse Intangible Infrastructure Index that encompasses all five sub-indices. In each of the sector sections of the report, we provide detail on how countries rank within this framework.

We adopted two methods to overcome difficulties with measuring 'intangible' concepts: (a) through the use of surveys, which we have labelled 'soft' data. For example, we have integrated qualitative scores on the perception of financial transparency or the ease of credit flows into our Financial Index; and we have used survey data on whether information technology skills are seen as readily available in the construction of our Tech index. (b) we have used 'hard' or factual datasets that reflect the state of intangible infrastructure. For example, we have incorporated the non-performing loan ratio into the Finance index since, to some extent, this reflects the degree and quality of bank sector regulation.

We have two caveats with respect to the index:

- (1) The dataset is only complete for all countries up to the end of 2006. It would, of course, be preferable to have more recent data but we find that the fabric of any one country's intangible infrastructure does not change that much from one year to the next. Hence, we are confident that the relative ranking of intangible infrastructure in 2006 is still relevant today.

- (2) The input variables used to construct each index may or may not have been the most appropriate. For instance, a high ratio of credit to GDP does not necessarily imply an appropriate degree of intangible infrastructure within the banking sector. Nevertheless, we are encouraged by the overall result for the index, which correlates well with levels of GDP per capita.

We would highlight the following features:

1) Statistically significant impact

Regressing the Credit Suisse Indices on GDP per capita growth rates does yield significant results and thus (thankfully) backs our thesis. Our model shows that a 1 point increase in the Credit Suisse Indices raises per capita growth by 0.01–0.02 percentage point for our group of countries, depending on the specific index. Statistically, it is a robust finding, but also conceptually. We remain mindful that many variables enter the equation of measuring economic growth and therefore only a very large move in the Credit Suisse Intangible Infrastructure Index will show an impact on growth.

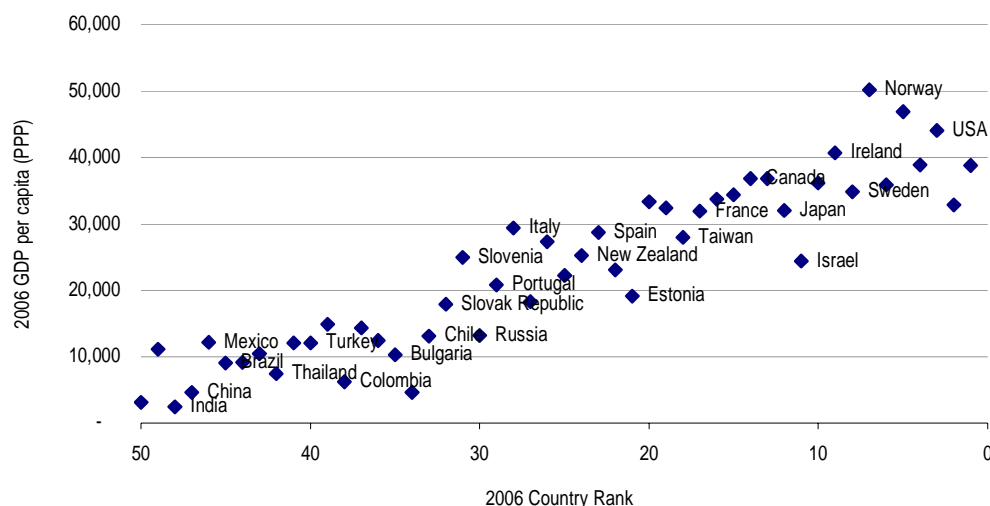
The impact on GDP per capita growth is stronger for developing than for industrial countries. For example, the impact of the total Credit Suisse Intangibles Index on Aggregate Growth is 0.03 (R-sq=41%), with the impact on developing countries being 0.035 (R-sq=48%) and for developed countries being 0.012 (R-sq=39%).

In other words, our analysis suggests that the incremental benefit of an additional unit of intangible infrastructure investment on economic growth is three times larger for emerging countries than for industrial economies.

2) Country ranking

Using the index, we score the quality of intangible infrastructure in each category by country and by year—from 1999 to 2006—out of a total sample of 50 countries. We find the top 10 countries as being Finland, the US, Hong Kong, Singapore, Sweden, Denmark, Japan, Norway, Israel and Switzerland. The ranking is not a surprise. It underscores the implicit role of intangible infrastructure build in achieving economic success.

Figure 23: Credit Suisse Intangible Infrastructure ranking vs GDP per capita (PPP, 2006)



Source: Credit Suisse estimates

By looking at the correlation between the index and the GDP per capita level per year, it encapsulates the relationship between intangible infrastructure build and a country's level of economic activity and wealth creation. The strong link between intangible infrastructure build and the level of economic activity is confirmed by the result. For the six-year time period the correlation is a solid 91%. However, rather than just the static scores, the trends in the rankings are the key focus for us.

3) Education and technology seem key

We can gauge the relative importance of the five different sub-indices. The results suggest education and tech are potentially the most important. To do this we have used Spearman's rank correlation co-efficient. As we show in Figure 24, it is the ranking in the education and tech sectors that correlate most highly with the ranking in the other sectors. In other words, the higher any one country is rated in education and technology, the more likely it is that that country will also perform well in terms of financial services, business services and healthcare. Healthcare has the lowest correlation, on average, with the other sectors (i.e. a high rating in healthcare is the least likely to imply high ratings in the other sectors).

Figure 24: Spearman's Rank Correlation Co-efficient*: 2006 data

	Education	Healthcare	Financial	Tech	Business Services	Average
Education	1.00	0.72	0.77	0.85	0.80	0.83
Healthcare	0.72	1.00	0.62	0.75	0.55	0.73
Financial	0.77	0.62	1.00	0.77	0.76	0.78
Tech	0.85	0.75	0.77	1.00	0.84	0.84
Business services	0.80	0.55	0.76	0.84	1.00	0.79

* the closer to 1, the more significant the result.

Source: Credit Suisse research

4) Where is the catch-up potential?

In Figure 25, we highlight those countries that offer a combination of (a) a current low ranking on the index (rated worse than 20 out of 50) and (b) where momentum in relative rankings is improving (comparing the ranking in 2006 with that of 1999).

Figure 25: Country ranking (2006) and change in rank (1999–2006)

	Improvement in rank (1999–2006)	2006 rank (out of 50)
Colombia	9	38
Korea	7	22
Czech Republic	6	25
South Africa	3	44
Turkey	3	40
Russia	2	30
Brazil	1	45
Chile	1	33
India	1	48
Venezuela	1	49

Source: Credit Suisse estimates

In line with this analysis, the countries that look to benefit from growth in intangible infrastructure are: India, South Korea, Brazil, Chile, Colombia, Venezuela, Czech Republic, Russia, Turkey and South Africa.

5) What about the BRICs?

A key observation in our view is how much further progress the BRIC economies can and need to make in terms of their intangible infrastructure. The prospect of these countries doing so presents a major investment opportunity and adds a different dimension to their investment case to date.

Of the four BRIC markets, Russia has the best momentum and the highest 2006 ranking (30 out of 50). This has been driven by considerable improvements in the Russian rank in our technology index and small improvements in its rank for business and financial services. Albeit from a much higher relative base, Russia has lost some ground in healthcare and education relative to the other main emerging markets.

Brazil has crept up one place (from 46th to 45th) between 1999 and 2006 in our overall intangible index. The improvement has come courtesy of healthcare (up five places, from 50th to 45th position as of 2006). Momentum in education and financial services has been relatively lacklustre.

India has also eked out a small improvement in its overall position within the index between 1999 and 2006, although as of 2006 it was still languishing down at 48th place. Large improvements in its ranking in the education and finance sub-indices were mostly offset by a surprisingly disappointing performance in its technology ranking. While growth in the absolute technology expenditure in India has been substantial over this period, relative *per capita* penetration rates have not outstripped the growth recorded in other emerging markets. This suggests plenty more growth in technology-related demand as GDP per capita increases.

China is fairly lowly rated (47 out of 50) on the latest data in our overall intangible index. Momentum has been poor, slipping two places since 1999. This probably reflects greater government focus on physical rather than intangible infrastructure over the last five years. On the whole, this looks set to change given (1) government commitment to intangible factors (as above) and (2) bottom-up forecasts, where our analysts suggest considerable growth particularly in tech, healthcare and education in China over the next five years.

From top down to bottom up...

In the sections that follow, we look specifically at the background, market structure, regulatory drivers and growth outlook of the listed stocks that can be categorised under our five intangible infrastructure pillars drawing off the feedback of our analysts. We focus primarily on the emerging markets, where we see the best growth potential, but we have also included discussion on developed market stocks that either offer strong emerging market exposure or a guide to best practice. Remember, we do see many instances in which the developed world will export its service sector-oriented skill-sets. We do find that growth projections vary significantly between the sectors and by region and country.

While the detail follows in the chapters ahead, we draw out the following highlights here:

1) Education

As noted above, education is arguably the most significant piece of this intangible jigsaw. This perhaps underscores the high rankings that the developed countries receive given that they dominate global spending on education.

However, in our view, the outlook for growth in education is now much more favourable in the emerging markets than it is for the developed markets. There are four main reasons why: growth in the school age population is faster (2.3% vs -1.3%, respectively, over the next eight years), prevailing enrolment ratios are typically much lower (tertiary enrolment of 41% vs 70% on average), forecast GDP growth (as a proxy for disposable income) is higher and fiscal positions are stronger. In addition, the emphasis that certain emerging market governments (including China, Russia and Saudi Arabia) are placing on the importance of education is encouraging. We find that India, Saudi Arabia, China, SE Asia,

Venezuela and Brazil offer reasonable prospects for increased education spend. Of relevance to investors, of course, is that an increasing provision of this education is taking place outside of the state sector. Meanwhile, with declining school-age populations and limited scope for enrolment ratios to increase further, the growth outlook for the education sector in some of the large developed markets (the UK, Spain, Japan and France) looks relatively poor. The US is perhaps the exception to this rule.

The key merits of the listed companies in this sector are the high barriers to entry, lack of cyclicality in revenues, high margins and strong free cash-flow conversion. We forecast growth rates well into double digits for all the listed emerging market stocks included in our coverage universe.

Figure 26: Emerging market education sector: forecast growth rates

Ticker	Stock	Headquarters	Mkt Cap (US\$mn)	% of revenue from emerging mkts, 2008E	3 year forecast earnings CAGR
AEDU11	Anhanguera Educacional	Brazil	710	100%	44%
KROT11	Kroton	Brazil	160	100%	55%
SEBB11	SEB	Brazil	149	100%	53%
RLSE.SI	Raffles Education	Singapore	675	90%	39%
EDU.N	New Oriental Education	China	1,905	100%	44%
EDSO.BO	Educomp Solutions	India	788	100%	82%
EVSI.BO	Everonn Systems India	India	75	100%	57%
NIIT.BO	NIIT	India	79	47%	-11%
072870.KQ	Megastudy	Korea	656	100%	19%

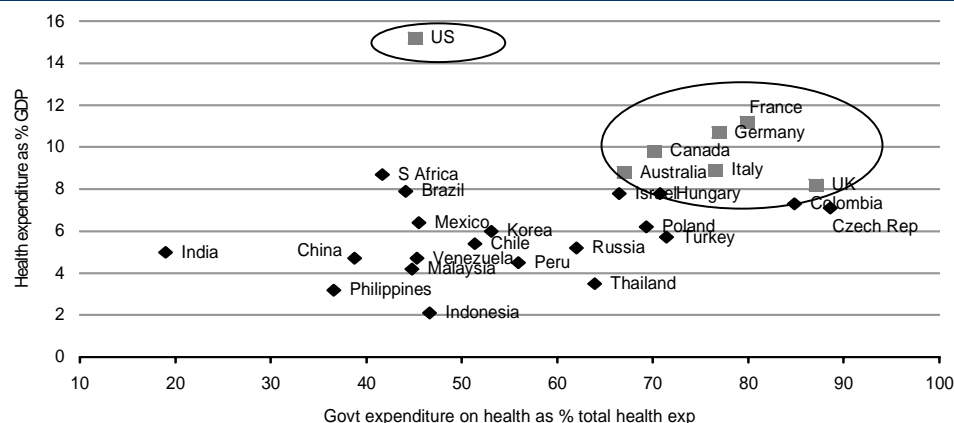
Source: Credit Suisse estimates

2) Healthcare

Globally, we estimate that healthcare is a US\$5.4trn business equivalent to c.10% of total GDP but dominated by spending in the developed world—85% of the total in 2005, despite accounting for only 36% of the global population. However, while the bulk of healthcare expenditure is concentrated in the developed markets, absolute growth has been strongest in the emerging markets (up 72% vs 50% for the developed markets between 2000 and 2005, according to the WHO). Bottom-up forecasts suggest continued strong growth (despite the global slowdown) in emerging market healthcare.

In the aftermath of the emerging market crisis of the late 1990s, healthcare took something of a back seat on the government reform agenda as other matters (banking regulation or external debt financing, for example) took priority. Compared to developed markets, the data clearly illustrate lower levels of healthcare spend in most emerging markets and a lower proportion of government healthcare expenditure.

Figure 27: Healthcare spending as % GDP and government expenditure on healthcare as % total healthcare spend, 2005



Source: UNESCO, Credit Suisse research

However, more recently, healthcare has moved up the priority list in key emerging markets such as China, Brazil and South Africa. In China, for instance, we expect government-led spending on healthcare should boost healthcare expenses as a percentage of GDP from 5% in 2005 to 10% by 2015E. Admittedly, government-led growth in healthcare is hampered by significant public sector financing constraints (for example, in India), but even here we expect growth to be buoyant driven by private, out-of-pocket sales.

Given the financing constraints on governments, demand is focused on lower-cost solutions. This clearly favours generic players. In some cases (Brazil, South Africa, India) governments are explicitly targeting higher generic sales. The private providers of healthcare services are also likely to be a key component in improving provision.

Figure 28: Emerging market healthcare sector: forecast growth rates

Ticker	Stock	Headquarters	Mkt Cap (US\$mn)	% of revenue from emerging mkts, earnings CAGR 2008E	3 year forecast
MR.N	Mindray Medical International	China	1,980	55%	46%
8199.HK	Shandong Weigao Group Medical	China	1,371	100%	50%
KLBF.JK	Kalbe Farma	Indonesia	346	100%	3%
REDY.BO	Dr. Reddy's Laboratories Limited	India	1,454	45%	25%
RANB.BO	Ranbaxy Laboratories Limited	India	1,771	45%	27%
SUN.BO	Sun Pharmaceuticals Industries	India	4,569	50%	9%
CIPL.BO	Cipla Limited	India	3,144	70%	19%
GLEN.BO	Glenmark Pharmaceuticals	India	1,635	50%	13%
LUPN.BO	Lupin Ltd	India	978	58%	16%
NTCJ.J	Netcare Limited	South Africa	1,408	47%	12%
MDCJ.J	Medi-Clinic Corporation	South Africa	995	68%	23%
GDRB.BU	Gedeon Richter	Hungary	2,483	60%	8%
HIK.L	Hikma	London	807	51%	14%
KRKG.LJ	KRKA	Slovenia	2,402	74%	18%

Source: Credit Suisse estimates

3) Finance

It is a tale of two halves: one half of the world is underleveraged (Latin America, most of EMEA, excluding South Africa, and parts of Asia, such as India, Indonesia, Pakistan) and the other half of the world is probably overleveraged (mostly developed markets and some of the larger Asian markets where debt levels are still unwinding from the peaks of the late 1990s). In light of the prevailing credit crunch it seems inevitable that credit/GDP ratios are set to converge, both as lending is curtailed in the highly leveraged markets and financial intermediation continues to grow in the lowly geared emerging markets.

Our emerging market banks analysts specifically highlight two areas where credit levels could afford to be structurally higher: (1) mortgages: in Brazil and Russia mortgage lending on 2007 data came to only 2% of GDP, in Turkey 4%, Czech Republic 10%, and Poland and Hungary both 12%. (2) Micro-finance: we believe there are opportunities in India and Indonesia to extend micro-financing.

Consensus forecasts put long-term growth in the aggregate emerging market banks universe at 12%. Looking beyond the current cyclical downturn, our analysts suggest the best long-term growth opportunities are in Brazil (Itau and Unibanco, who recently announced a merger), Turkey (YKB), Russia (Sberbank) and India (HDFC). We summarise some of our highest forecast growth estimates among the emerging market banks in the table below: The themes that tend to come out from our analysts tend to surround the supply of micro-finance, lending in the Small and Medium Enterprise (SME) space and a greater degree of consumer participation.

Figure 29: Selected emerging market bank stocks: forecast growth rates

Ticker	Stock	Main Listing	Mkt Cap (US\$mn)	% of revenue from emerging mkts, 2008E	3 year forecast earnings CAGR
1398.HK	Industrial and Commercial Bank of China	Hong Kong	163,772	100%	17%
3988.HK	Bank of China	Hong Kong	80,243	60%	11%
HDBK.BO	HDFC	India	7,893	100%	41%
AXBK.BO	Axis Bank Limited	India	2,946	100%	30%
IDFC.BO	Infrastructure Development Finance	India	1,364	100%	15%
PNBN.JK	Panin Bank	Indonesia	877	100%	28%
ITAU4	Itau	Brazil	51,527	100%	13%
BBDC4	Bradesco	Brazil	32,692	100%	8%
BBAS3	Banco do Brasil	Brazil	15,925	100%	15%
BRSR6	Banrisul	Brazil	1,053	100%	23%
GFNORTEO	Grupo Financiero Banorte	Mexico	3,257	100%	10%
COMPARTO	Compartamos	Mexico	636	100%	11%
SBER.RTS	Sberbank	Russia	17,809	100%	20%
STBK.RTS	Bank St Petersburg	Russia	310	100%	29%
VZRZ.RTS	Vozrozhdenie	Russia	270	100%	32%
YKBNK.IS	Yapi Kredi Bank	Turkey	5,305	100%	42%
ABLJ.J	African Bank	South Africa	2,156	100%	40%

Source: Credit Suisse estimates

4) Technology

We need to remind the reader here of the inextricable link between the hardware and software aspects of technology, as it is reflected in the stocks that emerge in our analysts' recommendations. If software carries the purer notion of the intangible economy, it still cannot function without hardware. Hence, our analysts highlight stocks from both areas, including also the telecom space.

More generally, the main thrust of our analysts' bullish argument on technology is that from 2001 through 2007, technology suffered from a prolonged cyclical overhang of excess capacity built as a result of the Internet/Y-2K/Dot.com bubbles. In addition, unlike other parts of the economy, technology was **not** well levered to the early phase of development in emerging markets—i.e. the tangible infrastructure investment needed to transform an essentially rural population into a more urban one.

From here, emerging economies complementing their tangible with intangible infrastructure investments should be a structural driver of growth for technology companies as the services and consumer sectors become more substantial parts of economic activity within these regions. Our analysts also believe that in more *developed* nations, an understanding that ongoing investment in intangible infrastructure is also needed to continue to drive productivity and maintain global competitiveness adds further impetus for growth in the sector.

Securing the most recent technology allows emerging markets the ability to accelerate the 'catch-up' process with developed countries. We believe the countries best set to exploit this are China, India, Korea, Malaysia and Russia.

Notwithstanding the nearer-term cyclical concerns to earnings, our bottom-up analysis reflects strong structural earnings forecasts for areas of our technology coverage universe. Specifically, we expect strong growth from companies with a high proportion of emerging market sales and those that rank among the lowest-cost producers. The product areas of particular interest include virtualisation and other software platforms, internet portals, mobile penetration.

Figure 30: Selected emerging market tech stocks: forecast growth rates

Ticker	Stock	Main Listing	Mkt Cap (US\$mn)	% of revenue from emerging mkts, earnings CAGR 2008E	3 year forecast earnings CAGR 2008E
0700.HK	Tencent Holdings	HKG	9,849	100%	42%
BIDU.OQ	Baidu	NSM	4,866	100%	44%
KONG.OQ	Kongzhong	NSM	119	100%	35%
PWRD.OQ	Perfect World Co Ltd	NMS	1,003	100%	41%
NTES.OQ	Netease.com	NSM	2,309	100%	21%
NCTY.OQ	THE9 Ltd	NSM	364	100%	15%
SINA.OQ	Sina Corporation	NSM	1,670	100%	35%
035720.KQ	Daum Communications	KOE	247	100%	61%
095660.KQ	Neowiz Games Corp	KOE	113	100%	19%
035420.KQ	NHN Corp	KOE	3,820	100%	23%
2317.TW	Hon Hai Precision	TAI	14,342	100%	4%
0763.HK	ZTE	HKG	2,960	100%	53%

Source: Credit Suisse estimates

5) Business services

There is still a structural story of relevance in the developed world, but the current cyclical pressure on corporate spending is reflected in a clouded outlook for earnings. There also seems little doubt in our mind that the growth in business services in emerging markets will be superior to the equivalent in developed markets. For instance:

- In the outsourcing division, Gartner expects worldwide spend on IT services to increase by 7.4% CAGR over 2007–12. Within this, emerging countries are expected to grow most quickly, by a 10–16% CAGR over 2007–12 vs 5–7% for developed markets.
- The global money transfer industry market was worth over US\$320bn in sales in 2007, but we expect it to top US\$500bn within the next five years, delivering a CAGR of c.9%. Revenue growth is expected to be strongest from China, India and Latin America.

However, isolating the emerging market growth potential is more difficult in this sector than in any of the others given the global nature of many of the main corporate players. It is hard to find pure-plays.

Hence, the likes of Western Union (in the global money transfer industry) or Accenture (a key competitor in outsourcing and consulting) have significantly diversified their geographical base and compete for business very effectively in the emerging market arena as well as in developed markets. Ultimately, given the poor global growth outlook, this implies less scope to capture strong earnings growth in individual stock names. That said, we still find several companies that are expected to deliver above-average earnings growth over the next couple of years. Specifically, we consider stocks that operate in the outsourcing industry, the money transfer industry and provide services that facilitate world trade (such as logistics, certification and legal advice).

Figure 31: Selected business services stocks: forecast growth rates

Sector	Ticker	Stock	Main Listing	Mkt Cap (US\$mn)	2 yr forecast earnings CAGR
Outsourcing and computer services	HPQ	Hewlett-Packard	NYS	89,364	2%
	IBM	International Business Machines	NYS	112,535	7%
	MINT.BO	Mindtree Ltd	BSE	179	18%
	SATY.BO	Satyam Computer	BSE	3,302	18%
	TCS.BO	Tata Consultancy Services	BSE	11,094	13%
	WIPR.BO	Wipro Ltd.	BSE	7,182	18%
Money Transfer	WU	Western Union	NYS	9,783	8%
Inspection, verification, testing and certification	SGSN.VX	SGS	Switzerland	6,481	14%

Source: Credit Suisse estimates

Intangible Infrastructure: The 'Five Pillars'

Education: spreading the word

Key findings

- Education is essentially a primary building block of intangible infrastructure. Without a basic level of knowledge and understanding in the population, it is difficult to implement widely the other aspects of intangible infrastructure that appear necessary to sustain higher GDP per capita.
- This notion is borne out by the correlation statistic (85%) between GDP per capita and our Credit Suisse Education index. We note that our Education index points to a possible threshold of development past which correlations with GDP per capita break down.
- Despite faster growth rates observed in some of the emerging economies in the past five years, education spend is still very much skewed towards a handful of more developed countries. The education budget of Germany, for instance, is larger than the education expenditure of the entire sub-Saharan African region.
- We consider the outlook for school-age demographics, enrolment ratios and the outlook for affordability to try to determine medium-term growth in education spending.
- We find that India, Saudi Arabia, China, South East Asia, Venezuela and Brazil offer reasonable prospects for increased education spend.
- With a contracting school-age population and limited scope for enrolment ratios to increase further, the growth outlook for the education sector in some of the large developed markets (UK, Spain, Japan and France) is relatively poor.
- The key merits of the listed sector are the high barriers to success, lack of cyclicalities in revenues, high margins and strong free-cash-flow conversion. Generally, Credit Suisse's analysts forecast growth rates for the sector well above GDP rates.

Figure 32: Education sector: Investment recommendations

Raffles Education: Exposed to fast-growing Chinese demand for education Raffles Education is currently the largest private education service provider in the Asia-Pacific region. China is the key contributor to revenue (80% in FY08). Rising affluence across Asia and constraints on the public infrastructure, coupled with supportive government policies, should continue to drive demand for private education services. We forecast a 44% earnings CAGR for Raffles from FY08 to FY10.	Ticker: RLSE.SI Rating: Outperform Su Tye Chua
Educomp: K-12 education in India Educomp is a leader across segments in K-12 education industry in India. We forecast an 82% 3-year EPS CAGR on the back of education spend as a rising priority for the family and government.	Ticker: EDSO.BO Rating: Outperform Sunil Tirumalai
New Oriental: Niche player in China's education market New Oriental focuses on overseas test preparation and English language training, two strong and growing niches in the education market in China. We expect New Oriental to sustain earnings growth well above 30% into the medium term.	Ticker: EDU.N Rating: Outperform Marisa Ho
Estacio Participacoes: Training young workers in Brazil Estácio Participações (ESTC3) is one of the largest for-profit post-secondary companies in the education sector in Brazil, with close to 200k students and 77 campuses. Most of the students enrolled are young workers in the mid to low income bracket, which we believe has strong growth potential.	Ticker: ESTC3 Rating: Outperform Luiz Otavio Campos
K12: A niche market in virtual public schooling K12 is a leading provider of publicly funded wholly online education to virtual public K-12 schools. We believe the large and under-penetrated addressable market lends itself to strong growth. We (conservatively) model 26% and 35% 5-year revenue and EBITDA CAGRs.	Ticker: LRN Rating: Outperform Kelly Flynn

Source: Company data, Credit Suisse estimates

The Credit Suisse Education Index

Figure 33: Country ranking (2006) and change in rank (1999–2006)

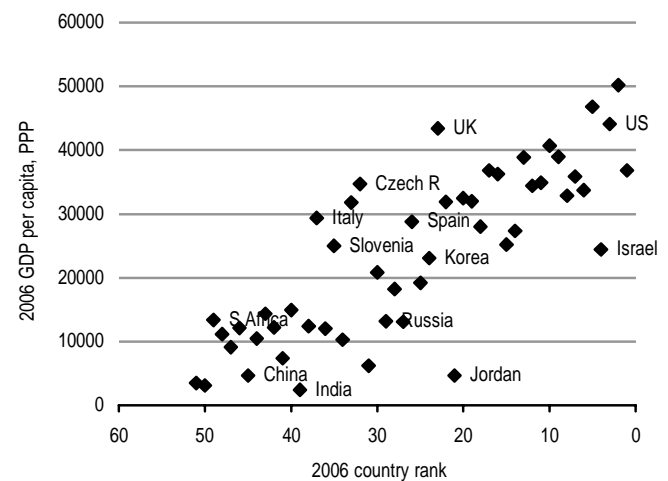
	Country	Improvement in rank (1999 - 2006)	2006 Rank (out of 51)
1	India	9	39
2	Chile	8	27
3	Colombia	6	31
4	Korea	4	24
5	Portugal	4	30
6	China	3	45
7	Indonesia	0	51
8	South Africa	0	49
9	Thailand	0	41
10	Brazil	-1	47
11	Czech R	-1	32
12	Russia	-1	29
13	Venezuela	-1	48
14	Argentina	-2	36
15	Mexico	-2	42

Source: Credit Suisse research

The Credit Suisse Education Index is a macro-oriented guide to investment decisions in the education sector by country and/or region. It effectively ranks 51 countries' ability to maintain an environment that sustains the development of financial infrastructure; and measures its relation to wealth creation and economic growth.

We have identified nine 'hard' and eight 'soft' data series—see Appendix 1. 'Hard' data analyse education as it can be readily measured, and we apply a two-thirds weight; 'Soft' data analyse education as it can be perceived, and we apply a one-third weight.

Figure 34: Education ranking vs GDP per capita (PPP, 2006)



Source: Credit Suisse research

Our correlation analysis points to a well defined relationship between our proprietary Credit Suisse Education Index and the level of GDP per capita, when all 51 countries are considered together. The overall correlation with the benchmark was 85%. It shows that the Credit Suisse Education index has a strong correlation with a country's development of income/wealth.

We have identified a few countries that present specific growth potential for education infrastructure. These are India, Chile, China, Thailand, South Africa, and Venezuela. Of note, not all regions present uniform correlations between the Credit Suisse Education Index and GDP per capita levels; and our analysis points to a possible threshold of development level, past which correlations with GDP per capita turn negative (e.g., Taiwan and Singapore).

The index has a statistically significant positive effect on GDP per capita growth, with an average one unit change in the index producing a 0.02pp change in the GDP per capita growth rate. (The R-squared for this regression is 42%.)

Education and the rise in 'for-profit' provision

The education sector accounts for the greatest budgetary expense in 32 out of 125 countries, on our estimates. According to UNESCO, the global education budget came to US\$2.46trn (on a PPP basis) in 2004 (latest global data available). However, since a large amount of education spending depends on public financing and management, the sector accounts for just 0.2% of the MSCI global index. Nevertheless, the 'for-profit' education sector has been growing for several years now fuelled by a combination of private-sector demand and public-private partnerships, particularly in the emerging markets.

In this section we consider the dynamics of the global education sector, historical growth rates and growth projections. We look in more detail at the industry trends in the main emerging markets of the listed sector: Brazil, Korea, China and India. We also include a discussion of the US for-profit education sector.

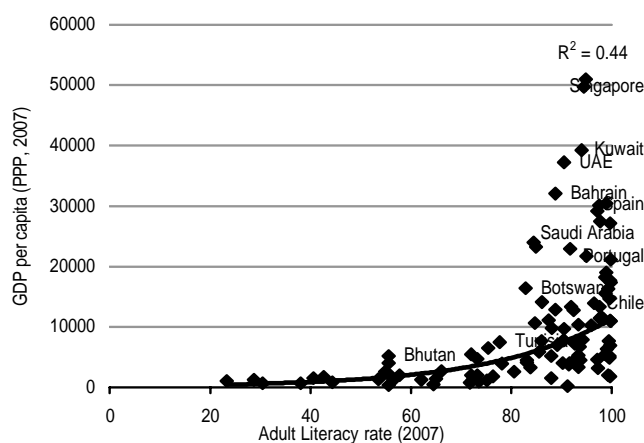
Although the for-profit sector in the US is more mature than it is in the abovementioned emerging markets, US companies do provide a 'best in class' template in terms of the 'for-profit' model and provide context to the theme. Moreover, we think they can be considered a derivative emerging market play, as a) relative to the not-for-profit sector, the for-profit sector disproportionately serves the rapidly growing population of Hispanic immigrants in the US; and b) certain US companies, such as Apollo Group, have started to expand into emerging markets, largely via acquisitions.

Financing constraints are already starting to dampen operating margins and cash-flow conversion in the US sector. In contrast, across Asia, education financing continues to be strongly supported by rising real wage growth and government initiatives, reflecting fiscal strength.

The role of education in growth

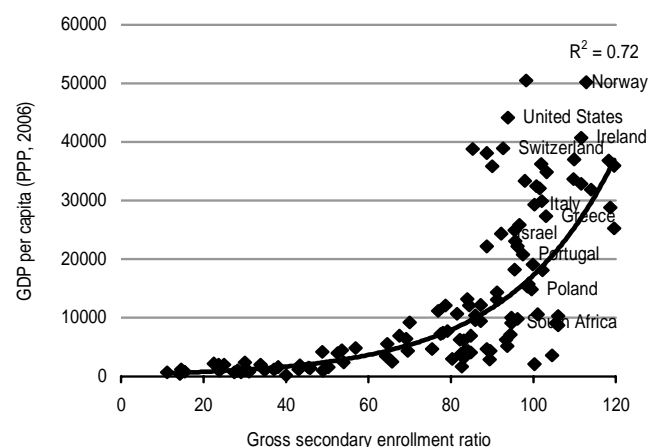
There is a strong link between education attainment and the level of GDP per capita. In Figure 35, we plot the relationship between literacy and GDP per capita (R^2 of 0.44) and in Figure 36, secondary school enrolment and GDP per capita (R^2 of 0.72). This summarises the role of education within intangible infrastructure—i.e., there is a relationship between higher levels of income and better education—but only up to a point. Analysis of our Credit Suisse Education Index points to a possible threshold of development level, past which correlations with GDP per capita break down.

Figure 35: Adult literacy rates vs GDP per capita



Source: IMF, UNESCO, Credit Suisse research

Figure 36: Secondary school enrolment vs GDP per capita



Source: IMF, UNESCO, Credit Suisse research

The 'for-profit' education sector has been growing for several years now

A strong link between educational attainment and GDP per capita

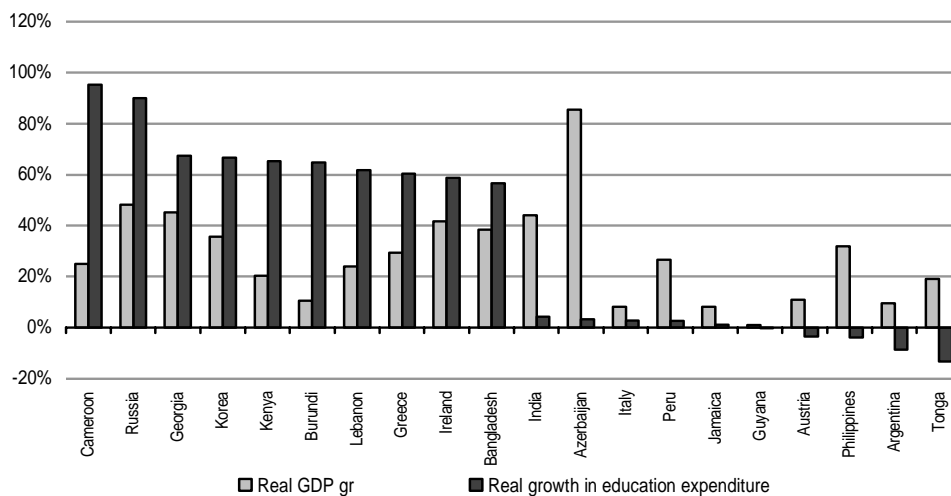
Who pays the fees?

In most countries, the state plays the predominant role in the management and financing of the education system. We calculate that on average for the main developed and emerging markets, private school enrolment comprises on average 14% of the total at the primary level, 19% at the secondary level and 33% at the tertiary level.

Between 1999 and 2005, global public sector education spending kept pace with real GDP growth. In 1999, global public education spend was 4.6% of GDP; in 2005 it was 4.8% of GDP. Growth in education spend has been strongest in mostly emerging markets (Cameroon, Russia, Georgia, Korea) and weakest in countries with fiscal problems (Argentina, Philippines). Growth in public sector education spending was also relatively subdued in India between 1999 and 2005.

Mostly publicly funded

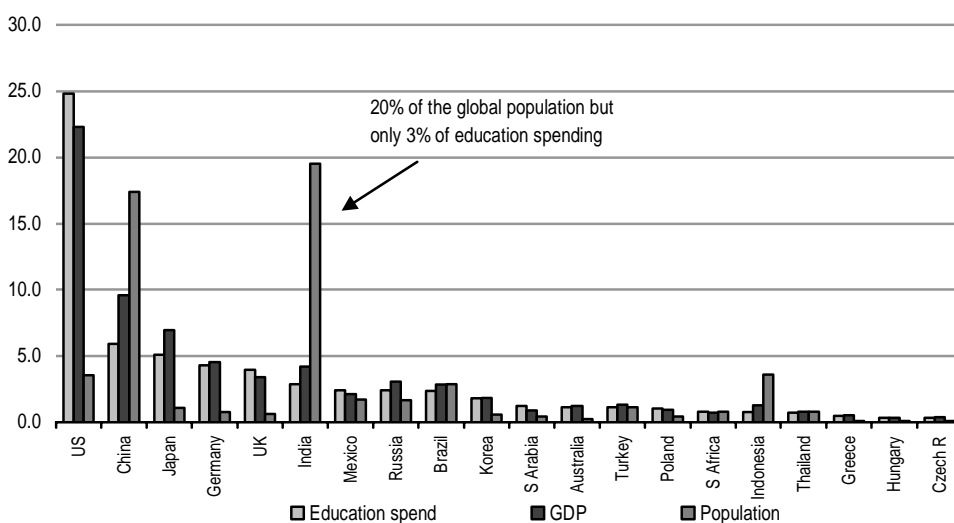
Figure 37: Real GDP growth and real growth in public sector education spending (2005/1999)



Growth in education spend has been strongest in mostly emerging markets and weakest in countries with fiscal problems

Source: IMF, UNESCO, Credit Suisse research

Figure 38: Public expenditure on education, GDP and school-age population as % world total (2005)



Nevertheless, spending is still very much skewed towards a handful of more developed countries

Source: IMF, UNESCO, Credit Suisse research

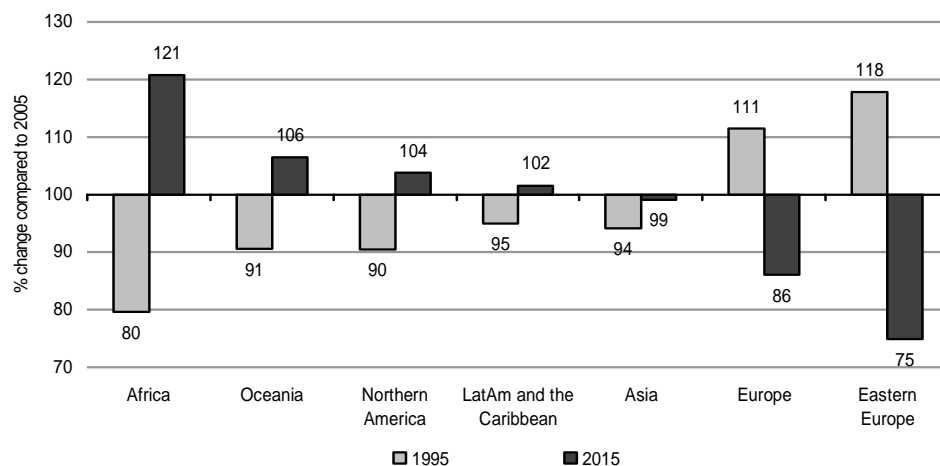
However, despite the faster growth rates observed in some of the emerging economies, spending is still very much skewed towards a handful of more developed countries. The US, which accounts for only 3.5% of the world's school-age population, accounts for 25% of the global education budget. Sub-Saharan Africa spends only 2.4% of the world's education resources for 15% of the school-age population. The education budget of Germany is larger than the education expenditure of the entire sub-Saharan African region.

The education scorecard

Where will education spending head from here, which countries see the greatest demand for it and—equally importantly—have the ability to fund it? We draw on three sets of basic data that may help determine growth in education spending over the next 10 years or so, and help rank countries in terms of the conditions in place that point to potential future spending trends—an effective 'scorecard'.

(a) Demographics. Figure 39 shows that the school age population is growing most quickly in Africa and is set to decline marginally in Asia by 2015. Europe and Eastern Europe seem set to see the largest regional declines in school age population between 2005 and 2015. Globally, there is set to be a marginal increase in the school-age population (up by 2% in 2015 compared with 2005).

Figure 39: School age population (ages 5–24) in 1995 and 2015 as a % of 2005 by region



Growth in the school age population is likely to be quickest in Africa. The growth outlook appears the worst in Eastern Europe

Source: UN Population Division, Credit Suisse research

Within Asia, India should see a continued rise in the school-age population (6% by 2015 compared to 2005). Meanwhile, Japan, China and Korea are all set to undergo declining school-age populations over the period (-11%, -12% and -17%, respectively). The school-age population also continues to grow in the US (another 5% by 2015 vs 2005, according to the UN). This largely reflects the strong immigration rate and rising proportion of Hispanic students. Most other developed markets are set to see declines in the school-age population or, at best, only tentative growth rates (UK -3%, Spain -3%, Italy -2%).

The US is one of the few developed markets where the school-age population looks set to grow

(b) Enrolment ratios. Even where the school-age population is set to decline, education spend may increase as enrolment and attainment increases. China is a good example: tertiary enrolment increased from 10% to 22% between 2001 and 2006.

(c) Affordability. As illustrated above by the unequal distribution of education budgets, higher incomes clearly imply higher education spend. One basic indicator is the projected rate of real GDP growth (which is strongly correlated to personal income growth).

Figure 40 combines these datasets (demographics, enrolment momentum, latest enrolment numbers and GDP forecasts) and ranks the results. On these measures, we find that India, Saudi Arabia, China and Malaysia offer reasonable prospects for increased education spend. The growth outlook in some of the large developed markets (UK, Spain, Japan and France) looks relatively poor.

Figure 40: Assessing the growth prospects for education spend

	Gr in school-age popn		Momentum in tertiary enrolment		Tertiary enrolment		Real GDP forecast		Overall rank
	2015/2005	Rank	2006–2001	Rank	2006	Rank	2012/2007	Rank	
India	6%	4	2%	25	12%	1	8.0%	2	1
Saudi Arabia	15%	1	7%	15	29%	9	5.5%	9	2
China	-12%	23	12%	8	22%	4	9.8%	1	3
Malaysia	6%	3	3%	22	29%	8	5.7%	8	4
Philippines	13%	2	-2%	28	28%	7	6.0%	5	5
Indonesia	-1%	14	3%	24	17%	3	6.5%	3	6
Venezuela	5%	5	24%	3	52%	15	3.2%	21	6
Brazil	0%	12	8%	13	25%	5	4.2%	16	8
Turkey	-1%	15	11%	9	35%	10	4.7%	12	8
Peru	0%	11	3%	21	35%	11	5.9%	6	10
S Africa	3%	7	1%	26	15%	2	4.4%	14	10
Chile	-5%	19	9%	11	47%	13	5.1%	10	12
Thailand	-7%	20	7%	17	46%	12	5.8%	7	13
Mexico	0%	13	6%	20	26%	6	3.7%	18	14
Czech R	-16%	25	19%	4	50%	14	4.2%	15	15
Argentina	1%	9	6%	18	64%	19	4.1%	17	16
US	5%	6	12%	7	82%	26	2.2%	25	17
Poland	-26%	27	11%	10	66%	20	4.8%	11	18
Greece	-11%	21	36%	1	95%	28	3.5%	19	19
Russia	-26%	28	7%	14	72%	24	6.2%	4	20
Italy	-2%	16	15%	5	67%	21	0.7%	28	20
Hungary	-14%	24	28%	2	69%	23	3.1%	22	22
Korea	-17%	26	13%	6	91%	27	4.5%	13	23
Australia	1%	8	6%	19	73%	25	3.3%	20	23
France	1%	10	3%	23	56%	16	2.1%	26	25
Japan	-11%	22	8%	12	57%	17	1.6%	27	26
Spain	-3%	18	7%	16	67%	22	2.8%	23	27
UK	-3%	17	0%	27	59%	18	2.5%	24	28

Source: UNESCO, IMF, Credit Suisse research

The listed education sector

At present, the listed education sector comprises c.20 sizable companies. Among the key merits of the sector are strong growth, high barriers to success, lack of cyclicity in revenues, high margins and strong free-cash-flow conversion. Generally, Credit Suisse's analysts forecast growth rates for the sector well above GDP rates:

- In the US, we forecast total post-secondary enrolment growth of 2–3% on a three–five year CAGR. This translates into an expected for-profit post-secondary revenue CAGR of 7–9%.
- In Brazil, we forecast new enrolments for the post-secondary level rising to 1.5 million by 2010 (from 1.2 million in 2005), equal to a CAGR of 4.6%. This would take total enrolments to 6.7 million by 2010E, giving a CAGR of 12.5% between 2007 and 2010E.
- We forecast a 44% earnings CAGR from FY08 to FY10 for Raffles Education (80% of its revenues were generated in China in FY08 and 11% in Singapore).

Growth rates for the education sector are generally well above GDP growth rates, on Credit Suisse forecasts

On the downside there is the question of financing. Ultimately, this appears to be a much greater risk for the developed markets, where the effects of the credit crunch are the most acute. In the US, for instance, more companies, such as ITT, are increasingly using their own balance sheets to lend to students. Cash-flow deterioration is already visible and we expect it to continue. In key emerging markets, the generally low leverage of the consumer sector, rising real wages and (mostly) healthy fiscal balances are supporting strong growth in private sector education spending, despite the credit crunch.

The developed market model—the US

While our approach in this report is to consider how the existence and development of 'intangible infrastructure' can drive and deepen the nature of economic growth in emerging markets, the experience and structure of major developed economies is important to consider here. As explained above, developed markets dominate global education spend and how the more successful economies have shaped their education structures provides important background. We specifically look at the US given it is a centre for the 'for-profit' sector and also as several US companies have considerable potential for expansion in emerging markets, as well as the intention to do so.

The 'Regulatory Triad'

The US education industry is highly regulated by various constituents, including the Federal Government (through the Department of Education), accreditors and states; in aggregate, these three constituents are often referred to as the 'Regulatory Triad'. Most statutes and regulations serve, directly or indirectly, to ensure that government financial aid is only provided to schools that deliver reasonably positive outcomes to students and that consumers are not defrauded.

The higher education addressable market is large and the for-profit sector still accounts for a relatively small share—6% of total post secondary enrolment in 2005, compared to private not-for-profit at 20% and the rest in the public domain, according to the US Department of Education. Of the 17.5 million students currently in higher education in the US, 39% are over 25 and 38% are part time.

In 2007, approximately 30% of the US population aged 25 years and above had earned a bachelor's degree or higher; 14% had not completed high school. A US Census Bureau report forecasts the proportion of students graduating high school will be between 87% and 91% by 2028 and that 27–31% will attain bachelor's degrees. On average during 2007, individuals with some college/associate's degree, bachelor's degree and advanced degree earned on average 17%, 63% and 105% more, respectively, than those with only a high school diploma.

Enrolment projections: Total post-secondary enrolments should grow at a 2–3% three- to five-year CAGR

We model a total post-secondary enrolment CAGR of 2.9% from 2007 to 2012E. We use regression analysis to derive our post-secondary enrolment growth forecasts. The independent variables we use in our regression are:

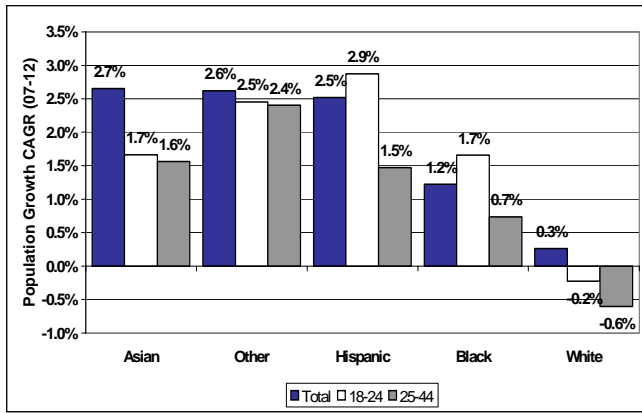
- *Unemployment growth for 18–24 population since 1970*: Captures impact of both demographic and economic factors.
- *Real personal disposable income growth since 1970*: Captures students' ability to afford tuition and related expenses.
- *PC penetration since 1990*: Captures the internet's contribution to post-secondary enrolment growth.

We expect enrolment growth to result from a combination of population growth (a 0.3% CAGR between 2007 and 2012E) and rising enrolment rates (a 2.7% CAGR between 2007 and 2012E).

We expect enrolments of traditional college-aged students (i.e., 18–24 years old) to grow faster than enrolments of older students (25–44 years old), due to differences in population growth. Of note, the growth of the 18–24 year old population will begin to decelerate in 2010 (according to the UN), which we expect will have a modest negative impact on sector growth. We expect online growth to slow as the market matures, but we still expect its growth to outpace on-ground growth. We estimate that approximately 60% of students that attend school online would not attend at all if an online facility was not available. Although

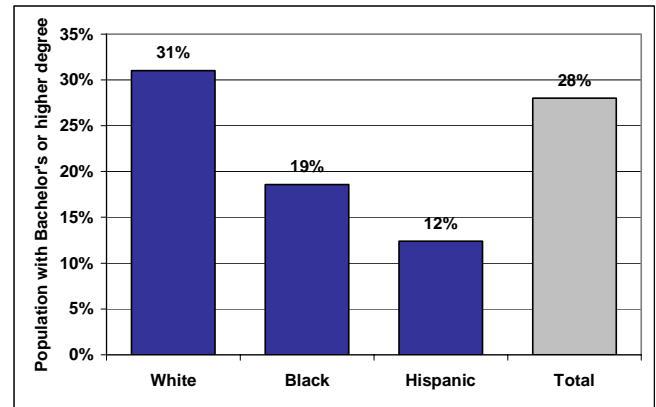
we do not have forecasts for enrolments by race, population growth expectations and current education attainment rates for each race suggest to us that enrolments are likely to grow fastest among the Hispanic and the black population.

Figure 41: US population growth CAGR by race and select age groups: 2007–12E



Source: Census Bureau estimates

Figure 42: Bachelor's degree attainment by race: 2006
% of population 24+ years with a bachelor's or higher degree



Source: Department of Education

We model for-profit post-secondary revenue should grow at a 7–9% three- to five-year CAGR

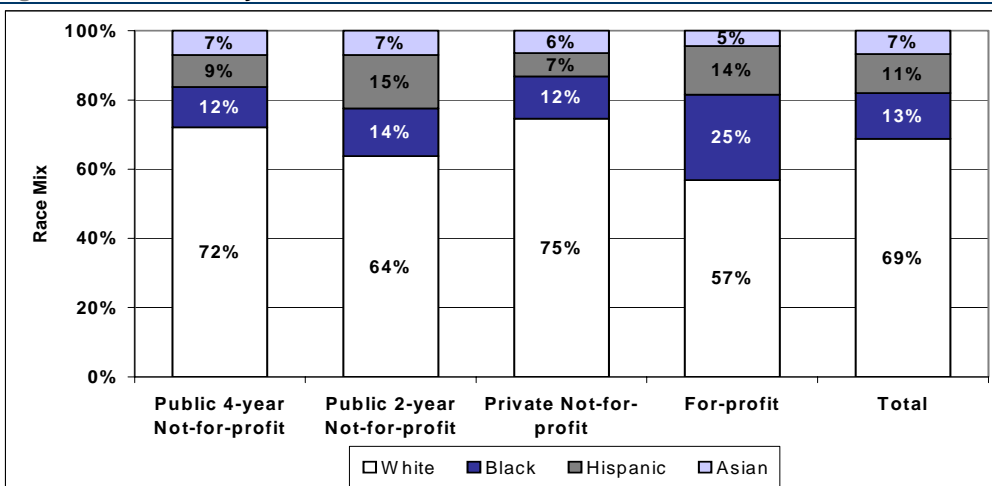
We forecast average annual for-profit post-secondary enrolment and revenue growth of 8.4% from 2007 to 2012. We expect margin expansion to result in a three- to five-year sector earnings CAGR of 9–12%.

The for-profit providers have taken share rapidly over the past two decades and we expect share gains to continue, albeit at a slower pace.

We believe that for-profits providers' share gains have resulted partly from their disproportionate exposure to certain rapidly growing segments of the student population, and we expect this to continue. For-profit companies have a larger share of internet enrolments than traditional enrolments. They also serve more minorities than not-for-profit schools do.

For-profit providers have disproportionate exposure to rapidly growing segments of the student population

Figure 43: Race mix by control of institution: 2005



Note: Excludes non-resident alien and Native American categories.

Source: Department of Education.

Although the US for-profit education companies remain largely focused on the US, the pace of these companies' international investments has increased recently. Laureate Education, which went private in 2007, had until then been the only sizeable US company

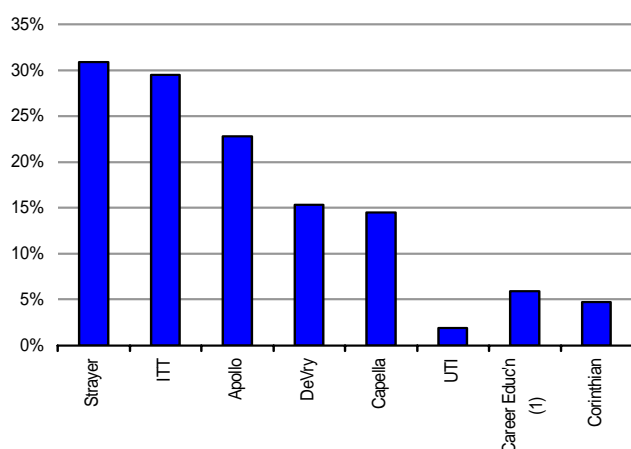
to make international growth a significant part of its strategy. However, in October 2007, Apollo Group formed Apollo Global, a US\$1bn joint venture with The Carlyle Group, to invest in international educational opportunities. So far, Apollo Global has acquired two companies—one based in Chile and the other in Mexico—for a combined purchase price of US\$91m. Other players have made small investments abroad as well, or have expressed interest in making international acquisitions in the coming years.

Profitability and other key business metrics

We generally believe post-secondary education is a good business, characterised by several compelling attributes, including:

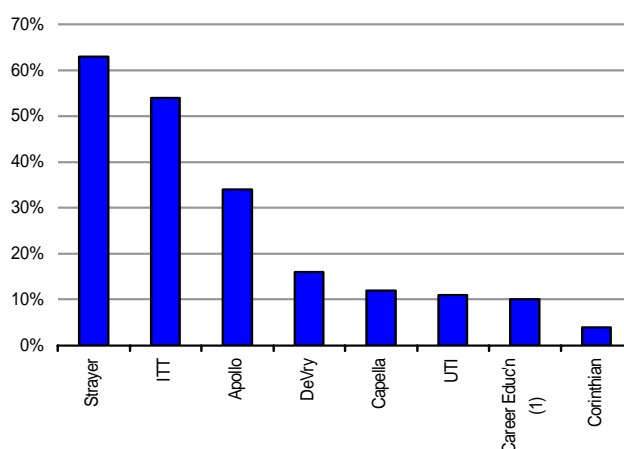
1. high margins (especially for those companies with more online exposure);
2. high returns; and
3. strong free-cash-flow conversion, since students tend to pay up-front.

Figure 44: Operating margins: FY08E



Note: (1) Excludes 'transitional' segment.
Source: Credit Suisse estimates

Figure 45: Average annual ROIC: FY07



Note: (1) Return on invested capital is after-tax operating income over the book value of equity plus debt.
Source: Company data

We have a significant caveat on operating margins and cash flow; as more companies, e.g., ITT, increasingly use their own balance sheets to lend to students, margins and cash-flow conversion may deteriorate for these companies. We have observed this to some extent already, and expect it to continue.

We also note that ROICs, while strong, are significantly lower when operating leases are capitalised and added to the capital base. This reflects the reality that an education company's earnings capacity is to some degree a function of its real estate capacity. As such, education companies have relatively high real estate related fixed expenses. Not surprisingly, those players with more internet education exposure (Apollo, Capella and Strayer) have less real estate exposure.

Tuition and affordability

During the past 10 years, tuitions fees at private and public institutions have grown at average annual rates of 5.6% and 7.1%, respectively, outpacing the 4.2% growth of Federal student loan and grant limits. The average annual cost (tuition and fees) of attending a four-year private institution during the 2007–08 academic year was US\$23,712, compared to US\$6,185 at a four-year public institution and US\$2,361 at a two-year public institution.

The percentage of students who borrow to fund their tuition and the average dollar amount borrowed both continue to rise.

Caveat: Margins and cash-flow conversion may deteriorate due to balance sheet lending

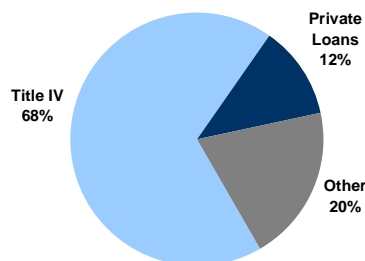
Lending situation

The biggest issue currently facing the sector is the student lending issue.

Most post-secondary tuition remains covered by the federal government through Title IV loans, grants and work-study programmes. Title IV programmes are authorised by the Higher Education Act (the HEA) and are so called because they are discussed in Title IV of the HEA. Title IV loans generally have wide eligibility standards, offer low interest rates, do not require credit checks or collateral, and provide a variety of deferment and extended repayment options.

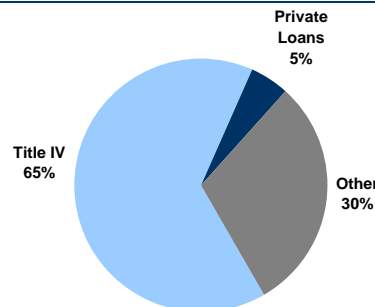
In the past decade, average college tuition rates have increased faster than annual federal aid limits, widening the gap between available federal funding and the cost of higher education. As a result, the use of private loans that are not guaranteed by the government has risen significantly in recent years. These loans have been widely used for many years by graduate students pursuing professional careers in high-paying fields such as law or medicine. They had not, however, been widely used by undergraduates until relatively recently. Sallie Mae, already the market leader in FFEL (Federal Family Education Loan) lending, has garnered the lead in private lending. Over the six years ended 2007, the private loan industry boomed, with aggregate originations increasing to US\$17bn in the 2006–07 academic year, a CAGR of 27%, according to the College Board. Private loans now constitute 22% of the entire student lending market, which compares with only 5% ten years ago. As for-profits' tuition fees have continued to rise, so too has their use of private loans as a source of tuition funding.

Figure 46: For-profits' average percentage of annual tuition derived from various sources: current



Source: Company data, Credit Suisse research

Figure 47: For-profits' average percentage of annual tuition derived from various sources: 1999–2000



Source: Company data, Credit Suisse research

Not surprisingly, those schools with the highest price points (Career Education, ITT and UTI) and those that cater to lower-income students (Corinthian) generate a greater percentage of their revenue from private loans in general, and from subprime private loans in particular. The exception is Capella, which has high tuition, but low private loan exposure, because most of its students are pursuing graduate degrees and are therefore eligible for more Title IV aid.

Until late 2007, Sallie Mae and certain banks were lining up to make private loans on the back of strong growth and solid profitability prospects and, we believe, because lenders assumed that offering private loans to college students made it more likely that the lender would also win that college's FFEL business. We also believe that until recently, it was not uncommon for lenders, in return for a contractual level of their FFEL loan business, to offer subprime students more attractive terms on private loans than they would get otherwise.

The 'perfect storm' hit the student loan industry in late 2007

Lenders participating in the FFEL programme used to receive healthy subsidies from the federal government to encourage lender participation. However, in October 2007, subsidies paid to the FFEL programme lenders were slashed—by 55 bps on Stafford loans

Most post-secondary tuition remains covered by the federal government

For-profits are relying more heavily on private loans

Career Education, ITT, Corinthian and UTI have greater exposure to private loans, particularly in the subprime category

Until recently, Sallie Mae and certain banks were lining up to make private loans

Subsidy cuts led Sallie Mae and others to walk away from subprime private loans

and 85 bps on PLUS loans for for-profit lenders; and by 40 bps on Stafford loans and 70 bps on PLUS loans for not-for-profit lenders. Other changes included a doubling of the origination fees paid to the government by lenders, to 1%. While FFEL programme lenders are still assessing the impact of these changes, it is clear that the programme is now much less profitable. The deterioration of investor interest in asset-backed securities, including those backed by student loans, has made matters even worse, especially for Sallie Mae and other non-bank student lenders with business models that rely on securitisations.

In the wake of eroding profitability, Sallie Mae and other providers of student loans have been forced to reassess their profitability and exposure to risk across all businesses. This has resulted in Sallie Mae and others walking away from subprime private lending. Indeed, early this year, for-profit schools, including Corinthian, Career Education and ITT received letters from Sallie Mae detailing its plans to stop making private loans to their subprime students. Some of these companies are now using their own balance sheets to provide some of the replacement funding, which is starting to drive up bad debt expense and hurt cash flow.

On 7 May 2008, President Bush signed student lending relief legislation that included the following key provisions: 1) Raises federal loan limits by US\$2,000, 2) Authorises the Education Department to act as 'secondary market of last resort' to purchase FFELP loans, and 3) Makes it easier for parents to take out loans on behalf of their children through the 'PLUS' loan programme. The loan limit increases are slated to benefit students this autumn, and should enable Career Education, Corinthian, ITT and UTI, which rely more heavily on private loans, to replace some lost private loans with Federal loans. As such, we see this legislation as somewhat of a saviour for these players. For Apollo, Capella, DeVry and Strayer, which do not rely much on private loans, loan limit increases may help demand (by reducing the need for out-of-pocket tuition payments). We think, based on public comments made by management teams and on our own conversations with various company managers, that Apollo is the only company that will be more aggressive with price increases than we previously expected as a result of loan limit increases.

We see May's student lending relief legislation as somewhat of a saviour for CECO, COCO, ITT and UTI

Key recommendation: Apollo (APOL, Outperform)

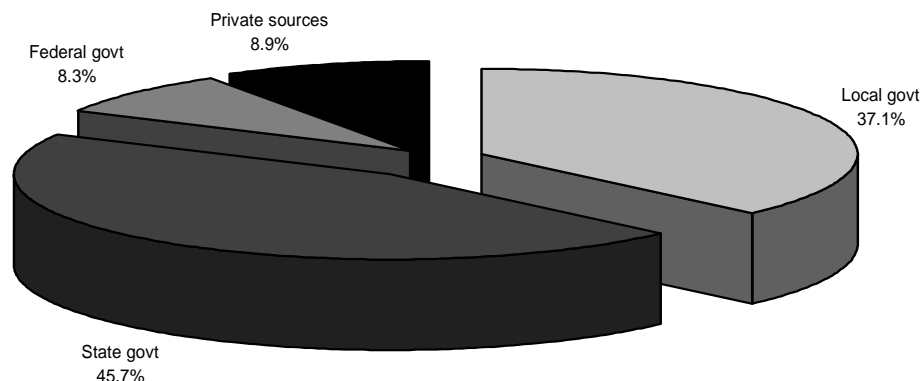
Apollo is an accredited provider of higher education. As of May 2008, Apollo enrolled 345,300 students (about 70% of whom were exclusively online), making it the largest private university operator in the US. We believe that, even following July 2008 tuition increases, Apollo's programmes are fairly reasonably priced relative to other for-profit institutions. Due partly to this and to its relatively high levels of employer tuition reimbursement, Apollo has little exposure to the private lending woes currently plaguing the industry. The company has made forays into emerging markets and US niches in the past few years. In October 2006, Apollo purchased Insight Schools, a virtual high school company and in October 2007, the company formed Apollo Global, a joint venture with The Carlyle Group to invest in international educational opportunities. These are both relatively small parts of the Apollo story today, but we think they offer promising growth.

Our positive thesis on Apollo is based largely on optimism about the potential impact of pricing and cost-cutting initiatives. We think the pricing and cost-cutting stories should boost the company's 3–5 year earnings CAGR to 15% and deliver upside versus consensus EPS growth estimates for 2009 and 2010. Our US\$88 price target, derived from our DCF analysis, implies 21x our CY10 EPS estimate, which is in line with the 5 year average multiple.

The US K-12 education sector

K-12 (Kindergarten through grade 12) includes elementary and secondary education for children aged 5–10 years and 11–17 years, respectively. Broadly defined, the market is huge: More than 57 million students, more than US\$550bn in annual spending on public schools alone, and over 124,000 public and private schools in aggregate. In the US, K-12 education relies mostly on public funding (federal, state and local). In Figure 48, we present the funding breakdown for the US K-12 sector.

Figure 48: US K-12 funding breakdown (2005)



The US K-12 sector is mostly publicly funded

Source: US Department of Education

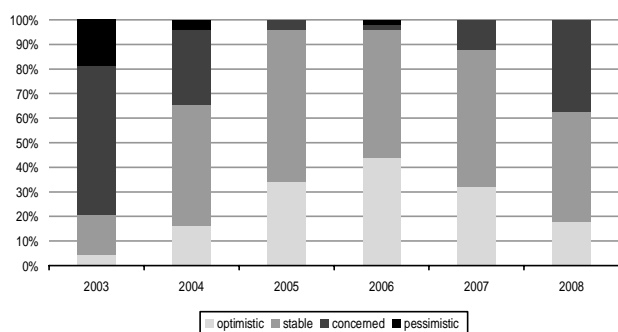
Federal, state and local budgets depend heavily on tax receipts and as such tend to fluctuate with economic cycles. Instructional material (textbooks, etc.) typically account for c.1% of total education expenditure. As all states but one in the US require balanced budgets, we do worry that the US economic slowdown may lead to spending cuts and that education budgets are unlikely to escape entirely unscathed.

Federal funding: The overall federal grant outlay in fiscal 2008 is budgeted to rise slightly. However, the Administration is looking to cut education, training, employment and social services grants by about 8%, terminating 43 low-priority or non-performing programmes. The federal budget constitutes only 5% of school and 11% of college funding, but it is an important driver of the testing and assessment market.

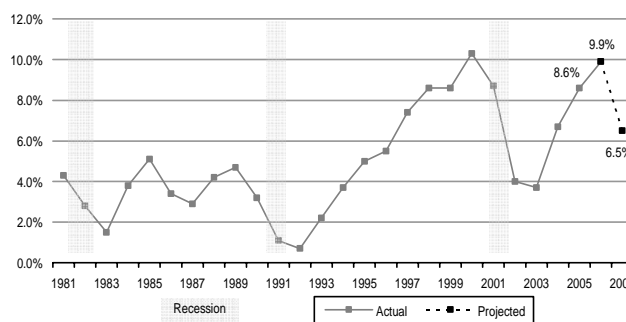
Fiscal constraints may mean cuts in federal funding

State funding: The short-term outlook for state budgets is somewhat gloomy, reflecting the weakness in the US economy. In the fiscal year ending June 2007, state revenues were up 3.1%, with over 30% of the states optimistic about their targets (Figure 49), following a 7.7% rise in the year to June 2006 (FY06) which, due to the late-cyclical nature of K-12 educational publishing, has been fuelling buoyant company results. However, the latest US State Budget update from the NCSL in August 2008 showed (i) 32 states with FY09 budget gaps; (ii) 10 states considering across-the-board budget cuts, (iii) 12 states specifically targeting higher education, and (iv) 11 states targeting elementary-secondary education.

Finally, the ratio between each state's year-end balance and total expenditure worsened, from 9.9% in FY06 to 6.5% at the end of FY07. While this is still well above the 3–5% range recommended by rating agencies (Figure 50), according to NCSL, these 'rainy day' funds will be quickly eroded as states seek to address their budget deficits.

Figure 49: State revenue outlook for the fiscal year (June year-end)

Source: NCSL, Credit Suisse research

Figure 50: State year-end balances as a % of general fund expenditures

Source: NCSL

There are two potential avenues that offer market exposure to the US K-12 segment:

- (a) quoted educational publishing names; and
- (b) the K-12 virtual public schools segment.

Educational publishing sector

The educational publishing sector has undergone a significant change of ownership over the past 10 years, with a substantial portion of the market now in private hands. However, we can derive from our bottom-up analysis a reasonable overview of industry growth and margins for the ELT (English Language Teaching) educational segment, which we compare below to the other professional publishing segments of legal, scientific, health, finance and B2B. Aggregate revenue growth has averaged only 4.3% (nominal) for the sector for the past four years and we expect only 3.3% on average for 2009E and 2010E.

Figure 51: Global educational publishing leading players, revenues, growth and margins

US\$ in millions, unless otherwise stated

(Dec year-end)	2004A	2005A	2006A	2007A	2008E	2009E	2010E
Pearson	4,255	4,845	5,301	5,260	5,766	6,107	6,329
Reed Elsevier	1,590	1,639	1,638	1,505			
Riverdeep				2,407	3,608	3,716	3,851
Scholastic (May ye)	405	416	413	414	NA	NA	NA
Wolters Kluwer	384	386	398				
WK Education (Bridgepoint)				416	425	438	454
Thomson Reuters	2,174	2,319	2,304				
McGraw-Hill	2,345	2,672	2,524	2,706	2,768	2,851	2,955
Total revenues	11,152	12,277	12,577	12,708	12,991	13,548	14,042
Total organic rev growth	2.3%	7.6%	1.9%	5.6%	2.3%	3.0%	3.6%
Total Operating profit	1,603	1,822	1,834	1,955	1,975	2,088	2,185
Growth (%)	5.3%	13.6%	0.6%	6.6%	1.0%	5.7%	4.6%
Wghtd average operating margin (%)	14.4%	14.8%	14.6%	15.4%	15.2%	15.4%	15.6%

Note: Riverdeep and WK Education figures are based on disclosed information for underlying assets to 2006 with estimated market average organic revenue growth applied thereafter. McGraw-Hill figures are based on disclosed information to 2007 then market average organic rev growth applied thereafter.

Source: Company data (except where separately noted) (Credit Suisse estimates for 2008, 2009 and 2010)

The main player in the sector is Pearson (PSON.L, Neutral). As well as educational publishing Pearson operates in business information (it owns a 61% stake in IDC and publishes the *Financial Times* business newspaper with affiliated titles and online services) and books (its Penguin Group is one of the world's leading book publishers, which includes brands such as Dorling Kindersley, Puffin and Ladybird). The company has been

consistently gaining share in US Schools educational publishing over the past three years, which we see as testament to one of the steadiest track records of pre-publication investment in the industry, widely-acclaimed innovation and a leading digital offering.

With a considerably downgraded underlying growth expectation for 2009, we believe Pearson shares are now in a much more stable position to weather the remaining negatives, namely: (i) US Schools funding news flow remaining under pressure; (ii) financial advertising and IDC trading yet to reflect the inevitable impact of the banking downturn; (iii) US Colleges student loan squeeze affecting its counter-cyclicality; and (iv) risk of heightened competition from WSJ international expansion under Murdoch. Pearson shares trade on a FY09 P/E of 11x on our estimates, a 7% premium to the European Professional publishers and a 14% premium to the European Media sector. With most of the underlying downgrades appearing to be behind us, yet with a comparatively more robust structural outlook compared with the rest of media, we argue that the shares are now up with events and have a Neutral rating.

US virtual K-12 education market segment

The virtual K-12 segment has a much more promising growth outlook, in our view; we expect enrolment growth in the nascent segment to overshadow the potential impact of states' budget cuts. We estimate there are currently at least 100,000 virtual charter school enrolments. The National Home Education Research Institute estimates that there are about 2.2m home-schooled students (about 4% of the total K-12 population). The Center for Education Reform estimates that charter schools enrol 1.1m students, or about 2% of the market. These market segments have been able to take market share partly due to growing dissatisfaction with the quality of public schools and increasing pressure on government to fund viable alternatives. We expect virtual schools to benefit from the same factors. Assuming average revenue per enrolment of US\$5,000, we estimate that revenues in the virtual school market would range from US\$5.5bn–11.0bn if the virtual school market were to attain enrolment share rates between those of the charter school and home school markets, respectively.

We believe the US virtual K-12 segment has a very promising growth outlook

K12, Inc. (LRN, Outperform) is the only pure play publicly held operator of virtual public schools, but there are several other players in the market place. The most direct independent competitors, in our view, are Connections Academy and, to a lesser extent, White Hat. A second and less obvious group of competitors is the post-secondary group—including companies such as Apollo Group—that are well capitalised and have experience with online delivery. Apollo purchased Insight Schools in October 2006. DeVry purchased Advanced Academics, an online high school business, in November 2007. Several competitors have made significant headway in the market in recent years; but we believe that K12 is at least four times as large as its nearest competitor. We think K12's market is one in which leadership breeds greater leadership, causing a 'network effect' that will continue to help K12 maintain its lead.

The education sector in Brazil

'Co-operative' regulation

Brazil's education system operates on a cooperative basis among federal, state and municipal governments. The federal government is responsible for organising and coordinating the entire system and providing the financial/technical support to the remaining levels of government to ensure equality in education across the country. State governments are responsible for providing some primary and secondary education. Municipalities are only responsible for providing primary education. Federal and state government are jointly responsible for the administration of post-secondary education.

The federal government issued two laws (the Education Act in 1971 and the National Education Plan in 2001) that determined the main roles of the country's education system. In short, legislation for the education system established the government's focus on primary and secondary education, while encouraging the private sector to participate in

post-secondary education. There are several institutions regulating the education system in Brazil. However, the main regulatory body is the Ministry of Education (MEC), which is the highest authority for post-secondary education within the national education system.

Post-secondary education in Brazil can be provided by public or private institutions, according to the Basic Framework Law for National Education (LBD). A private post-secondary education institution needs to be controlled, managed and supported by an individual or legal entity responsible for obtaining funds to meet the needs of its supported entities. Private post-secondary education institutions can be divided into three groups: (i) for-profit institutions, which are created and maintained by one or more individuals or private legal entities; (ii) not-for-profit private institutions; and (iii) philanthropic entities.

The 'for-profit' framework

The for-profit model became possible in 1999 when new legislation authorised that post-secondary institutions could be controlled by for-profit companies. For-profit institutions that hold the Program University for All (PROUNI) must allocate one full scholarship equivalent for each 10.7 enrolments at each programme in order to be exempt from income tax, social contributions and other taxes. In 2004, the endorsement of the PROUNI levelled the tax treatment between for-profit and not-for-profit institutions, further promoting private investments in the post-secondary education market.

The for-profit model became possible in 1999 in Brazil

Post-secondary education reform

The Brazilian Congress is currently discussing the post-secondary education reform bill, which would introduce various changes to the current regulatory regime. One of the main changes under discussion is the requirement for at least 70% of the voting capital of for-profit companies to be held directly or indirectly by Brazilian citizens, creating a barrier to entry in relation to foreign companies. A ban on franchising post-secondary institutions is another important issue being discussed, which, if approved, would limit competition within the sector. However, the reform is still in the initial stage of discussions and at this point we do not know if the bill will be amended or even approved.

Current reform under discussion could limit the extent of foreign involvement in the sector

The dynamics of the post-secondary segment in Brazil

Brazil's post-secondary education market is a large, growing, under-penetrated and highly fragmented market that is mainly served by private players. According to UNESCO, in 2004 Brazil was the largest post-secondary education market in Latin America as measured by enrolment, and the fifth-largest post-secondary education market worldwide. Last data available shows that private post-secondary educational institutions in Brazil registered R\$15.0bn in revenue in 2005, while annual expenditure on public post-secondary educational institutions by the government was R\$18.0bn.

Post-secondary education enrolment has increased significantly in recent years, rising from 1.8 million in 1995 to 4.6 million in 2006 (CAGR of 9.3%). The private market share of total enrolments rose from 60% in 1997 to 74% in 2006. Enrolment in public post-secondary institutions grew at a CAGR of 5.1% in the period 1995–2006, while the number of private players grew at double-digit rates over the same period (CAGR of 11.4%).

Post-secondary education enrolment grew at 9.3% CAGR between 1995 and 2006

Rising enrolment rates

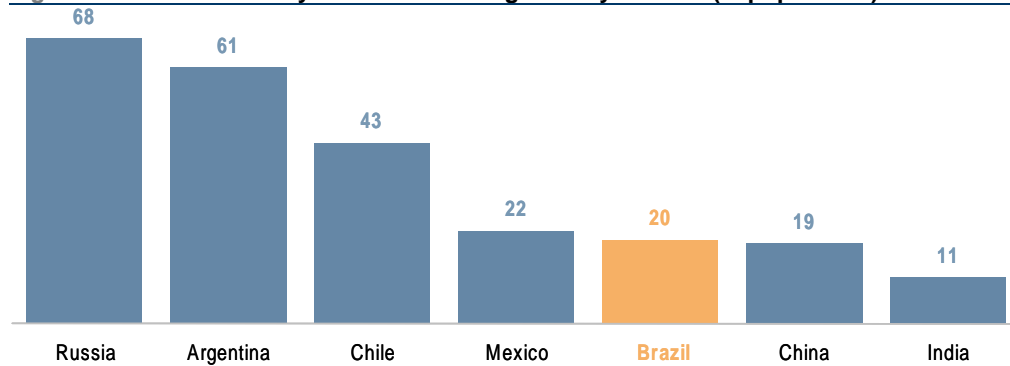
We believe that post-secondary educational enrolment in Brazil will continue to rise going forward, for the following reasons:

(i) Higher education attainment rates in the 18–24 year-old population, which is currently only ~20% penetrated. We think that there is room for improvement in the penetration of post-secondary education in Brazil, as supported by the following drivers:

- Government incentives: The current penetration rate (20%) of post-secondary education among 18–24 year-olds is below the MEC's aggressive goal of reaching 30% by 2010, which would represent enrolment of almost 7mn. Hence, we expect the government to offer further incentives to stimulate enrolment.

- Increase in average income levels: We view the increase in the average income of Brazilians as one of the main drivers of growth in post-secondary enrolment in recent years, and this looks set to continue.
- Decline in unemployment rates: We believe a sustainable drop in unemployment rates could further stimulate demand for post-secondary education services, mainly from working adults, since many receive financial incentives from employers to improve their education in the form of reimbursements.

Figure 52: Post-secondary enrolment among 18–24 year-olds (% population)



Post-secondary enrolment in Brazil is relatively low compared with the other large markets in Latin America

Source: *The Global Education Digest 2006 (UNESCO)*

(ii) The significant personal income premium attributed to a post-secondary degree. In Brazil, salary levels for workers with a post-secondary education are close to 170% higher than those without. The lure of higher wages is drawing in new students: Post-secondary enrolment among working adults grew at a CAGR of 20% in 2002–05, vs a total enrolment CAGR of 7.7%.

(iii) Lower tuition costs and the substantial and growing demand for skilled workers. Private post-secondary education institutions have been focusing on specific labour markets and designing flexible programmes to meet the needs of working young adults. This has led to decrease in average tuition costs (from R\$682 in 1999 to R\$447 in 2005) and an increase in the proportion of the population that is now able to afford private education.

(iv) Employer subsidies. Considering the Brazilian working population's average monthly income structure, we conclude that only 10% of the working population can afford a post-secondary course. However, we note that a large part of the working adult class has its educational expenses subsidised by the employer, which would leverage the proportion of people able to take a post-secondary degree (including this effect we believe that around 20–30% of the working population could afford post-secondary education).

What next? To estimate the growth in new enrolments in the post-secondary market we considered the number of students that concluded secondary education. In Brazil, 10.2mn students were enrolled in secondary education at end-2005 and, according to the country's Ministry of Education (MEC), enrolment grew at a CAGR of 6.6% in the period 1995–2005. According to Hoper Educacional, enrolment in secondary education should grow at a CAGR of 0.4% in 2006–10, to 10.6 million students in 2010, with the conclusion rate rising from 25% currently to 28%. The percentage of students that conclude secondary education and enrol in post-secondary institutions has been c.49% since 1998. Assuming that this rate remains flat through 2010 and taking the estimates from Hoper, we forecast new enrolments for post-secondary rising to 1.5 million by 2010 (from 1.2 million in 2005), for a CAGR in 2005–10E of 4.6%. Taking into account graduation and drop-out rates, we estimate that total post-secondary enrolment should reach 6.7 million by 2010 (up from 4.7 million in 2007).

We estimate that total post-secondary enrolment should reach 6.7m by 2010 (up from 4.7m in 2007)

Still a very fragmented industry...consolidation can improve profitability

Post-secondary education is still a very fragmented sector in Brazil. Growth in the number of post-secondary institutions over the past 10 years has been driven mainly by government incentives to stimulate private investment. Therefore, the number of private players more than doubled between 1995 and 2006, from 684 to 2,022, a CAGR of 10.4%. Meanwhile, given the government's focus on improving the penetration of primary education in the country, the number of public post-secondary educational institutions has remained quite stable, rising from 210 in 1995 to 248 in 2006.

This strong growth led to a proliferation of small institutions, resulting in a very fragmented market. We note that in 2005 (the most recent available information), student enrolment at the 10 largest private post-secondary education institutions accounted for 15% of total students enrolled and 22% of total revenues. We believe profitability in this segment is likely to increase as the companies start to gain scale as the student base increases; we consider this to be most likely for the largest 10 institutions. We believe many of the small companies with less than 500 students are operating below breakeven. In our view, an increase in profitability of the education segment will come as a result of consolidation. This is already happening. YTD the education sector has been the third-most-active one in the country in terms of M&A transactions.

A very fragmented market

Good opportunities to leverage growth

Other opportunities to leverage growth in the education industry are (i) the distance-learning segment, which would capture the large low-income class in Brazil; and (ii) the k-12 partnership in the public system (selling teaching methodologies to public institutions). Alternative sources of educational services, such as distance education and e-learning, have been developing strongly in Brazil over the past couple of years. According to ABRAED (Brazilian Association of Distance Learning), the number of distance education courses offered soared from 13 in 2000 to 382 in 2004, resulting in a rise in enrolment numbers from 1,758 in 2000 to 159,366 in 2004.

We note that the MEC recently issued a decree allowing colleges to substitute up to 20% of on-site-based course activities with distance learning activities, which should increase the penetration of these tools. There are also cost incentives: the average cost of a distance taught course is almost half the price of traditional courses.

We believe the only barrier to strong development in the distance and e-learning education markets in Brazil is regulation, which has recently changed, and it is still unclear how it will work going forward.

