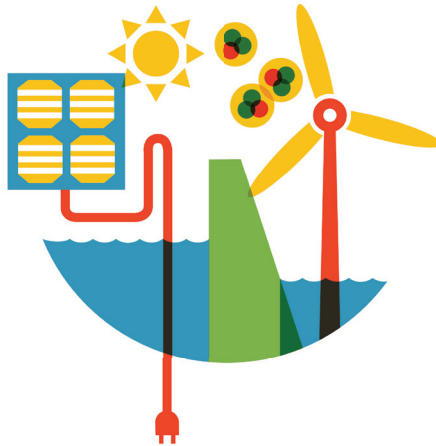


ASIA RISING

Engineering services



Environmental technology



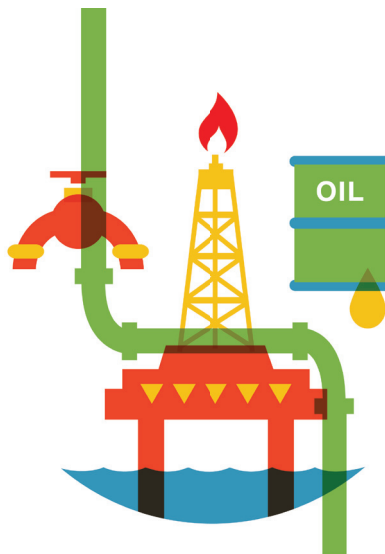
Food processing



Healthcare



Oil and gas



Wholesale and retail



An Economist Intelligence Unit report commissioned by

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ASIA RISING

Engineering services



An Economist
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**Industrial Dynamism
Barometer**
2014



Executive summary

The field of engineering services is extremely wide and varied, from aerospace to energy, from construction to automotive, and from electronics to software. But no matter which sub-sector a company operates in, the region of Asia Pacific is likely to be the most exciting in the world, thanks to its high-growth economies. A barometer of “industry dynamism” developed by the Economist Intelligence Unit shows that the engineering sector in Asia not only faces immense opportunity, but is succeeding in capturing this opportunity.

- **Asia stands out as being the most exciting part of the world for engineering services firms, thanks to impressive rates of economic growth.** In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. And most observers expect Asia’s share to keep rising for the foreseeable future.
- **Rapid economic growth translates into a wide range of engineering opportunities.** The Asian Development Bank calculates that Asia needs to invest between US\$8trn and US\$9trn in new infrastructure between 2010 and 2020. The construction of power stations, electricity grids, transport networks, and sewage and water systems will all require extensive engineering services. Just as significant, urbanisation has a long way to go in Asia. The United Nations estimates that 42% of Asia’s people were urbanised in 2009, compared to a global average of 50.5%. The ongoing processes of industrialisation and motorisation will be equally powerful in driving demand for engineering services. And sectors such as aviation will blossom. (see Box 2: “Aviation engineering takes off” on page 13.)
- **Asia’s engineering companies are growing at breakneck speed as they capitalise on these opportunities.** Between 2005 and 2011, the 120 or so engineering companies listed on the region’s stock exchanges grew top-line revenues by an average of 20% every year. What’s more, they delivered healthy and consistent profit margins of around 12.5%, as well as stable capital efficiency ratios. The number of listed companies in Asia’s engineering sector continues to rise, yet another sign of a dynamic market. Back in 2005, the sector had 94 listed companies. By 2011, that number had grown to 124.
- **Asia represents more than just an exciting market opportunity for engineering companies, increasingly it is becoming a major centre of R&D activity as well.** Back in 2002, Asia accounted for 27.2% of global R&D spending. By 2009, that share had grown to 33%—more than either North America or Europe. Much of this R&D spend comes from local companies and governments in Asia. But much also comes from global multinationals. Initially they chose Asia for its low-cost engineers. Today, the rationale for R&D investment in the region is no longer about cost, it is about accessing competencies as Asia moves up the value chain and develops world-class engineering and scientific capabilities. (See Box 1: “Asia and the frontlines of engineering R&D” on page 6.)



Asia's importance to engineering services companies

The engineering services sector is highly diverse, taking in a wide range of different industries: from aerospace to energy, from construction to automotive, and from electronics to software. Naturally, the forces driving this wide range of industries vary depending on the sector. However, underpinning the outlook for all of them is the rate of economic growth.

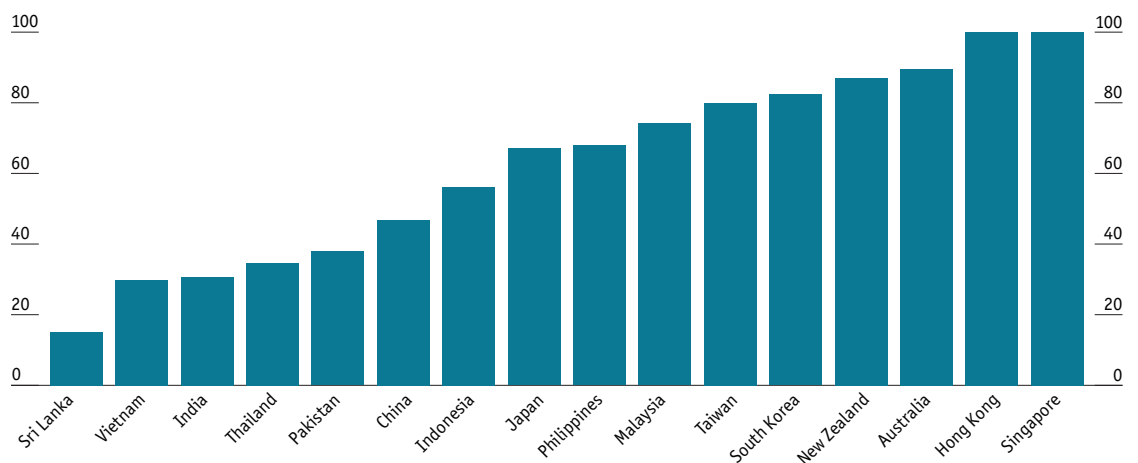
Given that Asia is the fastest growing region of the world, it also represents the most exciting market for engineering companies. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. And most observers expect Asia's share to keep rising for the foreseeable future.

This growing share of global economic output will create giant demand for infrastructure. The Asian Development Bank reckons that the region needs to invest between US\$8trn and US\$9trn in infrastructure between 2010 and 2020. This is the amount of investment needed to keep the region's economies growing at current rates.

Among the greatest infrastructure needs will be energy. ExxonMobil, a petrochemical giant, reckons that Asia's share of global energy consumption will rise from 38% in 2010 to 45% by 2040.¹ As energy demand grows, the region will need huge investment in power stations and electricity grids, as well as investment in up-stream activities in the oil and gas sector and alternative energy sources such as solar and geothermal.

Economic growth in Asia will also drive a continuing process of urbanisation. Many countries in the region are still predominantly rural (see chart 1). Indeed, the United Nations estimates that only 42% of Asia's people were urbanised in 2009, compared to a global average of 50.5%.

Chart 1: Urbanisation rates for Asia
(% of population living in cities)



Source: The Economist Intelligence Unit.

¹ ExxonMobil "2013 Outlook for Energy: A view to 2040"

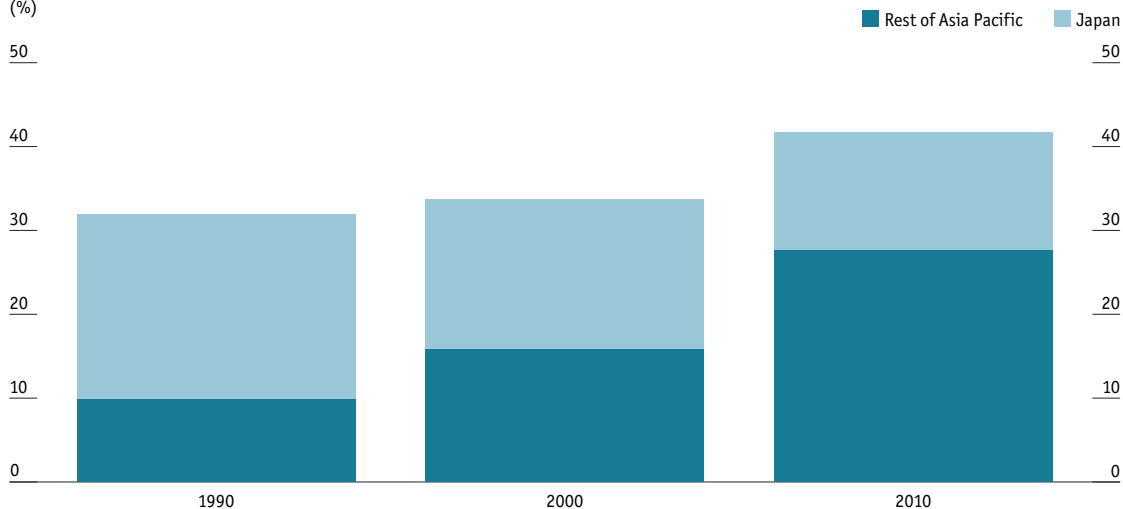


Engineering companies that provide services linked to urbanisation, construction, and related infrastructure will already recognise Asia’s rising significance. The United Nations identifies 958 cities around the world that had a population of 500,000 or more in 2009. Of these cities, 52% were located in Asia. Given that Asia’s cities will continue to grow, and that more new cities will continue to emerge, the engineering opportunity is exciting.

As incomes rise in Asia’s cities, demand will grow for better quality urban planning in order to avoid the chaos, pollution and sprawl that have characterised much of Asia’s urban development of the past. Promoting sustainability and quality of life will call for ever more sophisticated engineering services. “Governments in Asia are now much more focused on turning their cities into liveable environments,” says Scott Dunn, director of development in Asia for AECOM, a land use and planning consultancy. “They want better transport systems, better designed buildings, more efficient power grids, more reliable water and sanitation, and for all these things to be planned in an integrated way.”

As Asia grows, it is also rapidly industrialising, and its share of global manufacturing activity is rising. Back in 1990, Asia accounted for 31.8% of global manufacturing activity. By 2010, that share had risen to 41.7%. (See chart 2.) Some countries such as Vietnam and Myanmar are building out their industrial base for the first time. Other countries, such as Malaysia, Thailand and China are upgrading their industrial base as they move up the value chain into ever more sophisticated types of manufacturing. In all cases, the demand for engineering services will be strong.

Chart 2: Asia Pacific’s share of global manufacturing value added
(%)



Source: Unido

Given these characteristics, it is no surprise to see global companies setting ambitious targets for expansion. Take Atkins Global, a UK-headquartered engineering group. “Asia is our most significant growth engine,” says Alex Winchester, strategy director for Asia Pacific at Atkins. “Asia contributes slightly less than 10% of our global revenue today, and we expect to double that share in the next five years.”