Key recommendation: Anhanguera Educacional (AEDU11, Outperform)

Anhanguera Educacional is one of the largest post-secondary institutions in Brazil, focusing on the working adult segment. The company has a model based on small to mid-sized campuses spread across the most relevant regions of the country. The company has also started expanding into the distance-learning market. Over the past four years Anhanguera has developed a standardised model for its campuses, with all processes well defined and a centralised, shared services structure that allows the company to grow very rapidly. The M&A effort is ongoing, Anhanguera is one of the leaders in the consolidation process in Brazil.

Anhanguera is one of the leaders in the consolidation process in Brazil

Anhanguera is trading at 12.6x P/E 2008E, dropping to 10.7x for 2009E, which we view as very attractive if we consider the 55% earnings CAGR we forecast for the 2007–11 period.

Korea—education, a spring-board for growth

Koreans' enthusiasm for education has been one of the key drivers behind the country's rapid economic growth over the last 40 years and its growing 'knowledge-based' characteristics. In many respects, it serves as a good example of what other emerging economies need to have in place to grow and develop. In the case of Korea, we expect the trend to continue.

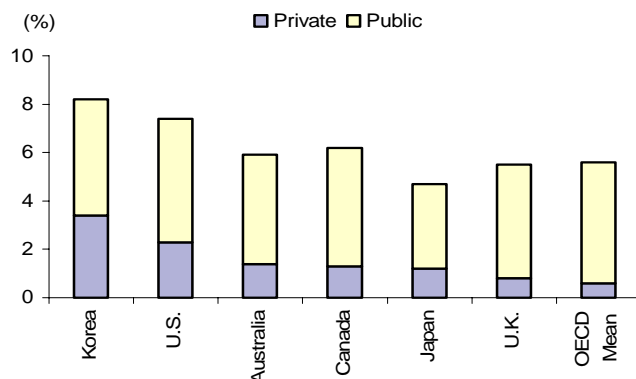
Enthusiasm for education

Prevalence of private education a striking feature

We estimate Korea's total education spending at c.KRW65trn in 2007, which is equivalent to 7% of GDP. We expect the spending to reach KRW81trn in 2012E, implying a CAGR of 4.5%. The private sector (mostly households) accounts for approximately 40% of the total education spending and the public sector makes up the rest. The government estimates the domestic private education market was KRW20trn in 2007.

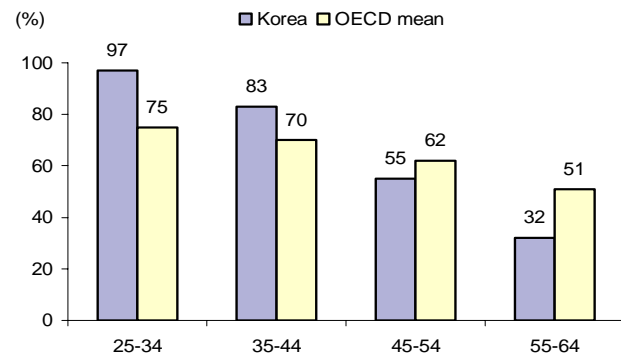
The OECD more aggressively estimates that Koreans spent 8.2% of GDP on education (3.4% for private education) in 2005, implying private education spending of KRW27trn. The 3.4% of GDP spending on private education is the highest among the OECD group, illustrating the Korean enthusiasm for education and an inefficient public education system.

Figure 53: Education spending (% of GDP)



Source: OECD (2005)

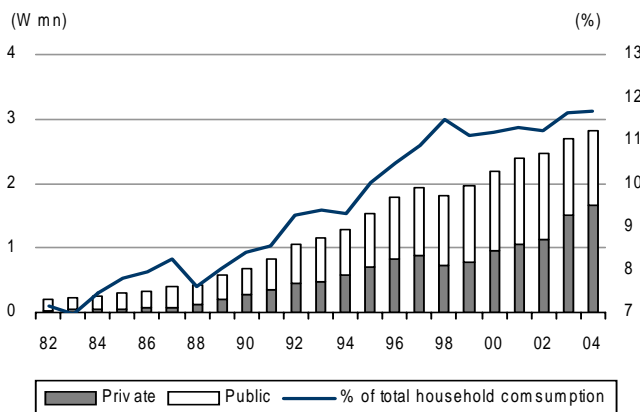
Figure 54: Population that has attained at least upper secondary education



Source: OECD (2003)

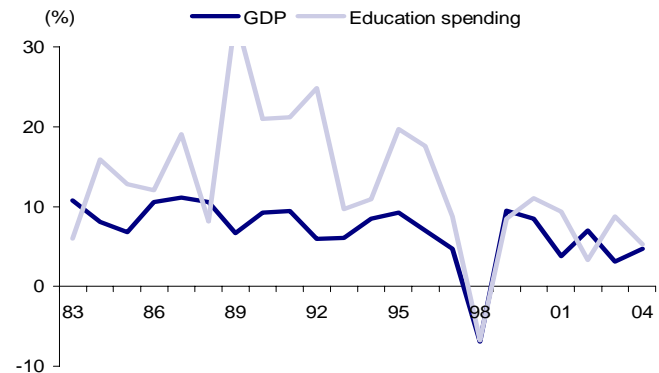
Korea's GDP grew by 12.7% per annum on average between 1982 and 2004. Over the same period, average spending on public and private education grew by 8.8% pa and 20.0% pa, respectively.

Figure 55: Annual education spending per household



Source: Korea National Statistical Office(KNSO)

Figure 56: Education spending growth vs GDP growth

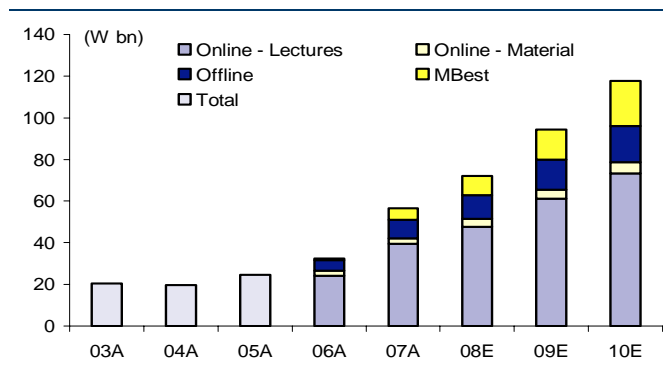


Source: KNSO

Bigger opportunities in online business

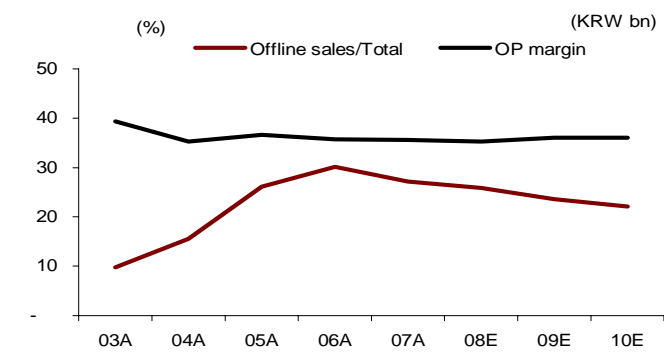
We believe online education services will gradually take market share away from offline services, given their advantages in terms of cost and accessibility. Megastudy (072870.KQ, Neutral), Korea's leading online lecturing service provider, has seen rapid growth in recent years.

Figure 57: Megastudy—revenue



Source: Megastudy, Credit Suisse estimates

Figure 58: Megastudy—adjusted OP margin (ex-stock option compensation expense)



Source: Megastudy, Credit Suisse estimates

Figure 59: Megastudy—OP margin by business

(%)	2004A	2005A	2006A	2007A	2008E	2009E	2010E
Online - Lectures	50.0	47.5	41.7	53.0	50.9	53.0	53.7
Online - Material	19.0	22.0	25.0	18.5	20.0	21.2	21.0
Offline	9.0	16.0	18.0	20.0	19.0	20.0	21.5
MBest	na	na	na	21.0	21.5	22.0	23.0
Total	39.3	34.8	31.9	35.7	33.3	33.8	34.8

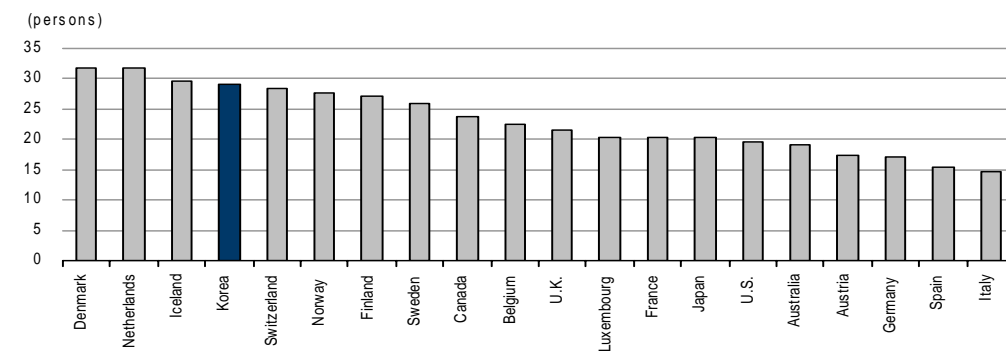
Note: Cost of online lectures includes stock option compensation costs and loss from online adult education

Source: Megastudy, Credit Suisse estimates

The online share of the total middle and high school private education market was only 2.0% and 7.2% in 2006, according to Megastudy's estimates, which translates into market sizes of W100bn and W220bn, respectively. The company forecasts that the online junior high and high school private education markets will grow to W548bn and W368bn, respectively, in 2010 with strong CAGRs (for 2006–10) of 44% and 28%, respectively. We agree with the high-growth scenario.

Korea's high broadband internet penetration is essential infrastructure for the online education industry. As of December 2006, Korea's broadband internet penetration of 29 subscribers per 100 inhabitants was the fourth-highest in the world.

Figure 60: Broadband internet subscribers per 100 inhabitants (Dec 2006)



Source: OECD

Singapore—education has been the key to success

Regulatory intervention aligns education with economic needs

The Ministry of Education (MOE) directs education policy in Singapore, controls the development and administration of state schools and plays an advisory and supervisory role in private schools. Education spending typically constitutes about 20% of the annual national budget, which subsidises state education and government-assisted private education for Singaporean citizens.

Among the key success factors for Singapore's rapid social and economic development since independence in 1965 is the ongoing heavy investment in education and training. This policy of closely aligning education with the changing demand for professional, technical and skilled manpower at various phases of economic growth has helped to shape the present national system of education. The Compulsory Education Act, which was passed in parliament in 2000, convenes compulsory education for children of primary school age, and made it a criminal offence for parents fail to enrol their children in school and ensure regular attendance.

About 75% of the cost of educating each undergraduate is subsidised through the national budget. The government has also raised the levels of financial aid—comprising bursaries and loans—given to students over the years and has recently announced that bursaries will cover up to the 66th percentile of households by income.

The rapid evolution of the private education landscape in Singapore has, over the years, resulted in standards differing considerably within the overall sector. The MOE plans to enhance regulation of the private education sector. Initiatives include establishing an independent body to regulate the sector, amending the framework to require that registration be renewed periodically so as to encourage private schools to consistently maintain standards.

Sector development

The education sector contributed about 2% of Singapore's GDP in 2007. Singapore welcomed about 80,000 foreign students in 2007, and as part of its Global Schoolhouse strategy, aims to attract 150,000 international students by 2015. This should create some 22,000 jobs and boost the sector's GDP contribution to 5%. The private education landscape in Singapore has evolved rapidly over the years. The number of private schools registered with the MOE has grown exponentially. It doubled in the 10 years between 1987 and 1997, from 150 to 305. It then quadrupled in the next 10 years up to 2007, from 305 to 1,200 private schools. The number of full-time foreign students enrolled in private schools also grew fourfold, from 9,000 in 1997 to 37,000 in 2007.

Transnational education and international schools

Singapore is a particularly important market for Australian and U.K. universities in transnational education. This refers to education in which the learners are located in a different country to that where the awarding institution is based. Singapore remains a major importer of transnational education, as its local tertiary education institutions are unable to meet existing demand.

Singapore has been encouraging a select group of elite foreign universities to offer programmes and establish branches in Singapore. Attracting these institutions to branch out is part of the government's plan to turn the country into an exporter of high-quality education. Hence, establishing a branch campus of INSEAD, an English-language business school based in France, and University of Chicago Graduate School of Business were milestones that have been widely celebrated.

The strong growth in Singapore's expatriate population in recent years—up 77,500 over 2006 to 875,500—and demand for pre-school education, as well as 'head-start' programmes for students, such as preparatory and boarding schools, has exacerbated the shortage of places in international schools for their children.

Heavy investment in education and training has been a feature since independence in 1965

Singapore aims to become an exporter of high-quality education

The government has recently acknowledged the squeeze on places in international schools as a 'constraint' here, and has stepped in to ease the shortage by aiding these schools on their expansion plans. The Economic Development Board (EDB) is also facilitating the expansion of the German European School and the United World College's second campus, as well as trying to interest top-quality institutions in setting up pre-tertiary schools here.

Key recommendation: Raffles Education (RLSE.SI, Outperform)

Raffles Education (RLS) is today the largest private-education service provider in the Asia-Pacific region, operating three universities and 22 colleges across nine countries, focused on design and business management training, with a total enrolment of more than 30,000 students. RLS has acquired three vocational colleges in the last 12 months, which act as a potential feeder base for its tertiary programmes. Overall, China drives North Asia sales, and remains the key contributor to revenue (80% in FY08). Outside China, RLS has largely expanded from its Singapore base, its second-largest market, while recent acquisitions have helped it leapfrog into Australia and New Zealand, which now contribute 11% of total revenue. Rising affluence across Asia and constraints on public infrastructure, coupled with supportive government policies, should continue to drive demand for private education services. In this environment, we expect private providers to flourish.

We have applied a 1x PEG ratio to derive our fair value estimate for RLS, which implies a FY09E P/E of 25x, based on our forecasts of 44% earnings CAGR from FY08 to FY10E. We believe that a 1x PEG ratio is justified for RLS, given the strong outlook for education in China, the company's strengthening franchise and strong earnings momentum.

India—on the verge of substantial growth

Constraints on the 'for-profit' sector

India follows a 12-year school format from grades 1 to 12. There are also pre-schools and kindergartens that cater for younger children. The curriculum at each grade is decided by the education board to which the particular school is affiliated. These include the Central Board for Secondary Education (CBSE), the Indian Certificate of Secondary Education (ICSE) and Departments of Education of various state governments of the country. Recognised universities and state governments oversee the higher education system.

Large corporate players have shunned the K-12 education market in India because of regulatory and social issues. Key regulations in India affecting the participation of private enterprises in school education include (as per CBSE guidelines) those outlined below:

- Private schools can be run only by trusts/educational societies which are non-proprietary in nature. The management control should not vest in a single person or a single family.
- The savings, if any, after meeting the expenditures of running the school, must be utilised for further promotion of the school. No part of the savings (profits) may be dispersed to any individual (within the trust or outside).
- Sale of a school from one trust/society to another is not allowed.

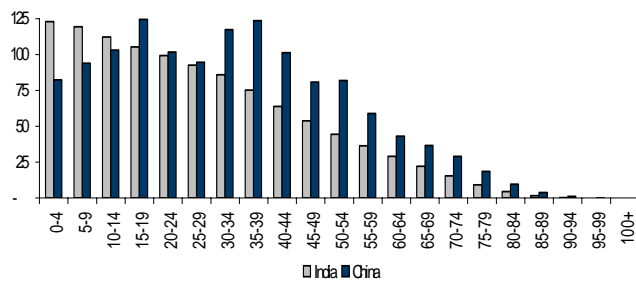
Apart from these stated regulations, education is a sensitive issue and there is social resistance to schools which are perceived as profit-making.

The market opportunity

India has 460 million children below 20 years of age, meaning that its school-aged population is 14% larger than China's. What's more, this difference is expected to rise to 37% by 2025, making India by far the largest potential education market.

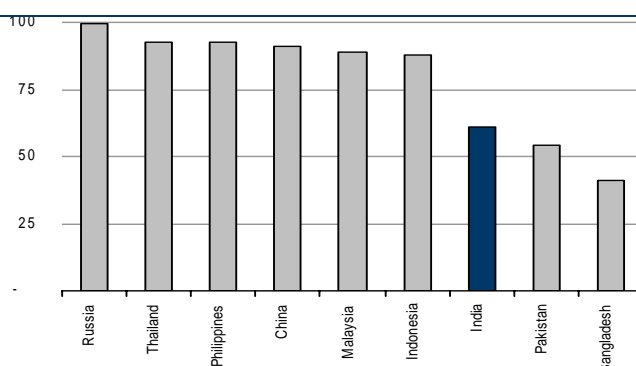
Private schools in India are not allowed to distribute profits

Substantial growth in the school-age population

Figure 61: Distribution of population in various age groups in mn (2005)

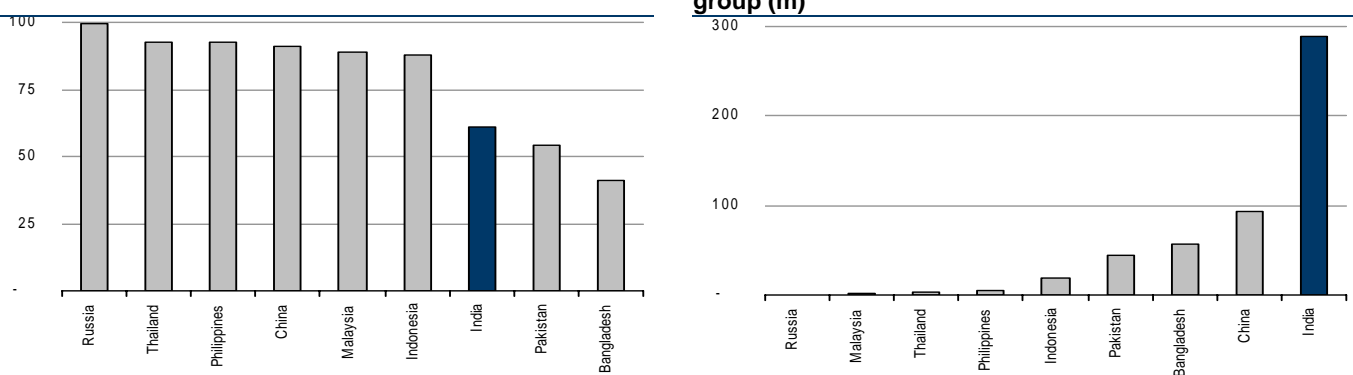
Source: US Census Bureau International Database

Using the standard measure of adult literacy rate (in the 15 years and above age group), India fares quite poorly compared with other emerging economies. India also has the largest illiterate adult population in the world, more than three times the size of China's.

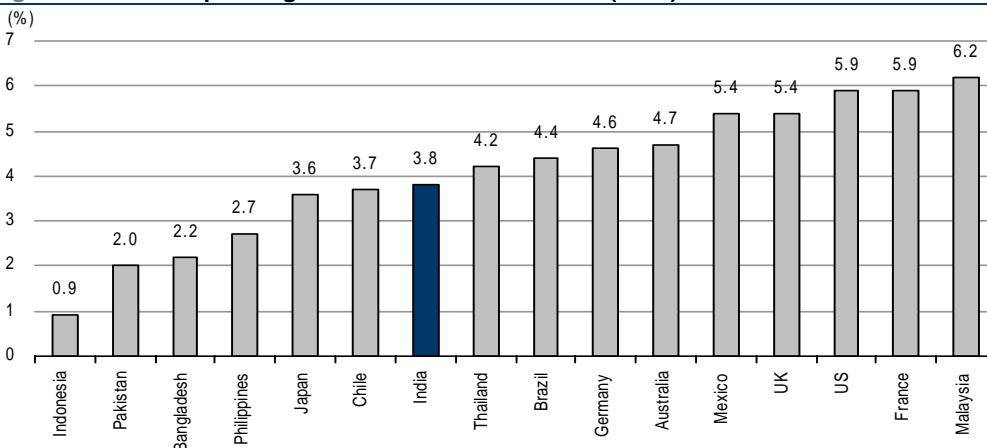
Figure 63: Literacy rate in 15 years-plus age group (%)

Source: UN Human development report 2005

We note that India's public expenditure on education is higher than emerging economies (where data is available), and below that of more developed economies. Thus, the problem facing the education sector is not one of funds.

Figure 64: Illiterate population in 15 years-plus age group (m)**Figure 65: Public spending on education as % of GDP (2004)**

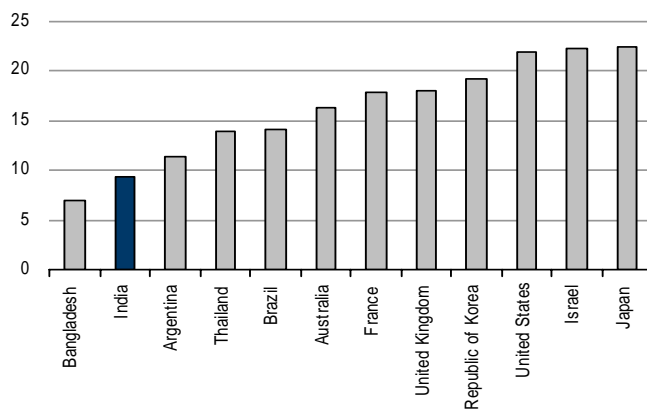
Source: UN Human development report 2005



Source: UNESCO Institute for Statistics

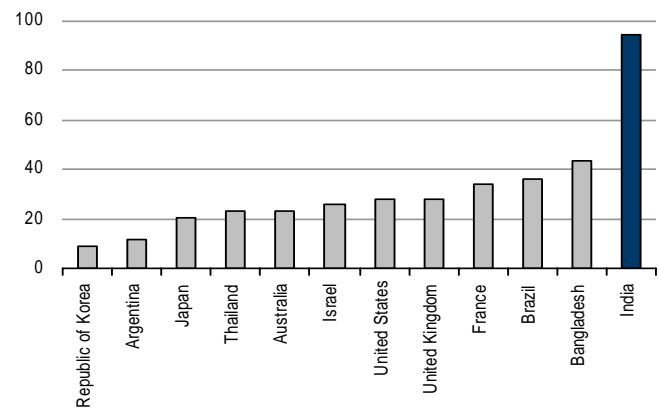
However, the anomaly in the education system is related to the way that government spending is prioritised. While other countries balance spending between the primary, secondary and higher levels, Indian government's spending is skewed towards higher education.

Figure 66: Spend on each primary pupil as % of GDP per capita



Source: UNESCO Institute for Statistics

Figure 67: Spend on each tertiary pupil as % of GDP per capita



Source: UNESCO Institute for Statistics

Opportunities in K-12 segment

(1) *IT infrastructure outsourcing by government schools:* Indian state governments started introducing IT in government schools around six years ago, outsourcing both hardware and services to private companies. The large scale of the market (>950,000 government schools in the country) and the low computer penetration in schools (<11%), gives a scalable business opportunity. If all these government schools were to start outsourcing their IT needs, we would be speaking of an industry with annual revenues in excess of US\$5bn. Companies such as Educomp, NIIT and Everonn are pursuing this opportunity (the three companies combined are present in less than 1.5% of government schools in the country).

(2) *Providing technology and pedagogical support to other private schools:* Private schools are ahead of the government schools in adopting technology. They generally have computer labs and basic computer training, and would be looking to use technology/multimedia in teaching general subjects. The private sector can participate by offering educational technology products/content to private schools. Despite the limited size of the addressable market (<20,000 schools), we estimate the potential to be easily in excess of US\$1.2bn in annual revenues.

(3) *The private schools business:* There are provisions which allow schools to operate on leased infrastructure and services for a stipulated minimum period (ex. minimum 30 year's lease for land under CBSE rules). Corporations can participate in the education sector by leasing out infrastructure/services to school trusts. Some of the corporations that have ventured into the education include Reliance group (Dhirubhai Ambani International School, not listed) and Educomp (Millennium Schools).

(4) *Supplementary teaching beyond schools:* Industry estimates show that the spending on children's education outside school is twice that spent on school fees and materials. This spending takes two forms: physical classes or online tutoring. While the former segment is large and highly fragmented, the latter is still evolving and is in the early stages of development.

(5) *Teacher training:* There is one teacher for every 40 primary school students in India, compared with one for less than 20 in most major nations. The government has recognised this problem, and is targeting the addition of teachers in government schools as a priority. Further, the need is being felt for a paradigm shift in teaching methodologies and use of technology in teaching. Even in private schools, teachers need to be regularly updated in terms of new developments in their subjects. Both these issues offer a chance for private participation on a large scale.

Opportunities beyond K-12

In the fast-growing Indian economy, almost all major sectors are growing at a scorching pace. As many of these are staff-intensive, this translates into an unprecedented demand for skilled workers. However, given the country's weak basic and specialised education system, an acute shortage of skilled staff is being felt across sectors. As these requirements cannot wait until the basic infrastructure improves itself, there is an opportunity for specialist training institutes/finishing schools to bridge the gap.

The IT training industry has already shown the way in terms of a successful model. This industry has recovered well after the slowdown around 2002, though near-term concerns about its outlook are rising. Among the other sectors, financial services, insurance, retail and aviation are also beginning to see corporate participation in finishing schools/training institutes. We believe these present an immense opportunity to be tapped by the private sector.

Key recommendation: Educomp (EDSO.BO, Outperform)

Educomp is a leader across segments in K-12 education industry in India. The company has a significant lead compared with competitors in (a) technology-based learning aids for students, (b) outsourcing by government schools, and (c) teacher training business. We note that there are a limited number of organised players in the Indian education sector and most of those players remain small. Thus, Educomp's initial success has given it a strong lead across various parameters, including (a) branding, (b) access to capital, (c) distribution strength, and (d) access to content.

Educomp is currently trading at FY3/09E P/E of 29x. While this may seem expensive, one needs to read this in the context of high growth. We expect a 95% three-year EPS CAGR—the PER rapidly falls to 10.6x for FY3/10E. Furthermore, this growth has high visibility, due to 1) the relatively higher priority that education spend has in the family budget (probably next only to food); and 2) increasing momentum in government spend on education providers.

China—encouraging the education sector

Regulatory framework fostering private sector provision

Private sector participation is generally not frowned upon in China. Policies are being introduced that encourage private sector participation in some areas as the state sector reduces its involvement over time. State-run schools in China are required to use government-approved curricula. Private schools, while also heavily regulated, enjoy greater flexibility in teaching or emphasising specific subjects, such as languages.

Figure 68: Climate for private sector participation in schools: China vs India and Brazil

	Population in 2005 (0–20 years old)	Private sector participation in schools
China	404m	Allowed to earn 'reasonable' profits
India	460m	Not allowed to earn profits
Brazil	66m	Encouraged, no restrictions on profits

Source: US Census Bureau, Credit Suisse

Unlike in India, private sector involvement in the education sector is encouraged in China

The principal regulations governing private education in China are The Law for Promoting Private Education (2003) and The Implementation Rules for the Law for Promoting Private Education (2004). Under these regulations, a private school may elect to be: 1) a school that does not require reasonable returns; or 2) a school that requires reasonable returns. A school that elects to require reasonable returns must publicly disclose such election and additional information.

Under these regulations, private schools have the same status as state-run schools, except that private schools are not allowed to provide certain special education programmes, such as military, police training and political education. State-run schools which provide compulsory education are not allowed to be converted into private schools.

For private schools able to award examination certificates, the types and amounts of fees charged are subject to government pricing approval, whereas schools that do not award exam certificates are only allowed to file the pricing information with the government pricing authority. For example, in the case of New Oriental (please see investment case below), its Yangzhou and Taixing schools do provide graduate certifications, and hence are subject to government price controls.

Overseas ownership prohibited

PRC laws currently prohibit foreign ownership of primary and middle schools for students in grades 1–9. Like other business areas in China where foreign ownership is not allowed, overseas-listed businesses which are run by domestic individuals have established an offshore/onshore structure that is designed to be compliant with the foreign ownership restriction, but at the same time allows substantially all the economic benefits from the domestic business to flow to foreign minority shareholders as well.

At the end of each fiscal year, every private school is required to allocate a certain amount to its development fund for the construction or maintenance of the school and equipment. For private schools designated as requiring reasonable returns, this reinvestment amount should be no less than 25% of the annual net income of the school. For private schools designated as not requiring reasonable returns, the amount should be no less than 25% of the annual increase in the net assets of the school.

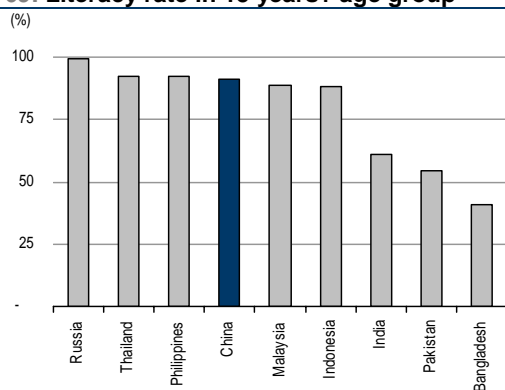
Chinese-foreign cooperation in operating schools or training programmes is specifically governed by the Regulations on Operating Chinese-foreign Schools (2003). The law encourages substantive cooperation between quality overseas education organisations and Chinese organisations to jointly operate various types of schools in China. Meanwhile, the Ministry of Public Security and the State Administration for Industry and Commerce (SAIC) jointly regulate consultation services for overseas studies.

China encourages some foreign participation in the education sector but not foreign ownership

Market opportunity

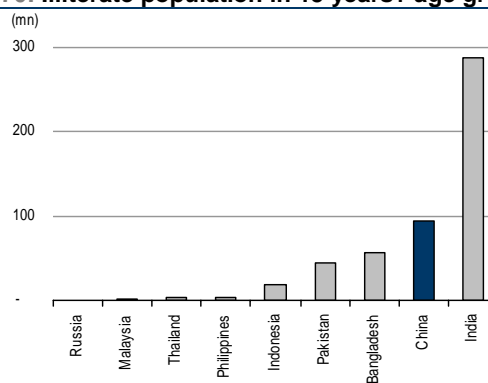
As a result of the one-child policy, parents are often willing to invest in their children's education and statistics show spending on education amounts to an important 15% of average household consumption. While estimates vary, there is broad agreement that education spending amounted to a mid-single-digit percentage of China's GDP in 2005, and is growing fast. Putting things into perspective, the education market is currently 10 times bigger than the advertising market in China.

Figure 69: Literacy rate in 15 years+ age group



Source: UN Human Development Report 2005

Figure 70: Illiterate population in 15 years+ age group



Source: UN Human Development Report 2005

China remains a twin-track economy, and its private sector education growth story is tied to continued urban growth in China. China's private sector education story is primarily one of supplementing, rather than substituting, the state-run sector, in our view. We note that China's overall literacy rate is already at a reasonable level compared with its regional emerging market peers but the sheer size of China's population still means the pool of illiterate people is enormous, at 93 million, according to the United Nation's Human Development Report 2005.

Business opportunities opening up...language proficiency

China's school system and policy backdrop led many operators to focus on the supplementary segments of the private education market (tutoring and classes outside schools, private schools for consumers looking for more than what the state sector provides, and vocational training to bridge the gap between school teaching and employment market needs), while some have also become involved in the substitutional segments, such as acquiring previously state-run schools and turning them into private operators.

New Oriental has a presence in most of these areas, although for regulatory risk and profitability reasons it has focused on English language training and test preparation products, both of which fall under what we would classify as the supplementary education product categories.

Test preparation and English language proficiency training should experience strong growth in China over the next several years. We expect demand to be driven by 1) Chinese students enrolling in local schools as English proficiency is increasingly being tested as a major subject for admission at the primary, secondary and post-secondary levels; and 2) Chinese students who want to pursue higher education (requiring standardised admissions and assessment tests, such as TOEFL, LSAT and GMAT) and job opportunities overseas. According to the 2006 China Statistics Yearbook, since 2002 more than 100,000 Chinese students have travelled overseas each year to enrol in higher education programmes, a number which is expected to rise by more than 30% to 200,000 in 2008.

As the Chinese economy continues to open up and Hollywood movies become ubiquitous, we expect the desire to learn English among the general population to continue on a sustained upward trend.

The China Education and Training Industry Research Report (2006-07) from ResearchInChina identified the English language training market to be worth approximately RMB15.0bn (US\$1.9bn) in 2006 implying a 5% market share for New Oriental. We expect this figure to double to RMB30bn (US\$3.8bn) by 2010, implying a 14.9% CAGR (we believe New Oriental's English-language training business can grow sustainably at 20–30% pa into the medium-term, driven by both volume and ASP growth).

Key recommendation: New Oriental Education (EDU.N, Outperform)

Overseas test preparation and English language training, two strong and growing niches in the education market in China, are New Oriental's strong suits accounting for 70% of its student enrolments in FY07. We expect New Oriental to sustain strong revenue and earnings growth of well above 20% into the medium-term, on a combination of 1) better-than-industry-average volume and ASP growth of its various products; and 2) its entry into new segments, both organically and by acquisition.

The company's key competitive advantages include 1) its leadership position in test preparation and English-language training (it has a network of 164 learning facilities in 35 cities); and 2) its strong brand and management team led by visionary founder/chairman and CEO, Michael Yu.

We expect test preparation and English language proficiency training to experience strong growth in China over the next several years...

...these are the strong elements in New Oriental's package

Figure 71: Summary of the listed education sector

Ticker	Company	Base	Description	Rating	Mkt cap (US\$m)	PE on FY1
APOL	Apollo Group Inc.	US	Apollo is a higher education provider and operates primarily under the flagship University of Phoenix and Axia College brands. As of mid-2008, Apollo enrolled 345,300 students, which made it the largest private university operator in the US.	O	12,304	22.1x
CPLA	Capella	US	Capella is an exclusively online post-secondary education company focused on graduate level programmes. Capella's enrolment totals more than 23,000 students.	O	1,022	36.9x
CECO	Career Education Corp.	US	CECO enrolls approximately 83,500 students at more than 80 campuses. Its schools offer master, bachelor, associate, and non-degree programmes in career-oriented fields such as IT, design, business, and culinary arts.	N	1,657	21.8x
COCO	Corinthian Colleges, Inc.	US	Corinthian Colleges offers associate, bachelor, and master degrees, as well as diploma and training programmes with a focus on business, healthcare, and technology to about 72,000 students.	N	1,395	27.0x
ESI	ITT Educational Services, Inc.	US	ESI operates 102 campuses and nine learning centres in 35 states under the ITT Technical Institute brand. Approximately 75% of ITT's nearly 55,000 students are enrolled in associate's degree programmes, mostly in technology-related fields.	N	3,531	17.7x
STRA	Strayer Education, Inc.	US	Strayer Education provides diploma, associate, bachelor, and master degree programmes in business, IT and accounting to more than 38,000 students at 60 campuses in the eastern US.	N	3,412	42.3x
DV	DeVry Inc.	US	DeVry owns and operates DeVry University, Becker Professional Review, Chamberlain College of Nursing, and Ross University. Total degree-seeking enrolment is more than 68,000 students.	N	4,171	26.3x
LRN	K12 Inc.	US	K12 is a leading provider of publicly funded wholly online education to virtual public primary and secondary schools. K12 enrolls about 40,000 students across 17 states and DC.	O	538	41.0x
LINC	Lincoln	US	Lincoln serves approximately 18,600 students, mostly in diploma-granting programmes across auto technology, skilled trades, business, IT and culinary fields.	O	358	19.1x
APEI	American Public Education, Inc.	US	APEI provides exclusively online post-secondary education to more than 30,000 students, mostly in the military.	O	746	48.0x
PSON.L	Pearson	UK	Pearson is an international media company with world-leading businesses in education, financial information and book publishing. It is one of the big three US schools publishers through Pearson Education.	N	7,708	11.6x
SCHL	Scholastic	US	Scholastic is a global children's publisher of education and media and has been publishing for >87 years.	NR	651	10.5x
MHP	McGraw-Hill	US	McGraw-Hill operates across financial services, education and business information markets through brands such as Standard & Poor's, BusinessWeek and McGraw-Hill Education. It is one of the big three US schools publishers.	NR	7,863	9.5x
AEDU11	Anhanguera Educacional	Brazil	AESA is one of the largest private for-profit post-secondary education institutions in Brazil. The company operates 45 campuses among 24 Brazilian states totalling 140,000 students. We expect the company to continue to grow in the post-secondary education segment, via a combination of: (i) the maturity of existing campuses; (ii) construction of new campuses; and (iii) acquisitions.	O	710	12.8x
KROT11	Kroton	Brazil	Kroton operates in the K-12 and post-secondary businesses. The company manages its own network of schools and campuses, as well as providing educational services, teaching technology and textbooks.	N	160	6.6x
SEBB11	SEB	Brazil	SEB is one of the best-known private education institutions in Brazil with a very strong brand, acting in different segments of the education sector, namely: basic education, sale of learning system, post-secondary education and distance learning.	O	149	5.5x
ESTC3	Estacio	Brazil	Estácio Participações (ESTC3) is one of the largest for-profit post-secondary companies in the education sector in Brazil, with close to 200k students and 77 campuses. Most of the students enrolled are young workers in the mid to low income bracket, which we believe has strong growth potential.	O	469	8.9x
EDU.N	New Oriental Education & Technology Group	China	New Oriental offers foreign language training, test preparation courses for assessment tests in the US, PRC and Commonwealth countries in primary and secondary school education; development and distribution of educational content; software and other technology; online classes.	O	1,905	27.9x
RLSE.SI	Raffles Education	Singapore	Raffles operates three universities and 22 colleges in Asia, offering courses in design, management, hospital and applied psychology.	O	675	9.2x
EDSO.BO	Educomp Solutions Ltd	India	Educomp Solutions is a leading player in the K-12 educational services segment in India. Its activities encompass learning content, learning infrastructure, teacher training, online tutoring and bricks-and-mortar schools.	O	788	29.1x

Source: Factset, IBES Consensus for non-rated companies, Credit Suisse research and estimates

Figure 72: Summary of the listed education sector, continued

Ticker	Company	Base	Description	Rating	Mkt cap (US\$m)	PE on FY1
EVSI.BO	Everonn Systems India Ltd	India	Everonn is a provider of K-12 learning content and learning infrastructure solutions. It also provides distant education programmes for professionals.	O	75	13.6x
NIIT.BO	NIIT	India	NIIT is the largest player in the professional training market and also offers IT infrastructure and learning content solutions to the K-12 segment. NIIT is also positioned as one of the key players in the corporate training segment in the US.	U	79	5.3x
072870.KQ	Megastudy Co Ltd	Korea	Megastudy provides online lecturing (60% of revenues in 2007), online material (10%) and offline institutional education (27%). The company has dominant market share and outstanding brand power.	N	656	18.9x
019680-KR	Daekyo	Korea	Daekyo focuses on home tutoring, this makes up 90% of revenues (including education material). Target customers are elementary school students /pre-school children.	NR	227	11.0x
067280-KR	CredU	Korea	CredU focuses on an E-learning service (65% of 2007 revenues). Target customers are office workers.	NR	168	42.2x
096240-KR	CDI Holdings	Korea	CDI specialises in English language courses. Offline institutional education made up 66% of 2007 revenues and online lecturing 27% of revenues.	NR	163	8.1x

Source: Factset, IBES Consensus for non-rated companies, Credit Suisse research and estimates

Healthcare: a spoonful of sugar

Key findings

- The mix of demographic trends and the accompanying educational framework affects the intangible foundations for economic prosperity. However, another key component in developing human capital is healthcare provision.
- Globally, we estimate that healthcare is a US\$5.4trn business (2007 WHO data) equivalent to c.10% of total GDP. While the bulk of healthcare expenditure is concentrated in the developed markets, absolute growth has been strongest in the emerging markets (up 72% vs 50% for the developed markets between 2000 and 2005, according to the WHO).
- In the aftermath of the emerging market crisis of the late 1990s, healthcare took something of a back seat on the government reform agenda as other matters (banking regulation or external debt financing, for example) took priority.
- More recently, healthcare has moved up the priority list in key emerging markets, such as China, Brazil and South Africa, and we expect this to continue. In China, for instance, we expect government-led spending to boost healthcare expenses from 5% of GDP in 2005 to 10% by 2015E. Elsewhere, government-led growth in healthcare is hampered by significant public sector financing constraints (for example, in India), but even here we expect growth to be buoyant, driven by private, out-of-pocket sales.
- Given the financing constraints on governments, demand is focused on lower-cost solutions. This clearly favours generic players. In some cases (Brazil, South Africa, India) governments are explicitly targeting higher generic sales. The private providers of healthcare services are also likely to be a key component in improving provision.

Figure 73: Healthcare sector: Investment recommendations

Mindray Medical: develops, manufactures, and markets medical devices

The Chinese government is committed to improving healthcare services and is channelling significant funds into the sector. A large part of the increased government spending is expected to be used to purchase medical devices and supplies. This should help accelerate the growth of leading domestic medical devices players such as Mindray Medical.

Ticker: MR.N

Rating: Outperform

Jinsong Du

Sun pharma: Indian pharmaceuticals manufacturer

65% of Sun revenues in 2007 were accounted for by the emerging markets. Most of these revenues were contributed by Indian formulations (77% of emerging market exposure) where Sun has maintained a dominant position in chronic therapeutic areas (which have tended to be less cyclical and faster growing than the average growth in pharma products).

Ticker: SUN.BO

Rating: Outperform

Neelkanth Mishra

Amil: managed care in Brazil

Amil is the largest MCO (managed care organisation) in Brazil, in terms of plan members and revenues. Over the past four years the company has grown revenues at 23% p.a. while earnings have expanded by 58%. We forecast an earnings CAGR of 25% for the 2007-10 period.

Ticker: AMIL3

Rating: Outperform

Luiz Otavio Campos

TEVA: the world's largest generic drug manufacturer

The three reasons why we like it are: (1) We think concerns over generic Copaxone are overdone, given a strong patent position. (2) Teva's broad portfolio means it should continue to benefit from increased generic utilisation, particularly in the emerging markets. (3) Teva has a number of visible generic growth drivers, including: Lotrel, Risperdal, Lamictal, and Effexor XR. We think the company can grow in the 12–15% range during 2008–12E.

Ticker: TEVA

Rating: Outperform

Marc Goodman

Gedeon Richter: largest pharmaceutical company in Central and Eastern Europe

Gedeon Richter should continue to benefit from its oral contraceptive (OC) franchise (which accounted for c30% of its 2007 revenues). 38% of 2007 revenues came from Russia and the CIS, 19% from CEE (ex Hungary), 18% came from Hungary. Gedeon trades at a notable discount to the peer group, reflecting concerns over the growth outlook in Hungary. In our opinion, this bad news is sufficiently priced in.

Ticker: GDRB.BU

Rating: Outperform

Ravi Mehrotra

Source: Company data, Credit Suisse estimates

The Credit Suisse Healthcare index

Figure 74: Country ranking (2006) and change in rank (1999–06)

	Country	Improvement in rank (1999 - 2006)	2006 Rank (out of 54)
1	Turkey	10	36
2	Lithuania	9	30
3	Korea	7	38
4	Hungary	6	24
5	Slovenia	6	28
6	Venezuela	6	42
7	Brazil	5	45
8	Colombia	5	47
9	Croatia	2	26
10	Estonia	2	31
11	Thailand	2	49
12	China	1	48
13	Greece	1	22
14	Taiwan	1	39
15	Bulgaria	0	29

* we list all countries, sorted by change in rank, which are rated lower than 20 on their 2006 score Source: Credit Suisse estimates

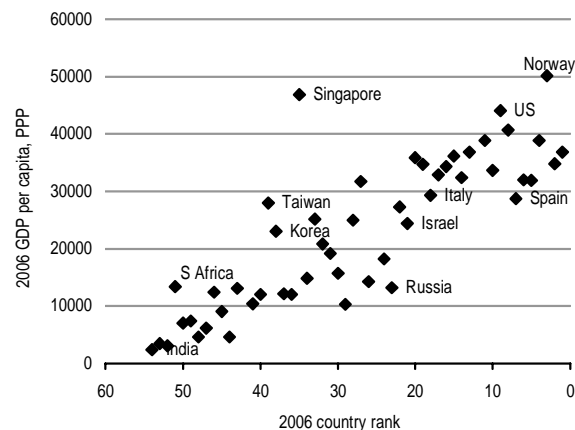
The CS Healthcare index is a macro-oriented guide to investment decisions in the Healthcare sector by country and/or region. It effectively ranks countries' (54) ability to maintain an environment which sustains the development of the healthcare infrastructure; and measures its relation to wealth creation and economic growth. Not surprisingly, the top-ranking countries are mostly developed markets. The low-ranking countries are largely emerging markets. The countries of greatest interest to us are among those that rank low and have a tendency to improve their ranking from year to year.

We measure healthcare touching on four broad components: healthcare status, healthcare resources, healthcare utilisation, and healthcare expenditure.

In the construct of the composite index, we standardise components that are measured in different units (e.g., USD; shares of GDP; shares of totals in general—for example share of total exports; rates of growth (percentage changes); number of people; patents). Unlike in the other indices we have constructed, in which we have both 'hard' and 'soft' data, with 'hard' data being those that are readily measured and 'soft' data that which can be perceived, the CS Healthcare index is comprised of only hard data. We have identified them as follows:

- Total health expenditure per capita (US\$ per capita)
- Life expectancy at birth (average estimate)
- Infant mortality (under 5 mortality rate/ 1000 live births)
- Medical assistance (number of inhabitants per physician and per nurse)
- Immunisation DPT (Diphtheria, Pertussis and Tetanus)

Figure 75: Healthcare ranking vs GDP per capita (PPP, 2006)



Source: Credit Suisse estimates

Our results are solid: Based on a panel of 51 countries over seven years, the CS Healthcare index has a positive correlation with GDP per capita output of 79%. For a smaller available panel of 39 countries over five years, the CS Healthcare index also has a positive impact on GDP per capita growth: A 1 point rise in the CS Healthcare index raises GDP per capita growth by 0.022 percentage points. This result is significant at the 99% level of confidence, and the associated R-squared is equal to 42%.

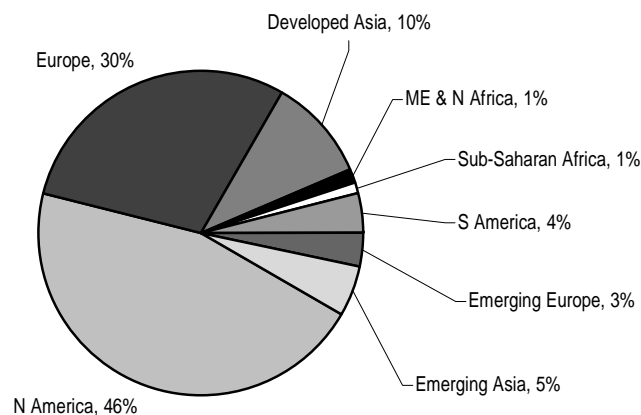
Finally, when we analyse the regional and country-based growth potential measured by our CS Healthcare index, we identify the following regions with the largest catch-up potential: Eastern Europe, Latin America and South East Asia. As for specific countries, out of the total number of 54 countries, we note Hungary, Colombia, and Taiwan as the countries with strongest growth potential. The CS Healthcare index of Hungary has 82% correlation with GDP per capita output; for Colombia this correlation is 80%; and for Taiwan it is 66%.

The global landscape

Globally, we estimate that healthcare is a US\$5.4trn business (on 2007 WHO numbers). The bulk of this expenditure is concentrated in the developed markets, mainly the United States and Europe. On 2005 data, developed markets accounted for 85% of global healthcare spend, despite accounting for only 36% of the global population. Within the emerging world, Asia ranks above its peers.

Globally, healthcare spend has been growing at a slightly faster rate than real GDP. According to the World Health Organisation (WHO), in 2000, healthcare accounted for 9.2% of global GDP; by 2005 this had increased to 9.9%. *Relative to GDP*, the fastest growth in healthcare spend has been in the developed regions. The growth in healthcare spending is mainly due to technological advances and the growth in social wealth to afford such investments. *Absolute* growth in healthcare spend has been strongest in the emerging markets.

Figure 76: Regional healthcare spend as % world total (2005)



Source: WHO, Credit Suisse research

Figure 77: Regional healthcare spend

	Healthcare spend (US\$bn)	Healthcare spend (% GDP)		Growth	
	2005	2000	2005	Chg (as % GDP) 2005/2000	Chg (in US\$ terms) CAGR 2005/2000
N America	2,001	12.9%	14.7%	1.9%	8.0%
Europe	1,308	8.7%	9.6%	0.9%	12.0%
Developed Asia	451	7.6%	8.2%	0.6%	2.7%
ME & N Africa	64	4.9%	4.7%	-0.2%	8.0%
Sub-Saharan Africa	41	5.7%	5.7%	0.0%	13.6%
S America	178	6.8%	7.0%	0.2%	5.5%
Emerging Europe	142	5.6%	5.9%	0.3%	19.1%
Emerging Asia	221	4.2%	4.7%	0.5%	13.9%

Source: WHO, Credit Suisse research

Healthcare: a structural growth story

Global healthcare spend is likely to see double-digit growth over the medium term, driven by a significant increase in absolute spending in the emerging markets. From a macro perspective, through the combination of GDP growth, government policy, and demographics, we expect the fastest growth rates in healthcare spend to come through across most of emerging Asia (China, India, Malaysia and Thailand), parts of Latin America (Brazil, Mexico and Chile) and particularly in the Middle East and North Africa

(MENA). For the record, PriceWaterhouse Coopers has predicted the top seven emerging markets (Brazil, China, India, Mexico, Indonesia, Russia and Turkey) will increase their combined GDP from US\$5.1 trillion in 2004 to US\$15.7 trillion by 2020, and healthcare spend will account for 19% of the global healthcare market, from 8% in 2004.

There is clearly a good fit between healthcare services and GDP per capita. As GDP improves for the emerging economies, healthcare spend is also likely to pick up. Indeed, as Credit Suisse's economics team has found, healthcare spend may have to pick up in order for GDP to improve (see page 57 for more details). The econometric study shows that a 1 point rise in the CS Healthcare index raises GDP per capita growth by 0.022 percentage points. While this may seem small, on the face of it, the fact that one can isolate any effect from healthcare for such a complex variable as GDP suggests the influence is significant.

Reform and investment in emerging countries

In the aftermath of the emerging market crisis of the late 1990s, healthcare took something of a back seat on the government reform agenda as other matters (banking regulation or external debt financing, for example) took priority. More recently, healthcare has moved up the reform agenda in key emerging markets:

- In China, post the SARS outbreak of 2003, the Chinese government committed to significantly increasing government funding in healthcare. We expect government-led spending on healthcare to boost healthcare expenses as a percentage of GDP from 5% in 2005 to 10% by 2015E.
- In Brazil, in December 2007, the government launched 'PAC da Saúde', a package that foresees investments of R\$89bn (equivalent to 3.8% of GDP) in the healthcare sector until 2011. Plans include increasing the number of medical teams by 13,000 (from 27,000 currently) to provide care for 130mn people, compared with 87mn currently.
- In South Africa, the government has, albeit very belatedly, embarked on what is largely reported to be the biggest HIV treatment programme by any individual country, with backing from the Global Fund and PEPFAR (the US-run President's Emergency Plan for AIDS Relief) projects. This programme, which began in 2004, includes treatment to prevent mother-to-child transmission (during childbirth), post-exposure prophylaxis and treatment for patients with end-stage HIV (AIDS). A concomitant increase in expenditure on TB and other diseases associated with HIV has also occurred.

Elsewhere, government-led growth in healthcare is less likely, on the back of significant public sector financing constraints, but even here we expect growth to be buoyant, driven by private, out-of-pocket sales.

- In India, for example, the government has not yet taken any meaningful steps to accelerate investment or growth in healthcare. However, on the back of private financing, we expect significant growth across the healthcare spectrum: from pharmaceutical sales (12-14% growth CAGR expected over the next decade) and devices to hospitals, diagnostic labs and pharmacies and pharmaceutical distributors, even without much growth in public spending.

But, with the usual competing demands for limited finances, demand is focused on lower-cost solutions. This clearly favours generic players. In some cases governments are explicitly targeting higher generic sales:

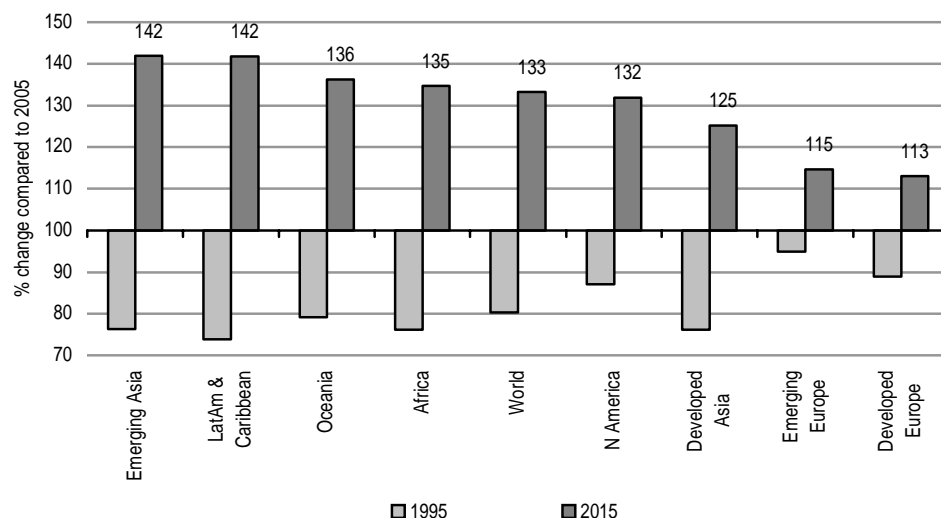
- Generic drugs only started to be produced in Brazil in February 2000, six months after approval of the Law of the Generics. Initially, demand was very sluggish, given lack of confidence in the generic substitute. But, sales have soared following a government-sponsored advertising campaign to inform people of the benefits of generic drugs. The number of registrations for generic drugs in Brazil has increased 15-fold between 2000 and June 2008, to almost 2,500 registrations.

- In South Africa, since 2003 pharmacists have been required to offer patients a generic substitute for any medicine prescribed (unless the prescribing doctor specifically states that this is not appropriate).

A growing but aging population

The combination of increased longevity with decreasing fertility rates (in most regions) leads to an aging population. Overall, an increasing proportion of elderly members of the population should have a positive impact on the healthcare sectors, as demand for healthcare services increases. We expect longevity to increase in both developed and emerging countries. Interestingly, given the lower initial base, we expect comparably greater growth in emerging markets owing to improvements in both healthcare and sanitation.

Figure 78: Population over 60 in 1995 and 2015 as a % of 2005 by region



Source: UN Population Division, Credit Suisse research

As we illustrate in the chart above, on a regional basis, the fastest growth in the over-60s population is forecast to occur in emerging Asia, followed by Latin America. Overall growth for Africa is fairly strong (up 35% by 2015 compared with 2005) but within that, growth in North Africa (projected at 42%) is the key driver. The Middle East is also likely to experience strong population growth, particularly in the over-60s category. The over-60s population is forecast by the UN to grow by 62% in Saudi Arabia, 92% in the UAE and 60% in Oman by 2015. Growth in the size of the elderly population brings with it significant growth in chronic disease. This will have serious implications for the cost and configuration of health systems within the region. We would expect the drugs that are focused on the elderly (including dyslipidemia, diabetes and hypertension) to be key beneficiaries.

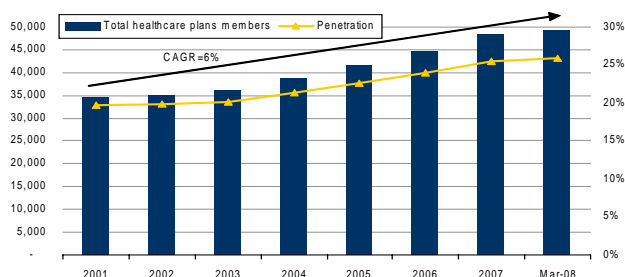
Brazil—overloaded and constrained

The Brazilian public healthcare system comprises the SUS (Unified Health System). SUS is one of the largest public healthcare systems in the world. Its network consists of more than 60,000 units assisting more than 350mn patients per year, providing coverage for almost 80% of the population. However, the system is widely perceived as overloaded and unsatisfactory. In our view, this perception derives from the difficulties the population faces in scheduling a simple doctor's visit, for example. In 1994 government expenditure on healthcare was 2.3% of GDP, by 2006 this had declined to 1.7% of GDP. Going forward, we expect this amount to remain basically flat relative to GDP, since a budget ruling requires that healthcare expenses cannot fall further relative to GDP. Nevertheless, we do not expect that amount to increase, since the government has limited funds available.

The poor performance of the public healthcare system means the country has become more dependant on the private healthcare plan sector. The Brazilian private healthcare plan and health insurance industry started up 40 years ago as an initiative of certain large companies to ensure their employees and their family members a better quality of healthcare coverage. The industry developed rapidly as the Brazilian public healthcare system became overstretched. According to the National Health Agency (ANS), the number of healthcare plan members totalled 48mn in 2007, of which 17% were exclusive dental care members. From 2000 to 2007, the number of healthcare plan members grew at a 5.5% CAGR, versus the population CAGR of 1.7%. In the same period, healthcare plan revenues increased by a 13.4% CAGR to R\$47bn.

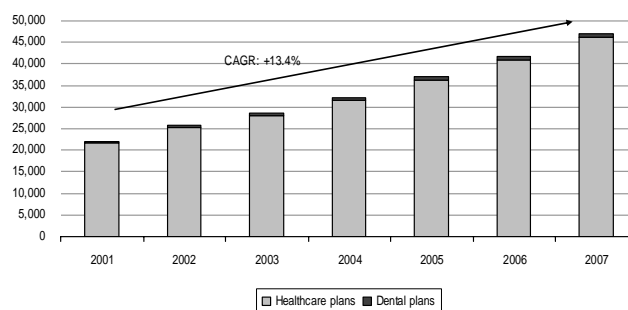
Private healthcare provision filling a gap

Figure 79: Healthcare plan members
Thousand



Source: ANS

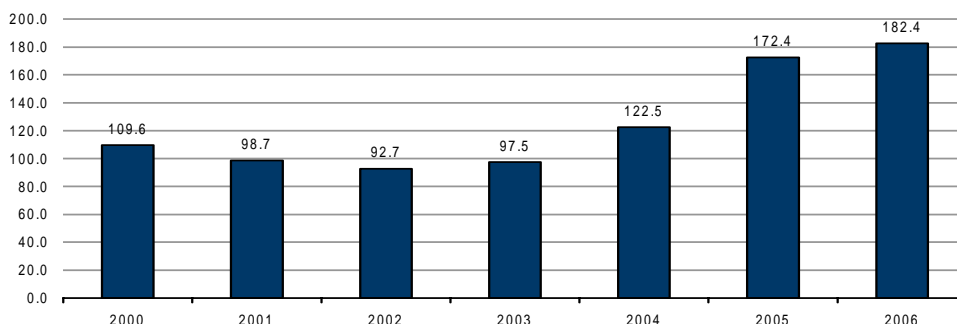
Figure 80: Healthcare plan revenues (excluding dental care), R\$ in millions



Source: ANS

In terms of healthcare expenditure per capita, the country has also been improving; a result of (i) a stronger economy, (ii) lower unemployment levels; and (iii) higher wages.

Figure 81: Total healthcare expenses per capita
US\$/capita



Source: WHO, Credit Suisse research

At the same time an aging population should pose a further challenge to the sector and expectations are that healthcare expenses should continue to increase for the next several decades.

Regulatory framework—foreign investment precluded

Despite the demands on its own system, Brazil imposes restrictions on foreign investments in the healthcare industry. The government prohibits any direct or indirect foreign investment in the Brazilian healthcare system, except as otherwise established by law or in one of the three following events: (i) donations from international organisations tied to the UN; (ii) through technical cooperation entities; (iii) through financing or loans. The exception to the rule is that the law permits health assistance through private, national or international companies. Those companies are allowed to own their hospital facilities as long as they exist for their plan members.

There are two agencies that then regulate the activities of the domestic companies operating in the healthcare sector: (i) the National Health Agency (ANS), which is mainly responsible for regulating the private healthcare plan industry and controlling the activity of its players; and (ii) the Sanitary Inspection Agency (ANVISA), which inspects products and services, including medical drugs, cosmetics and laboratories.

In our view, one of the most important responsibilities of the ANS is to set price adjustments for individual healthcare plans. The adjustment rates are defined on a yearly basis for the period between May to April of the following year. In order to calculate the price adjustment rate, the regulatory body considers, among other factors, the inflation index in Brazil and the medical inflation rate.

The Brazilian ‘FDA’

Brazil’s drug approval system is controlled by ANVISA. Medical drugs are registered by the General Drugs Management (GGMED), which is also responsible for approving changes and inclusions after the drug registration, as well as for renewing registrations. For all drugs, the registration filing usually takes 8–12 months to be approved and must be renewed every five years.

In our view, the role of ANVISA will be key, as we expect the government’s focus in terms of the healthcare sector to be more on trying to offer cheaper drugs to the population. The government has already been putting more pressure on (i) greater generics use; (ii) promoting R&D efforts; and (iii) providing further finance to the sector (the ‘Profarma’ scheme). We describe all three initiatives in more detail later.

Drug pricing key due to cost constraints

Another initiative on that front is the Farmacia Popular, or ‘low-income pharmacy’, which has also helped increase the penetration of drug usage. Under this programme (started in March 2006), medicines for hypertension and diabetes were made available at a 90% discount in approximately 1,200 private-sector pharmacies. The experience has already been successful in countries such as France, Germany, Spain, Portugal and Canada.

Patent protection and the role of generics

Brazil’s patent approval system is controlled by the Brazilian Industrial Property Office (INPI), as established in the Law of Patents approved in 1996. Since 2000, ANVISA has also been responsible for approving patents related to medical drugs in order to ensure technical analysis of the processes and, therefore, make it easier to identify whether a patent can or cannot be granted. Drugs are typically protected for 20 years under patent rules. After this, the production of generics is allowed. Prices for generics must be at least 40% lower than regular prices (as the company did not have to invest in marketing and R&D).

Even though generic drugs started to be produced in Europe and in the US in the 1960s, they started to be manufactured in Brazil only in February 2000, six months after approval of the Law of the Generics, under the mandate of President Fernando Henrique Cardoso. Initially, both consumers and doctors were reluctant to buy generic drugs since they didn’t

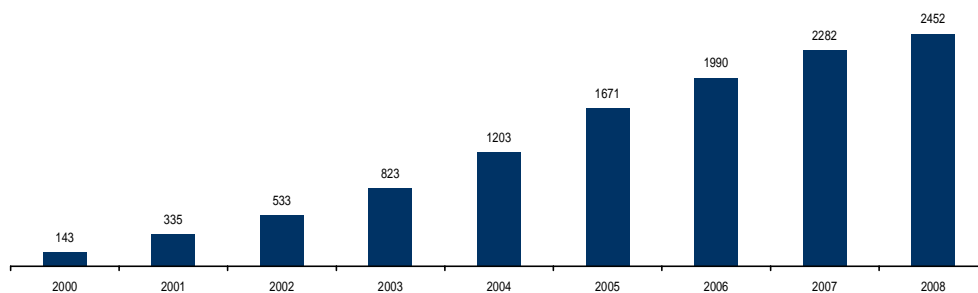
know if the generic drug would have the same effect as the reference drug. The Brazilian government then launched a large advertising campaign to inform people of the benefits of generic drugs, which resulted in an increase in demand and, hence, production. The number of registrations for generic drugs in Brazil increased by 15.0x from 2000 to June 2008, to almost 2,500 registrations. Today the largest producer of generic drugs in Brazil is EMS Pharma, a local laboratory. Local labs (EMS, Medley, Eurofarma) are focusing more on being leaders in cost rather than innovation.

There has been one formal government-sanctioned patent break in Brazil. In May 2007, the government and the MOH signed a decree that officially determined the compulsory licence of a drug called Efavirenz, an anti-retroviral produced by Merck Sharp&Dohme. This was the first time the Brazilian government approved a patent break of a medical drug. This means that Brazil can either start to produce the drug, which we expect in 2009, or import it from other laboratories approved by the WHO. Currently, three Indian laboratories—Cipla, Ranbaxy and Aurobindo—meet the efficiency and quality requirements established by WHO.

The break of the patent of Efavirenz by the Brazilian government is in accordance with the international legislation of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) as well as the national legislation, which allows patents to be broken in cases of public interest, national emergency, insufficient supply and absence of local exploration of the drug. In the case of Efavirenz, the main argument was national public interest.

The AIDS case break of patent

Figure 82: Cumulative number of registrations for generic drugs as of 30 June 2008



Source: ANVISA, Credit Suisse research

Figure 83: Largest pharma producers and generic exposure

#	Company	% sales	# generics	% total
1	Sanofi-aventis	6.7%	24	3.8%
2	Aché	6.5%	0	0.0%
3	EMS	5.2%	272	42.6%
4	Novartis	4.8%	27	4.2%
5	Pfizer	4.6%	0	0.0%
6	Medley	4.0%	169	26.4%
7	Boehringer Ingelheim	2.9%	0	0.0%
8	Schering Plough	2.8%	0	0.0%
9	Eurofarma	2.8%	147	23.0%
10	Schering do Brasil	2.7%	0	0.0%
Total		43.0%	639	100.0%

Source: Company data, Credit Suisse research

R&D development

Compared with other important emerging economies, R&D investment appears to be very low in Brazil. An import substitution policy remained in effect during the 1960s, 1970s and 1980s (similar to the one adopted by China and India), which included an emphasis on strengthening the domestic research system. The strategy also included the creation of barriers to the import of foreign technology, a vital source of learning that would probably have led to faster developments in healthcare R&D.

The government changed its import substitution policy in the 1990s, when it adopted a free market approach that included deregulation and privatisation. Much of the motivation to adopt this revised strategy came from the desire to attract foreign investment. In 1996 the government approved the Patent Law (Law No. 9279/96), affording intellectual property (IP) protection to pharmaceutical products. However, Brazil's IP regime is poorly resourced, slowing patent activity by R&D professionals in the country. Recently, the Brazilian government has made more efforts to ensure the development of healthcare R&D. The Innovation Law (2004) and the law that fosters technology investments (the so-called 'Lei do Bem' (2005)) are evidence of the government's efforts to support innovation.

Government policy has not fostered domestic R&D

The policy of the Brazilian government to meet domestic demand for anti-retroviral (ARV) drugs has promoted increased levels of manufacture and collaboration on production. However, this has not yet translated into increased innovation in this therapeutic area. The tropical diseases prevalent in Brazil, together with the biodiversity of its natural resources, has, however, spurred the emergence of a biotechnology region in Minas Gerais and the founding of a number of biotechnology firms.

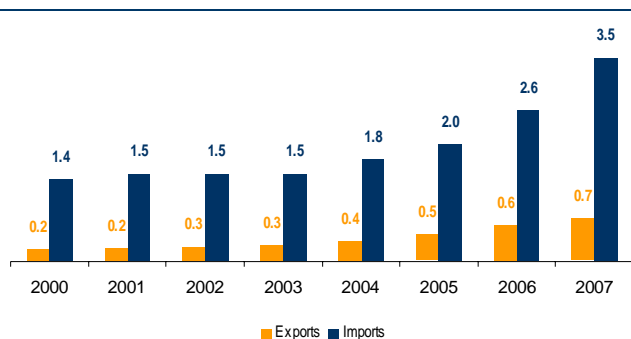
Financing the healthcare sector

One of the main government initiatives to improve the environment for the pharma sector and provide support for health R&D was the Profarma programme supported by BNDES. In 2004, the National Development Bank (BNDES) launched the Program for the Development of Pharmaceuticals' Production Chain ('Profarma') in order to foster the production of drugs in Brazil, as well as improve their quality.

As of August 2007, more than three years after its implementation, Profarma's portfolio had 49 projects with approximately R\$2bn in investments, with BNDES' financial support accounting for R\$1.03bn of the total amount. Currently, 42 of the 49 projects in Profarma's portfolio have already been approved or are at the contract execution stage. However, these projects take a long time to be implemented. Hence, projects supported by Profarma have not yet shown any significant result in the pharmaceutical sector. The construction or modernisation of a pharmaceutical plant has to be made according to ANVISA's manufacturing practices rules, which are subject to the GMP (Good Manufacturing Practices) and other operational aspects. After construction of the industrial unit, which takes 2–3 years, equipment must be individually analysed and approved by ANVISA. The bottom line is that the trade balance still shows that this industry is very fragile in Brazil. Despite the depreciation of the real at the beginning of 1999, Brazil continues to run a 'healthcare deficit'.

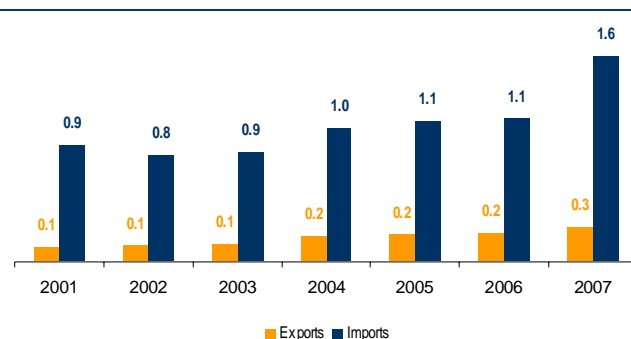
Project rolled out but mixed results to date

Figure 84: Drugs trade balance (US\$m)



Source: BNDES, Credit Suisse research

Figure 85: Medical equipment and devices trade balance (US\$m)



Source: BNDES, Credit Suisse research

Profarma ended in December 2007. However, BNDES and the Brazilian Ministry of Health developed a new programme to support the development of the National Health Industrial Complex. The total budget is R\$3bn and should remain in effect until 2012.

In December 2007, the Brazilian government launched 'PAC da Saúde', a package that envisages investments of R\$89bn in the healthcare sector until 2011. Plans include increasing the number of medical teams by 13,000 (from 27,000 currently) to provide care for 130 million people, compared with 87 million currently. The government also plans to increase the number of ambulances, as well as to strengthen the production of medical drugs, increasing by 50% the total supply of drugs produced by 19 official (public) laboratories.

Brazilian key stock selections

Since there are no pharma companies listed in Brazil, we have identified two listed healthcare providers which are well placed to benefit from the rising demand for healthcare services in the country; namely, Amil (a healthcare plan service provider) and Dasa (a clinical/image testing lab company). The generics demand will be fulfilled by stocks outside the region (e.g. Europe and India).

- **Amil (AMIL3)** Amil is the largest MCO (managed care organisation) in Brazil in terms of plan members and revenues, with roughly 3 million members. Following recent acquisitions, the company now holds 7% of the total Brazilian private healthcare plan market. The company offers both traditional healthcare plans and also dental plans. Amil operates under a vertically integrated structure and has its own vertically integrated network of five hospitals, 19 healthcare centres, around 200 clinics and 7 special units for cardio and physiotherapy treatment. Over the past four years the company has grown revenues at 23% per annum, while earnings have expanded by 58% on a combination of organic expansion and acquisitions. We forecast an earnings CAGR of 25% for the 2007–10 period and rate the stock as Outperform.
- **Diagnósticos da America (DASA3)** DASA is the largest company in Brazil's diagnostic industry. It operates in two segments: (i) retail; and (ii) wholesale markets. The retail operation comprises clinical analysis tests and imaging tests for individuals. The wholesale operation comprises (a) lab to lab, where Dasa processes samples collected in laboratories around the country; and (b) public services, where the company operates several collection points for the government and processes those samples in its own central labs. There are two key positives for Dasa: (1) Brazil's aging population, which will lead to increased demand for both clinical and imaging services; and (2) expanding public sector demand, since the company has a dedicated business unit operating for the government, with scale to provide services at low prices. We rate the stock as Outperform.

E-EMEA—differing policies, different countries

There is limited consistency in the nature of healthcare in the emerging markets in E-EMEA. A degree of fragmentation is a reflection of the geographical distinctions within the region (and the associated language, social and legislative differences), but also the differences in social standards and development in Europe. The EU has attempted to bring a measure of consistency to the market in the form of the European pharmaceutical directive (Directive 2001/83/EC and regulation 2309/93), but member states have individual regimes adapted to their own needs.

The key drivers for the sector are:

- (1) Continued healthcare reforms (focused on reducing the cost of healthcare, a scenario that favours generic players) and concomitant healthcare spend;
- (2) Favourable shifts in population demographics;
- (3) Significant upcoming product patent expiries (with €18bn of European product sales expected to go generic in 2007–12).

This combination of drivers will obviously affect different countries to varying degrees. In our view, they will find particular traction in the MENA and CEE markets. The established position of the branded generics industries in the CIS/CEE and MENA regions, allied to the structurally stronger economic backdrop and relatively modest healthcare spend has hitherto created a period of unprecedented growth, which we expect to continue.

(1) Disparities in terms of healthcare spending

In terms of overall healthcare spend there are distinct differences among the EMEA markets. Western European markets spend a comparatively high level of GDP on healthcare, despite the differences in underlying reimbursement, pricing and regulation systems and attitude to generics. On average, Western European countries spend 9.2% of GDP on healthcare (ranging from 7.5% of GDP in Austria to 11.5% of GDP in Switzerland). To put this into context, the biggest spender—the US—spends US\$1,673bn on healthcare, equivalent to 15.2% of GDP.

As one would expect, comparatively, CEE spends much less on healthcare. As a percentage of GDP, the CEE market has a relatively consistent level of spend, with an average of 6.7% of GDP spent on healthcare (up from 6.3% in 1998). This is c.25% lower than the percentage of GDP spent on healthcare in Europe and 55% lower than the US.

Turning to the MENA region, healthcare spend as a percentage of GDP is a relatively modest 5.3% of GDP, on average. In our view, given the modest current spend, well-established (yet fragmented) branded generics markets, the strong oil price, improving socio-economic indicators and shifting population demographics, the MENA region has the most significant potential for increased healthcare spending within the EMEA region.

This analysis highlights two key facts, in our view:

- The absolute differences in actual healthcare spend between regions are significant and in some cases disproportionate. According to the WHO, the US spends US\$5,724/head on healthcare compared with US\$2,705/head in Western Europe (even though the two regions have comparable GDP/head). CEE Europe only spends US\$866/head on healthcare (36% of the Western European level). Given that the average GDP for CEE (US\$9,165) is c.29% of the mean GDP for Western Europe, this level seems broadly in line with available resources. The MENA region lags significantly, with an average healthcare spend/head of US\$435 (50% of the CEE spend and 16% of the Western European spend), despite an average GDP/head of US\$8,563 (93% of the value of the CEE region and 27% of the Western European average).
- Healthcare spend per head is increasing across all countries and regions. On average, healthcare spending in the US increased from US\$4,602/head in 2000 to US\$5,724/head in 2003 (a CAGR of 7.5%) according to the WHO. In Western Europe, it has increased from US\$2,286/head to US\$2,705/head (a CAGR of 6%). In CEE Europe, it has increased from US\$669/head to US\$866/head (a CAGR of 8.9%). In the MENA region, it has increased from US\$392/head to US\$435/head (a CAGR of 3.5%).

Emerging spending growing but from a low base

(2) Population demographics

The region we would highlight as having particularly favourable demographic development is the MENA region. It has experienced the highest rate of population growth in the world over the past 50 years, the total population increasing from around 112m in 1950 to around 415m currently, according to the UN. The US Census Bureau estimates that this population will double again to at least 833m by 2050 (an increase of around 2% p.a.). The combination of overall population growth with an increasingly elderly population (for example, the OECD expects the population of Egyptian seniors—60 years and older—to increase from 4.3m in 2000 to 23.7m in 2050) will bring with it significant growth in chronic disease. This will have serious implications for the cost and configuration of health systems within the region.

Getting older and living longer will increase demands on healthcare systems

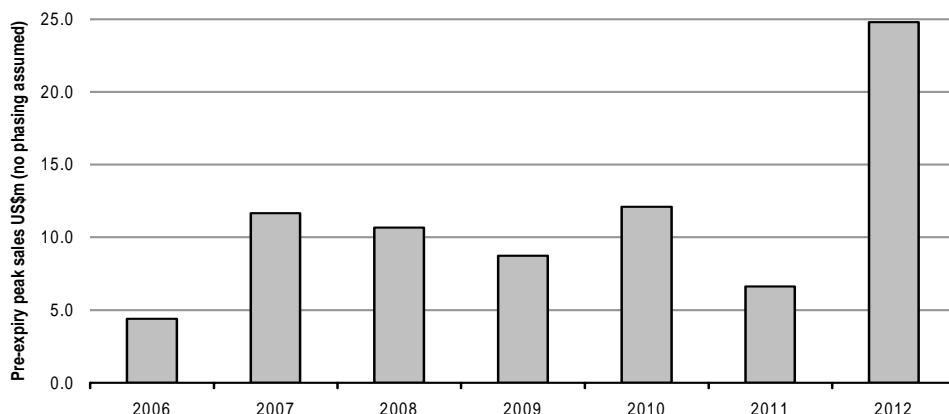
(3) Upcoming product patent expiries

One of the core drivers for a healthy generic market must be replenishment of the product pipeline, i.e. continued patent expiries from the large pharmaceutical companies. As shown in Figure 86, we expect a continued strong sequence of product patent expiries from 2007–12 in the emerging world. As the chart below indicates, 2012 looks set to be a bumper year for the generics industry (including the genericisation of Lexapro, Advair, Singulair, Diovan Seroquel and Plavix). While these products will clearly face varying degrees of competition, with US\$74.6bn of originator product sales going generic from 2007–12, using the simple rule of thumb that a generics market is worth 5–10% of the originator market, this results in an incremental US\$3.5bn–7.5bn of generic sales being added to the industry.

€18bn of European product sales expected to go generic in 2007–12

Figure 86: Upcoming worldwide patent expiries

US\$ in millions

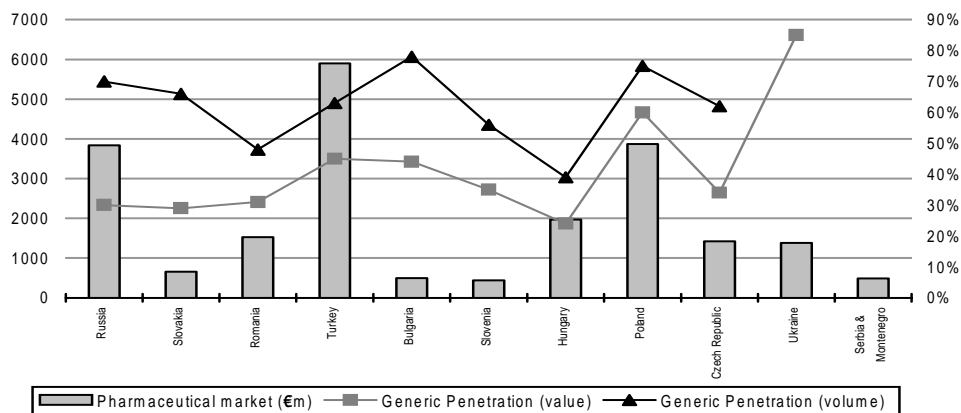


Source: Company data, Credit Suisse estimates

Increasing generic utilisation rates

In CEE, the historical paucity of healthcare funding, combined with strong local pharmaceuticals producers, has meant the penetration of generic drugs is comparatively much higher (both in volume and value) than in the US or the UK. This reflects a 'branded generic market' where generic, off-patent drugs are marketed as a 'brand'.

Figure 87: Pharmaceutical spending and generic share of market: CEE, 2006



Source: Actavis data, Credit Suisse research

These drugs have a comparatively higher margin than the comparable drugs sold as 'generics' in Western Europe. The difference is that the originator pharmaceuticals element of the CEE market is much lower in terms of value, i.e. these markets have evolved to work with lower levels of healthcare funding. As such, the educational element of the branded drug sales force detailing has been important to the physicians and this 'brand loyalty' will not be easy to overcome. However, the local market healthcare funding is under pressure in CEE. While the recent experience in Hungary is clearly at one end of the spectrum, overall we expect continued pressure on state funding of healthcare schemes. Ultimately, this means the brand value of these generic drugs is likely to fade.