But the rising importance of Asia to the engineering sector is not limited to expanding demand for goods and services in the region. Just as interesting is the rising supply of engineering talent. Asia is home to more than half of the world’s population, and education levels are climbing, creating an attractive pool of engineering talent. More and more global companies are shifting their research and development teams to Asia to avail of this talent. (See “Box 1: Asia and the frontlines of engineering R&D”.)

Box 1: Asia and the frontlines of engineering R&D

It’s no surprise to find that Asia’s share of global R&D expenditure is rising. Back in 2002, Asia accounted for 27.2% of world R&D spend. By 2009, that share had grown to 33%—more than either North America or Europe. (See chart 3.) For engineering companies, this represents a significant shift.

A big part of this growing R&D spend is funded and driven by local governments, universities and companies in Asia. However, much of Asia’s rising R&D comes from global multinationals, such as from Europe and US, shifting their R&D centres to the region. Research from Zinnov, an India-based consulting firm, shows that, of the world’s 500 biggest companies, 385 have set up an R&D centre in China, and 228 have set up an R&D centre in India. And while these two giant population centres have attracted more global R&D investment than other Asian nations thanks to their larger pool of engineers, they are far from being alone.

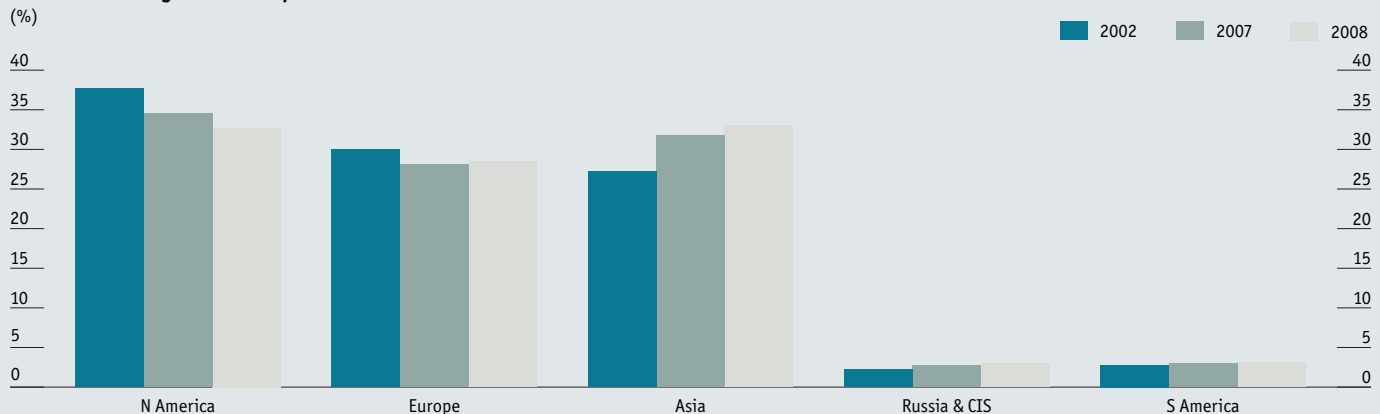
The motives behind global companies investing in R&D in Asia vary depending on the sector. However, certain broad trends are apparent. In the 1990s, many firms moved R&D from the West to the East in order to avail of lower wages, with advances in computing and communications enabling them to connect low-cost Asian R&D hubs to global operations.

In these early years, much of the R&D work was low-end and unexciting, such as software coding and testing, or else it was focused mostly on localising global products for Asia’s markets. Over time, however, this “labour cost arbitrage” has changed rapidly. Wages of Asia’s engineers have risen rapidly so that they are often no longer cheaper than their counterparts in the West.

But just as wages have risen, so too have the sophistication and experience of Asia’s engineering talent. As such, the focus in these R&D hubs has moved up the value chain. While some of them continue to focus on localisation efforts, especially given the rising importance of Asia’s markets, many of them are increasingly taking the global lead for certain product lines or service development, from conceptualisation to design, construction and testing. As one R&D manager in a software centre in India puts it: “The rationale for investing in R&D in Asia today is no longer about cost, it is about competencies.”

As Asia’s share of engineering markets grows, so the need for global companies to be close to this opportunity and to develop solutions that are appropriate to the market, will rise. The outlook for global investment in Asia’s R&D capabilities looks bright indeed.

Chart 3: Share of global R&D expenditure



Source: UNESCO



How dynamic is Asia’s engineering services sector?

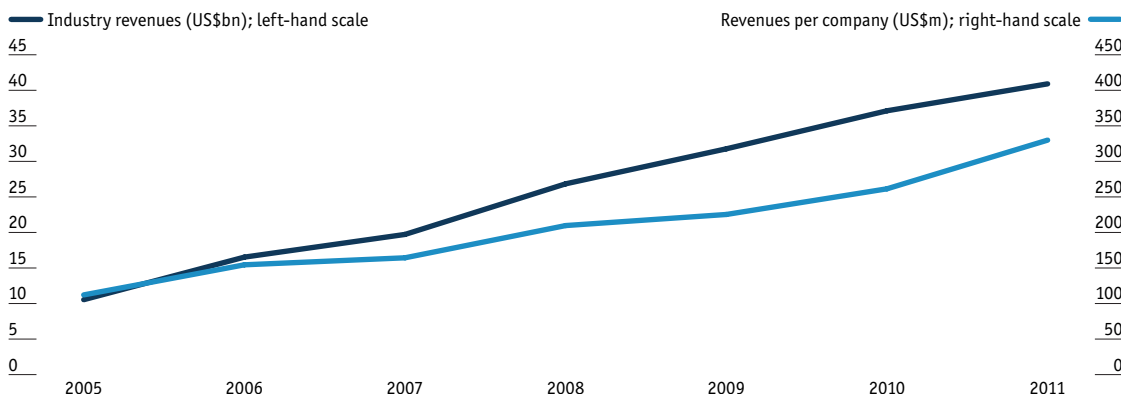
Given the economic and development profile of Asia, the region clearly represents an exciting market for the engineering sector. But how dynamic are Asia’s home-grown engineering companies in responding to this landscape of opportunity? How vibrant is the sector?

Dynamism as a concept is about activity and progress. The term implies high levels of change, development and movement. Are companies in a particular sector growing? How quickly? Are more companies entering the market? Are rates of investment rising? How profitable is the industry? Are businesses investing in R&D and innovation?

To answer these questions, the Economist Intelligence Unit analysed the performance of more than 120 companies listed on stock exchanges in Asia, from 2005 to 2011.² Their combined performance provides valuable insight into the health of the industry, and whether this is a sector that can be considered dynamic and exciting.

What is immediately clear is that the industry is enjoying high rates of growth. Back in 2005, companies in the sector had average revenues of US\$112m. By 2011, this had risen to US\$330m—giving an annual growth rate of almost 20%. (See chart 4.) By global standards, Asia’s listed engineering firms remain relatively small. The largest listed company in the sector had revenues of US\$6.99bn. By comparison, GE, a US-based engineering group, had revenues that year of US\$147bn. Nonetheless, if the region’s impressive growth rates continue, this gap will close. (See table 1.)

Chart 4: Total revenue for all Asia’s listed engineering services companies (US\$bn), and average revenue per company (US\$m)



Source: Company accounts.

Interestingly, the rate of growth hardly slowed during the years of the Global Financial Crisis of 2008 and 2009. Doubtless this is because many countries in Asia launched large fiscal stimulus measures to offset the impact of a perilously weak global economy. Indeed, public finances in much of Asia are strong compared to Western nations, and this strength enabled government spending in the region

² Countries included in the analysis were: China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand



Asia Rising – Industrial Dynamism Barometer:
Engineering services

Table 1: The ten largest listed engineering companies in Asia (ranked by revenues in 2011)

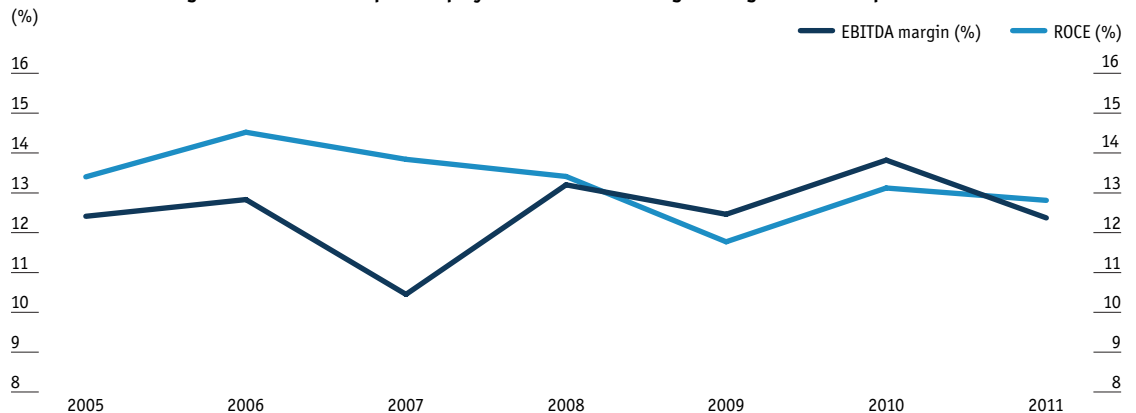
	Revenue in 2011 (US\$ bn)
Sembcorp Industries Ltd	6.99
China National Chemical Engineering Co Ltd	6.76
Singapore Technologies Engineering Ltd	4.63
Punj Lloyd Ltd	2.02
China Aluminium International Engineering	1.94
GMR Infrastructure Ltd	1.63
China CAMC Engineering Co Ltd	1.14
Zhejiang Yasha Decoration Co Ltd	1.11
Hongrun Construction Group Co Ltd	0.94
Malaysia Marine and Heavy Engineering Holdings	0.69

Source: Company accounts

to compensate for weak global conditions. Much of this fiscal stimulus was directed at infrastructure, which helped sustain strong revenue growth for Asia’s engineering sector.

Importantly, Asia’s engineering companies are maintaining profit margins in line with revenue growth. While the performance varies from year-to-year, EBITDA margins have stayed around 12.5%, while return on capital employed for the sector has hovered around 13%. (See chart 5.)

Chart 5: EBITDA margin* and return on capital employed for Asia’s listed engineering services companies



* Earnings before interest, tax, depreciation and amortisation.

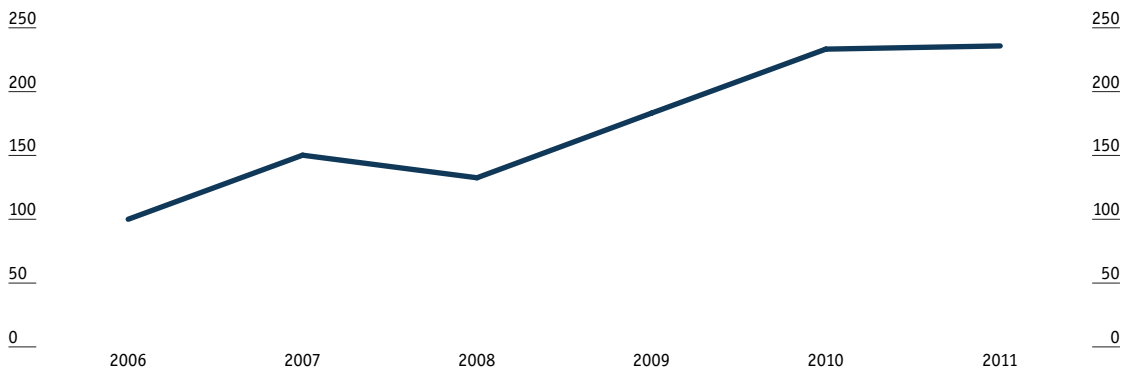
Source: Company accounts.

One measure of an industry’s dynamism is the number of companies in the sector. If the number of companies is increasing, it suggests a market of opportunity and change. In engineering, the number of listed companies in Asia has risen over the period of this study, from 94 in 2005 to 124 in 2011. Private companies are clearly going public in order to raise the capital they need to address opportunities they see unfolding before them.



Combining all the various aspects that define “industry dynamism”, the Economist Intelligence Unit has created a “dynamism barometer” that shows how the sector is evolving. This index combines a host of industry measures, such as growth rates, profitability, competition, and investment rates. Setting the index to equal 100 in the year 2006, it shows that the industry is experiencing rising levels of dynamism. By 2011, the barometer had risen to a measure of 236. (See chart 6.)

Chart 6: Engineering services barometer of industry dynamism
(2006 equals 100)



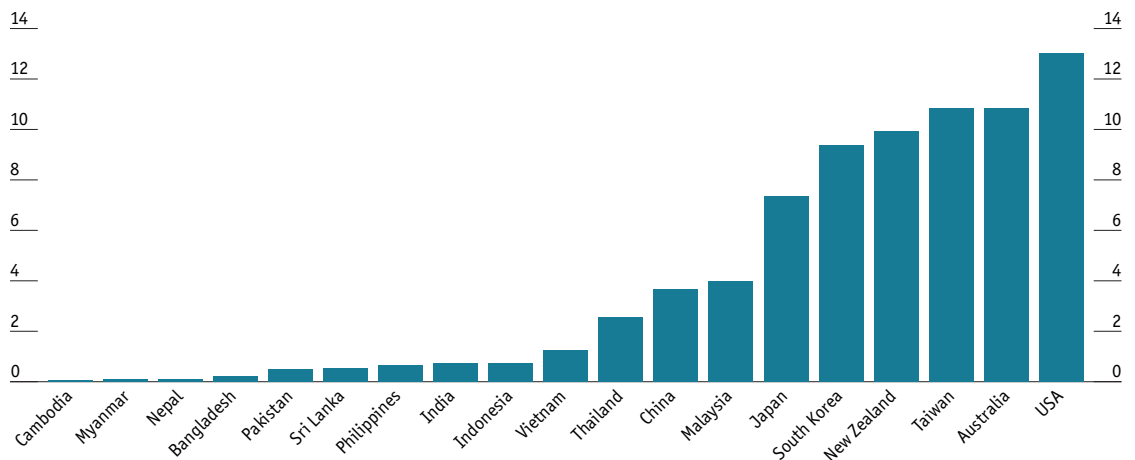
Source: The Economist Intelligence Unit.



Where are the opportunities?

The opportunities for engineering companies in Asia vary by sector, but arguably the need to build infrastructure carries the greatest potential. In power, for example, levels of electricity production in emerging Asia are well below levels in rich countries. (See chart 7.) As incomes rise, the demand for power generation will grow substantially.

Chart 7: Kilowatt hours of electricity production per capita
(‘000)



Data is for latest available year.
Source: The Economist Intelligence Unit & CIA World Factbook.

“One of the biggest opportunities for us in South-east Asia is the energy sector,” says Jeremy Lee, head of South-east Asia at Moog, a US engineering company that makes motors, motion control devices, actuators and other industrial components. “In Myanmar, for example, there is a huge shortage of power generating capacity, which we are helping to address. The whole ASEAN region is a big opportunity in this regard. Not just downstream, but upstream too. Places like Malaysia and Singapore have a lot of companies serving the oil and gas and marine sectors, with a big demand for high-end engineering services.”

The ongoing construction of transport infrastructure will see equally strong demand for engineering services. Take high-speed rail (where trains travel at an average speed of above 200kmh). In 2012, China had the world’s longest high-speed rail network, with 10,000km of high-speed rail services. But by the end of 2015, this network is expected to expand to 18,000km. China is not alone. In South-east Asia, for example, authorities have unveiled plans for a high-speed rail connection between Kuala Lumpur and Singapore to be completed by 2020. Other types of railway, from urban metro systems in Jakarta, to new lines deepening the connectivity across Thailand, Myanmar, Cambodia, Laos and Vietnam are also on the cards.



As power stations are built and transport links are strengthened, and as cities grow, the need for planning services will rise so that the investments are made efficiently and in an integrated manner. Sustainability will be an ever more important feature of engineering projects in order to manage the pressures of population growth, resource constraints, environmental degradation and quality of life. Demand for green buildings and for energy efficiency services will rise.

The degree to which infrastructure is built in Asia will be highly dependent on government policy and plans, which naturally vary by country. Every country in Asia needs infrastructure investment, even a highly-developed economy like Japan, where the challenges centre on upgrading infrastructure that is now ageing, as well as replacing the country's nuclear capacity with new energy sources following the Fukushima disaster. As such, companies face a broad landscape of opportunity, but must be careful choosing which opportunities to follow.

"In many parts of Asia, the environment for infrastructure investment isn't good enough," notes Francis Yeoh, group MD of YTL, a Malaysian conglomerate with interests ranging from cement and construction to power, water and hotels. "The regulatory environment can be unreliable, and levels of transparency can be too weak to give investors confidence."

Interestingly, he adds, it isn't always the poorest countries that are the worst in this regard. As he notes, infrastructure in the lowest-income economies is often funded by multilateral institutions such as the World Bank and the Asia Development Bank, whose oversight gives investors greater certainty and transparency.

At Atkins Global, Mr Winchester agrees. "A lot of governments have big ambitions and exciting plans, but that doesn't mean they'll translate into business for us," he notes. "Sometimes the plans are very well developed, but often they aren't. Sometimes the financing is shaky. Sometimes the transparency around government procurement isn't good enough."

Alongside infrastructure, opportunities for engineering firms exist in serving Asia's manufacturers. Patterns of manufacturing activity in Asia, and the engineering services they require, are constantly shifting. In countries operating at the technology frontier, such as Japan, Taiwan and South Korea, the emphasis will be on high-end research and development. Behind them are countries such as China, Thailand, and Malaysia that already have a deep industrial sector, but are keen to improve productivity and move into the highest segments of manufacturing activity. Other countries, such as Vietnam and Indonesia, are further down the value chain, and often are building out their industrial base for the first time.

At Moog, Mr Lee says the opportunities for his company are most closely aligned with makers of high-end industrial equipment found in places such as Japan, Taiwan and South Korea. In South-east Asia, he adds, manufacturing is at an earlier stage of development, focusing more on assembly of consumer electronics and automotives. Nonetheless, he adds, the industrial base in South-east Asia is deepening, and as it deepens, so the opportunities will grow for his company.

Many other sectors will see demand soar for engineering services. Among them is aviation-centred engineering, with Asia already comprising the largest part of the global aviation market. (See "Box 2: Aviation engineering takes off".)



Asia Rising – Industrial Dynamism Barometer: Engineering services

Asia will also see its share of global technology spending rise as communication networks are built out and internet penetration deepens. In 2011, Asia accounted for 37% of global IT spending. By 2016, the Economist Intelligence Unit reckons that share will grow to 47%. Not only will this call for huge support from engineering services companies to install and maintain this IT infrastructure, it will also create a platform for new internet services. Indeed, as the world's centre of gravity for telecoms and internet usage shifts to Asia, the region will increasingly become the place where R&D happens in the communication sector, spawning new technologies and new business models.



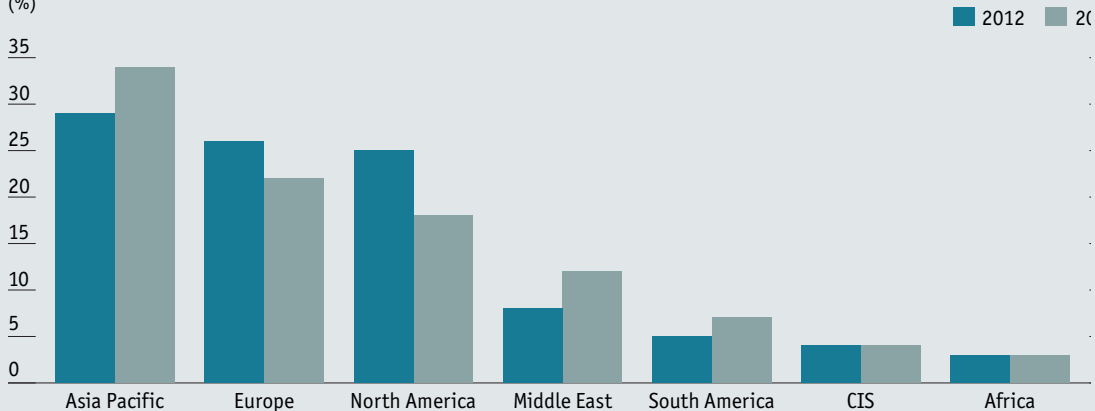
Box 2: Aviation engineering takes off

As incomes rise in Asia, more and more consumers are travelling overseas, both for business and pleasure. Indeed, Asia is already the biggest aviation market in the world, contributing 29% of all chargeable passenger kilometres flown in 2012. Airbus, a European aircraft manufacturer, forecasts that Asia's share will keep rising, and make up 34% of the passenger market by 2032. (See Chart 8.)

will see demand soar for maintenance and repair operations (MRO). ICF International, a US engineering group, calculates that the market for MRO in Asia will rise from US\$14.2bn in 2012 to US\$24.5bn in 2021, taking the region's share of the global market from 27% to 32%.

New hubs will emerge as centres of excellence for the aviation industry. Opportunities

Chart 8: Share of world revenue passenger kilometres (%)



Source: Airbus.

This soaring growth in Asia's aviation sector presents a giant opportunity for engineering companies. Boeing, a US aircraft maker, predicts that Asia will buy 12,820 new fixed wing aircraft between 2013 and 2032, or 36.3% of the global total.