'Brand loyalty' and high margins in CEE

EMEA key stock recommendations—generics focus

We see upside in three EMEA-exposed pharma stocks:

- **Gedeon Richter—fundamentally strong and from late 2008 could see 'OC' upside.** We remain positively biased towards Gedeon Richter and hold the view that the stock could become increasingly investable in late 2008. Gedeon Richter has one of the lowest (and tightly controlled) COG, G&A and S&M cost bases, translating into some of the highest margins. Moreover, we see two unique aspects to Gedeon Richter: namely its oral contraceptive (OC) franchise (which accounts for c30% of its 2007 revenue base) and its proprietary CNS-focused pipeline. Both of these may provide upside in late 2008 and 2009, with the OC franchise benefiting from increased utilisation rates in the CIS region, especially Russia. From a geographical revenue-split perspective, we think Gedeon Richter has arguably the best foot print (38% of 2007 revenues came from Russia and the CIS, 19% from CEE (ex Hungary), 18% from Hungary). On PE and EV/EBITDA valuations, Gedeon Richter is trading at a notable discount to the peer group on our estimates, which, in our opinion, reflects the historical disappointment in its home market of Hungary and continued concerns about this market, from both a macro and healthcare reform point of view. We believe the poor visibility on the Polpharma deal has also negatively impacted investor sentiment. Although we can understand the influence of the 'Hungary issue' on sentiment for Gedeon Richter stock, we highlight that Hungary only accounts for c18% of 2007 revenues (and we estimate this will be <15% post completion of the Polpharma deal). We rate the stock as Outperform.
- **Hikma—MENA focus offers long-term potential, short-term US concerns.** In our view, the MENA region (c51% of Hikma's 2008E revenues) offers the best long-term pricing environment for generic drugs, as well as the greatest growth potential. While operations in the US (accounting for 32% of 2007 revenues) have been disappointing, the vast majority of Hikma's revenues offer higher quality and superior growth prospects, relative to the 'average' EMEA generics company. However, the opacity on the US business and the fact that Hikma's unique macro backdrop is recognised with a premium valuation, means we rate the stock a Neutral.
- **KRKA—strong fundamentals, premium valuation curbs our appetite.** KRKA has a top-tier geographical sales mix with regards to diversity and inclusion of attractive markets: 23% of FY07 revenues were derived from Russian/CIS, 21% from Western Europe and 26% from Central Europe. The key reason we retain an Underperform rating on the stock is due to valuation: KRKA is trading at a significant premium on all key matrices, on our estimates.

South Africa—private/public imbalance

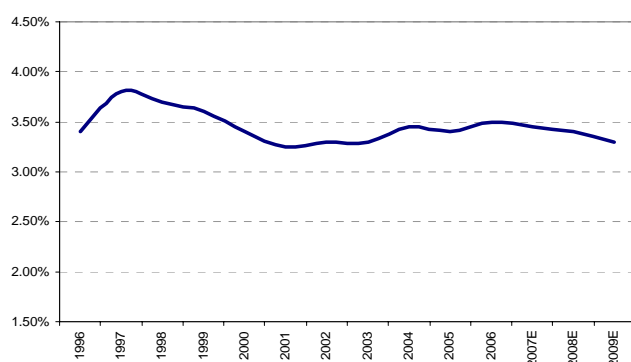
As one of the wealthiest and more developed African countries, one would expect South Africa to have well developed healthcare infrastructure and good health-quality indicators. Sadly, this is not the case. While overall expenditure on healthcare (as a percentage of GDP) is on a par with the average for Africa at 8%, the expenditure on public health is well below that of other African countries. This statistic epitomises the lack of investment in the public health system in South Africa over the last 15 years, and has led to rapid growth in private health expenditure, which provides far superior services, albeit to only a small proportion of the population: 60% of healthcare expenditure in South Africa is in the private sector, which provides for only 14% of the population. This obvious inequality in healthcare services is currently a key focus of government attention, but instead of pouring more money into the public sector, the government has embarked on an aggressive curtailment of the private sector by introducing regulations to cap prices in the pharmaceutical market, limiting private hospital developments, and proposing caps on private hospital tariff increases.

While real expenditure on public healthcare has increased somewhat, relative to GDP it has declined. The government's key focus over the last 10 years has been to increase spending on social welfare, not healthcare. However, current projections from the Treasury for future health expenditure show strong growth, particularly for strategic priorities like HIV, TB and malaria, as well as significantly increased expenditure on hospitals. However, this growth seems unlikely to raise public health expenditure to above 4% of GDP.

By international standards South Africa's overall healthcare statistics are poor and worsening, on recent trends. South Africa is one of very few Millennium Development Goal signatories whose infant mortality rate has actually increased (to 56 per 1000 in 2006, from 50 in 2000, according to the WHO). The same trend can be seen for general life expectancy in the country, as shown in Figure 90 below. This is in sharp contrast with the usual trend of increasing life expectancy with increased GDP per capita, see Figure 91. This has arisen from the dramatic increases in HIV/AIDS and TB, which have not been effectively addressed owing to the government's unusual stance on HIV/AIDS.

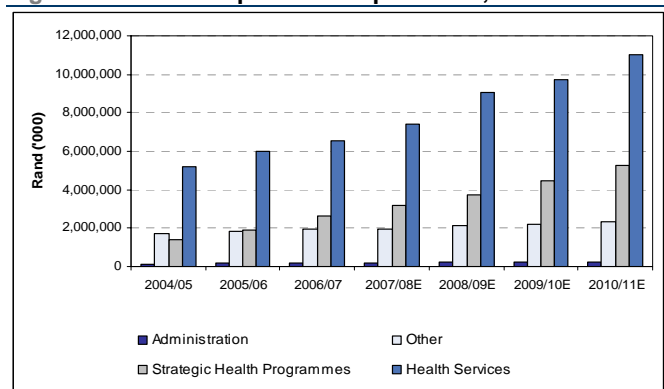
Outlook not encouraging;
standards poor

Figure 88: Public health expenditure as % of GDP

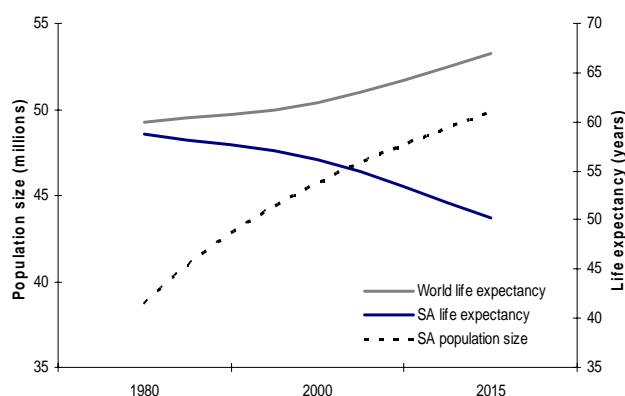


Source: Health Systems Trust

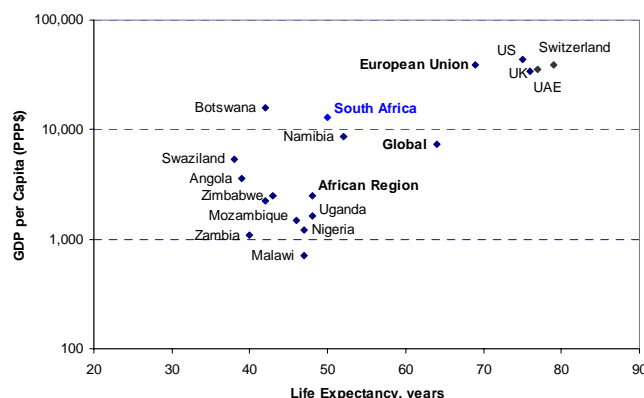
Figure 89: Health department expenditure, 2004–2010



Source: National Treasury

Figure 90: South African adult life expectancy and population growth, 1980–2015

Source: WHO, IMF

Figure 91: Sub-Saharan Africa GDP versus adult life expectancy (per 1000 population)

Source: ASSA, StatsSA, UN

Government healthcare priorities

Notwithstanding the concerns expressed above, there are two key priorities that the government has targeted in the coming years which will be beneficial to certain elements of the healthcare market and, consequently, companies in this space; namely:

- Pharmaceuticals—owing to tenders to provide HIV treatment;
- Hospital infrastructure and services—given the poor public services.

1. Plans for the treatment of AIDS

One of the government's key changes in healthcare priorities has been to belatedly acknowledge the rapid spread of HIV in South Africa and the consequent increase in mortality rates. South Africa has the highest HIV prevalence rate in the world, with more than 5 million people estimated to have the disease (c16% of the population). The government has embarked on what is largely reported to be the biggest HIV treatment programme by any individual country, with backing from the Global Fund and PEPFAR projects. This programme, which began in 2004, includes treatment to prevent mother-to-child transmission (during childbirth), post-exposure prophylaxis and treatment for patients with end-stage HIV (AIDS). A concomitant increase in expenditure on TB and other diseases associated with HIV has also occurred.

The key beneficiaries of these programmes have been pharmaceutical firms (particularly generics players), who can provide the volumes of drugs required, at an attractive price. The most recent ARV drug tender (awarded in July 2008) was worth R3.6bn (US\$460mn) between July 2008 and 2010. There is a bias towards companies who manufacture generics locally and have Black Economic Empowerment credentials, rather than simply the manufacturer with the keenest price. Thus it was no real surprise to see the South African generics players winning the majority of the tenders.

Undertaking the biggest HIV treatment programme of any individual country

Figure 92: South African ARV tender awards

2008 ARV contract awards	R m	% share
Aspen Pharmacare*	2,053	56.8%
Adcock Ingram*	756	20.9%
GlaxoSmithKline	249	6.9%
Sonke (Ranbaxy)**	163	4.5%
Enaleni (Cipla-Medpro)*	69	1.9%
Others	329	9.1%
Total value (R m)	3,615	100%

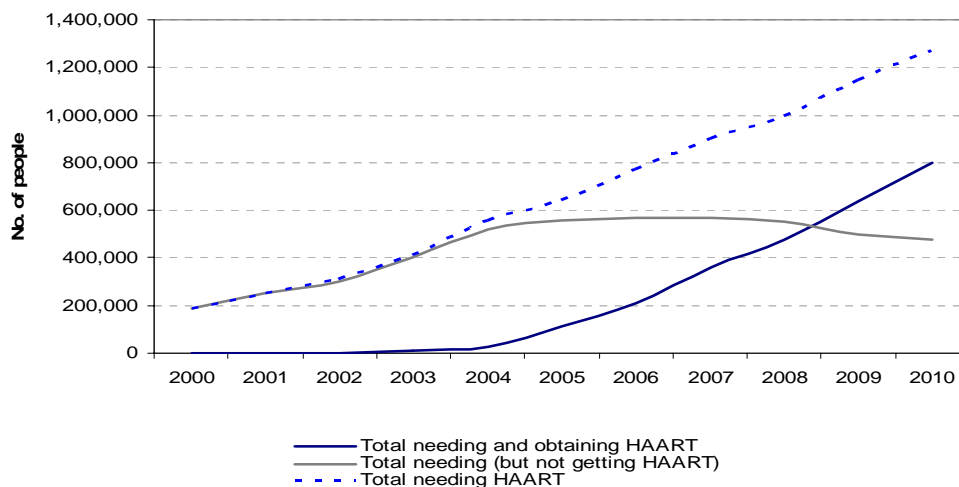
Source: Department of Health, *South African generics providers, **Ranbaxy subsidiary

These South African generics companies have invested heavily in manufacturing capacity to meet the volume of drugs required for state tenders, as well as high-quality manufacturing plants to meet global manufacturing standards. Importantly, the companies have also had to invest in R&D to develop their own generic ARV drugs, have them registered with the local Medicines Research Council, and market aggressively in order to compete against the drugs supplied by multinational companies. This investment, however, does make it possible for the likes of Aspen and Adcock to market and distribute their drugs into other emerging markets, particularly other African countries.

Investment by generic companies

There are approximately 400,000 people receiving HIV treatment at present, according to the Department of Health, and this figure is set to rise to at least 500,000 through the new tender. This is far below the actual number of people who are infected with the disease (>5 million), and below the targets set out by government.

Figure 93: No. of people needing and obtaining HAART (highly active antiretroviral therapy) in South Africa



Source: *J Acquir Immune Defic Syndr*, Vol 43, No 5, December 15 2006

Thus, there is an understandable expectation within the market that ARV tenders may get bigger still, and will certainly be rolled out for the foreseeable future to sustain the treatment programme. This would clearly present very good news for the local generics providers, but this view needs to be tempered by the characteristically slow treatment roll-out by the government, and the fact that the trigger for commencement of treatment is a severe immuno-compromised state (i.e. not just HIV positive status).

The surge in the TB epidemic in South Africa, and the emergence of multi-drug resistant TB, suggest that generics players who can manufacture generic treatment formulations will also be well placed, as would producers of any malarial vaccine that is developed. This is also true of most sub-Saharan countries where the incidence of HIV and TB is also high. Sub-Saharan Africa now accounts for more than 65% of all HIV infections in the world.

2. Hospital infrastructure and services

In the past few years the government has implemented a 'Hospital Revitalisation Programme' which has been allocated additional funding to refurbish or rebuild public hospitals. In some cases new hospitals are also being built through this programme. This programme is budgeted to run until 2010 and is a much-needed stimulus for the public hospital system, which has suffered from chronic underinvestment for many years.

This hospital revitalisation programme doesn't particularly benefit any of the private healthcare providers per se, but may benefit one of the pharmaceutical companies, such as Adcock Ingram (AIPJ.J), which provides various hospitals with diagnostic and other medical equipment. Private hospital providers, Netcare (NTCJ.J) and Medi-Clinic (MDCJ.J), continue to benefit from the considerable differences in quality between the public and private health facilities.

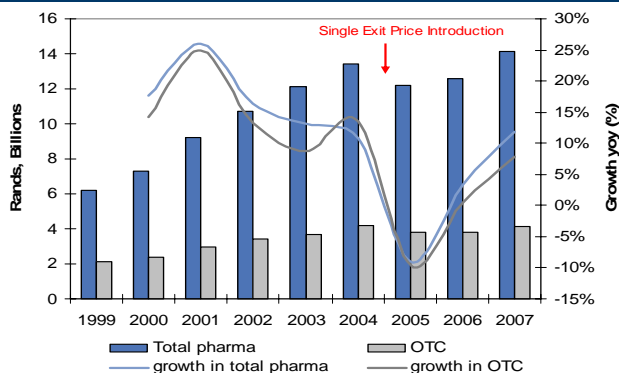
Patent risk from parallel imports?

Well-formed regulatory environment in South Africa

As might be expected for one of the more advanced economies in the emerging world, South Africa has a relatively well rounded processes regarding regulation, though in common with other countries, the encouragement of generics is at the heart of it. We would highlight the following:

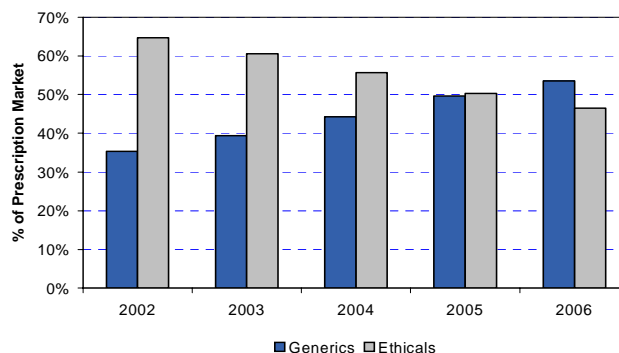
- **Intellectual property laws**—South Africa is a member of WTO and hence a TRIPS signatory. Thus patents and intellectual property are protected in law. However, the government has introduced some legislation which allows for parallel importation and compulsory licensing of patented drugs. These measures were put in place to give the Department of Health the ability to gain access to cheaper generic versions of patented drugs if it chose to do so. Currently, the Department has not used these powers, but if it did so it would potentially benefit the South African generics producers.
- **Tax incentives**—In 2006 the government introduced the R&D Tax Incentive Programme, which is designed to encourage private sector investment in scientific and technological R&D activities by providing attractive tax deductions: a deduction of 150% of expenditure on eligible R&D activities is allowed, and capital expenditure on R&D assets will be deductible over three years. This programme includes pharmaceutical R&D and is thus good for the local generic providers and might encourage new entrants. In addition to this programme, academic institutions now receive extra grant funding for research papers.
- **Country-specific issues—SEP (Single Exit Policy)**. This has effectively regulated the price increases allowed for all drugs manufactured within South Africa since its implementation in 2004. All manufacturers in South Africa have to disclose the ex-manufacturing cost for each drug they produce, and these prices are then uplifted by a government-dictated price increase, which is meant to be issued annually. This regulation has had a significant impact on local manufacturers' revenues and margins, particularly as there were significant delays in the announcement of the annual price uplifts. However, the increased utilisation of drugs in South Africa has meant that volumes, and hence revenues, have kept growing despite the introduction of the SEP.
- **Generic substitution**—Since 2003 pharmacists have been required to offer patients a generic substitute for any medicine prescribed (unless the prescribing doctor specifically states that this shouldn't happen). This has led to increased utilisation of generics within South Africa. This trend of increasing generic penetration is likely to continue, in our view.

Figure 94: South African pharma has seen good growth despite the introduction of the SEP



Source: Company data

Figure 95: Generic usage increasing substantially
Measured in units prescribed



Source: Company data

- **International benchmarking**—The government is currently undertaking an international drug pricing exercise to assess the level at which to set drug prices in South Africa. This process could have a further negative impact on ethical (patented) and generic drug prices, and consequently on manufacturers' margins, once it is rolled out. However, the introduction of this legislation is well behind schedule, and will be imposed on ethical drugs first, and generic drugs 12 months later.
- **Branded generics**—South African generics providers, similar to some of those in central and eastern Europe, utilise a sales force to market their generic drugs. This has resulted in a large branded generics market which is effectively a barrier to entry for other generics providers who rely on competitive pricing rather than marketing.
- **Government Employees Medical Scheme (GEMS)**—the scheme has allowed civil servants to take up employer-subsidised medical insurance and has led to an additional 600,000 lives being covered by medical insurance. This scheme has proved to be a boost for the private hospital sector over the past 18 months, as admissions and patient days have grown. There is further talk about introducing a low income medical scheme to increase the insured coverage further, and this may also boost the private hospital sector's revenues.
- **New regulations on the horizon**—The government has proposed two new bills which would both have an impact on the health sector in South Africa. Potentially the most damaging is the Health Amendment Bill, which will give the Department of Health the ability to set prices across the entire private health sector, including hospitals, specialists and GPs, and which may result in under recovery of cost inputs and certainly a squeeze on margins, in our view. The second bill would potentially improve the drug registration and licensing process, but would require a number of food stuffs, vitamins, and FMCG goods which purport to have medicinal properties also to be licensed.

South African healthcare stock focus

Aspen Pharmacare (Underperform, TP R37.50) has been aggressively expanding its operations out of South Africa. It is essentially a generics manufacturer, but also produces some patented drugs under licence for multinational pharmaceutical firms. Aspen's key focus is on branded generics. In other words, it sells generics by utilising a sales force to enhance the marketing of the generic products. It has a wide range of drug formulations across all therapeutic areas, and is currently the number one player in South Africa by total market share.

Aspen has embarked on a strategy to become a global generics producer. It has recently formed a joint venture with Strides Arcolab (of India) to develop a manufacturing and distribution model in South America (Brazil, Venezuela and Mexico). Earlier in 2008 it bought a 60% stake in Shelys, an East African pharmaceutical company with its own manufacturing and distribution network. More recently, it has completed two deals with GlaxoSmithKline (GSK), the first of which will allow it to manufacture and distribute four GSK (off-patent) drugs into emerging markets globally; and the second deal sees Aspen manufacturing some GSK drugs in South Africa, which GSK will then market and distribute into emerging markets (particularly Africa). Potentially, these deals provide significant future exposure to emerging markets. While this expansion should enhance revenues and earnings over the medium term, we believe a lot of this growth is currently in the price.

China—realigning priorities

Public sector healthcare spending in China has underperformed GDP for much of the last 20 years. The main reason for this decline is the Chinese government's decision more than two decades ago, to reduce its contribution to total healthcare expenses. Government funds as a percentage of China's total healthcare expenses dropped from 39% in 1985 to only 15.5% in 2000, and have stayed around that level ever since. This has meant the growth of China's healthcare expenses has been driven mainly by the growth in household income. Payments by individual Chinese now account for 54% of total healthcare expenses, up from 20% in 1978 (according to the Ministry of Health).

After the SARS outbreak in 2003, the Chinese government realised the importance of a robust public healthcare system and committed to significantly increasing government funding in healthcare. Improvements to infrastructure are urgently required. According to the Ministry of Health (MOH), 49% of Chinese people choose not to go to hospitals when they fall sick. We expect government-led spending on healthcare to boost healthcare expenses as a percentage of GDP from 5% in 2005 to 10% in 2015E.

Key reforms are underway in both the healthcare delivery system (a draft reform document has very recently been made available for public comment) and healthcare financing (a framework for healthcare insurance has already taken shape). The plan is to alleviate the high out-of-pocket payment issue by expanding social insurance coverage and creating commercial insurance. The specific aim of China's new social health insurance policy is 'universal but basic coverage'. The Chinese government has also set the goal of covering almost 100% of the rural population by the end of 2008, 80% of the urban population by 2010 and almost 100% by 2020. Given the fact that as of 2003, 71% of the total population was still uninsured, this was an aggressive goal. Although official data show 72% coverage of the total population by the end of 2007, we believe the effective coverage ratio is much lower, closer to 41%.

Figure 96: China's current health insurance coverage and future goals

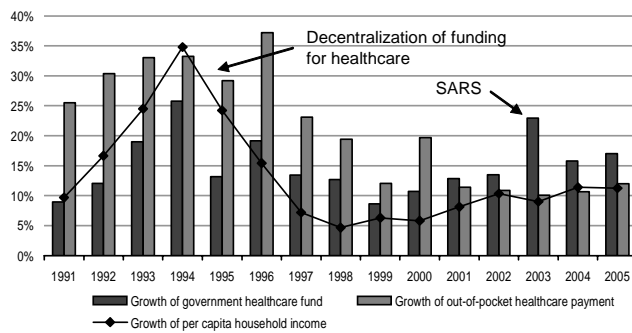
	Target number of participants (mn)	Number of participants by the end of 2007 (mn)	Coverage rate by the end of 2007 (%)	year Target coverage
The New Cooperative programme for rural residents	730	726	99	100% by 2008
The Basic Medical Insurance for urban employees	340	180	53	80% by 2010
The Basic Medical Insurance for other urban residents	240	43	18	80% by 2010
Total	1,310	949	72	

Source: Ministry of Health

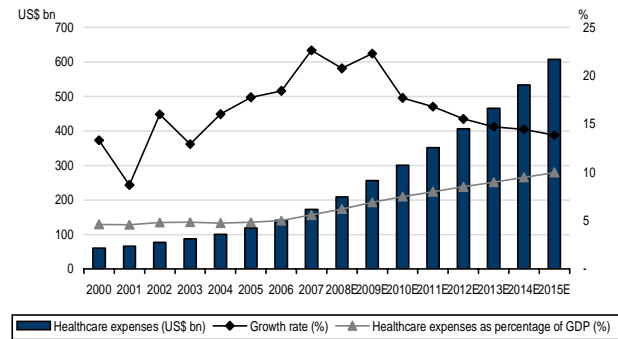
As a result, the Chinese government is taking every effort to increase the penetration rate of both basic medical insurance for urban employees and the new cooperative health insurance programme for rural residents. The government is also conducting pilot programmes for basic medical insurance for other urban residents (including the unemployed, retired, students, etc.).

Other key potential drivers of healthcare spending in China are the ageing population and rising incomes. Primarily owing to China's one-child policy, the percentage of the population that is of working age is expected to decrease from 68% at present to 66.4% by 2015E. We forecast the incremental demand for healthcare spending by 2015E to be US\$483bn in China, compared with US\$690bn in the US.

Demographic considerations

Figure 97: Growth rates of healthcare expenditure from different sources

Source: MOH, National Statistics Bureau

Figure 98: China's healthcare expenses and growth

Source: MOH, National Statistics Bureau

Regulatory controls and incentives

Given the low priority of healthcare expenditure in the past, the regulatory background is a combination of a relaxed attitude as to its provision but at the same time a degree of control where future development is concerned (drugs, medical devices, etc.) We would highlight the following:

- **There are no restrictions on foreign investment in healthcare now.** On December 11, 2004, the Chinese government announced that all restrictions on foreign investment in the area of pharmaceutical distribution—including those on shareholding, geographical areas and number of retail pharmacies—and all limitations on foreign investment relating to franchising were to be lifted from the date of announcement. Despite removal of the barriers, foreign companies are moving slowly and cautiously into the pharmaceutical sales and distribution sector in China owing to low profit margins and a lack of transparency in the sector, in our view.
- **R&D tax incentives.** The Chinese government is making efforts to encourage home-grown R&D in the healthcare industry by providing R&D funds and tax incentives. In February 2006, China published very detailed guidelines for the country's science and technology development until 2020, targeting an increase in the ratio of scientific research and department expenses from 1.2% of GDP in 2004 (RMB196.6bn) to 2% and 2.5% (on a par with the current levels of Taiwan and Germany), about RMB360bn and RMB900bn, in 2010 and 2020, respectively. While the government is still rather vague on how it wants to achieve its target, the target itself is not vague at all. The government has laid out eight objectives it wants to achieve within 15 years: one of the objectives is the improvement in healthcare-related technologies. In July 2006, the Ministry of Science and Technology (MOST) announced the first list of 'National Innovative Enterprises'. Twelve pharmaceutical companies were on the list, the largest number for a single industry. Most recently, at the end of December 2006, China's Standing Committee of National People's Congress (NPC) passed the draft law for corporate tax unification, which is expected to be implemented in 2008. In this draft law, R&D expenses enjoy additional tax deductions (i.e., actual R&D expenses x 150% = tax deductibles for R&D). We believe the government grants, favourable taxation and other benefits should help home-grown R&D in the healthcare industry for the long term. However, we believe the impact of the R&D-related incentives and government-led R&D plans will be gradual.
- **Device approval system.** China's drug and medical device approval system is directed by the State Food and Drug Administration (SFDA), which has now been merged into the Ministry of Health (MOH) in the wake of the cabinet restructuring in March 2008. The drug and medical device approval system was much more relaxed before 2005, when formal SFDA commissioner Mr Xiaoyu Zheng was arrested and subsequently executed for corruption. He was accused of taking bribes from a

counterfeit drug manufacturer and deliberately approved those drugs in the market. Mr Mingli Shao succeeded as the SFDA commissioner and started a self-review of the body. SFDA increased the barriers to entry by significantly raising the standards for new product approvals and licences for manufacturing and distributing products in order to increase the overall quality.

(I) Growth potential—medical equipment

Propelled mainly by an upcoming government-led nationwide replacement and upgrade cycle, we expect China's medical device market to have a CAGR of more than 20% from 2007-10E.

Medical equipment:
Leveraging off government
spending

China's medical devices industry is relatively less mature than that of the pharmaceutical industry, but is one of the first beneficiaries of healthcare reform. To date, most of the domestic medical device manufacturers are still focusing on products with a low technology barrier. With Chinese returnees to the medical devices sector from overseas having either joined local firms or started their own companies in the past few years, there have been some breakthroughs in areas such as drug-eluting stents (DES) and Digital X-ray (DR). However, intellectual property (IP) issues could be a potential concern for the industry, as more and more Chinese companies start exporting, leveraging off their low-cost manufacturing advantage.

The consumption of medical devices in China is much higher than domestic production of such. We estimate the total medical device market in China was worth about US\$8bn in 2005 (vs US\$3bn of domestic production). Foreign brands, such as Johnson & Johnson and General Electric, still dominate the Chinese medical device market —especially in the high-end and high value-added segments. This situation will change soon, in our view, primarily because of the replacement cycle and government spending, and the government's encouragement of domestic brands.

According to semi-governmental surveys, more than 60% of China's medical equipment was purchased more than 15 years ago. This is largely because two decades ago the central government decided to shift the burden of funding the healthcare system to local governments and the hospitals themselves. While the hospitals in coastal cities were largely able to become self-sufficient by gaining profits from the sales of medicine and other medical charges, hospitals in poorer provinces, especially small-sized ones and those in the rural areas, were left with little budget to purchase medical equipment. Facing deteriorating facilities in hospitals nationwide, the government has decided to spend heavily on medical equipment purchases, especially for rural hospitals.

Big spending replacement
plans

(II) Growth potential: Global shift to R&D outsourcing and low-cost manufacturing

From 1996, multinationals started forming collaborations with state-owned pharmaceutical research institutions for synthesis and screening of new chemical compounds (NCEs) with therapeutic properties. This trend has continued and expanded. China has become a 'hot' destination for outsourcing manufacturing and clinical research in recent years, offering foreign companies significant cost savings.

According to United Nations Conference on Trade and Development's (UNCTAD) survey on the internationalisation of R&D, published in December 2006, China is already the number-three location of R&D centres outside the home countries of the companies that participated in the survey. Companies that participated in the survey also ranked China as the number-one location in the world for future foreign R&D activities.

Many major pharmaceutical companies, such as AstraZeneca, Eli Lilly, GlaxoSmithKline, Novo Nordisk, Pfizer, Roche and Sanofi-Aventis have either already established or are in the midst of building R&D centres in China. While these new R&D centres of multinationals are mainly focused on conducting clinical trials of new drugs, some, such as those of Eli Lilly and Novo Nordisk, also conduct basic research in finding new drug leads.

Some international companies (mostly small ones) have gone a step further, to launch new drugs in China first. This is to take advantage of the lower costs of new drug clinical research and product launch. International companies' increasing R&D activities in China have helped create the right environment for Chinese contract research organisations (CROs), in our view.

Alongside the focus on the potential to outsource R&D to China, low-cost drug production has also become a major priority for global firms. Over the past few decades, India has grown from being almost non-existent in the international pharmaceutical market to one of the top exporters in the world. However, in a recent survey by consulting firm, Bain & Co., regarding the low-cost drug manufacturing destinations sought out by global pharmaceutical firms, 90% of respondents considered China as a 'better choice' for low-cost drug manufacturing—a position earlier dominated by India. The respondents in the survey were mainly managerial executives of pharmaceutical companies based in the United States, Europe and Asia.

Contract manufacturing organisations (CMO): Take over low-cost manufacturing leadership in the long run

Outsourcing drug manufacturing to China is a process that has already begun. Back in October 2006, Pfizer CentreSource, an operating unit of Pfizer Global Manufacturing, announced that it had decided to outsource the manufacturing of some of its APIs (active pharmaceutical ingredients) to two Asian contract manufacturers: ScinoPharm (not listed) of Taiwan and Shanghai Pharmaceutical Co. A number of international API producers, such as Roche, are taking the lead to form joint ventures with Chinese companies in order to produce high-quality APIs in China.

According to Italy's Chemical Pharmaceutical Generic Association (CPA), the global API market is expected to grow 8.2% annually, from US\$31bn in 2005 to US\$46bn in 2010, while China's should grow 17.2% annually over the same period from US\$4.4bn in 2005 to US\$9.9bn in 2010. By 2010, China's market share in the global API market should be 21.5%, according to CPA.

Figure 99: China's market share in the global API market (2005–10E)

	2005	2010E	2005-10E CAGR (%)
China (US\$ bn)	4.4	9.9	17.2
World (US\$ bn)	31.0	46.0	8.2
China's market share (%)	14.2	21.5	

Source: Chemical Pharmaceutical Generic Association

(III) Growth potential: Private healthcare provision

The Chinese government's view of private hospitals has been lukewarm in the past, even though for the past few years the private sector's participation in the healthcare services sector has officially been encouraged. This is primarily because of the concern that private hospitals' 'for-profit' business model could go against the general purpose of the healthcare industry as a welfare system.

Recently, the Chinese government seems to have realised the need to address the growing middle class population's demand for better and more customised medical services. During the healthcare reform-related discussions, many government officials also started to believe a larger and more vibrant private sector should help improve the overall standard of the healthcare services industry in China.

More recently, at the end of January 2007, a senior official for the State Administration of Taxation published an article advocating tax exemption for private, for-profit hospitals, in order to rapidly develop the sector. We believe the government is likely to implement favourable policies towards private hospitals. As a result, we expect the government to encourage more rapid development of private hospitals.

However, the regulations governing private hospitals are still not well defined, and the implementation of policies towards private hospitals varies significantly from region to region in China. We believe the demand for private medical devices is rising and the sector should have significant growth for the long term, but there are still significant regulatory risks in this sector.

China—key stock recommendations

- **Mindray Medical and Shandong Weigao (Outperform): Boosted by increasing Chinese government spend.** Currently only 17% of total healthcare expenses in China are funded by the government, and healthcare provision in rural areas and communities is generally poor. The Chinese government has committed to changing that and as such is channelling significant funds into the system. A large part of the increased government spending is expected to be used to purchase medical devices and supplies. This should help accelerate the growth of leading domestic medical devices players, such as Mindray Medical and Shandong Weigao.
- **China Medical Technologies: Taps into the trend of disease prevention and early detection in China.** For decades, the healthcare system in China has been focused on disease treatment. The current healthcare reform, with the aim of learning from other countries in terms of lowering medical costs, has been trying to coordinate efforts to switch the focus to disease prevention and early detection. In our view, China Medical Technologies, a leading in-vitro diagnostics (IVD) systems maker in China, stands to benefit from the increase in market demand for diagnostic products.
- **WuXi PharmaTech (WX) (Outperform): Leads the global offshore outsourcing of drug R&D.** With the increasing number of drugs going off-patent and surging R&D costs globally, major pharma and biotech companies alike are increasingly outsourcing their drug R&D activities, especially to offshore centres in China and India. We think WuXi PharmaTech, the largest contract research organisation (CRO) in Asia, should take a significant share of the growing business.

India—need to build effective infrastructure

India ranks among the laggards in the world on most measures of healthcare development. Healthcare expenditure was US\$35bn in 2004 (equivalent to 5.2% of India's GDP), growing at a 15% CAGR in the previous 10 years (according to the WHO). Although India's absolute healthcare spending is comparable to other developing countries, per-capita healthcare expenditure (adjusted for purchasing power parity) comes to only US\$28, among the lowest in the world. WHO data shows that about 80% of expenditure on healthcare in India is private, and 97% of this is out-of-pocket. Public health expenditure in India is among the lowest in the world, at around 1% of GDP compared with c.3% of GDP for other developing countries.

Physical infrastructure is severely constrained: India only has 0.6 doctors (world average 1.5) and 1.03 beds available per thousand people. Other developing nations, such as China and Thailand, have 4.3 beds per thousand people.

Regulatory environment conducive to change

India's low-cost manufacturing (costs are only 40% of equivalent FDA-compliant plants in the US), availability of highly skilled talent (at 10-15% of wages in the US) and strong chemical skills attract FDI. Several global firms are either setting up/buying manufacturing plants (e.g. Watson, Ratiopharm, Teva) or forming partnerships of some sort with Indian companies for contract manufacturing. In contrast with several other industries in India, there are very few barriers to FDI in India:

- India has no restrictions on foreign investments in the drugs and pharmaceuticals sector, with the limit for foreign investment through the automatic route at 100%.
- Automatic approval is granted for Foreign Technology Agreements for all bulk drugs and their intermediates/formulations, except those produced using recombinant DNA technology.
- Foreign Direct Investment in hospital services is restricted to automatic approval up to 51% by way of foreign investment in equity.

Few barriers to FDI...

The Indian government provides various R&D tax incentives to promote healthcare activities:

...and tax incentives for R&D

- The pharmaceutical and biotechnology industry enjoys tax reduction up to 150% of its R&D expenses.
- R&D companies enjoy a 10-year tax holiday.
- Exemptions from price controls for new indigenously developed drugs for 15 years from the date of commencement of commercial production.
- Drugs manufactured through an indigenously developed process are eligible for exemption from price controls until expiry of the patent.
- Hospitals commencing operations during the next five years will enjoy a five-year tax holiday.

India brought its patent system in line with the international norms in 2005, by amending the patent laws to allow product patents along with process patents (earlier only process patents were recognised). The new laws do not allow new indications for drugs to be patented, but new chemical forms of existing substances can be, provided they increase the drug's efficacy.

Patent protection

However, the new patent regime in India does not apply retroactively, implying that:

- Drugs discovered before 1995 (even if patented elsewhere) can be copied.
- New drugs (those discovered after 2005) can be patented.
- All new patent filings for the period between 1995 and 2005 are now being processed.

The Central Drug Standards Control Organisation (CDSCO) is the principal national drug authority in India. It registers all imported drugs and is responsible for clinical trials and quality standards. Registration of a new drug entails a fee of Rs 50,000 (cUS\$1,250). While there is no fixed timeframe within which the application must be reviewed, the typical range for application review is 12–18 months.

The definition of new drugs in India is given as drugs never before marketed in India, drugs with new therapeutic purposes or dosages, which have not been marketed in India, and new fixed-dose combinations of two or more drugs. All vaccines are considered new drugs, unless notified by the DCGI (Drug Controller General India).

Healthcare growth driven by private sector income growth

The government has not yet taken any meaningful steps to accelerate investment or growth in healthcare. However, as most of spending in India is private, and out-of-pocket, we expect significant growth across the entire healthcare spectrum: from pharmaceutical sales (we forecast 12-14% growth CAGR over the next decade) and devices to hospitals, diagnostic labs and pharmacies and pharmaceutical distributors, even without much growth in public spending.

For pharmaceuticals, market growth is driven by (1) rising income and changing lifestyles; (2) rising health insurance; and (3) current low level of penetration in the rural market (only ~45% of Indians have access to western medicine). Rising income levels are improving diagnosis and also treatment compliance (patients who would stop taking medication for economic reasons once the symptoms subside are now likely to complete the dose regimen). With prosperity spreading to tier-2 and 3 towns as well as villages, doctors also find it more viable to set up practice in these previously under-penetrated regions.

Several Indian generic pharmaceutical companies are already of meaningful size in terms of revenue and profit: the second-largest generic company by market capitalisation globally is Sun Pharmaceuticals. However, increasing competitiveness in the industry (largely driven by over-investment in India) is reducing the attractiveness of this market.

Generics industry displays global scale

Indian companies have started to increase their spending on generic biologics in anticipation of approved regulations in the US and Europe. In the interim they continue to sell filgrastim, rituximab, Epoietin, Interferon alpha and GCSF in Asia (including India and China), Eastern Europe, Africa and South America. We think bio-generics is a safer option than new drug discovery research for Indian generic companies and also fills the opportunity gap until the Indian companies' balance sheets become strong enough to take the risk of innovative R&D drugs.

In India we believe Custom Research and Manufacturing Services (CRAMS) will continue to see accelerated investment. Given the cost advantages, availability of trained resources, and availability of an ecosystem, Indian companies have been in the market for several years. However, with big pharma facing challenges on R&D productivity and a fast-expiring pipeline, on-the-ground activity on CRAMS is picking up strongly. After the 2005 implementation of product patents in India, big pharma's comfort levels on IP protection have also improved, and higher-quality business is now moving to India.

The outsourced pharmaceuticals manufacturing market was worth US\$15bn in 2006, with API manufacturing accounting for US\$10bn and finished dosages the rest. This market is expected to see continued growth globally (10%-plus CAGR), but for Indian companies, revenue growth could be 20%-plus for the next few years. Indian CRAMS players had a share of ~15% of the global pharmaceutical manufacturing market in 2005 and this share is expected to increase to 20%+ by FY2010.

Contract Research is another market in its infancy. There are three facets to this opportunity: (1) conducting clinical trials for pharmaceutical companies; (2) conducting outsourced research (e.g. Lilly's and Merck's deals with Piramal Healthcare; GSK and Merck's partnerships with Ranbaxy)—these involve the conduct of clinical trials in India, but the outsourcing is at a higher level; and (3) interpreting data generated by clinical trials (conducted in or outside India). Contract Research Organisations (CROs) in India are still small, and talent constrained, but could see very rapid growth, in our view. We expect the number of research outsourcing deals to grow significantly.

Contract research
outsourcing

India—key stock opportunities

The stock opportunities as we see them in India stem as much from the companies' ability to gain from the demand elsewhere in the emerging world as from India specifically. We highlight the following:

Sun Pharma has been the most consistent performer among Indian pharmaceutical companies, and we see no reason to expect a change going forward. Adjusted for the one-off sales from generic Protonix and Effexor XR, the proportion of expected sales coming from emerging markets in FY09 is ~65%. Most of these revenues are contributed by Indian formulations (77% of emerging market exposure) where Sun has maintained a dominant position in most therapeutic areas in which it is present. Sun takes a long-term view, and is among the highest spenders on R&D among Indian companies. In India (a branded generics market), the company focuses on chronic therapeutic areas which are less cyclical and faster growing. Its share of revenues from chronic are a high 65% (for the market the ratio is 27%). In the US, the company focuses on a prudent mix of difficult-to-manufacture/low-competition drugs and the high volume/heavy competition molecules. Effective market share is 17% in the drugs it sells, with 30%-plus EBITDA margins. With 30-plus filings a year, we expect the company to continue its 25-30% CAGR revenue growth in the US. We believe Sun Pharma has among the best prospects in the Indian pharmaceutical sector longer-term and rate the stock as Outperform.

Lupin: Emerging markets are expected to contribute 58% of Lupin's revenue in FY09. Most of these revenues are contributed by Indian formulations (71% of emerging market exposure in FY09). Lupin has been growing well above the industry average growth rate in the India. We believe this growth is sustainable, given ample scope to increase market share (even from current levels), particularly given Lupin's focus on the rural market (20% of total Indian market and growing at 3x industry average). We believe Lupin garners ~15% of its domestic sales from the rural market.

Lupin has prudently used its strategy of economies of scale to expand rapidly in the US generics market—with just 15 products it garnered sales of US\$180mn in FY08. With 9-10 products expected to be launched in FY09, we expect sales momentum to continue, going forward. Even in the US market, the company's investments are now shifting towards more difficult-to-manufacture drugs. The company's strengths in the 'prils' (a class of antihypertensive drugs) are already well acknowledged. Lupin is now focusing on controlled release substances—an area targeted by almost every Indian generic company, and one area where Lupin still has to prove itself. We are encouraged by its guidance of filing two ANDAs (Abbreviated New Drug Applications) for oral contraceptives this year—a large and promising market where Indian competition is almost non-existent. We believe that the Kyowa acquisition was a very good move, given the increasing genericisation expected in the Japanese market. Lupin clearly has a head start in Japan now compared with other Indian companies. One cloud on the horizon is the recent audit (yet to be concluded) of Lupin's Mandideep facility in India by the US FDA. According to the company, this is an audit of GMP (Good Manufacturing Practices). Since Mandideep is a major component of Lupin's manufacturing base, we believe sentiment towards the stock is likely to remain subdued until the FDA audit is satisfactorily concluded.

Cipla is one of the oldest companies in the Indian pharmaceutical industry. It has the highest exposure (70%) to the emerging markets in our coverage. Of this exposure, Indian branded generic drugs constitute 64%, Africa 23%, Middle East 7% and rest is to Australasia. Overall, in the Indian market, Cipla is a market leader, with more than 5% market share, and has been growing above the industry average growth. It is the market leader in respiratory, anti-HIV and urology therapeutic areas. Cipla's product mix lends stability to its revenues with chronic share being as high as 44% vs 27% for the market. In the overseas markets, Cipla forms partnerships with local firms to market their products. This enables Cipla to grow its export markets with little investment in the front end, but also exposes it to the risk of customers setting up their own manufacturing in India, or changing suppliers (or just being acquired—as happened with Ivax).

Cipla is one of the few generic suppliers of inhalers in the world. We are particularly excited by the growing revenue share of inhalers and injectables, which are high-margin products. The transition from CFC to HFA inhalers is targeted to be completed by Dec-08 in the US and by 2010 in India and should provide momentum to Cipla's revenue from inhalers. The company is also a market leader in anti-retrovirals (ARVs), though this segment has seen a significant decline in profitability in the past two years, with competition growing and the customer base consolidating. It has the best technology and approvals, the highest share in WHO contracts and the lowest pricing. We rate the stock Neutral because of lack of disclosure and zero interaction with management. This makes near-term forecasting very difficult. However, we believe this is a good longer-term choice, given the past track record of management in terms of prudent capital allocation and market-beating growth, a low-risk business model, strong franchise in the domestic market and presence in the high-growth respiratory segment.

Indonesia—population a major driver

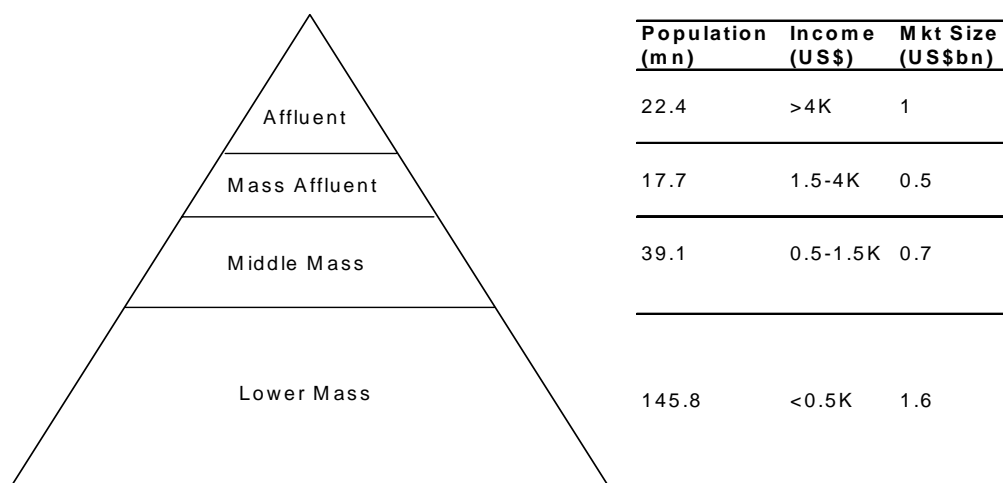
In 2007, the Indonesian pharmaceutical market was worth Rp25.6tn (approximately US\$2.8bn). Indonesia currently has the lowest healthcare-spending-to-GDP ratio of all countries in the South East Asian region, largely reflecting the country's lower purchasing power. Given that Indonesia has by far the largest population in the region, improvement in the country's purchasing power may translate into significant gains for the healthcare sector. IMF forecasts suggest Indonesian real GDP growth (6.5% on average between 2008 and 2012) will continue to outstrip the global average (4%).

Indonesian healthcare is characterised by 60% prescription and 40% of over-the-counter (OTC) products. The high OTC contribution reflects the low affordability of a large part of the population and lack of nationwide medical insurance. The Indonesian government provides free medical treatment for the poor only at hospitals and state community health centres. It also ensures that price increases in pharmaceutical products are limited. In short term, we see potential for margin compression for pharmaceutical product manufacturers, given the existing regulation, which seeks to promote the availability of cheaper healthcare products to the mass market. In the longer term, with sustained economic growth, we believe the country offers attractive growth potential.

Patent law and product registration rules in Indonesia have been implemented according to WTO standards. However, lack of human capital and other necessary resources somewhat capped the country's research and development into healthcare products. As a result, the healthcare segment in Indonesia primarily focuses on the manufacturing of pharmaceutical products, rather than creation of new products. Indonesia's healthcare segment is highly fragmented, with around 200 pharmaceutical companies, including around 30 multi-national corporations (MNCs), competing in the market.

We believe the primary barrier to entry in Indonesia's healthcare sector is the requirement for new entrants to build their distribution network, given: (1) the biggest target market for Indonesia is the mass market segment, living in rural rather than urban areas; (2) Indonesia is an archipelago covering a substantial geographical area.

Figure 100: Industry segmentation



Source: Credit Suisse research

Indonesia—key stock opportunity

Kalbe Farma is one of the largest pharmaceutical companies in South East Asia. It is a vertically integrated pharmaceutical company, deriving 73% of its revenues from its pharmaceutical segments, 20% from nutritional products, 4% from packaging and 3% from other segments. Kalbe Farma has the largest market share of Indonesia's OTC drugs and energy drink markets. Kalbe currently generates 95% of its top line from Indonesia's domestic market with the remainder exported to South East Asian region.

Kalbe Farma exhibits significant competitive advantages: (1) a wide product range; (2) strong market positioning as a market leader in most segments; (3) a solid distribution network across the Indonesian archipelago; (4) a high degree of bargaining power over suppliers; (5) savvy marketing skills; and (6) strong brand equity. In the short term, Kalbe is suffering some margin pressures owing to higher production costs on the back of surging raw material prices and operating costs. In the longer term, we expect Kalbe to pass on the higher costs to consumers. We currently rate the stock as Neutral, reflecting short-term concerns over the margin squeeze but strong long-term growth potential, given Kalbe's leading market position.

Multinationals with leverage to emerging markets

The multinational healthcare products (pharmaceutical, biotech and medical device) companies all have exposure to emerging markets. However, at the present time the bulk of the profits are generated from developed regions, mainly the United States and developed European markets. With the number of patent expirations increasing and the likelihood for U.S. healthcare system reform increasing, the opportunities in emerging markets have become a more central part of corporate strategies.

For most European pharmaceutical companies, emerging market revenues already account for around 15–20% of total and if they continue to grow as strongly (at an average 3x the global Pharma growth), they will account for a quarter to one third of most companies' revenues by 2012 (on our estimates). U.S.-based pharmaceutical companies derive slightly less sales (10–15% on average) from what we classify as emerging markets. Given the U.S. patent expirations in the coming years, we expect this percentage to increase over the next five years. We also expect U.S. medical device companies to focus on geographic expansion, particularly into the emerging market regions, as growth in the U.S. has slowed and Medicare reimbursement pressures continue to grow.

Figure 101: Emerging market revenues for the European Pharma large cap universe

Company	2008E revenues (\$m)	% of global sales	Growth LC %	Comment
GlaxoSmithKline	5,636	12%	15%	Company-specific emerging market definition
AstraZeneca	4,525	14%	20%	Company-specific emerging market definition (includes Eastern Europe)
Sanofi-aventis	7,894	23%	12%	Based on global except WE, NA and Japan
Novartis	4,393	10%	22%	Excludes Eastern Europe. Significantly larger exposure if Eastern European generics business is included
Roche	8,864	20%	16%	Includes CEMAI. If excluding CEMAI exposure, only in the low teens % of total Group sales
Merck KGaA	1,823	19%	31%	Biased to Chemicals presence in Asia
Bayer	6,013	15%	32%	Includes Crop Science and Materials exposure
Novo Nordisk	1,847	20%	32%	Based on International operations
Total European coverage	40,995		20%	
Total emerging Pharma market (IMS)	181,350		17%	

Source: Credit Suisse estimates, based on company data and IMS

Figure 102: Emerging market revenues for the United States Pharma large cap universe

Company	2008E revenues (\$m)	% of global sales	Comments on estimates
Abbott	\$2,982	10%	Assumed greater than half of "all other revenues"
Bristol-Myers Squibb	\$1,775	8.5%	Per Company, emerging markets are 8-9%
Johnson & Johnson	\$9,727	15%	Assumed 70% of combined revenues from western hemisphere (non-US) and Africa/Asia-Pacific
Eli Lilly	\$1,439	7%	Per Company, emerging markets are 5-10%
Merck	\$3,111	13%	Includes other revenues and small portion of Europe, Middle East & Africa
Pfizer	\$6,346	13%	Per Company, emerging markets are 13%
Schering-Plough	\$3,126	17%	Per Company, emerging markets are 17.6%
Wyeth	\$3,763	16%	Estimates per Company
Total U.S. coverage	\$32,269		

Source: Company data, Credit Suisse estimates

R&D efforts and partnerships

Many pharmaceutical companies have established not only the usual manufacturing and distribution/packaging local operations, but also high-end operations, such as new R&D centres and alliances with local companies within the emerging markets. This has partly been made possible by changes in emerging markets as their economies have improved. For example, in China, there has been a significant increase in scholars returning from abroad and PhDs awarded in China.

Many pharma companies have or are interested in opening an R&D centre either in China or India. A list of R&D centres, partnerships and manufacturing centres for European companies is provided below. Although the disclosure is less transparent for many U.S. names, these companies all claim to have a significant presence in emerging markets.

Figure 103: European Pharma—major R&D efforts in emerging markets

Company	R&D centres
GlaxoSmithKline	R&D centre in Shanghai—centre of excellence in Neuroscience
AstraZeneca	Innovation centre in China operational 2010—focused on translational science in oncology
Sanofi-aventis	New R&D centre in Goa, biostatistics centre and biotherapeutics core discovery team in China
Novartis	Opening a Shanghai R&D centre
Roche	R&D Centre at Zhangjiang Hi-Tech Park in Shanghai opened November 2004
Merck KGaA	Beijing-Merck Pharmaceutical consulting
Bayer	Nexavar (novel oncology treatment) approved in China even before receiving approval in Japan
Novo Nordisk	R&D centre in Beijing (since January 2002, expanded in October 2006)

Source: Company data

Figure 104: European Pharma—major R&D partnerships in emerging markets

Company	R&D partnerships
GlaxoSmithKline	Aspen (South Africa) deal—access to 450 molecules portfolio tailored to emerging markets—first-wave commercialisation 2010 In China—partnerships with Wuxi Pharma, Chempartner, Charles River, Chinese Academy of Science, Natural Product Research Centre, Tsinghua University
AstraZeneca	38 projects partnered with 700 hospitals since 1996 in China
Sanofi-aventis	Cancer stem cells research collaboration with Institute of Haematology, Tianjin, Chinese Academy of Medical Sciences. Offer on Zentiva (generics) to strengthen position in emerging markets
Novartis	-
Roche	Alzheimer's collaboration with Chinese National Human Genome Centre
Merck KGaA	-
Bayer	Acquisition of domestic TopSun OTC business (pending)
Novo Nordisk	Research Foundation with Chinese Academy of Science (March 2007) Licensing agreement with Dr Reddy's Research Foundation (March 1997)

Source: Company data

Figure 105: European Pharma—major manufacturing/ distribution efforts in emerging markets

Company	Manufacturing/ Distribution
GlaxoSmithKline	Over 90% of Indian product manufactured locally
AstraZeneca	Manufacturing in Wuxi, China—3,000 employees in China
Sanofi-aventis	Pharmaceutical plant in Goa, Sanofi Pasteur vaccine production site in China, new facility for influenza vaccine planned in Shenzhen for 2012
Novartis	New distribution agreement with Hai Chang for CV in China (Consumer Health)
Roche	Roche announced end-2004 building of a second high tech manufacturing facility in Shanghai to produce the cancer medicine Xeloda and the transplantation medicine CellCept for the Chinese market as of 2006
Merck KGaA	-
Bayer	Bayer largest fully integrated polymer site in China—over 6500 employees in China
Novo Nordisk	Tianjin (China)—250 employees, device manufacturing and packaging; Monte Carlos (Brazil)—700 employees, device manufacturing and packaging; dedicated contract manufacturing set up with Torrent in India (500 employees)

Source: Company data

Clearly, problems remain in emerging market countries. For example, in China, where IP has been significantly strengthened, there is an unpredictable reimbursement system. One such case is Bayer's novel liver cancer drug, Nexavar, which was approved quickly, but it was not reimbursed, which poses drug accessibility problems. In India, intellectual property remains an issue as shown by a court decision in August 2006 to dismiss Novartis' petition challenging constitutionality of Section 3(d). Unlike other WTO member countries, India has a unique provision in its patent law, Section 3(d). This provision excludes important developments in the form of incremental innovation, and ignores the importance of side effects, ultimately denying patients in India new and better medicines.

European players

We do not currently have the European pharmaceutical stocks under coverage. Four companies in Europe with sizeable exposure to emerging markets are described below. We describe these companies' emerging markets exposures based on the company information below. However, we make no assumptions on how this exposure will affect the groups' earnings, valuations or stock market performance.

■ Novo Nordisk

Novo Nordisk is the leading insulin manufacturer worldwide with a c50% market share, and one of only three long experienced players in the injectable anti-diabetics market—the others being Lilly and Sanofi-aventis. Emerging markets account for more than 75% of diabetes patients, yet these currently account for only 20% of worldwide insulin sales. However, the growth is almost three times that of the global insulin market.

While a large portion of Novo Nordisk sales in emerging markets is derived from human insulins, Novo Nordisk insists demand is growing quickly enough for the more sophisticated analogues and pens, which are not available through local players. The combination of a strong franchise, strengthening of intellectual property rights and the relative difficulty in copying some of these analogue injectable drugs means it is difficult for local players to take market share from Novo Nordisk.

Novo Nordisk has recently opened a new plant for the production of the new NovoPen in China. This is a copy of its site in Denmark. The risk remains of training Chinese staff that may take information with them to a local player. However, Novo Nordisk relies on minimising potential leakage of IP by being one of the employers of choice in China and recourse to strengthened country IP law if necessary.

■ GlaxoSmithKline

Legacy in India: Historically, GlaxoSmithKline (GSK) has had a leadership position in India—it currently holds a 5% market share, according to the company. More than 25% of all GSK product volume is sold in India, which indicates huge potential for revenue growth as the economy develops and affordability ratios improve.

Building a tailored emerging market portfolio: the Aspen deal: GSK signed a deal with South African drug company, Aspen, in July 2008 which the company believes will significantly extend its pharmaceutical portfolio in developing markets. Under the terms of the collaboration, GSK gains access to a broad portfolio and pipeline of branded pharmaceuticals (450 molecules) on a license and supply basis. Products should be competitively sourced by GSK through access to low-cost manufacturing from Aspen and its partners. GSK will register the products in emerging markets where they haven't already been approved, as well as assuming responsibility for distribution and commercialisation. Aspen will continue to market these products in Sub-Saharan Africa.

Playing the vaccine card: GSK vaccine sales account for nearly £2bn or 9% of total group sales but grew at 20% in 2007. A large part of the company's vaccine portfolio and pipeline is targeted to the developing world. GSK has offered its vaccines to key organisations for vaccination programmes in developing countries for more than 20 years. Sales of Rotarix (for rotavirus which is a leading cause of death in emerging markets) reached £91m in 2007 (nearly £70m from the developing regions). In Brazil, Rotarix mass vaccination has taken off rapidly from launch, reaching 5 million doses or over 60% coverage in 2007, from 0 in 2005. New vaccine production facilities are being built in India, Singapore and China; some packaging activities are already performed in Shanghai.

■ Novartis

Novartis is a diversified Pharma company and we believe many of the opportunities in emerging markets are outside the prescription drug business. Novartis' generics business Sandoz had revenues of nearly US\$4bn (almost 20% of group sales) in H1 2008, growing at 13%, driven by emerging markets. Following the implementation of Project Succeed for emerging market expansion and earlier acquisitions (LEK in 2002, Hexal in 2005), the emerging market generics portfolio is growing at nearly 30% p.a. according to the company.

■ Sanofi-aventis

In June, Sanofi-aventis made an offer for Czech generic company, Zentiva, specialising in the development, manufacturing and marketing of 'branded equivalents' or generics. The company holds leading positions in the Czech, Turkish, Romanian and Slovak markets and is an important player in the Central and Eastern European region. Sanofi-aventis is not the only Pharma company significantly expanding in Eastern Europe (Novartis efforts discussed earlier) but, with Eastern European markets set to grow from US\$40bn in 2007 (IMS) to US\$70bn by 2012, we believe there may be enough benefits to be spread around, despite increased competition.

The other opportunities for Sanofi-aventis in emerging markets are:

(1) The portfolio—the exposure to diabetes in its portfolio through two blockbuster brands, Amaryl (an oral anti-diabetic) and Lantus (the world's best-selling long-acting insulin analogue), as well as to cardiovascular and bone diseases through established brands, Plavix and Actonel, fits the demand profile of key emerging markets.

(2) A legacy issue—Sanofi-aventis strategy of 'no market and no drug are too small' has meant it has built and retained a presence in a number of emerging markets. In China it has 2,000 sales representatives (mainly driving Plavix growth) and another 1,100 sales representatives in Brazil.

Investment implications for U.S. pharmaceuticals

We believe emerging market growth will be aggressively sought by all U.S. major Pharmaceutical companies over the next 5-10 year horizon. We don't see this source of growth as a principal driver of our investment thesis because in the medium term the U.S. pharmaceutical companies will also experience substantial headwinds in domestic performance, causing sales and earnings growth to decelerate relative to 2008 levels. Obviously, the main domestic pressures are caused by material patent expiries, a loss of pricing power and pipeline inadequacies.

If we were forced to invest solely on the growth opportunity coming from the emerging markets, we would prefer the names with the greatest exposure, namely Schering Plough (17% of global sales), Wyeth (16% of global sales) and Johnson & Johnson (15% of global sales).

Schering-Plough and Wyeth are Outperform-rated stocks for which our estimates are materially above the Street. Our thesis on Schering-Plough is predicated on the potential for positive earnings revisions driven by too-conservative projections for cholesterol equity income and cost-savings programmes. We see future earnings reports as a catalyst for these upgrades. Our sum-of-the-parts and DCF valuation analysis implies value for Wyeth at US\$54 and we believe expectations are too low in regards to WYE margin expansion and products like Relistor and Prevnam 13.

Johnson & Johnson is fully valued and rated Neutral, but its presence in emerging markets is positively unique with regard to its substantial consumer and pharmaceutical businesses. Local investments and brand equity capabilities may serve JNJ particularly well in this region, potentially allowing it to exceed local growth rates.

Emerging markets not a main priority for Biotech

Biotech companies typically target disease areas that can support highly priced and high-margin products. For example, companies like Genentech and Amgen sell oncology (cancer) products which provide only incremental improvements in survival but carry a high price tag (e.g. Avastin costs ~US\$50,000–US\$100,000 per course of therapy). As a result, developing countries have not been a high priority for biotech companies as these countries, appropriately, are not willing to pay for drugs that are so expensive compared with their benefit. However, other disease areas, such as HIV and AIDS, are critically important to developing countries. To that end, Gilead, whose primary focus is on HIV, does have an important emerging market strategy. Specifically, the 'Gilead Access Program' makes its leading anti-HIV products, Truvada and Viread, available to more than 125 developing countries at a reduced price. The pricing in the programme is tiered, such that Gilead uses per capita gross national income (GNI) and prevalence of disease in order to price the drugs, based on a country's ability to pay for therapy. In addition to its pricing strategy, Gilead has offered manufacturing and distribution agreements, as well as licence agreements with generic manufacturers to produce Viread and Truvada for developing countries under the Gilead Access Program.

Gilead's pricing policy can present challenges, as countries that end up paying a higher price often are unhappy at having to pay a margin to the company on the drugs. Brazil is a good example of a country that has historically paid a price above Gilead's cost for the products but seems to be constantly threatening to break the company's patents if the price is not lowered. We think that countries such as Russia and China, which are becoming wealthier and have a significant prevalence of HIV, could provide additional opportunity for Gilead. However, the risk of these countries either threatening or actually breaking Gilead's patents limits the upside from such opportunities.

Figure 106: Selected healthcare stocks with significant emerging market exposure

Ticker	Company	Base	Description	% revs from emg mkts 2008E	Rating	Mkt cap (US\$m)	PE on FY1
AMIL3	Amil	Brazil	Amil is the largest MCO in Brazil. Following acquisitions, the company now holds 7% of the total Brazilian private healthcare plan market.	100%	O	1,299	7.1x
DASA3	Diagnosticos da America	Brazil	Diagnósticos da América is the largest chain of clinical and imaging diagnostic testing laboratories in Latin America.	100%	O	605	9.2x
PFRM3	Profarma	Brazil	Profarma is the second-largest distributor of pharmaceutical products in Brazil.	100%	O	106	3.6x
MR.N	Mindray Medical International Ltd	China	Mindray Medical International Limited develops, manufactures, and markets medical devices. Healthcare reform and an increase in healthcare insurance should boost demand for medical devices in China.	55%	O	1,980	14.8x
8199.HK	Shandong Weigao Group Medical	China	Shandong Weigao Group is a leading medical device/consumables manufacturer in China.	100%	O	1,371	18.6x
600062	Beijing Double-Crane Pharmaceutical	China	Medicines accounted for 98% of 2007 gross revenues; Medical Machinery, 1% and Other, 1%	100%	NR	1,579	26.4x
002038	Beijing SL Pharmaceutical	China	Engaged in the production of pharmaceuticals such as coenzyme complex, interleukin-2 and rhG-CSF injections.	100%	NR	1,063	33.8x
600511	China National Medicines Corp.	China	Principally engaged in the manufacture and sale of pharmaceutical products and healthcare products.	100%	NR	868	32.0x
600518	Guangdong Kangmei Pharmaceutical	China	Principally engaged in the manufacture and sale of pharmaceuticals. The company's products include: cephalosporin, penicillin, doxazosin mesylate, norfloxacin, metronidazole, amoxicillin and Chinese medicines.	100%	NR	817	19.7x
600664	Harbin Pharmaceutical	China	Western Medicine accounted for 73% of 2007 gross revenues; Chinese Medicine, 14%; Health Products, 9% and Other, 4%	100%	NR	1,702	18.2x
002007	Hualan Biological Engineering Inc.	China	Principally engaged in the research and development, production and sale of blood products.	100%	NR	1,090	42.0x
600276	Jiangsu Hengrui Medicine Co. Ltd.	China	Injections accounted for 78% of 2007 gross revenues; Tablets, 19%; Raw Medicine, 2% and Other, 1%	100%	NR	2,510	38.4x
600812	North China Pharmaceutical	China	Manufactures, sells and exports pharmaceuticals, chemicals and other medical products	100%	NR	903	23.6x
000999	Sanjiu Medical & Pharmaceutical	China	Medicine accounted for 88% of 2007 gross revenues; Packaging and Printing, 8%; Medical Services, 1% and Other 3%	100%	NR	2,000	27.7x
000423	Shandong Dong-E E-Jiao Co. Ltd.	China	Principally engaged in the manufacture and sale of traditional Chinese medicines, healthcare products, medical equipment and pharmaceutical necessities.	100%	NR	1,074	25.5x
002022	Shanghai Kehua Bio-Engineering Co. Ltd.	China	Primarily engaged in the research, production and sale of enzyme-immunoassay kits (including rapid test strip), clinical chemistry reagents · nucleic acid detection kits, Recombinant drugs and reagent-related automated detection devices.	100%	NR	909	34.7x
000538	Yunnan Baiyao Group Co. Ltd.	China	Sale of Medicine accounted for 99% of 2007 gross revenues; sale of Capsules, 1%.	100%	NR	2,089	34.1x
KLBF.JK	Kalbe Farma	Indonesia	Kalbe manufactures pharmaceutical and consumer health products and, through its subsidiaries, it operates packaging and distribution channels.	100%	N	346	6.0x
REDY.O	Dr. Reddy's Laboratories Limited	India	Dr. Reddy's is one of the largest Indian pharmaceutical companies. Exposure mainly to high-growth branded generics in India and Russia.	45%	O	1,454	10.5x
RANB.O	Ranbaxy Laboratories Limited	India	Ranbaxy is the leading Indian pharmaceutical company. Most of the emerging market exposure is to Indian-branded generic drugs and the rest is divided among CIS, Latin America and Africa.	45%	O	1,771	-162.7x
SUN.BO	Sun Pharmaceuticals Industries Limited	India	Sun Pharmaceuticals is one of the largest and most profitable Indian pharmaceutical companies, making rapid strides in its international business. 77% of emerging countries revenues is contributed by India.	50%	O	4,569	10.5x

Source: Factset, IBES Consensus for not rated companies, company data for 2008 emerging markets estimates for non-rated stocks Credit Suisse research and estimates

Figure 107: Selected healthcare stocks with significant emerging market exposure, continued

Ticker	Company	Base	Description	% revs from emg mkts 2008E	Rating	Mkt cap (US\$m)	PE on FY1
CIPL.BO	Cipla Limited	India	Cipla is another large Indian pharmaceutical company, making rapid strides in its international business. Indian-branded generic drugs constitute 64% of emerging exposure and 23% is to Africa.	70%	N	3,144	20.6x
GLEN.B O	Glenmark Pharmaceuticals	India	Glenmark is a research-driven, vertically integrated Indian pharmaceuticals manufacturer. Indian Formulations constitute 50% of emerging market exposure, Latin America 17% and Semi-regulated markets (Asia, Africa and CIS) constitute 20%.	50%	O	1,635	16.8x
LUPN.B O	Lupin Ltd	India	Lupin is a vertically integrated Indian pharma manufacturer focusing on Cephalosporins and Anti-TB medicines. India constitutes 71% of emerging market exposure.	58%	N	978	12.6x
532488	Divi's Laboratories Ltd.	India	Manufactures and sells active pharma ingredients and intermediates.	NA	NR	1,747	17.1x
500302	Piramal Healthcare Ltd	India	Pharmaceuticals accounted for 96% of fiscal 2007 gross revenues and Other Business, 4%	NA	NR	1,005	10.6x
512299	Sterling Biotech	India	Manufactures and sells gelatine and co-enzyme Q10.	NA	NR	980	n/a
PHRS	Pharmstandard	Russia	Pharmaceutical products accounted for 86% fiscal 2007 revenues and Medical Equipment, 14%.	100%	NR	800	8.3x
P27	Parkway Holdings Ltd.	Singapore	Singapore hospitals accounted for 53% of 2007 revenues; Healthcare services, 26%; International hospitals, 20%; and Non-healthcare, 1%.	25%	NR	858	14.8x
000100	Yuhan Corp.	Korea	Manufactures pharmaceutical products.	100%	NR	1,327	16.8x
NTCJ.J	Netcare Limited	South Africa	Netcare is a private healthcare provider and has hospital and primary facilities in South Africa and the UK. Exposure is mainly to South Africa, but management has started looking at other countries in Africa, and Recently won a tender in Lesotho.	47%	N	1,408	13.5x
MDCJ.J	Medi-Clinic Corporation	South Africa	Medi-Clinic is a private healthcare provider and has hospital facilities in South Africa, Switzerland, Namibia and the UAE. Exposure in South Africa and Namibia is stable, but growing in the UAE. Management is considering opportunities in Africa.	68%	U	995	18.3x
APNJ.J	Aspen Pharmacare	South Africa	Aspen is largely a generic pharma co, based in South Africa, with operations in India, South America, Australia, East Africa and the UK. Has a licensing deal with GSK.	75%	U	1,470	11.4x
EASTq.L	EastPharma	Turkey	EastPharma is an investment vehicle based in Turkey. Its main current asset is an 86% (economic value) holding in the Istanbul-listed branded generic company, Deva.	100%	N	267	65.8x
GDRB.B U	Gedeon Richter	Hungary	Gedeon Richter is the largest pharma co in Central and Eastern Europe. It is the world's largest producer of oral contraceptives and is a dominant drug company in CIS.	60%	O	2,483	13.5x
HIK.L	Hikma	UK	Hikma is a multinational generics player. The MENA region (c51% of Hikma's 08E revs) offers the best l-t pricing environment for generics drugs we think, and the greatest potential for increased utilisation rates/market growth.	51%	N	807	14.7x
KRKG.LJ	KRKA	Slovenia	Leading EMEA generic company. Besides its home market, Slovenia, KRKA has expanded operations to other Central and East European countries (CEE). We see future growth in Eastern Europe and, particularly, Russia.	74%	U	2,402	11.3x
STAGn.D E	Stada Arzneimittel	Germany	Stada has a limited exposure to emerging markets. The major markets are Serbia, contributing c10% and Russia c7%. We expect strong growth in Russia owing to the contribution from the Makiz acquisition.	20%	N	1,585	9.4x
ZNTVsp. PR	Zentiva	Czech Republic	Zentiva is a leading Eastern European generics company. Zentiva's major markets are Czech Republic and Turkey, followed by Poland, Russia, Romania, etc. We are cautious about the growth prospects in Turkey, where Eczacibasi has lower margins and there is pricing pressure and Czech Republic, again due to pricing pressure.	81%	N	2,037	24.4x

Source: Factset, IBES Consensus for not rated companies, company data for 2008 emerging markets estimates for non-rated stocks Credit Suisse research and estimates

Finance: Emerging market banking

Key findings

- A fully-functioning, efficient and well-regulated banking system is generally indicative of higher levels of GDP per capita. As such, we see the finance sector as one of the key components of intangible infrastructure.
- The Credit Suisse Financials Index reveals a very strong correlation of 82% with the GDP per capita output level.
- The credit crisis currently afflicting global banks has several parallels with the emerging market crisis of the mid-to-late 1990s. Credit/GDP ratios in key developed markets are stretched, current accounts are clearly in deficit, and the outlook for fiscal accounts appears poor.
- The upshot is that the majority of developed market banks look set to undergo subdued growth for the next 3–5 years. However, we think it is important to disentangle the cyclical concerns from the structural story that is more supportive of the emerging world.
- Meanwhile, prospects for the emerging market banks appear much brighter. Credit ratios are relatively low, exposure to the housing market is minimal, and key currencies are supported by hefty current account surpluses.
- In this section, we consider five aspects of emerging market banking systems: regulations, penetration, concentration, profitability and foreign ownership.
- In aggregate, we believe the best growth opportunities are in Latin America and emerging Europe. On a long-term view, Mexico (credit/GDP of 30%), Brazil (36%), Turkey (31%) and Russia (38%) have particularly strong growth outlooks on our data.
- Growth opportunities appear greatest in consumer lending (particularly mortgage lending in Brazil and emerging Europe), SME lending (particularly in Russia and Thailand) and micro-finance (in India and Indonesia).

Figure 108: Financial sector: Investment recommendations

Yapi Kredi Bank: a play on Turkish convergence YKB's fast expansion strategy has created a higher cost base compared to its peers, but we see downside room for costs and upside room in revenue productivity and profitability as employee/branch efficiency increases in the medium term.	Ticker: YKBNK.IS Rating: Outperform Akin Tuzun
HDFC Bank: least earnings risk in the current macro environment HDFC Bank is the second-largest private sector bank in India. We believe HDFC Bank's earnings have the least risk in the current macro environment given a high proportion of low-cost current and savings deposits, high provisions, and potential synergies from the recent acquisition of Centurion Bank of Punjab. We forecast an earnings CAGR of 30% over the next three years.	Ticker: HDBK.BO Rating: Neutral Aditya Singhanian
ICBC: strong deposit base ICBC is the largest bank in China with the strongest deposit franchise (17% market share as at 2007), and is particularly strong in urban China. Wealth management for both the retail and corporate sectors remains a grossly untapped area in China and hence offers one of the potentially strongest growth prospects.	Ticker: 1398.HK Rating: Neutral Sherry Lin
BBVA: exposure to Latin America On our estimates, 45% of BBVA 2009 earnings are from Latin America, mostly Mexico. Looking beyond the current economic downturn, we believe Latin America (including Mexico) offers strong long-term growth potential in loan growth. Post the currency crises of previous decades, the Latin banking sector appears to be relatively well capitalised and, hence, well positioned to weather the prevailing slowdown.	Ticker: BBVA.MC Rating: Outperform Santiago Lopez
Ping An: Chinese life insurance Ping An provides exposure to the attractive long-term Chinese life insurance industry at valuation multiples that are at a 30% discount to China Life, its major peer. We believe the strong long-term economic growth, low insurance penetration and rising household incomes in China will support 20% compound annual growth in embedded value from 2009E to 2012E.	Ticker: 2318.HK Rating: Outperform Christopher Esson

Source: Company data, Credit Suisse estimates

The Credit Suisse Financials Index

Figure 109: Country ranking (2006) & change in rank (1999–2006)

Country	Improvement in rank (1999 - 2006)	2006 Rank (out of 49)
Russia	9	36
India	8	32
Turkey	8	34
Ukraine	7	41
Chile	5	23
Colombia	4	33
Czech Republic	4	30
Greece	3	28
Mexico	3	40
Romania	3	44
Slovak Republic	3	29
Bulgaria	2	42
Venezuela	2	47
China	0	27
Brazil	0	39

* we list all countries, sorted by change in rank, which are rated lower than 20 on their 2006 score Source: Credit Suisse estimates

The Credit Suisse Financials Index aims at being a macro-oriented guide to investment decisions in the Financial Services sector by country and/or region. To this end, we set out to a) construct an index for Financial Services that ranks the ability of countries (49) to maintain an environment which sustains the development of financial infrastructure; and b) measure the index's relation to wealth creation and economic growth.

In the construct of the composite index, we standardise components that are measured in different units (e.g. US\$; shares of GDP; shares of totals in general (e.g. share of total exports); rates of growth (percentage changes). The components we use are categorised by market structure and market penetration and are divided between 'hard' and 'soft' data. 'Hard' data are readily measured (with an applied two-thirds weight), while 'soft' data can be perceived (with an applied one-third weight).

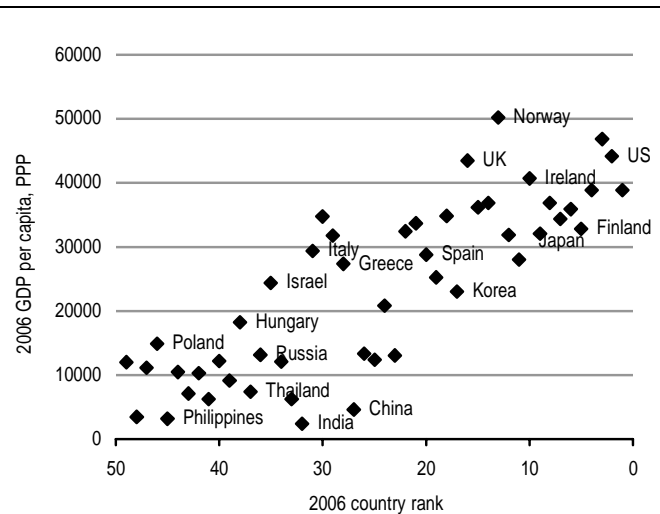
Market structure:

- Banks' non-performing loans/total loans (hard data)
- The inverse of net interest margin/assets (hard data)
- Credit flows easily from banks to businesses (soft data)
- Sufficient transparency in financial institutions (soft data)
- Transparency of government policy is satisfactory (soft data)

Market penetration:

- Number of financial cards per capita (hard data)
- Total lending to private sector share of GDP (hard data)

Figure 110: Finance ranking vs GDP per capita (PPP, 2006)



Source: Credit Suisse estimates

Main findings: The Credit Suisse Financials Index reveals a very strong correlation of 82% with the GDP per capita output *level*. The correlation by regions underscores the importance of financial services in explaining economic development: the correlation stands at 76% for emerging markets, whereas for developed countries, it stands at a lower 44%. It is particularly high for non-Japan Asia (93%) and Turkey and Israel (86% each).

The Credit Suisse Financials Index also displays a significant effect on GDP *growth*: our analysis implies that a 1 point increase in our Financials Index increases per capita growth by 0.01 percentage point for our group of countries. Statistically, it is a robust finding, but also conceptually, as we remain mindful that many variables enter the equation of measuring economic growth.

Finally, our analysis suggests that regions presenting growth potential are Eastern Europe, Asia and Latin America, with the following countries having the strongest financial services infrastructure growth potential: Russia, India, Turkey, Ukraine and Chile.

A note of caution: measuring the relationship between financials services and economic growth is a difficult task. It varies greatly across countries and stages of development. As per the discussion above, the causality is not clear, and there are plenty of examples of credit/GDP well ahead or behind the prevailing level of GDP per capita. We note, for example, that bank deposits as a percentage of GDP represent 0.4% in India, as we suspect that bank intermediation is still developing. But, it is only slightly higher in the US, at 0.5%, as the degree of financial intermediation has expanded beyond banks.

Banking trends: a key pillar of growth

Banking is one of the main pillars of economic growth. Simple regression analysis shows the strong link between GDP per capita and credit/GDP. But, this is far from a strictly linear relationship from at least two aspects:

(a) The causality is not clear. Economic growth may thrive on the back of a transparent, competitive financial system, but that system may only develop as a result of, or at best in tandem with, higher rates of GDP.

(b) There are plenty of examples of credit/GDP well ahead or behind the prevailing level of GDP per capita. Take Malaysia in 1996, for example: credit/GDP stood at a very high 158%, implying GDP per capita in the region of current UK levels (US\$46,000), when in fact it was only US\$4,836 (according to IMF data).

Whatever the degree of bank penetration, a well capitalised, well regulated banking system can potentially mitigate the impact of a recession or vice versa. Take Brazil and Mexico, for example: the peso devaluation in December 1994 undermined an over-extended, under-capitalised Mexican banking system (we estimate the cost of the bank bailout to the tax payer at over 20% of GDP). In addition, the precarious state of the banks heightened the recession in Mexico (-6.2% GDP growth in 1995) and hampered the recovery (average GDP growth in the five years following the crisis of just 2.9%). In contrast, the much stronger position of the Brazilian banking system meant a significant slowdown but no contraction in GDP (0.3% growth in 1999) following the devaluation of the real in January 1999.

Well-capitalised and regulated banking system key

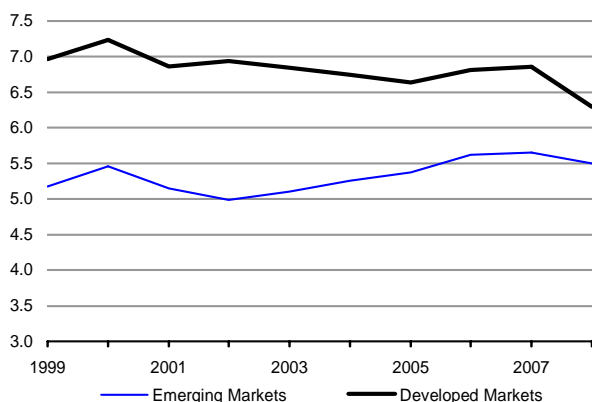
The average credit/GDP ratio for the emerging markets was just 47% in 2007, compared to developed markets at 139%. Some convergence in these ratios looks likely over the medium to long term. On the one hand, after particularly robust growth over the past 10 years, credit extension in many developed markets looks set to underperform overall GDP growth; on the other, from a much more subdued base, emerging market credit appears to have significant potential to outstrip GDP growth.