An increasing number of these aircraft, and the components that go into them, will be made in Asia. In 2014, an Indonesian company, PT Dirgantara Indonesia (PTDI), won a US\$60.7m order from the Philippine air force to supply two military transporters based on a design from Airbus. PTDI was already building the ribs that go inside the wings of Airbus's A380 plane, the world's largest passenger jet. But with its new contract, it now joins China, India and Japan as places in Asia building complete aircraft.

Alongside manufacturing, the aviation sector

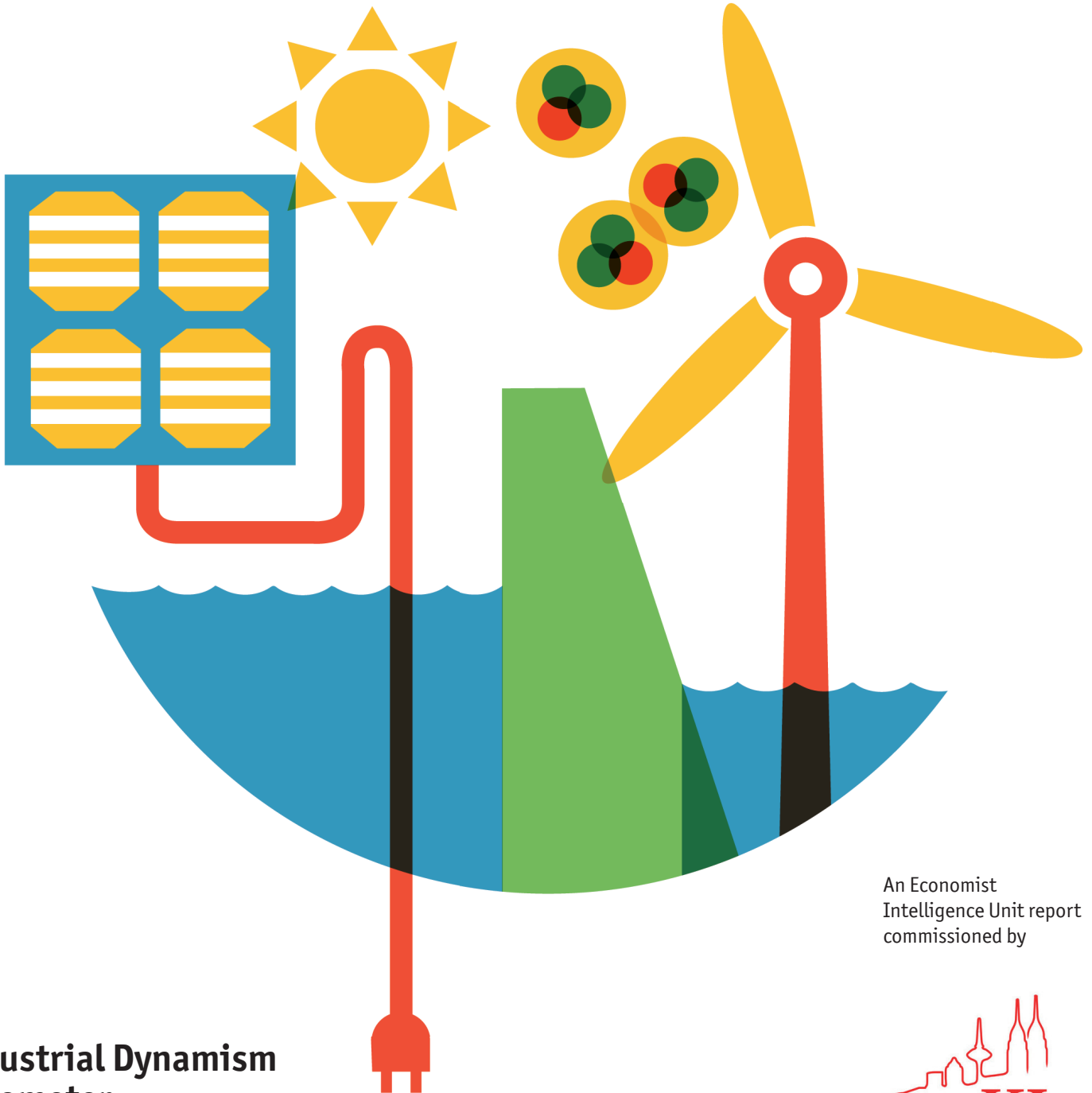
will exist for businesses to get involved in these hubs in countless ways, from providing training services, to setting up R&D facilities and manufacturing plants, to running MRO operations.

Opportunities will also emerge to build these new hubs. Consider Atkins Global, a UK-headquartered engineering group. In March 2014, Atkins announced a major project in Malaysia, when it was named as the lead consultant and master planner for Asia Aerospace City (AAC) in Kuala Lumpur. At a projected cost of MYR2bn (US\$610m), AAC will be a hub for the aerospace sector and related services. Built around Subang airport, much of the development will be made up of education facilities to train aerospace engineers, but will also house aerospace companies and be a centre of aeronautical R&D.

A report from The Economist Intelligence Unit

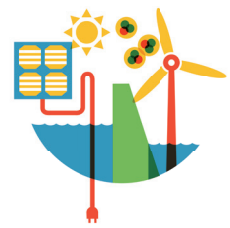
ASIA RISING

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**Industrial Dynamism
Barometer**
2014



Executive summary

As Asia's economies grow, the region will need to improve the sustainability of its development, from managing energy and resource usage, to planning how cities expand. For clean technology companies, the outlook is exciting. A barometer of "industry dynamism" developed by the Economist Intelligence Unit shows that the sector is becoming more vibrant as the opportunities unfold. While the global financial crisis caused difficulties for many firms in the sector, confidence is building, especially as governments in Asia become more committed to going green.

The report's key findings include:

- **Asia stands out as being the most exciting part of the world for cleantech businesses.** The region's population is set to grow by 800m people by 2040, and incomes are rising, creating tremendous environmental pressures. Asia already emits more carbon dioxide than the US, the European Union and the Russian Federation combined. This landscape offers significant opportunity for companies that provide solutions which limit the environmental impact of these changing demographics. One such opportunity will be in improving energy efficiency. (See Box 1: "The greenest kilowatt of energy is the one not consumed", on page 25.)
- **Policy support for renewable energy in Europe has fallen away, but is strong in Asia.** European austerity programmes resulting from the global financial crisis in 2008 have reduced government support for renewables. Conversely, many Asian governments are aggressively pushing the cleantech sector to reach the scale needed to be commercially viable.
- **Asia is in the midst of a giant wave of urbanisation, which will demand huge investment in building more efficient urban environments and infrastructure.** (See Box 2: "UrbanisAsian", on page 26.) For example, water resources will come under ever increasing stress, calling for better water supply and sanitation systems, as well as infrastructure designed to re-use urban wastewater.
- **Asia is experiencing record levels of cleantech investment.** While cleantech investment in the rest of the world declines, Asia's improving policy landscape and growth opportunities have driven investment to record levels. Across the six years of this study, the value of fixed assets per company increased by an average of 9% every year, suggesting strong belief in the sector's potential.
- **The combined revenues of Asia's cleantech firms more than doubled over the period of the study, but revenue per company rose slowly.** From 2005 to 2011 Asian cleantech firms reported a combined growth rate of nearly 13% a year. Much of this growth came from an increase in the number of listed companies, with revenue per company rising at just 3% a year. However, the rising number of cleantech firms listed on Asia's stockmarkets suggests strong interest from investors in the sector's potential.
- **While overall growth is strong, rising labour costs have squeezed profit margins.** Across the period of the study, income at Asia's cleantech firms has grown at just 1.3% a year, with margins squeezed by average labour costs per worker rising from US\$6,000 in 2005 to US\$13,000 in 2011.



Asia's importance to cleantech and clean energy companies

The cleantech and clean energy sector includes a diverse range of companies. Among them are those focused on developing renewable energy sources such as wind and solar. There are also those that promote energy efficiency or improve the use of scarce resources, especially water supplies. Others in the sector concentrate on reducing pollution, increasing recycling or using many of these techniques to improve living standards in urban environments.

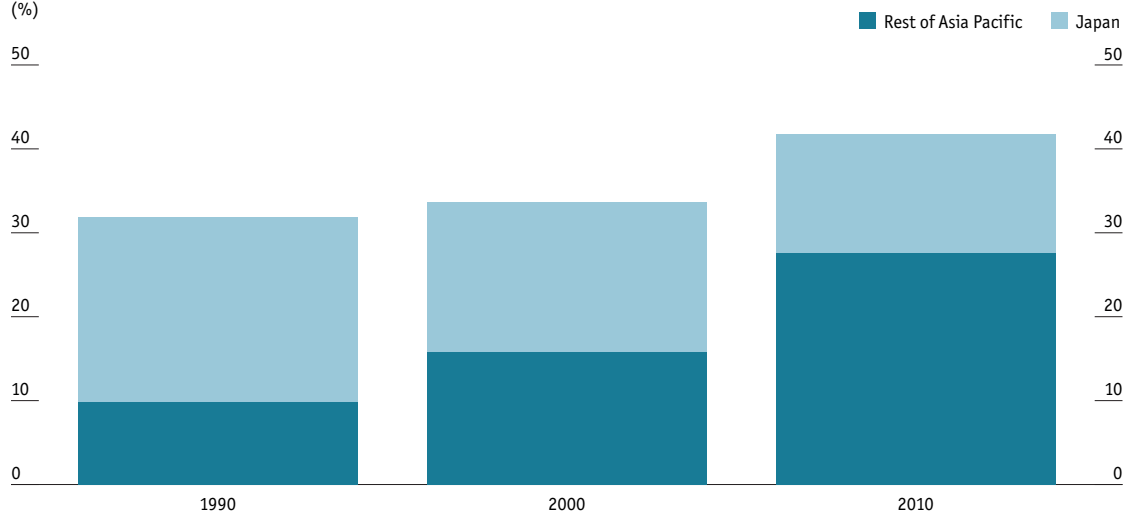
But despite the breadth of the cleantech sector, all companies within it are driven by two sets of factors: first, the underlying fundamentals of economics and demographics, and second, the policy environment that governments put in place. On both counts, Asia stands out as being the most exciting part of the world for cleantech businesses.

The demographics are clear. Today, Asia has more than half of the world's people, and the population is growing. In 2010, Asia's population stood at 3.8bn people. By 2040, it will rise to 4.6bn. Adding another 800m people will create tremendous environmental pressures that must be carefully managed.

But it isn't only about adding more people. Each of them is also getting richer—and incomes are rising faster in Asia than anywhere else. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. And this share of global economic activity will keep rising into the foreseeable future, adding to the environmental burden.

Consider Asia's share of global energy demand. ExxonMobil, a petrochemical giant, reckons that Asia's share of global energy consumption will rise from 38% in 2010 to 45% by 2040.¹ Managing the

Chart 1: Asia Pacific's share of global manufacturing value added (%)



Source: Unido.