Structural potential for credit expansion

It is this aspect of growth in emerging market intangible infrastructure that we explore in this section. Specifically, we look in some detail at the trends and opportunities across the emerging market banking systems. We highlight six key considerations:

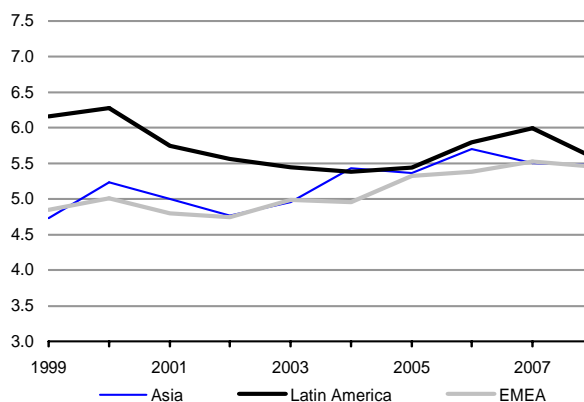
(1) Regulations. The legacy of the Asian, Russian and Latin currency crises of the mid-1990s, 1998 and 2000/01, respectively, has been step-changes in the regulatory environment.

Figure 111: Emerging vs developed financial transparency



Source: IMD, Credit Suisse research

Figure 112: Emerging market financial transparency

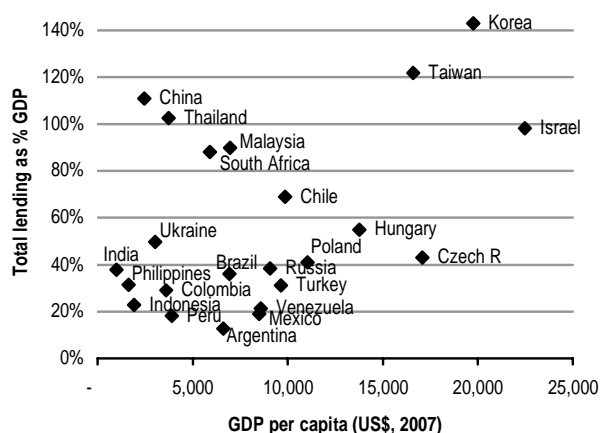


Source: IMD, Credit Suisse estimates

Better regulation has brought with it greater transparency in the financial system. IMD survey data show the extent to which this has improved for the emerging markets. From an average score of 5.2 (on a scale of 0 to 10) in 1999, emerging markets improved to 5.7 in 2007. The improvement is most obvious within the Asian and EMEA markets.

(2) Penetration. Total credit/GDP remains relatively low across Latin America and emerging Europe. Despite significant declines since the mid-1990s, Asian credit levels are still, in aggregate, relatively high after adjusting for their GDP per capita.

Figure 113: Total lending as % GDP vs GDP per capita



Source: IMF, EIU, Credit Suisse research

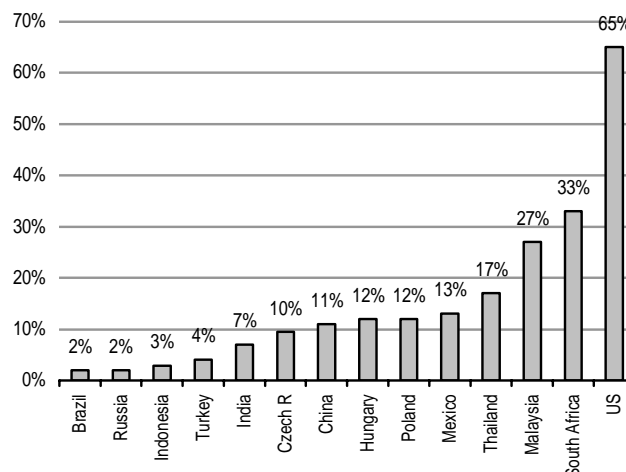
In aggregate, the best growth opportunities look to be in Latin America and emerging Europe. On a long-term view, Mexico (credit/GDP of 30%), Brazil (36%), Turkey (31%) and Russia (38%) have particularly strong growth outlooks. This is particularly the case for Brazil and Turkey if, as we expect, high nominal interest rates shift to structurally lower levels over the medium to long term.

Consumer lending appears to have been the most neglected area of emerging market banking over the last 10–20 years. Mortgage exposure in many of the markets is particularly low. This implies relative insulation from the current housing market downturn, but also long-term growth potential. Relative to per capita income, mortgage lending is notably low in Brazil (2% of GDP), Russia (2%), Turkey (4%), Czech Republic (10%), and Poland and Hungary (both at 12%).

The other main area of growth potential is lending to SMEs. In this respect, we highlight the potential in Thailand (SME loans/SME GDP at 48% is less than half the ratio of non-SME credit/non-SME GDP 142%), in Russia (latest data shows that at end-2004, SMEs contributed just 12% to GDP compared to around 50% for most developed countries), and the government-backed case for greater micro-finance in both India and Indonesia.

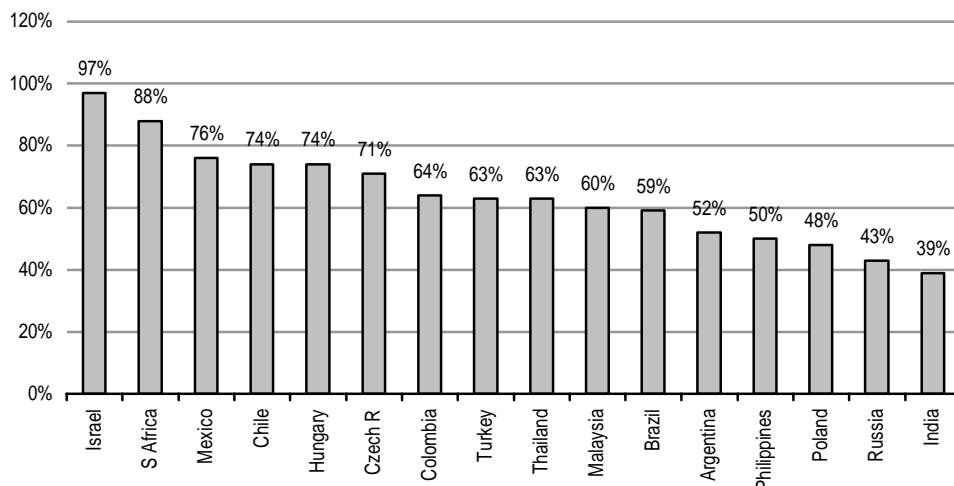
(3) Concentration. Typically, there has been very significant consolidation in the number of emerging market banks in the wake of the various currency and financial crises since the Tequila crisis at the end of 1994. On average, the largest five banks in the emerging markets accounted for 64% of total system assets in 2007.

Figure 114: Mortgage lending as % GDP



Source: IMF, EIU, Credit Suisse research

Consumer and SME lending offers greatest potential for growth, in our view

Figure 115: Top 5 banks assets as % total system, 2007

Source: Credit Suisse research

(4) Profitability. Banks in Brazil, Turkey and South Africa rank among the highest ROEs across the emerging markets universe. In Brazil, this reflects high net interest margins, which should decline as interest rates come down over the long term. But, this should be somewhat mitigated by lower provision charges and possibly costs.

Banks in China and Thailand have delivered lower levels of profitability. In the former, this reflects strong state intervention, which, to a large extent, still determines the net interest margin (although controls have been eased over the past couple of years) and very low fee income. Changes to this depend on the regulator and are only likely to be gradual. Thailand has taken the best part of 10 years for the banking system to recover from the Asian crisis. Provision costs are, only this year, finally starting to converge on the Asian average.

Figure 116: Average banking sector ROE breakdown (2007A)

	Brazil	Mexico	Poland	Hungary	Czech	Russia	S Africa	Turkey	China	Malaysia	India	Thailand
Net interest income	6.4%	6.1%	3.7%	5.5%	2.9%	5.6%	3.0%	4.5%	2.9%	2.5%	2.9%	3.4%
Non-interest income	3.2%	2.8%	2.9%	2.9%	2.9%	2.2%	3.2%	3.0%	0.4%	1.7%	5.6%	1.7%
Costs	-5.5%	-4.6%	-3.2%	-4.5%	-2.5%	-3.8%	-3.3%	-3.2%	-1.4%	-1.8%	-2.2%	-2.9%
Provisions	-1.6%	-0.9%	-0.1%	-0.7%	-0.2%	-1.0%	-0.5%	-1.0%	-0.3%	-0.5%	-0.6%	-1.0%
Pretax profits	2.4%	3.3%	3.3%	3.2%	3.2%	3.1%	2.4%	3.3%	1.6%	2.0%	1.7%	1.0%
Tax	-0.4%	-1.1%	-0.6%	-0.5%	-0.5%	-0.7%	-0.6%	-0.6%	-0.5%	-0.5%	-0.5%	-0.4%
ROAA	2.0%	2.2%	2.7%	2.7%	2.7%	2.4%	1.7%	2.7%	1.1%	1.5%	1.2%	0.6%
Leverage (x)	12.7	9.0	8.8	9.3	8.1	8.9	15.0	10.1	15.4	15.0	15.1	10.7
ROE	25.9%	20.1%	23.8%	24.9%	22.1%	20.6%	25.8%	25.2%	17.7%	21.7%	17.6%	6.4%

Source: Company data, Credit Suisse research

(5) Foreign ownership of emerging market banks is very high across much of emerging Europe and parts of Latin America. Foreign stakes in Asian banking systems are lower as (a) high credit/GDP ratios have dampened demand and (b) as government restrictions on foreign ownership have, in several cases, precluded majority sales.

Figure 117: Share of bank assets held by foreign banks

	% ownership		Value US\$ bn
	1990	2004	
Bulgaria	0	80	13
Czech Rep	10	96	99
Hungary	10	83	68
Poland	3	68	105
China	0	2	71
India	5	8	36
Korea	4	8	65
Malaysia		18	32
Thailand	5	18	32
Argentina	10	48	31
Brazil	6	27	107
Chile	19	42	35
Mexico	2	82	342
Peru	4	46	11
Venezuela	1	34	9

Source: CGFS (2004); ECB; national central banks, BIS calculations

There are two issues. First, from the point of view of the foreign institutions, we believe it is clear that investing in emerging markets has provided an important avenue for growth. Santander is an example, where new business in Latin America provided the bank with attractive revenue diversification. However, not all of the acquisitions have added value to shareholders, as can be seen in Figure 119.

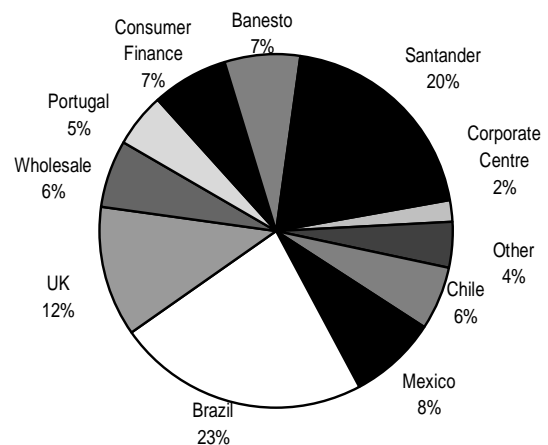
Figure 118: SAN's capital employed track record (€m)

Division	Capital employed (€m)	2008E Net Income	ROCE	Cost of Equity
BTO and BCH	20,000	2,041	10.2%	9.1%
Chile	3,500	600	17.1%	11.9%
Mexico	2,500	791	31.6%	11.6%
Brazil	10,000	1,086	10.9%	12.2%
Abbey	14,500	1,360	9.4%	9.9%
ABN	10,700	1,156	10.8%	13.0%
Total	61,200	7,034	11.5%	10.7%
Total Brazil + Abbey + ABN	35,200	3,602	10.2%	11.5%

Source: Credit Suisse estimates. Capital employed includes the cost of early retirement funds and restructuring costs.

Second, the Latin experience suggests that a dominant presence by foreign players does not necessarily improve the functioning of the banking system. In Argentina in the late 1990s, when the country's convertibility system was still in place, it was argued that foreign interest (around 40% of total system's assets were in the hands of foreign players) would help safeguard the banking system. In fact, it appears to have made little difference who owned the assets given the disarray in macroeconomic policy.

It is true that developed market banks can enhance capital, technology and competition, therefore benefiting the system and the country. However, one negative aspect is that credit decisions are occasionally taken abroad, and may not always reflect the fundamentals of the domestic economy. Brazil felt the contagion from the Argentine financial crisis in 2001 as foreign banks that were present in both countries pulled credit lines to Brazil and Brazilian companies.

Figure 119: SAN's 2008E valuation (% by area)

Source: Credit Suisse estimates. Corporate Center includes corporate costs, unrealised capital gains and excess provisions

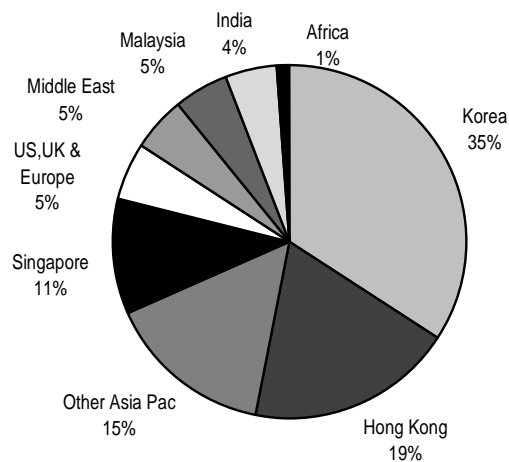
Another negative aspect of foreign ownership is that acquisitions are often de-listed from the local stock market. In our view, this has two negative consequences: 1) it removes the discipline imposed by equity markets which can complement the work of supervising authorities; and 2) it undermines the development of local equity markets and narrows the choice for domestic investors. The Mexican equity market has suffered most obviously from this trend. We believe it may have made some sense for the regulators to oblige BBVA and Citibank to maintain a minimum public float in their bank acquisitions.

Two major banks that have made significant acquisitions in the emerging markets over recent decades are Standard Chartered and HSBC.

Standard Chartered derived over 90% of profits from Asia, Africa and the Middle East in 2007. It typically has market shares of 5–10% across its geographical footprint. It has recently shifted its business model away from mass market products such as mortgages and now focuses more on the higher-end consumer, with 50% of consumer revenues derived from wealth management operations and deposits. SME and non-mortgage consumer lending now account for over 40% of its consumer loan portfolio. Wholesale banking accounts for around 50% of group revenues but c65% of group profits.

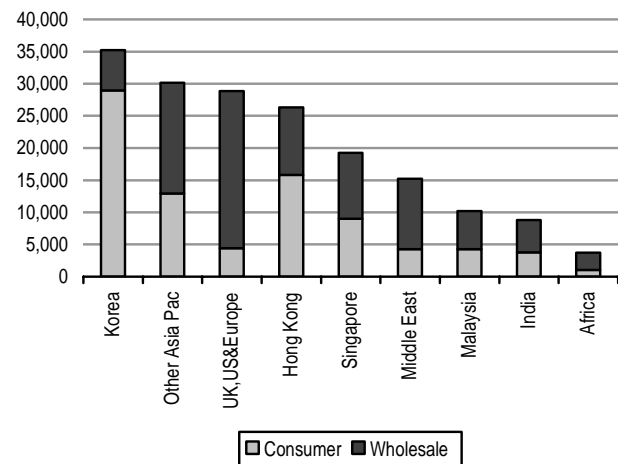
Following recent acquisitions in Korea and Taiwan, and an increasing organic presence in China, Standard Chartered now has a sizeable presence across key Asian markets, enabling it to benefit from structural growth trends. We believe that while Asia and the Middle East are clearly not immune to the global economic slowdown, we still expect superior growth from these regions compared with Europe and the US. In addition, we believe that Standard Chartered is well positioned to gain market share in areas where both domestic and foreign banks have pulled back due to liquidity and capital constraints. Indeed, the pre-emptive rights issue announced by Standard Chartered on 24 November 2008 provides an increased capital buffer to both take advantage of such opportunities and better withstand a potentially sharper downturn. We do, however, remain cautious on near-term earnings prospects given the prospect of increasing impairment and slowing revenue growth. We therefore remain Neutral on the stock.

Figure 120: STAN consumer loan portfolio (H1 08)



Source: Company data

Figure 121: STAN loan portfolio (H1 08)

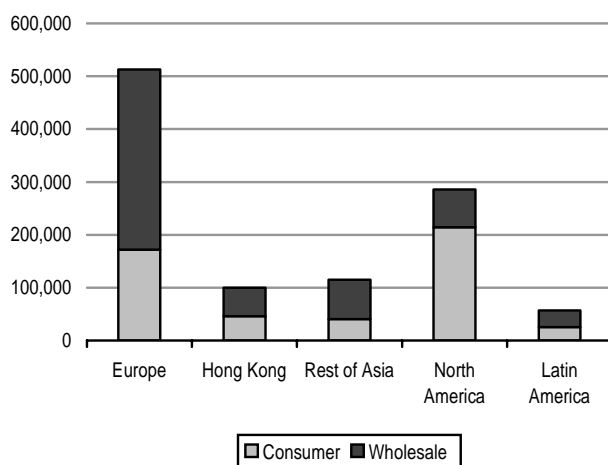


Source: Company data

HSBC is a global bank that has recently focused growth opportunities (organic and by acquisition) on emerging markets franchises, which in 2008E we expect will account for as much as 60% of group pre-tax profit, although this partially reflects contracting earnings across the US business. Emerging markets remain a much smaller part of the group's balance sheet, with Hong Kong, Asia and Latin America accounting for only 25% of the group loan portfolio. Within this, consumer banking only accounts for 40%, with recent growth in emerging markets focused more on the corporate and wholesale businesses.

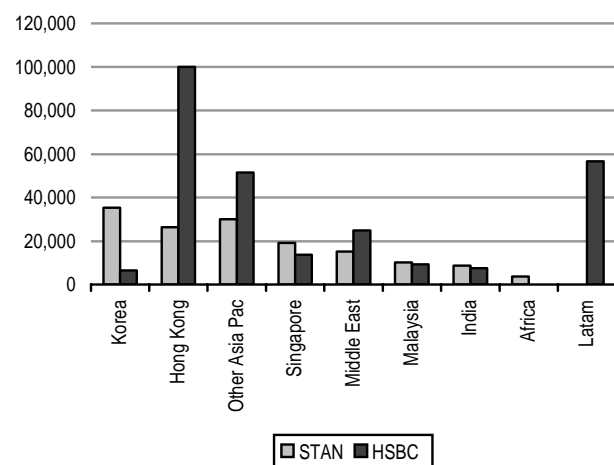
HSBC's consumer business offers full-scale banking to the general public as well as offering the higher-end wealth management and private banking products. It has a similar Asian footprint to Standard Chartered's, but with a much larger presence in Hong Kong. The US\$100bn Hong Kong loan portfolio is broadly split between consumer and wholesale with mortgages accounting for 30%. HSBC currently has market share of 27% in new mortgage lending compared with Standard Chartered at 8.5%. HSBC also has a larger loan portfolio across the rest of Asia but we note this includes a loan portfolio of \$12.7bn in Australia which is not material for Standard Chartered. The one gap in HSBC's Asian footprint appears to be Korea. Note that HSBC recently terminated its agreement to acquire 51% of Korea Exchange Bank, citing falling asset values in world financial markets, although it stated that it remains committed to growing its business in Korea. We believe that HSBC as a group is less geared to structural growth opportunities across Asia given its sizeable European and US operations. Indeed, we remain cautious about the earnings outlook given increasing impairment across these loan portfolios, which we do not believe is currently discounted by the premium valuation of the stock.

Figure 122: HSBC loan portfolio (H1 08)



Source: Company data

Figure 123: STAN vs HSBC loan portfolio



Source: Company data

Brazilian banks: further convergence

Lessons learned from the early 1990s

The Brazilian banking system (on the private side, at least) is fairly sophisticated, particularly in terms of transaction processing capabilities. Credit levels are still low, but steady progress has been made since the end of hyperinflation in 1994.

Brazil's leading position in banking technology is mostly a legacy of the hyperinflation era. Brazil is a country with a population of 186 million and there are 14 cities with over 1 million inhabitants. When inflation was running at 2% per day in the early 1990s, it was imperative that funds could flow smoothly. For the past 20 years, the Brazilian system has cleared the majority of its cheques overnight. During the numerous failed economic plans of the 1980s and 1990s, banks would take a holiday on the Friday only to open for business on Monday with a new national currency or denomination. Consequently, the system was forced to make huge technological investments and develop its transactions processing capabilities.

On the negative side, the legacy of the high inflation makes the Brazilian system one of the most regulated among the emerging markets. The Central Bank of Brazil is the regulator. Reserve requirements on deposits are among the highest worldwide and although they have been higher in the past, we do not expect them to converge to international levels until interest rates reach single digits. High reserve requirements and low demand for loans in the later part of 1990s also led to another distortion: banks had little incentive to borrow through deposits, which led clients to shift their savings to investment funds. Consequently, banks have almost twice their deposit base in plain vanilla fixed income mutual funds. In the longer term, as interest rates continue to move lower and credit grows, those funds are likely shift back to banks' balance sheets.

Another important feature in Brazil is the high asset spreads. There is a huge asymmetry of information that reduces the mobility of bank clients. The decision of where to open a bank account normally comes from the employer. Once individuals receive their salaries in a given bank, they have little incentive to change. This reflects the absence of a positive credit bureau, the opaque structure of fees and the lack of a true mortgage market. These issues are being dealt with gradually, and recent regulation is making fees more comparable. However, we believe mobility will only increase significantly with the growth in a competitive mortgage market.

Concentration in the sector is fairly high. The largest five banks in Brazil controlled 59% of assets in the total system as at end 2007 compared to 74% in Chile, 76% in Mexico and 88% in South Africa. After the merger between Santander and ABN in Brazil, we currently see four large players with average market shares of 15–20%, depending on the product.

Figure 124: Top 10 Brazilian banks (R\$ millions), 2007

	Ranking	Assets	Share	Deposits	Share	Branches	Share
1	BB	403,468	16.3%	195,475	20.6%	4,117	26.3%
2	BRADESCO	348,350	14.1%	123,715	13.1%	3,205	20.5%
3	ITAU	339,594	13.8%	87,027	9.2%	2,639	16.8%
4	ABN+SANTANDER	291,500	11.8%	117,831	12.4%	1,257	8.0%
5	CEF	264,393	10.7%	148,015	15.6%	206	1.3%
6	UNIBANCO	169,713	6.9%	52,795	5.6%	947	6.0%
7	HSBC	97,489	3.9%	53,572	5.7%	925	5.9%
8	VOTORANTIM	73,632	3.0%	20,963	2.2%	14	0.1%
9	SAFRA	61,695	2.5%	9,479	1.0%	124	0.8%
10	NOSSA CAIXA	54,011	2.2%	32,999	3.5%	560	3.6%

Source: Central Bank of Brasil

NPL risk increasing in 2009

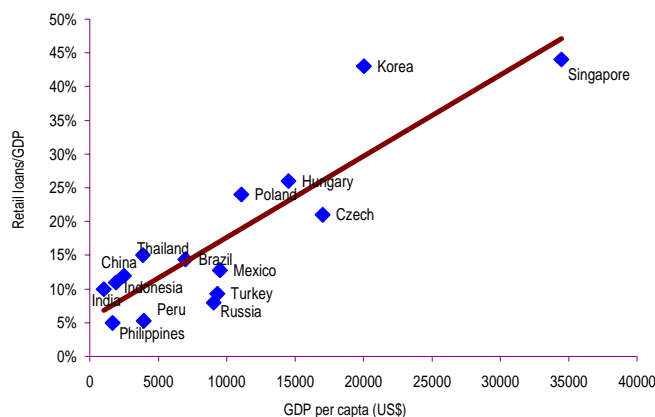
The economic reforms taken in the early 1990s and the benign international scenario from 2003 led Brazil to embark on the strongest growth cycle seen since 1970. The average GDP growth rate has risen from 2.2% between 1995 and 2002 to 3.8% between 2003 and 2007. Economic stability led to a surge in the country's investment rate, which has grown above GDP for the last three years. Growth has been led by domestic demand in the last few years and credit has been one of the main drivers.

But with GDP growth expected, on our estimates, to slow down in 2009 to 3.0% versus 5.4% in 2008, we foresee a more challenging environment for Brazilian banks. We expect growth in retail lending to slow significantly and NPLs are likely to increase. The combination of lower interest rates and low economic growth looks set to reduce banks' return on assets. We expect ROE, therefore, to decline from the current 25% to around 20%.

Banking penetration

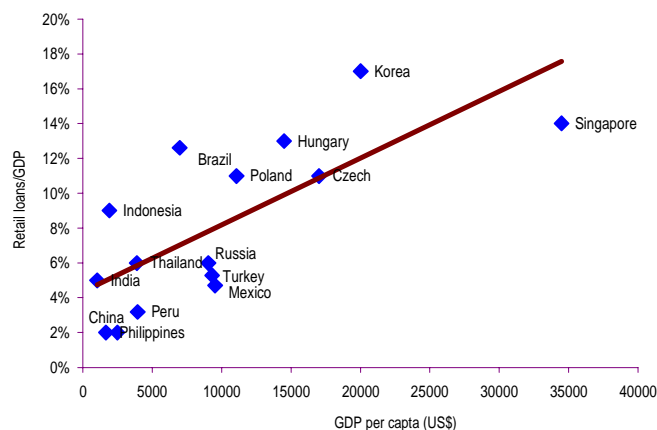
Back in 2002, credit penetration levels in Brazil were below those seen in most of the rest of the emerging markets. Since then, accumulated loan growth has been 206% and credit/GDP is now at 36%. However, most of the reason for Brazil's lower penetration is the absence of a mortgage market. If we look at total retail credit/GDP and normalise by per capita income, we still see Brazil as an under-penetrated market, but a lot less so once mortgages are excluded.

Figure 125: Retail loans including mortgages



Source: Credit Suisse research

Figure 126: Retail loans excluding mortgages



Source: Credit Suisse research

The major opportunity in Brazilian banking is the mortgage market, which today accounts for only 2% of GDP. We believe Brazil is, in that sense, three or four years behind Mexico. Although foreclosure laws have improved and the banks now appear comfortable with the new framework, lower interest rates and the development of a yield curve are still necessary.

Structural profitability

With average ROAs of over 2.5% in 2007 for the top retail banks, Brazil is a very profitable banking market. The main contribution to such high profitability is on the margin and fee fronts. In our view, the high margins basically stem from two issues:

- High interest rates: Brazil still has among the highest real and nominal interest rates in the world, which positively contribute to securities income;
- High spreads on retail operations: a function of the previously discussed asymmetry of information and also high NPLs.

We believe the higher fee ratios are a function of the transaction processing excellence and also the asymmetry of information and low comparability of service fee packages between banks. It is also related to the huge volumes of money market mutual funds, which are a perfect substitute for time deposits. In a world with lower reserve requirements, these funds would be added back to the balance sheet and fund management fees would be reduced.

Expenses are still an issue and they are much higher than in most other markets. This reflects the high costs involved in operating in Brazil, not just in terms of physical infrastructure, but also high labour costs and indirect taxes. In Brazil, for every real a bank pays an employee, approximately another R\$1.20 is paid in taxes.

Although the low asset base due to the absence of a mortgage market distorts the ratios, all in all, Brazil has one of the most profitable banking sectors within the emerging markets, which we expect to remain so for the next few years.

Mexican finance: mostly foreign-owned

Legacy issues shape a landscape of low penetration

During the Latin America debt crisis of the early 1980s, the Mexican government nationalised the banking system in 1982, and then re-privatised it over 1991 and 1992. Following the economic and financial reforms, the number of banks was reduced from the previous 77 (state-controlled) to 20 in 1993. With the devaluation of the peso in December 1994, Mexico went through a period of crisis and faced a slowdown in GDP growth. Total loans in the system fell by 43% between end 1994 and 1997, reflecting huge write-offs in segments such as mortgages and credit cards.

After the 1994–95 crisis, Mexico developed a rescue package to deal with the situation. The immediate initiatives were to avoid a collapse of the system: (i) 'dollar liquidity mechanism' whereby banks could borrow money from the Central Bank to meet their foreign currency obligations; and (ii) the government also implemented a Temporary Capitalization Program (Procapte) to fund the banks. After that, during 1995 and 1996, the government designed specific programmes for each debtor segment. Most of the rescue programmes were implemented through a government agency called FOBAPROA (later renamed IPAB), to which banks sold their problem loans under a loss-sharing scheme. Under the deal, the government accepted 75% of the losses and the banks the remaining 25%. Even the banks' 25% share proved to be too much of a burden and, by 2002, only one of the privatised banks remained in the hands of its original shareholders. All of that came also at significant pain to Mexican taxpayers, as the cost of the bank bailout was over 20% of GDP.

Since the crisis, only GF Banorte currently remains in the hands of its original shareholder. Between 1999 and 2002, the system's leading banks were acquired by foreign players, as their shareholders did not have the financial flexibility or appetite to comply with the recapitalisation needs following the crisis.

The system is now fairly concentrated, with the top five banks accounting for 76% of the system's assets. Aside from GF Banorte, the other listed names are Grupo Financiero Inbursa (more exposed to insurance and pensions) and the microlenders, Compartamos and Financiera Independencia.

Figure 127: Top 10 Mexican banks (P\$ millions)

Rank	Institution	Assets	Share (%)	Loans	Share (%)	Deposits	Share (%)
1	BBVA Bancomer	741,276	23.7	477,975	27.4	521,474	25.3
2	Banamex	589,719	18.9	264,855	15.2	339,170	16.4
3	Santander	427,598	13.7	232,060	13.3	261,804	12.7
4	HSBC	355,526	11.4	201,924	11.6	273,385	13.3
5	Mercantil del Norte	273,048	8.7	187,655	10.8	222,942	10.8
6	Scotia Bank Inverlat	138,560	4.4	90,200	5.2	104,425	5.1
7	Inbursa	131,820	4.2	99,837	5.7	91,823	4.5
8	ING Bank	68,724	2.2	3,239	0.2	3,986	0.2
9	Del Bajilo	54,516	1.7	43,163	2.5	43,966	2.1
10	Azteca	53,183	1.7	22,634	1.3	46,990	2.3

Source: Central Bank of Mexico

The lack of a well-capitalised financial system inevitably meant very poor loan growth for Mexico between 1995 and 2001. As a result, Mexico stands out today with one of the lowest credit/GDP ratios (19% at end-2007) across the emerging economies, especially when normalised by per capita income.

We believe the banks in Mexico are well regulated, which is done by the CNBV. A big contrast to Brazil is that there are no reserve requirements in Mexico.

One of the biggest advantages Mexico has over Brazil is a well designed system for low-income mortgages. President Fox's 2001–06 housing programme was very successful. The mortgage financing system in Mexico is divided into four institutional groups. The main source is government-mandated housing funds, whose funding is provided by workers' pensions. This basically comprises Infonavit (for private-sector employees) and Fovissste (for public-sector employees). The second most important source of mortgage financing is provided by SHF (Sociedad Hipotecaria Federal), which provides loans mainly through Sofoles (non-bank financial institutions) and, to a lesser extent, through commercial banks. From 2009 onward, SHF will no longer provide direct financing, but only guarantees. The third source is direct subsidies from public housing agencies. Finally, the fourth source is Sofoles and commercial banks, which are focused on the middle-income segments.

Low-income mortgage
framework differentiates
Mexico

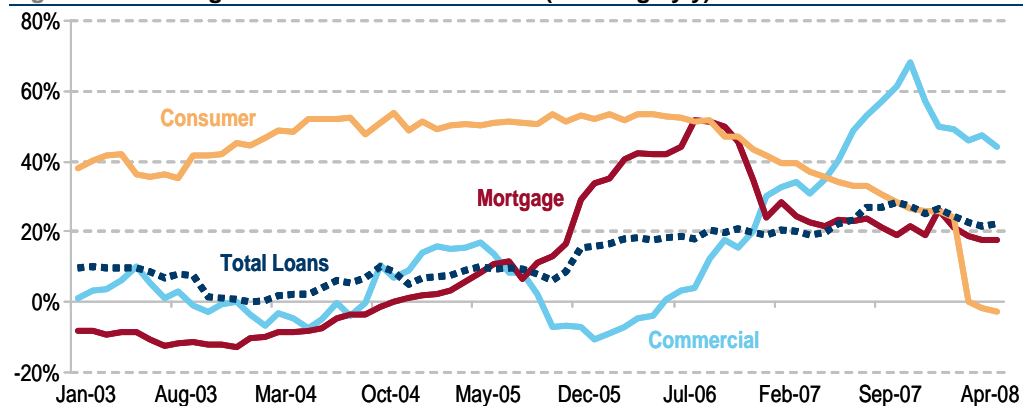
From mid-1997, with the development of a new pension system, the banks have been able to benefit from the related fees and commissions. Plus, the insurance business has taken off with the introduction of annuity schemes. With this, the banking system has slowly recovered. From 1997 to 2003, Mexico's loan CAGR increased to 9.4% per year. In the last five years (2004–08) Mexico has been growing above the US, and credit growth is one of the main drivers.

Macro environment driven by ties to the US

Due to the strong trade and economic links with the US, the Mexican economy is highly correlated to the performance of its northern neighbour. The slowdown in the US is likely to filter through to Mexico fairly strongly over the next 12 months. We expect aggregate GDP growth of 2.4% for Mexico in 2008, compared to 3.3% in 2007.

On the external front, the main risk is the state of the US auto industry, given that part of the strength in Mexico's recent industrial production was related to auto exports. On the domestic front, the risks are the impact of rising inflation on consumer spending and the downward trend in remittances.

On the inflation front, expectations have worsened: we forecast 6% by year-end 2008 compared to the Central Bank target of 3%. Nevertheless, we expect the central bank to maintain the overnight rate at 7.5% for the remainder of 2008, but the risks are to the upside.

Figure 128: Loan growth breakdown in Mexico (% change y/y)

Source: Central Bank of Mexico

Consumer and mortgage lending growth has been slowing since mid-2007, although a recent reclassification by one major bank distorts the statistics. However, given the very low credit penetration, we believe that even with GDP growth between 2% and 2.5%, retail loan growth can still sustain nominal growth rates of 20% for the next few years.

Low penetration presents a structural opportunity

Of all emerging markets, Mexico is the one that shows the lowest loan penetration levels, especially if adjusted by per capita income. Although the very strong mortgage growth of the past five years has taken the ratio of mortgage loans/GDP (13%) closer to some of Mexico's peers, there still appears to be very significant potential in consumer lending, particularly mortgages.

The only investable commercial bank in Mexico is Grupo Financiero Banorte, given that the rest of the system is majority-owned by foreign institutions. Although it has fallen slightly over the last three years, Banorte's profitability is structurally high and in line with the rest of Latin American and most of other emerging markets.

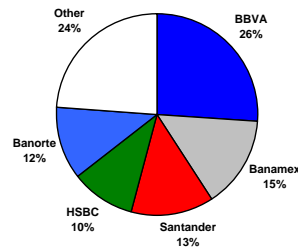
One of the main differences to Brazil is the lower fee ratio. In addition, provisioning levels are much lower, reflecting lower interest rates and the greater weight of the mortgage market.

BBVA and Mexico

Although BBVA is posting aggressive growth rates in key Latin American markets, we believe we are still in the early stages of the growth cycle. In our view, current valuations are not fully reflecting the long-term potential of certain areas. The Mexican banking sector has posted average rates of growth of close to 20% p.a. in the past four years (more than 30% annual growth in consumer lending, mortgages and commercial loans) but loans as a percentage of GDP stand at around 30%, one of the lowest levels of any investment grade country in the world. Loans to GDP are still three times lower than the pre-crisis levels and the banking sector is still yet to regain the lost ground vs non-banking sources of financing, which account for more than 55% market share (only 26% of the companies use bank financing, according to the Bank of Mexico).

In our view, Bancomer continues to be the best-positioned franchise via which to extract long-term value from the Mexican banking system, with a 26% loan market share in an oligopolistic market with high returns.

Figure 129: Mexico: Loans market share (2007)



Source: CNBV

Bancomer continues to deliver relatively strong growth in its Mexican loan book, with rates of growth exceeding 10% in commercial, consumer and mortgage loans, which account for more than 80% of Bancomer's performing loan book. The company has been able to maintain its NIM between 4.0% and 6.0% in the past seven quarters, in spite of growing competition in the sector, thanks to the increase in interest rates.

Bancomer continues to have one of the best funding structures of any major Mexican bank with an average cost of funding 10% lower than its peers, which represents a significant competitive advantage over the medium term. Going forward we expect BBVA's Mexican operations to deliver €2.0bn net income per annum in the 2008E–2010E period. Mexico should represent around 35% of BBVA's earnings in FY2009, according to our estimates.

The bank is currently generating close to 40% return on the original investment per annum. We believe Bancomer's ability to maintain a below-average cost of funding (between 80% and 90% of the main competitors' average) should allow it to increase its intermediation levels gradually while margins remain stable as a percentage of local rates. In our view, Bancomer can sustain a return on economic capital of 30–40% over the next two to three years, with loan growth around 5–10% p.a., something that we do not think is fully reflected in BBVA's valuation.

Chinese banking: successfully restructured

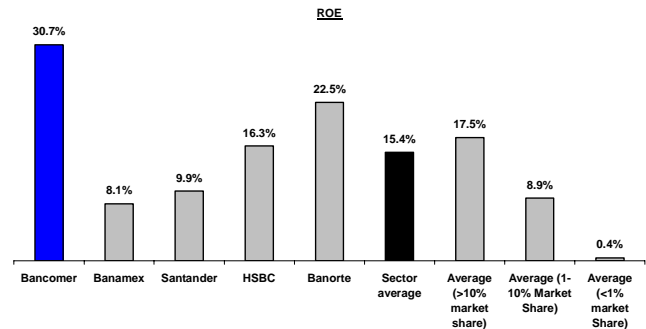
An industry in its infancy

Modern banking in China has a relatively short history and evolved more rapidly at the turn of this century. From the establishment of the PRC in 1949 to the late 1970s, the People's Bank of China (PBC) served as both a central bank as well as a commercial bank to support a centrally planned economy. In the late 1970s, when China underwent dramatic economic reform, the banking sector also went through significant structural changes where the commercial banking functions were separated from PBC into four wholly owned government entities with different policy focuses. These four entities are the precedents for the existing big four state banks: Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Bank of China (BOC) and Agricultural Bank of China (ABC).

Three out of the four state banks (with the exception of ABC) are now listed in both Hong Kong and Shanghai and have gone through extensive restructurings. First in 1994, China created three policy banks and stopped the big four from making policy loans. The banks were also allowed to broaden their business scope to operate beyond their originally specified areas, which increased competition between them. In the meantime, more national bank licences were granted in the 1980s and 1990s (which are referred to as shareholding banks in China).

The health of the China banking system was greatly strengthened from 2005, when large state banks were publicly listed. Since then, the equity/assets ratio has increased significantly while the NPL ratio has fallen sharply. The Chinese government has recapitalised the large state banks twice, once in the late 1990s, when four asset

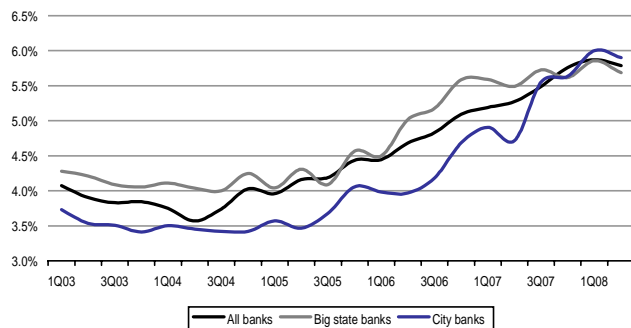
Figure 130: Mexican banks: ROE (3Q08)



Source: CNBV, Credit Suisse research

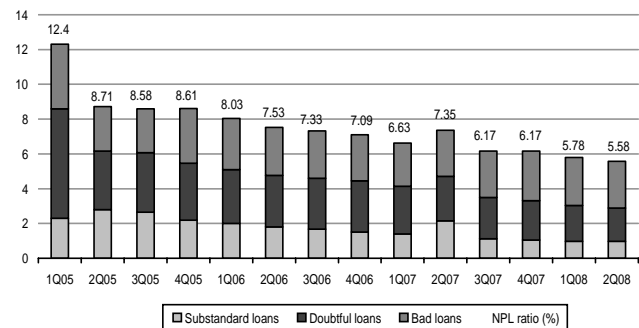
management companies (AMC) were created to assume NPLs of the state banks, and secondly prior to the public listings, when China tapped into the fast rising foreign exchange reserves to clean up the stock of NPLs. The fast-growing economy and strong fiscal stance have contributed to a fairly successful restructuring of the banking system.

Figure 131: Equity/capital ratio strengthens



Source: CEIC

Figure 132: NPL ratio and breakdown of Chinese banks



Source: CEIC

Active regulation by the PBC

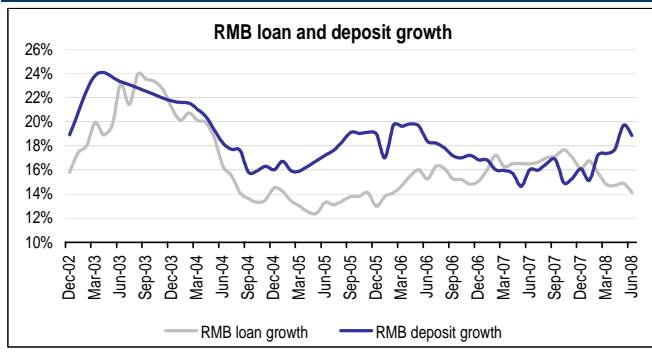
Regulations remain very important in dictating the profitability and growth of Chinese banks, particularly the regulations on RMB loans and deposit rates. The PBC, the central bank in China, sets various benchmark interest rates for RMB loans and deposits. The benchmark deposit rates serve as the ceiling for RMB deposits and effectively limit competition, particularly from foreign banks. Large Chinese banks, with their extensive branch network, continue to enjoy strong deposit franchises. Regulations on RMB lending rates are more lax. The PBC used to allow banks to charge RMB loans at interest rates within a band based on the benchmark interest rates. This band was enlarged over time until the upper limit was abolished in 1994. The floor remains at 90% of benchmark interest rates for most types of loans (the floor of lending rates on residential mortgages is 85%).

The regulations therefore ensure a guaranteed loan and deposit spread while allowing Chinese banks to start implementing risk-based pricing on loans. Over the past two years, China has undertaken a tight monetary policy to keep its credit growth in check. This monetary policy has led to a reduction in bank leverage. The cost, however, has been more than compensated for by a wider loan/deposit spread.

The PBC maintains a 75% ceiling on the RMB loan/deposit ratio as a means of keeping leverage in check for Chinese banks. This regulation has limited the RMB loan growth for smaller banks and foreign banks that do not have a strong RMB deposit base. With underlying credit demand in China still very strong, smaller banks in China are currently operating with a RMB LDR fairly close to the ceiling, while larger Chinese banks have much more liquid balance sheets with LDR hovering around 60%.

The PBC also sets a required reserve ratio (RRR) on RMB deposits that Chinese banks accept. The ratio has been used as a lever for the government to implement its monetary policy. The requirement does impose costs on the banks as the required reserve deposits bear a minimum interest rate of 1.89% (vs inter-bank interest rates of c.3% and a one-year RMB lending benchmark interest rate of 7.47%). Since 2007, China has adopted a tighter monetary policy to rein in strong loan growth in the market. Raising the RRR has been the most frequently used measure to sterilise the liquidity in the market. As of June 2008, RRR had reached 17.5%, a historical high and more than double the level seen a year ago.

Figure 133: RMB loan and deposit growth



Source: CEIC

Another important regulatory aspect is a 'target' on system loan growth that the PBC sets on an annual basis. While this is not a hard rule, the PBC's 'soft control' over RMB loan growth can be quite effective. Towards the end of each year, the PBC sets out the loan growth target for the next year. The large state banks have to meet with the regulator towards the end of every year to review their actual loan growth and explain any deviation from the target. The annual 'check' was intensified this year and now takes place on a quarterly basis. Banks that had grown loans more aggressively in the past were ordered to subscribe to low-yield government bonds as a punitive action.

Banking penetration

Banks in China remain the most important capital intermediaries, which is evidenced by a very high loan/GDP and deposit/GDP ratio (111% and 161%, respectively, at the end of 2007). Developing a stronger capital market has been a key focus for the Chinese government. Despite recent rapid growth, the amount of capital raised through exchanges remained small (3.5% of GDP in 2007). Longer term, disintermediation remains a structural threat to the growth of China's banks. However, retail banking remains an area that is still under-penetrated. Currently, 87% of total system loans are corporate loans.

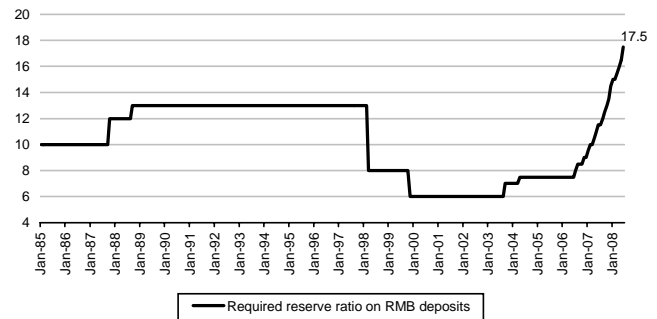
With a still low penetration—11% of GDP—mortgages remain a business with great growth potential. Penetration should rise with the increase in GDP per capita and growing home ownership. Although near-term growth in the housing market is likely to be affected by government's macro policy, the long-term growth is fundamentally supported by rapidly rising household wealth, particularly in urban areas.

84% of consumer loans in China are mortgages, which leaves other consumer finance at just 2% of GDP. As household wealth continues to accumulate, consumer finance is likely to pick-up. Banks, at this stage, remain very cautious about growing their consumer finance business aggressively, partly due to the lack of a national credit bureau. This is likely to change gradually as infrastructure improves. Credit card business has been singled out as a key focus for banks to tap into as the ability to track transactions provides valuable information on consumer behaviour. At present, debit cards dominate the overall card business in China and card settlement has grown very quickly over the past few years. However, total issued credit cards in 2007 reached only 90 million and represent just 15% of the entire 594 million urban population.

Private banking / Wealth management

The broader wealth management and private banking business that tailor to high-net-worth and affluent mass Chinese is another area with great growth potential in China. Currently, China households' financial wealth remains highly concentrated in bank deposits, which account for around 75% of China households' financial wealth allocation. Over time, the wealth allocation should diversify away from deposits into shares, insurance products, funds and other investments. The trend is expected to broaden banks' fee incomes, which now account for only 10–15% of banks' revenues.

Figure 134: Required reserve ratio on RMB deposits



Source: CEIC

Mortgage market under-penetrated and offers great potential

Wealth management to grow as individuals diversify from deposits

Shorter-term cyclical influences will play a role

We expect China's GDP growth to decelerate further into 2009 (to 8.0%) from 11.9% in 2007 and 9.0% in 2008. The slowdown is driven by slowing external growth that has already fed through to much slower momentum in exports. The slowdown is likely to affect banks' earnings growth in several respects. First, the wider net interest margin that banks have enjoyed since 2H07 has likely peaked: real deposit rates remain in negative territory, which could increase social pressure for more rapid increases in benchmark deposit rates than lending rates, if household wealth continues to be negatively affected by the correction in the stock market and a weak property market. Second, corporate profits are likely to come under pressure, which may have a negative impact on asset quality in 2009.

Structural versus cyclical

Notwithstanding these immediate considerations of the cycle, structural profitability of China banking sector is still relatively low in the context of emerging markets. The lower profitability reflects lower net interest margins and very low fee-based income. The low margin also reflects low share of consumer loans on bank's balance sheets. However, the upside on margins from growing consumer loans is likely countered to some extent by heightened competition if loans and deposit rates are de-regulated. Growth in fee-based income is an area for improved profitability. Allowing commercial banks to operate across other non-bank businesses is one important future regulatory change that could help diversify Chinese banks' reliance on spread income and improve the sector's profitability.

Key recommendation: Industrial and Commercial Bank of China (ICBC, 1398.HK, Neutral)

ICBC is the largest bank in China with the strongest deposit franchise (17% market share as at 2007), and is particularly strong in urban China. ICBC also has the largest branch network (16,476 domestic branches, 20% of total bank branches in China), which potentially safeguards its deposit franchise when the banking market's deposit rates are regulated and capped. The strong deposit base is an important asset and base for the bank to develop its universal banking model given the long-term threat of disintermediation facing the sector. Wealth management for both the retail and corporate sectors remains a grossly untapped area in China and hence offers one of the strongest growth prospects. In short, we believe that ICBC's strong deposits/customer base will help the bank to move forward faster than peers once regulations allow it.

China: life insurance potential

Although a full analysis of the life insurance industry in emerging markets is beyond the scope of this report, we thought the investment opportunities for life insurance in China were significant enough to warrant a quick overview and provide a consideration for the wider markets. We also believe that the new China healthcare financing framework discussed in the Healthcare section of this report could provide opportunities for domestic life insurance companies. While it is still too early to identify which firms will come to dominate the domestic health insurance market, we think eventual winners will be those firms that have been most adept at responding to regulatory change, product design and distribution (including pricing). China Life and Ping An both appear well positioned to benefit from this opportunity, in our view.

The regulator is the key to the outlook for profitability and growth in China's insurance sector. Strict product design and pricing controls, a gradualist approach to approving the expansion of new entrants (especially foreign), and more recent initiatives to broaden asset-liability management flexibility and deepen penetration are all positive for the outlook. The impact of the regulator can be broken down into four areas:

(1) Deepening insurance penetration

Consistent with the early stage of the insurance sector's development and relatively low GDP per capita, insurance penetration is low at just 3.5% as at the end of 2007 (split 2.5% in the life insurance industry and 1% in P&C insurance). While it is our expectation that penetration would ordinarily improve with rising household incomes, we believe the regulator is committed to accelerating this process.

Regulatory commitment to develop the sector

(2) Pricing controls

While there is little doubt that insurance industry in China is competitive, we believe the regulator has sought to limit the impact of irrational pricing. For example, in the life insurance sector, the cap on the guarantee rate (of 2.5%) has played a role in preventing unhealthy price-driven competition and facilitated the development and growth of participating policies (where a share of investment risk is taken by the policyholder). This has allowed China's insurers to grow out of some of the legacy problems that emerged from the late-1990s arising from high guarantee policies.

In the P&C market, where higher price visibility has underpinned a period of severe (and arguably irrational) competition, the regulator has sought to intervene where the industry has failed to find 'pricing equilibrium'. For example, the maximum discount relative to filed base rates in the auto insurance segment was cut in half (to 30%) and the recent focus on actuarial reserving and capital adequacy is in part designed to interrupt the cycle of cash-flow underwriting that has undermined industry profitability.

(3) Restrictions on foreign competition

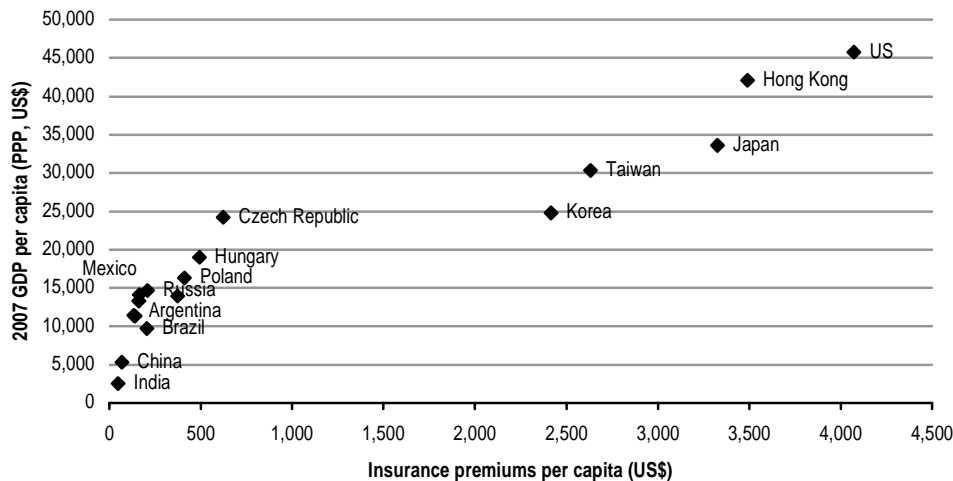
While the China insurance market has opened up to foreign insurers, in practicality, there remain substantial operational restrictions that limit the ability of the foreigners to compete. While we do not view the regulatory approach as necessarily stifling the foreign insurers, we do believe that the focus on gradual and sustainable development has necessitated a relatively moderate rate of expansion for the foreign invested insurers.

(4) Investment liberalisation

Over the past three years, the China insurance regulator has gradually eased restrictions on where the insurers can invest: For example:

- The cap on equity investments was lifted to 20% (from 15%) with the limit on funds invested directly in the equities (rather than mutual funds) increased from 5% to 10%;
- Approval has been given for investment in infrastructure. Initially, the cap is set at 5% of investment for life insurers and 2% of investments for P&C insurers. We view infrastructure as a particularly suitable asset class for life insurers given strong (and inflationary) cash returns and long asset duration;
- Rules may be further relaxed to allow insurers to invest in commercial property. We also view this as a suitable asset class (in small doses) given the return metrics;
- Up to 5% of insurers assets can be deployed in private equity style stakes in unlisted PRC banks; and
- Up to 15% of assets can be invested in overseas markets. The insurers have not really taken up this option as fixed interest investment is not attractive given RMB appreciation. However, it does provide flexibility for the medium to long term.

The net effect of the investment liberalisation is, in our opinion, an increase in the cross-cycle investment yield. In our view, this helps the life insurance sector in three key ways: improved margins, higher customer retention and improved growth.

Figure 135: Insurance premiums and GDP per capita

Source: IMF, Credit Suisse research

Overall, we also believe this ties in with a broader need for the authorities to hasten the deepening of the capital markets (both debt and equity) so that the nation's savings can be put to use more productively. As one of the major investors in the capital markets, the insurers appear well placed to benefit from this deepening process.

Key recommendation: Ping An (2318.HK, Outperform)

Ping An provides exposure to the attractive long-term Chinese life insurance industry at valuation multiples that are at a 30% discount to China Life, its major peer. We believe the strong economic growth, low insurance penetration and rising household incomes in China will support 20% compound annual growth in embedded value from 2009 to 2012.

Ping An is pursuing a universal financial services business model encompassing three key pillars: insurance, banking and investment. The core of the group is insurance, where its number two ranking in the life insurance industry provides it with a large, wealthy customer base into which it can cross-sell. Given high levels of bank deposits among households and the likely diversification of these deposits as the capital market deepens, we believe it makes strategic sense to position across the financial services value chain. The regulatory regime has ensured only a gradual expansion of foreign insurers and restrictions on pricing and product design continue to reinforce the dominance of the large-scale players in the industry.

Ping An trades at around 1.7x P/EV and 12x NBAP based on our 2009E. This represents a discount relative to its closest comparative, China Life, which trades at 2.0x P/EV and 19x VNB.

India: banking sector under-penetrated

Regulatory environment relatively tighter

The Indian banking regulator, Reserve Bank of India, requires banks to maintain a Statutory Liquidity Ratio (SLR) and a Cash Reserve Ratio (CRR). The mandated minimum level of SLR is 24% of net demand and time liabilities (effectively deposits) which banks meet by investing in SLR bonds (effectively government securities). The CRR requirement is currently 5.5% of deposits: banks are required to hold cash with the regulator which earns zero interest. These reserve requirements restrict the loan/deposit ratio for the banking sector to about 75% (75% currently).

The RBI has recently been permitted to reduce the SLR from 24% and also has a stated medium-term objective to reduce the CRR to 3%. We believe this is possible as: 1) rapid growth in life insurance, asset management and pension funds increases demand for long-tenor and low-risk assets like government securities; and 2) the government borrowing requirements decline relative to domestic savings as the savings rate increases. This should be a catalyst for higher credit penetration levels in India. This has the potential to improve: 1) interest rate and liquidity risk management and 2) returns on assets.

In addition, banks are mandated to lend 40% of total loans to priority sectors and this continues to consume a significant portion of the bank resources. Some of these loans also have regulated interest rates. Effectively, of the deposits raised, only 40% is allocated purely on a commercial basis, net of the SLR, CRR and priority sector requirements.

Government ownership has also been significantly high in the Indian banking system. Entry restrictions for private banks have been high, with very few licences granted in the past. Foreign banks are not permitted to buy healthy private sector banks currently, but can buy 'sick' banks. While privatisation of state-owned entities (government banks still own c.70% of assets in the banking system) is unlikely, the private sector has grown much faster and continues to gain market share which is likely to be a key trend going forward.

Government ownership still a prominent feature

Capital adequacy requirements for Indian banks could potentially ease significantly over time, which would free a substantial amount of capital. Currently, risk weight on mortgages is between 50% and 100% and on retail loans is at 125%, compared to Basel II risk weights of 35% and 75%, respectively. Indian banks have recently been permitted to raise preferred capital for Tier I, which should help improve leverage. The regulator had recently increased minimum Tier I to 6% (from 4.5%), keeping in mind higher macro risks, but this could potentially revert to 4.5%.

Growth is cooling; expect NPLs to rise from all-time lows

India has witnessed high levels of credit growth in the last 3–4 years (30%+). Growth has been driven by 1) strong economic growth; 2) higher savings driven by the government and corporate sectors; 3) low interest rates and strong consumption growth between 2001 and 2005; 4) buoyant capital markets; 5) significant investments by new players in insurance and asset management; and 6) a robust investment pipeline in the last 2–3 years.

This has led to credit penetration levels reaching c.50% of GDP, but this still significantly lags most regional peers. FY07–08 witnessed significantly lower levels of growth (c.23%) on account of higher interest rates. We are likely to see further moderation in growth given the macro concerns on deficits and inflationary pressures leading to monetary policy tightening. Economic growth has already slowed perceptibly in the last 12 months. Real GDP growth has declined from around 9–10% to about 8–8.5% in the last few quarters.

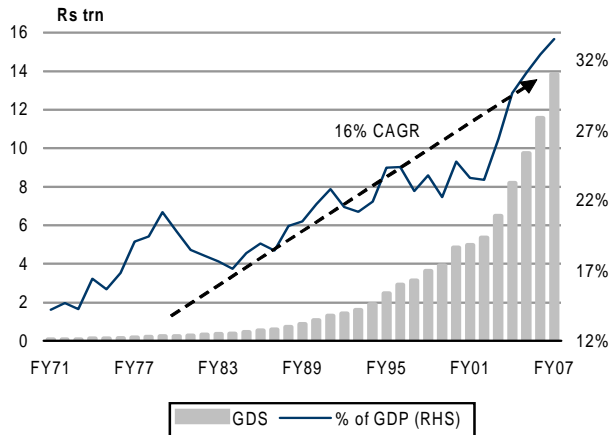
Credit penetration still lagging regional peers

Strong economic and credit growth for the last 4–5 years have helped reduce non-performing loans to all-time lows. With growth experiencing some slowdown, we are likely to see some increase in system NPLs in the near term. There has already been a spike in retail NPLs in FY08 and we should see other segments also witnessing some pain given high interest rates and slowing growth.

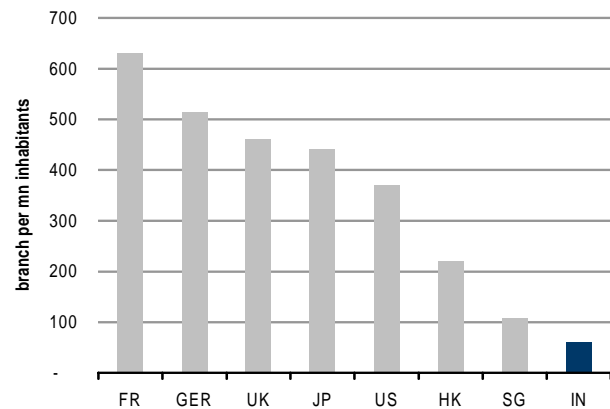
Micro financing can widen banking penetration

India's financial sector penetration has increased significantly as income levels have risen. However, it still significantly lags developed market peers in terms of per capita income. Further, the proportion of households in the middle to high income brackets, which are much more likely to be able to demand and afford financial services products, is expected to continue increasing at a rapid pace.

Savings as a proportion of GDP in India has risen significantly over the years. The key driver for this growth has been increasing income levels and a lower dependency ratio. India's working age population is projected to grow significantly, leading to a lower dependency ratio. Rising urbanisation, along with social changes like reducing average family size, is likely to drive higher demand for financial services long term.

Figure 136: Gross domestic savings growth

Source: Reserve Bank of India, Credit Suisse research

Figure 137: Bank branches per million people

Source: Credit Suisse research

A key reason for the low levels of banking sector penetration has also been the inability of banks to access the bulk of the population. Financial inclusiveness was one of the key reasons behind the nationalisation of the banking sector. The government banks, post-nationalisation, increased distribution rapidly during the 1970s and 1980s, but it is still low on a per capita basis. As the distribution network expands, along with alternative modes of reaching potential customers, we should see further improvement in financial penetration.

One area where we could see significant expansion is in micro finance. Micro finance in India is mainly implemented through the Self-Help Group (SHG) Bank Linkage Programme and the Micro-finance institutions. These programmes are aimed at improving the financial inclusiveness in the country and can offer large growth opportunities. According to our estimates, 52% of India's population is still outside the purview of the traditional banking system compared to less than 10% in developed market counterparts. As at 31 March 2007, over 2.9 million SHGs have been linked to banks involving a total credit flow of over Rs180bn (total disbursements).

Micro finance targeted to improve financial 'inclusion'

Commercial banks provided over 50% of the loans to SHGs followed by the Regional Rural Banks (RRBs) and the Co-operatives. Interest rates on loans granted by banks to SHGs are deregulated and loans to individual farmers through SHGs are treated as direct agricultural finance. The key growth drivers in this sphere are: 1) increasing focus by banks as it helps them meet their priority sector lending norms with lower costs (both operational and lower NPLs) and 2) scope for rapid growth in the non-southern region given the large regional imbalance and success of the initiative in the South. The key challenges will be: 1) ensuring quality of the new SHGs and members' training; and 2) converting SHGs to enterprises so that this creates a sustainable living for the people covered. There are no listed plays in this sector, but it offers plenty of business opportunities to banks and NBFCs focusing on the initiative as a growth driver.

Another key and growing component of inclusive banking is the lending by MFIs that are societies, trusts, cooperatives or 'not for profit' companies or non-banking financial companies (NBFCs) registered with the RBI. This sector currently covers 8.32 million borrowers (Sa-Dhan Report 2007). The NBFC segment within this sector accounts for 42.8%(Sa-Dhan Report 2007) of the borrowers and is the fastest-growing segment.

Key recommendation: HDFC Bank (HDBK.BO, Neutral)

HDFC Bank is the second-largest private sector bank in India with a total asset base of Rs1.3trn (US\$32bn) at March 2008 and a strong retail franchise both in terms of assets and liabilities. It primarily operates in the non-mortgage retail lending space, with these assets constituting 62% of total assets in FY ending March 08.

We believe HDFC Bank's earnings are least at risk in the current macro environment. HDFC Bank has historically had the best deposits mix in the sector, with a high proportion of low-cost current and savings deposits and low dependence on wholesale funding. We also see significant synergy benefits from the recent acquisition of Centurion Bank of Punjab (CBOP), including lower term deposit costs, particularly bulk and scale benefits of a bigger balance sheet. We expect HDFC Bank to leverage the CBOP franchise and grow savings deposits at a 34% CAGR over three years. It also has one of the best asset qualities in the sector and has high coverage levels: over 100% including specific and general loan loss provisions. The high coverage highlights the strength of the bank's earnings and ability to sustain any asset shocks in the future.

The stock is currently trading at 2.4x FY09E BV and 18x FY03/09E earnings. We think that this is justified given the three-year 30% CAGR that we expect it to deliver.

Indonesia: micro lending opportunity

Regulatory driver: KUR (Kredit Usaha Rakyat) loans and banking architecture

As with India, Indonesia represents another region where the micro-finance story is an important opportunity and could potentially underpin growth in the banking sector. The Indonesia banking architecture which was introduced in 2004 is also being reviewed, presenting a changing environment for banks operating in the country.

Under present guidance, the central bank wants: 1) to reduce the number of small banks (with capital less than Rp100bn or approximately US\$11m); 2) to strengthen the capital base of 'national licence banks'; 3) to strengthen local banks with international licence; and 4) to encourage development of Shariah banking.

National bank status under the current architecture is defined as a bank with a minimum capital size of Rp10trn (approximately US\$1.1bn). Bank Indonesia does not specify the deadline to achieve this amount of capital, however, the central bank is encouraging national banks to reach Rp10trn capital during the 2010–15 period.

Bank Indonesia encourages banks with international operations to have a capital size of Rp50trn (c.US\$5.49bn). There is no time frame set to achieve this target. The banks with overseas operations are the three state-owned banks (Bank Mandiri, BRI and BNI) and the private sector bank, BCA (Bank Central Asia). Currently, the largest bank in terms of capital is Bank Mandiri: it has shareholder equity of Rp27.7trn (c.US\$3.04bn).

In addition to these capital requirements, there is a ruling on 'single presence policy' (SPP). Basically, the SPP ruling says that two banks with same shareholder must merge or create a holding company or one of them should be divested to less than controlling ownership. In this regard, there is a plan to create financial holding companies for state-owned banks. In our view, there is a possibility that the next step after creating a financial holding company will be two of the four SOE banks being merged (e.g. Bank Mandiri and BNI).

Figure 138: Capital ratio

Bank	Capital (Rp bn)	CAR Jun08	Tier1 Ratio Jun08	Equity to Asset Jun08
Bank Mandiri (Persero) (BMRI.JK)	27,711	17.60%	14.40%	9.10%
Bank Rakyat Indonesia (BBRI.JK)	19,202	13.90%	12.60%	8.80%
Bank Central Asia (BBCA.JK)	20,838	16.70%	15.30%	9.40%
Bank Danamon (BDMN.JK)	10,296	16.00%	16.00%	10.70%
Bank Negara Indonesia (BBNI.JK)	14,665	14.50%	10.80%	8.30%
Bank Internasional Indonesia (BNI.JK)	5,157	18.60%	11.30%	9.10%
Bank CIMB Niaga (BNGA.JK)	5,426	15.30%	11.40%	9.20%
Bank Pan Indonesia (PNBN.JK)	7,615	21.10%	16.80%	12.70%

Source: Company data, Credit Suisse research

KUR loans (Kredit Usaha Rakyat) are a new government initiative programme on micro loans launched in 4Q07. The credit risk of KUR loans is guaranteed by the state-owned insurance company (up to 70% of the principal amount). The government covers the cost of the insurance premium.

Micro finance initiative
should stimulate growth

Post the capital injection of Rp1.5trn (c.US\$165m) to the insurance company, the government has targeted three state-owned banks (BRI [Bank Rakyat Indonesia], Bank Mandiri and BNI [Bank Negara Indonesia]) to grow KUR loans up to Rp15trn (c.US\$1.64bn) over 2008 and 2009.

Of the three SOE banks, BRI has recorded significant new bookings in KUR loans. KUR loans in BRI grew from Rp0.2trn in January 2008 to Rp5.1trn in June 2008.

In addition to the three large SOE banks, KUR loans are also distributed by smaller SOE banks, such as BTN (not listed) and Bukopin.

Strong credit growth, 32 % y/y, but we expect softening in 2H08

As of June 2008, aggregate lending was growing at 32% y/y. High agricultural prices and decentralisation (a new system in Indonesia) have been the main drivers of growth, particularly outside Java. An example of the strong demand has been motorcycle sales. These were up 30% y/y in H108 in Java but grew 70% in Sumatra island, 54% in Kalimantan and 52% in Sulawesi island.

However, we expect the softening of commodity prices and the latent effects of inflation to affect demand and credit growth in the final months of 2008 and into 2009. Nevertheless, given continued strong pent-up demand, plus the government-backed KUR programme, we expect nominal credit growth of between 15% and 25%.

Banking penetration

Prior to 1998 Asian crisis there were 240 commercial banks in Indonesia. During the crisis, 100 banks were closed. Currently, there are 128 banks in Indonesia. However, the top 20 banks account for 90% of the bank assets.

Prior to the 1998 Asian crisis, loans/GDP in Indonesia came to about 55%. As part of the recapitalisation programme, half of the assets were transferred to the Indonesia Bank Restructuring Agency (IBRA). Therefore, loans/GDP come to only about 28% currently. However, the system aggregate loan/deposit ratio has gradually increased, especially given the high rates of credit growth since 2003. LDR has now reached 75%.

Most of mortgage loans in Indonesia are floating rate because deposits in Indonesia are short-term in tenor. Mortgages make up only about 10% of total loans in the country.

A clear area of significant growth potential is the micro lending business in Indonesia. There are three commercial banks that actively extend micro loans: BRI, Danamon and Mandiri. BRI has the longest track record in this area: 100 years of experience. BRI has about 4300 micro loans units. Bank Danamon (owned by Temasek, Singapore) entered the micro loans and motorcycle financing business roughly five years ago. Bank Mandiri entered the micro loans business less than two years. Bank Danamon is growing the business quickly: currently it has about 700 micro loans units. Bank Mandiri currently has 450 micro units and it targets to grow that to 1,000 units by end of 2009.

Micro loans in Indonesia is a high-yield business. The lending rate of micro loans at present is around 28% to 40% pa compared to central bank policy rate of 9.0%. The sector still appears under-penetrated because these customers used to borrow from 'loan sharks'. Operational costs are high because banks collect 'repayment' daily or weekly from their customers. The cost of credit in this sector is about 4%.

Figure 139: Micro loans

Bank		June 08 (Rp tn)	1H08 Δ Y/Y	% of total loans	No of units June 08
Bank Mandiri	Micro & small	3.5	63%	3%	450
Bank Rakyat Indonesia	Micro	38.8	30%	28%	4,306
	Small consumer	26.5	31%	19%	
Bank Danamon	CMM+SEMM	11.1	40%	18%	702
	Motorcycle	11.5	29%	18%	

Source: Company data, Credit Suisse research

Structural profitability: high ROEs and net income margins

BRI generates net interest margin (NIM) about 10% so that it is able to have net ROE of 25–28%. Bank Danamon, with a higher cost of funds than BRI, it is able to generate ROE of 19–22%. Because it is a corporate bank (lower NIM), Bank Mandiri has ROE of 18–20%. Indonesia's cost of equity is 17%, with a risk free rate of 12%.

Key recommendations: Bank Central Asia (BBCA.IJ, Neutral), Bank Rakyat Indonesia (BRI) (BBRI.IJ, Outperform)

BCA is the one of the most popular retail banks in Indonesia with a 12% share of deposits. 76% of deposits come from low-cost funds (saving and demand deposits). BCA uses its dominant position in the deposit market to grow corporate loans as well as mortgages, credit card and car loans. At the moment, BCA is not expanding lending to the mid-size commercial sector while it prepares lending infrastructure in this segment.

There are only two Indonesian banks that focus on micro loans: BRI and Danamon. However, since BRI is a large retail bank (11% share in the deposit market in 2007) it has much lower cost of funds than Bank Danamon. Micro loans for BRI yield 25–28% pa compared to its cost of funds of around 5%. BRI has 4,400 units in Indonesia and is strong in rural areas. It is currently expanding its funding capacity by opening branches in the cities. On the lending side, BRI is expanding into consumer banking (mortgages and credit cards) and corporate loans. The bank has said it intends to limit corporate loans to 20% of total loans as corporate loans have lower net interest margins.

BRI's valuations are not cheap compared to regional banks. However, it is the only large Indonesian bank with an ROE above 25%. As of June 2008, BRI had a net interest margin of 10.4%, with 3.3% gross NPL and 178% provision coverage. We forecast 28% ROE for 2008 and 29% for 2009.

Malaysia: still relatively high debt levels

Regulatory measures to reduce risk in the system

In order to ensure the Malaysian banks were better prepared for a credit downturn, over the past few years the central bank and government have undertaken measures to enhance the health of the banks. Pre-emptive measures have also been introduced by the government to ease the burden of rising inflation on borrowers. Measures include: tighter provisions; relaxation of rules on foreign ownership; implementation of Basel II; relaxation of rules on capital composition and dividend distribution; withdrawals permitted from the national pension fund and cuts in mandatory contributions.

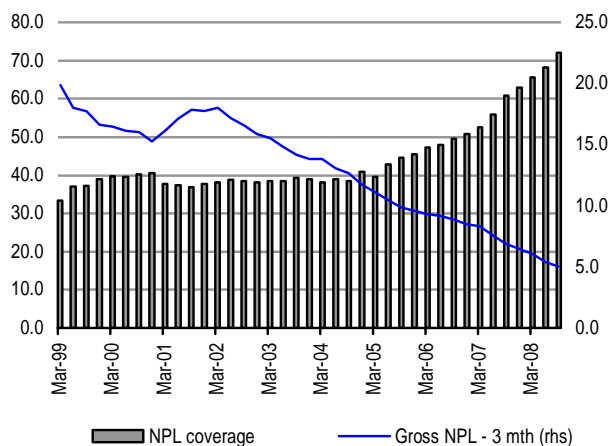
Loan growth likely to slow

Total loan growth was running at 10.5% y/y in Sept 2008 versus 11% in Aug 2008 and 9.5% in Sept 2007. Loan growth has been driven primarily by corporate loan growth (up 11.5% in Sept 2008 y/y). Meanwhile, consumer loan growth is still reasonable (9.5% in Sept 2008 y/y) but has started to moderate. We expect loan growth to decelerate as: 1) consumer spending will likely be affected by the higher cost of living (we forecast inflation running at 6.3% by year-end 2008, albeit normalising to close to 3% in 2009); 2) mortgage loan growth could slow as property developers hold back on new launches due to higher construction costs and weaker demand; 3) cost inflation could dampen SME

loan appetite; and 4) political uncertainty could dampen credit expansion. However, a potential slowdown in debt capital market activity due to the spike in bond yields could increase demand for corporate loans and mitigate the slowdown in the near term. Nevertheless, leading indicators such as loan applications and approvals have shown slower growth recently, implying a potential slowdown in loan growth in the coming months.

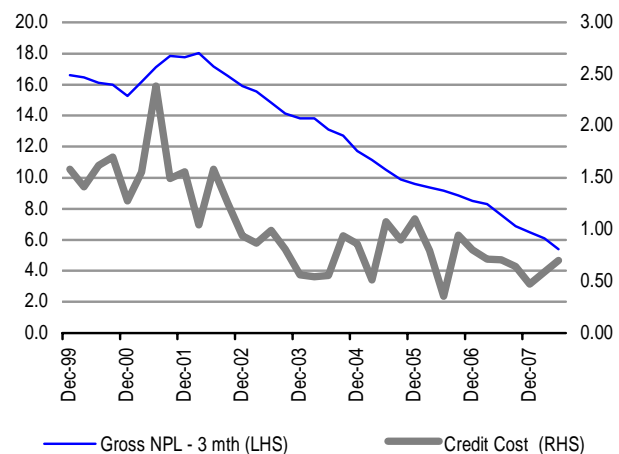
The gross NPL ratio has been improving and the rate of improvement has picked up since 2004 as the authorities pressured banks to write down collateral values for NPLs. The banking system gross NPL ratio has declined to 5.1% as at end-3Q08 versus 14% as at end-2003. NPL coverage has improved to 72% (excluding collateral) as at end-3Q08 compared with 39% as at end-2003.

Figure 140: System gross NPL ratio vs NPL coverage



Source: Bank Negara Malaysia, Credit Suisse research

Figure 141: NPL ratio vs credit cost



Source: Bank Negara Malaysia, Credit Suisse research

Credit Suisse's economics team expects the central bank to maintain the policy rate at 3.5% for the rest of 2008 and lower it by 0.5pp to 3.0% by end-2009 to spur economic growth. The impact of any rate cut on the banks depends on the following factors.

- Net interbank position of the banks. Banks which are large interbank lenders earn less when the policy rate is cut and vice versa. HL Bank, Public and BCHB have among the largest net interbank assets.
- Base lending rate (BLR) changes. We expect the banks to lower BLRs in response to any cuts in OPR, hence re-pricing the current BLR-based loans outstanding. Therefore, banks with a larger proportion of variable rate loans should be worse off. Given the heightened credit risk, we suspect banks may not reduce lending rates proportionately with any policy rate cuts.
- Response of banks in terms of deposit rates. Competition for deposits and some pressure from the government or politicians could prevent banks from cutting deposit rates by a similar quantum as any policy rate cut.
- Mix of fixed and variable rate loans. Banks with higher portions of variable rate loans would fare comparatively worse. Among the banks, Alliance has the highest portion of variable rate loans (83% of total) as at end-2007.

Generally, we find that Malaysian banks are negatively geared to interest rate cuts. Among the banks under our coverage, we think Alliance and HL Bank could face greater margin pressure than other banks will from policy rate cuts.

Penetration rate: private sector more highly geared than Asian counterparts

Loans have been growing at a slower pace than GDP since the Asian financial crisis. As a result, the loan/GDP ratio has been on a steady decline to 0.5x as at end 2Q08 since hitting its peak of 1.5x in 1997. While this can be partially attributed to corporate de-gearing, we believe that the shift to alternative means of borrowing, such as debt capital markets and Islamic borrowings, has dampened banking system loan growth.

The household debt/GDP ratio has been rising since the Asian financial crisis as consumers stepped up borrowings to fund purchases of houses and cars. Malaysia's household debt/GDP of 51% appears high compared to other countries with similar income per capita. We believe that the comparatively higher gearing within households could be due to 1) high car ownership owing to unreliable public transport system; 2) Malaysia has one of the highest car price levels in the world due to the high import duties; and 3) high forced savings rate of 23% out of total savings rate of 42% (due to national pension scheme).

Key recommendation: Alliance Financial Group (ALFG.KL, Outperform)

Alliance is among the few banks that we expect to gain loan market share during this challenging operating environment as it has a strong management team (with the backing of Temasek) and is not distracted by any internal restructuring and/or M+A activity. Having been through a 'clean-up' exercise in recent years, we believe that the group has sufficient earnings buffers to weather a challenging operating environment. By FY10, management has said it aims to raise the group's ROE to 18% (vs Credit Suisse's 14% projection for FY09) through (1) increasing its penetration of the retail and SME loan segments; and (2) enhancing fee income through the introduction of a wider array of financial products. We also think the group is over-capitalised and has capacity to step up dividend payments.

Alliance is trading at a P/E of 8x FY March 2009E and a P/BV of 1.2x (projected 14% ROE for FY09). Therefore, we think the stock is under-valued, especially if we assume that management is capable of achieving its target ROE of 18% by FY10.

Pakistan banks: moving towards consolidation

Reform-led transformation

Pakistan banks have made tremendous progress over the past two decades as a result of financial sector reforms initiated by the central bank (State Bank of Pakistan, SBP) in the early 1990s. Since then, SBP's supervision and regulatory capabilities have been strengthened, which has allowed it to adopt a more proactive approach to regulating the financial sector. Another critical factor responsible for transformation of banks has been privatisation of public sector banks, which previously accounted for the vast majority of system assets and NPLs. Successful privatisation and effective regulation have led to significantly stronger balance sheets and profitability than in the past and the majority of the banking sector assets are now in the private sector.

Some key initiatives undertaken by SBP recently include increasing the Minimum Capital Requirement (MCR) to PKR 23bn (US\$290m) by CY13; adopting a variable CAR regime and raising the minimum limit to 10% under Basel 2 reporting, from 8% under Basel 1 reporting from CY08; introducing separate prudential regulations for corporate, SME, consumer, agriculture, and micro financing; and removing the benefit of Forced Sale Value (FSV) from provisioning.

Over the last few years, Pakistan's banks have come to enjoy some of the highest loan spreads in the Asian region in excess of 7% with NIMs above 6%. In addition, as the economy took off, loan growth accelerated to a CAGR of 26% between CY02 and CY06. High margins, combined with rising margins, led to sector ROE rising in excess of 20%. This in turn has attracted significant international interest, leading to acquisitions by Temasek Holdings, Standard Chartered Bank and ABN Amro (now RBS) of domestic banks, while Barclays obtained a banking licence in CY07 and started operations only recently in CY08.

Legacy of the Asian crisis

Figure 142: Top 10 Pakistan banks (PKR bn)

Rank	Institution	Assets	Share (%)	Deposits	Share (%)	Branches	Share (%)
1	National Bank of Pakistan	738	14.5	564	15.1	1,261	16.4
2	Habib Bank Ltd	703	13.8	538	14.3	1,489	19.3
3	United Bank Ltd	538	10.6	408	10.9	1,095	14.2
4	MCB Bank Ltd	397	7.8	302	8.0	1,026	13.3
5	Allied Bank Ltd	333	6.6	278	7.4	757	9.8
6	Bank Alfalah Ltd	309	6.1	263	7.0	231	3.0
7	Std. Ch. Bank Pakistan Ltd	270	5.3	178	4.7	143	1.9
8	Bank of Punjab	227	4.5	187	5.0	272	3.5
9	Habib Metropolitan Bank	189	3.7	132	3.5	100	1.3
10	Askari Bank Ltd	178	3.5	135	3.6	150	1.9

Source: Company data

Banking penetration still lags its peers in Asia

Banking penetration has been improving steadily with the loans/GDP ratio rising from 22% in CY03 to 30% in CY06, but it remains far behind its Asian peers. The fact that business loans penetration, which account for over 85% of total loans, is also below Asian peers highlights that Pakistan is a very under-banked market in Asia. This is primarily due to the fact that Pakistan is a cash-driven economy with a large parallel economy that meets its credit requirements from the informal sector. Consumer and mortgage penetration levels are also very low in compared to Asian peers, although there has recently been some improvement in the consumer segment.