¹ ExxonMobil "2013 Outlook for Energy: A view to 2040"

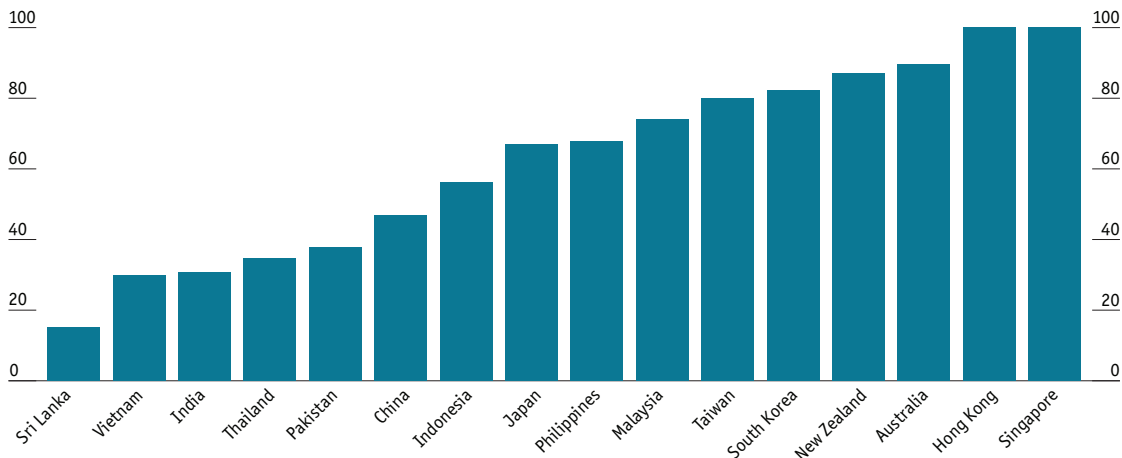


environmental impact of this surging demand for energy will present important opportunities for renewable energy firms, and for companies providing energy efficiency services.

Consider too Asia’s share of global manufacturing activity. Back in 1990, Asia accounted for 31.8% of global manufacturing activity. By 2010, that share had risen to 41.7%. (See chart 1.) Given this dominance of global manufacturing, the need for new technologies to manage industrial pollution as well as to improve resource use efficiency will be substantial.

Alongside industrialisation, Asia is also experiencing rapid rates of urbanisation. Many countries in the region are still predominantly rural (see chart 2), but this picture is changing. The construction activity that accompany the growth of Asia’s cities will have profound environmental consequences. The cement industry, for example, is one of the biggest emitters of carbon. Equally, the need for better waste-management services will rise sharply as urban populations rise. So too will the demand for water services and sanitation. And as Asia’s cities and infrastructure are built, and as people become wealthier, car ownership will increase, with all the inevitable implications of rising motorisation.

Chart 2: Urbanisation rates for Asia
(% of population living in cities)



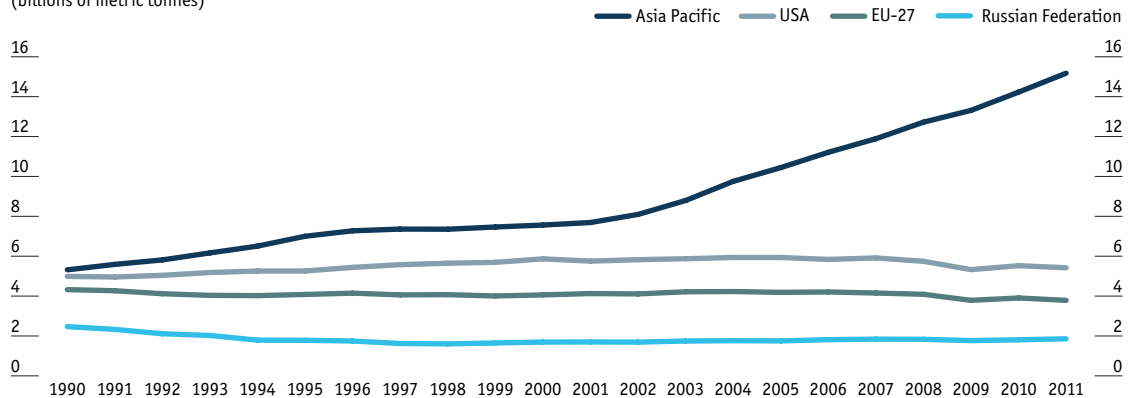
Source: The Economist Intelligence Unit.

Just as important as the growing number of urban dwellers is the quality of urban environments. Many of Asia’s cities have developed with little urban planning, giving rise to chaotic, sprawling, polluted settlements. But this is changing, says Scott Dunn, director of development in Asia for AECOM, a land use and planning consultancy. “Governments in Asia are now much more focused on turning their cities into liveable environments,” he says. “They want better transport systems, better designed buildings, more efficient power grids, more reliable water and sanitation, and for all these things to be planned in an integrated way.”

Asia clearly faces a future of giant environmental and social challenges, from controlling harmful emissions and pollution, to managing scarce resources such as water, to improving land management. Consider Asia’s carbon footprint. By 2011, the region’s carbon-dioxide emissions were already greater than the combined total produced by North America, the European Union and the Russian Federation.



Chart 3: Annual carbon-dioxide emissions from fossil fuel use and cement production per region, 1990-2011
(billions of metric tonnes)



Source: PBL Netherlands Environmental Assessment Agency.

(See chart 3.) Unless measures are taken, this picture will worsen significantly in the years ahead, with worrying consequences for global warming.

While conditions such as these are necessary for the growth of the cleantech industry, they are not sufficient. A supportive regime of government policy is just as important. Without stricter rules governing environmental issues, businesses, urban planners, and society at large often continue with their existing unsustainable practices and ignore cleantech alternatives. Equally, without government support such as subsidies, some green technologies are too expensive to implement, at least in the early stages of their development.

Importantly, however, many governments in Asia are starting to take these issues seriously. Indeed, some are emerging as global leaders in the battle to improve environmental performance. Many in the cleantech industry now regard Asia as the most promising part of the globe.

“Policy support for renewable energy has a tendency to be volatile,” notes Theodore Gitzos, regional manager for South-east Asia at Martifer Solar, a Portuguese photovoltaic company. He points to the situation in Europe, where government support for solar energy was strong during the 2000s, but then disappeared almost completely with the onset of the global financial crisis in 2008 as austerity programmes were put in place. “Policy support in Europe has fallen away, but it is rising in Asia. The policy environment here has become quite attractive.”

Jack Curtis, vice-president for Asia Pacific at First Solar, a US photovoltaic company, agrees. “A lot of what makes a market attractive is the policy environment,” he says. “In Europe, the past few years have seen dramatic cuts in support mechanisms. But in China there is now an aggressive push to get the solar energy industry to the sort of scale where it is commercially sustainable. Japan is also supporting solar as an alternative to nuclear power after the Fukushima earthquake.” First Solar committed to invest US\$100m in Japan in November 2013 on the back of the new policy shift.

Companies also point to South-east Asia as offering promising opportunities in clean energy, notably Indonesia, Thailand, Malaysia and the Philippines. The motivation behind these new policies varies from reducing the pollution and emissions of traditional energy sources such as coal to improving energy security by having a more diversified energy mix. Given that most of Asia is a net

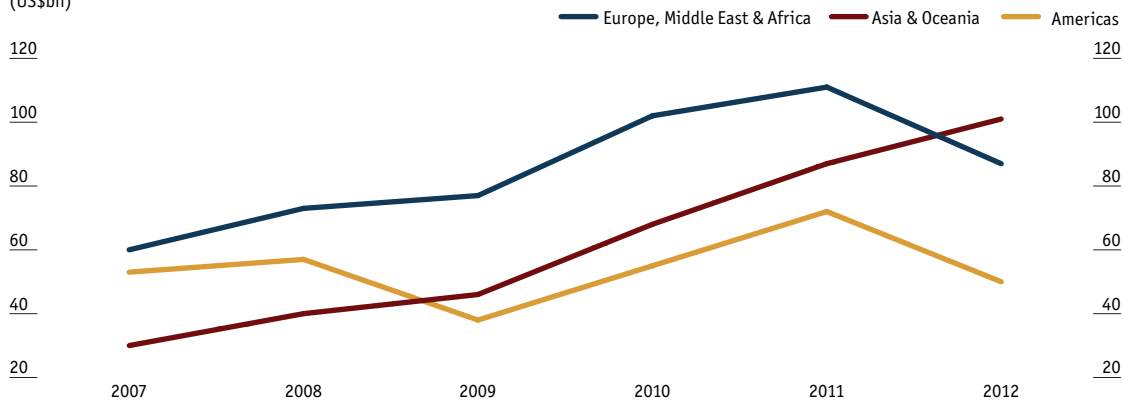


energy importer, having domestic sources of renewable energy also holds the promise of reducing the impact of volatile global commodity prices.

With Asia’s improving policy landscape, it is no surprise to find the region attracting record levels of cleantech investment. In clean energy, research from Pew Charitable Trusts shows that in 2012, the Asia-Pacific Region overtook Europe as the biggest recipient of investment. (See chart 4.)

A similar picture is emerging in other areas of the cleantech sector, whether it be improving water management, upgrading building standards, promoting green vehicles, or battling industrial pollution.

Chart 4: Total investment in clean energy by region
(US\$bn)



Source: Pew Charitable Trusts.



How dynamic is Asia’s cleantech sector?

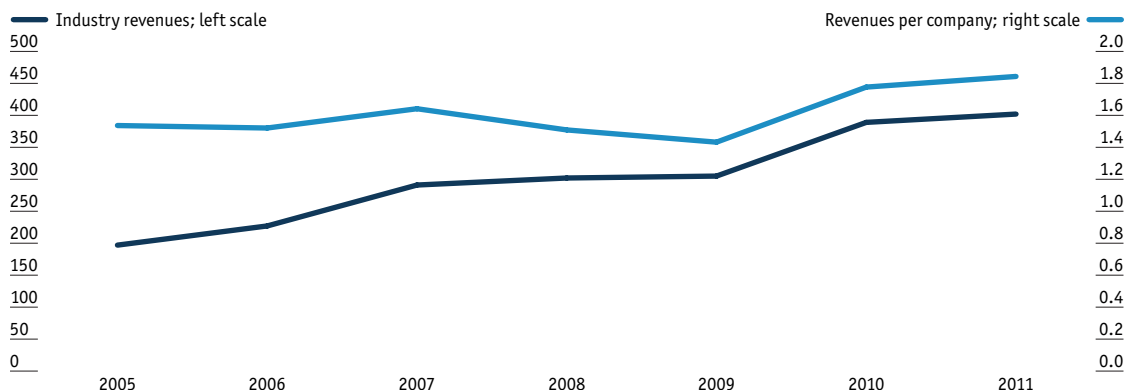
Given strong economic and demographic fundamentals, coupled with an improving policy environment, Asia clearly represents an exciting market for the cleantech sector. But how dynamic is the industry in responding to this landscape of opportunity? How vibrant is the sector?