We believe a significant opportunity lies within the business segment even though it already accounts for majority of system loans. In order to achieve this, banks would need to make the transition from asset-backed financing to cash flow-based financing along with developing cluster-based programmes to lower intermediation costs for SMEs. We think opportunities in the consumer segment will be limited in the short run as the economy goes through structural adjustments and mortgage financing is unlikely to take off until foreclosure laws are strengthened.

Structural attractions, though some cyclical issues in the near term

Pakistan banks enjoy the highest ROE in the Asian region, which is primarily driven by high NIMs. NIMs have been fairly consistent in the rising interest rate environment of the last few years as banks have managed to increase their asset yield with a six-month lag to KIBOR, while cost of funds has risen with a 12-month lag. Since funding costs have remained stubbornly low, banks have managed to earn attractive spreads on investment in government securities.

Fee income currently constitutes more than half of non-interest income, but in an environment where net interest margins dominate total return the impact of fee income is limited.

Although Pakistan has been one of the most profitable markets in the Asian region we still expect it to see near-term pressures given the deteriorating macro environment. Pakistan's economy has gone through a boom period starting FY02, when growth accelerated on the back of reforms initiated by the previous government and abundant global liquidity. Since FY02, the economy has grown at an average of 6.2% pa, although growth has recently started to slow. The economy started showing signs of stress in FY08 as fiscal and current account deficits ballooned to 8.3% and 8.4% of GDP, respectively, while inflation started to peak and was reported in excess of 25% for October 2008, a 30-year high.

In response to some of these challenges SBP has been continuously tightening monetary policy, but the impact on aggregate demand has been diluted due to debt monetisation and inelasticity of deposit rates. The most recent policy action was on 12 November 2008 when SBP raised the discount rate by 200bp to 15%, and we suspect this may be the last hike in the current cycle, as inflation is likely to peak over next 2-3 months before the high base effect is felt. We expect GDP growth for FY09E in the range of 3.5–4% as Pakistan undergoes a period of structural adjustment, resulting in slower loan growth in CY09.

Growth forecast to slow cyclically from here

Historically, banks have benefited from monetary tightening as assets have been re-priced faster than liabilities. As a result, SBP imposed a minimum saving deposit rate of 5% in its monetary policy statement of 22 May 2008, citing inelasticity of deposit rates (averaging 2.1%), leaving little incentive for currency in circulation to move into bank accounts. This led to a sharp rise in deposit costs in June 2008 but subsequently banks have been able to raise lending rates sharply as KIBOR has risen on inflationary fears and a liquidity crunch. We now expect KIBOR to remain high into 1H09 and as a result NIM should rise further in CY09 before starting to shrink in CY10.

Against this backdrop, we estimate bank earnings will come under pressure as asset quality deteriorates and NPLs rise. At current levels, we see further downside risk in stock prices of National Bank Ltd, MCB Bank Ltd, United Bank Ltd, Habib Bank Ltd, and Allied Bank Ltd before the structural attractions reassert themselves.

Key recommendation: MCB Bank Limited (MCB.KA, Underperform)

Though we currently have an Underperform on MCB, we think it remains one of the best-managed banks in Pakistan, with the lowest NPL ratio and highest coverage ratio among its peers. It is also well capitalised with a Tier 1 ratio of 15.8% and total CAR of 18.2%. Additionally, MCB has one of the strongest deposit franchises in Pakistan, with the lowest funding costs, while it also enjoys one of the highest asset yields among its peers. Recently Maybank of Malaysia acquired a 20% stake in MCB, which we expect will lead to operational and business efficiencies.

MCB is one of the few banks in Pakistan with excess capital at a time when the global financial industry is undergoing a meltdown. Aware of its enviable position, MCB's management has stated it would evaluate acquisition options both within and outside Pakistan, as valuations are turning attractive, after peaking over the last few years. We estimate MCB has approximately US\$300 million of excess capital to invest and could potentially partner with Maybank if a larger, suitable opportunity were available. Furthermore promoters of MCB have extended their interests in Adamjee Insurance, which is one of the largest insurance companies in Pakistan, and this has potential to help boost fee income for MCB in the future.

Thailand: de-leveraged but not under-leveraged

Improved transparency and competition

The Bank of Thailand (BOT), the local regulator, has been very active in tightening bank regulation over the past five years. It has tightened NPL accounting standards, increased provisioning requirements and forced the conversion of finance companies to banks to bring them under its supervision.

The most important change this year is the new Financial Institutions Act, which came into force in August. The act enables the BOT to undertake consolidated supervision and makes it easier for foreigners to buy controlling stakes in local banks. The act could facilitate the sale of two state-owned banks to foreigners, which could raise the level of competition in the sector.

A Deposit Insurance Act also came into force in August. Deposit insurance, covering THB1m of deposits, will be phased in over five years, replacing the current blanket guarantee of all bank deposits. Introduction of deposit insurance should raise the cost of funds for smaller banks, but there isn't likely to be enough consolidation to alter industry dynamics.

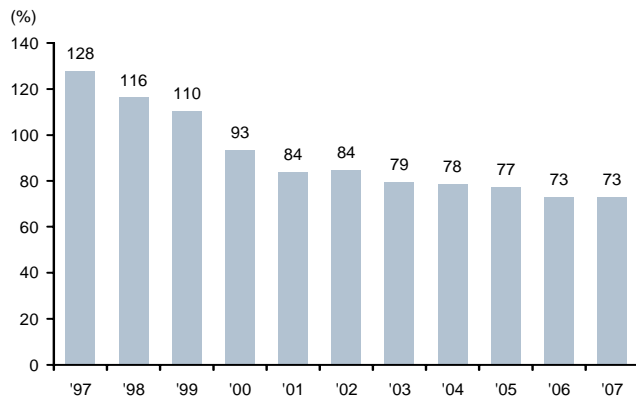
Banks will be required to set aside capital for operational risk in line with Basel II at the end of this year. The BOT has said it plans to implement the IRB approach for banks at some point, but has given no timeline. We think IRB is several years away at least.

The September 2006 coup ended FTA negotiations with the US that looked set to open the Thai market to foreign banks, which at present are severely limited in their ability to build branch and ATM networks. Given the anti-free trade sentiment in the US and political instability in Thailand, we think a new FTA is unlikely, but cannot be ruled out.

Despite leveraging since Asian crisis, market isn't 'under-banked'

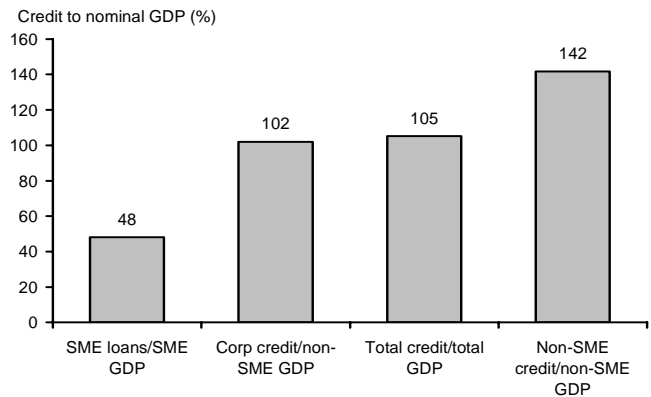
Thailand has undergone substantial de-leveraging since the Asian crisis, with loan growth falling short of nominal GDP growth for 10 consecutive years. As a result, the banking system loans/GDP ratio has fallen from 128% in 1997 to 73% in 2007. The SME sector appears most under-penetrated, largely because banks focused on large corporate clients in the pre-crisis years. The current ratio of SME loans/SME GDP (48%) is less than half the ratio of non-SME credit/non-SME GDP (142%).

Figure 143: Banking system loans to nominal GDP



Source: Bank of Thailand, Credit Suisse research

Figure 144: Loans to GDP

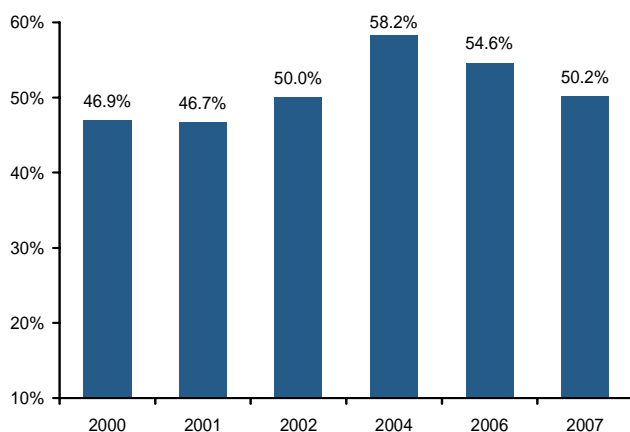


Source: Bank of Thailand, Office of SME Promotion, Credit Suisse research

Households also do not appear overleveraged compared with historical levels or other Asian countries. According to the National Statistics Office, household debt/income was 50.2% as of the end of 2007.

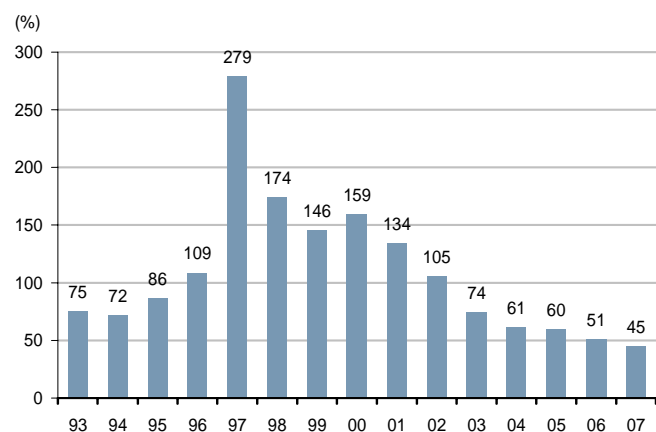
The comfortable debt/equity ratio of listed companies indicates that the corporate sector has de-leveraged, although it does not yet appear under-leveraged. On Credit Suisse numbers, Thai corporate debt/equity has dropped from 279% in 1997 to 45% in 2007.

Figure 145: Household debt as % of income



Source: National Statistics Office, Credit Suisse research

Figure 146: Listed company D/E ratio



Source: Company data, Credit Suisse research

Over the longer term, we think growth is likely to be strongest in SME lending owing to low leverage in the sector. Retail lending should also see above-average growth, as household debt is moderate and wage growth strong (ranging between 4% and 7% even in the weak economy of the past four years). Credit cards have low penetration, but the 20% regulatory interest rate ceiling limits growth in the near term. Cross-selling of insurance and mutual fund products should grow strongly owing to low penetration of insurance and mutual funds. Lending to areas outside Bangkok should be strong. Hire purchase lending for vehicle sales has been growing rapidly.

Profitability has improved, although capital base increased

Thai banks have increased ROAs to be more or less in line with Asian averages in recent years as the burden of NPLs has eased. The ROE has not shown as consistent gains owing to increases in the capital base. After a decade of painful provisions to offset the NPLs from the crisis of the late 1990s, provisions are finally due to normalise this year. Non-interest income as a percentage of gross operating income is low by Asian standards. In the short run, we think cost/income ratios could rise modestly as banks invest in IT and branches, but any rise is likely to be limited.

Risks posed by the macro environment

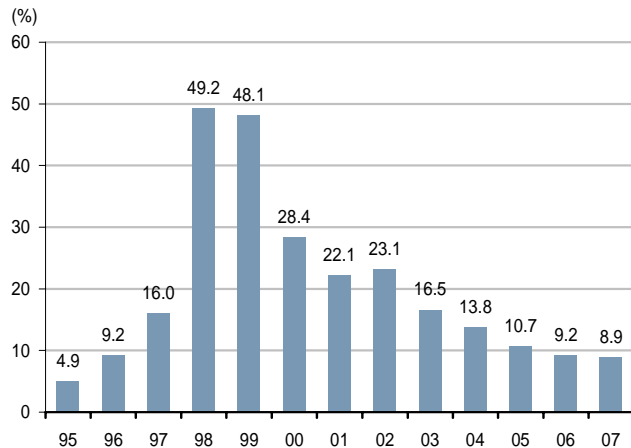
The economic environment has deteriorated considerably over the past 5–6 months. As recently as 1Q08, it appeared that Thailand was in the early stages of recovery from a painful three-year slump, but that recovery looks to have faltered. Although inflation—which had taken a heavy toll on consumer and business sentiment in 2Q—has subsided, heightened political tensions and headwinds from global financial distress look set to slow down consumption, investment and exports in coming months.

At 3.25%, Thailand's real interest rate remains in negative territory. Nonetheless, the BOT has indicated a willingness to cut rates as the risk to growth and inflation appears to be to the downside.

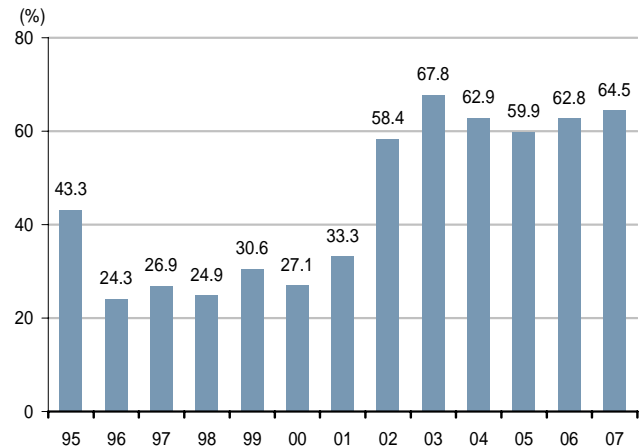
Political uncertainty is depressing business sentiment and slowing progress on much-needed infrastructure projects. Elections did not resolve the longstanding conflict between supporters and opponents of former prime minister Shinawatra. Thailand looks set to have a weak, unstable government for the rest of the year and possibly beyond.

In our view, the one bright spot is the agricultural sector. Thailand controls 34% of the global rice trade. It is also the world's largest exporter of rubber and prawns, and a major exporter of tapioca (for animal feed), sugar and fish. With rice prices up nearly 60% over the last year, Thailand's rural areas are enjoying an unusual bounty, and anecdotal evidence indicates that consumption outside Bangkok is healthy. As of Q108, loans to provincial areas accounted for 28% of total loans, and growth was running at 9.5% y/y. Additional government stimulus programmes in the provincial areas could also provide a boost to rural income. Unfortunately, commercial bank sector exposure outside Bangkok is small, in part owing to the dominance in the provinces of unlisted government policy banks. With the plunge in global commodity prices, rice prices are 44% off their peaks but remain 54% above the year-end 2007 level.

We think asset quality has reached a medium-term peak. Thai banks have spent the past decade reducing the huge weight of NPLs accumulated in the Asian crisis (1997–1998) via restructuring, write-offs and sales, with the sector NPL ratio falling from about 50% in the crisis to 9% in 2007. The LLR coverage ratio, in the meantime, has risen from 25% in 1998 to 65% in 2007. These numbers understate the extent of the clean-up, as NPL classification standards have been greatly tightened. Nonetheless, the prospect of deteriorating economic growth indicates that the rate of formation of new NPLs will soon rise, and that it will become harder to restructure or sell existing NPLs.

Figure 147: NPLs to total loans

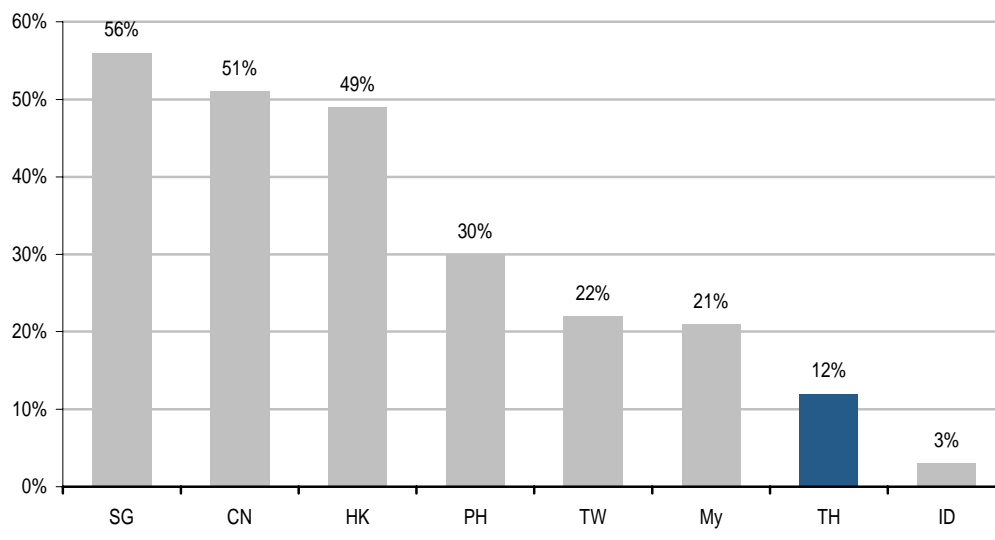
Source: Company data, Credit Suisse research

Figure 148: LLR coverage

Source: Company data, Credit Suisse research

In the near term, we are more concerned about SME loans, hire purchase and unsecured personal loans than large corporate credit. Hire purchase lenders have already suffered a decline in asset quality and rising credit costs in the past two quarters but we think the worst is yet to come. Small businesses, particularly those exposed to exports, tourism and construction, could suffer margin squeeze and cash flow problems as the global and domestic economy slows. The prospect of rising unemployment next year points to a higher risk for unsecured personal loans, including credit card lending. As Thailand has not seen a property price bubble, we see fewer problems in terms of mortgage lending, although some signs of caution (e.g. banks have started tightening their mortgage underwriting standards) have emerged.

Nonetheless, we believe a risk stemming from asset quality to be limited to earnings only, and not to capital or book value. Loan growth in Thailand has been extremely weak since the crisis, and we think it is unlikely that a very serious NPL problem will appear.

Figure 149: Property price appreciation: End 2004–2Q08

Source: Credit Suisse research

Key recommendations: Kasikornbank (KBANf.BK, Outperform), Siam Commercial Bank (SCB.BK, Neutral)

We believe Kasikornbank (Kbank) offers investors the best combination of value, growth and quality in Thailand. Kbank is Thailand's leader in SME lending. It is the only bank with a large presence in the smaller end of the SME chain and has a well-established footprint in the fast-growing agricultural areas outside Bangkok. An under-penetrated segment, SME lending is growing faster than corporate lending and offers higher margins than corporate or retail. Kbank is also strong in corporate and retail banking and has a balanced loan portfolio. Kbank has the highest loan yields and spreads of any of the large banks.

Although less attractively valued than Kbank, Siam Commercial Bank (SCB) is probably Thailand's premier bank operationally. For several years, it has been the country's fastest-growing large bank, and it generates the highest ROA among the big banks.

SCB is the country's leading retail bank, backed by the largest branch network. In recent years, it has expanded aggressively in SME lending, although it has yet to penetrate the micro-SME market dominated by Kbank. Now the third-largest bank by assets, SCB aims to be the largest bank in Thailand. So far, it has managed to grow without sacrificing profitability, although this year it has slowed loan growth sharply owing to concerns about the economy and problems integrating its recently consolidated hire-purchase arm.

Central European 3: externally led slowdown

Emerging markets with developed market regulation

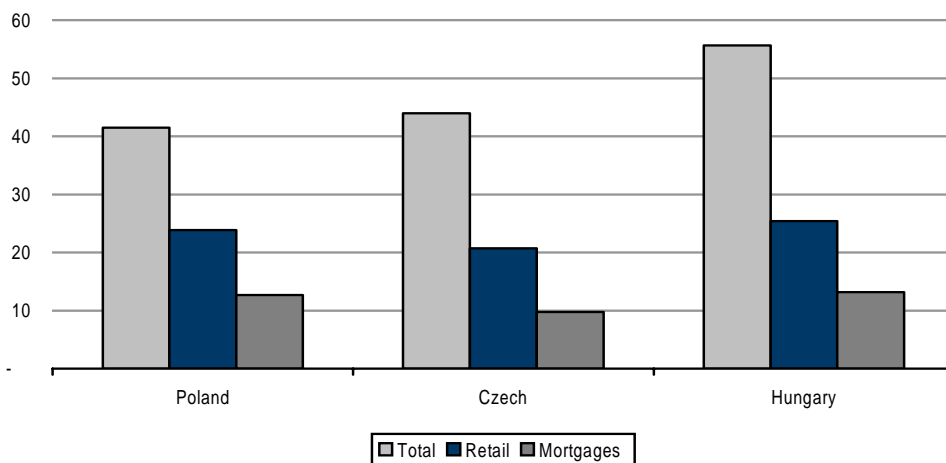
The CE3 countries of Poland, Hungary and Czech Republic are similar in a number of ways and often considered together. They are members of the EU (having joined together in 2004) and are closely linked to trading partners in the Euro zone. Prior to joining the EU, significant FDI flows were made into the countries and these have continued post accession. These flows included buying up the majority of local banks by European and other Western banks. OTP in Hungary is the only significant independent bank remaining in CE3 (PKO BP is another contender, although it is state-controlled).

As members of the EU and potential Euro zone participants, the CE3 countries have moved their institutional and legislative frameworks towards the EU standard. This has included independence of these countries' central banks, improvements in the transparency and the legal code. Regulators have steered a course towards the Basel II accord, with banks reporting capital levels on a BIS template along-side local regulations for a number of years and (since the beginning of 2008) BIS replacing local standards.

Other regulations include recommendations on foreign currency (FX) lending in Poland. FX lending is prevalent in central Europe due to the interest rate differential between the Swiss franc or euro and the local currency. In 2007, the Polish banking regulator introduced Regulation S requiring the banks to take certain steps to assess the suitability of FX lending for the customer before granting the loan.

Penetration increasing: FX lending a feature (and a risk?)

Banking penetration is lower in the CE3 countries than in their Western neighbours. Penetration is highest in the corporate sector in Czech Republic and Hungary, but strong growth in mortgages means that retail lending is larger in the retail sector for Poland. Within these three countries, Hungary has the highest overall penetration, while Poland has the lowest.

Figure 150: CE3 loans/GDP, March 2008 balance over 2007 GDP (%)

Note: Retail includes mortgages

Source: Central banks, Credit Suisse research

Within this lending, FX lending has grown considerably and now makes up 51% of mortgage lending in Hungary and 57% in Poland. In Czech Republic, this has not happened.

Differing profitability drivers

The ROA across the three markets is the same (2.7% in 2007); however, these are achieved by different means. The contrast is stronger between Hungary and the other two markets.

In Hungary, the net interest income per total assets is significantly higher (5.5% in 2007 vs 2.9% for Czech Republic and 3.7% for Poland). This is partially due to the main player (OTP) in Hungary, which makes around 15% of its earnings from less developed (and therefore higher margin) countries, such as Russia, Ukraine and some of the Balkans. However, it also reflects the concentrated structure of the Hungarian market, where OTP remains the price setter.

The level of provisions/total assets is also higher in Hungary (0.7% in 2007 vs 0.2% for Czech Republic and 0.1% for Poland). This reflects both abnormally low levels in Poland and Czech Republic following a number of write-backs by the banks over 2007, and also increased provisions in Hungary taken due to the Austerity Package's slowing effect on the macro-economic environment.

Poland and Czech Republic differ on the net interest margin and cost/total assets lines as well, though by a smaller degree. This is due to the more retail-focused business of the Polish banks compared to the Czech banks. The retail business leads to higher margins on lending, but also requires a more costly branch network to support the business.

Foreign ownership

A substantial portion of the banking sectors in these countries is owned by foreign banks. As a result the products offered by banks in CE3 are relatively sophisticated. It also means that competition in some of these markets is fairly high, particularly in Poland.

Figure 151: Banks with exposure to CE3

CE3	Czech Republic	Poland	Hungary	Rating	TP
Pekao	N	Y	N	NEUTRAL	PLN 216
PKO BP	N	Y	N	OUTPERFORM	PLN 58
Komerční	Y	N	N	NEUTRAL	CZK 4200
OTP	N	N	Y	OUTPERFORM	HUF 11000
KBC	Y	Y	N	OUTPERFORM	€43
Unicredito	Y	Y	Y	OUTPERFORM	€2.7
Allied Irish Bank	N	Y	N	UNDERPERFORM	€3.25
Societe Generale	Y	N	N	NEUTRAL	€56
Raiffeisen International	Y	Y	Y	NR	NR
Erste	Y	N	Y	NR	NR

Note: Unicredito's exposure to Poland is via Pekao and BPH, SocGen's exposure to Czech Rep is via Komerční

Source: Company data, Credit Suisse estimates

External factors driving the slowdown

Macro-economic growth was strong for CE3 for the 2003–07 period, with the exception of Hungary in 2007. Over this period, growth has been driven by a high level of investment, particularly funded by FDI flows from the EU, and (towards the end of the period) by local consumer demand.

However, the slowdown in Europe is likely to translate into slower growth in the CE3. Hungary and Czech Republic are among the most open economies in the emerging markets: exports make up almost 80% of both countries' GDP. Poland is less open but still more so than the weighted average level for EMEA and Latin America. In addition, Poland and the Czech Republic have seen significant appreciation of their currencies against the euro since 2004. The zloty and koruna have traded at, or near, all-time highs against the euro for much of 2008. This adds to the vulnerability in the face of an export-led slowdown. Hungary has seen significant depreciation of the forint on the back of significant capital flight. Credit Suisse economists are forecasting Euro zone growth of 1.0% in 2008 and -0.3% in 2009, compared with 2.6% in 2007 and 3.0% in 2006.

Hungary has not tracked Europe and the German economy to the same extent as the others. This is because of a period of loose fiscal and monetary policy up until 2007. However, since 2006, the government has raised taxes to counter the high level of fiscal and current account deficits. This has been dubbed the Austerity Package. It has led to a sharp deceleration in growth over 2007. Credit Suisse economists expect growth in Hungary to remain low in 2008 and 2009. They see the prevailing political uncertainty as a major impediment to further reform progress and fiscal consolidation.

On the credit front, retail loans are generally growing faster than corporate and SME lending in CE3. We think the main opportunity remains in the consumer sector, although, in the face of a Euro zone slowdown, current growth rates are likely to be somewhat muted for the next couple of years. Mortgages have been the strongest growing credit product in both the Czech Republic and Poland over the last two years. This has been spurred on by rising household incomes, combined with lower interest rates, making mortgages more affordable. Hungary has not seen the same level of growth in mortgages, as it underwent a period of huge mortgage growth over the 2002–04 period owing to the high levels of government subsidies. Outside the lending sphere, mutual funds have seen rapid levels of growth, especially in Poland. However, following the equity market falls in late 2007, there have been large outflows of funds and it is not clear that the growth seen in mid-2007 will be repeated over 2008 or 2009.

Sensitivity to European slowdown

Strong growth in mortgages

Russian banks: imbalance in industry structure

Scope for consolidation

The Russian banking market is currently small, relative to the size of the economy. The long-term growth potential is huge, in our view. For now, the sector is made up of a large number of very small banks and a smaller number of larger banks plus one huge bank, Sberbank. Sberbank is the only bank that has a truly pan-Russian presence. Foreign banks have only a small share of the overall market. We believe the government may use the current market conditions to drive consolidation of the sector, with larger banks buying up smaller ones who face liquidity difficulties.

The regulatory environment is overseen by the Central Bank of Russia. The main trend currently on the regulatory front is tightening reserve requirements as a means of fighting inflation. In addition, there have been moves to improve the transparency of charges on loans to make borrowers more aware of the actual cost of debt. This was a targeted response to the very high rates charged by some short-term consumer lenders. The central bank has also been increasing the level of anti-money laundering regulations and monitoring.

Short-term difficulties are substantial...

The increase in global risk aversion is having a profound impact on the Russian banking sector:

- Retail deposits have started to decline. We believe this is being driven by retail depositors' concerns over the ruble exchange rate and the potential for banking failure.
- Banks are unable to raise funding in the debt markets, and with the slowdown (and recent reversal) in deposit growth, we believe loan growth is likely to slow significantly. We think this may lead to a large increase in non-performing loans. Currently we have no indication that this will threaten the large banks' (VTB and Sberbank) capital positions; however, we believe it will represent a serious headwind for earnings.
- Interbank liquidity has dried up, this has led to two bank failures to date. We believe more of the smaller banks will be taken over by larger banks in state-sponsored bailouts.

All of this has led to the banking sector performing very poorly in 2008. We believe this is likely to continue over the near term. The government has acted quickly in response to the crisis, providing subordinated loans to key banks and funding to allow some corporates to roll over foreign debt obligations, as well as other measures to ease interbank liquidity. We do not think a widescale systemic failure is likely; however, we believe there remains the risk of policy mistakes, particularly over the depreciation of the ruble.

We believe that the funding base will remain a constraint following the resolution of the crisis. Savings in Russia are low, and a substantial portion of the economy's wealth is stored off-shore in the form of the government's foreign currency reserves. How this is transferred into the banking system during the crisis may be a key determinant of the speed of recovery.

...but longer-term growth prospects are still strong

Under our base case of no major crisis in the banking sector, we believe it will emerge with fewer and larger banks, probably with a large degree of government ownership (the top four banks are already controlled by the government; we expect that there will be fewer independent operations). This could lead to a less competitive market overall.

We still think the industry has strong long-term prospects. Penetration levels are low compared with both CEE and Western Europe. Mortgages are very much in their infancy and we see this as a market with significant growth potential. We also see potential for strong growth in the rest of the retail market. As at the end of March 2008, we calculate that corporate lending was worth 27% of GDP, retail lending (including mortgages) some 8% of GDP and mortgage lending just 2% of GDP.

Given the experience in the more developed CE3 countries, we would expect mortgage lending to offer a significant growth opportunity over the next five years in the retail sector. In addition, we think credit cards and mutual funds offer potential growth. However, we expect these types of products to take longer to develop fully, as they are typically seen developing in countries with higher levels of income than currently prevail in Russia.

Corporates, particularly large corporates, have used the local bond market, the Eurobond market and the syndicated loan markets as significant sources of funding. These sources are no longer as readily available, which should help support the corporate loan market. Banks are likely to fund a significant part of the infrastructure and investment spending that is planned over the next 30 years. In addition, the SME sector is very underdeveloped in Russia: the latest data we can find show that at the end of 2004, SMEs contributed 12% of GDP compared with around 50% for most developed countries. We believe that SME lending growth will accelerate.

High NIMs but poor cost control

The majority of revenue is earned through net interest income given a combination of high margins still available on lending plus the underdeveloped nature of other products that would drive fee and commission income.

Costs are high compared other countries in EEMEA. There is a large difference between the banks in the sector in the level of costs. A number of more corporate banks are much more efficient than the average. However, there are also some more retail-focused banks with larger branch networks and less efficient working practices that are considerably worse than average. We expect the more corporate banks to move into the retail market and so expand their cost base, while we expect to see the less efficient banks rationalise operations and improve efficiency.

Provisions are higher in most EEMEA countries; this reflects the lower standard of credit systems in a number of the banks as well as the lower level of income per capita.

Key recommendation: Sberbank (SBER.RTS, Outperform)

Sberbank's business model is that of a conventional deposit-taking and lending bank. As the legacy Soviet Savings bank, it is the largest bank in the country by most metrics, including branch numbers, retail and corporate deposits, and retail and corporate loans.

As one of the few banks to have not failed during the financial crisis in 1998, Sberbank is regarded by many retail customers as the most trust-worthy bank in Russia. As a result, it is the price setter in the Russian market for deposits and able to gather deposits at a lower cost than competitors. Its legacy as a state bank means it also performs a number of administrative roles within the Russian economy, such as the collection of utility bill payments from retail customers. As a result a high proportion of the banking population have at least one bank account with Sberbank. This gives Sberbank unparalleled access to the Russian retail banking market, including the largest database of Russian retail banking customers. Sberbank's presence in the more rural areas of Russia means it is able to gather deposits at a lower interest cost as there is little or no competition. This contributes to the bank's low cost of funding overall. The Russian equity market has recently collapsed following a number of headline grabbing pieces of negative news at a time when risk aversion has been extremely high. We see the growth story at Sberbank as compelling and these valuations as a good entry point for investors with a long-term investment horizon.

South Africa: profits under pressure

First world banking system in an emerging market

The South African banking system is fairly sophisticated, resembling first-world banking systems more than emerging market systems. This leaves comparisons with other emerging markets more difficult, since there are higher penetration levels in SA, and more product maturity (the size of the mortgage market is c.US\$120bn, about 70% of which is

residential) than in many truly emerging economies. SA banks offer a safer investment than many of their emerging market peers, with more stable earnings, lower bad debt ratios (average around 1.0% through-the-cycle) but also lower growth prospects.

The SA banking market is well-consolidated. The market is made up of four full-service banks, which have 88% market share of total loans. Of these four, Standard Bank is the largest, with a balanced portfolio of retail, corporate and insurance, and the largest African and emerging market portfolio of businesses. FirstRand is also a balanced portfolio bank, but makes 90–95% of its earnings from South Africa in 2007. Absa (majority-owned by Barclays) focuses more on retail banking (c.60% of its earnings) while Nedbank (majority-owned by Old Mutual) focuses more on corporate and investment banking (c.60% of its earnings). There are then two niche banks: Investec, an investment bank with a very strong private banking franchise, and African Bank (known as Abil), which lends to middle and lower-income customers, and also recently bought one of the large furniture retailers which targets a similar customer base.

Well consolidated sector of full-service banks

From a regulatory perspective, the National Credit Act was brought about in June 2007, aimed at protecting the consumer. Strict rules against reckless lending, and a more difficult environment for collecting collateral, has led to a tightening in credit criteria across the industry. Recently, the Competition Commission released its enquiry into the banking sector with proposals to reduce bank charges such as inter-change fees, ATM fees and penalty fees. We expect this to have about a 3–5% impact on bank earnings growth starting from the middle of 2009 (already factored into our forecasts).

Penetration higher, growth prospects lower

At 88%, private sector credit/GDP is much higher, in aggregate, in South Africa than in other EMEA or Latin American markets. Growth potential is, therefore, commensurately lower than these other markets. The opportunity lies, we believe, in expanding bank lending to the corporate market and lower-income customers, who have been the main beneficiaries of the shift in wealth distribution in post-apartheid South Africa:

- **Corporate and investment banking:** With government infrastructure development (a promise has been made of about R400bn of spending between 2007 and 2012), there is likely to be large capital requirements in the economy. While much of the government lending will go through the bond market, numerous downstream industries will likely benefit from government spending of this nature, and this is where the banks will be focusing their attention. Furthermore, investment banking continues to grow strongly. Not only are there numerous project and structured finance opportunities as a result of infrastructure development (both in SA and other African countries), but there remains a steady flow of Black Economic Empowerment (BEE) deals to support overall corporate activity. The commodity boom at the moment is also leading to opportunities for the SA banks to make money out of the mining industry, which remains in a healthy position. In contrast, global bulge bracket investment banks seem to be reducing their activity levels in SA as a result of capital constraints at the group level.
- **Micro-lending:** Small loans of usually less than R25 000 to formally-employed medium to lower-income customers. This is the domain of Abil, and the company does it very well, but the Big Four banks are also pushing into this market. These loans are largely done at much higher rates than high street banking (around 40%) but attract bad debt ratios of around 10% (compared to an average of 1% in mainstream banking). Rates are fixed, so customers are largely unaffected by rising interest rates, but bad debts increase in this industry when inflation is very high and unemployment picks up, both of which are risks at the moment. Through the cycle, there is enormous demand from this customer base for bank loans, and there appears to be a good opportunity for big banks to expand overall margins in an environment where competitive pressures are driving mainstream banking margins down.

Competition pressurises margins

The structure of the SA banking market is such that roughly 50% of revenue is generated from net interest income, and 50% from non-interest revenue (trading, insurance, investment banking fee income and retail bank charges). Interest margins are fairly tight because of fierce competition for market share among the main players.

Profits under pressure

The SA bank earnings are under pressure at the moment. Low and benign interest rates from over 2004 to 2006 led to record consumer debt levels (latest data puts household debt at 78% of disposable income). Now, inflation is forcing the SA Reserve Bank (SARB) to raise interest rates to get inflation back within its 3–6% target range (latest was 11%). We are forecasting average earnings growth for the sector of just 5% in 2008.

The macro environment is keeping retail banking under pressure, but there is some respite in the corporate and investment banking divisions. Although there has been a sharp slowdown in consumer demand (as both consumer disposable income and employment declines), corporate SA is still operating at record capacity utilisation, which is driving substantial investment. Furthermore, government infrastructure plans continue to be rolled out, as capacity constraints have been identified and need to be rectified (the recent electricity outages are a good example). Nevertheless, we believe the corporate cycle will not be strong enough to offset poor retail earnings for the sector in 2008.

Longer term, growth is likely to be driven by shifts in wealth distribution as racial inequalities continue to dissipate.

Key recommendations: Abil (ABLJ.J, Outperform)

Abil is the largest microlender in South Africa, with about 25% market share as at end 2007. It makes unsecured loans to higher-risk retail customers, charging a higher total income yield than high-street banking. To fund this, it attracts corporate deposits, and issues three-year bonds into the market. Its recent acquisition of Ellerines (a furniture retailer) appears odd at first glance, but Ellerines makes all of its profits out of its finance book, which has a similar target market to Abil.

Abil's acquisition of Ellerines gives it access to about R1.5bn of surplus capital and significant potential to extract operational efficiencies. Abil's FY08 earnings look likely to be negatively affected by some one-off items (including a charge for Ellerines' BEE deal). As a sweetener, we expect Abil to pay a special dividend of around R500m, followed by another special dividend of R1bn in FY09. The earnings outlook appears strong, given the operational efficiencies that can be extracted from Ellerines (we expect 39% in FY10).

The barriers to entry into the microlending market are not high in physical terms, but are very high in terms of expertise. This was proven in 2002/03 when a number of Abil's newer and less experienced competitors went bankrupt because they were chasing market share rather than watching risk controls closely. Abil has shown itself to be a top operator in this industry, with sophisticated risk modelling, client segmentation and collections. This is difficult to replicate, although the Big Four banks have all increased their presence in this market in the last three years.

Abil is trading on a forward PE of 10.0x to September 2008, but 8.8x if one excludes non-recurring items. The forward dividend yield is 9.3% to September 2008 and 12.2% to September 2009.

Turkish banks: long-term growth potential

Lessons from Brazil

There are obvious parallels to draw between the Turkish and Brazilian banking systems. Years of high inflation and interest rates have meant that in both cases banks had a fairly straightforward operation in collecting deposits and investing in government securities.

The year 2001 was a turning point for Turkish banks as the 2000–01 financial crisis caused some banks to cease trading, highlighting the need for a stricter regulatory environment. The Banking Regulation and Supervision Agency (BRSA) was established and became the primary institution for regulating Turkish banks. In addition to BRSA, the Central Bank of the Republic of Turkey (CBT) and Turkish Banks Association and Capital Markets Board (CMB) have regulatory roles and assume a more active role now, compared with pre-2000.

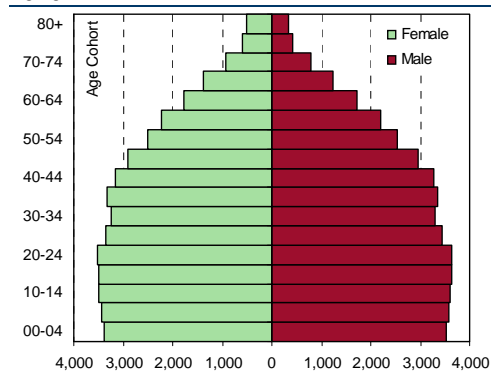
Turkish banks report quarterly IFRS results. Basel II is partially implemented now as Turkish banks calculate market risk and operational risk. BRSA was guiding for January 2009 for the full implementation of Basel II, but it has recently postponed this (new date not determined yet) due to the volatility in global markets and delays related to the new Turkish commercial code.

High loan growth expected ... structural demographic support

We expect 3.5% and 4% real GDP growth for Turkey in 2008 and 2009, respectively. We expect interest rates to fall slightly in 2009 as the inflationary pressures of 2008 start to ebb. Total loans in the system corresponded to 31% of GDP at year-end 2007. We expect the loans to GDP ratio to increase as EU convergence moves ahead although, we believe, the recent global financial turmoil may postpone this convergence for a few years. Nevertheless, the shift in Turkish banking from an investor base to a lending system is likely to continue, thereby driving relatively high rates of loan growth in the long run.

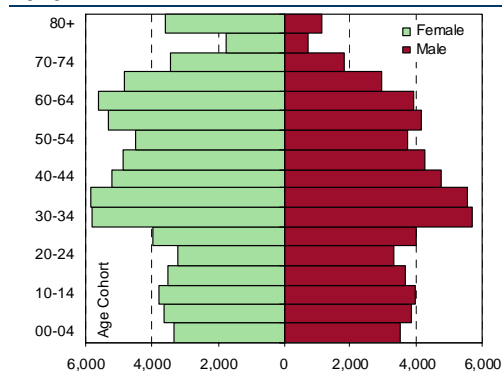
Turkey also remains supported by the favourable longer-term demographics picture relative to the other larger EMEA countries and improving income distribution trends. The main risks to the banking sector appear to be from the currency, financing of the current account deficit and the potential for political turbulence.

Figure 152: Turkey population pyramid, 2020E



Source: Credit Suisse Demographics Research

Figure 153: Russia population pyramid, 2020E



Source: Credit Suisse Demographics Research

Low penetration

Banking penetration is low in Turkey. The latest data available from the Turkish Banks Association shows that, as of YE07, there were c.75 million bank accounts (population of Turkey: c.71 million) and of these, 3.1 million commanded 94% of local currency savings deposits. The average balance for the remaining c.72 million was TRY 141 while c.66 million of these had an average balance of TRY3. On the other hand, total deposits and total loans in the system correspond to 40% and 31% of 2007 GDP.

The Turkish government is currently working on measures to register money flows by using the banks. For instance, there is a plan to make it mandatory for Turkish companies to pay salaries through banks. We think such attempts will be important catalysts to increase banking penetration in Turkey.

On the corporate front, as international banks have had less appetite to lend to companies in Turkey and loan prices have risen on the back of the recent developments in global markets, corporates have started to secure loans from Turkish banks. For instance, BC Partners funded about half of the US\$3.2bn Migros deal with cash from its €5.8bn (US\$8.5bn) leveraged buyout fund while the rest will be provided by Isbank, Garanti and Vakifbank. Almond Holding A.S. secured a US\$400m loan from Garanti Bank to use for new investments and the purchase of Acibadem Saglik shares. We expect this trend to continue in an environment of scarce liquidity in international markets. Corporate and SME loans constituted c.70% of total loans in Turkish banking system as at the end of 2007 while the share of consumer loans (including credit cards) was around 30%. We think there is further room for growth in the consumer segment.

Turkish banks filling the gap vacated by the international banks for corporate lending

With respect to credit cards, deputies from the ruling party AKP have recently submitted a draft law to parliament in order to cap the monthly credit card interest rates at 2.7% versus the current level of 4.4%. Currently, the Central Bank of Turkey determines the cap on credit card interest rates. We think the likelihood of such a new law passing the parliament is low.

Another sub-category of retail loans, mortgage loans, is in its infancy in Turkey. Mortgage/housing loans correspond to only 4% of GDP in Turkey versus 65% in the US and 50% in the EU. While we would not expect Turkish banks to reach developed country levels, we believe there is significant room for growth on this front. There was no mortgage system a few years ago and Turkish banks used to offer housing loans (just like auto loans), but because of the high interest rates and volatile economic environment, these products were not popular. With the onset of single-digit inflation, improving stability in the Turkish economy and lower interest rates, mortgage/housing loans are becoming more popular. Income distribution is changing in favour of low and middle-income groups, further supporting mortgage growth.

Nascent consumer market

Growing competition

Today the banking sector in Turkey is much more competitive than it was a decade ago or compared to the CE3 or Russia now. For example, the top three banks in Russia have c.70% market share in deposits versus the top six listed banks in Turkey with c.60%. The leading bank in lending has 13% market share and the leading bank in assets has 15% market share in Turkey as of YE07. The mortgage system is still in its infancy, which means Turkish banks are not exposed to mortgage-related or sub-prime risks.

There has been a phase of consolidation and we expect a second phase in the coming years. After the 2000–01 financial crisis, foreign banks' interest in Turkey materialised in the form of acquisitions and share purchases. Today international financial institutions, such as Citigroup, GECF, Unicredit, NBB, Dexia, ING, HSBC, BNP Paribas, Fortis and Bank Turan Alem, are all involved in the Turkish banking system.

Net interest income is the major driver of revenues for Turkish banks, benefiting from loans and securities with high average yields. On the cost side, there are major differences among banks. Costs are high at YKB as it has an aggressive expansion plan, while costs at Halkbank are low due to lower staff costs and presence in rural areas. Yapi Kredi is the most leveraged bank under our coverage and Akbank is sitting on excess capital.

Figure 154: Turkish banks (Top 20 banks in terms of asset size as of YE07)

TRY in millions, unless otherwise stated.

TRY in millions, unless otherwise stated.								
Listed	Onwership status	Foreign partner	Assets	Loans	Deposits	Branches	Personnel	
Ziraat		State	No	80,942	21,604	68,250	1,251	20,872
Isbank	ISCTR.IS	Private	No	80,181	33,980	48,533	939	19,414
Akbank	AKBNK.IS	Private	Citigroup / minority	68,205	37,016	41,044	716	13,513
Garanti	GARAN.IS	Private	GECF - JV	67,578	37,218	39,098	588	14,517
YKB	YKBNK.IS	Private	UCI - JV	50,353	28,509	32,167	676	14,249
Vakif	VAKBN.IS	State	No	42,408	23,470	28,863	362	8,700
Halk	HALKB.IS	State	No	40,234	18,121	30,841	590	11,484
Finans	FINBN.IS	Private / foreign	NBG / majority	20,882	14,174	12,958	411	9,061
Denizbank	DENIZ.IS	Private / foreign	Dexia / majority	14,912	10,405	9,217	320	6,634
HSBC Bank		Private / foreign	HSBC	13,432	9,345	7,663	237	5,733
Oyakbank		Private / foreign	ING	12,541	8,511	8,904	365	5,922
TEB	TEBNK.IS	Private	BNP Paribas - JV	11,801	6,864	7,083	273	5,141
Fortis Bank	FORTS.IS	Private / foreign	Fortis / majority	9,891	5,528	5,647	268	5,041
Sekerbank	SKBNK.IS	Private	Bank Turan Alem / J	6,088	3,614	4,155	235	3,824
Iller Bankası		Dev / inv. bank	No	5,613	4,162	0	19	3,186
Citibank A.S.		Private / foreign	Citigroup	4,883	2,554	0	4	314
TSKB	TSKB.IS	Dev / inv. bank	No	4,194	1,952	3,251	54	2,349
Turk Eximbank		Dev / inv. bank	No	4,164	3,233	0	2	392
Anadolu Bank		Private	No	3,030	1,764	1,856	76	1,724
Tekstilbank	TEKST.IS	Private	No	2,902	2,083	1,514	59	1,547

Source: Turkish Banks Association

Key recommendation: Yapi Kredi Bank (YKBNK.IS, Outperform)

Yapi Kredi Bank is our long-term top pick among the Turkish banks under our coverage. We think that the ownership structure of YKB is ideal, with joint control by Italy's Unicredit Group (which has a strong CEE presence and banking know-how) and Turkey's leading multi-industry conglomerate, Koc Group (contributing local business and Turkish consumer know-how). Note that the Italian partner has already contributed a Western-style long-term approach to managing the bank's operations and adopted capital discipline.

YKB's fast expansion strategy has created a higher cost base compared to its peers, but we see downside room for costs and upside room in revenue productivity and profitability as employee/branch efficiency increases in the medium/long term. Competition with low-cost bases will have to invest more while YKB should be reaping the fruits of its earlier investments and benefiting from cross-selling opportunities.

Figure 155: Selected emerging market banks with relatively strong three-year CAGR forecast earnings

Ticker	Company	Base	Description	Rating	Mkt cap (US\$m)	PE on FY1	3-yr CAGR earnings forecast
BBAS3	Banco do Brasil	Brazil	The oldest bank in Brazil, today Banco do Brasil (BB) is the largest financial group in the country. Recent entrance into the vehicle financing and mortgage businesses should boost market share.	UP	15,925	6.3x	N/A
BRSR6	Banrisul	Brazil	Banrisul is a multiple-bank controlled by the State of Rio Grande do Sul, with operations concentrated in the south of Brazil. The bank has a large position in the payroll segment, which accounts for 24% of total loans.	N	1,053	5.2x	N/A
ITAU4	Itaú	Brazil	The second-largest Brazilian private bank. Its branch network (17% market share) provides diversified and cheap funding sources. We expect the SME segment, in which Itaú is a leader, will yield strong growth opportunities.	O	51,527	10.5x	N/A
BBDC4	Bradesco	Brazil	Bradesco is the largest Brazilian private bank, with US\$237.2bn in total assets. It offers full range retail and corporate banking services. It has a large insurance division, which accounted for 28% of net profit in 2Q08.	N	32,692	8.9x	N/A
3328.HK	Bank of China	China	The fifth-largest bank in China, with a 4.2% and 4.0% market share of total banking system loans and deposits, respectively. The bank has 2,592 branches nationwide, mainly in China's affluent urban coastal areas.	U	32,114	7.6x	14%
0939.HK	CCB	China	China Construction Bank (CCB) is a leading commercial bank in China	N	123,324	8.0x	16%
1398.HK	ICBC	China	Industrial and Commercial Bank of China (ICBC) is the largest commercial bank in China in terms of total assets, loans and deposits.	N	163,772	9.4x	17%
OTPB.BU	OTP	Hungary	OTP is Hungary's largest bank, with a deposit market share of 30%. Growth could be driven by expanding its presence in Russia & Ukraine.	O	4,067	3.3x	17%

Source: Credit Suisse research and estimates

Figure 156: Selected emerging market banks with relatively strong three-year CAGR forecast earnings, continued

Ticker	Company	Base	Description	Rating	Mkt cap (US\$m)	PE on FY1	3-yr CAGR earnings forecast
AXBK.BO	Axis Bank Limited	India	Third-largest private sector bank in India in terms of an assets. Large corporate/ SME investment pipeline should drive growth.	U	2,946	9.7x	30%
HDBK.BO	HDFC Bank	India	HDFC Bank is the second-largest private sector bank in India, with a strong position in corporate banking and treasury, and retail banking segments.	N	7,893	18.6x	41%
IDFC.BO	Infrastructure Devt Finance	India	IDFC offers infrastructure project financing services. The company primarily finances energy, telecoms and transportation projects.	N	1,364	8.2x	15%
KTKM.BO	Kotak Mahindra	India	Kotak Mahindra Bank is a new private sector bank.	N	2,333	14.7x	15%
PNBN.JK	Panin Bank	Indonesia	Indonesia's mid-size bank, with 2.2% market share in deposits and 2.9% market share in loans.	O	877	12.8x	28%
HSBKq.L	Halyk Bank	Kazakhstan	Halyk is one of the largest banks in Kazakhstan. It has one of the largest exposures to the retail segment. There are potential acquisitions in other Central Asian countries and there is potential to expand operations in Russia.	O	917	310.7x	18%
ALDB.KA	Allied Bank Limited	Pakistan	ABL has undergone a massive transformation in profitability since privatisation in 2004. Focus is on the corporate sector.	U	477	8.8x	22%
HBL.KA	Habib Bank Limited	Pakistan	HBL is one of the largest banks in Pakistan with the most extensive branch network. It has substantial international operations.	U	1,340	7.7x	17%
UBL.KA	United Bank Limited	Pakistan	The third-largest bank in Pakistan, with significant international operations in the Middle East.	U	881	6.2x	21%
BAPE.WA	Pekao	Poland	Second-largest bank in Poland by assets. One of the more universal financial institutions in the country, Pekao has significant operations in asset management, brokerage and leasing.	N	9,754	8.5x	20%
PKOB.WA	PKO BP	Poland	One of the two largest banks in Poland, 52% is owned by the state.	O	10,738	8.7x	15%
MMBMI.RT S	Bank Moskv S	Russia	Bank of Moscow is controlled by the City of Moscow. It is predominantly a corporate bank based in Moscow, although it is aiming to develop its retail business and expand its (already meaningful) presence outside Moscow	U	4,160	13.4x	13%
STBK.RTS	Bank St Petersburg	Russia	The bank operates in St Petersburg and the surrounding region. It is largely a corporate lender but aims to increase retail activity. It is privately owned, but has close links with the local government.	U	310	3.0x	29%
SBER.RTS	Sberbank	Russia	Sberbank is by far the biggest bank in Russia, with a 24% market share in deposits. Mortgage, retail and corporate lending are likely to be the main growth drivers, in our view.	O	17,809	4.1x	20%
URSA_p.R TS	URSA Bank	Russia	URSA operates in the Ural and Siberian regions. It is focused on SME and retail banking. Management has large holdings in URSA and other banks giving rise to potential mergers.	U	363	1.6x	26%
VZRZ.RTS	Vozrozhdenie	Russia	The bank operates throughout the Moscow region and areas in European Russia. It has a strong SME franchise.	O	270	2.5x	32%
ABLJ.J	African Bank	South Africa	A micro-lender (unsecured lending to higher-risk retail clients) that recently bought a furniture retailer to take advantage of operational and capital efficiencies it feels it can extract from this business.	O	2,156	11.7x	40%
SBKJ.J	Standard Bank	South Africa	One of the big four banks in South Africa. Standard's strong corporate franchise in SA should benefit from the healthy corporate cycle. We think acquisitive growth will also be important as Standard still has cUS\$1bn of surplus capital.	O	13,016	9.8x	9%
KT.BK	Krung Thai	Thailand	Thailand's second-largest bank, with 16% lending market share.	O	1,040	3.4x	14%
AKBNK.IS	AKBANK	Turkey	Akbank is the second-largest private bank in Turkey in terms of assets, deposits and branches but the largest in terms of loans.	N	8,242	6.1x	19%
GARAN.IS	GARANTI	Turkey	Garanti is one of the leading private commercial banks in Turkey, with a strong focus on retail banking.	N	6,118	4.8x	22%
HALKB.IS	HALKBANK	Turkey	Seventh-largest bank in Turkey in terms of assets.	N	3,274	4.1x	22%
ISCTR.IS	IS Bank	Turkey	Turkey's largest private bank in terms of assets, deposits and number of branches, while it also is a quasi-holding company with industrial investments. The bank is controlled by its pension fund.	O	7,080	4.2x	24%
VAKBN.IS	VAKIFBANK	Turkey	Sixth-largest bank in Turkey in terms of assets. The bank engages in investment banking and capital market activities, in addition to the basic banking products and services.	O	1,917	2.8x	21%
YKBNK.IS	YAPI KREDI	Turkey	One of four largest private sector banks in Turkey, c10% deposit market share.	O	5,305	5.8x	42%

Source: Credit Suisse research and estimates

Technology: joining the dots

Key findings

- The technology sector influences many aspects of nation-building. Its implementation represents not only a stand-alone category but also has the potential to significantly impact the other categories within our definition of Intangible Infrastructure.
- Technology innovation is integral to the development of the other pillars of our analysis, such as health and education. More generally, the technology network is at the root of the key component of communication upon which growth is dependent.
- Ostensibly, we should be interested in the more intangible elements of technology for this exercise: for instance, software solutions, system processing capabilities or Internet security. In practice, it is impossible to disaggregate software from hardware and hence, we look at aspects of both in our discussion.
- The transition from tangible to intangible infrastructure, as emerging economies develop their service sectors, is a key structural driver for growth in the tech sector. Securing the most recent technology allows emerging markets the ability to accelerate the 'catch-up' process with developed countries. We believe the countries best set to exploit this are China, India, Korea, Malaysia and Russia.
- We thus forecast continued strong growth for parts of our technology universe. Specifically, we expect companies with a high proportion of emerging market sales and the lowest-cost producers to deliver superior earnings growth.
- Intellectual Property Rights (IPR) Law Expert, Richard E. Neff (Partner and Chair, IP & Technology Group at Greenberg Glusker in Los Angeles), advised us on this project and concluded that both the growth and protection of IP in tech increased markedly since 1990 in the developing world. He remains optimistic about the prospects for IPR improvement over the next 5–10 years in key NJA countries such as India, China and Indonesia.

Figure 157: Technology sector: Investment recommendations

Tencent Holdings

Tencent's QQ Instant Messaging platform has >780m registered users in China. We forecast Tencent to have a 3yr earnings CAGR of 49.6% over 2007–10 due to: i) fast-growing Instant Messaging users in China; ii) continuous successful monetisation of its user-base; iii) cost control strategies to maintain stable and high margins.

Ticker: 0700.HK

Rating: Outperform

Wallace Cheung

Sina Corporation

Sina is i) the largest Internet portal in China in terms of traffic and revenue, providing Chinese-language content and services; ii) the most popular blog service provider in China; iii) one of the largest Wireless VAS providers in China. We forecast a 3yr earnings CAGR of 49% over 2007–10.

Ticker: SINA.OQ

Rating: Outperform

Wallace Cheung

ZTE

ZTE is the second-largest telecom equipment supplier in China (behind unlisted Huawei). We forecast strong earnings growth (3yr earnings CAGR of 53% over 2007–10) on the back of strong pent-up demand for handset and networking equipment in China and the emerging markets.

Ticker: 0763.HK

Rating: Outperform

Wallace Cheung

MSFT

Microsoft offers strong long-term growth as well as near-term defensive characteristics given its dominant position in the software market. Emerging markets currently account for c.15% of total sales, but we expect this to rise to c.20% by 2012. We forecast a CAGR of 8.6% for earnings over the next 2yrs, despite the poor global economic environment.

Ticker: MSFT

Rating: Outperform

Philip Winslow

Cisco Systems Inc.

Cisco manufactures and sells networking and communications technologies, products and services. We estimate that 23% of revenues were derived from emerging markets in 2008 and that by 2012 this will have increased to 30–35%.

Ticker: CSCO

Rating: Neutral

Paul Silverstein

Source: Company data, Credit Suisse estimates

The Credit Suisse Technology Index

Figure 158: Country ranking (2006) and change in rank (1999–2006)

	Country	Improvement in rank (1999 - 2006)	2006 Rank (out of 51)
1	Russia	8	32
2	S Africa	7	40
3	Venezuela	7	39
4	Portugal	5	27
5	Czech R	4	22
6	Colombia	3	42
7	Thailand	3	47
8	Italy	1	21
9	Argentina	0	41
10	Indonesia	0	51
11	Poland	0	38
12	Turkey	0	43
13	China	-1	50
14	Hungary	-1	26
15	Malaysia	-1	33

* we list all countries, sorted by change in rank, which are rated lower than 20 on their 2006 score Source: Credit Suisse estimates

The Credit Suisse Tech Index is a macro-oriented guide to investment decisions in the Tech sector by country and/or region. It effectively ranks countries' (51) ability to maintain an environment which sustains the development of tech infrastructure; and measures its relation to wealth creation and economic growth.

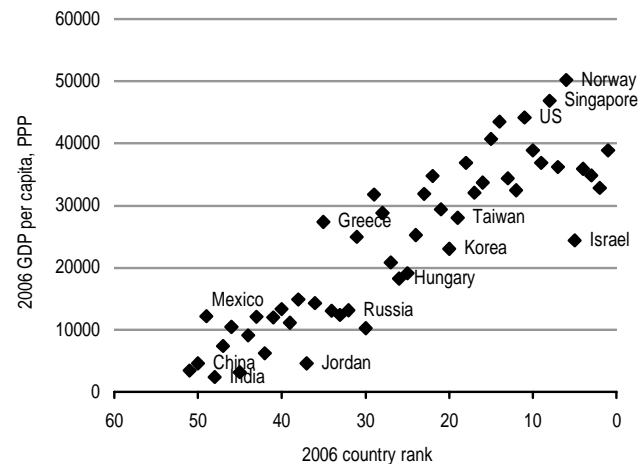
In the construct of the composite index, we standardise components that are measured in different units (e.g. US\$); shares of GDP; shares of totals in general (e.g. share of total exports); rates of growth (percentage changes); number of people. The components are divided between 'hard' and 'soft' data. 'Hard' data are readily measured (with an applied two-thirds weight), while 'soft' data can be perceived (with an applied one-third weight).

In terms of 'hard' data, we have selected the following: computers per capita (per 1,000 people); and Mobile telephone subscribers (per 1,000 people). We selected two 'soft' data points: technological cooperation between companies is depicted as sufficient; and information technology skills are seen as readily available.

In the construct of the index, we were confronted with a major measuring problem: the price distortion of tech items, whose prices are falling and quality rising rapidly. As a result, we refrained from including in the index components based on nominal dollar-based variables, in addition to those that are highly correlated with another.

The Credit Suisse Tech Index has a 88% correlation with GDP per capita and displays a significant effect on aggregate growth.

Figure 159: Technology ranking vs GDP per capita (PPP, 2006)



Source: Credit Suisse estimates

Our results show that a 1 point increase in the Credit Suisse Technology Index increases per capita growth by 0.01 percentage point. (The R-squared measuring the overall fit of the model is 38%.) Unlike with the other indices we have constructed, however, these results can be traced largely to the group of industrial economies where the effect is 0.007 (with an R-sq of 40%), as opposed to emerging market economies. Narrowing the growth implications to specific sectors, the estimated positive growth effect can be traced to services, where it is measured by a coefficient of 0.007 and R-sq of 37%. Our regional analysis points to multiple regions where the correlation between the Credit Suisse Tech Index and GDP per capita is high: Western Europe, 81%; Eastern Europe, 73%; Non-Japan Asia, 93%; Turkey-Jordan-Israel, 99%; Japan, 71%; and South Africa, 87%. Based on analysing the time series of the 51 countries in our sample, we identified five emerging markets displaying very strong growth potential in technology:

- 1) Chile: correlation (GDP per capita with the Credit Suisse Tech Index) = 80%
- 2) Czech Republic: correlation (GDP per capita with the CS Tech Index) = 76%
- 3) Korea: correlation (GDP per capita with the CS Tech Index) = 79%
- 4) Malaysia: correlation (GDP per capita with the CS Tech Index) = 73%
- 5) South Africa: correlation (GDP per capita with the CS Tech Index) = 87%.

Technology: the transmission mechanism

The technology sector, perhaps more than any other, permeates and influences many aspects of nation building as its implementation represents not only a stand-alone category but also has the potential to significantly impact the other categories within our definition of intangible infrastructure: the analog semiconductors that interpret cat-scans; the classroom PC that fosters a child's natural curiosity; and the IT infrastructure that supports a service economy and advanced banking systems. In addition, technology tends to have the added benefit of providing not minor benefits with long gestation periods but logarithmic improvements in relatively short order.

When pursuing a theme labelled 'intangible', the natural area one would look to concentrate on within technology would be software-driven processes. However, in reality, software and hardware are inextricably linked. Software and broadband without hardware are orphans; hardware without software is brawn without intellect; and without broadband both are structurally hamstrung. Hence, we have considered technology in the round here but with the accent on its intangible influences.

Software and hardware are inextricably linked

We have segmented our analysis into four categories: hardware/computation, software, telecom/broadband and telecom/voice. While telecom/voice is perhaps best to treat as a stand-alone category and in some ways displays characteristics closest to tangible infrastructure, we still think it is central to the intangible quality of efficient communication upon which most productivity improvements depend.

Measuring the impact of technology broadly on a society is somewhat challenging. Technology clearly improves productivity, quality of life, and economic progress, but because of its deflationary characteristics also invites increased competition, lower prices and potential economic disruptions—the horse and buggy gave way to the automobile, typists to word processing, and bank tellers to ATMs, for example. Ultimately, it is technology's ability to lower costs and spur elasticity while creating new markets that makes it a positive force for economic development.

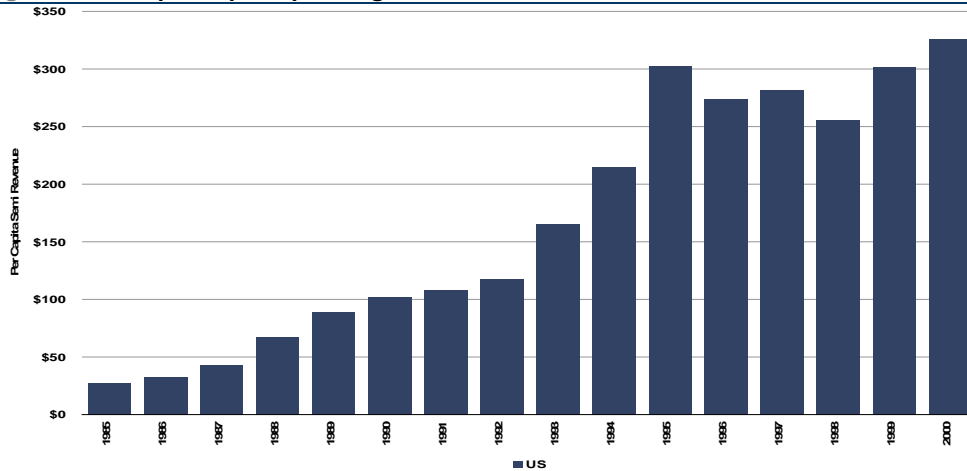
How do we judge its impact?

Defining the opportunity: what we are playing for?

Our Tech Strategy Group has been arguing that the technology sector is on the verge of a new phase, in part due to two key drivers: 1) emerging markets transitioning from tangible to intangible infrastructure as they continue to nation-build; and 2) more developed nations understanding that intangible infrastructure is needed to continue to drive productivity and maintain global competitiveness (albeit this recognition seems stronger in the private than public sector). We have defined three phases of technology growth:

Phase 1: accelerating penetration

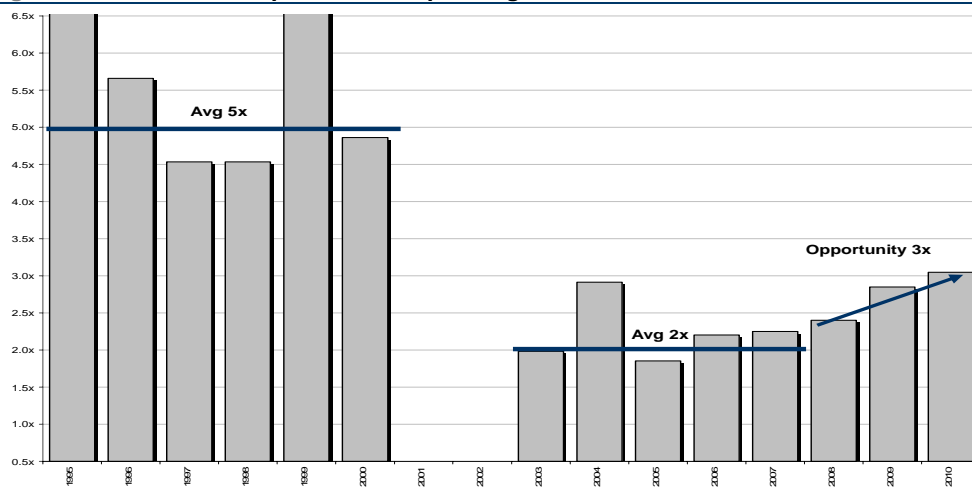
From the late 1990s through to 2000, technology experienced accelerating penetration growth in developed markets. During this period, US per capita spending on semiconductors (we use semiconductors as a barometer of overall tech penetration due to their ubiquity in electronic products) increased from US\$25 per person in 1988 to over US\$300 per person in 2000, a 12-fold increase which allowed technology to be insulated from most economic cycles and drove growth rates well in excess of global GDP.

Figure 160: US per capita spending on semiconductors, 1985–2000

Source: SIA, U.S. Census Bureau, Credit Suisse estimates

Phase 2: digesting the bubble/waiting for the emerging market ‘Godot’

From 2001 through 2007, technology has suffered from a prolonged cyclical overhang of excess capacity built as a result of the Internet/Y-2K/Dot.com bubbles. In addition, unlike other parts of the economy, technology was *not* well levered to the early phase of development in emerging markets—i.e. the tangible infrastructure investment needed to transform an essentially rural population into a more urban one. As a result, technology’s leverage to the overall economy dropped significantly, going negative in 2001 and 2002 and averaging only a 2x multiplier from 2003–07, down from 5x in the previous phase.

Figure 161: Growth multiple to GDP expanding

Source: Gartner, Credit Suisse estimates

Phase 3: cyclical headwinds but structural tailwinds

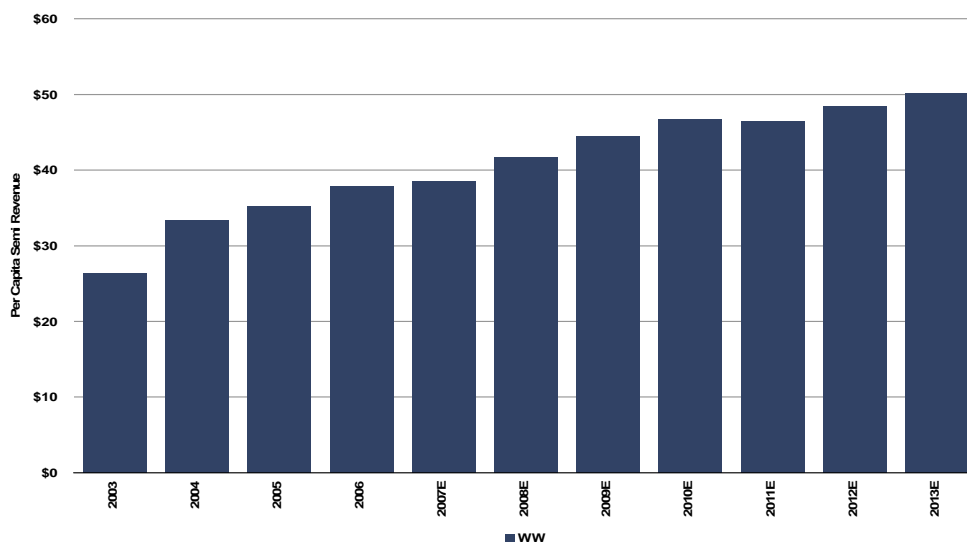
The prospect of a near global recession in industrial production, which is likely to be typified by pressure on corporate spending and capital spending specifically, will pose its challenges. We are also likely to see the constraints posed on the developments of new technology by limited access to capital. However, if we take a more structural look, the years ahead provide the opportunity for tech’s growth multiplier to increase from 2x over the last four years to 3–3.5x over the next five. There are two key drivers of this: **a)** penetration growth accelerating in emerging markets and **b)** supply rationalisation which has occurred since the prior bubbles. We believe this is a non-consensus view, as most market participants believe that structural growth rates in technology are being hampered by technology’s naturally deflationary characteristics. We would argue that the market is mislabelling longer-duration cyclical trends (excess capacity) as the new structural norm.

(a) Penetration growth accelerating in emerging markets. We referenced earlier in this report the penetration growth in the developed markets from 1985 to 2000 by examining per capita spending of semiconductors in the US over that time period. This penetration growth was clearly a key component in tech's growth multiple to GDP in the 1990s. While a repeat of the 1990s' phenomena is not possible in the developed markets, we do believe *global* penetration is still in the early innings. Figure 162 shows our view of penetration growth in semis from 2003 to 2013E on a global basis. Relative to our population size, we look at relevant population filtered by an affordability index. The important thing to also note, of course, is that GDP per capita itself has increased substantially in a number of emerging markets, as we have highlighted (e.g. GDP per capita in China is up 85% over the last five years to the end of 2007, according to the IMF), providing further backing for this.

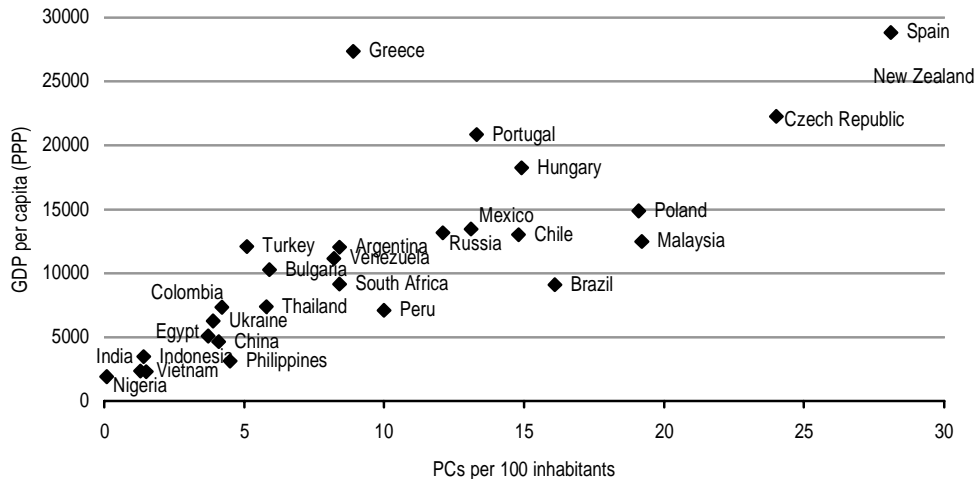
A per capita analysis of semiconductor penetration growth is a bit misleading as it implies that consumers, not corporations, dominate spending. In reality, consumers only represent 15% of global technology spending, with corporations representing 85%. Of the corporate spend, two-thirds is done by the service sector, with only 10% by the manufacturing sector. As such, when looking at the rate of penetration growth of technology in emerging markets, the prerequisite is not so much per capita income but the realisation that as per capita income grows and a middle class begins to emerge, services become a bigger part of demand.

Simply put, technology is not all that leveraged to emerging geographies such as China as long as they are only the manufacturer of the world's goods. This may indeed tie in with the fact that China has not to date scored well on the technology component in our technology index. However, this is changing and as GDP per capita increases further, it is likely that we will see a greater proportion of China's expenditure dedicated to the service sector as its intangible infrastructure is built out.

Figure 162: Global semiconductor per capita spending

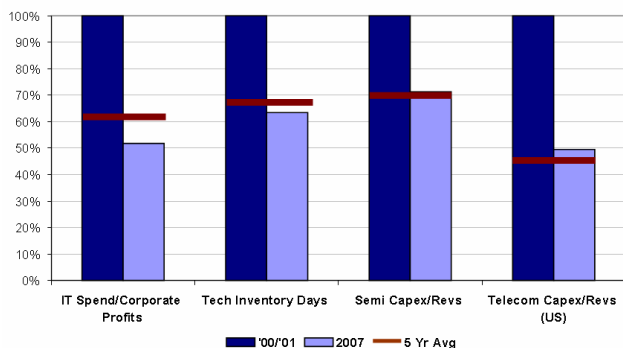


Source: SIA, U.S. Census Bureau, Credit Suisse estimates

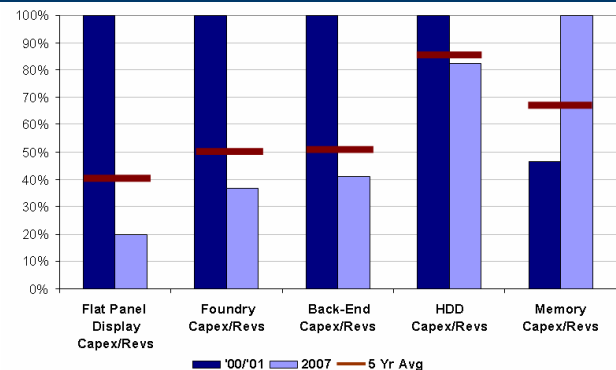
Figure 163: PC penetration rates vs GDP per capita (2006)

Source: World Bank, IMF, Credit Suisse research

(b) Supply rationalisation which has occurred since the prior bubbles. Along with the intangible infrastructure needs of the developing world, there is a second element to our technology thesis: that of supply rationalisation. We believe 2008 marks the first year in which supply is in balance (excluding memory) in over a decade (see Figure 164 and Figure 165). Both charts look at different supply metrics during three periods of time: the peak, the end of 2007, and the 2002–07 average. Except for memory, where overcapacity is ramped and well understood, most of our other supply metrics appear extremely healthy. While macro-economic headwinds could be problematic for technology over the next 12 months, we would argue that demand issues have been more transitory while supply issues tend to take longer to correct. Healthy supply is obviously a much better cyclical and structural operating environment for the aggregate sector.

Figure 164: Supply chain metrics healthy

Source: Company data, Credit Suisse research

Figure 165: Supply chain metrics healthy

Source: Company data, Credit Suisse research

From top down to bottom up...

Against this backdrop, our Software, Hardware, Telecom Wireless, Telecom Wireline and Asian Broadband and Internet analysts have provided detailed thoughts on their sector relative to the Intangible Infrastructure theme. As previously highlighted, software and hardware intermingle here in our thinking, given the clear inter-dependency. Note that we have viewed IT services companies as a component of business services for this purpose.

We would draw out the following key observations:

(1) Software: better pricing power

Efficient use of software can help accelerate the catch-up process for emerging economies through rapidly improving productivity and effectively skipping a stage of development that the mature economies had to go through. It is thus noteworthy that the emerging markets are on course to garner 16% of total worldwide software spending in 2008, with their growth rates forecast to exceed those of North America and Western Europe for at least the next five years. From an investor's perspective, we show that software has the greatest pricing power, reflecting the fact, that unlike hardware and semis, software products are not as easily commoditised and hence their innovative qualities can demand higher margins. In this report, we focus on enterprise software, virtualisation and Internet security. This is clearly not an exhaustive list of relevant applications.

Accelerating the 'catch-up'

Our key recommendations are the global leaders in the software sector such as Microsoft and SAP. We believe the growth in 'virtualisation' software is still centred on the Americas (accounting for 58% of the roll-out), with EMEA taking up 29% and Asia accounting for only 13% (mostly via the Asian offices of global MNCs). However, we expect that demand from Asia will grow over time, as the Asian companies start to embrace virtualisation more actively. This is good news for the main virtualisation software vendors VMWare, Citrix and Microsoft), but also throws up opportunities for the Asian systems integrators such as Datacraft, PCCW and Wipro.

(2) IT hardware: the network effects

While tangible by definition, hardware such as PCs are the basic source of facilitation of the development of intangible infrastructure. In the last 30–40 years, the developed markets have witnessed an incredible transformation with the use of computing in commerce and culture. Emerging markets have begun to mirror this transformation, but what took 30–40 years in the developed markets is likely to take only 10 years in the emerging markets, in our view, with a sizeable impact on productivity when combined with the development in related software.

Skipping a generation

We believe that PCs are entering into the sweet spot of penetration growth over the next five years, with the potential for reasonable growth despite the global downturn. Demand from the emerging markets is the key driver: 76% of PC unit growth in 2007 came from the emerging markets. Our top recommendation in the PC food chain is **Intel**.

(3) Communications: playing leapfrog

As suggested above, efficient communication is a key intangible part of an economy's framework that can only be delivered from tangible infrastructure. Wireless build-outs by service providers throughout the emerging market regions stand out, as most of these countries, suffering from limited wireline infrastructure, have sought to leapfrog their economies technologically into the 21st century. We expect mobile subscribers to continue to grow, reaching some 4.4 billion globally by 2010 (up from 3.2 billion as at the end of 2007), with 93% of the growth coming from emerging markets. The infrastructure deployments by service providers in emerging market regions in turn are a precursor to increasing deployments of next-generation LAN/SAN and WAN infrastructure by enterprises. Key beneficiaries are in **Cisco** in communications infrastructure and **Qualcomm, Ericsson, Nokia** and **ZTE** in wireless equipment.

Communication networks are tangible but communication is more abstract

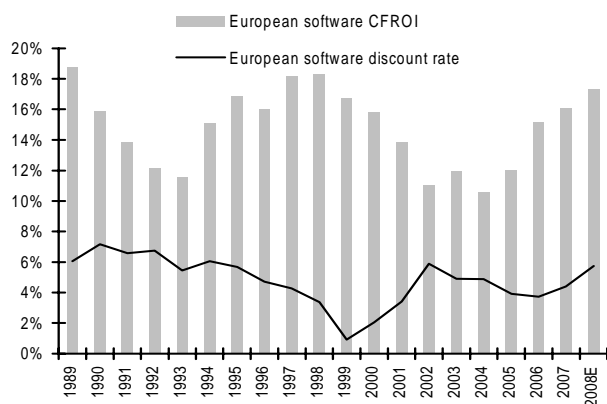
Software: lowering costs and improving efficiencies

The software industry comprises businesses involved in the development, maintenance, and publication of computer software. The software industry essentially began in the mid-1970s at the time of the personal computer revolution¹. The industry has been characterised by rapid innovation. In our opinion, the reason for the constant innovation is that software is inherently the value-adding component of the IT budget. In other words, without the application software to process information and to automate procedures, or the infrastructure software to deploy those applications and to store and deliver associated data, what is the purpose of IT?