Dynamism as a concept is about activity and progress. The term implies high levels of change, development and movement. Are companies in a particular sector growing? How quickly? Are more companies entering the market? Are rates of investment rising? How profitable is the industry? Are businesses investing in research and development (R&D) and innovation?

To answer these questions, the Economist Intelligence Unit analysed the performance of the 200 or so cleantech companies listed on stock exchanges in Asia from 2005 to 2011.² Their combined performance provides valuable insight into the health of the industry, and whether this is a sector that can be considered dynamic and exciting.

The research shows that the industry is growing in overall size. The combined revenues of Asia’s listed cleantech firms more than doubled from US\$197bn in 2005 to US\$411bn in 2011, giving a growth rate of nearly 13% a year. Much of this growth came because the number of cleantech companies listed in Asia rose from 128 to 212 over the period. As such, the revenue per company rose by a much slower pace—at just 3% a year. (See chart 5.)

Chart 5: Combined revenues for Asia’s listed cleantech firms, and average revenue per company
(US\$bn)



Source: Company accounts.

The relatively lacklustre growth of revenues per company might imply that the industry lacks dynamism. However, many of the companies in the sector are already large, which makes rapid growth harder to achieve. (See table 1.) And the fact that revenues for the sector as a whole more than doubled during the period suggests an industry that is indeed exciting. The sharp increase in the number of listed companies in Asia’s cleantech sector suggests strong demand for raising investment capital, healthy investor interest and a positive outlook for the industry.

² Countries included in the analysis were: China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand.

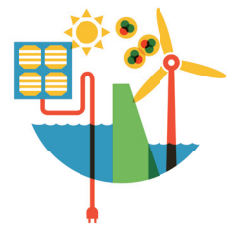


Table 1: The ten largest listed cleantech companies in Asia (ranked by revenues in 2011)

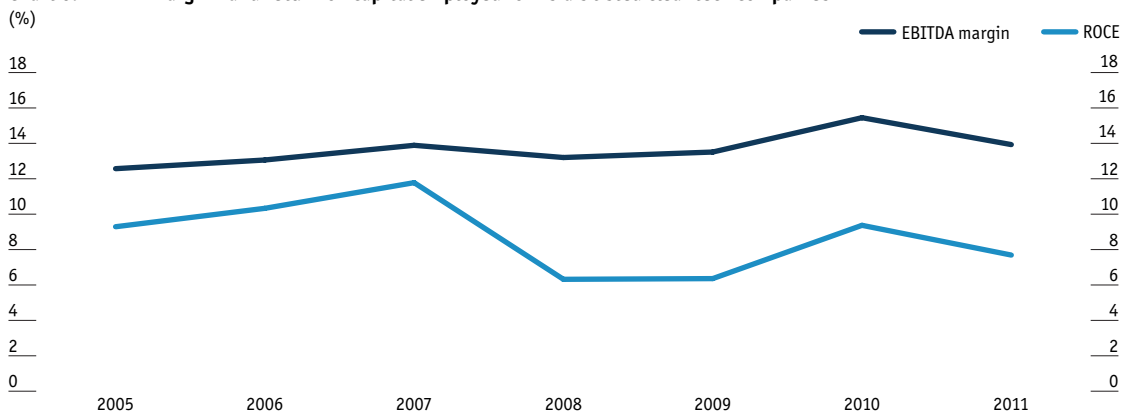
Company	Revenues in 2011 (US\$ bn)
Toray Industries Inc	19.34
Fuji Heavy Industries Ltd	18.47
Kajima Corp	17.75
Kyocera Corp	14.50
Shin-Etsu Chemical Co Ltd	12.75
Sekisui Chemical Co Ltd	11.75
Datang Intl Power Generation Co Ltd	11.50
Shanghai Electric Group Co Ltd	10.86
Sumitomo Forestry Co Ltd	10.13
Hyosung Corp	9.85

Source: Company accounts

Were it not for the impact of the recent global financial crisis, revenues would certainly have risen by much more. Before the crisis, supportive government policies in the West encouraged the growth of cleantech companies globally. Asia was no exception as more and more companies began producing goods such as solar panels and wind turbines to meet Western demand. But when those supportive policies were scaled back, the world faced a landscape of overcapacity and falling prices, causing many companies to experience falling sales.

Many of the world’s clean technologies, especially green energy, are not yet competitive with traditional alternatives and require government subsidies and support to get off the ground. Since 2009, however, environmental policies in Asia have started to compensate for falling support elsewhere and revenues are once again rising. Asia’s cleantech companies are increasingly being driven by growing demand within their home region and growing support from their local governments, rather than from markets in the West.

Chart 6: EBITDA margin* and return on capital employed for Asia’s listed cleantech companies



* Earnings before interest, tax, depreciation and amortisation.

Source: Company accounts.



The picture with profits has followed a similar path to revenues. Income per company has stayed almost flat across the period of study, growing by an annual average of just 1.3%. As such, profit margins and returns on capital have either stayed flat or fallen. (See chart 6.)

Asia is not alone in seeing its cleantech sector struggle following the financial crisis. A study by Ernst & Young, an auditing company, shows that revenue for the sector at a global level fell 3% in 2011 over the year earlier, while the sector's market capitalisation plunged by 41%.³

But a shifting policy landscape is not the only challenge that cleantech firms face in Asia. Costs are also rising, especially labour costs. For the 200 companies in our study, the average labour cost per worker rose from US\$6,000 in 2005 to US\$13,000 in 2011. In part, this is because the demand for workers is exceeding the supply.

"Finding talent is our biggest challenge," says Juan Aguiriano at DuPont, a US chemical company. Mr Aguiriano is worldwide managing director at DuPont Sustainable Solutions, a division that works with companies to improve their environmental, social and financial performance. "Asia has an abundance of smart people but many of them aren't really focused on sustainability as a career option yet," he says. "But it's changing. The younger you go, the more people you find who are motivated as much by [social] purpose as they are by money."

From a sales perspective, Mr Aguiriano also sees challenges in the mindset of potential clients. Notably, he says, many companies in Asia think about sustainability issues as compliance and risk avoidance measures. Relatively few have recognised it as a source of competitiveness, of reducing cost, and of "changing the value proposition of their businesses". The exceptions, he says, are some of the region's large conglomerates, such as Tata & Sons in India, some of the state-owned enterprises in China and some of the region's big oil and gas groups, such as PTT in Thailand and Petronas in Malaysia.

Another important indicator of industry dynamism is investment—with rising levels of investment suggesting greater belief in the future opportunity. Across the six years of the study, the value of fixed assets per company increased by an average of 9% every year, suggesting strong belief in the sector's potential. But one aspect of the investment picture is less encouraging: the money going into research and development (R&D). In this regard, Asia's cleantech sector is showing relatively little dynamism. The absolute quantity of R&D spending has barely changed across the study period, from US\$31m per company in 2005 to US\$37m per company in 2011. As a percentage of sales, these figures are low—R&D expenditure amounts to 2% of revenues, a figure that remained static for six years.

Many observers believe that, given how long it takes for some green innovations to become cost competitive, governments need to step in and help to fund some of the R&D that the sector needs. In Asia, this is starting to happen. In South-east Asia, for example, the Malaysian government teamed up with Japan-based Asian Energy Investments in September 2013 to launch a US\$100m fund to seed green energy innovations in the region.⁴

Combining all the various aspects that define "industry dynamism", the Economist Intelligence Unit has created a "dynamism barometer" that shows how the sector is evolving. This index combines a host of industry measures, such as growth rates, profitability, competition and investment rates. Setting

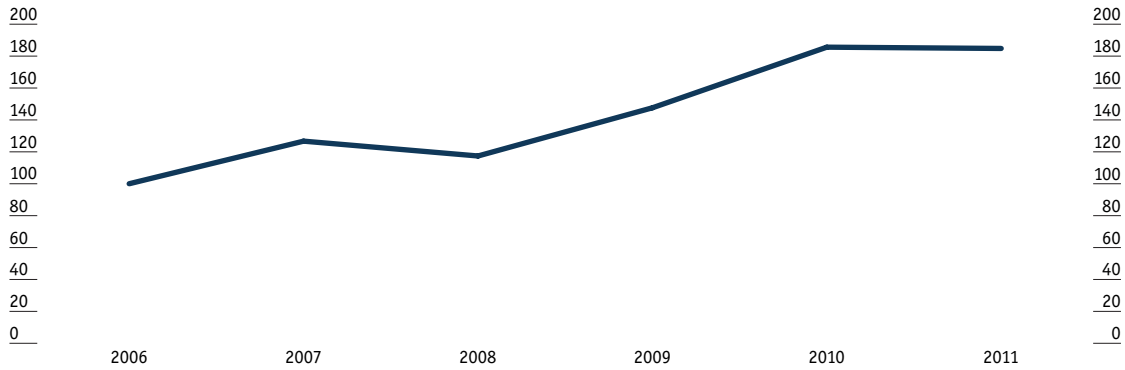
³ "Cleantech Matters: Global Competitiveness", 2012, Ernst & Young

⁴ "Malaysia launches \$100 mln clean energy fund", Reuters, September 23rd, 2013



the index to equal 100 in the year 2006, it shows that the industry is experiencing rising levels of dynamism. By 2011, the barometer had risen to a measure of 185. (See chart 7.)

Chart 7: Cleantech barometer of industry dynamism
(2006 equals 100)



Source: The Economist Intelligence Unit.



Where are the opportunities?

It is clear that Asia's need for cleantech services is large and growing swiftly every year. It is equally clear that the sector has had a somewhat tumultuous journey in recent years as the policy landscape in Europe and North America has waxed and waned in its support for green technologies. As the focus of policy support shifts towards Asia, where are the biggest opportunities?

In green energy, Mr Curtis at First Solar says the key is to identify markets where the policy environment is sufficiently stable to provide a bridge to take technologies such as solar from where they are today to a position of cost competitiveness in the future. "The more solar that gets built, the more prices will come down, so we need policy platforms that provide support up to the point where the industry is commercially established," he says.

He notes that prices for solar are currently falling sharply, partly because of over-capacity, but also because technology is improving and the industry is maturing. In certain situations, he adds, solar is already cost-competitive, such as in Japan, which is heavily reliant on imports of natural gas. "Japan is paying around US\$16 per mbtu of gas, and solar starts to be competitive at prices of around US\$10 and above."

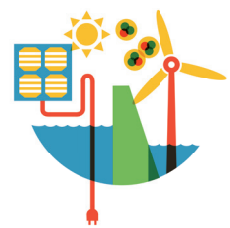
He also points to the possibilities of providing solar power to places that don't have grid electricity. "Indonesia is pushing solar energy as an off-grid alternative to diesel, which is what is often used today. Solar is very competitive with off-grid diesel prices."

Opportunities exist for every other type of clean technology business too, not just in energy. As Asia gets richer, its middle class is expanding at incredible speed. Asia's middle class numbered 529m in 2009 but will swell to 1.74bn by 2020.⁵ This group of largely urban, increasingly wealthy citizens will demand clean water, efficient waste management and, increasingly, it will not stand for pollution. Governments will be under pressure to manage the environmental impact of economic growth. Companies will be under pressure too, both from governments and from consumers, presenting giant opportunities for green services and technologies.

At AECOM, Mr Dunn calculates that Asia has 130 cities with more than 1m inhabitants. By 2030, the United Nations expects that figure to rise to 250. Managing this phenomenal tide of urbanisation in a way that creates pleasant living environments for Asia's swelling middle class will present big opportunities for many cleantech firms.

In particular, the rising demand for water in Asia will call for a huge improvement in how this resource is managed. As people get wealthier, they consume far more water through flushing toilets, washing cars, consuming goods that use water in the manufacturing process, and countless other ways. Yet, water is seriously limited in many countries such as China and India. Governments will need to invest heavily in technologies and management processes that ensure water is used and re-used as efficiently as possible.

⁵ World Bank (middle class = households with daily expenditure between US\$10 and US\$100 using PPP in 2009 terms)



Box 1: The greenest kilowatt of energy is the one not consumed

With high economic growth rates, electricity consumption in Asia is rising swiftly. Much of this increasing electricity demand is being met by using the cheapest available fuel sources, notably coal, and, increasingly, gas. The inevitable results are growing emissions of carbon, sulphur and other pollutants, as well as growing reliance on imported fuel. What's more, because many countries in Asia are still relatively poor, electricity is still heavily subsidised, giving rise to deteriorating public finances.

“Governments in Asia realise that this is not a sustainable situation,” says Pierre Cheyron, chief executive of Cofely South-east Asia, a provider of energy efficiency services and part of French utility GDF Suez. “While everyone recognises the need to build more power facilities, there is an increasing emphasis on energy efficiency measures too. This is a new policy direction. It's happening across South-east Asia.”

In the past, adds Mr Cheyron, sustainable energy policies often focused on using more renewables but now the emphasis is shifting to reducing the amount of energy needed in the first place. “At the end of the day, the greenest kilowatt hour of electricity is the kilowatt that

you avoid having to generate.”

Like much of the cleantech sector, he believes that governments have to be involved to drive adoption of energy efficiency techniques, for example by setting building standards that stipulate minimum levels of insulation. In countries with high electricity prices, such as the Philippines, the case for investing in energy efficiency is easy to make. But in places with electricity subsidies, regulations are often needed to drive different behaviour.

Looking at Asia, Mr Cheyron sees the greatest opportunity in heavy industries such as the cement, glass and automotive sectors, where energy consumption can be reduced by as much as 50%. A second big opportunity is from companies that run data centres, which are heavy consumers of energy. Just as significant are opportunities to improve the energy efficiency of buildings, including office blocks, hotels, shopping malls or schools.

“By reconfiguring the insulation and the air-conditioning systems, you can reduce energy consumption sharply,” he says. “We recently did a project for the headquarters of the Bank of the Philippine Islands and their energy costs came down by 30%.”



Box 2: UrbanisAsian

It is accepted wisdom that cities are the engines driving the global economy. Not only are urban populations rising faster than rural populations, thanks to inward migration, but productivity in cities is rising faster than in rural areas, driving incomes up at a much faster pace. This combination of faster population growth and faster income growth makes cities the dynamos of the future.

Looking at a map of where cities are growing fastest, Asia stands out as being the most significant part of the world. McKinsey & Co, a management consultancy, calculates that 420

cities in emerging markets will contribute 45% of global GDP growth between 2010 and 2025. Of these 420 cities, more than half of them (284) are in Asia.

Naturally, many of Asia's biggest urban centres will be in China and India, given their giant populations. But South-east Asia will have many significant economic engines of its own. (See table 2.) As these cities grow, the demand for clean-tech companies to provide efficient, clean, and sustainable living environments will rise sharply.

Table 2: South-east Asia's fastest growing cities between 2010 and 2025 (population in millions)

		2010	2025	Annual growth rate (%)
Manila	Philippines	12.3	17.2	1.35
Jakarta	Indonesia	9.6	12.8	1.16
Bangkok	Thailand	6.9	9.4	1.24
Ho Chi Minh	Vietnam	6.2	9.7	1.81
Singapore	Singapore	5.1	5.8	0.52
Yangon	Myanmar	4.4	6.4	1.51
Surabaya	Indonesia	2.8	3.6	1.01
Hanoi	Vietnam	2.7	4.7	2.24
Cebu	Philippines	2.5	3.7	1.58
Bandung	Indonesia	2.4	3.2	1.16
Bekasi	Indonesia	2.3	3.2	1.33
Davao	Philippines	2.2	3.4	1.76
Medan	Indonesia	2.1	2.8	1.16
Tangerang	Indonesia	1.8	2.5	1.32
Depok	Indonesia	1.7	2.4	1.39
Semarang	Indonesia	1.6	2.1	1.09
George Town	Malaysia	1.6	2.1	1.09
Kuala Lumpur	Malaysia	1.5	2.2	1.54
Johor Bahru	Malaysia	1.4	1.9	1.23
Pekan Baru	Indonesia	0.9	1.5	2.06
Batam	Indonesia	0.9	1.8	2.81
Samarinda	Indonesia	0.7	1.1	1.82
Samut Prakan	Thailand	0.7	1.6	3.36
Balikpapan	Indonesia	0.6	0.8	1.16
	Total	74.9	105.9	1.40

Source: McKinsey Global Institute & Economist Intelligence Unit

ASIA RISING

Food processing



An Economist
Intelligence Unit report
commissioned by

Commissioned by:



Industrial Dynamism
Barometer

2014



Executive summary

Consumption of food in Asia is rising at robust rates, driven by an expanding population, rising incomes and increasing urbanisation. But capturing this opportunity isn't simple. Consumer tastes vary widely across the region, and food retail infrastructure is deeply limited in many markets. Nonetheless, a barometer of "industry dynamism" developed by the Economist Intelligence Unit shows that the food sector in Asia is overcoming these challenges and thriving.

- **Asia stands out as being the most exciting part of the world for food processing businesses.** Not only does Asia account for more than half the world's population already, it will add another 800m people by 2040. These people are getting rapidly richer. Between 2007 and 2050, the real value (i.e., ignoring inflation) of Asia's spending on food is forecast to double. This increase will represent three quarters of the global increase over this period.
- **Rapid urbanisation is changing food consumption patterns, and creating opportunities for more efficient distribution.** As people move to cities, not only do their incomes rise, and their diets become richer and more diversified, they also become exposed to modern retail formats such as supermarkets and convenience stores, making it easier for brands to put their products in front of consumers.
- **Asia's food companies are growing at breakneck speed as they capitalise on these opportunities.** Between 2005 and 2011, the 400 or so food companies listed on the region's stock exchanges grew top-line revenues by an average of 23% every year. Moreover, they delivered healthy and consistent profit margins of around 11%, as well as improving capital efficiency ratios.
- **Asia's rising food demand provides innumerable opportunities, but companies will need to invest in innovation in order to tailor their products to the vast diversity of local taste preferences across the region.** Global brands will have to localise their products. (See Box 2: "Reinventing Oreos", on page 37.) But Asia will be a rich source of new home-grown food ideas too. For example, Asia is home to 62% of the world's Muslim population, presenting an exciting, and fast-growing market for halal-certified food. (See Box 1: "Feeding 1.6bn Muslims", on page 36.)
- **The food opportunity in Asia extends upstream into rural supply chains too.** Much of the region's agricultural supply chains are deeply inefficient, with some estimates suggesting around one-third of all food rots before it reaches the consumer. Meeting the region's rapidly rising demand for food, as well as satisfying government demands for improved food security and more stringent food standards, will call for heavy investment in supply chains.



Asia's importance to food companies

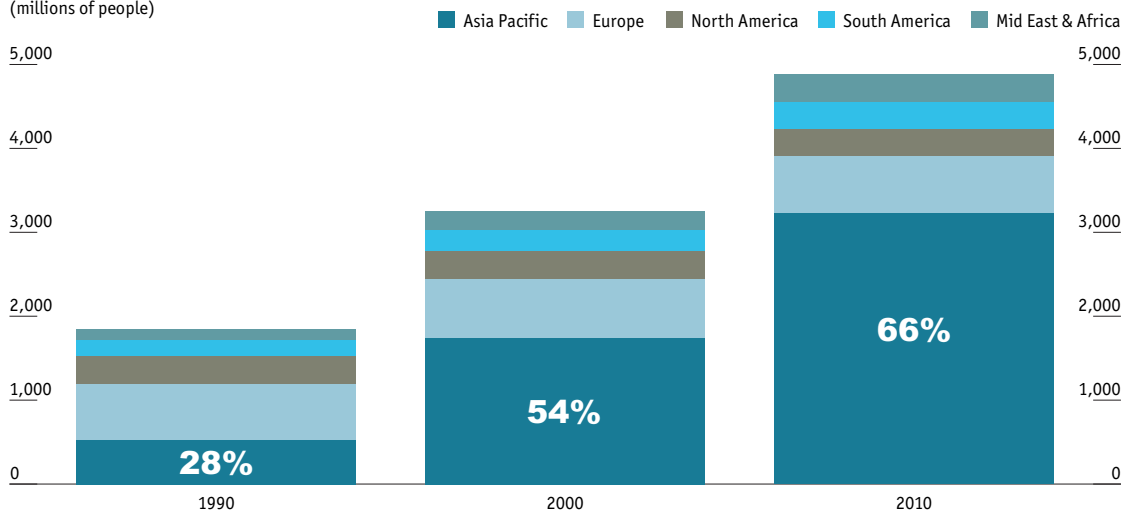
Food consumption is fuelled by three key factors. The first is the size of the population. The second is how much income each person earns, measured by per capita GDP. And the third is the degree of urbanisation. In Asia, all three of these drivers of growth are rising at tremendous speed, making the region the most exciting part of the world for food companies.

For a start, Asia has more than half of the world's people, and the population is growing. In 2010, Asia's population stood at 3.8bn people. By 2040, it will rise to 4.6bn, creating an additional 800m mouths to feed, an average of 27m extra people every year.

But not only is Asia's population expanding, the average wealth of the population is also rising. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. And most observers expect Asia's share to keep rising for the foreseeable future. Per capita incomes in Asia are growing faster than in any other region of the world.

Given this positive demographic and income picture, the size of the middle class in Asia is growing at a rate that the world has never experienced before. In 2009, the size of Asia's middle class stood at 525m individuals, or 28% of the global middle class. By 2020, Asia will be home to 1.74bn middle class citizens, equal to 54% of the global total. (See chart 1.)