Value-creation

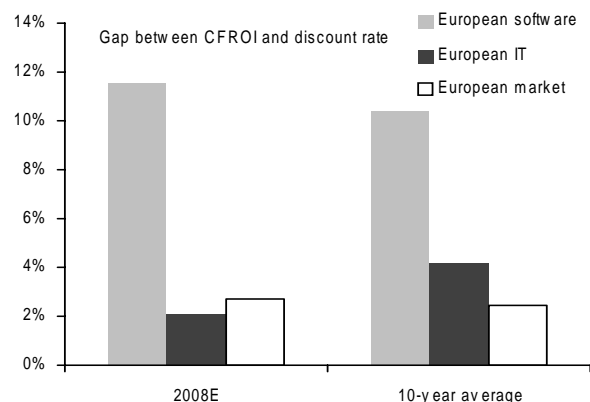
Software has arguably created the greatest relative value among the tech sub-sectors as well as the fastest growth rates. Its CFROI[®]/discount rate is nearly five times that of the market and three times that of the tech average.

Figure 166: Software has consistently been strongly value-creating, with CFROI[®] exceeding its discount rate...



Source: Credit Suisse HOLT

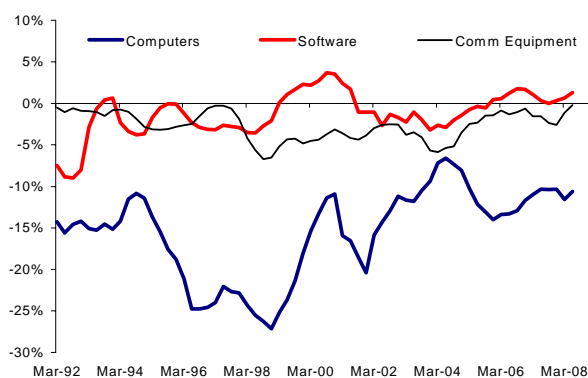
Figure 167: ... far more value-creating, in fact, than the rest of the tech space and the market as a whole



Source: Credit Suisse HOLT

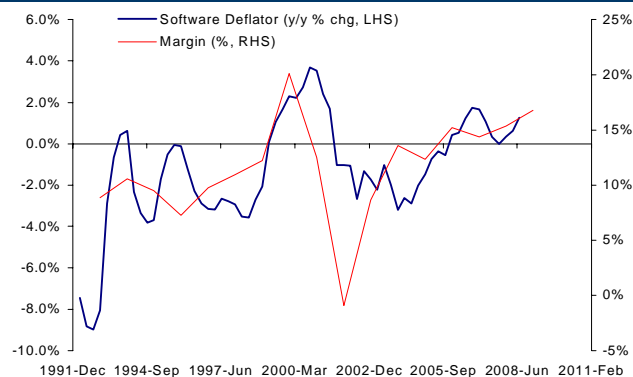
Within the tech sector, software has the greatest pricing power, reflecting the fact that unlike hardware and semis, software products are not generally commoditised. Recent price increases by Citrix, SAP and Oracle provide anecdotal evidence for this thesis. Macro data also supports this idea.

Figure 168: Tech price indices show that software has the most pricing power



Source: BEA

Figure 169: Software deflator versus margins



Source: BEA, Credit Suisse research

¹ www.wikipedia.com

Current macro-level business requirements are driving a fundamental readdressing of IT strategy, with the focus on cost and efficiency. Software plays a critical role in reducing costs and improving efficiency and productivity through the automation or elimination of manual processes. Software also enables more leveraged operating costs through the use of unified communications, IP and virtualisation, thus reducing hardware and physical expenses.

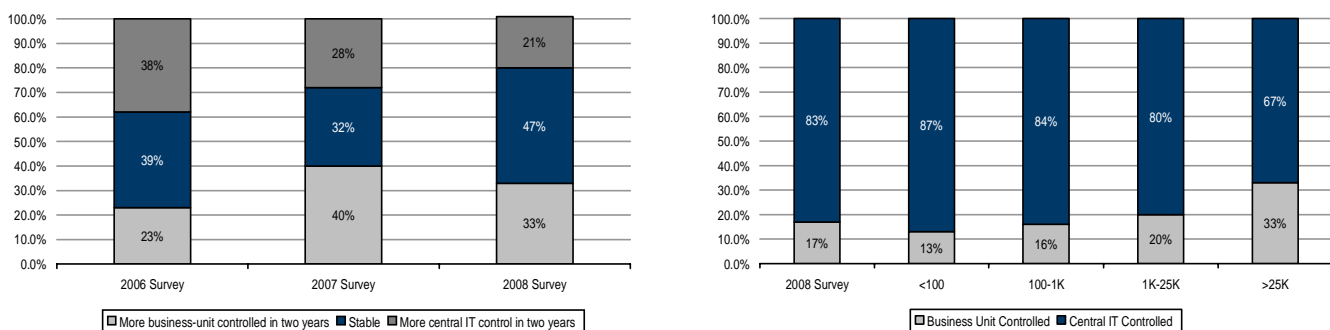
Growing importance of IT in business processes and productivity

While the late 1990s' application binge echoed across the majority of the first half of this decade in lacklustre licence growth, vendors' claims that enterprise software was a measurable contributor to overall productivity were starting to be recognised as fact. For example, Alan Greenspan observed in 1999 that technology spending correlated with overall productivity. Since the downturn in software spending during the early 2000s, more and more evidence has emerged that IT spending could drive greater productivity across all sectors of the economy².

In our opinion, the recognition that IT increased productivity heralded the start of a significant shift in IT buying patterns—particularly for enterprise software³. Specifically, business decision-makers have shown growing awareness about the potential benefits of software solutions to their organisations' productivity and financial success—a trend signalling the beginning of a broader shift in decision-making power for software purchases from IT to business⁴.

While software vendors also continue to face buying decisions that are overwhelmingly centralised in the IT department, the importance of the individual business unit in decision making is growing at the largest companies—i.e. those with more than 25,000 employees⁵. For example, in the annual Enterprise Software Survey conducted by McKinsey & SandHill in early 2008, 33% of enterprises in the survey suggested that the business unit would control more of the decision-making process in IT purchases two years from now versus 21% that suggested more centralised IT control of purchase decisions. In comparison, in the 2006 survey, 38% of respondents expected more centralised IT decision making as compared with only 23% anticipating increasing control by the business unit (Figure 170).

Figure 170: CIO Survey—'Estimate what portion of final software purchase decisions (specific software brand/product selections) are centrally controlled versus controlled by business units, today and two years from now'



Source: McKinsey & SandHill Enterprise Software Customer Survey, 2008

² www.itmanagement.earthweb.com—"The Recession-Proof Enterprise Software Market: It's Not 2002", February 3, 2008

³ www.itmanagement.earthweb.com—"The Recession-Proof Enterprise Software Market: It's Not 2002", February 3, 2008

⁴ IDC—"Worldwide Business Intelligence Tools 2008–2012 Forecast: Limited Impact of Short-Term Economic Uncertainty"

⁵ Credit Suisse—"VMware: The Ultimate Virtualization Machine"

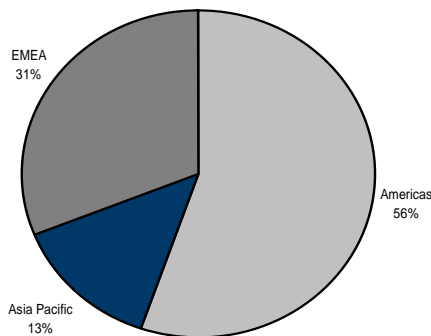
In our opinion, the emerging line-of-business buyer opens new revenue sources as compared with the slowdown during the early 2000s, as well as new opportunities for a software market that had traditionally sold much larger and often bloated software projects to IT managers⁶. As such, we expect healthy demand for innovative applications that can be justified with respect to improving revenues or lowering costs, including business intelligence software that has become increasingly attractive for business unit managers. While certain sectors of the US economy, such as financial services and retail, could experience a significant slowdown in IT spending, we believe that line-of-business buyers increasingly recognise that enterprise software can increase productivity and improve competitive advantage, resulting in a positive ROI and positive net effect on the business⁷.

Ultimately, the market recovery that started in 2004 after an abrupt decline in the early part of the decade has transitioned into a pivotal period for the enterprise software marketplace. New technologies, user demands for higher levels of collaboration and personalisation, and a combination of economic and business forces have merged into a whirlwind of change for software vendors, the enterprise software marketplace, and the emerging class of line-of-business IT buyers. This, we believe could result in greater stability in software spending as compared with the post-1990s' application spending hangover.⁸

Globalisation

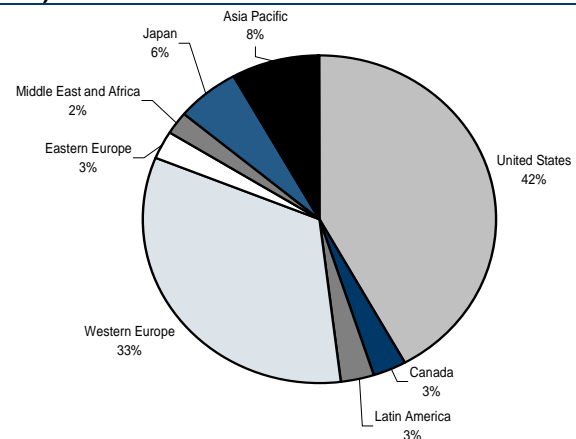
Not only have many software vendors realised significant savings by moving software support and some levels of R&D offshore, but these countries have also provided new market opportunities⁹. Specifically, the US accounted for less than 45% of software spending in 2007 as compared with 50–60% at the end of the 1990s and early 2000s. Europe, the Middle East and Africa now account for nearly 40% of the global software market versus 25–30% in the late 1990s¹⁰. Latin America, Central and Eastern Europe, Asia and Pacific (not including Japan), and the Middle East and Africa in 2008 will represent approximately 16% of worldwide total software spending, with their growth rates exceeding those of North America and Western Europe (see Figure 173).

Figure 171: Worldwide software spending by geography (2001)



Source: IDC

Figure 172: Worldwide software spending by geography (2007)



Source: Gartner

⁶ www.itmanagement.earthweb.com—"The Recession-Proof Enterprise Software Market: It's Not 2002", February 3, 2008

⁷ www.itmanagement.earthweb.com—"The Recession-Proof Enterprise Software Market: It's Not 2002", February 3, 2008

⁸ Gartner—"Key Evolutionary Shifts Will Continue for the Enterprise Software Industry in 2008".

⁹ Gartner—"Key Evolutionary Shifts Will Continue for the Enterprise Software Industry in 2008".

¹⁰ Gartner—Dataquest Insight: "Software Markets Should Weather Economic Slowdown, but Restructurings Are Expected"

Figure 173: Enterprise software revenue growth by geography

	2006	2007	2008	2009	2010	2011	2012
Americas	9.8%	10.0%	7.5%	8.0%	7.5%	7.5%	7.1%
EMEA	8.9%	18.0%	12.7%	7.2%	6.5%	6.4%	6.2%
Asia Pacific and Japan	10.1%	12.7%	12.6%	10.4%	9.9%	9.6%	9.2%

Source: Gartner

Virtualisation software: upside for Asian systems integrators

The market for virtualisation software is expected to be one of the fastest growing segments within the virtualisation ecosystem. The IDC estimates that the overall market is worth US\$4bn, and it is projected to grow at a compounded rate of 26% between 2006 and 2011, to reach US\$7.5bn. It also serves as a key illustration of how the emerging world can move straight to high productivity/low cost solutions without having to go through the intermediate steps the developed economies have.

Geographically, the majority (58%) of virtualisation software deployment is still centred on the Americas, with EMEA (Europe, Middle East & Africa) taking up 29% and Asia accounting for only 13% (mostly via the Asian offices of global MNCs). However, we expect that demand from Asia will grow over time, as the Asian companies start to embrace virtualisation more actively.

According to IDC, the virtualisation services market itself is worth US\$7bn and can be split into hardware support (a 39% share), software support (16%), IT consulting (11%), system integrations (23%) and education (11%). The overall virtualisation service market is expected to see a CAGR of 16% in the next three years, with the faster growth for IT consulting and systems integration.

Datacraft is a good example of how an Asian company can benefit from virtualisation. A large number of its clients are the Asian offices of global financial players. Prompted by virtualisation efforts initiated at their head offices in the US, these clients are looking to deploy virtualisation solutions in Asia. However, there has been a lack of support in this region, as virtualisation is fairly new in Asia. As such, Datacraft recruited talent in this area, and sent its own staff to VMware and Citrix for training and certification.

Datacraft starting to offer supporting services for virtualisation

The company has since started several virtualisation projects in Asia, by getting involved in systems integration, hardware/software support and training, and working with partners, such as VMware and Citrix. As of now, virtualisation is still not a big part of its business but it has the potential to become a major revenue stream in the future. We believe other integrators such as PCCW, Wipro and NCS are also well positioned to tap into this market, as they have a strong on-the-ground presence and client relationships in the region.

We also see potential for other systems integrators

Key stock recommendations

■ Microsoft: sustainable growth with a defensive revenue stream

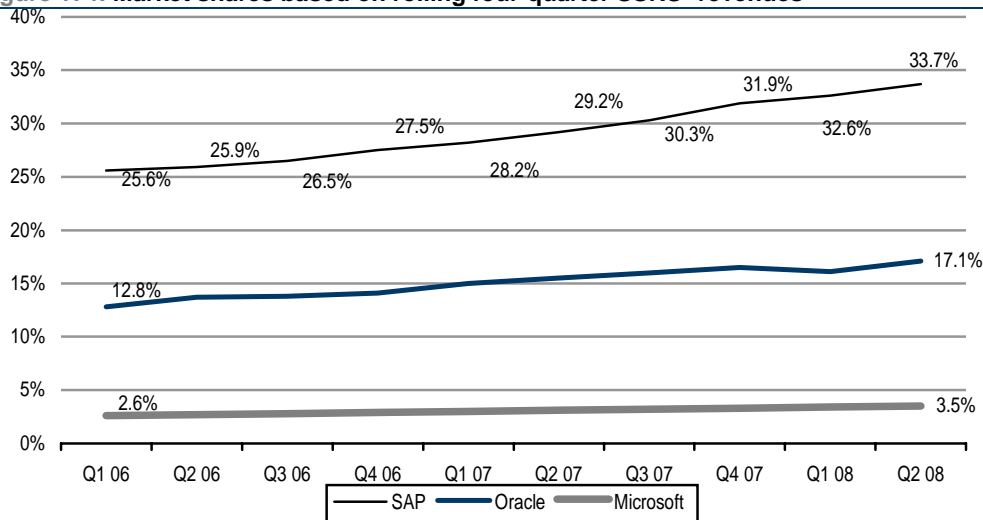
We believe that the market has meaningfully undervalued not only the long-term sustainable growth but also the near-term defensive characteristics of Microsoft's dominant market positions with respect to its client operating system and office productivity suites. Microsoft's business model enables it to generate tremendous leverage from incremental sales given essentially zero incremental costs for new units of its software products.

By providing regional specific versions of its applications, the company is also able to use price to penetrate new markets without simultaneously eroding prices in other regions, therefore maintaining margins while driving higher profits. The ubiquity of Microsoft's operating system and productivity applications create a powerful intangible advantage for capturing new users and a competitive obstacle for competitors (in both developed and emerging countries) to gain traction given limited compatibility. Continued strong roll-out of virtualisation software, which has taken off in developed markets but is yet to feed through significantly into the emerging markets, is another growth area for Microsoft (as well as VMWare and Citrix).

■ SAP and Oracle: enterprise software duopoly

In the enterprise application software market, SAP and Oracle currently hold nearly 51% of the relevant market share (based on data published on SAP Q208 presentation and our estimates). Excluding Microsoft and IBM, few companies have over 1% share in the software product revenue market.

Figure 174: Market shares based on rolling four-quarter SSRS* revenues



Source: Company presentation (SAP), Credit Suisse research

* SSRS = SQL (Structured Query Language) Server Reporting Services

Technology spend in emerging economies is likely to be in two phases: first in hardware and basic IT Services and then in software applications that can enhance productivity. There is already evidence in emerging economies of accelerated spending on software applications and we expect this to continue over the next few years.

We favour SAP for three specific reasons: 1) It generates nearly 15% of its SQL Server Reporting Services (SSRS) revenues from emerging economies and this segment saw around 40% y/y growth in 2007. In FY08E, we expect emerging markets to contribute around 40% of incremental growth in product revenues. 2) SAP installation momentum is also a function of the number of systems integrator specialists in a particular geography. The rapid expansion of pure-play offshore vendors in countries such as India provides SAP with an adequate base of technology specialists with SAP experience. 3) Enterprise applications currently account for nearly 40% of SAP's product revenue spend. We currently rate the stock Outperform.

Although Oracle's product portfolio is extensive, its flagship product remains its database offering, which is at the cutting edge of product innovation and routinely sets the standard in terms of performance and scalability based on industry-standard benchmarks. Maintaining the fastest, most reliable database in the industry has enabled Oracle to become the dominant provider of databases, with a 44.3% market share in 2007, according to the IDC.

Oracle's dominance in the database market serves as a strong competitive advantage, not only because database software is one of the largest segments within software, with revenues of more than US\$18.8bn in 2007 (according to the IDC), but also because this technology accounts for one of the most strategically important systems in IT. By providing the database, Oracle essentially serves as the foundation for its customers' IT infrastructures. Using the database segment as a launching pad, Oracle is able to expand into other software markets, such as applications, thereby displacing competitors with little risk of being displaced itself. Notwithstanding various innovations in enterprise applications and hardware utilisation, such as on-demand delivery and virtualisation, the database remains central to any organisation's IT budget planning and we believe will be a key beneficiary of accelerated technology spending in emerging economies. We currently rate Oracle Neutral.

We prefer SAP to Oracle

Internet security: protecting business

With the Internet now an integral part of businesses worldwide, IT security is an important feature and its role is crucial in the expansion of technology-based development in emerging economies, particularly for multinationals operating in these regions. Competitive pressures have forced many businesses to become accessible to the outside world—enabling partners to connect to the company extranet, and remote employees to connect to the company intra- and extranet. Internally, employees need to communicate with each other and connect to other systems to access information. A company's IT systems need to be able to authenticate and authorise users to access confidential information.

The network security industry is expanding as volumes of unauthorised access to digitally stored IP, and the risks this implies, have risen in the recent past. Since a company's ability to preserve its competitive advantage is directly dependent on security, IT spend on security software is less discretionary and consequently less cyclical. Companies' requirements are for integrated security systems that include firewall, anti-virus, VPN support, intrusion prevention and detection, all of which makes their digital data less open to attack.

Security preserves competitive advantage

In a recent CIO survey conducted by Credit Suisse's US software analysts, respondents rated security as a top spending priority that is poised to continue to gain a higher percentage of overall IT budgets in 2008 and going forward. Recent research from the IDC estimates a 12.3% CAGR in revenues in the security industry from 2007–12E, while it expects the overall software industry to grow by around 8%.

We believe security software should be able to maintain prices, even in a downturn, as the potential cost of having inadequate security far outweighs the cost of the security software. There are three broad developments that we think will drive continued strong growth in IT security requirements:

1. Software as a service

The 'Software as a Service' (SaaS) business model has gained widespread acceptance recently. On-Demand software is ready for use immediately upon subscription and adopts a 'pay as you use' plan. With no upfront payments, no installation fees, and limited consulting fees, financial risk is kept to a minimum in order to attract customers who are less inclined to spend on software application products. Based on IDC research, the SaaS market amounted to US\$3.7bn in 2006 and IDC estimates a 32% sales CAGR until the end of 2011, with revenues of nearly US\$15bn at that point.

32% sales CAGR for SaaS until 2011E

In the case of On-Demand software, the software vendor maintains the software and hardware to run the application. Customers use either a browser or a 'thick client' to access the software application via the Internet. However, accessing company-specific information outside the firm's intranet poses a lot of security concerns, which need to be addressed by security measures such as web access management, which includes centralised authentication and authorisation, VPN access and firewall protection. In addition, it is industry standard practice, that software vendors are likely to store the data specific to various firms in the same physical location. Hence it is important that in the (rare) event of a security breach, the damage is contained as much as possible.

2. Virtualisation: security issues

As explained earlier, virtualisation is one of the more recent secular themes in software, along with the Software as a Service (SaaS) business model. Virtualisation broadly refers to the abstraction of computer resources from physical resources. In other words, using virtualisation a single physical resource (such as a server, operating system or software application) can be made to appear to function as multiple logical resources. IDC expects a 23.4% revenue CAGR in the virtualisation market over 2007–12.

Significant productivity benefits but security risks

Virtualisation has its own security concerns. For example, since a single physical entity can be masked to function as multiple logical resources and vice versa, containing a breach is essential. In other words, security must ensure that a security violation on one logical resource does not affect other logical resources associated with the same underlying physical resource.

3. Emerging markets set to drive growth further

There is rising demand for IT security in emerging economies driven by India and China. Various factors hinder more widespread acceptance of the Internet in emerging economies—differences in attitude, lack of information, crime and a general lack of trust in using the Internet to trade. This trend has been changing recently, however, with soaring rates of Internet adoption and the growth of telecommunication infrastructure and equipment. With increased adoption, the threat of Internet-based attacks increases demand for IT security solutions.

20–30% growth in GEM for international players

As Internet penetration in emerging economies increases, so, we believe, does the need for companies to operate online portals. For example, activities such as renting DVDs or book shopping may take place increasingly via the Internet rather than visiting a physical store. These consumer trends are likely to drive further the need for Internet security software as these B2C companies in emerging economies expand into the Internet and open online stores.

The key players in the IT security space are network companies such as **Cisco Systems** and **Juniper Networks** and security technology companies such as **Check Point Software Technologies**, **Trend Micro**, **Symantec**, **McAfee**, and **Websense**.

IT hardware: brawn meets brain

Software is pointless without hardware. The tangible network has to be in place in order to build the intangible infrastructure around it. Just as we have highlighted the growth opportunities for software, we also see opportunities for the exponents of hardware.

In the past 30–40 years, developed markets have been transformed by computing in commerce and culture. Emerging markets have begun to mirror this transformation, but what took 30–40 years in the developed markets is likely to happen over the next decade in the emerging markets, in our view. We believe the fast-increasing demand for home computing and the need to expand IT infrastructures in emerging markets should provide a sustainable growth opportunity for IT hardware vendors going forward.

Emerging markets are likely to see accelerated development

While emerging markets represent a large and fast-growing opportunity for the broader IT hardware industry, certain sub-segments are likely to be more leveraged than others to this incremental demand. PCs have been an obvious beneficiary of emerging market growth. In 2007, Asia-Pac and ROW (Rest of World) shipments represented 49.8% of total PC shipments in 2007, up from 38.9% in 2002. Most importantly, Asia-Pac and ROW regions accounted for 75.8% of PC unit growth in 2007, and we expect this to continue. Asia-Pac and ROW still remain significantly under-penetrated by servers, although these regions' shares of the overall server pie are increasing. In 2007, emerging market server shipments represented only 27% of total server shipments, but units grew by 14% y/y versus overall industry growth of only 7%. In the following sections, we discuss briefly the impact of emerging markets on growth in the PC and server market and highlight key sources of competitive advantage.

Emerging markets represent key growth drivers

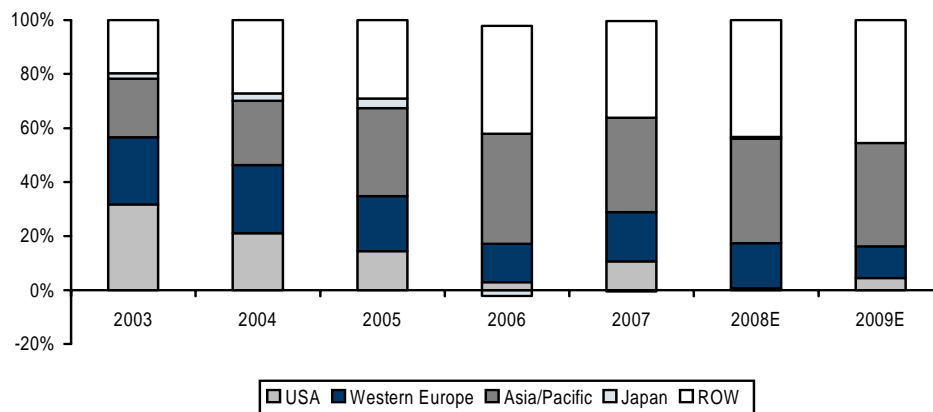
The PC industry globally makes nearly US\$248bn in annual revenues, making it the largest IT hardware segment by a substantial margin, according to the IDC. We expect PC units to grow 14% in 2008E and 13% in 2009E, and revenues to increase by 9.0% and 6.6% over the same period. Longer term, we expect a 9.7% CAGR in PC units 2010E–15E, with industry revenues growing by 2.8%. By 2015, we expect the market opportunity to reach US\$339bn.

Over the past few decades, PCs have evolved into commodity-like products, as the PC manufacturers have had little room to add differentiated proprietary technology: software has had the greater value add and margin. Indeed, to gain share, PC manufacturers have had to focus on other sources of competitive advantage, such as cost structure, distribution mix and design and branding. PC demand by region shows the clear importance of emerging geographies. Indeed, the Asia-Pacific and Rest of World (ROW) regions were critical in countering a volatile contribution from the US last year. Together, Asia-Pac and ROW accounted for 71.3% of total industry unit growth in 2007. Western Europe accounted for 18.4% of growth, while the US contributed 10.7% (Figure 175).

PCs are the commodity,
software the margin play

Although we forecast a deceleration in certain regions for 2008, our forecast assumes that emerging regions continue to represent a key component of industry growth. We expect Asia-Pacific and ROW to account for 71% of total unit growth this year.

Figure 175: Emerging regions should account for the bulk of PC market growth
% of Y/Y change in total units



Source: Gartner Personal Computer Quarterly Statistics Worldwide Database, June 2008 and Credit Suisse estimates for 2008–09.

Emerging markets will drive incremental server demand, particularly in x86 server and blades

The overall server market represents approximately US\$54.55bn of annual IT hardware revenues. Although the server market has registered an average annual revenue growth rate of 4.4% over the past five years, we expect growth of only 1% over the next two years. Over the longer term (2010E–15E), we expect the market to grow at an average rate of 0.1% per annum. Our forecast is somewhat conservative owing to our concerns about the deflationary impact of server virtualisation software and our belief that the UNIX market's growth will remain under steady secular pressure. Nevertheless, emerging markets growth is likely to be faster than that in other regions.

Virtualisation: potential
growth area for software,
potential threat for servers

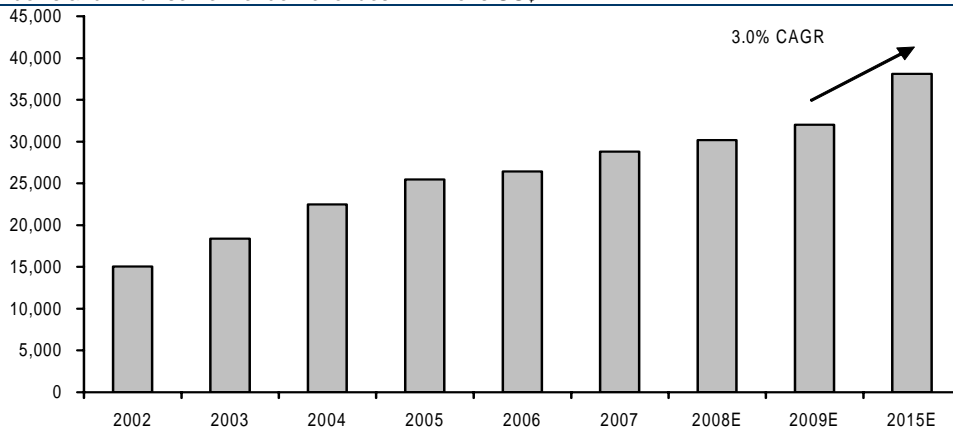
The emerging server market is still under-penetrated and remains a large opportunity for growth, in our view. In 2007, Asia-Pac and ROW accounted for 26.6% of worldwide server shipments, up from 22.3% in 2002. We expect a more substantial increase over time, since we expect trends that have played out in the mature markets to follow the same course in the emerging markets. This should be particularly true for blade servers and industry standard systems. While cost structure is the key source of competitive advantage in industry standard systems, R&D is far more important in blades. The blade market is currently dominated by HP and IBM.

Although the x86 server market grew units by a 15.2% average annual rate from 2002 to 2007, we assume this growth will slow owing to the increasing adoption of server virtualisation software. We therefore forecast combined Windows and Linux server unit growth of only 8.3% for 2008 and 4.7% for 2009. From 2010E to 2015E, we assume unit growth of 4.1%. This dour unit outlook is somewhat mitigated by the stabilising effect of virtualisation on ASPs (average selling prices). We assume that x86 server ASPs will

decline only by 3.2% in 2008E and will increase by 1.3% in 2009E. This would produce revenue growth of 4.8% in 2008E and 6.1% in 2009E. We assume revenue growth of 3% (Figure 176) in 2009E–15E.

Figure 176: Combined Worldwide Windows and Linux server revenue forecast

Windows and Linux server vendor revenues in millions US\$

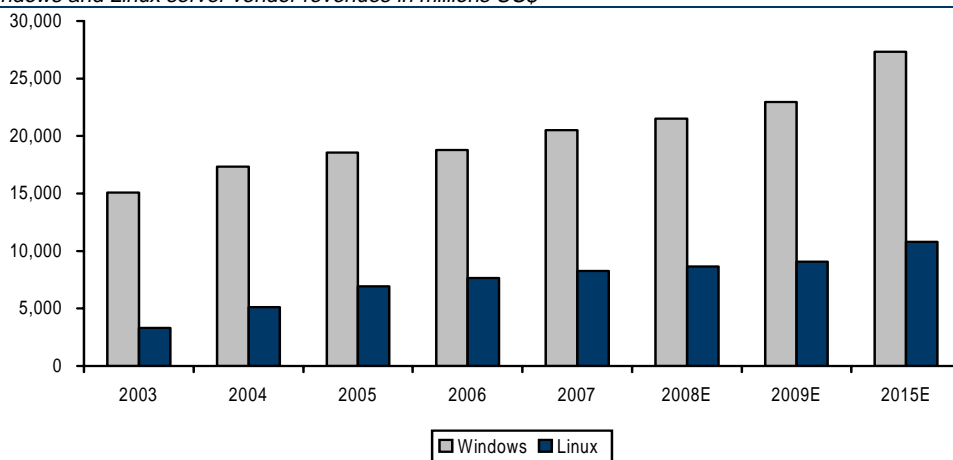


Source: Gartner Servers Quarterly Statistics Worldwide Database, July 2008. Credit Suisse estimates for 2008–15.

Within this forecast, we assume that Linux server growth will slightly outpace Windows growth, owing largely to the increased propensity for enterprises to virtualise Windows server environments (Figure 177).

Figure 177: Worldwide Windows vs Linux server revenue forecast

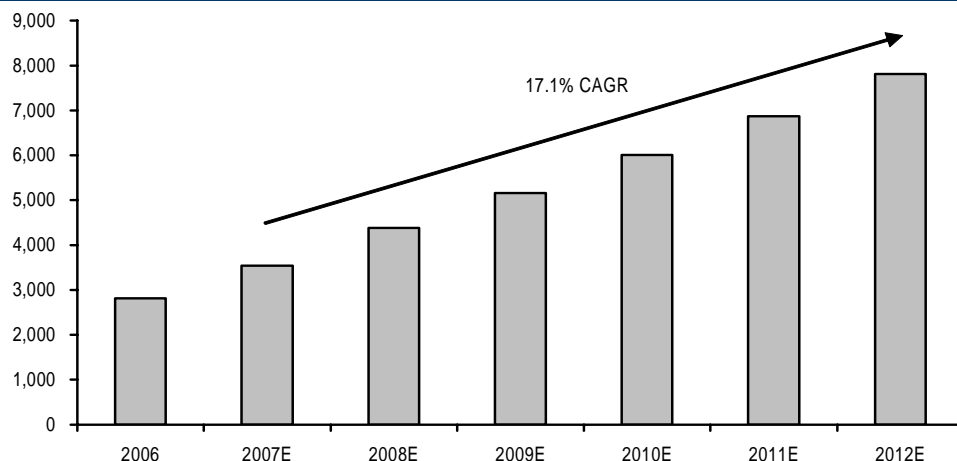
Windows and Linux server vendor revenues in millions US\$



Source: Gartner Servers Quarterly Statistics Worldwide Database, July 2008. Credit Suisse estimates for 2008–15.

We also believe blade servers represent a key potential source of revenue and profit growth for the server industry. Blade servers save IT managers money on real estate and cooling costs, which has historically been important in developed markets. In addition, we believe the valuation proposition of blades perhaps has greater importance in emerging markets where real estate and cooling costs are of greater concern to IT managers. While industry standard servers can be substituted without vendor dependence, blades tend to be more proprietary in nature and a vendor's installed base can be quite stable. This improves the long-term margin profile of the product since price competition is not a primary driver of sales. Hewlett-Packard currently holds an increasing share lead over number two IBM, although new product introductions from IBM and others could alter the competitive dynamic over time. We expect a 17.1% CAGR in blade servers revenues over 2007–12E.

Blade servers major growth area

Figure 178: Worldwide blade server revenue forecast*Worldwide blade server vendor revenues in US\$ millions*

Source: Gartner Dataquest Insight: Blade Server Growth Plods Steadily Ahead, October 2007. Credit Suisse estimates

Key stock recommendations:

- **Intel (INTC, Outperform):** We favour INTC for the following three reasons: (1) A key component of our thesis is that PCs are on the cusp of entering the 'sweet spot' of the penetration 'S' curve and that PC penetration will accelerate, from the mid-teens to 50%—INTC's 80% share in PC/MPUs should make it one of the leading beneficiaries of this growth; (2) Strong products and roadmap in the two fastest-growing PC segments—notebooks (40% of 2007 revenues) and servers (19% of 2007 revenues); and (3) Server growth potential continues to be under-appreciated by the market—growth in Software as a Service (SaaS) web applications, an increase in online multimedia content and growth in low-end notebooks primarily intended for accessing the web, should continue to drive strong demand for servers over the next five years. We reiterate our Outperform rating on INTC based on the strength of its product line and market share gains, especially in notebooks and servers.
- **EMC Corp (EMC, Outperform):** Despite the prevailing economic uncertainty, networked storage is likely to remain a top priority among IT managers, even though their budgets may be under pressure. EMC's leading market share should serve it well in this respect. We believe networked storage also represents a large opportunity in emerging countries—given the rates of economic growth, we would not be surprised to see enterprise infrastructure build-outs accelerate in the next three to five years. This would be beneficial to network storage vendors. In addition to being the market leader, EMC's intellectual property is highly defensible with over 1,630 patents issued and 1,650 patent applications pending with the U.S. Patent and Trademark Office, which will serve as a barrier for entry for competing storage solution providers. EMC's existing exposure to emerging markets, which we estimate is around 12–14% of total sales, is modest, but will likely continue to grow at a multiple of the corporate growth rate. To take advantage of this opportunity, EMC is making investments now in its direct sales force while also working to expand its network of channel, alliance, and service partners in these international arenas. As a point of reference on EMC's execution on its growth strategies, the emerging markets grew sales 40% y/y in the most recent quarter.

Communications equipment: it's good to talk

Although we are again analysing a hardware industry with communications equipment, communication is a key intangible, in our view, and an absence of efficient communication networks has a material impact on productivity. Establishing communication networks within any developing economy is vital—failure to do so would likely stall growth, specifically hindering the ability to engage with the international markets.

From a global perspective, there remains a meaningful gulf between developed and emerging markets in terms of communications infrastructure. This is evident in the degree of penetration of wireline networks, broadband access and telephony. In the developed markets, copper and—increasingly—fibre-based wireline networks are ubiquitous, and broadband access penetration rates typically are in excess of 50% of the population, with access speeds typically greater than 1Mbps. Enterprise networks are also ubiquitous, rely on IP (Internet Protocol)-based next-generation technologies, and bring together various technologies including wireless LAN and traffic processing/application management with basic Layer 1 transport and Layers 2 and 3 switching and routing technologies. Emerging economies, in contrast, typically lack extensive wireline networks, suffer from broadband deployment rates that are less than 10% of connected homes, are still well below their developed market peers in telephony penetration and are characterised by enterprise LANs whose technology and functionality are relatively rudimentary. These disparities result in significant disparities in productivity.

The gulf between emerging and developed markets

Better communications infrastructure is fundamental in the emerging markets to the provisioning of productivity enhancing services and applications and the process of deploying new and upgrading existing communications infrastructure has already commenced. India, China, Russia and countries throughout the Asia-Pacific, Latin America, Eastern Europe, Africa and Middle East regions have significantly ramped up their investments in both wireline and wireless communication infrastructure. Wireless build-outs (as illustrated by capex/revenue ratios) by service providers throughout the emerging markets regions stand out, as most of these countries, suffering from limited wireline infrastructure, have sought to leapfrog their economies into the 21st century. Infrastructure deployments by service providers in emerging market regions in turn are a precursor to the increasing deployment of next-generation LAN/SAN and WAN infrastructure by enterprises.

Better communications infrastructure is fundamental to emerging markets

Figure 179: Capex/revenue ratio by region (2004–08E)

Global Capex/ Revenue - Annual Capex as % of Revenues	2004	2005	2006	2007	2008E
United States	16.0%	16.8%	17.7%	17.2%	17.1%
Europe	13.6%	13.4%	14.3%	14.2%	13.4%
Asia-Pacific	19.7%	19.1%	20.0%	20.5%	20.1%
Japan	15.9%	17.5%	17.2%	15.9%	18.9%
Korea	15.7%	14.8%	17.8%	17.0%	18.9%
China	31.1%	28.4%	29.1%	29.3%	31.8%
Scandinavia	17.7%	19.6%	16.6%	17.5%	16.6%
Russia	37.3%	35.9%	24.5%	20.3%	24.4%
India	31.7%	32.8%	36.3%	51.6%	52.1%
Middle East	31.7%	21.4%	16.3%	20.7%	24.5%
Africa	21.0%	24.0%	26.1%	18.8%	32.6%
Latin America	16.5%	15.8%	14.3%	14.2%	13.5%
Canada	22.6%	23.3%	19.3%	18.7%	21.3%
Total	17.0%	17.3%	17.6%	17.6%	18.3%

Source: Company data, Credit Suisse estimates

These trends are further illustrated in Figure 180. Capital expenditures by service providers in emerging market regions have seen a c.24% CAGR over the past five years versus approximately 9% for service provider capex in developed markets over the same period. As a result, service provider capital expenditures in emerging markets have increased by 10 percentage points as a share of global carrier capital expenditures—to 35% in calendar 2008E from 25% in calendar 2003.

Figure 180: Global carrier capex

Global Capex - Annual \$ USD millions	2003	2004	2005	2006	2007	2008E	2009E	CAGR 2003-08E
AGGREGATE CAPEX	148,345	176,476	200,516	225,626	256,684	285,693	279,452	14.0%
Developed Markets	109,014	124,134	137,539	151,548	162,132	169,447	155,772	9.2%
Wireline	60,302	65,716	74,638	86,172	99,826	104,668	93,513	11.6%
Wireless	48,712	58,418	62,901	65,375	62,306	64,779	62,259	5.9%
Emerging Markets	39,330	52,342	62,977	74,078	94,553	116,246	123,680	24.2%
Wireline	17,417	23,853	24,531	25,634	29,285	33,352	36,270	13.9%
Wireless	21,913	28,489	38,447	48,444	65,268	82,895	87,411	30.4%
Wireline	77,720	89,569	99,169	111,806	129,111	138,019	129,782	12.2%
Developed Markets	60,302	65,716	74,638	86,172	99,826	104,668	93,513	11.6%
Emerging Markets	17,417	23,853	24,531	25,634	29,285	33,352	36,270	13.9%
Wireless	70,625	86,907	101,348	113,820	127,574	147,674	149,670	15.9%
Developed Markets	48,712	58,418	62,901	65,375	62,306	64,779	62,259	5.9%
Emerging Markets	21,913	28,489	38,447	48,444	65,268	82,895	87,411	30.4%

Global Capex - Y/Y Growth	2004	2005	2006	2007	2008E	2009E
AGGREGATE CAPEX	19.0%	13.6%	12.5%	13.8%	11.3%	-2.2%
Developed Markets	13.9%	10.8%	10.2%	7.0%	4.5%	-8.1%
Wireline	9.0%	13.6%	15.5%	15.8%	4.9%	-10.7%
Wireless	19.9%	7.7%	3.9%	-4.7%	4.0%	-3.9%
Emerging Markets	33.1%	20.3%	17.6%	27.6%	22.9%	6.4%
Wireline	36.9%	2.8%	4.5%	14.2%	13.9%	8.7%
Wireless	30.0%	35.0%	26.0%	34.7%	27.0%	5.4%
Wireline	15.2%	10.7%	12.7%	15.5%	6.9%	-6.0%
Developed Markets	9.0%	13.6%	15.5%	15.8%	4.9%	-10.7%
Emerging Markets	36.9%	2.8%	4.5%	14.2%	13.9%	8.7%
Wireless	23.1%	16.6%	12.3%	12.1%	15.8%	1.4%
Developed Markets	19.9%	7.7%	3.9%	-4.7%	4.0%	-3.9%
Emerging Markets	30.0%	35.0%	26.0%	34.7%	27.0%	5.4%

Source: Company data, Credit Suisse estimates

As evidence of the importance of wireless network deployment in emerging markets, wireless infrastructure capex continues to outpace wireline infrastructure capex in emerging markets by approximately 100%. Over time, we would expect to see increased capex on wireline relative to wireless infrastructure in emerging markets. This is likely to be required as demand for an efficient and capable network increases as traffic from enterprise and residential customers picks up.

Wireline likely to follow
current wireless build

Overall, our industry growth forecasts for 2008–12 illustrate that the majority of incremental growth in global carrier capital expenditures is likely to be driven by emerging market economies, where we expect to see an 8.3% CAGR 2007–12E versus a 2.0% CAGR in developed markets. Notably, accelerating growth rates in the Latin America, Middle East and Africa regions, from 2009E to 2012E, are anticipated, on our forecasts, to offset some of the decelerating growth rates in non-Japan Asia and Eastern Europe.

Figure 181: Telecom equipment investment forecast by region

Telecom Equipment USD millions	2005	2006	2007	2008E	2009E	2010E	2011E	2012E	CAGR (%) 2007-2012E
Latin America	22,933	21,107	19,492	20,113	20,946	22,793	24,952	27,447	7.1
Y/Y growth		-8.0%	-7.7%	3.2%	4.1%	8.8%	9.5%	10.0%	
Eastern Europe	18,515	20,623	22,257	23,979	27,683	30,411	32,087	33,692	8.6
Y/Y growth		11.4%	7.9%	7.7%	15.4%	9.9%	5.5%	5.0%	
Middle East and Africa	16,294	20,389	23,716	25,891	28,252	31,153	34,455	38,245	10.0
Y/Y growth		25.1%	16.3%	9.2%	9.1%	10.3%	10.6%	11.0%	
Non-Japan Asia Pacific	62,246	76,027	87,727	101,271	115,099	129,131	127,982	129,262	8.1
Y/Y growth		22.1%	15.4%	15.4%	13.7%	12.2%	-0.9%	1.0%	
Total Emerging Markets	119,988	138,147	153,192	171,254	191,981	213,488	219,476	228,646	8.3
Y/Y growth		15.1%	10.9%	11.8%	12.1%	11.2%	2.8%	4.2%	
Total Developed Markets	184,995	196,041	201,006	204,245	208,608	212,509	218,113	222,475	2.0
Y/Y growth		6.0%	2.5%	1.6%	2.1%	1.9%	2.6%	2.0%	

Source: Gartner, Credit Suisse estimates

The opportunity for communication infrastructure and other technology companies is illustrated by Saudi Arabia's public announcement of its intention to build six entirely new cities at a cost of over US\$300bn. A proportion of this will go towards deploying the latest technology, including a next-generation communication/networking infrastructure, in order to maximise the economic and social potential of the planned cities.

The main players

Cisco, as the leading and dominant supplier of communications networking equipment, is the most leveraged among its peers to the emerging markets, from a product, customer and geographic perspective. Its business is broad-based and is still characterised by limited competition. While wireless contracts are typically larger than wireline, the market within the emerging economies is characterised by intense competition and correspondingly intense price and margin pressure. We note that Cisco's Layer 3 routing and Layer 2 Ethernet switching platforms should continue to play a significant role in the wireless backhaul portion of wireless network build-outs in China, India and other emerging market regions.

Cisco is the dominant force

Over the past three years and until Q1 FY08, Cisco's emerging markets revenue increased by over 25% per year. Even with the decelerating growth rate in the emerging markets over the past several quarters, Cisco's revenue from this segment is still growing—in excess of 23%—which is over twice the company's total revenue growth rate.

Cisco does not include China and India in its emerging markets segment, as it already has extensive infrastructure in place in each region. We show Cisco's growth rates in these regions separately in Figure 182. The importance of these regions to Cisco's future growth and outlook can perhaps best be appreciated by Cisco's announcement of its intention to invest US\$16bn in its China operations over the next five years.

Figure 182: Cisco: Total revenues by market

CSCO Geographic Revenues	2005				2006				2007				2008			
	Oct-04	Jan-05	Apr-05	Jul-05	Oct-05	Jan-06	Apr-06	Jul-06	Oct-06	Jan-07	Apr-07	Jul-07	Oct-07	Jan-08	Apr-08	Jul-08
Developed Market Revenues	4,988	4,964	5,174	5,384	5,379	5,288	6,070	6,418	6,677	6,702	7,127	7,418	7,710	7,558	7,629	7,879
% total revenues	83.5%	81.9%	83.6%	81.8%	82.1%	79.8%	82.9%	80.4%	81.6%	79.4%	80.4%	78.6%	80.7%	76.9%	77.9%	76.0%
% Q/Q growth	n/a	-0.5%	4.2%	4.1%	-0.1%	-1.7%	14.8%	5.7%	4.0%	0.4%	6.3%	4.1%	3.9%	-2.0%	0.9%	3.3%
% Y/Y growth	n/a	n/a	n/a	n/a	7.8%	6.5%	17.3%	19.2%	24.1%	26.7%	17.4%	15.6%	15.5%	12.8%	7.0%	6.2%
Emerging Market Revenues	983	1,098	1,013	1,197	1,171	1,340	1,252	1,566	1,507	1,737	1,739	2,015	1,844	2,273	2,162	2,485
% total revenues	16.5%	18.1%	16.4%	18.2%	17.9%	20.2%	17.1%	19.6%	18.4%	20.6%	19.6%	21.4%	19.3%	23.1%	22.1%	24.0%
% Q/Q growth	n/a	10.0%	-9.6%	11.1%	-1.7%	13.1%	-15.4%	14.7%	-6.1%	11.8%	-4.7%	8.9%	-9.6%	19.8%	-4.5%	8.6%
% Y/Y growth	n/a	n/a	n/a	n/a	19.1%	22.0%	23.6%	30.8%	28.7%	29.6%	38.9%	28.7%	22.4%	30.9%	24.3%	23.3%
CSCO Asia-Pacific Market Revenues	566	623	603	694	635	720	648	850	755	847	900	1,049	977	1,048	1,037	1,192
% total revenues	9.5%	10.3%	9.7%	10.5%	9.7%	10.9%	8.9%	10.6%	9.2%	10.0%	10.2%	11.1%	10.2%	10.7%	10.6%	11.5%
% Q/Q growth	n/a	8.4%	-5.2%	8.2%	-8.1%	12.1%	-18.5%	20.3%	-13.3%	8.8%	1.1%	9.5%	-8.0%	4.2%	-0.6%	8.6%
% Y/Y growth	n/a	n/a	n/a	n/a	12.2%	15.6%	7.5%	22.5%	18.9%	17.6%	38.9%	23.4%	29.4%	23.7%	15.2%	13.6%
CSCO Emerging Market Revenues	417	475	410	503	536	620	604	716	752	890	839	966	867	1,225	1,125	1,293
% total revenues	7.0%	7.8%	6.6%	7.6%	8.2%	9.4%	8.2%	9.0%	9.2%	10.5%	9.5%	10.2%	9.1%	12.5%	11.5%	12.5%
% Q/Q growth	n/a	12.2%	-15.4%	15.3%	7.1%	14.3%	-11.8%	8.7%	2.5%	14.8%	-10.3%	8.2%	-11.4%	37.3%	-7.8%	8.6%
% Y/Y growth	n/a	n/a	n/a	n/a	28.5%	30.5%	47.3%	42.3%	40.3%	43.5%	38.9%	34.9%	15.3%	37.6%	34.1%	33.9%

Source: Company data, Credit Suisse research

Cisco's profitability in emerging markets is not, however, representative of the overall industry. Gross margin derived from sales in emerging markets for most communication product markets remains well below that generated in developed markets. Wireless and transport (i.e. optical transport and broadband access) infrastructure stands out in terms of product markets that suffer from significant disparity in pricing and margins between emerging and developed markets. Hence, while higher growth potential exists in emerging markets, increased competition in these markets has helped to compress gross margins in recent years. Throughout 2007 and 2008, Cisco's gross margin in emerging markets has generally lagged developed markets, by as much as c.500bps in the October fiscal first quarter of 2008. We would not expect this trend reverse as competition is unlikely to subside in the foreseeable future.

Another sign of the opportunity and the threat posed by emerging markets comes in the form of the emergence of Huawei, a supplier with headquarters in Shenzhen, China. Over the past decade, Huawei has matured from a start-up supplier with well under than US\$1bn of revenue, to one of the largest and fastest growing global suppliers of communications infrastructure. In the process, Huawei has emerged as perhaps the largest competitive threat to a number of Western suppliers, including Ericsson, Alcatel Lucent, Nokia Siemens, Nortel and Motorola. Huawei derives approximately 90% of its revenues from service providers, which also helps explain the difference between the growth rate of global capital expenditures and the revenue growth rates for Alcatel Lucent, Ericsson, Motorola, Nokia Siemens Networks, and Nortel in recent years. Huawei's communications infrastructure revenues increased to over US\$10.7bn in calendar 2007 from less than US\$2bn in calendar 2000. In 2007 alone, Huawei's revenues increased by 47.3%, or US\$3.5bn. China accounted for approximately 28%, or almost US\$3.5bn, of Huawei's total revenues in calendar 2007.

Huawei: one of the largest and fastest-growing global suppliers of communications infrastructure

Geographical exposure

The following figure sets forth a table of communication equipment suppliers and the geographical exposure for each of the respective companies.

Figure 183: Geographical exposure of Communications Equipment Supplier companies (2007)

			Total			Non-North America/U.S. Exposure Broken Down by Region				
			Revenues (million USD)	North America / U.S.	Non-North America / U.S.	EMEA	Japan	Asia-Pacific	Latin America	International (as reported by the company)
3Com	COMS	\$ 336.4	12.7%	87.3%	22.4%		58.5%	6.3%		
Acme Packet	APKT	\$ 31.7	55.0%	45.0%					45.0%	
ADC Telecommunications	ADCT	\$ 338.5	58.4%	41.5%	25.4%		9.8%	6.3%		
Adtran	ADTN	\$ 119.9	86.8%	13.2%					13.2%	
ADVA Optical	ADV-DE	\$ 80.9	31.8%	68.2%	57.4%		10.8%			
Airspan	AIRN	\$ 17.2	14.0%	86.0%	50.0%		12.0%	24.0%		
Airvana	AIRV	\$ 37.7	98.0%	2.0%					2.0%	
Alcatel/Lucent	ALU	\$ 5,783.9	4.9%	67.2%	41.4%		17.3%	8.5%		
Allot	ALLT	\$ 8.3	32.0%	68.0%	37.0%		31.0%	0.0%		
Alvarion	ALVR	\$ 67.2	9.0%	91.0%	53.0%		9.0%	29.0%		
ARRIS	ARRS	\$ 273.5	70.0%	31.0%	11.4%		4.9%	14.7%		
Aruba	ARUN	\$ 42.6	65.9%	34.1%	20.1%		10.3%	3.7%		
AudioCodes	AUDC	\$ 43.7	57.0%	43.0%	31.0%		12.0%			
Aware	AWRE	\$ 5.9	61.8%	38.2%					38.2%	
BigBand	BBND	\$ 39.9	87.0%	13.0%	3.9%		3.8%	5.2%		
BlueCoat	BCSI	\$ 88.2	46.6%	53.4%	37.3%		15.2%	0.9%		
Brocade	BRCD	\$ 354.9	62.0%	38.0%	28.5%		9.4%			
Ceragon	CRNT	\$ 47.2	11.0%	89.0%	37.0%		50.0%	2.0%		
Ciena	CIEI	\$ 227.4	74.5%	25.5%					25.5%	
Cisco	CSCO	\$ 9,791.0	52.2%	47.8%	21.9%	10.2%	10.6%	5.0%		
Commscope	CTV	\$ 1,005.1	50.2%	49.8%	27.3%		15.0%	7.5%		
Ditech	DITC	\$ 6.7	55.4%	44.6%	24.3%		15.7%	4.6%		
D-Link	625487	\$ 269.3	24.0%	76.0%	27.0%		49.0%			
Echelon	ELON	\$ 35.6	39.1%	60.9%	44.8%		16.2%			
Ericsson	ERICY	\$ 7,047.2	9.8%	90.8%	52.2%		29.2%	9.4%		
Extreme	EXTR	\$ 82.0	36.7%	63.3%	46.6%		15.6%	1.1%		
F5	FFIV	\$ 159.1	57.0%	43.0%	21.0%	11.0%	11.0%			
Foundry	FDRY	\$ 150.1	72.8%	27.2%	15.7%		7.6%	3.9%		
Harmonic	HLIT	\$ 87.3	61.4%	38.6%					38.6%	
Infinera	INFN	\$ 95.5	80.6%	19.4%	17.9%		1.5%			
Juniper Networks	JNPR	\$ 822.9	51.0%	49.0%	29.0%		20.0%			
Motorola	MOT	\$ 7,450.0	83.0%	17.0%					17.0%	
Netgear	NTGR	\$ 198.2	40.0%	60.0%	50.0%		10.0%			
Nokia-Siemens	NOK	\$ 19,316.0	3.5%	96.5%	50.5%		37.8%	8.2%		
Nortel	NT	\$ 2,758.0	45.2%	54.8%	21.4%		28.5%	4.8%		
Packeteer	PKTR	\$ 37.2	46.2%	53.8%	24.5%		29.4%			
Polycom	PLCM	\$ 258.9	53.0%	47.0%	27.0%		17.0%	3.0%		
Radware	RDWR	\$ 22.2	24.0%	76.0%	36.0%		40.0%			
Riverbed	RVBD	\$ 73.0	55.0%	45.0%					45.0%	
Sandvine	SAND.L	\$ 8.3	86.1%	13.9%	6.9%		5.5%		1.5%	
Shoretel	SHOR	\$ 31.5	94.2%	5.8%					5.8%	
Sonus	SONS	\$ 74.0	83.0%	17.0%	11.0%	4.0%	1.0%		1.0%	
Starent	STAR	\$ 56.2	95.9%	4.1%		2.0%	1.7%		0.3%	
Sycamore	SCMR	\$ 41.5	43.0%	57.0%					57.0%	
Tandberg	TAA-NO	\$ 178.1	44.9%	55.1%	44.3%		10.7%			
Tekelec	TKLC	\$ 118.2	53.0%	47.0%					47.0%	
Tellabs	TLAB	\$ 464.0	75.3%	24.7%					24.7%	
UTStarcom	UTSI	\$ 586.0	72.0%	28.0%	2.9%	2.2%	20.0%	2.9%		
Veraz	VRAZ	\$ 27.9	16.0%	84.0%					84.0%	
Voltaire	VOLT	\$ 16.6	53.0%	47.0%	36.0%	5.5%	5.5%			
Westell	WSTL	\$ 44.7	94.4%	5.6%					5.6%	
Zhone Technologies	ZHNE	\$ 43.0	45.9%	54.1%	24.0%		2.9%	27.2%		
ZTE	B04KP8	\$ 1,208.0	26.2%	73.8%			73.8%			
Average		\$ 60,508.2	33.2%	66.9%	33.1%	1.7%	23.4%	5.9%	2.7%	

Source: Company data, Credit Suisse research

Wireless equipment: driving intangible benefits

Over the past few years, we believe that the rapid growth in mobile subscribers, especially within emerging markets (that has now reached some 2.3 billion out of a global base of 3.2 billion as of the end of 2007), is in part due to a common belief by governments, regulators, operators and equipment vendors in not only the economic benefits of mobile telephony, but also the social benefits. The key strategy to drive growth has been to lower the affordability threshold and, in turn, improve penetration. We argue that this approach has indeed been successful and we expect that the number of subscribers will continue to grow, reaching some 4.4 billion by 2010E, with 93% of the growth coming from emerging markets.

Emerging market
subscribers dominate
subscriber statistics

In this respect, we believe that such growth continues to be additive to the wireless handset and infrastructure markets. However, we now believe that in addition to this, several significant emerging markets are beginning to consider major rollouts of wireless networks for 3G technology, namely in India and China, which will bring data services to such markets for the first time, given the relatively low fixed line penetration along with material improvements in productivity and efficiency. We believe that the correlation between GDP growth and the intangible benefits of wireless technology remain highly linked, with the only difference being that while the growth over the past decade was as a result of falling prices and improving penetration, the current focus will move to improving faster data networks and 3G data services. Again, we point to the example of a tangible form of infrastructure (3G networks) facilitating the demand for an intangible feature: data.

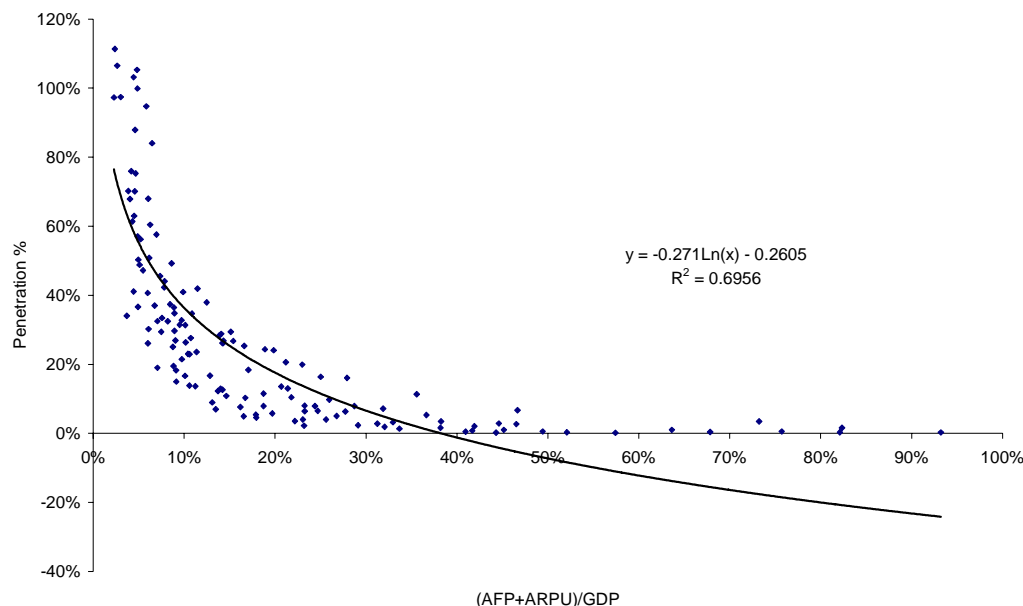
Data driver—intangible
driver for the BRIC world

A high intangible benefit from the rollout of voice telephony remains

There is a statistically significant relationship between mobile affordability and mobile penetration and GDP. Based on cross-sectional data for 26 countries since 1995, we find a statistically significant relationship (R squared of around 70%) between mobile affordability ((ARPU+AFP)/GDP) and mobile penetration.

Figure 184: Linking affordability to mobile penetration—statistically significant

Units in %, unless otherwise stated



Source: Credit Suisse research

Prices have been successfully driven down at the low end of the market from both a handset cost and ARPU perspective through many means, including increased buying pressure from the GSMA.

This should mean that subscribers will continue to grow

We argue that the clear and proven correlation between mobile telephony and GDP growth means that the continued expansion of the tangible mobile network coverage remains a key investment that will in turn deliver intangible benefits. We assume that the mobile subscriber base will grow from 3.2 billion in 2007 to 4.4 billion by 2010E, with the bulk of growth coming from emerging market regions, namely India, China and Africa.

Figure 185: Mobile subscribers by region

Mobile Subscribers in '000

	2004	2005	2006	2007	2008E	2009E	2010E	CAGR 07–10E
Maturing markets								
Asia-Pacific (developed)*	137,294	143,371	151,034	157,925	159,443	163,354	167,830	2.0%
North America	196,362	223,537	249,183	274,505	289,986	303,423	320,204	5.3%
Western Europe	368,571	402,518	436,695	451,912	466,117	476,701	485,928	2.4%
Sub-total (A)	702,227	769,427	836,912	884,342	915,546	943,478	973,963	3.3%
% change	10%	10%	9%	6%	4%	3%	3%	
% market	40%	35%	31%	28%	25%	23%	22%	
Less developed markets								
India	48,220	75,923	142,115	222,513	326,512	415,439	475,628	28.8%
China	316,324	374,444	443,603	531,829	638,555	732,073	830,456	16.0%
Rest of Asia Pacific**	168,014	221,928	306,325	389,344	475,671	532,116	582,546	14.4%
Africa	75,828	127,625	190,172	260,143	326,796	392,882	458,742	20.8%
Central/Eastern Europe	181,186	267,857	329,591	371,467	404,725	417,580	430,862	5.1%
Latin America	172,087	239,333	303,646	348,736	387,338	409,344	429,130	7.2%
Middle East	71,361	98,423	128,759	158,000	181,763	196,394	212,750	10.4%
Sub-total (B)	1,033,019	1,405,532	1,844,210	2,282,032	2,741,361	3,095,829	3,420,114	14.4%
% change	38%	36%	31%	24%	20%	13%	10%	
% market	60%	65%	69%	72%	75%	77%	78%	
Global total (A+B)	1,735,247	2,174,959	2,681,122	3,166,374	3,656,907	4,039,307	4,394,077	11.5%
% change	25%	25%	23%	18%	15%	10%	9%	

Source: Company data, Credit Suisse estimates

* Korea, Japan, Australia, Hong Kong, Taiwan, Singapore

** Including Thailand, Indonesia, Malaysia, Philippines

The next leg is 3G investment

While we believe that the rollout of 2.5G voice networks and its benefit to GDP is understood, we believe that the next major development within the wireless equipment space could be the accelerated upgrade cycle to move these networks onto 3G technology. In theory, this would drive higher data speeds, improve productivity for businesses and accelerate the rollout of the Internet. Indeed, we believe that the drivers of these trends are becoming increasingly clear, with regulators in major markets such as India and China embracing the need for significant investment in such networks.

Emerging market fixed line penetration is low, so wireless is needed for data services

One key driver highlighting the need for 3G rollouts in emerging markets is simply that currently, fixed-line penetration is low. Indeed, as shown in Figure 186, in several markets such as India and China, mobile penetration now meaningfully exceeds fixed-line. This indicates that the preferred means of delivering data services in such countries is potentially via a 3G wireless network, which will in turn require significant investment. This will of course benefit the handset industry over time, but first and foremost we believe it will benefit the wireless infrastructure market.

Figure 186: Wireless penetration is currently around double wireline penetration in the top 10 emerging markets

Country	Wireless penetration	Wireline penetration
China	39.9%	32.0%
India	19.6%	5.1%
Indonesia	35.2%	6.1%
Brazil	61.5%	21.4%
Mexico	58.6%	20.4%
Russia	109.4%	30.2%
Thailand	71.8%	11.3%
Philippines	52.7%	4.0%
South Africa	67.4%	9.9%
Nigeria	28.7%	1.1%
Total	38.4%	17.8%

Source: Company data, Credit Suisse estimates

Chinese 3G rollouts imminent: a major spending boom looks likely

On 24 May 2008, China's MII (Ministry of Industry and Information), NDRC (National Development and Reform Commission) and the MOF (Ministry of Finance) made a joint official announcement on the Chinese telecom industry restructuring plan, with all four Chinese operators announcing their restructuring plans as follows.

- China Telecom, China's fixed-line operator, has acquired China Unicom's CDMA network and will merge with China Satellite Communications Corp. As a result of this restructuring, China Telecom will become an integrated service provider and deploy a CDMA2000/EV-DO network migrating the existing operations from China Unicom. Subsequently, China Telecom's parent company has announced that it intends to spend over Rmb80bn (US\$12bn) on CDMA network capacity and coverage expansion over the next three years. The network capacity is expected to reach over 200 million users, with China Telecom targeting an additional subscriber base of over 100m. 70% of the spending is expected to be on base stations.
- China Mobile will acquire China Railcom and China Tietong. We believe that China Mobile will migrate towards a GSM/TD-SCDMA network and will also focus on high-growth businesses such as broadband and IPTV. As evidence of China Mobile's support for the TD-SCDMA technology, the phase I pre-commercial trial was for eight cities, with the next phase planned to roll out to a total of 300 cities. More recently, according to sina.com, the MII has allowed China Mobile to conduct nationwide TD-SCDMA trials. We think this could be viewed as a sign that the government will release China's first 3G mobile licence to China Mobile (however, the MII has previously said that it will issue formal 3G licences upon completion of the telecom industry restructuring).
- China Unicom to merge with China Netcom. This merger is now substantially complete. We would expect the merged entity to receive a formal 3G licence to provide WCDMA services in China. Given that we see Netcom as one of the weaker players, the success and global scale of WCDMA would be an advantage versus other technologies: we believe that this merger will allow the 'New China Unicom' to position itself within WCDMA and fixed line. In addition, China Unicom recently announced that it intends to spend around Rmb100bn (US\$14.6bn) on its 3G network over the next three years.

We believe that the above is a precursor to Chinese 3G licensing and networks being rolled out. Indeed, in Figure 187, we summarise the speculated or confirmed investment plans of the Chinese carriers. As noted, the upgrade cost could be some US\$13.4bn compared with overall wireless infrastructure revenues of US\$56.4bn in 2007—i.e. accounting for some 24% of the total wireless infrastructure market in 2007.

Figure 187: Per annum 3G spending by Chinese 3G operators is equivalent to some 24% of overall infra revenues in 2007

US\$ in billions, unless otherwise stated

Operator	Technology	Total spending plan (US\$)	Time frame (yrs)	Per annum spend (US\$)
China Telecom	CDMA2000 EVDO	12	3	4
China Mobile	TDSCDMA	4.5	1	4.5
China Unicom	WCDMA	14.6	3	4.9
Total		31.1		13.4
% of 2007 wireless infra revenues				23.7%

Source: Company data, Credit Suisse estimates

India is also eyeing 3G licensing

Shortly after the Chinese telecom restructuring announcements, the Indian telecoms regulator announced that 3G licensing could take place in the next six months. The government has recently issued some guidelines on what to expect:

- spectrum to be allotted through a global auction, with new entrants (including foreign companies) being allowed to participate;
- reserve price for auction for pan-India spectrum placed at Rs 20.2bn; and
- winning bidders, if not currently holding UASL, will have to pay a UASL entry fee in addition to a 3G fee (Rs 16bn for pan-India).

Overall, we believe that while the risks of delays here could indeed be high, it is clear again that another major emerging market will pursue 3G network rollouts, improving the outlook for wireless infrastructure longer term.

Figure 188: Cellular networks: Regulation and extent of development in emerging Asia

Country	FY08E GDP/capita (US\$)	MNP	3G licences issued	Foreign ownership restrictions	No. of competitors	Local content availability	FY08E 2G penetration	FY08E 3G penetration
China	3,240	No	No	Yes	3	Yes	452	n/a
Hong Kong	31,923	Yes	Yes	No	5	Yes	1,146	254
India	1,082	No	No	Yes	7-10	None	294	Nil
Korea	19,808	Yes	Yes	Yes	3	Extensive	944	355
Taiwan	19,300	Yes	Yes	Yes	3	Yes	960	491
Philippines	2,022	No	Yes	No	3	Some	683	Nil
Singapore	42,227	Yes	Yes	No	3	Some	1,293	468
Malaysia	8,108	Yes	Yes	Yes	4	Some	852	50
Thailand	4,716	No	No	Yes	5	None	878	Nil
Indonesia	2,225	No	Yes	Yes	10	None	621	Nil

Source: Company data, Credit Suisse estimates

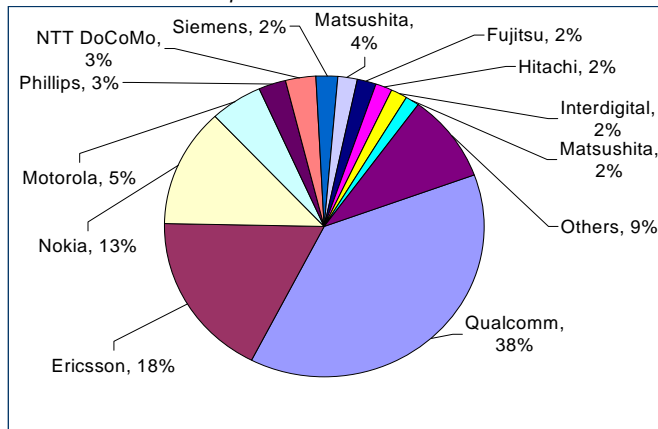
Key recommendations

The companies within the wireless equipment area that we believe will directly benefit from this growth are:

- **Qualcomm (QCOM, Outperform):** We expect Qualcomm's addressable market to grow at an average rate of 22% pa over 2007–10E, from 382 million units to 698 million. This growth is being driven by the acceleration of WCDMA principally in developed markets today. However, we believe that the uptake in China and India could be significant in the longer term. Here, we believe that on the chipset side, Qualcomm should benefit, given its strong product roadmap and ease of implementation. On the licensing side, we believe that Qualcomm's robust IPR position (as shown in Figure 189 and Figure 190, it is seen as a robust provider of IPR based upon two different studies), combined with the company's successful track record in enforcing IPR in markets such as India, China and Latin America, as well as the recent recognition by Nokia of its 2G, 3G and 4G patent position indicate that the company

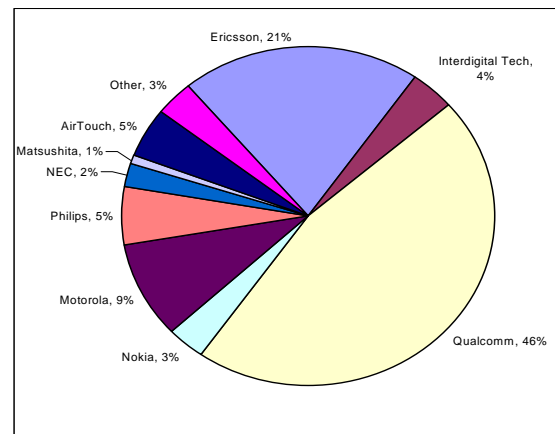
should benefit longer term. Notwithstanding near-term inventory issues in the QCT business, we believe that given strong long-term growth prospects, fading litigation risks and scope for leverage, the stock is inexpensive, trading at 11.8x our fiscal 2010 estimates. In addition, we continue to see an additional 15–20% earnings upside potential from share buybacks, new-growth areas (such as Gobi and Snapdragon), potential opportunities at Motorola, Chinese 3G restructuring and Nokia.

Figure 189: Qualcomm leads on declared patents...
% of declared WCDMA patents



Source: Cellular Standards and Patents, Goodman & Myers, 2005

Figure 190: ...and on declared essential citations
% of essential citations



Source: 'Patent Counting, A Misleading Index of Patent Value: A Critique of Goodman & Myers'—Martin & De Meyer, 2006

- **Nokia (NOK, Neutral):** With a market share of 40% globally and 50% in emerging markets, as well as being the strongest brand in Asia, it is hard to see how Nokia will not benefit from the continuing growth of voice penetration in emerging markets, especially with the opportunity to use its installed base to directly sell consumer Internet services to such markets. We also believe that competitively, the company has barriers to entry in the form of chipset efficiency, IPR, brand, scale and distribution which others may struggle to replicate, even if local competition in China is likely to intensify over time. However, for now the stock is rated Neutral, given the nearer-term concerns over its smartphone positioning and the limited top-line growth we envisage in the next 12 months.

Delivering Internet content in Non-Japan Asia

Asia: Internet and content accessed over fixed line

Clearly, intangible infrastructure cannot flourish without adequate tangible infrastructure being in place: the two enjoy symbiotic development. Thus, Internet content businesses tend to be strongest in Korea and Taiwan and weakest in less-developed parts of Asia.

Broadband penetration in Non-Japan Asia is now 34 broadband connections per 1,000. Of course, the penetration rates vary widely, depending on the GDP per capita and the regulatory structure of the industry.

Penetration rates are, not surprisingly, highest in the markets with the highest GDP per capita. However, GDP levels seem to be a necessary, but not sufficient, condition for broadband growth. We note that in markets where there is a more aggressive regulatory regime, enforcing greater competition, penetration rates tend to be higher. Hong Kong, Korea and Taiwan fit this model, while Singapore lags somewhat, given its current duopoly structure. In some cases, the regulator attempts to open competition at the access level, rather than in the form of duplicate infrastructure, by unbundling the local loop (ULL). This has been done in Hong Kong, Korea and Taiwan.

Figure 191: Broadband networks—regulation and extent of development in emerging Asia

Country	FY08E GDP/capita (US\$)	ULL*	NGN planned?	Subsidised?	Launch date	No. of competitors	Local (language) content	FY08E Broadband penetration*
China	3,240	No	No	n.a.	n.a.	2	Yes	53.3
Hong Kong	31,923	Yes	No	n.a.	n.a.	5	Bi-lingual	285.8
India	1,082	No	No	n.a.	n.a.	Multiple	Limited	4.6
Korea	19,808	Yes	Yes	No	2005	Multiple	Extensive	315.6
Taiwan	19,300	Yes	Planning	No	n.a.	1	Bi-lingual	217.9
Philippines	2,022	No	No	n.a.	n.a.	1	Limited	12.2
Singapore	42,227	No	Yes	Yes	2Q09	2	Some	216.3
Malaysia	8,108	No	Yes	Yes	n.a.	1	Some	62.7
Thailand	4,716	No	No	n.a.	n.a.	3	Limited	21.0
Indonesia	2,225	No	No	n.a.	n.a.	1	Limited	3.0

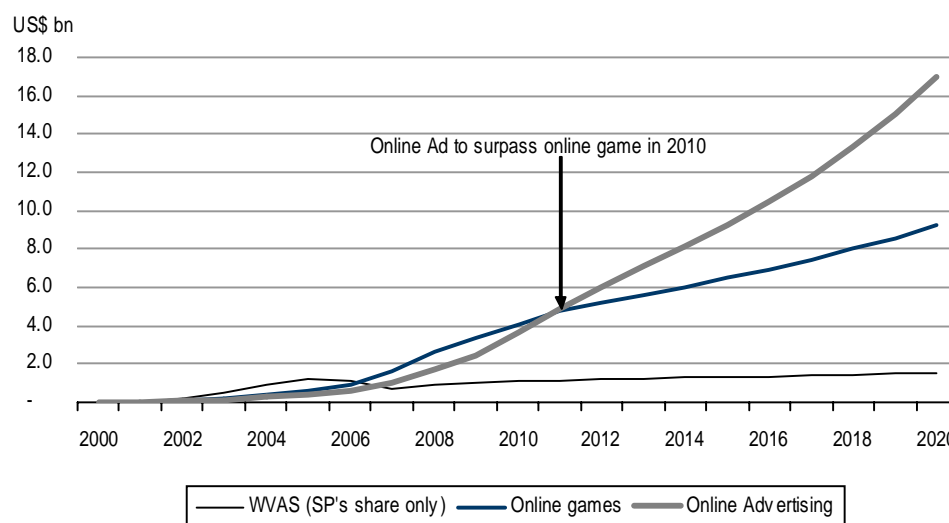
Source: Company data, Credit Suisse estimates * penetration measured by broadband connections per thousand people

With one of the best broadband infrastructures in the world, Korea's Internet sector is flourishing. We believe well over 90% of traffic remains inside Korea. With innovative products and unique services tuned to local culture and language, the country's Internet space is dominated by local players such as NHN and Daum in Internet portal, NCsoft and Nexon in online game, G-Market and Auction in the open market e-commerce space and SK Communications (Cyworld) in social-networking sites. Korean content providers are backed by significant revenues generated from online ads, which are already the world's highest in terms of online ads to the total ad market (16%).

Internet sector strong in Korea

In H108, according to China Internet Network Information Center (CNNIC), a semi-government research entity, China had 253m Internet users, up 56.2% y/y or 20.5% half on half. The growth of China's Internet users is accelerating, given supportive government policy, carriers' continuous investment in Internet infrastructure, the stringent regulation of traditional media, as well as the successful incubation of 'killer applications'. Currently, we forecast China's Internet users to grow at a 7.7% 2008–18 CAGR to reach 650 million by 2020. Our forecast assumes the China Internet market will undergo a fast-growth phase in the next two to three years until reaching 400–500 million, similar to the size of the urban population in China. Afterwards, we expect the growth of China Internet users to slow down to match the rate of urbanisation.

China is the largest Internet market in the world, in terms of number of users

Figure 192: Online games, online advertising and WVAS market forecast

Source: Credit Suisse estimates

There are three key successful and profitable business models in the Chinese Internet market—wireless value-added services (WVAS), online games and online advertising. Currently, online gaming is the largest Internet segment in China, with a US\$2.7bn market size. In the long run, we expect online advertising (including brand advertising and paid search) to surpass online games, given the strong growth in the consumer market and the rising advertising budget from traditional into online media.

The Chinese Internet market has incubated 16 listed companies, with a market capitalisation of over US\$50bn. These businesses tend to be particularly cash generative: we estimate all listed Chinese Internet companies have over US\$5bn net cash on hand and already employ in excess of 30,000 staff each in China. Within the sector, we have Outperform ratings on **NetEase**, **Sina**, **Tencent** and **Perfect World**. Among these, we believe Tencent, the largest Instant Messaging (IM) provider in China, should provide the best long-term sustainable growth due to its: i) huge community size (over 822m registered users and a 342 million active user base); ii) diversified business portfolio (including online games, non-game Internet VAS, wireless VAS, online advertising (portals), paid search, and C2C platform); and iii) strong balance sheet (Tencent had US\$577m of net cash at Q208 and should generate US\$250m+ free cash flow per year.)

Asia: Internet and content accessed over cellular

With wireless data to total ARPU reaching well over 20%, mobile data is flourishing in Korea. Wireless data services, however, have remained in a walled garden of mobile operators. The three operators—SKT, KTF and LGT—maintain their own mobile portal and basically control what goes in and out of the mobile data platform. For the paid content service, mobile operators take 10% of fees as part of a revenue-sharing scheme. As operators start migrating the subscriber base to a 3G service, further efforts are being made to implement a full browsing service under the mobile platform.

Although the mobile penetration rate has reached nearly 100% in Taiwan, the use of Internet content over cellular is disappointingly low. Over the last three-and-a-half years, the data revenue percentage has picked up by only 4ppt from 6% to 10%. Besides, SMS accounts for 50% of the data usage. Other non-SMS data usage remains not so popular. Internet and content over cellular remain limited in Taiwan.

In China, wireless value-added services (WVAS) is a sizable market, we estimate it is worth US\$937m. WVAS services are predominantly based (70%+ of revenue) on 2G technology, because most handsets can only support 2G services. Thus, most content over cellular is low intensity, e.g. ringtones, pictures, but not video. The growth of the WVAS market has mainly been driven by the fast growth of cellular subscribers in China and strong carrier promotions. However, with more stringent policies on content, carriers' stronger control on the WVAS platform and carriers' partial move into the walled-garden platform, we expect much lower growth in WVAS going forward. We expect the WVAS market to grow at a CAGR of only 5.8% in 2007–17.

We think China's wireless internet market offers very significant business potential as the 3G network is deployed and 2.5G/3G handsets increase their penetration. The high variety of content, applications and services should attract more users. However, carrier content strategy remains a key overhang on the WVAS market. In the meantime, various WVAS players have listed, including Linktone, Kongzhong and Hurray. In addition, major Internet companies, e.g. Sina, Sohu and Tencent, provide WVAS as part of their portfolios.

For the developing markets (India, Indonesia, Thailand and the Philippines), we do not foresee any meaningful investment in next-generation infrastructure until the penetration rates of first-generation broadband services (ADSL) have picked up.

Next-Generation Networks: putting the next growth driver in place

In Singapore, Prime Minister Lee Hsien Loong announced plans for a Next-Generation National Network (NGN) in March 2006. The concept is to build an ultra-high-speed next-generation wired network capable of delivering symmetric speeds of between 100 Mbps and 1 Gbps to 100% of homes, offices and schools in Singapore by 2015. The IDA will subsidise the project to the tune of S\$1bn (US\$735m), and winning bids will be announced for both projects by end-February 2009. Following the Singaporean example, Malaysia has also announced an NGN project, with the government likely to subsidise it with around RM2.4bn (US\$700m). Malaysia's High-Speed Broadband project is intended to provide speeds of 100 Mbps to 1 Gbps to 1.3m premises (roughly 25% of the total) in Malaysia over the next 10 years.

In other countries, the market is set to decide the pace of NGN growth. NGN is well underway in Korea, with subscribers with 100 Mbps over 4m (out of total broadband subs of 12.1m). All three major broadband operators—KT, Hanaro and Powercomm—are aggressively migrating their lower broadband subs over to their NGN platforms.

In Taiwan, given that ChungHwa Telecom is the largest integrated operator, it will likely play the key role in NGN in the market. With 90% broadband market share, CHT has already indicated that it plans to invest NT\$130bn (c.US\$4.2bn) in NGN over seven years (2007–13).

For the developing markets (India, China, Indonesia, Thailand and the Philippines), we do not foresee any meaningful investment in Next-Generation infrastructure until penetration rates of first-generation broadband services (ADSL) have picked up.

Trends in IT and IP protection in emerging markets

By IP Law Expert Richard E. Neff, Partner and Chair, IP & Technology Group at Greenberg Glusker in Los Angeles

The 1990s represented the high-water mark of multilateral intellectual property protection in a world dominated by US power and influence. The WTO's TRIPS (Trade-Related Aspects of Intellectual Property Rights) Agreement, which was adopted in 1994, introduced the concept of minimum worldwide intellectual property standards. Throughout the 1990s, US industry associations in conjunction with the US government (and with some assistance from the European Union) also worked bilaterally to ensure that most of the world's copyright and other intellectual property laws were reformed to ensure protection of computer software and stronger patent protection also. The EU strengthened its own protection through directives such as the EU Software Directive (1991) and Database Directive (1994). After TRIPS was adopted, any country that wished to accede to the WTO, such as China, had to agree to elevate its IPR protection to TRIPS levels. TRIPS ensured not only national treatment and most-favoured nation treatment for all member countries, but established worldwide protection of computer programmes as literary works, ensured the protection of databases and compilations, and prevented the commercial rental of computer programmes without the creator's consent. A minimum 50-year term was ensured for the protection of works not based on the life of an author.

However, the most radical—and necessary—provisions of the TRIPS Agreement concerned the first worldwide standards on enforcement of intellectual property rights, in Part III. These standards required: (1) US-style judicial procedures, requiring reasoned opinions based on evidence and at least some US-style discovery; (2) ordering parties to desist from infringement, preventing the entry of infringing goods into commerce, and preserving evidence through the use of injunctions; (3) damages adequate to compensate injury, and the possibility of pre-established or statutory damages even for innocent infringement; (4) provisional measures on an ex parte basis where delay might cause irreparable harm or evidence could be destroyed; (5) stronger border measures to interdict the importation of pirated and counterfeit goods; (6) criminal procedures and penalties at least for wilful trademark counterfeiting and copyright piracy on a commercial scale.

The US and the EU tended to view the TRIPS Agreement as a threshold of universal protection, but developing countries with their overburdened and ineffective courts and enforcement resources often viewed the Agreement as a worthy goal. Both the US and the EU often favoured a TRIPS-Plus approach in bilateral negotiations, seeking IPR protection and enforcement standards higher than the TRIPS baseline from developing countries. Some of TRIPS-Plus was embodied in the WIPO (World Intellectual Property Organization) Copyright Treaty, adopted at the end of 1996, which took effect years later in 2002 after it was ratified by 30 countries. At present there are 67 member countries, excluding Brazil, India, Russia, South Africa and most of the EU (even though the EU directives reflect most of its provisions). This was an attempt to ensure a baseline level of international protection for digital works, and made clear that the author controls communicating a work to the public, and the making available of works to the public. This was the first international treaty that prescribed effective legal remedies against the circumvention of technological measures used by authors to protect their works, as well as prohibiting the removal or alteration of rights management information (RMI) without authorisation, or distribution or communication to the public of works with RMI removed.

The first decade of the new millennium has been marked not only by a relative decline in US geopolitical and economic power relative to the 1990s, but a growing critique in the developing world about whether the adoption of US and EU-sponsored or mandated levels of substantive and procedural IPR protection is in their national interests. Not only have a significant number of countries resisted ratifying the WIPO Copyright Treaty, but a growing 'Development Agenda' questions whether strong IPR protection, in areas such as digital protection and enforcement and strong patent protection, is warranted. An example was the Development Agenda proposed by Argentina and Brazil at WIPO in 2004, which stated

in part: "... many of the developing countries and LDCs that have taken up higher IP obligations in recent years simply lack the necessary infrastructure and institutional capacity to absorb such technology... Even in developing countries that may have a degree of absorptive technological capacity, higher standards of intellectual property protection have failed to foster the transfer of technology through foreign direct investment and licensing."

Consequently, while both the growth and protection of intellectual property and information technology increased markedly since 1990 in the developing world, in the more multi-polar world of 2008, IPR protection may have reached a plateau, engendering a developing country backlash, with some emerging countries expressing more interest in focusing on other priorities.

Figure 193: Summary: Trends in IT and IP protection in emerging markets

Key regions	Current IP protection rights	Trend in conditions over last 5–10 years*	Expectations for next 5–10 years*
Latin America	Adequate IP protection on books, relatively poor enforcement and weak protection in practice, especially in smaller markets. Some call-centre outsourcing (e.g., Costa Rica), but language and education limitations on R&D outsourcing. Brazil has most significant domestic development.	1	2 overall: deterioration in certain markets e.g., Venezuela, Ecuador; stability or improvement in others.
Eastern Europe + Russia	Improving legislative landscape in Eastern Europe due to European integration, weak protection in Russia. Growing market for goods due to reasonably high growth rate, problem is lack of protection in Russia. Growing outsourcing of R&D to Eastern Europe.	Eastern Europe: 1; Russia: 2	Improvements in Eastern Europe with European integration: 1; possible deterioration in Russia: 3
Middle East + South Africa	South Africa has decent IP protection due to English legal tradition. Middle East (outside of Israel) tends to offer inadequate protection. Israel is one of the world's major R&D centres; the rest of the Middle East lacks language skills and educational infrastructure.	1	Possible improvements in certain Middle Eastern markets: e.g., Emirates; 2 in general
Non Japan Asia	Remarkable growth and improvement in certain countries (e.g., Korea), China and India remain problematic for protection. Both are growing markets for goods and services, and promising centres of R&D.	1	1: as markets develop and try to attract R&D, expect improvements
Key countries			
Brazil	Good IP laws on books (except patent protection), but a patchy enforcement record. Some R&D and development, market leader in Latin America. Better tradition of IP enforcement than most emerging markets.	2	2
India	Very poor enforcement, ineffective judicial system (no criminal convictions in software piracy), but good R&D. Threat of tech transfer always exists where enforcement is lax.	2	1
China	Improved legal infrastructure. Enforcement depends on government will but signs of progress (e.g. 2007 IPR Action Plan resulted in numerous shutdowns). However, the threat of tech transfer remains, given corruption and generally low respect for IP rights.	1	1
Indonesia	Indonesia ranks badly in terms of use of illegal software. According to IIPA, the 2007 software piracy rate was estimated at 85%, meaning only 15% of applications in use in Indonesia were legitimate. In 2007, the Indonesia authorities began prosecuting more cases involving end-user piracy of business software, but the targets are typically small businesses.	2	1
South Africa	Good legal system and reasonable enforcement, relatively weak educational system and entrepreneurship, with significant brain drain still dampening the prospects for strong R&D development.	2	2
Turkey	Turkish authorities have stepped up IP anti-piracy enforcement over the past few years, but business software piracy end-user rates are still high, estimated at 64% in 2007. Enforcement is generally poor but may improve with recently created specialised IP units to tackle this crime.	1	1
Russia	Enforcement has improved: in 2007, the Russian Ministry of the Interior reported that more than 7500 criminal cases were opened against IPR crimes, however, piracy is still rampant. Enforcement could suffer from deteriorating bilateral relations with the US. Good R&D potential, but high risk of intentional tech transfer and industrial espionage.	2	3

Source: Richard E. Neff, Partner and Chair, IP & Technology Group at Greenberg Glusker in Los Angeles

* 1 = Improvement, 2 = stability, 3 = deterioration

Figure 194: Selected tech stocks with significant emerging market exposure

Ticker	Company	Main listing	Description	% revs from emg mkts 2008E	Rec	Mkt cap (US\$m)	PE on FY1
Chinese internet							
0700.HK	Tencent Holdings	HKG	Tencent's QQ Instant Messaging platform has over 780mn registered users. We expect an EPS CAGR of 29.5% from 2008E-13E, mainly due to the continued rapid growth in Instant Messaging users in China.	100%	O	9,849	26.0x
BIDU.OQ	Baidu	NSM	Baidu is the largest search engine and portal in China. We expect an EPS CAGR of 31.5% from 2008E-13E, mainly due to the strong growth in Chinese internet search traffic.	100%	N	4,866	28.3x
KONG.OQ	Kongzhong	NSM	Kongzhong is the largest WAP and one of the top three Chinese WVAS service providers. We expect an EPS CAGR of 69% from 2008E-13E on the back of increasing wireless data usage post the 3G licence issuance.	100%	N	119 4092.7	x
PWRD.OQ	Perfect World Co Ltd	NMS	Perfect World is a leading online game operator and developer in China. We expect an EPS CAGR of 9.4% from 2008E-13E, mainly thanks to a successful game pipeline.	100%	O	1,003	51.2x
SNDA.OQ	Shanda	NSM	Shanda is the largest online game operator in China. We expect Shanda's EPS CAGR to decline by 7.5% from 2008E-13E owing to: i) the absence of a successful game pipeline; ii) aging of existing games; iii) rising costs.	100%	N	1,635	20.1x
NTES.OQ	Netease.com	NSM	NetEase is a leading online game operator and developer. NetEase is also one of the top three general portals in China and provides WVAS to mobile phone users. We expect an EPS CAGR of 10.1% from 2008E-13E.	100%	O	2,309	280.5x
NCTY.OQ	THE9 Ltd	NSM	The9 is one of the top three online game operators in China. We expect The9 5-year EPS growth will be at 4.3% CAGR 08E-13E due to: (i) moderate growth of key licensed games; (ii) incremental growth from self-developed games.	100%	N	364	6.0x
SINA.OQ	Sina Corporation	NSM	Sina is (i) the largest internet portal in China, in terms of traffic and revenue; (ii) the most popular blog service provider in China; (iii) one of the largest wireless VAS providers in China. We expect an EPS CAGR of 28.6% from 2008E-13E, mainly due to growth in the wireless data business.	100%	O	1,670	21.2x
Korean internet							
037150.KQ	CJ Internet Corp	KOE	As one of key game portals in Korea, CJi both develops and publishes web board games and casual games. Growth is largely generated by the company's aggressive game publishing operation.	>90%	O	171	8.5x
035720.KQ	Daum Communications	KOE	Daum Corp is one of Korea's leading internet portal service providers. We expect Daum's earnings growth to be driven by growth of the online ad market and increasing market share.	>90%	O	247	6.7x
036570.KS	NC Soft	KSC	NCsoft Corporation develops and markets computer software, such as web editing software and on-line games.	>90%	N	608	30.2x
095660.KQ	Neowiz Games	KOE	Neowiz Games is one of largest online game portals in Korea. The company both develops and publishes online web board and casual games.	>90%	O	113	7.8x
035420.KQ	NHN Corp	KOE	NHN Corp provides internet sites with web portal services and marketing services through text and banner advertisements. NHN's growth depends on growth of the Korean online ad market. NHN is also looking to launch its search services in overseas markets such as Japan and China.	100%	O	3,820	15.3x
066270.KQ	SK Communications	KOE	SKComm offers diverse online services, such as a search portal, online instant messenger and a social network site. SKComm's growth strategy is centred around monetising the high level of traffic on its social network site (Cyworld).	>90%	O	137	-10.3x
Software							
MSFT	Microsoft Corp.	NSQ	Microsoft develops a wide range of software products including the Windows operating system. Microsoft relies on emerging markets to generate growth of its Windows operating system. Success in emerging markets also depends on Microsoft's ability to limit piracy, a recent area of focus for the company.	~15%	O	185,680	10.0x
ADSK	Autodesk Inc.	NSQ	Autodesk sells computer-aided design software and services. Growth in emerging markets is driven by architectural and commercial construction design activities.	17-18%	N	3,834	8.4x
ORCL	Oracle Corporation	NSQ	Oracle is a leading provider of enterprise software which includes database technology, business applications and professional services. Oracle has established dominance in the emerging markets, mostly through its database business.	20%	N	84,231	10.6x
SAPG.F	SAP	FRA	SAP is one of the world's largest developers and suppliers of integrated enterprise business applications. China, India and Russia have all been growing strongly for the group.	13%	O	40,661	15.1x

Source Credit Suisse research and estimates

Figure 195: Selected tech stocks with significant emerging market exposure

Ticker	Company	Main listing	Description	% revs Rec from emg mkts 2008E		Mkt cap (US\$m)	PE on FY1
Hardware/semis							
INTC	Intel Corp.	NSQ	Intel is the world's largest semiconductor company and the largest supplier of microprocessors (CPUs). Higher PC penetration in the emerging markets is key to Intel's growth outlook. We believe the introduction of netbook PCs in emerging markets at affordable prices will be another supporting factor.	45-50%	O	78,550	11.8x
LLTC	Linear Technology Corp.	NSQ	Linear Technology designs, manufactures and markets a broad line of high-performance analog semiconductors. The specialised product portfolio and high margin leverage has allowed LLTC to maintain high gross margins and protects the stock from downside risks in a recessionary environment.	30-35%	O	4,471	12.9x
2330.TW	TSMC	TAI	TSMC manufactures and markets integrated circuits. 70% of direct revenues are from US customers, but 45% of chip consumption is bound for emerging markets and should grow with rising consumer product and PC penetration.	45%	O	31,741	10.2x
BRCM	Broadcom Corp.	NSQ	Broadcom is the leading provider of components for manufacturers of broadband digital transmission equipment. Broadcom benefits from rising tech penetration rates of digital set-tops, digital TV and wireless connectivity.	40%	O	6,743	9.3x
DELL	Dell Inc.	NSQ	Dell is one of the world's leading computer systems companies. Dell generated 61% of 2007 revenues from the Americas, 25% from EMEA and 14% from Asia-Pacific including Japan. In Dell's July 2008 quarter, BRIC revenues grew 41% year-on-year and contributed 9% of revenues.	17-19%	O	22,329	8.0x
EMC	EMC Corp.	NYS	EMC designs, manufactures, markets and supports high-performance storage products and provides related services for mainframe, open systems and network-attached computer storage markets worldwide. The US represents approximately 56% of EMC's revenues, EMEA contributes about 30%, while Asia-Pacific including Japan contributes about 10% of total revenues.	16-18%	O	21,959	13.6x
HPQ	Hewlett-Packard	NYS	Global leader in computing & imaging solutions, printing systems, IT services. EMEA is its largest region, accounting for c41% of total revenues. The US represents c33% of revs. Canada and Latin America contribute an incremental 9%. Asia-Pacific incl Japan rounds out the geography mix at c17%.	18-20%	N	89,364	9.6x
IBM	International Business Machines	NYS	IBM develops and manufactures advanced IT products and services. The Americas generated 41% of 2007 revenues, EMEA contributed roughly 35%, while Asia-Pacific including Japan was nearly 20% of revenues. The BRIC region continues to be IBM's fastest growing, increasing c18% y/y in 2007.	22-24%	N	112,535	9.4x
2353.TW	Acer Inc.	TAI	Acer distributes semiconductor products, personal computers, computer peripherals, multimedia products, and computer software. The company also provides maintenance and repair services to customers.	NA	O	3,350	9.4x
2454.TW	MediaTek Inc.	TAI	MediaTek is a fabless company. It designs and sells integrated circuits for DVD players, optical storage drives, handset baseband and digital TVs. It has the largest global market share for DVD players and is growing in handsets.	NA	N	7,155	10.8x
2317.TW	Hon Hai Precision	TAI	Hon Hai manufactures and markets electronic connectors and cable assemblies. It is a beneficiary of rising PC penetration in emerging markets. It is also increasingly involved in producing networking equipment.	NA	O	14,342	7.4x
Communications Equipment							
QCOM	Qualcomm	NSQ	A chipset manufacturer. We expect Qualcomm's addressable market to grow at an average 28% pa over 2007-10E. This growth is being driven by the acceleration of WCDMA, principally in developed markets. However, we believe that the uptake in China and India could be significant longer term.	29%	O	55,574	15.8x
MOT	Motorola	NYSE	A handset manufacturer and wireless/fixed infrastructure equipment provider. The Americas made up 65-70% of total revenues in 2007.	36%	U	9,768	74.4x
NOK1V.HE	Nokia	Finland	A handset manufacturer and wireless/fixed infrastructure equipment provider.	56%	N	55,369	7.9x
ERICb.ST	Ericsson	Sweden	A wireless and fixed infrastructure equipment provider.	65%	U	22,693	11.6x
0763.HK	ZTE	HKG	ZTE is one of the major suppliers of handset and networking equipment in China and other emerging markets.	100%	O	2,960	11.4x
CSCO	Cisco Systems Inc.	NSQ	Cisco manufactures and sells networking and communications technologies and products to enterprise customers and service providers. The company also provides services including technical support and advanced services.	23%	N	98,777	12.5x
JNPR	Juniper Networks	NSQ	Juniper Networks provides security and networking solutions to service providers, enterprises, government, and educational institutions worldwide. To date, much of the growth has been driven by service provider build-outs and increasing bandwidth demand in EMEA, China, and the ASEAN nations.	35-40%	N	9,635	14.7x

Source: Credit Suisse research and estimates

Business services: we can fix it

Key findings

- Business services form an important support structure for economic growth, enabling companies to function in a more efficient and competitive way. Services like IT or logistics, which can in theory be done in-house, in practice allow companies to concentrate more on core businesses. Typically, we have found that the greater the penetration of business services in a country, the higher the GDP per capita.
- The theme has a relevance in both developed and developing economies. Developed economies continue to improve their productivity through outsourcing while developing economies access the best-in-class global providers of the services they require to participate in external trade and facilitate consumer activity. Selecting stocks now isn't straightforward as the cyclical slowdown does in many cases cloud the nearer-term earnings outlook. We highlight three key areas for the long term.
- In the outsourcing division, Gartner expects worldwide spend on IT services to increase by a 7.4% CAGR over 2007–12. Within this, emerging countries are expected to grow most quickly, by a 10–16% CAGR over 2007–12 vs 5–7% for developed markets.
- The global money transfer industry market was worth more than US\$320bn in sales in 2007 but we expect it to top US\$500bn within the next five years, delivering a CAGR of c.9%. With the global economic slowdown, we forecast transfers to developing countries to decline by 1% in 2009, with a 6% rebound in 2010. Revenue growth is strongest from China, India and Latin America.
- Global trade has grown by an average 6.9% per annum over the last 20 years, according to the IMF. The structural growth in exports looks set to continue with the continued advance in global communications. Beneficiaries are: (1) logistics; (2) inspection and certification companies; and (3) legal publishing companies.

Figure 196: Business Services Sector: Investment recommendations

Infosys Technologies: well established offshore model

The offshore IT services industry is highly competitive, with established Indian players and growing presence of MNCs. However, Infosys enjoys a strong advantage through 1) a strong brand name, and 2) an excellent management team. We forecast a 9% 3yr EPS CAGR for the company.

Ticker: INFY.BO

Rating: Outperform

Bhuvnesh Singh

Accenture: a potential beneficiary of cost-cutting trends

As the credit crunch spreads, we believe demand for outsourcing and specialised consulting will ultimately increase, benefiting players such as Accenture with large global presence and multi-service offerings. The company has c.US\$3.4bn in cash with virtually no debt, we forecast a 10% CY09 FCF yield. We expect Accenture to grow revenues and EPS at 10% and 15% CAGRs, respectively, over the next 5yrs.

Ticker: ACN

Rating: Outperform

Bryan Keane

Western Union: big is beautiful

WU is the largest money transfer company in the world, with roughly 17% of the market as at end 2007. Barriers to entry in the remittance market are high. A large network of agents must be combined with expertise in International anti-money-laundering, plus the remittance laws for individual countries.

Ticker: WU

Rating: Neutral

Bryan Keane

TNT: benefiting from the long-term trend towards greater global trade

On our estimates, 58% of TNT's 2008E EBIT comes from its European mail business, with the other 42% derived from its global Express business. TNT has confirmed that it intends to continue its geographic expansion despite slowing profitability, which we believe puts it in a good position for the long term.

Ticker: TNT.AS

Rating: Outperform

Peter Hyde

SGS: regulations on quality, safety and environmental standards are proliferating

Looking at the strong underlying trends (outsourcing of testing services, increase in safety requirements, regulations and standards and the shortening of product life cycles), we believe SGS will be able to maintain a high organic growth rate going forward. We forecast a 3yr CAGR in earnings of 13%.

Ticker: SGSN.VX

Rating: Outperform

Patrick Jnglin

Source: Company data, Credit Suisse estimates

The Credit Suisse Business Services Index

Figure 197: Country ranking (2006) and change in rank (1999–2006)

	Country	Improvement in rank (1999 - 2006)	2006 Rank (out of 50)
1	India	14	26
2	Colombia	9	39
3	Thailand	5	30
4	China	4	37
5	Australia	3	23
6	Brazil	2	44
7	Russia	2	32
8	South Africa	2	46
9	Chile	1	29
10	Hungary	1	27
11	Turkey	0	41
12	UK	0	22
13	Venezuela	0	50
14	Mexico	-1	48
15	Argentina	-2	47

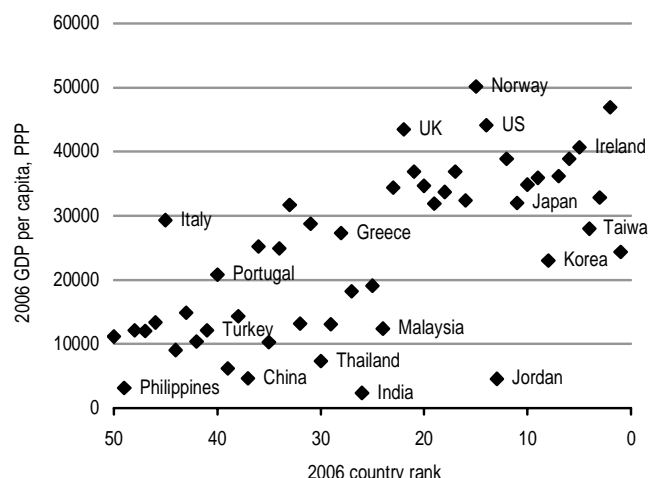
* we list all countries, sorted by change in rank, which are rated lower than 20 on their 2006 score Source: Credit Suisse estimates

The Credit Suisse Business Services Index is a macro-oriented guide to investment decisions in the Business Services sector by country and/or region. It effectively ranks countries' (50) ability to maintain an environment which sustains the development of financial infrastructure; and measures its relation to wealth creation and economic growth.

We have identified four 'hard' data series, those that are readily measured, and five 'soft' data series, those that can be perceived, and applied a two-thirds and one-third weighting to them, respectively. The hard data we selected are: exports of commercial services percentage of GDP; business expenditure on R&D percentage of GDP; total R&D personnel nationwide per capita (full-time work equivalent (FTE) per 1000 people); and patents granted to residents/R&D personnel in business. The soft series are: relocation of R&D facilities is not a threat to the future of your economy; product and service legislation does not deter business activity; skilled labour is readily available; brain drain does not hinder competitiveness in your economy; and entrepreneurship of managers is widespread in business.

Our results show a well-defined relationship between the Credit Suisse Business Services Index and GDP per capita of 69%. The highest correlation of GDP per capita with the Credit Suisse Business Index is observed for the regions of Western Europe, 63%; non-Japan Asia, 89%; Turkey-Israel-Jordan group, 85%; and South Africa, 73%.

Figure 198: Business Services ranking vs GDP per capita (PPP, 2006)



Source: IMF, Credit Suisse estimates

We identify the following regions that present growth potential: South East Asia, the Middle East, Latin America, Eastern Europe and South Africa. More specifically, the countries that present the largest growth potential for Business Services are: India, Colombia, Thailand, China, Brazil and Russia.

The Credit Suisse Business Services Index displays a significant effect on aggregate growth. We calculate that an average 1 point increase in the index produces 0.014 change in GDP per capita growth. The R-squared measuring the overall fit of the model is 40%.

When the same model is applied to both the manufacturing and the services sectors, we find that the Credit Suisse Business Services Index has a positive impact on services output per capita growth, but not on manufacturing value-added per capita growth: a 1 point increase in the Credit Suisse Business Services Index increases services per capita growth by 0.01 percentage points, similar to the effect on the economy as a whole. The R-squared in this case is 38%.

When the same tests are performed separately on developed and developing economies, we find that the impact is larger on emerging countries (a coefficient of 0.02%) than on industrial countries (0.001%).

Finally, when we study the effect of the Credit Suisse Business Services Index on services growth by levels of development, we do not find a statistically significant effect for the developed countries group, but we still find that the index impacts growth with a coefficient of 0.0175 in the case of developing countries. The R-sq in this case is 44%.

Efficiency, cost-cutting and globalisation drive the growth in business services

Within overall services, business services form an important support structure for economic growth, enabling companies to function in a more efficient and competitive way. Services like IT or recruitment, which can in theory be done in house, in practice allow companies to concentrate more on core businesses while depending on trusted experts for other activities. Typically, we have found that the greater the penetration of business services, the higher the GDP per capita. The Credit Suisse Business Services Index displays a correlation co-efficient of 69% with GDP per capita (see previous page for the summary details).

In this section, we consider four areas of global business services:

- **Outsourcing:** Outsourcing helps businesses to better utilise management resources by focusing more on core activities while trusting peripheral activities to the hands of specialist (and potentially cheaper) vendors.
- **Money transfer:** Worker migration, which helps correct labour supply/demand mismatch around the world, has the effect of removing the working population away from their dependants. Money transfer services provide the support system allowing migrant workers to remit savings to families in home countries.
- **Global trading:** Global trade has grown by an average 6.9% pa over the last 20 years, according to the IMF. We expect the *structural* growth in exports to continue with the advance in global communications and the Internet. Three broad sectors benefit and facilitate the expansion in global trading and investment: (1) logistics companies; (2) companies providing services in the field of inspection, testing, verification and certifications; and (3) legal publishing companies, which provide information on tax, accounting and regulation across international markets.
- **Employment services:** In the current scenario of shrinking working population, increasing demands on the right skills and volatility in businesses, employment service firms help companies better manage their human resources with appropriate hiring and temporary hiring.

Of these four, the first three offer the most immediate promise as they have more of a global structural aspect to them rather than being too exposed to the deterioration in labour markets in the developed world. Here, the cyclical negatives risk swamping the structural story.

- As one indication of the growth in outsourcing, Gartner expects worldwide spend on IT services to increase by a 7.4% CAGR over 2007–12. Within this, emerging countries are expected to grow most quickly, by a 10–16% CAGR over 2007–12 vs 5–7% expected from developed markets.
- The global money transfer industry market was worth more than US\$320bn in sales in 2007 but we expect it to top US\$500bn within the next five years, delivering a CAGR of c.9%. With the global economic slowdown, we forecast transfers to developing countries to decline by 1% in 2009, with a 6% rebound in 2010. Revenue growth is strongest from China, India and Latin America.
- Structurally, we expect expansion in global trade to continue, thanks to better communication links which ultimately connect the marketplace on a worldwide basis. Cyclically, trade is likely to take a sharp downturn as the global economy slows. Nevertheless, our growth forecasts for some of the trade-related stocks are relatively strong: we forecast a three-year earnings CAGR at SGS (in the regulation and certification industry) of 13%, and a 3-year EBIT CAGR of 11% and 9% respectively for Expeditors (a freight forwarding company) and Landstar (a ground transporter).

IT outsourcing: a supply and demand story for the emerging markets

IT outsourcing involves sourcing from third-party vendors of IT-related services such as application development, support and maintenance; IT infrastructure management; and package implementation. When such services are sourced from outside the home country (and in most cases from a lower-cost country), it becomes off-shored IT services. Vendors offering IT outsourcing also frequently offer business process outsourcing (BPO) services like customer care, finance and accounts or HR services.

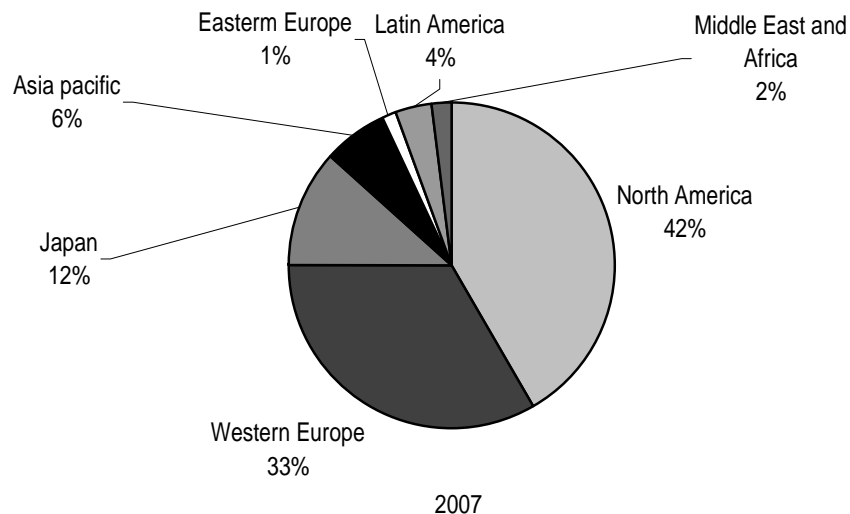
A key trend in recent years in the global outsourcing industry is the growing importance of emerging markets, as both sources of demand and supply. Such companies and industries are improving the intangible infrastructure in the developed world while also improving their own. Our stock recommendation list is skewed towards companies which are leveraged to either of these trends (demand or supply) in emerging markets in a strong way.

Emerging markets leading the growth

Of the US\$748bn worldwide spent on IT services in 2007, the developed countries in North America, Western Europe and Japan accounted for a lion's share (87%). The overall market is expected to grow at a 7.4% CAGR over 2007–12 (according to Gartner).

Emerging countries are increasing their share in the overall spend. Gartner expects the IT services spend in Latin America, Asia-Pacific, the Middle-East and Eastern Europe to register a 10–16% CAGR over 2007–12 vs 5–7% expected from developed markets.

Figure 199: Share of Global IT services market by geographies (2007)



Source: Gartner, Credit Suisse estimates

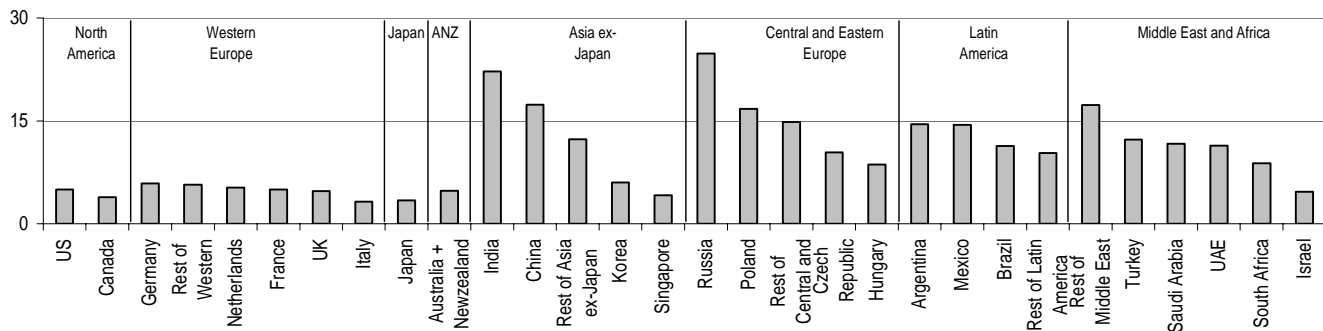
Figure 200: Worldwide IT services spending

US\$ mn	2003	2007	2012E	CAGR 03–07	CAGR 07–12E
North America	240,622	311,545	436,739	6.7%	7.0%
Western Europe	170,679	248,959	342,641	9.9%	6.6%
Japan	76,763	87,508	112,315	3.3%	5.1%
Asia Pacific	29,205	48,020	75,579	13.2%	9.5%
Eastern Europe	6,236	9,678	17,733	11.6%	12.9%
Latin America	15,714	26,964	56,002	14.5%	15.7%
Middle East and Africa	9,562	15,350	27,798	12.6%	12.6%
Total	548,781	748,024	1,068,807	8.1%	7.4%

Source: Gartner, Credit Suisse estimates

The consulting group IDC estimates that some of the fastest-growing IT services markets over the next five years will be Russia, India, China, Poland, Argentina and Mexico.

Figure 201: IT services market growth across countries (% CAGR over 2007–11E)

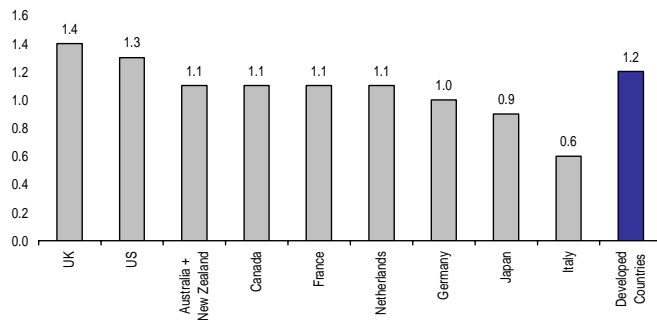


Source: IDC, Credit Suisse estimates

Measuring the market potential in emerging markets

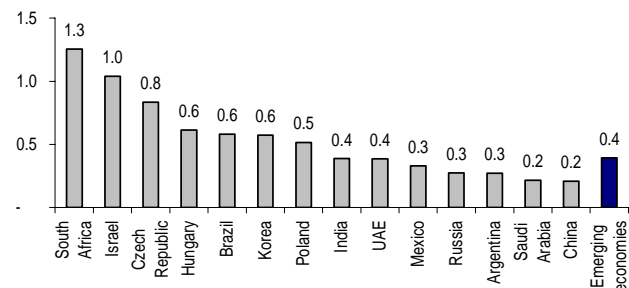
We take nine developed and 14 emerging economies which together account for close to 90% of worldwide IT services spend at end 2007. One metric to measure the penetration of IT services spending is the total spend relative to GDP. For developed countries, this percentage was 1.2% at end 2007, while it is just 0.4% for emerging countries (based on IDC and World Bank data).

Figure 202: IT services spend as % of GDP (developed countries, 2007)



Source: IDC, World Bank, Credit Suisse estimates

Figure 203: IT services spend as % of GDP (emerging countries, 2007)



Source: IDC, World Bank, Credit Suisse estimates

If the IT services penetration in the emerging markets were to be at the same level as for developed countries it would triple from current levels. In this case, emerging markets would account for 25% of the total market, which would be difficult to ignore.

Figure 204: Potential size of IT services market in emerging countries

2007	IT services spend (US\$m)	IT services spend as % of GDP
US	183,844	1.3%
Other developed countries	186,130	1.0%
Developed countries	369,975	1.2%
Emerging countries	42,531	0.4%
Total IT services	412,505	
Emerging countries with IT services spend / GDP similar to developed countries	125,887	1.2%
Total IT services (new)	495,861	

Note: Data from IDC excludes business process management and other services that are included in the Gartner data, and hence the total market sizes are different. Source: IDC, World Bank, Credit Suisse estimates

However, emerging markets could have lower profitability

However, data on operating margins from EDS (now an HPQ company) and TCS suggest that, although emerging markets offer faster growth, they also have lower rates of profitability, in general. This could be attributed to:

- lower pricing in line with lower cost structures; and
- limited ability to offshore to locations with lower costs than the home country.

Figure 205: Operating margins by geography

EDS	2007
Americas	15.2%
EMEA	15.6%
Asia Pacific	10.4%
Infosys	FY3/08
North America	31.4%
Europe	35.4%
India	53.4%
RoW	19.1%
TCS	FY3/08
America	31.7%
Europe	30.5%
India	16.1%
Others	23.7%

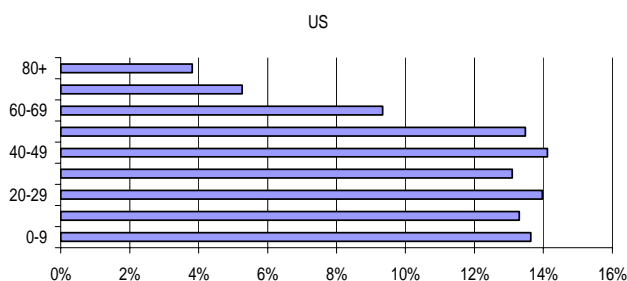
Source: Company data, Credit Suisse research

Offshoring: emerging markets doubling up as sources of supply

The dominant and compelling trend over the last 10 years in the outsourcing landscape is the emergence of offshore services as a viable business threat to traditional outsourcing. In just the last five years, offshore IT service providers (primarily India-based) have managed to increase their market share from ~0.5% to over 5%. The key drivers propelling such phenomenal growth are:

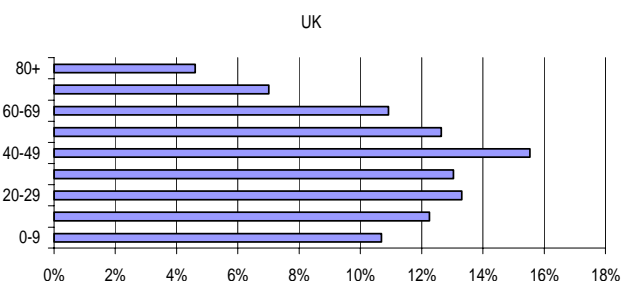
(1) Labour supply/demand. One of the key drivers for growth in outsourcing and offshoring is a mismatch between demand and supply of skilled labour in developed markets. The primary reason for this mismatch in the developed world is an ageing population profile.

Figure 206: Population pyramid for the US (2010)

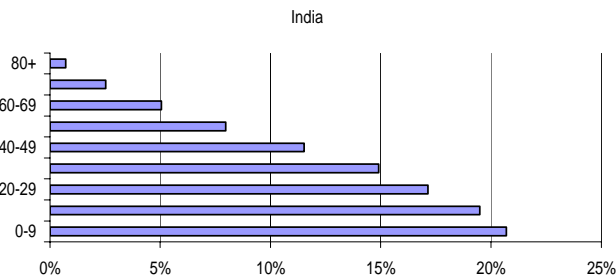


Source: US census bureau, Credit Suisse estimates

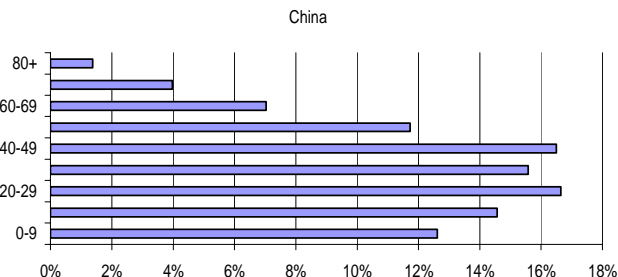
Figure 207: Population pyramid for the UK (2010)



Source: US census bureau, Credit Suisse estimates

Figure 208: Population pyramid for the India (2010)

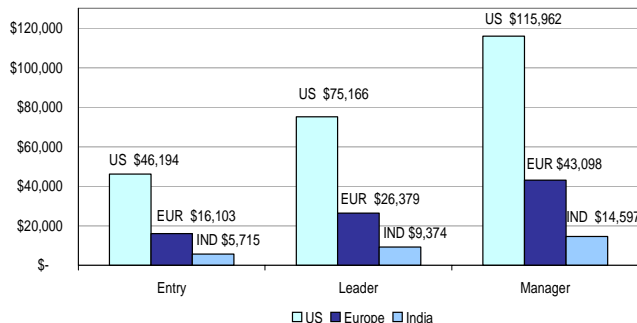
Source: US census bureau, Credit Suisse estimates

Figure 209: Population pyramid for the China (2010)

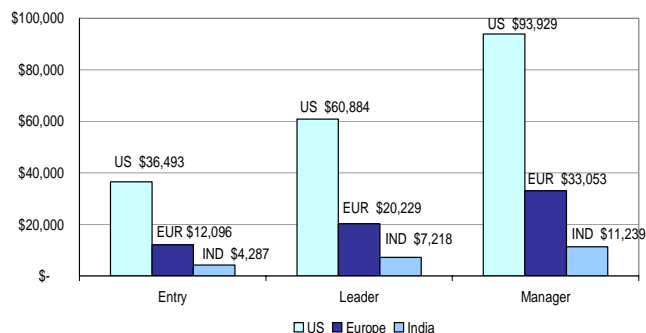
Source: US census bureau, Credit Suisse estimates

However, while demographics are an important driver, it is not sufficient by itself. What is also important is the availability of the relevant skills in the labour pool. According to a study conducted by Watson Wyatt, there is an expected shortage of IT staff over the next five years of as much as 20–40% in the US. Meanwhile, Nasscom estimates that India graduates nearly 2.5 million students a year (including 350,000 engineers). The Indian IT/BPO industry (including exports and domestic sales) employs close to 2 million skilled workers. Of these, just a little under 400,000 are focused on the domestic market, indicating surplus supply in the country.

(2) Cost arbitrage. While geographical mismatch of demand and supply of skilled labour makes offshoring a necessity, wage differentials make it attractive. With entry level salaries in India at around a tenth of that in the US for similar skills, and communication costs falling continuously, use of offshore resources versus domestic onsite resources makes a compelling business case for customers of IT services in developed markets.

Figure 210: Average ITO salaries (2007)

Source: neoIT, Credit Suisse estimates

Figure 211: Average voice BPO salaries (2007)

Source: neoIT, Credit Suisse estimates

Cost reduction has typically been associated with outsourcing efforts, and remains a powerful driver of outsourcing:

- According to a Forrester Research report, US companies could stand to save 12%-17% annually when outsourcing infrastructure management and application services.
- Deloitte Touche Tohmatsu (DTT) reported that nearly half of U.S. banks offshore operations and yield savings of nearly 40%.
- Offshore BPO work within the BFSI segment also provides for improved efficiencies. According to NASSCOM, offshore BPO work generated 15-20% efficiency gains within the segment.

However, while costs are a focus area, they are not the sole reason for outsourcing operations. A recent provider poll from EquaTerra (a services sourcing consulting company) reported that buyers were focusing more on process improvements and innovation and transformation in their outsourcing efforts than on cost reductions.

From the customer's point of view, there is always a decision between performing offshore activities in a captive entity, or to use third-party vendors. A captive operation is an offshore entity established by the customer, typically to reap cost savings and streamline back-office operations. The captive approach can prove lucrative in that it eliminates third-party expenses and provides the parent with complete control of the offshored operation. Deloitte Touche Tohmatsu reported that companies with more than 5,000 workers offshore realise average savings of 45–50% in labour costs per annum, making captive operations an attractive option. A Nasscom-IDC study of 2005 estimated that over 50% of IT spend in India by corporates was spent on internal operations. However, beyond a certain scale, management of the captive operations could place undue strain on the parent company's management resources, possibly at the cost of core business activities. In such a case, the parent company may consider selling off / reducing its stake in the captive entity to get in more focused management. There is also the opportunity to monetise an operation that could possibly help other customers in the same industry.

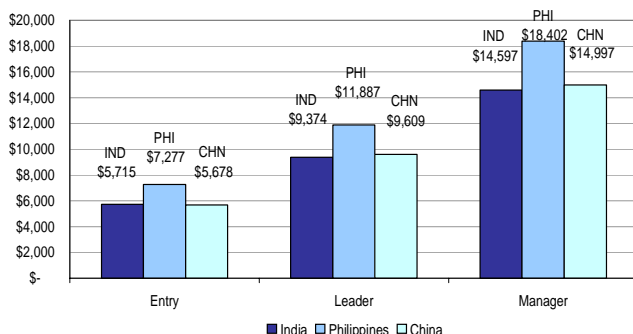
Indian companies have taken the lead in evolving the offshore business model on the back of structural advantages, such as a well established English education system, a sharp rise in engineering colleges over the last 10 years, and the large, young population. In addition, the Indian government took steps to nurture the industry through tax holidays to companies that built up in software technology parks (STPI). The holiday offered companies a lower tax rate and allowed for 100% foreign investment. With the STPI expected to expire in March 2010 (recently extended from March 2009), the Indian government has created special economic zones (SEZs) to continue the development of infrastructure and stimulate local economies. The SEZs offer tax-free status for the first five years, and a lower tax rate over an additional five years.

However, India may be losing advantage to other locations. NASSCOM expects the demand for IT-BPO skills to grow in India, with an expected shortfall of 0.5 million skilled workers by 2010 (with 70% concentrated in the BPO sector). This manifests itself in two problems:

- Sharp wage inflation, to the tune of 10–15% over the past few years, has quickly affected India's competitiveness in the global outsourcing landscape.
- With most of the good-quality engineering colleges already covered under the campus recruitment programmes of IT companies, recruiters are forced to look out for lower-grade engineering/graduate colleges. This manpower may require extended training.

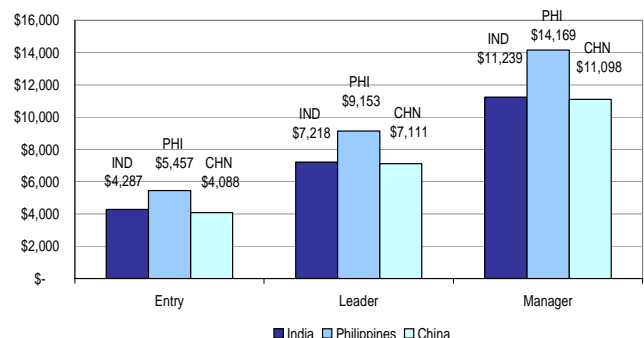
Data from neoIT shows that China could have a slight advantage on salary levels over India.

Figure 212: Average ITO salaries (2007)



Source: neoIT, Credit Suisse research

Figure 213: Average Voice BPO salaries (2007)



Source: neoIT, Credit Suisse research

With the above problems reducing the attractiveness of India as an offshore destination, other countries/cities are looking to attract offshore work. Some of the key contenders include those mentioned in Figure 214.

Figure 214: Emerging outsourcing destinations

Location	Positives	Negatives
China	Ability to scale (population) Low cost Proximity to Japan and Japanese language and culture	Language - English is not as prevalent as in India Easy IP rules
Russia	Highly educated human resource Major US companies like Intel, Motorola, Sun etc already have sizeable development presence	Relative inexperience - evident in very few CMM certified companies Language - English is not as prevalent as in India Business environment not friendly
Brazil	Proximity to US, time zone similarities Ability to scale (population)	Labour costs around 30% higher than India and China Language - English is not as prevalent as in India
Ireland	Favourable taxes English language familiarity	High costs compared to other destinations
Philippines	Well established call centre industry Similarity to US in language and education system	Lacks size and scale
Israel	Highly educated human resource	Political stability
Romania	Proximity to European economies, time zone similarities Lower costs compared to W.European countries English language familiarity	Lacks size and scale

Source: Company data, Credit Suisse research

What are the opportunities in outsourcing?

Figure 215 lists the various opportunities within IT services, with corresponding growth rates, margins and key players. Of these, application development, system integration and BPO are the largest segments. We note that offshore outsourcing encompasses most of the services in general IT services, with an emphasis on delivering the services from a remote location.

Figure 215: Types of outsourcing

Service Type	Description	Average Stats	Key Drivers/Factors	Key Players
IT Consulting	•Often includes systems integration work (links applications to each other or to an existing IT infrastructure) and Application development •Strategic, architectural, and implementation work	•Avg Rev Growth: 5-8% •Avg Margins: 15-20%	•Exposed to discretionary spending •Exposed to the offshore wave	ACN- 60% of rev. CapGemini- 15% of rev. BP- 100% of rev. Deloitte-24% of rev CSC- 35% of rev IBM- 30% of GS rev Atos Origin- 48% of rev
IT Outsourcing (ITO)	•Infrastructure outsourcing, desktop/network management, data center outsourcing	•Avg Rev Growth: 0-4% •Avg Margins: 5-8%	•Highly commoditized •Capital intensive	EDS- 55% of rev. CSC- 47% of rev. IBM- 28% of rev. Unisys-35-40% of rev.
Business Process Outsourcing (BPO)	•Assumption of responsibility for a client's specific business process •HR Outsourcing, F&A Outsourcing, transaction processing	•Avg Rev Growth: 8-10% •Avg Margins: 10-15%	•Expanding service offerings •Low capital intensity •Recent consolidation activity •Intensifying competition from offshore companies	ACS- 75% of rev. IBM-15 % of GS rev. EDS- 15% of rev. Hewitt- 65% of rev.
Application Outsourcing	•Application Maintenance & Development	•Avg Rev Growth: 7-8% •Avg Margins: 10%-15%	•Moving offshore •Development move •Discretionary	ACN- 20% of rev. EDS- 30% of rev. CSC- 20% of rev. IBM- 15% of GS rev.
Offshore Outsourcing	•Application •BPO •Testing Services •Remote Infrastructure Outsourcing	•Avg Rev Growth: 25-40% •Avg Margins: 20-28%	•Relatively immature •Expanding beyond traditional application work •Captives pose a threat •Multinationals aggressively expanding	Infosys *SYNT Tata Consultancy Wipro *WNS Cognizant *EXLS Satyam *G

Source: Company data, Credit Suisse research

Market structure: fragmented and evolving

The global IT services market is quite fragmented, with the largest vendor (IBM global services) accounting for only 7.2% of the worldwide market as at the end of 2007. The top 10 vendors account for only 25.6% of the market, with market shares rapidly falling off beyond the top 10.

Figure 216: The Global IT services market is highly fragmented

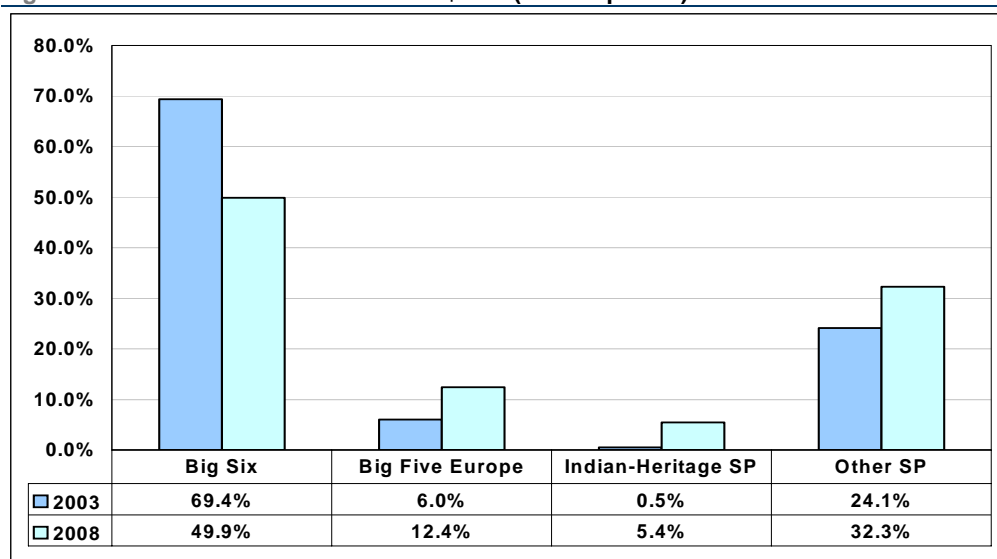
Company	2006 sales (US\$m)	% share	2007 sales (US\$m)	% share
IBM	48,247	7.1%	54,148	7.2%
EDS	21,396	3.2%	22,130	3.0%
Accenture	17,228	2.5%	20,616	2.8%
Fujitsu	17,918	2.6%	18,620	2.5%
HP services	15,963	2.4%	17,252	2.3%
CSC	15,136	2.2%	16,306	2.2%
Lockheed martin	10,875	1.6%	11,957	1.6%
CapGemini	10,020	1.5%	11,914	1.6%
Northrop Grumman	8,876	1.3%	9,879	1.3%
NEC	8,745	1.3%	9,014	1.2%
<i>Top 10</i>	<i>174,404</i>	<i>25.8%</i>	<i>191,836</i>	<i>25.6%</i>
Total end user spending	677,058	100.0%	748,055	100.0%

Source: Gartner, Credit Suisse research

With an increase in deal volume and break up of mega deals, smaller IT service players have been able to offer specialised services at lower prices and enter the market. While the Big Six services providers (IBM, Accenture, ACS, CSC, EDS / HP (taken separately)) continue to dominate the market, they are losing share to regional and other players.

TPI, a outsourcing advisory firm, regularly tracks the contract wins by various service providers, and says that share of the Big Six providers in annualised value of contracts awarded globally has fallen from 69.4% in 2003 to less than 50% in 1Q CY08. At the same time, the Big Five European providers (CapGemini, Logica, T-Systems, Steria, Atos Origin) have doubled their share, while India-based service providers (like TCS, Infosys, Wipro, Satyam, HCL Tech, among others) have also seen a sharp rise in market share from negligible levels earlier.

Figure 217: Services market share >US\$25m (March quarter)



Source: TPI, Credit Suisse research

We present in Figure 218 profiles of some of the leading players in the global IT services space.

Figure 218: Global IT services companies

Ticker	Company	Main listing	Description	Rec	Mkt cap (US\$m)	P/E on FY1E
ACN	Accenture	NYS	Key business lines: Outsourcing 40%, Consulting 60%. Key geographies: Americas 41%, EMEA 50%, APAC 9%. Manpower: Total-180,000, GDN-77,000 of which India-35,000	O	21,816	11.0x
ACS	Affiliated Computer Services	NYS	Key business lines: BPO 75%. Key geographies: US 93%. Manpower: Total-63,000 of which Global-16,000	O	3,968	11.0x
ATOS.PA	Atos Origin	PAR	6% consulting, 54% managed services and 40% systems integration Minimal exposure to Emerging Markets (< 3%). 4000 headcount in Asia-Pacific with around 3000 in India	U	1,566	6.8x
CAPP.PA	Capgemini	PAR	9% consulting, 38% technology Services, 37% Outsourcing and 16% Local profession. 23.4% of the total headcount (20,250) Asia-Pacific with almost all of the offshore headcount in India.	O	4,680	8.2x
CTSH	Cognizant Technology Solutions.	NSM	CTSH provides application development and maintenance through an offshore/on-site delivery model.	O	5,591	13.3x
CCC.L	Computace LSE nter		57% revs from UK and 30% from Germany, Zero exposure to emerging markets.	O	169	3.8x
CSC	Computer Sciences Corp.	NYS	Key business lines: Global Commercial -65%, North America Public Sector - 35%. Key geographies: US 60%, UK 13%, Other Europe 16%, Other 11%. Manpower: Total-89,000 of which APAC-21,300 and EMEA 19,500	N	4,266	7.0x
EXLS	ExlService Holdings Inc.	NSM	Key business lines: BPO: 82%. Key geographies: UK 50%, US: 50%. Manpower: Total-9,300; 100% of which India	N	208	17.2x
FIS	Fidelity National Information Services	NYS	Provides credit, debit and merchant card processing, e-banking, check risk management and check cashing services to financial institutions and merchants worldwide.	N	3,295	11.4x
FISV	Fiserv, Inc.	NSM	Provides information management systems and services to the financial and insurance industries through three segments: Financial Institution Services, Insurance Services and Investment Support Services.	O	5,592	10.4x
G	Genpact	NYS	Key business lines: BPO: 100% Key geographies: Americas 10%, India 80%, Europe: 5%, 5% APAC. Manpower: Total-42,000	O	1,739	14.4x
GPN	Global Payments, Inc.	NYS	An electronic transaction processor that enables consumers, corporations, and government agencies to purchase goods and services through the use of credit and debit cards.	N	2,934	14.3x
HCLT.BO	HCL Technologies	BSE	HCL Technologies Limited provides software development and related engineering services.	U	1,854	5.9x
HPQ	Hewlett-Packard	NYS	EMEA is largest region, representing nearly 41% of total revenues. The United States represents about 33% of revenues. Canada and Latin America contribute about 9% of revenues. Asia-Pacific including Japan rounds out the geography mix at about 17%.	N	89,364	9.6x
IDR.MC	Indra	MCE	c9.1% of revenue from Latin America and c68% from Spain	O	3,335	14.0x
INFY.BO	Infosys Technologies Ltd.	BSE	Key business lines ADM 43%, Consulting and package implementation 24%. Key geographies North America 63%, Europe 27%. Manpower Total 94,000, predominantly India based	O	14,377	12.3x
IBM	International Business Machines	NYS	IBM provides the most comprehensive geographic disclosures within our coverage universe. The Americas region generates 41% of revenues, EMEA contributes c.35%, while Asia-Pacific including Japan makes up the rest.	N	112,535	9.4x
JKHY	Jack Henry & Associates	NSM	A provider of integrated computer systems to banks with under \$30 billion of total assets, as well as credit unions and other financial institutions in the US.	N	1,595	14.7x
LOG.L	Logica	LSE	Key Geographies - 28% of revenues from the Nordic markets, 20% from UK, 20% France, 28% other Europe and c5% of revenues from the rest of the world. 3,900 strong workforce in India.	U	1,487	5.4x
MINT.BO	Mindtree Ltd	BSE	Mindtree is an Indian IT services company offering offshore IT and R&D services.	U	179	9.4x
SATY.BO	Satyam Computer	BSE	Key business lines: Software development and maintenance 45%, Consulting and enterprise business solutions 45% Key geographies: North America 61%, Europe 21% Manpower: Total-51.643	U	3,302	7.1x

Source: Factset, IBES Consensus for not rated companies, Credit Suisse research and estimates

Figure 219: Global IT services companies, continued

Ticker	Company	Main listing	Description	Rec	Mkt cap (US\$m)	P/E on FY1E
SYNT	Syntel	NSM	Key business lines: IT Services: 70%; BPO: 14%. Key geographies: US 88%. Manpower: Total-10,000 of which India: 7,000	N	993	12.6x
TCS.BO	Tata Consultancy Services	BSE	Key business lines ADM 47%, Enterprise solutions 13%, Business intelligence 9%, Infra services 8%. Key geographies North America 51%, UK 20%, Europe 10%, India 9%. Manpower Total-116,000, of which 10,500 outside India	O	11,094	9.6x
TEML.BO	Tech Mahindra Limited	BSE	Tech Mahindra provides offshore IT services primarily to global telecom companies.	U	553	2.6x
TIE1V.HE	Tietoanator	HEL	currently 20% of the headcount is in offshore locations. The company expects this to become 40% in the next 3-5 years. Largely a Scandinavian player with minimal exposure outside of Europe.	N	767	9.1x
TSS	Total System Services	NYS	A provider of payment processing and support services for the credit and debit card industries. The company serves consumer, commercial, debit, and retail card accounts in the U.S. and internationally.	N	2,803	11.1x
UIS	Unisys Corporation	NYS	The Group's principal activity is to provide services and technology to commercial businesses and governments throughout the world. UIS operates in two segments: Services and Technology.	NR	243	3.2x
WIPR.BO	Wipro Ltd.	BSE	Key business lines: ADM 45%, Infrastructure services 19%, Package implementation 11%, BPO 9%. Key geographies: US 60%, Europe 27%, India and Middle East 7%. Manpower: Total-96,000, of which 61,000 focussed on Global IT services, 21,000 on BPO and 13,500 on	O	7,182	9.8x
WNS.N	WNS Global Services	NYS	Key business lines: BPO: 100%. Key geographies: UK 50%, N America: 36%. Manpower: Total-18,000 of which India: 17,500	O	381	35.9x

Factset, IBES Consensus for not rated companies, Credit Suisse research and estimates

The money transfer industry: profiting from immigration

The highly fragmented global remittance market is over US\$320bn. We expect the global remittance market to top US\$500bn in five years, delivering a CAGR of c.9%.

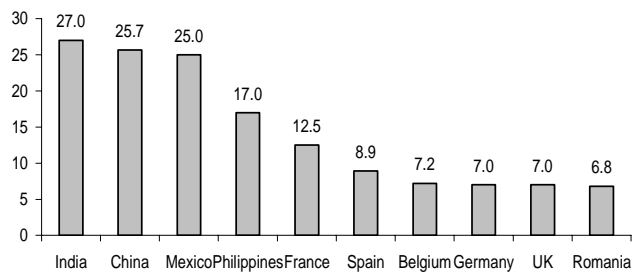
The money transfer industry is driven by the forces of globalisation and migration. Rules, policies and regulations help define the flows of capital and labour, which, in turn, determine the flow of remittances. The global nature of money transfer benefits companies with large geographically dispersed networks. We can think of few other industries that benefit as much from the twin drivers of globalisation and migration.

The money transfer industry has firm links to both developed and emerging markets. Remittances follow the reverse path of labour flow, which is strongly from the emerging to the developed world. Thus, it is not surprising that most of the top destinations of remittances are emerging economies like India, China and Mexico.

The links between globalisation, immigration and money transfer

It is the developing world where we see the fastest money transfer growth rates, whether intra-country or inter-country, as this is typically where labour is exported and capital imported. Strong revenue growth has come from China, India and Latin America, all beneficiaries of outsourcing, globalisation and the migration associated with urbanisation. Echoing the flow and structure of capital mobility, the main money transfer beneficiaries have networks in both developed and developing areas to facilitate remittances of workers to their families. Not surprisingly, then, the destination of money transfers match the sources of migrant workers.

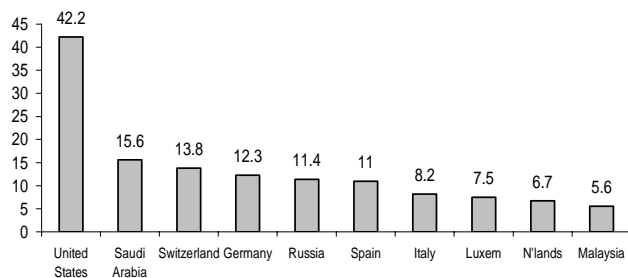
Figure 220: Top remittance-receiving countries (2007, US\$bn)



Source: World Bank, Credit Suisse research

Note that these trends do not capture the flow of intra-country transfers. With the heavy investment and sharp economic rise in the city centres of India and China, we expect that the remittance flows would follow a similar trend—from more developed areas to less developed areas. On the other side of this equation, there is obviously a strong relationship between where immigrants go and the origin of remittances, as shown in Figure 222 and Figure 223.

Figure 222: Top remittance-sending countries (2007, US\$bn)



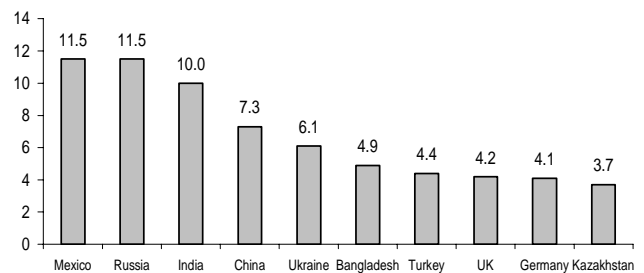
Source: World Bank, Credit Suisse estimates

A fragmented industry

Given the strong global demographic trends driving money transfer, the competition in the industry is fierce. From financial institutions to informal networks, the US\$320bn+ (2007 data) market remains highly fragmented. Consider that the largest money transfer company in the industry, Western Union, held just 17% of the total market at end 2007. Yet even that market share is still larger than its next two closest competitors combined, with the remainder consisting of small 'mom & pop' stores.

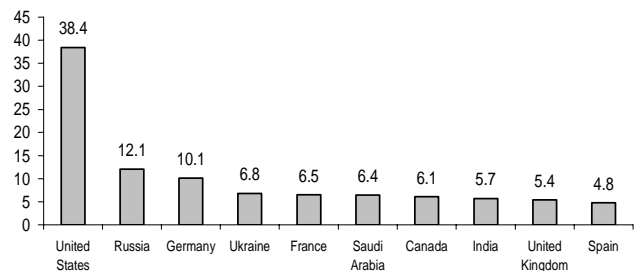
Money transfer pricing has declined by an average of 3% annually as competitors have expanded their networks. Nevertheless, the money transfer industry remains lucrative, with operating margins typically in the 20–30% range. Figure 224 and Figure 225 demonstrate the cost of sending US\$300 from the US to Mexico in select cities as multiple competitors entered the lucrative US to Mexico remittance corridor.

Figure 221: Top emigration countries (m)

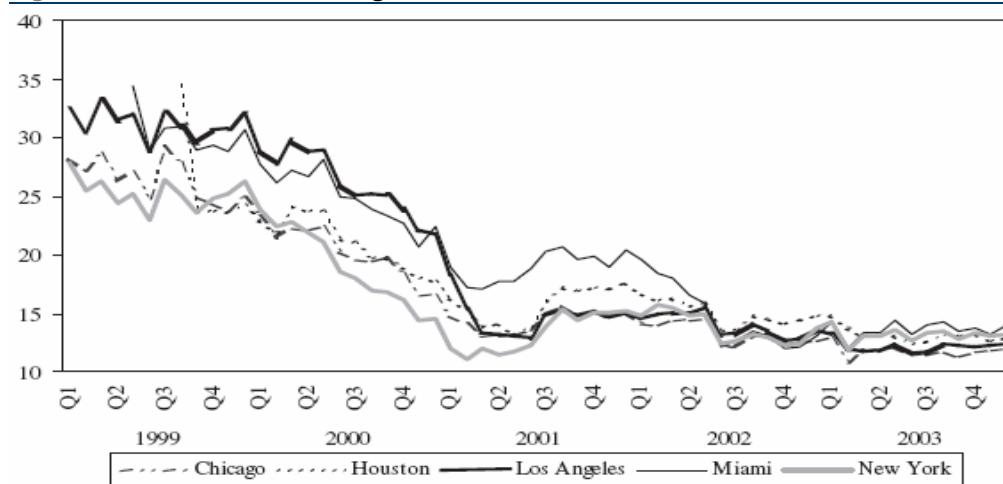


Source: Development Prospects Group, World Bank

Figure 223: Top immigration countries (m)



Source: UN Population division, World Bank

Figure 224: Total cost of sending US\$300 from US to Mexico in select cities

Source: PROFECO, World Bank

Figure 225: Average cost of sending US\$300 to Mexico from select cities

Origin	1999	2000	2001	2002	2003	Reduction
Chicago	\$24.20	\$19.60	\$13.70	\$13.70	\$11.60	52.1%
Dallas	\$27.00	\$25.40	\$16.30	\$14.60	\$13.10	51.5%
Houston	\$22.40	\$20.40	\$15.70	\$14.90	\$12.90	42.4%
Los Angeles	\$29.30	\$23.70	\$14.30	\$14.00	\$12.20	58.4%
Miami	\$29.10	\$22.70	\$18.40	\$16.50	\$12.70	56.4%
New York	\$24.70	\$18.50	\$13.50	\$13.90	\$13.20	46.6%
Sacramento		\$19.60	\$15.10	\$15.20	\$14.10	28.1%
San Jose			\$14.60	\$14.50	\$12.90	11.6%
Average	\$26.12	\$21.41	\$15.20	\$14.66	\$12.84	50.8%

Source: PROFECO, World, Bank

While new entrants typically compete on the basis of price, pricing is only a minor concern for users. This may sound counterintuitive, as remittance users (undocumented and under banked) tend to be more price-sensitive; however security and speed are generally higher priorities. Figure 226 details the results of a survey taken by Tomas Rivera Policy Institute (TRPI) regarding key remittance concerns.

Figure 226: Importance to remittance users

Arrives securely	51%
Arrives on time	17%
Able to collect easily	16%
Cost of transaction	13%
Exchange rate	3%

Source: TRPI, Credit Suisse research

Regulations and the money transfer industry

Regulations in money transfer cover from protection against terrorism and money-laundering to tax evasion. Regulation remains a burden for money transfer firms. However, the difficulties of navigating inter- and intra- country regulations have helped limit the number of large, international competitors entering the market. While new entrants to money transfer constantly emerge, their operations are typically limited to intra country transfers or between just two countries, serving a specialised niche.

Restrictive immigration policies in countries where labour and capital arbitrage opportunities abound often result unintentionally in drivers that benefit the money transfer industry:

- The pull for inexpensive mobile labour (skilled or otherwise) often supersedes immigration policy, leading to wide labour movement.

- Undocumented and illegal workers are less likely to use official bank services, and therefore must rely on informal financial and bill paying services that are offered through money transfer companies.
- Restrictive immigration policies often force selective migration, with just one or two members of a family migrating, leaving children and extended family behind. This selective migration often necessitates the transfer of wages to a home country.

Alternative methods of money transfer

New methods and technologies for money transfer, such as mobile money transfer (MMT), are constantly evolving. Using mobile phones to transfer money could potentially by-pass entire agent networks, making each mobile phone and its user a node in the network. The concepts are simple but powerful, and financial institutions, mobile phone operators and money transfer companies are all racing to become leaders in MMT.

Intra-country MMT in Kenya, the Philippines, and South Africa has seen rapid success. In these countries, regulatory and technological concerns are minimal, helping to spread the adoption of MMT. However, MMT still requires expertise in navigating through the various rules and regulations governing international money transfer. Further, until anti-terrorism/anti-money laundering concerns are overcome, the adoption of Internet-based, MMT, or other alternative remittance methods is likely to be limited.

The key players

With a market share of 17%, more than its next two largest competitors combined, **Western Union** (WU) is our preferred pick in the money transfer segment. In an industry where brand, size and scale matter, WU is without peer. Its next closest competitor is **MoneyGram** (~6% of the market). The third competitor in money transfer is **Global Payments**, which owns its agent locations, giving it a high fixed-cost model. While WU has been facing slowdowns in key domestic and Mexico markets in the past year owing to the economic slowdown, these markets now appear to be stabilising. In addition, growth in International markets, namely India and China, has remained resilient and solidly in the double digit range.

Figure 227: Money transfer stocks

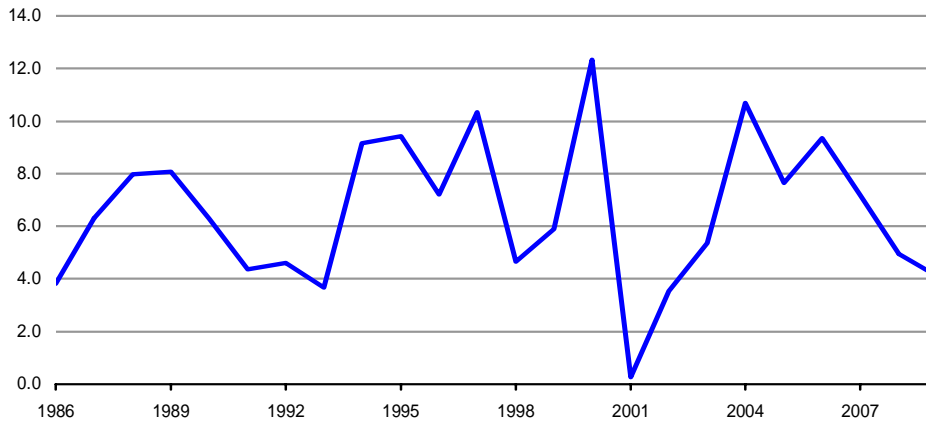
Ticker	Company	Main listing	Description	Rating	Mkt cap (US\$m)	P/E on FY1E
ADP	Automatic Data Processing	US	Employer Services accounted for 65% of fiscal 2007 gross revenues; Brokerage Services, 21%; Dealer Services, 13%; and Securities Clearing & Others, 1%.	N	18,168	15.1x
PAYX	Paychex	US	Provides payroll, human resource and employee benefits outsourcing solutions for small-to medium-sized businesses.	N	10,203	17.6x
GPN	Global Payments	US	The merchant services segment targets customers in many vertical industries, including financial institutions, gaming and government. The money transfer segment targets immigrants in the US and Europe.	N	2,934	14.3x
MA	MasterCard Inc	US	Provides a variety of services in support of the credit, debit and related payment programmes of financial institutions.	N	19,074	15.5x
MGI	MoneyGram International	US	Global Funds Transfer accounted for 71% of 2007 gross revenues; Payment Systems, 29%.	NR	86	9.0x
V	Visa	US	Primary customers are financial institutions, for which Visa provides processing services and payment facilities.	N	23,598	19.1x
WU	Western Union	US	Consumer-to-consumer financial transfers accounted for 84% of fiscal 2007 revenues; Consumer-to-business, 14% and Others, 2%	N	9,783	10.2x

Source: Factset, IBES Consensus for non rated companies, Credit Suisse research and estimates

Global trade: Getting in the game

Global trade has grown by an average 6.9% per annum over the past 20 years according to the IMF and, as we postulate in the overview, the structural growth in exports looks set to continue with the advance in global communications and the internet.

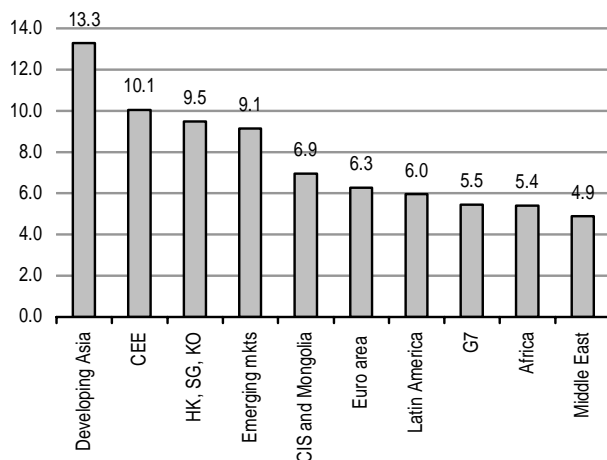
Figure 228: Global trade volume of goods and services (% y/y)



Source: IMF, Credit Suisse research

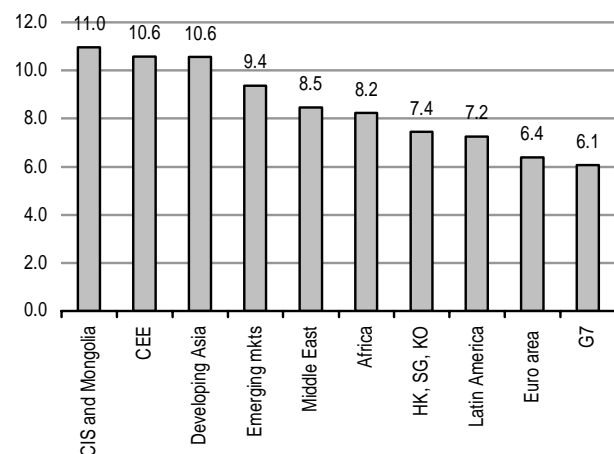
The main drivers of this growth have been the emerging markets. IMF data show that emerging markets in aggregate have grown export volumes by 9.1% (compared to the G7 with growth of just 5.5%) over the past 10 years. The key driver has been Developing Asia, with export volumes up 13.3% p.a. on average over the past 10 years.

Figure 229: Average annual growth in export volumes (1997–2007)



Source: IMF, Credit Suisse research

Figure 230: Average annual growth in import volumes (1997–2007)



Source: IMF, Credit Suisse research

Three broad sectors benefit and facilitate the expansion in trading and investment: (1) logistics companies; (2) companies providing services in the field of inspection, testing, verification and certifications and (3) Legal publishing companies, which provide information on tax, accounting and regulation across international markets. We look at each in turn below.

(1) Logistics: Benefiting from globalisation

Any developing country needs to trade with other countries. For this it needs the ability to import and export physical goods, which in turn requires a combination of shipping, air, road, rail and associated services.

The main beneficiaries from the growth in global trade have been the shipping lines (for example Maersk), the long-haul airlines (such as Air France-KLM or Lufthansa), the freight forwarders (for example Kuehne + Nagel, Panalpina and Expeditors) and the Express businesses (such as TNT and DPWN).

Logistics companies typically operate an asset-light business model with minimal capital expenditure requirements. As such, logistics companies (as compared to asset-based transportation companies) generate higher returns on invested capital and returns on assets. In addition, with minimal operating leverage, logistics companies are generally better able to weather economic downturns.

While the cyclical growth in trade has been and, we believe, will continue to be a function of overall GDP growth (trade has grown at roughly 1.5x real GDP over the past 30 years) and globalisation, when we look at the mode of transport other factors come into account. These include the following:

Determining the type of transport

- **The volume of goods that needs to be moved.** Clearly airfreight is more appropriate for low-volume goods, shipping more appropriate for high volume goods.
- **The cost of goods.** Boeing has estimated that the cost of goods flown by air tends to exceed US\$16 per kilogram. In times of greater customer cost-consciousness, there tends to be a shift away from the higher cost service of air to the cheaper cost service of sea-freight.
- **Time sensitivity.** Moving goods by air is much quicker than moving goods by other modes of transport. For instance, it takes 1.5 days for express airfreight to move goods from Asia to Europe, compared with 25 days for ocean traffic, giving airfreight a 23.5-day advantage over sea.
- **Relative price.** Over time, freight yields have tended to decline. More recently, the increasing cost of fuel has seen the introduction of large air and shipping fuel surcharges, which on balance has increased the cost of air versus sea and land. At least in the very short term we see this as material and anticipate a modal shift away from air towards the cheaper options of sea and, where possible, road or rail.
- **Geography.** In certain geographies, transportation by a certain mode is not a viable alternative.
- **Environmental impact.** Increasingly the environmental impact of decisions is an important consideration in terms of getting goods to market. In general terms this tends to count against using air as a mode of transport and count in favour of using rail.
- **Security.** Often clients and countries are worried about the security of goods during transit and entry into countries. The client's final decision might therefore not be the cheapest option but the one that guarantees delivery.

We would argue that while initially developing countries rely on road, rail and sea services (depending on their physical location), as development progresses air freight services are a bigger focus as these tend to focus on low-volume, high-value, time-sensitive goods.

Developing the network

In order to enable trade, other ancillary 'logistics' services are required. These include the presence of air and sea freight forwarders, the provision of Express capabilities and ultimately the development of one or more quality road networks and the presence of global logistics companies. For instance, over the past two years TNT has acquired road haulage companies in India, China and Brazil through which it intends to build strong

domestic road networks in the respective regions and simultaneously integrate these regional networks into its global Express network. Meanwhile Deutsche Post World Net (DPWN) has developed an Express air network centred in Hong Kong, which enables it to serve the whole of the Asian Pacific region overnight and connects to Europe and America via joint ventures with Lufthansa and North West airlines respectively. This will provide DPWN and TNT with growth but will also enable multinational corporations to ship time-sensitive packages within, into and out of India, Asia and South America.

Generally foreign direct investment is dependent on the provision of these facilities and occasionally will not occur unless these services are provided by a quality, well established corporate. For instance, many auto manufacturers have only established facilities in the world's emerging markets once they are sure that their preferred logistics providers will be present (for example, Exel).

Such networks are a prerequisite for FDI

We think that different products and services enter emerging markets at different points in countries' evolution and with different levels of capital. For instance, DHL estimates that it invested over US\$1.6bn between 2000 and 2006 in developing an ASEAN Express network, whereas freight forwarding companies might initially set up one office with a few staff.

Within the European quoted logistics space DPWN provides the most comprehensive service, offering Express, air freight, sea freight, road freight and supply chain management activities. Kuehne + Nagel and Panalpina also operate globally, predominantly offering air and sea freight forwarding activities. Kuehne + Nagel now operates in more than 100 countries, including 20 in the Asia Pacific region, 11 in Africa and 17 in Central and South America, and has 19 offices, almost 1,000 employees and 27,000 square metres of warehouse space in Brazil, where it is the largest air freight forwarder and customs clearance broker. TNT is focused on the Express business with its main areas of operations being Europe and Asia.

In the US, the three major logistics companies are Expeditors (freight consolidation and forwarding) and CH Robinson and Landstar (which provide multi-modal ground transportation).

Key stock recommendations

Within this space our preferred business models are those of TNT (Outperform), Expeditors (Outperform), Landstar (Outperform) and Kuehne +Nagel (Neutral).

- Although 58% of TNT's 2008E EBIT comes from its predominantly European mail business, the other 42% is derived from its global Express business. We are forecasting 2008E EBIT of €1.2bn, falling to €1.1bn in 2009E, primarily because we forecast a relatively sharp and deep slowdown in Express profitability due to weakening global economic fundamentals. However, TNT has confirmed that it intends to continue its geographic expansion despite slowing profitability. TNT currently trades on a 2009E EV/EBITDA of 4.0x and a P/E of 7.0x.
- Expeditors (EXPD) has the largest market share of the air and ocean freight forwarding industry. The company has a diverse geographic presence, with 25% of 2007 revenues from North America, 57% from Asia, 14% from Europe and 4% from other regions. EXPD generates high returns on invested capital and equity—five-year average ROIC and ROE at the end of 2007 were approximately 40% and 25%, respectively. We estimate the market is pricing for three- to five-year EBIT growth of about 9.2% for EXPD, which is below our forecast of 11.0%.
- Landstar (LSTR) operates a transportation and logistics services business, primarily throughout North America. The company's asset-light, variable cost model offers investors protection in a cyclical downturn. LSTR generates high returns on invested capital and equity—five-year average ROIC and ROE at the end of 2007 were nearly 30% and 45%, respectively. We estimate the market is pricing for three- to five-year EBIT growth of about 8.4% for LSTR, which is below our forecast of 9.0%.

- For Kuehne + Nagel we estimate a 2008–2011 sales and EBITDA CAGR of 4.5%, based predominantly on its ability to win market share and develop greater than average cross selling opportunities. We continue to like the long-term K+N story based on its strong track record, sound strategy, sensible business model and well-respected management team. However, it ought to be noted that in the short term we believe current market expectations are roughly c10% too high (slowdown of global trade flows, difficult base comparisons and possible margin pressure in the Contract Logistics business) and are not yet fully priced in. We have therefore recently downgraded our rating from Outperform to Neutral (*Kuehne + Nagel: Downgrade to Neutral*, 10 October 2008). Despite the recent slow down of global trade flows we do not expect Kuehne +Nagel to stop expanding its global network. Kuehne + Nagel trades on a 2009E EV/EBITDA of 4.7x and a P/E of 10.6x.

Figure 231: Logistics sector

Ticker	Company	Main listing	Description	Rating	Mkt cap (US\$m)	P/E on FY1E
KNIN.VX	Kuehne + Nagel	Switzerland	Kuehne + Nagel operates globally, predominantly offering air and sea freight forwarding activities in more than 100 countries, including 20 in the Asia Pacific region, 11 in Africa and 17 in Central and South America. It is now the largest air freight forwarder and customs clearance broker in Brazil.	N	7,291	14.6x
TNT.AS	TNT	Netherlands	TNT is focused on mail and Express business with its main areas of operations being Europe and Asia. We expect 58% of TNT's 2008E EBIT to come from its predominantly European mail business, with the other 42% derived from its global Express business.	O	7,543	8.2x
DPWGn.DE	DPWN	Germany	DPWN offers a comprehensive logistics service, in Express, air freight, sea freight, road freight and supply chain management activities.	N	17,332	11.9x
PWTN.S	Panalpina	Switzerland	Panalpina is focussed on offering solutions for intercontinental air freight and ocean freight shipments, as well as providing associated supply chain management solutions.	N	1,193	11.1x
EXPD	Expeditors International	US	Expeditors (EXPD) is the market share leader in the air and ocean freight forwarding industry. The company has a diverse geographic presence, with 25% of revenues from North America, 57% from Asia, 14% from Europe and 4% from other regions.	O	7,312	23.5x
LSTR	Landstar System Inc.	US	Landstar operates a transportation and logistics services business primarily throughout North America. The company's asset-light, variable cost model offers investors protection in a cyclical downturn.	O	1,704	14.7x

Source: Factset, IBES Consensus for non rated companies, Credit Suisse research and estimates

(2) Regulation and certification: setting the standard

Trust between people, companies and governments is a key requirement in enabling trade. When there is trust throughout supply chains, transactions are simpler and more efficient, margins are higher and distance is no longer an issue. Services in the field of inspection, testing, verification and certifications enable speedier trading and ultimately get products to market faster.

Companies such as SGS, Intertek or Bureau Veritas support governments, institutions and partner organisations by applying a wide range of trade verification services that assess compliance with regulatory requirements and enhance government revenues. Such services help governments in emerging countries to secure fiscal revenues from international trade. Import verification programmes, also known as pre-shipment inspection (PSI) have provided a comprehensive solution for more than 40 years. SGS has been the industry leader during this time and has kept abreast of trade liberalisation and the evolution of complex international supply chains. GIS facilitates trade, supports good governance and promotes sustainable development.

Other services that enable trade are testing and inspection. These are useful for manufacturers, importers, exporters and retailers in reducing the risks involved in transactions, improving efficiency for clients and ensuring compliance to contractual or regulatory requirements in manufacturing sourcing.

Fragmented industry with growth potential

The testing services industry, which is still highly fragmented, has a long-term record of growth. We estimate that the top 20 players account for just 45% of the global market and tie-ups between the larger players could yield substantial synergies, in our view. Barriers to entry are relatively high given the relatively complex requirements for technical skills and equipment, service quality and global network in order to service a multinational client base. The most important players in this field are SGS, Bureau Veritas and Intertek.

- **SGS** is the world's leading inspection, verification, testing and certification company. Established in 1878, SGS started by offering agricultural inspection services to grain traders in Europe. During the mid 20th century, SGS started to diversify its service by offering inspection, testing and verification services across a variety of sectors, including industrial, minerals and oil, gas and chemicals among others. Currently, SGS employs over 50,000 people and operates more than 1,000 offices and laboratories around the world. In 2007 the company generated sales of more than SFr 4.3bn with an EBIT margin of more than 16%.
- **Bureau Veritas** is the world's second-largest group (based on revenue and number of employees in 2006) in conformity assessment services in the areas of quality, health and safety, security, environment and social responsibility and the world leader in QHSE (Quality, Health, Safety, Environment) services excluding commodities testing. The group's business involves inspecting, testing, auditing or certifying products, assets and management systems (particularly against ISO standards) based on regulatory or voluntarily adopted standards. In 2007 Bureau Veritas achieved revenues of more than €2bn and the group's operating margin increased to 15.1%. It recently increased its investment in regions of the world with stronger relative growth such as Latin America, the Middle East and Asia.
- **Intertek** is the third-largest listed international provider of quality and safety services. Similar to SGS and Bureau Veritas, Intertek provides testing, inspection and certification of products, commodities and systems. In 2007 Intertek achieved sales of €775m and its operating margin amounted to 15.6%.

There are four key drivers of a positive stance on this industry:

- The long-term rise in global trade stimulates increased demand for testing and inspection services, as the locations where products and goods are manufactured and utilised or consumed are increasingly disconnected.
- Regulations concerning quality, safety and environmental standards are proliferating and the ability to offer testing and certification for multifarious country or regional directives increasingly becomes the preserve of the larger, international entities.
- There is an increasing tendency for customers to outsource in-house testing services, recognising the significant potential for economies of scale from pooling lab resources.
- The increasing importance of reputation to customers favouring the large, long-established global players at the expense of smaller operators.

However, it seems likely that slowing global GDP growth will pressure top-line growth in the consumer goods testing space, in our view. The principal driver of consumer goods testing volumes is the number of product variants, rather than the volume of goods traded. There is evidence that key players such as Marks & Spencer (an important customer of Intertek) are responding to weakening retail spending by narrowing and deepening their ranges—i.e., reducing the number of clothing variants, but stocking a greater number of size variations.

Key recommendation

Despite the global slowdown, we continue to like the shares of SGS. Management has successfully transformed the group into one of the most competitive and productive service organisations in the world, in our view. Ten years ago, SGS was heavily exposed to the

government contract business; it now has a much more balanced portfolio of businesses, reducing its dependency on the volume of global trade flows and commodity prices. SGS currently has leading market positions in agricultural services, minerals services, oil, gas & chemical services, consumer testing, systems & services and trade assurance businesses.

Looking at the strong underlying trends (global trade growth, outsourcing of testing services, increase in safety requirements, regulations and standards and the shortening of product life cycles) we believe that SGS will be able to maintain a high organic growth rate going forward. In our view, SGS's 2011E EPS target of SFr 105 should be achieved through organic top-line growth of 10% (CAGR), a further improvement of the operating margin and selective acquisitions (overall we calculate that more than SFr 500m of net liquid funds should be available for acquisitions going forward).

Figure 232: Regulation and certification companies

Ticker	Company	Main listing	Description	Rating	Mkt cap (US\$m)	P/E on FY1E
SGSN.VX	SGS	Switzerland	SGS is the world's leading inspection, verification, testing and certification company operating across a variety of sectors, including industrial, minerals and oil, gas and chemicals among others. Currently, SGS employs over 50,000 people and operates more than 1,000 offices and laboratories around the world.	O	6,481	13.5x
BVI.PA	Bureau Veritas	Paris	Bureau Veritas is the world's second-largest group (based on revenue and number of employees in 2006) in conformity assessment services. Its business involves inspecting, testing, auditing or certifying products, assets and management systems (particularly against ISO standards) based on regulatory or voluntarily adopted standards.	NR	3,852	12.7x
ITRK.L	Intertek	London	Intertek is the third-largest listed international provider of quality and safety services. Similar to SGS and Bureau Veritas, Intertek provides testing, inspection and certification of products, commodities and systems.	NR	1,829	12.4x

Source: Factset, IBES Consensus for not rated companies, Credit Suisse research and estimates

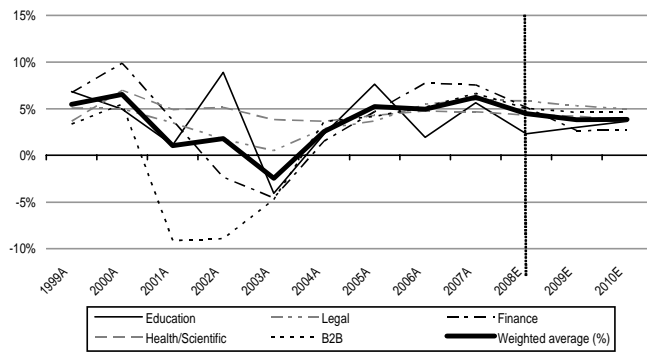
(3) Legal publishers: Explaining the regulatory framework

The Legal Publishing industry is also actively engaged in international expansion. As an industry, legal publishing is approximately the same size as the global Education Publishing market. On our numbers, the mainstream Legal Information market generated roughly US\$10.2bn in revenues in 2007, representing 21% of the revenues generated by the leading Global Professional Publishers, with an increasing amount stemming from emerging markets.

We define Legal Information in the broadest sense, which includes tax, accounting and regulatory publishing. These global markets are typically oligopolies, often dominated by the big three publishing companies: Wolters Kluwer, Reed Elsevier and Thomson Reuters. Their products are varied but include case law and proprietary legal content services and solutions to large and small law firms, and proprietary content, related forms and workflow tools for areas such as corporate law, banking, bankruptcy, trade regulation, antitrust, franchising, intellectual property, human resources, pensions and international law. Revenues can frequently be subscription-based, and are almost always supported by some form of pricing power from typically high barriers to entry for the 'must-have' information—hence margins are typically high.

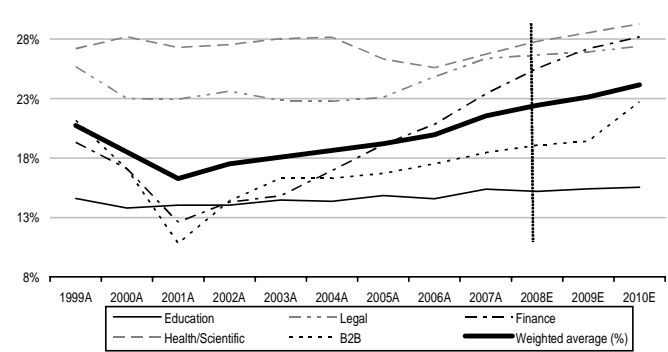
Over the past 10 years, this segment has enjoyed average organic revenue growth in excess of 4.0% and average operating margins of 24%, but both metrics have been trending upwards as the companies fully embrace digital opportunities and pursue revenues in adjacent markets, such as through workflow solutions and emerging markets.

Figure 233: Professional publishing organic rev growth, including legal publishing at an average of +4.0% p.a.



Source: Company data, Credit Suisse estimates

Figure 234: Professional publishing operating margins, including legal publishing at 27% and trending up



Source: Company data, Credit Suisse estimates

The legal publishers underwent substantial investment in their core markets during the 1990s, which was essential at a time when textbooks, journals, directories and newsletters were evolving rapidly into CD-ROMs, e-mail and online delivery mechanisms. Just 10 years later, over 60% of legal information revenues are generated through digital methods, which has generated substantial gains to customers. The main advantages stem from the power of searching thousands of fields for relevant legal precedents or reference points and the wide array of sophisticated added functionality that can then be offered, such as related news or automatically billing a lawyer's time to clients.

Importantly, this process has moved the legal information providers into a business model than can be more easily adapted for new markets, especially where these involve adding efficiencies to the global infrastructure of a firm. A good example of this would be the sophisticated but easy-to-use legal search tools that a senior lawyer will have on his desktop, thereby avoiding the need for a research assistant, who would previously have trawled through hundreds of legal citations making notes. The move towards digital distribution has further boosted the scalability of the global Legal Publishers and international expansion remains a high priority for most. This is also true for emerging markets exposure, which while a relatively small proportion of the European Publishers' group revenues currently, is a widely targeted opportunity for added growth.

- We estimate Reed Elsevier will generate 28% of its Legal Publishing revenues outside of its core North American business in 2008. In 2007, this LexisNexis International business enjoyed organic revenue growth of 8% and strong margin and profit growth. Underlying revenue growth has now been at or around this level for each of the past four years, driven by the growing penetration of online information services across its markets and new publishing. Good growth has been enjoyed in the UK, France and southern Africa in particular, as well as emerging markets such as India, Korea, China and Taiwan.
- Wolters Kluwer's Tax, Accounting and Legal division represents 40% of its Legal Publishing revenues. Within this Wolters Kluwer Tax and Accounting operates in the market under the brand name CCH delivering innovative integrated research and software solutions that provide a strategic business advantage to its customers. This sub-division holds major market positions in the US, Canada and Asia Pacific.
- At Thomson Reuters, Legal information (incl Tax & Accounting) makes up 36% of 2009 revenues on our estimates. Of the 25% of this division that is outside North America, we estimate 25% is in emerging markets.

How are the legal publishers involved in global intangible infrastructure?

Figure 235: Emerging market exposure for the major Global Legal Publishers

Ticker	Company	% group revs from legal publishing (2009E)	% group revs related to emg mkts legal publishing (2009E)	Comment	Rating	Mkt cap (US\$m)	P/E on FY1E
ELSN.AS	Reed Elsevier	51%	5.8%	LexisNexis International is Reed's non-US legal publishing sub-division. We estimate half of this division is in faster growth markets. It enjoyed organic revenue growth of 8% and strong margin and profit growth in 2007. The focus is increasingly on the emerging markets, particularly China, India, Korea and Taiwan.	O	9,219	11.0x
WLSNc.AS	Wolters Kluwer	64%	2.7%	Its legal publishing exposure is through its TAL and LTRE divisions, of which Wolters Kluwer Tax Accounting is a sub-division of TAL, and operates in US, Canada and Asia Pacific. We assume 20% of this sub-division is in Asia Pacific.	U	5,295	9.4x
TRIL.L	Thomson Reuters	36%	2.3%	Legal information (incl Tax & Accounting) makes up 36% of 2009E revenues. Of the 25% of this division that is outside North America, we estimate 25% is in emerging markets.	N	16,475	11.5x

Source: Factset, IBES Consensus for non rated companies, Credit Suisse research and estimates

Employment services

The extent of the employment services industry in any one country is to some extent a measure of its labour market regulation and development, and in that sense it reflects an element of a country's intangible infrastructure. Its existence at present is more of a developed market phenomenon and in those regions it remains a source of long-term industry growth, although it currently faces significant cyclical challenges. However, we focus on it here for two reasons. (1) Beyond the immediate cyclical woes, labour market deregulation and outsourcing still present growth opportunities for these companies in developed economies. (2) Looking further down the line, the experience of these companies and the nature of regulation in their markets may be a relevant template for how emerging economies ultimately mature.

The employment services industry essentially fulfils two roles: (1) it adds flexibility to costs and headcount through the supply of temporary staff and (2) it facilitates the link between employers and job seekers. This generally becomes a more difficult proposition as economies develop, since required skills become more specialised in the shift from primary to tertiary industry and matching skills to jobs requires greater managerial input.

The US has one of the largest employment services sectors reflecting the combination of relatively extensive labour market regulation and the tertiary nature of the economy. However, recent changes in labour market regulation in Europe and Asia have underpinned growth in the temporary staffing market. Specifically, we expect CAGR in revenues for this sector of 18% in Italy, 15% in Germany and 12% in Japan over the next three years. The employment services industry in the emerging markets is very nascent. Typically, emerging markets have less labour market regulation, hence hiring and firing staff may not incur the costs it does in more developed markets precluding the need for temporary staff, and given the primary nature of these economies it is less difficult to match jobs to skills. That said, Manpower has been expanding in emerging markets.

The size of the US employment services sector, including temporary staffing and permanent placement firms is in the range of US\$135bn–145bn.

Figure 236: US staffing industry segment revenue
US\$ in billions

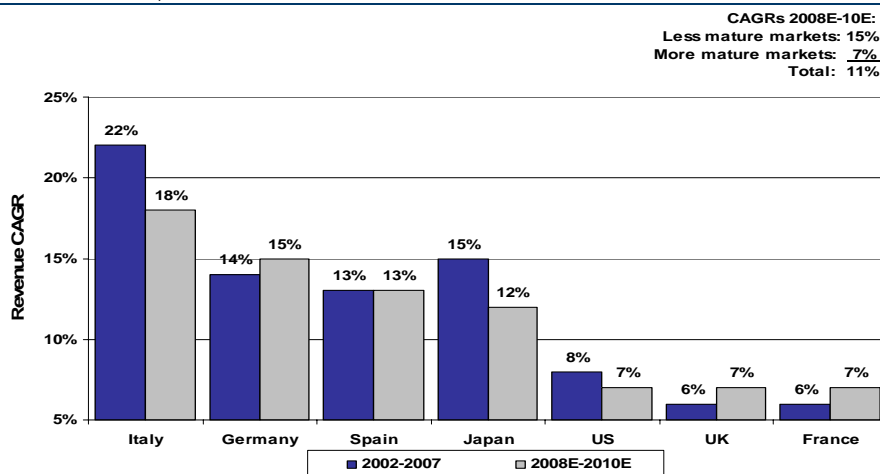
	2003	2004	2005	2006	2007E	2008E
Temporary Help						
Commercial	\$ 34.7	\$ 39.9	\$ 42.8	\$ 44.0	\$ 42.2	\$ 43.6
Office/Clerical	15.0	15.6	16.8	17.1	16.5	16.6
Industrial	19.8	24.3	26.0	26.9	25.7	27.0
Professional/Specialty	38.6	41.9	46.6	50.8	54.8	59.5
IT Staffing	14.3	15.8	17.4	19.0	20.7	22.7
Healthcare	10.2	9.8	10.0	10.6	11.4	12.3
Accounting	5.4	6.6	8.1	8.9	9.4	10.2
Technical/Engineering	4.6	5.1	5.9	6.5	7.1	7.8
Legal	1.0	1.1	1.3	1.5	1.6	1.7
Other	3.2	3.5	3.9	4.2	4.5	4.8
Total Temporary Help	\$ 73.3	\$ 81.8	\$ 89.4	\$ 94.8	\$ 97.0	\$ 103.1
Place & Search						
Contingency	\$ 4.0	\$ 5.0	\$ 6.7	\$ 9.1	\$ 10.4	\$ 11.5
Retained Search	4.2	5.1	5.7	6.4	7.6	9.2
Temp-to-hire	3.5	4.3	5.6	7.1	7.4	7.9
Total Place & Search	\$ 11.7	\$ 14.4	\$ 18.1	\$ 22.6	\$ 25.5	\$ 28.6
PEO/Staff Leasing	\$ 7.4	\$ 8.0	\$ 8.7	\$ 9.4	\$ 9.9	\$ 10.4
Outplacement	1.3	1.1	1.0	1.0	1.0	1.0
Total Staffing Industry	\$ 93.7	\$ 105.3	\$ 117.1	\$ 127.8	\$ 133.4	\$ 143.1

Source: Staffing Industry Analysts, Inc.

We believe that the US market could grow to an estimated US\$188bn by 2012, CAGR of 7%. This rate of growth is slightly lower (2pp) than the average growth rate since 2004.

While we have not been able to identify any consistent data on the overall size of the global market, we have been able to estimate annual growth. Growth rates vary depending on whether the market is immature or mature. We have seen and expect continued strong secular growth in Europe and Asia, and in Germany, Italy and Japan specifically, where recent deregulation and legal changes aimed at increasing business flexibility have created tailwinds for the staffing industry.

Figure 238: Less versus more mature staffing market estimated revenue growth
2008E-10E CAGR, %



Source: CIETT, European Foundation for Living and Working Conditions, BLS, Credit Suisse estimates.

Note: More mature markets include U.S., UK and France; less mature—Italy, Germany, Spain, Japan

Value proposition—what drives adoption

We highlight two factors that are driving growth rates in the employment services business:

Slowing global workforce growth is fuelling demand for skills

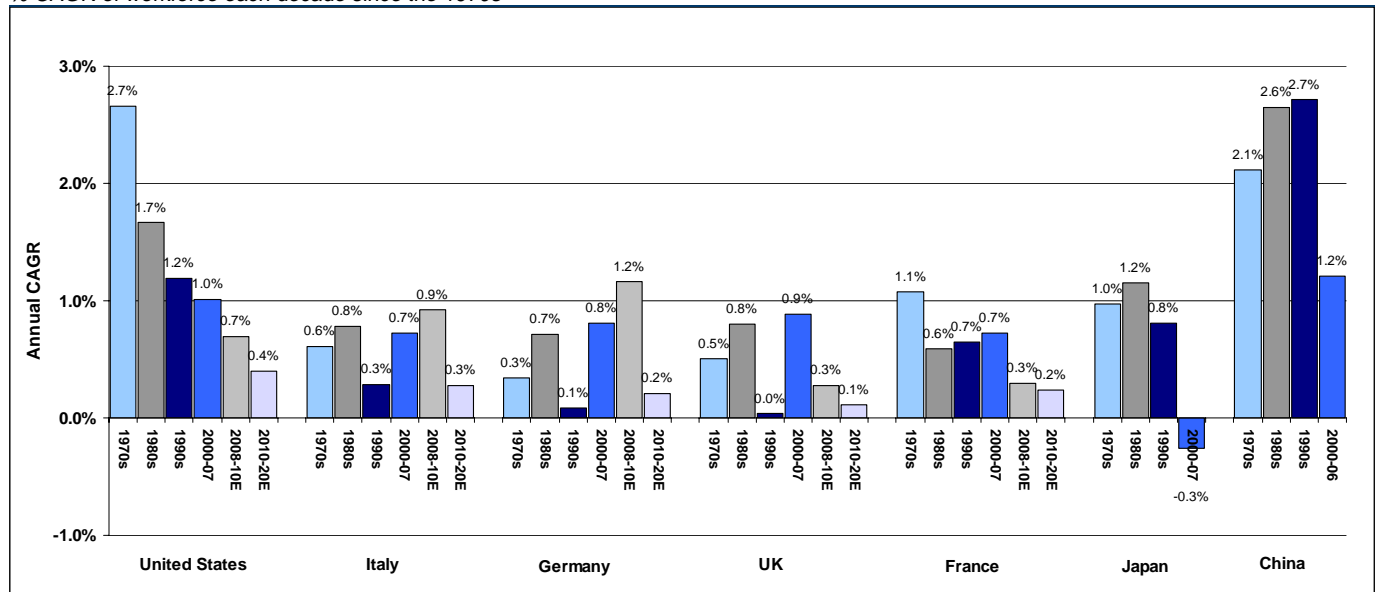
Economic cycles notwithstanding, demographics and related social factors are leading to a shortage of skilled workers across the globe. Technological innovation, globalisation and rising security concerns have caused the 'average job' to require more hard skills than in the past and have placed a premium on integrity and other 'soft skills'. Simultaneously, workforce growth has been slowing in the US and many industrialised countries, and is likely to continue to do so, as outlined in Figure 239, following decades of declining birth rates.

Figure 237: US staffing industry segment revenue growth
Y/Y Growth

	2004	2005	2006	2007E	2008E
Temporary Help					
Commercial	15%	7%	3%	-4%	3%
Office/Clerical	4%	8%	2%	-4%	1%
Industrial	23%	7%	4%	-5%	5%
Professional/Specialty	9%	11%	9%	8%	9%
IT Staffing	11%	10%	10%	9%	10%
Healthcare	-3%	3%	6%	7%	8%
Accounting	23%	23%	11%	6%	8%
Technical/Engineering	11%	15%	11%	10%	9%
Legal	15%	15%	14%	9%	8%
Other	11%	11%	8%	7%	7%
Total Temporary Help	12%	9%	6%	2%	6%
Place & Search					
Contingency	25%	35%	35%	15%	10%
Retained Search	21%	12%	12%	19%	20%
Temp-to-hire	25%	30%	25%	5%	7%
Total Place & Search	24%	25%	25%	13%	12%
PEO/Staff Leasing	8%	9%	9%	5%	5%
Outplacement	-16%	-5%	-1%	2%	0%
Total Staffing Industry	12%	11%	9%	4%	7%

Source: Staffing Industry Analysts, Inc.

Figure 239: United States, Italy, Germany, United Kingdom, France, Japan, and China—workforce growth
 % CAGR of workforce each decade since the 1970s



Note: Projections for Japan and China not available. Source: BLS, European Commission, Credit Suisse estimates.

This issue is exacerbated by the decreasing average tenure of the younger workforce, which changes jobs more often because it sees it as a way to achieve upward mobility, foregoes a more conventional 'mail-to-boardroom' career path, or has experienced downsizing. On the back of this trend, average job tenure in the US has dropped from 5.1 years in 1983 to 4.5 years in 2006 (according to the Bureau of Labor Statistics).

Increasing usage of temporary workers facilitates flexibility.

In the United States and across the globe, companies continue to become more comfortable employing temporary staff (temps) to make cost structures 'permanently flexible'. Employing temps facilitates quick hiring and firing of employees, and reduces costs associated with workers' compensation, healthcare benefits and severance expenses. The appeal here is obvious as competition and shareholder pressure increase the burden on companies to operate as efficiently and flexibly as possible.

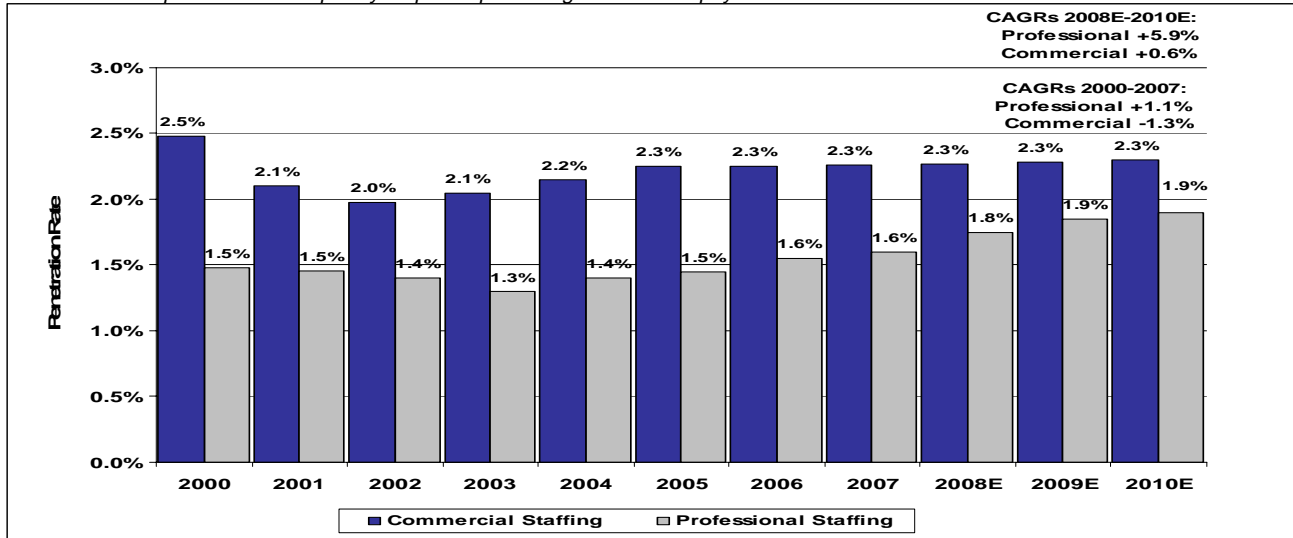
Business opportunities

We believe the best growth opportunities will come from less mature 'professional staffing' niches in the United States; and Asia and 'other' European countries, where recent changes to labour laws and regulations have created strong tailwinds for the staffing sector.

■ Professional staffing still immature in the United States and globally

As the staffing industry came of age in the US in 1980s and 1990s, companies at first were understandably more comfortable utilising temps in lower-skill industrial and clerical categories and less comfortable utilising them in higher-skill 'professional' categories, such as accounting and information technology. This resulted in higher penetration rates in commercial categories than in professional. We consider the commercial segment to be relatively mature in the United States and expect its volume growth to be tepid and pricing pressure to increase over the next few years. We expect stronger volume growth and stable pricing in the professional staffing niches. This is consistent with the rising penetration rates that we expect in professional staffing categories in coming years, as illustrated in Figure 240.

Figure 240: US professional and commercial temporary penetration rates
commercial and professional temporary help as a percentage of nonfarm payrolls



Source: Bureau of Labor Statistics, Credit Suisse estimates.

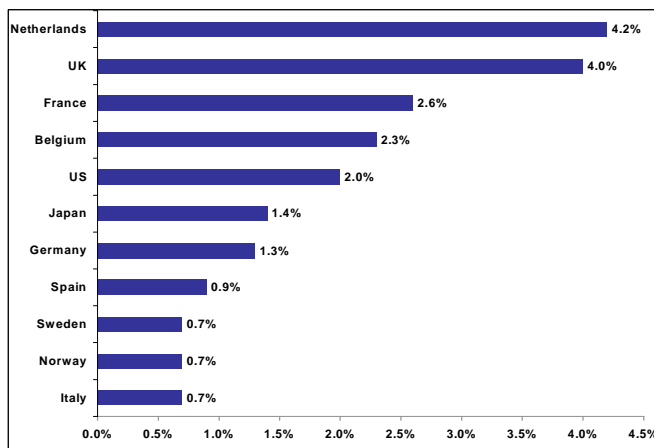
Within the professional staffing category, we favour the accounting and finance and information technology niches. We believe that accounting and finance will continue to benefit from the increasing emphasis on tightening corporate controls; the seasonal nature of accounting needs make this niche well suited to the temporary employment model. We also see solid secular demand in information technology, as businesses deploy more technology, and face evolving regulatory pressures and shortening technology product cycles.

- Rapid adoption of the temporary employment model in Europe and Asia

To date, staffing companies have done a good job fulfilling demand, as illustrated by temporary employees' penetration of the US workforce, which has gone from about 0.5% in 1980 to slightly less than 2% currently, enjoying its strongest growth in the 1980s.

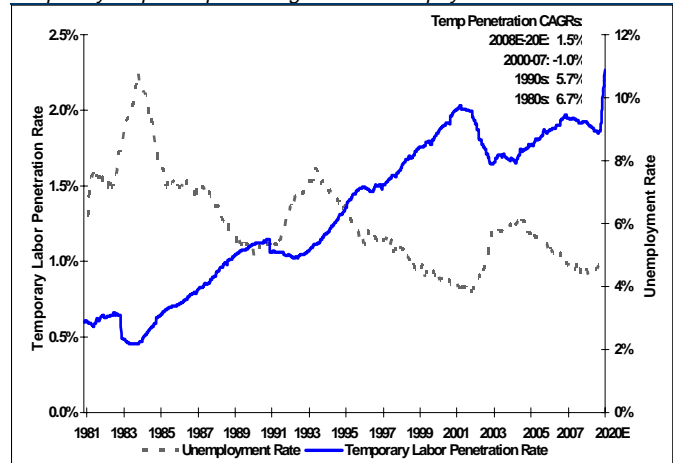
We have seen—and expect to continue to see—strong secular growth in Germany, Italy and Japan, large industrialised counties in which recent deregulation and legal changes have created tailwinds for the staffing industry. Due in part to less stringent regulations, temporary staffing penetration rates in these countries are likely to rise.

Figure 241: Temporary staffing penetration by country
temporary help as a percentage of nonfarm payrolls



Source: Bureau of Labor Statistics, CIETT, Manpower, Credit Suisse

Figure 242: Temps' penetration of US nonfarm payrolls
temporary help as a percentage of nonfarm payrolls



Source: Company data, Credit Suisse estimates

Figure 243 provides a brief summary of the regulatory changes that have occurred in each country that impact the staffing firms.

We believe the environment in which the temporary staffing industry tends to achieve the highest penetration is that of a large, industrialised country where labour laws are strict, but where temporary staffing is legal, accepted, and relatively lightly regulated. France and the Netherlands are examples of two such countries, and their penetration rates are relatively high. We believe Germany, Italy, and Japan also present opportunities now that historically stringent laws and regulations have been eased.

Figure 243: Summary of recent deregulation

Country	Sample of Key Changes	Year
Japan	Bans on using temps in manufacturing sector removed	2004
	Maximum assignment length extended in manufacturing categories	2007
Germany	New legislation lifted ban on 'synchronization' (synching employment contract with length of assignment), allowed fixed term (rather than open ended) employment contracts, and lifted maximum assignment length restriction.	2004
Italy	Temporary staffing legalized	1997
	Legislation allows temp firm to provide permanent placement, outplacement and other HR services	2003

Source: Credit Suisse research

Competitive landscape

Market share data across various regions is sporadic for most countries because the competitive landscape is highly fragmented. However, one exception is France where the top three vendors—Manpower, Randstad/Vedior and Adecco have a combined 75% market share.

In the mid-to-late 1990s, pricing pressure for large contracts, especially for Manpower, became severe and at times irrational, leading to significant industry margin pressure. However, we believe the market has become more rational, Manpower's overseas competitors such as Adecco and Randstad/Vedior have learnt that it is unprofitable to aggressively discount large contracts, and this new-found focus on profitability has become more of a theme for industry players in recent years. Even with the current market slowdown, we expect to see less pricing pressure than during the last cycle.

We also expect the mature 'commercial services' segment to face more pricing pressure over the coming years, whereas 'professional services' pricing should hold relatively steady.

In general, 'commercial services' tends to be lower-margin business than 'professional services', mainly because the former involves lower skill industrial and clerical work while the latter involves higher-end skills such as accounting and information technology. This difference in margins is best illustrated by looking at Manpower, which is viewed primarily as a 'commercial services' firm, where EBIT margins are in the low single digits, versus Robert Half and MPS Group, which focus on 'professional services' and yield EBIT margins in the high-single to low-double-digit and mid-to-high single range, respectively.

The key players

Figure 244: Key employment services companies

Ticker	Company	Main listing	Description	Rating	Mkt cap (US\$m)	P/E on FY1E
ADEN.VX	Adecco	VTX	Adecco is the largest global staffing agency focusing on temporary staffing solutions. Its business is concentrated on light industrial (50% revenues), office clerical (40%), professional (10%). Its main revenue centres are France (33% of total), US (8%) and EMEA (35%).	NR	5,527	6.6x
ASF	Administaff, Inc.	NYS	Provides small and medium-sized businesses with a Personnel Management System. The company's system includes benefits and payroll administration, medical and worker's compensation insurance programs, personnel records management etc.	NR	470	10.1x
ADP	Automatic Data Processing	NYS	Company provides computer services, including employer, brokerage, dealer, and automotive services.	N	18,168	15.1x
CDI	CDI Corporation	NYS	CDI Corp. provides staffing and outsourcing services to Fortune 500 customers. The Company provides customised technical, information technology, professional, and administrative staffing and outsourcing solutions.	NR	193	9.3x
CPS	ChoicePoint	NYS	A provider of information, identification and credential verification services.	NR	3,431	NA
DHX	Dice Holdings Inc.	NYS	Dice Holdings Inc is a specialist in career sites and career fairs. The company provides services to help recruiters, consultants and businesses hire and train highly qualified professionals.	NR	210	11.8x
FADV	First Advantage Corporation	NSM	First Advantage Corporation, through its subsidiaries, provides information services. The company provides solutions for the screening, certification, and risk mitigation needs of corporations and consumers across the US.	NR	634	13.2x
GVHR	Gevity HR Inc.	NSQ	Provides human resource solutions to businesses across the US. The company provides recruiting services, employee management and development programs, payroll processing, and business protection services.	NR	39	1.3x
HSII	Heidrick & Struggles International, Inc.	NSM	The group's principal activities are to provide executive search and leadership consulting services. The group helps its clients build leadership teams by facilitating the recruitment, management, development and retention of personnel for their executive management positions. Specialises in the recruitment of senior executives who earn more than US\$300,000/year. Revenues split between the US (52%), Europe (35%) and APAC (13%).	N	360	8.5x
HEW	Hewitt Associates	NYS	Hewitt Associates is a global HR outsourcing and consulting firm.	NR	3,215	24.7x
HHGP	Hudson Highland Group, Inc.	NMS	Provides global recruitment and human capital consulting solutions. The company operates across the permanent, contracting, and consulting markets, specialising in mid-level selection.	NR	80	NA
KELYA	Kelly Services	NSQ	Kelly Services, Inc. provides staffing services to a diversified group of customers through offices located in North America, Europe, and the Pacific Rim.	NR	431	7.4x
KFRC	KFORCE	NSQ	A full-service, professional staffing firm providing flexible and permanent staffing solutions for organisations and career management for individuals.	NR	263	7.1x
KFY	Korn/Ferry International	NYS	Korn/Ferry is the world's largest executive retained search firm, specialising in senior executive-level placements. KFY is in the S&P MidCap 400. Focused on executive recruiting (84% of revenues). Revenues accrued in the US (62%), Europe (23%), APAC (12%) and South America (3%).	N	548	8.5x
MAN	Manpower	NYS	Manpower Inc. is a world leader in the staffing industry, providing services through 3,900 offices in 51 countries. Business concentrated on light industrial (50% revenues), office clerical (40%), professional (10%). Main revenue centres are France (33% of total), US (8%) and EMEA (35%).	O	2,474	6.5x
MPS	MPS Group, Inc.	NYS	MPS is a global provider of human capital solutions including professional and IT staffing and solutions. Business split between professional services (58% of revenues and IT staffing (42%). The US accounts for just less than 60% of revenues.	N	598	9.2x
ASGN	On Assignment	NMS	On Assignment, Inc. places professional employees on both long- and short-term assignments through its Lab Support, Healthcare Financial Staffing, and Enviro- Staff divisions.	NR	205	24.0x
PAYX	Paychex	NSQ	Paychex, Inc. is a leading, national provider of employer and employee administrative services.	N	10,203	17.6x

Source: Factset, IBES Consensus for non rated companies, Credit Suisse research and estimates

Figure 245: Key employment services companies, continued

Ticker	Company	Main listing	Description	Rating	Mkt cap (US\$m)	P/E on FY1E
RAND.AS	Randstad	AMS	Randstad is an international staffing operation based in the Netherlands, its core market. Services range from temporary staffing and permanent placement to in-house services. Since acquiring Vedior in 2008, the Randstad Group is the second largest HR services provider in the world.	NR	3,157	4.6x
RECN	Resources Global Professionals	NSQ	Resources Connection is a professional services firm that provides F&A, HR management, and IT services. Mainly focused on the US market (75% of 2007 revenues).	N	783	16.9x
RHI	Robert Half International	NYS	Robert Half International is the worlds largest specialised staffing service. Its divisions include Accountemps, RH Finance & Accounting, and RH Management Resources, for temporary, full-time, and project professionals. Business focused on temporary staffing (78% of revenues), permanent placement (10%), risk consulting (12%). The US accounts for c. 70% of 2007 revenues.	N	3,192	12.9x
SFN	Spherion	NYS	Spherion Corporation provides workforce management services. The company provides talent assessment, search and recruitment, career consulting, human capital measurement, and outsourcing.	NR	128	7.3x
TLEO	Taleo Corp	NMS	A provider of enterprise staffing management solutions that enable large organisations to establish, automate and manage worldwide staffing processes for professional, hourly and temporary staff.	NR	195	215.3x

Source: Factset, IBES Consensus for non rated companies, Credit Suisse research and estimates

Appendix 1: Index methodology

Data

The core source of data we are working with is an IMD Competitiveness Center data bank of 323 criteria, about 180 of which could be used in the build-up of the five sub-indices as referred to in the overview: education; R&D; healthcare; financial services; business services. The objective is to use some of their indicators together with data from other sources, so that the resulting index performances, measured by a correlation with a benchmark, would improve. The additional data sources vary with the sub-index constructed. Some examples of additional sources are: Economic Intelligence Unit data banks by EIU; World Development Indicators by the World Bank; UNESCO website by UN; OECD data banks by OECD and others.

Standardisation

(a) Standardising all variables

Standardisation is necessary since we are working with both hard and survey data. The hard data come in different unit measures: USD; shares of GDP; shares of totals in general (for example share of total exports); rates of growth (percentage changes); number of people, patents, etc. The soft data are qualitative in nature and are measured in 0-10 ranking numbers. To combine these differently scaled variables, we need to transform them into standard normal variables.

Standardisation is the creation of standard normal variables, which requires the following steps:

1. Compute annual average values (\bar{x}) for the entire population of 53 economies.
2. Calculate the annual standard deviations for each criterion:

$$S = \sqrt{\frac{\sum (x - \bar{x})^2}{N}}$$

x = original value

\bar{x} = average value of the 53 economies

N = number of economies

S = Standard Deviation

3. Compute the annual standardised values (STD values) for each of the 53 economies for every criterion (i):

$$STDvalue_i = \frac{x - \bar{x}}{S}$$

(b) Creating time series

The second step is to put together all annual standardised values of the same indicator into a time series. By doing so, we obtain the transformation of the indicator that reflects the deviation of each country's observation from the annual mean for this variable, corrected for the average annual spread of the variable. Since the variable has no nominal units of measurement, it makes it possible to combine it with other variables into an index.

The standardised values measure relative differences between the economies' performances. Since the cross-sectional means are subtracted from the values of the indicators for each year, the annual standardised values that we end up with are 'stripped' from their cross-sectional variation, thus putting the emphasis on their time variation. This makes standardisation a good tool for preparing the data for time-series analysis as well.

Appendix 2: Macro risk ranking

Figure 246: Macro risk ranking

Rank	Country	Current account balance, 2008E	Net external debt / GDP	Private sector credit / GDP	Loan / deposits	Commodity exports / GDP	CDS spreads	Short term external debt (less FX reserves) / GDP	Score
1	Iceland	-18%	839%	435%	204%	1%	1,000	248%	229
2	Bulgaria	-18%	92%	71%	130%	4%	565	3%	202
3	Estonia	-8%	112%	96%	190%	-3%	590	27%	186
4	Spain	-9%	75%	166%	117%	-3%	99	44%	185
5	Lithuania	-8%	79%	62%	150%	-1%	580	0%	180
6	Latvia	-11%	134%	30%	254%	-3%	865	26%	176
7	Greece	-14%	94%	81%	109%	-4%	na	39%	176
8	Romania	-19%	69%	35%	122%	-4%	615	na	171
9	South Africa	-8%	18%	93%	92%	4%	611	-1%	162
10	Ukraine	-9%	21%	63%	150%	-6%	2,600	-3%	158
11	UK	-2%	25%	198%	127%	-1%	68	303%	155
12	Hungary	-5%	82%	63%	119%	-2%	535	-1%	153
13	US	-4%	18%	226%	100%	-2%	37	37%	148
14	Poland	-6%	34%	45%	115%	-2%	280	-3%	145
15	Ireland	-3%	12%	183%	116%	0%	120	363%	140
16	Chile	-2%	19%	77%	125%	20%	305	-4%	135
17	Denmark	2%	3%	185%	167%	4%	60	74%	131
18	Italy	-3%	6%	85%	129%	-4%	127	39%	131
19	Brazil	-3%	2%	51%	139%	4%	565	-10%	127
20	Colombia	-4%	9%	34%	110%	8%	na	-7%	126
21	Korea	-1%	23%	107%	130%	-9%	680	-7%	122
22	Turkey	-6%	25%	38%	85%	-5%	800	-3%	120
23	Russia	1%	-4%	43%	149%	16%	1,106	-25%	111
24	Argentina	1%	23%	13%	77%	13%	4,161	-5%	99
25	Mexico	-2%	4%	18%	99%	2%	556	-6%	97
26	India	-3%	-2%	53%	79%	-4%	na	-17%	95
27	Indonesia	1%	17%	25%	67%	5%	1,090	-9%	78
28	Malaysia	14%	-30%	108%	73%	10%	498	-39%	74
29	Thailand	1%	-6%	89%	92%	-5%	497	-24%	70
30	Egypt	0%	-4%	40%	55%	-1%	800	-18%	68
31	Japan	3%	-50%	137%	76%	-4%	na	5%	64
32	Hong Kong	8%	-35%	145%	94%	-10%	110	157%	55
33	China	4%	-34%	123%	60%	-5%	264	-39%	54
34	Philippines	3%	17%	27%	61%	-7%	768	-15%	46
35	Singapore	14%	-94%	105%	83%	-10%	na	na	39
	Average	-5%	56%	95%	121%	1%	734	0	136

Source: IMF, © Datastream International Limited ALL RIGHTS RESERVED, the BLOOMBERG PROFESSIONAL™ service, Credit Suisse research

Appendix 3: Further reading

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 Abbott Laboratories (ABT, \$52.39, NEUTRAL, TP \$58.00)
 Accenture Ltd. (ACN, \$30.98, OUTPERFORM, TP \$48.00)
 Acer Inc. (2353.TW, NT\$42.20, OUTPERFORM, TP NT\$53.00)
 Adcock Ingram Holdings Ltd (AIPJ.J, R36.00, OUTPERFORM [V], TP R43.00)
 Adecco (ADEN.VX, SFr36.04)
 Administaff, Inc. (ASF, \$17.08)
 Aeon (8267, ¥848, NEUTRAL [V], TP ¥1,055, OVERWEIGHT)
 Affiliated Computer Services Inc. (ACS, \$40.45, OUTPERFORM, TP \$61.00)
 *African Bank Investment Ltd (ABLI.J, R27.25, OUTPERFORM, TP R33.50)
 AGCO Corp (AG, \$24.62, OUTPERFORM [V], TP \$40.00)
 Agrium Inc. (AGU, \$31.42, NEUTRAL [V], TP \$60.00)
 AIB Mortgage Bank (FI00599)
 Ajinomoto (2802, ¥1,010, NEUTRAL, TP ¥850, MARKET WEIGHT)
 Akbank (AKBNK.IS, 4.30, NEUTRAL [V], TP 7.75)
 Alcatel-Lucent (ALU, \$2.14, OUTPERFORM [V], TP \$5.00, MARKET WEIGHT)
 ALL - Am. Lat. Logistica (ALLL11, \$4.99, OUTPERFORM [V], TP \$13.30)
 Alliance Financial Group BHD (ALFG.KL, RM1.92, OUTPERFORM, TP RM2.30)
 Allied Bank Limited (ALDB.KA, PRs57.88, UNDERPERFORM, TP PRs44.00)
 Allied Irish Banks (ALBK.I, Eu 2.70, UNDERPERFORM, TP Eu 3.25, MARKET WEIGHT)
 American Public Education, Inc. (APEI, \$39.56, OUTPERFORM, TP \$57.00)
 Amgen Inc. (AMGN, \$55.54, OUTPERFORM, TP \$72.00)
 Amil (AMIL3, \$3.60, OUTPERFORM [V], TP \$12.00)
 Anglo Irish Bank (ANGL.I, Eu .85, NEUTRAL [V], TP Eu 1.00, MARKET WEIGHT)
 Anhanguera Educacional (AEDU11, \$5.90, OUTPERFORM [V], TP \$27.00)
 Apollo Group Inc. (APOL, \$76.84, OUTPERFORM [V], TP \$88.00)
 Archer Daniels Midland Inc. (ADM, \$27.38, NEUTRAL, TP \$30.00)
 *Aspen Pharmacare Holding (APNJ.J, R37.45, UNDERPERFORM, TP R37.50)
 Associated British Foods (ABF.L, 677.00 p, NEUTRAL, TP 750.00 p, OVERWEIGHT)
 *Astral Foods (ARLJ.J, R90.00, OUTPERFORM, TP R110.00)
 Atos Origin (ATOS.PA, Eu17.35, UNDERPERFORM, TP Eu33.00, OVERWEIGHT)
 Aurobindo Pharma Limited (ARBN.BO, Rs110.60, OUTPERFORM, TP Rs550.00)
 Australian Agricultural Company Limited (AAC.AX, A\$1.37)
 Autodesk Inc. (ADSK, \$16.59, NEUTRAL, TP \$10.50)
 Automatic Data Processing, Inc. (ADP, \$41.06, NEUTRAL, TP \$36.00)
 Axis Bank Limited (AXBK.BO, Rs406.85, UNDERPERFORM [V], TP Rs518.00)
 Baidu (BIDU.OQ, \$142.75, NEUTRAL [V], TP \$138.00)
 Banco do Brasil (BBAS3, \$6.21, UNDERPERFORM [V], TP \$8.40)
 Banco Santander Central Hispano SA (SAN) (SAN.MC, Eu 6.43, OUTPERFORM, TP Eu 11, MARKET WEIGHT)
 Bank Central Asia (BBCA.JK, Rp2700.00, NEUTRAL, TP Rp2700)
 Bank CIMB Niaga Tbk PT (BNGA.JK, Rp420.00)
 Bank Danamon (BDMN.JK, Rp2550.00, NEUTRAL, TP Rp3000.00)
 Bank Internasional Indonesia Tbk PT (BNII.JK, Rp490.00)
 Bank Mandiri (Persero) (BMRI.JK, Rp1470.00, NEUTRAL, TP Rp1400.00)
 Bank Moskovy (MMBM.RTS, \$32.00, UNDERPERFORM, TP \$18.00)
 Bank Negara Indonesia (BBNI.JK, Rp510.00, UNDERPERFORM [V], TP Rp380)
 Bank of China Ltd (3988.HK, HK\$2.45, NEUTRAL, TP HK\$2.32)
 Bank of Communications (3328.HK, HK\$5.08, UNDERPERFORM [V], TP HK\$4.11)
 Bank Pan Indonesia Tbk (PNBN.JK, Rp520.00, OUTPERFORM [V], TP Rp900.00)
 Bank Rakyat Indonesia (BBRI.JK, Rp3175.00, OUTPERFORM [V], TP Rp4600)
 Bank St Petersburg (STBK.RTS, \$1.10, UNDERPERFORM [V], TP \$2.80)
 Banrisul (BRSR6, \$2.58, NEUTRAL [V], TP \$3.7)
 Barclays (BARC.L, 169.40p, NEUTRAL [V], TP 200.00p, MARKET WEIGHT)
 BBVA (BBVA.MC, Eu 8.14, OUTPERFORM, TP Eu 15.00, MARKET WEIGHT)
 Beijing Double-Crane Pharmaceutical Co Ltd (600062.SS, Rmb22.91)
 BNP Paribas (BNPP.PA, Eu 43.33, OUTPERFORM, TP Eu 70.00, MARKET WEIGHT)
 Bradesco (BBDC4, \$10.70, NEUTRAL [V], TP \$14.60)
 Brasil Ecodiesel (ECOD3, \$.31)
 Brasilagro S.A. (AGRO3, \$3.36, OUTPERFORM, TP \$9.00)

Bristol-Myers Squibb (BMY, \$20.70, RESTRICTED)
 Broadcom Corp. (BRM, \$15.31, OUTPERFORM [V], TP \$20.00)
 Bunge Limited (BG, \$42.46, RESTRICTED)
 Bureau Veritas SA (BVI.PA, Eu28.05)
 Cadbury (CBRY.L, 551.50 p, UNDERPERFORM, TP 565.00 p, OVERWEIGHT)
 Campbell Soup Company (CPB, \$32.05, NEUTRAL, TP \$35.00)
 Capella Education Company (CPLA, \$59.86, OUTPERFORM [V], TP \$55.00)
 Capgemini (CAPP.PA, Eu25.27, OUTPERFORM, TP Eu36.00, OVERWEIGHT)
 Career Education Corp. (CECO, \$18.48, NEUTRAL [V], TP \$16.00)
 Carrefour (CARR.PA, Eu29.71, NEUTRAL, TP Eu35.00, MARKET WEIGHT)
 Casino Guichard (CASP.PA, Eu47.83, UNDERPERFORM, TP Eu52.00, MARKET WEIGHT)
 CDI Corporation (CDI, \$10.23)
 CF Industries (CF, \$52.63, OUTPERFORM [V], TP \$110.00)
 Chaoda Modern Agriculture (0682.HK, HK\$4.49)
 Charoen Pokphand Foods Public (CPF.BK, Bt2.80)
 Checkpoint Systems, Inc. (CKP, \$11.56)
 China Construction Bank (0939.HK, HK\$4.09, NEUTRAL [V], TP HK\$3.65)
 China Life Insurance Co. (2628.HK, HK\$19.94, OUTPERFORM [V], TP HK\$25.00)
 China Medical Technologies, Inc. (CMED.OQ, \$18.99, RESTRICTED [V])
 China Mengniu Dairy (2319.HK, HK\$7.62, UNDERPERFORM [V], TP HK\$11.00)
 China Mobile Limited (0941.HK, HK\$71.10, OUTPERFORM [V], TP HK\$90.00)
 China National Medicines Corporation (600511.SS, Rmb25.62)
 China Telecom (0728.HK, HK\$2.95, NEUTRAL [V], TP HK\$3.60)
 China Yurun (1068.HK, HK\$8.60, NEUTRAL [V], TP HK\$8.85)
 ChoicePoint, Inc. (CPS, \$49.85)
 ChungHwa Telecom (2412.TW, NT\$52.50, OUTPERFORM, TP NT\$68.00)
 Cipla Limited (CIPL.BO, Rs183.45, NEUTRAL, TP Rs220.00)
 Cipla Medpro South Africa Ltd (CMPJ.J, R2.30, OUTPERFORM, TP R3.84)
 Cisco Systems Inc. (CSCO, \$16.54, NEUTRAL [V], TP \$19.00)
 Citi (C, \$8.29, NEUTRAL [V], TP \$10.00)
 Citrix Systems Inc. (CTXS, \$26.66, OUTPERFORM [V], TP \$39.50)
 CJ Corporation (001040.KS, W30,200)
 CJ Internet Corp (037150.KQ, W11,050, OUTPERFORM [V], TP W12,300)
 Cognizant Technology Solutions Corp. (CTSH, \$19.20, OUTPERFORM [V], TP \$28.00)
 Compartamos (COMPARTO, \$1.49, OUTPERFORM, TP \$4.20)
 Computacenter (CCC.L, 68.75 p, OUTPERFORM [V], TP 200.00 p, OVERWEIGHT)
 Computer Sciences Corp. (CSC, \$27.86, NEUTRAL, TP \$38.00)
 ConAgra Foods, Inc. (CAG, \$14.75, NEUTRAL, TP \$21.00)
 Corinthian Colleges, Inc. (COCO, \$16.08, NEUTRAL [V], TP \$12.00)
 Daekyo Co Ltd (019680.KS, W4,200)
 Danone (DANO.PA, Eu45.28, OUTPERFORM, TP Eu63.00, OVERWEIGHT)
 Daum Communications Corp (035720.KQ, W28,000, OUTPERFORM [V], TP W50,000)
 Dean Foods Company (DF, \$14.56, OUTPERFORM, TP \$25.00)
 Deere & Co. (DE, \$34.81, OUTPERFORM, TP \$44.00)
 Del Monte Foods Company (DLM, \$5.92, UNDERPERFORM, TP \$5.50)
 Dell Inc. (DELL, \$11.17, OUTPERFORM, TP \$15.00)
 Deutsche Post AG (DPW.Gn.DE, Eu11.29, NEUTRAL, TP Eu10.80, MARKET WEIGHT)
 Dexia (DEXI.BR, Eu 3.41, UNDERPERFORM [V], TP Eu 5.00, MARKET WEIGHT)
 DeVry Inc. (DV, \$57.48, NEUTRAL, TP \$52.00)
 Diagnosticos da America (DASA3, \$10.64, OUTPERFORM [V], TP \$29.00)
 Dice Holdings Inc. (DHX, \$3.19)
 Dow Chemical Company (DOW, \$18.55, NEUTRAL, TP \$27.00)
 Dr. Reddy's Laboratories Limited (REDY.BO, Rs428.15, OUTPERFORM, TP Rs810.00)
 EastPharma (EASTq.L, \$3.95, NEUTRAL [V], TP \$2.98, OVERWEIGHT)
 Educomp Solutions Ltd (EDSO.BO, Rs2261.45, OUTPERFORM [V], TP Rs2700.00)
 Electronic Data Systems Corp. (EDS, \$24.96)
 Eli Lilly (LLY, \$34.15, NEUTRAL, TP \$42.00)
 EMC Corp. (EMC, \$10.57, OUTPERFORM, TP \$14.00)
 Emergency Medical Services Corp. (EMS, \$33.92, NEUTRAL [V], TP \$33.00)
 Ericsson (ERICb.ST, SKr57.60, UNDERPERFORM, TP SKr40.00, MARKET WEIGHT)
 Estacio Participacoes (ESTC3, \$5.97, OUTPERFORM [V], TP \$17.00)
 Everonn Systems India Ltd (EVSI.BO, Rs247.30, OUTPERFORM [V], TP Rs245.00)
 ExlService Holdings Inc. (EXLS, \$7.10, NEUTRAL [V], TP \$9.00)
 Expeditors International of Washington (EXPD, \$33.43, OUTPERFORM, TP \$45.00)
 Fidelity National Information Services (FIS, \$17.18, NEUTRAL, TP \$17.00)

Financiera Independencia (FINDEP, \$.59, OUTPERFORM, TP \$1.30)
 First Advantage Corporation (FADV, \$12.57)
 FirstRand Limited (FSRJ.J, R16.50, OUTPERFORM, TP R18.00)
 Fiserv, Inc. (FISV, \$34.14, OUTPERFORM, TP \$50.00)
 Fuji Oil (2607, ¥1,206, NEUTRAL, TP ¥1,330, MARKET WEIGHT)
 G.F. Inbursa (GFINBURO, \$2.61, NEUTRAL, TP \$3.20)
 Garanti Bank (GARAN.IS, 2.28, NEUTRAL [V], TP 4.90)
 Gedeon Richter (GDRB.BU, HUF27100.00, OUTPERFORM, TP HUF28093.00, OVERWEIGHT)
 Genentech, Inc. (DNA, \$76.60, RESTRICTED [V])
 General Electric (GE, \$17.17, NEUTRAL, TP \$18.00)
 General Mills (GIS, \$63.17, OUTPERFORM, TP \$72.00)
 Genpact (G, \$7.93, OUTPERFORM [V], TP \$13.00)
 Gevity HR Inc. (GVHR, \$1.59)
 Gilead Sciences (GILD, \$44.79, OUTPERFORM [V], TP \$54.00)
 Glenmark Pharmaceuticals (GLEN.BO, Rs324.00, OUTPERFORM [V], TP Rs350.00)
 Global Bio-Chem Technology (0809.HK, HK\$70)
 Global Payments, Inc. (GPN, \$36.17, NEUTRAL, TP \$42.00)
 Golden Hope Plantation (GHOP.KL)
 Grupo Financiero Banorte (GFNORTEO, \$1.61, OUTPERFORM, TP \$5.20)
 H.J. Heinz Company (HNZ, \$38.84, OUTPERFORM, TP \$47.00)
 Habib Bank Limited (HBL.KA, PRs138.45, UNDERPERFORM, TP PRs116.00)
 Halkbank (HALKB.IS, 4.10, NEUTRAL [V], TP 9.09)
 Halyk Bank (HSBKq.L, \$3.38, OUTPERFORM, TP \$18.00)
 HCL Technologies (HCLT.BO, Rs137.30, UNDERPERFORM [V], TP Rs150.00, MARKET WEIGHT)
 HDFC Bank (HDBK.BO, Rs920.40, NEUTRAL, TP Rs1209.00)
 Heidrick & Struggles International, Inc. (HSII, \$20.70, NEUTRAL [V], TP \$24.00)
 Hewitt Associates (HEW, \$28.58)
 Hewlett-Packard (HPQ, \$35.28, NEUTRAL, TP \$35.00)
 Hikma (HIK.L, 277.50 p, NEUTRAL, TP 306.00 p, OVERWEIGHT)
 Hon Hai Precision (2317.TW, NT\$64.40, OUTPERFORM [V], TP NT\$81.00)
 Hong Leong Bank (HLBB.KL, RM5.00, UNDERPERFORM, TP RM4.60)
 Hormel Foods (HRL, \$26.56, NEUTRAL, TP \$29.00)
 HSBC Holdings (HSBA.L, 715.00p, NEUTRAL, TP 800.00p, MARKET WEIGHT)
 Hudson Highland Group, Inc. (HHGP, \$3.14)
 *Illovo Sugar Limited (ILVJ.J, R22.00, OUTPERFORM, TP R28.00)
 Incitec Pivot Limited (IPL.AX, A\$2.70, RESTRICTED [V])
 Indofood Agri Resources Ltd (IFAR.SI, S\$4.47, OUTPERFORM [V], TP S\$7.70)
 Indofood Sukses Makmur (INDF.JK, Rp970.00, OUTPERFORM [V], TP Rp1575.00)
 Indra (IDR.MC, Eu16.00, OUTPERFORM, TP Eu19.00, OVERWEIGHT)
 Industrial & Commercial Bank of China (1398.HK, HK\$3.80, NEUTRAL, TP HK\$3.50)
 Infosys Technologies Ltd. (INFY.BO, Rs1245.00, OUTPERFORM, TP Rs1650.00, MARKET WEIGHT)
 Infrastructure Development Finance Co Ltd (IDFC.BO, Rs52.20, NEUTRAL [V], TP Rs64.00)
 ING Group (ING.AS, Eu 6.60, OUTPERFORM, TP Eu 16.50, MARKET WEIGHT)
 Intel Corp. (INTC, \$13.80, OUTPERFORM [V], TP \$18.00)
 International Business Machines (IBM, \$81.60, NEUTRAL, TP \$90.00)
 Intertek (ITRK.L, 755.00 p)
 IOI Corporation (IOIB.KL, RM3.24, UNDERPERFORM [V], TP RM2.45)
 Itau (ITAU4, \$12.40, OUTPERFORM [V], TP \$17.10)
 Itausa (ITSA4, \$3.57, OUTPERFORM, \$5.25)
 ITT Educational Services, Inc. (ESI, \$90.08, NEUTRAL [V], TP \$84.00)
 Jack Henry & Associates (JKHY, \$18.41, NEUTRAL, TP \$17.00)
 Johnson & Johnson (JNJ, \$58.58, NEUTRAL, TP \$66.00)
 Juniper Networks (JNPR, \$17.38, NEUTRAL [V], TP \$20.00)
 K + S (SDFG.DE, Eu35.26, OUTPERFORM [V], TP Eu60.00, OVERWEIGHT)
 K12 Inc. (LRN, \$18.25, OUTPERFORM [V], TP \$32.00)
 Kalbe Farma (KLB.FJ, Rp410.00, NEUTRAL, TP Rp660.00)
 Kasikornbank (KBANK.BK, Bt42.50, OUTPERFORM, TP Bt68.00)
 KBC (KBC.BR, Eu23.60, OUTPERFORM, TP Eu43.00, MARKET WEIGHT)
 Kellogg Company (K, \$43.43, OUTPERFORM, TP \$57.00)
 Kelly Services (KELYA, \$11.65)
 Kforce Inc. (KFRC, \$6.80)
 Komercni Banka (BKOMsp.PR, Kc3000.00, NEUTRAL, TP Kc4200.00)
 Kongzhong (KONG.OQ, \$3.39, NEUTRAL [V], TP \$4.10)
 Korn/Ferry International (KFY, \$12.31, NEUTRAL, TP \$17.00)
 Kotak Mahindra Bank Ltd (KTKM.BO, Rs334.90, NEUTRAL [V], TP Rs501.00)

Kraft Foods, Inc. (KFT, \$27.21, NEUTRAL, TP \$33.00)
 KRKA (KRKG.LJ, Eu53.40, UNDERPERFORM, TP Eu69.00, OVERWEIGHT)
 Kroger Co. (KR, \$27.66, OUTPERFORM, TP \$32.00)
 Kroton (KROT11, \$5.10, NEUTRAL [V], TP \$14.00)
 Krung Thai Bank (KTB.BK, Bt3.30, OUTPERFORM, TP Bt5.60)
 KT Corp (030200.KS, W33,350, UNDERPERFORM, TP W32,000)
 KT Freetel (032390.KS, W28,500, UNDERPERFORM, TP W25,500)
 Kuala Lumpur Kepong (KLKK.KL, RM8.35, OUTPERFORM, TP RM10.00)
 Kubota (6326, ¥555, OUTPERFORM [V], TP ¥540, UNDERWEIGHT)
 Kuehne + Nagel (KNIN.VX, SFr73.75, NEUTRAL, TP SFr70.00, UNDERWEIGHT)
 Landstar System Inc. (LSTR, \$32.14, OUTPERFORM, TP \$45.00)
 LG Telecom (032640.KS, W10,800, NEUTRAL, TP W9,000)
 Lincoln Educational Services (LINC, \$13.75, OUTPERFORM, TP \$18.00)
 Linear Technology Corp. (LLTC, \$19.95, OUTPERFORM, TP \$25.00)
 Linktone (LTON.OQ, \$.79)
 Lockheed Martin (LMT, \$77.11, NEUTRAL, TP \$100.00)
 Logica (LOG.L, 66.00 p, UNDERPERFORM [V], TP 80.00 p, OVERWEIGHT)
 Lupin Ltd (LUPN.BO, Rs585.35, NEUTRAL, TP Rs620.00)
 Manpower (MAN, \$31.48, OUTPERFORM, TP \$53.00)
 MasterCard, Inc. (MA, \$145.30, NEUTRAL [V], TP \$200.00)
 McAfee Inc. (MFE, \$30.33, OUTPERFORM, TP \$36.00)
 MCB Bank Limited (MCB.KA, PRs235.75, UNDERPERFORM [V], TP PRs147.00)
 McGraw-Hill Companies (MHP, \$25.00)
 MediaTek Inc. (2454.TW, NT\$224.50, NEUTRAL [V], TP NT\$277)
 *Medi-Clinic (MDCJ.J, R18.10, UNDERPERFORM, TP R16.60)
 Megastudy Co Ltd (072870.KQ, W152,000, NEUTRAL [V], TP W180,000)
 Meiji Dairies (2261, ¥495)
 Merck & Co. (MRK, \$26.72, NEUTRAL, TP \$34.00)
 Microsoft Corp. (MSFT, \$20.22, OUTPERFORM, TP \$33.00)
 Mindray Medical International Ltd (MR.N, \$18.08, OUTPERFORM [V], TP \$36.00)
 Mindtree Ltd (MINT.BO, Rs233.10, UNDERPERFORM, TP Rs310.00, MARKET WEIGHT)
 MoneyGram International, Inc. (MGI, \$1.03)
 Mosaic Co (MOS, \$30.35, OUTPERFORM [V], TP \$70.00)
 Motorola Inc. (MOT, \$4.31, UNDERPERFORM [V], TP \$5.00, MARKET WEIGHT)
 MPS Group, Inc. (MPS, \$6.62, NEUTRAL [V], TP \$10.00)
 National Bank of Greece (NBGr.AT, Eu 14.80, OUTPERFORM, TP Eu 30.00, MARKET WEIGHT)
 National Bank of Pakistan (NBPK.KA, PRs93.02, NEUTRAL, TP PRs103.00)
 NC Soft (036570.KS, W43,650, NEUTRAL [V], TP W42,000)
 Nedbank Group Limited (NEDJ.J, R93.50, NEUTRAL, TP R107.00)
 Neowiz Games Corp (095660.KQ, W17,300, OUTPERFORM [V], TP W22,000)
 Nestle (Malaysia) (NESM.KL, RM27.50)
 Nestle (NESN.VX, SFr43.94, OUTPERFORM, TP SFr54.00, OVERWEIGHT)
 Netease.com (NTES.OQ, \$19.06, OUTPERFORM [V], TP \$28.50)
 *Network Healthcare (NTCJ.J, R7.70, NEUTRAL, TP R8.00)
 New Oriental Education & Technology Group (EDU.N, \$51.08, OUTPERFORM [V], TP \$81.30)
 NHN Corp (035420.KQ, KRW 108,000, OUTPERFORM, TP KRW 190,000)
 NIIT (NIIT.BO, Rs23.75, UNDERPERFORM [V], TP Rs25.00)
 Nokia (NOK1V.HE, Eu11.09, NEUTRAL, TP Eu12.00, MARKET WEIGHT)
 Nong Shim (004370.KS, W225,500, NEUTRAL, TP W250,000)
 Nortel Networks Corp. (NT, \$.57, RESTRICTED [V])
 North China Pharmaceutical, Limited (600812.SS, Rmb5.98)
 Northern Foods (NFDS.L, 52.50 p, UNDERPERFORM, TP 80.00 p, OVERWEIGHT)
 Northrop Grumman Corporation (NOC, \$40.95, OUTPERFORM, TP \$71.00)
 Nossa Caixa (BNCA3, \$27.57, NEUTRAL [V], TP \$18.24)
 Old Mutual (OMLJ.J, R8.05, NEUTRAL, TP R17.00)
 On Assignment (ASGN, \$5.75)
 Oracle Corporation (ORCL, \$16.09, NEUTRAL, TP \$22.00)
 Orica Limited (ORI.AX, A\$15.63, OUTPERFORM, TP A\$26.50)
 OTP (OTPB.BU, HUF2955.00, OUTPERFORM, TP HUF11000.00)
 Panalpina (PWTN.S, SFr57.90, NEUTRAL [V], TP SFr55.00, UNDERWEIGHT)
 Parkway Holdings (PARM.SI, S\$1.29, OUTPERFORM, TP S\$2.88)
 Paychex (PAYX, \$28.26, NEUTRAL, TP \$32.00)
 PCCW Ltd (0008.HK, HK\$3.54, NEUTRAL, TP HK\$5.00)
 Pearson (PSON.L, 619.50 p, NEUTRAL, TP 630.00 p, UNDERWEIGHT)
 Pekao (BAPE.WA, PLN111.00, NEUTRAL, TP PLN216.00)

People's Food Holdings Ltd (PPFH.SI, S\$.62, NEUTRAL [V], TP S\$.78)
 Perdigao (PRGA3, \$15.45, OUTPERFORM [V], TP \$24.50)
 Perfect World Co Ltd (PWRD.OQ, \$17.67, OUTPERFORM [V], TP \$29.20)
 Petrobras (PBR, \$20.94, NEUTRAL [V], TP \$30.00)
 Pfizer (PFE, \$16.43, NEUTRAL, TP \$19.00)
 Pharmstandard (PHST.RTS, \$21.25)
 Ping An Insurance (2318.HK, HK\$29.25, OUTPERFORM [V], TP HK\$47.00)
 PKO BP (PKOB.WA, PLN32.00, OUTPERFORM, TP PLN58.00)
 Potash Corporation of Saskatchewan (POT, \$61.64, NEUTRAL [V], TP \$125.00)
 Powercom Co Ltd (3043.TW, NT\$10.00)
 Profarma (PFRM3, \$2.93, OUTPERFORM [V], TP \$12.50)
 PT Astra Agro Lestari Tbk (AALI.JK, Rp8450.00, OUTPERFORM [V], TP Rp8500.00)
 PT London Sumatra Indonesia (LSIP.JK, Rp2725.00, OUTPERFORM [V], TP Rp2800.00)
 Punjab National Bank Ltd (PNBK.BO, Rs448.70, NEUTRAL, TP Rs360.00)
 QUALCOMM Inc. (QCOM, \$33.57, OUTPERFORM [V], TP \$45.00, MARKET WEIGHT)
 Raffles Education (RLSE.SI, S\$.44, OUTPERFORM [V], TP S\$1.20)
 Ranbaxy Laboratories Limited (RANB.BO, Rs208.80, OUTPERFORM, TP Rs220.00)
 Randstad (RAND.AS, Eu14.67)
 Reed Elsevier NV (ELSN.AS, Eu9.26, OUTPERFORM, TP Eu13.10, UNDERWEIGHT)
 Resources Global Professionals (RECN, \$17.31, NEUTRAL, TP \$22.00)
 Robert Half International (RHI, \$20.89, NEUTRAL, TP \$21.00)
 Sadia (SDIA4, \$1.43, NEUTRAL [V], TP \$4.75)
 Safeway Inc. (SWY, \$21.80, NEUTRAL, TP \$30.00)
 Santander Bancorp (SBP, \$9.88)
 Sao Martinho (SMT03, \$4.99, NEUTRAL [V], TP \$11.00)
 SAP (SAPG.F, Eu26.77, OUTPERFORM, TP Eu32.00, OVERWEIGHT)
 Sara Lee Corporation (SLE, \$9.18, NEUTRAL, TP \$12.50)
 Satyam Computer (SATY.BO, Rs243.00, UNDERPERFORM, TP Rs290.00, MARKET WEIGHT)
 Sberbank (SBER.RTS, \$.83, OUTPERFORM, TP \$1.70)
 Schering-Plough (SGP, \$16.81, OUTPERFORM, TP \$22.00)
 Scholastic Corporation (SCHL, \$15.27)
 SEB (SEBB11, \$3.69, OUTPERFORM, TP \$17.00)
 SGS Surveillance (SGSN.VX, SFr1030.00, OUTPERFORM, TP SFr1625.00, OVERWEIGHT)
 Shanda (SNDA.OQ, \$22.64, NEUTRAL [V], TP \$23.00)
 Shandong Weigao Group Medical (8199.HK, HK\$11.00, OUTPERFORM [V], TP HK\$19.00)
 Shin-Etsu Chemical (4063, ¥3,640, OUTPERFORM, TP ¥6,000, MARKET WEIGHT)
 Siam Commercial Bank (SCB.BK, Bt48.00, NEUTRAL, TP Bt61.00)
 Sime Darby (SIME.KL, RM5.85, UNDERPERFORM, TP RM5.88)
 Sina Corporation (SINA.OQ, \$30.07, OUTPERFORM [V], TP \$41.50)
 Sinofert Holdings Ltd (0297.HK, HK\$3.45, UNDERPERFORM [V], TP HK\$3.10)
 SK Communications Co Ltd (066270.KQ, W4,650, OUTPERFORM [V], TP W14,000)
 SLC Agrícola (SLCE3, \$4.90, OUTPERFORM [V], TP \$11.00)
 Smithfield Foods (SFD, \$6.81, NEUTRAL, TP \$8.00)
 Societe Generale (SOGN.PA, Eu 33.38, NEUTRAL [V], TP Eu 56.00, MARKET WEIGHT)
 Sohu.com (SOHU.OQ, \$43.69, RESTRICTED [V])
 Spherion (SFN, \$2.25)
 Stada Arzneimittel (STAGn.DE, Eu21.26, NEUTRAL, TP Eu26.00, OVERWEIGHT)
 *Standard Bank Group Limited (SBKJ.J, R86.58, OUTPERFORM, TP R91.00)
 Standard Chartered Plc (2888.HK, HK\$95.00, NEUTRAL, TP HK\$85.00)
 Strayer Education, Inc. (STRA, \$239.61, NEUTRAL, TP \$220.00)
 Sun Pharmaceuticals Industries Limited (SUN.BO, Rs1080.20, OUTPERFORM, TP Rs1370.00)
 SUPERVALU INC. (SVU, \$11.91, NEUTRAL, TP \$23.00)
 Symantec Corporation (SYMC, \$12.03, OUTPERFORM, TP \$20.00)
 Syntel (SYNT, \$24.02, NEUTRAL [V], TP \$24.00)
 Taiwan Fertilizer Co Ltd (1722.TW, NT\$48.20, OUTPERFORM [V], TP NT\$76.40)
 Taiwan Semiconductor Manufacturing (2330.TW, NT\$40.80, OUTPERFORM, TP NT\$50.00)
 Taleo Corp (TLEO, \$6.46)
 Tata Consultancy Services (TCS.BO, Rs562.00, OUTPERFORM, TP Rs725.00, MARKET WEIGHT)
 Tech Mahindra Limited (TEML.BO, Rs225.15, UNDERPERFORM [V], TP Rs490.00, MARKET WEIGHT)
 Tencent Holdings (0700.HK, HK\$42.50, OUTPERFORM [V], TP HK\$68.00)
 Teva Pharmaceutical Industries (TEVA, \$43.15, OUTPERFORM, TP \$55.00)
 The Coca-Cola Company (KO, \$46.87, NEUTRAL, TP \$55.00)
 THE9 Ltd (NCTY.OQ, \$12.64, NEUTRAL [V], TP \$18.00)
 Thomson Reuters PLC (TRIL.L, 1299.00 p, NEUTRAL, TP 1300.00 p)
 Tietoenator (TIE1V.HE, Eu8.17, NEUTRAL, TP Eu12.00, OVERWEIGHT)

Tiffany & Co. (TIF, \$19.79, NEUTRAL, TP \$20.00)
 *Tongaat-Hulett Group Ltd (TONJ.J, R50.50, UNDERPERFORM, TP R78.00)
 TNT (TNT.AS, Eu16.50, OUTPERFORM, TP Eu24.50, MARKET WEIGHT)
 Total System Services (TSS, \$14.27, NEUTRAL, TP \$17.00)
 Türkiye İ̇ Bankası (ISCTR.IS, 4.02, OUTPERFORM [V], TP 9.12)
 Tyson Foods (TSN, \$6.71, NEUTRAL, TP \$8.00)
 Unicredit (CRDI.MI, Eu1.79, OUTPERFORM, TP Eu2.70, MARKET WEIGHT)
 Unilever NV (UNc.AS, Eu18.33, UNDERPERFORM, TP Eu21.00, OVERWEIGHT)
 Unisys Corporation (UIS, \$.67)
 United Bank Limited (UBL.KA, PRs68.25, UNDERPERFORM, TP PRs68.00)
 United Tractors (UNTR.JK, Rp3975.00, OUTPERFORM [V], TP Rp7900.00)
 Universal Technical Institute (UTI, \$19.23, NEUTRAL [V], TP \$16.00)
 URSA Bank (URSA_p.RTS, \$.27, UNDERPERFORM [V], TP \$.40)
 Vakıfbank (VAKBN.IS, 1.20, OUTPERFORM [V], TP 3.52)
 VeraSun Energy Corporation (VSE, \$1.05)
 Visa Inc. (V, \$52.56, NEUTRAL [V], TP \$57.00)
 VMware Inc. (VMW, \$19.35, UNDERPERFORM [V], TP \$20.00)
 Volkswagen (VOWG.F, Eu280.72, UNDERPERFORM [V], TP Eu115.00, UNDERWEIGHT)
 Votorantim (VCP, \$5.56, RESTRICTED [V])
 Vozrozhdenie (VZRZ.RTS, \$11.36, OUTPERFORM, TP \$24.00)
 VTB (VTBRq.L, \$2.20, UNDERPERFORM, TP \$2.90)
 Watson Pharmaceuticals (WPI, \$23.75, UNDERPERFORM, TP \$23.00)
 Websense Inc. (WBSN, \$16.17, NEUTRAL, TP \$19.00)
 Wesfarmers Limited (WES.AX, A\$18.94, UNDERPERFORM, TP A\$19.50)
 Western Union (WU, \$13.27, NEUTRAL, TP \$23.00)
 Wilmar International Ltd (WLIL.SI, S\$2.78, OUTPERFORM [V], TP S\$3.30)
 Wimm-Bill-Dann Foods (WBD.N, \$23.83, NEUTRAL [V], TP \$26.60)
 Wipro Ltd. (WIPR.BO, Rs243.30, OUTPERFORM [V], TP Rs340.00, MARKET WEIGHT)
 Wm. Wrigley Jr. Company (WWY, \$79.97)
 WNS Global Services (WNS.N, \$9.00, OUTPERFORM [V], TP \$14.00)
 Wolters Kluwer (WLSNc.AS, Eu13.28, UNDERPERFORM, TP Eu14.00, UNDERWEIGHT)
 WuXi PharmaTech Cayman Inc. (WX.N, \$6.08, OUTPERFORM [V], TP \$13.20)
 Wyeth (WYE, \$36.01, OUTPERFORM, TP \$45.00)
 Xiwang Sugar (2088.HK, HK\$.94, NEUTRAL [V], TP HK\$3.52)
 Yapi Kredi Bank (YKBNK.IS, 1.91, OUTPERFORM [V], TP 3.95)
 Zentiva (ZNTVsp.PR, Kc1067.00, NEUTRAL, TP Kc1150.00, OVERWEIGHT)
 ZTE (0763.HK, HK\$16.80, OUTPERFORM [V], TP HK\$42.50)

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Disclosure Appendix

Important Global Disclosures

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Outperform (O): The stock's total return is expected to exceed the industry average* by at least 10-15% (or more, depending on perceived risk) over the next 12 months.

Neutral (N): The stock's total return is expected to be in line with the industry average* (range of $\pm 10\%$) over the next 12 months.

Underperform (U):** The stock's total return is expected to underperform the industry average* by 10-15% or more over the next 12 months.

**The industry average refers to the average total return of the relevant country or regional index (except with respect to Europe, where stock ratings are relative to the analyst's industry coverage universe).*

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