Chart 1: Size of the global middle class*
(millions of people)



*Households with daily expenditure between US\$10 and US\$100, measured using PPP.
Source: World Bank.

As people get richer, not only do they consume more food, but their diets change too. In Asia, diets have traditionally been highly starch-based, thanks to a high rice content. But with rising wealth, diets become more varied, higher-value and more protein-based. The middle class eats far more wheat-based products, meat, dairy, seafood, fruit and vegetables.

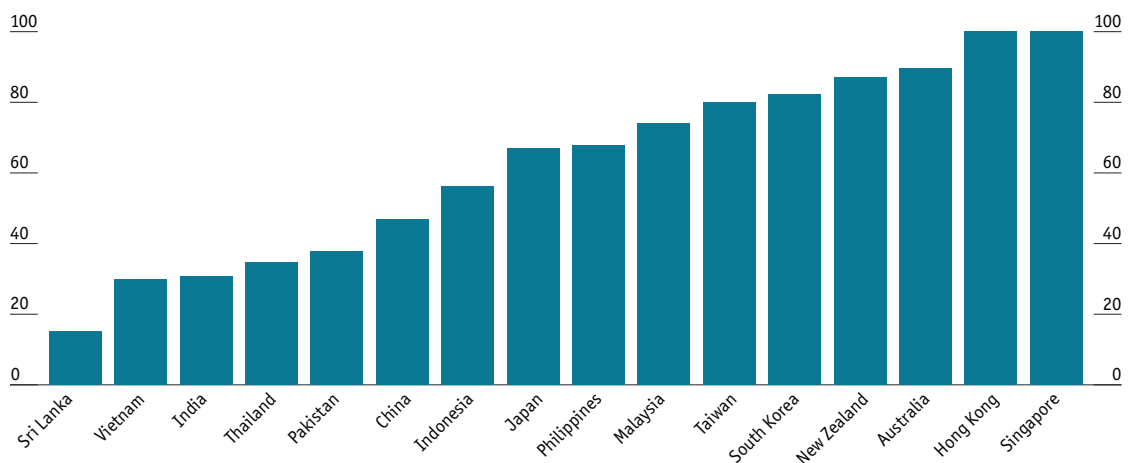
In China, for example, in the period between 1990 and 2011, consumption of vegetable oil grew by an average of 7% every year. Poultry consumption per person grew by 6.6% every year. Fruit



consumption is currently growing by 9% a year. And these rates of growth will continue. Between 2007 and 2050, the value of food consumption in Asia is forecast to grow by 100% in real terms (i.e., excluding inflation). This growth will account for three quarters of the total increase in global food consumption over that period.¹

Working alongside these two forces is the third trend of urbanisation. As people move from the countryside to the cities, their incomes rise and they eat more. In China, for example, city dwellers ate 34kg of meat per person in 2009 compared to just 20kg per person in rural areas. Just as importantly, they come into reach of modern retail formats, be it supermarkets, restaurants or convenience stores that are not widely available outside city areas. In Asia, urbanisation is progressing swiftly, but still has a long way to go. In Sri Lanka, for instance, only 17% of the population is urban. In Vietnam, the figure is 25%. (See chart 2.)

Chart 2: Urbanisation rates for Asia
(% of population living in cities)



Source: The Economist Intelligence Unit.

“The expansion of the middle class in Asia is creating huge demand for food,” says Job Leuning, head of cocoa operations in Asia for Cargill, a big commodity trader. “As incomes rise, suddenly people who couldn’t buy things like chocolate before can now afford them. Asia has the best growth potential for our business of anywhere in the world.”

Cargill has been investing heavily in its cocoa operations in Asia in recent years to meet the region’s rising demand, including building a giant cocoa processing plant in Indonesia, and two cocoa research and development centres, one in Kuala Lumpur in Malaysia and another in Beijing in China.

But alongside these exciting prospects for the food industry come many challenges too. Asia has enjoyed tremendous productivity growth in its agricultural output over recent decades. But if the region is to continue feeding itself, then productivity will need to improve further. Given that land is constrained, governments will need to encourage farmers to improve crop yields and farm efficiency.

They will also need to improve the infrastructure needed to handle post-harvest produce. The Asia Development Bank (ADB) estimates around one-third of all the food that Asia produces rots before

¹ “What Asia wants: Long-term food consumption trends in Asia”, Australian Bureau of Agricultural and Resource Economics and Sciences, October 2013



it reaches end consumers thanks to a lack of infrastructure such as modern cold chain systems and warehouses.

Alongside land constraints, limited water resources will be equally important to address, especially as the trappings of rising incomes—such as showers and flushing toilets—create competing demands for scarce water. Given these constraints, it is unlikely that Asia will be able to produce enough of its own food and will therefore need to rely on imports from other parts of the world.

In 2013, China’s Xinjiang Production and Construction Corp and Ukrainian agricultural firm KSG Agro signed a 50-year deal under which 3m hectares of land will eventually be farmed to provide grain and meat for Chinese consumers.² More and more deals of this nature are likely to be signed as domestic companies seek to meet voracious domestic demand and governments try to boost food security.

Equally important will be a focus on food quality alongside food quantity. Malnutrition and stunting remain widespread in Asia’s poorer countries, calling for a focus on raising the nutritional content of food. According to the ADB, 14% of Asia’s population—more than 500m people—are currently undernourished.³ And food safety scares erupt regularly across the region, highlighting the need for better regulations and better enforcement of them.

² “Ukraine to become China’s largest overseas farmer in 3m hectare deal”, South China Morning Post, September 22nd, 2013

³ “Food Security in Asia and the Pacific”, Asia Development Bank, 2013



How dynamic is Asia’s food processing sector?

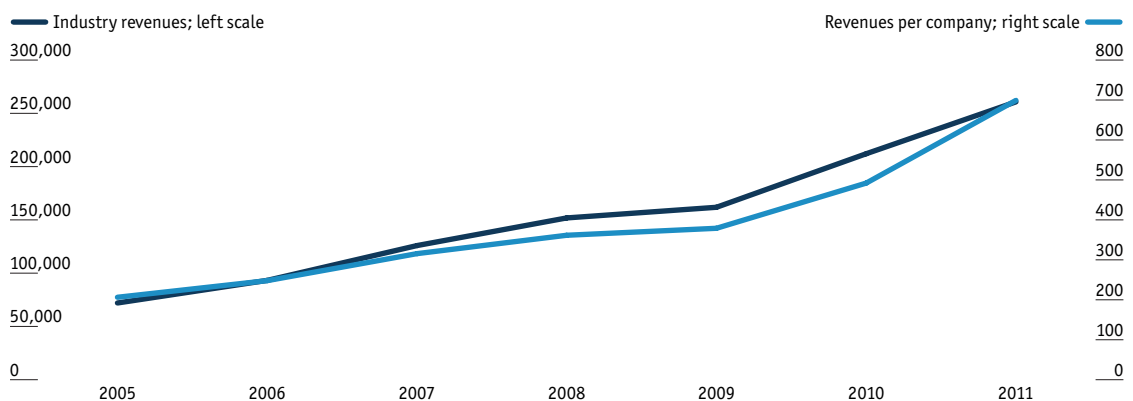
Given the economic and demographic picture in Asia, the region clearly represents an exciting market for the food sector. But how dynamic are Asia’s home-grown food companies in responding to this landscape of opportunity? How vibrant is the sector?

Dynamism as a concept is about activity and progress. The term implies high levels of change, development and movement. Are companies in a particular sector growing? How quickly? Are more companies entering the market? Are rates of investment rising? How profitable is the industry? Are businesses investing in research and development (R&D) and innovation?

To answer these questions, the Economist Intelligence Unit analysed the performance of almost 400 food companies listed on stock exchanges in Asia, from 2005 to 2011. Their combined performance provides valuable insight into the health of the industry, and whether this is a sector that can be considered dynamic and exciting.

What is immediately clear is that the industry is enjoying high rates of growth. Back in 2005, companies in the sector had average revenues of US\$206m. By 2011, this had risen to US\$699m—giving an annual growth rate of almost 23%. Growth rates slowed a little in 2009, during the global financial crisis, but never fell, suggesting an industry with a high degree of resilience. (See chart 3.) Arguably, Asia’s food sector can be described as both high-growth and defensive (where customers don’t reduce their spending during recessions) at the same time—a rare combination.

Chart 3: Total revenue for all Asia’s listed food companies and average revenue per company
(US\$m)



Importantly, Asia’s food companies are showing strong profit growth too. Profit margins are healthy, but essentially have remained steady over the period at around 11%, suggesting costs are rising in line with revenues. This steady level of profitability is impressive given that certain costs in Asia are rising rapidly. Among them, the cost of regulation is rising.

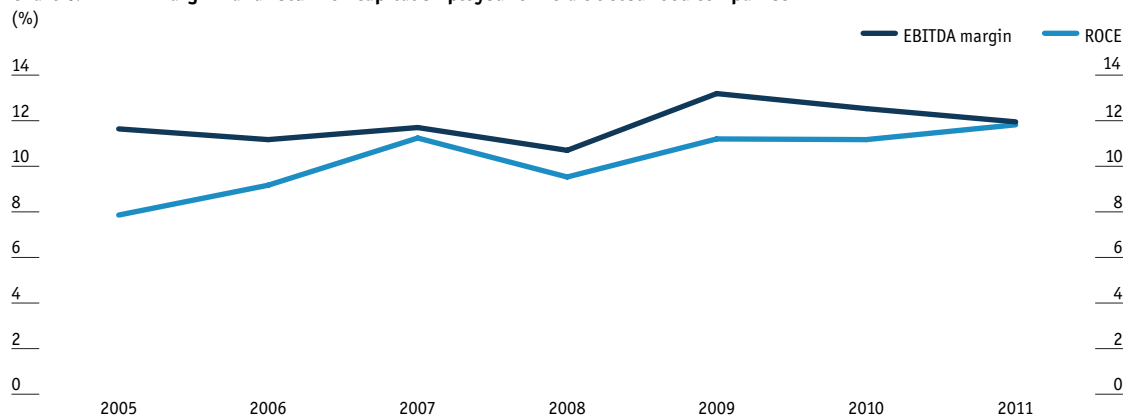
“Governments in every market are getting much tougher about safety, quality and health aspects, and putting in place stricter regulations,” says Peter Foyston, managing director in Asia Pacific for Goodman Fielder, an Australian food company. “Managing the integrity of food supply chains is hard in



many places because often there isn't visibility as to where ingredients have come from. But the need to get greater transparency is there, so companies have to comply."

While profit margins may be flat, the performance of the food industry when measured by return on capital employed (ROCE) has improved from an ROCE of 7.9% in 2005 to 11.8% in 2011. Given the industry's flat operating margins, an improving ROCE suggests that companies are generating ever rising revenues from their assets. Capital productivity is improving. (See chart 4.)

Chart 4: EBITDA margin* and return on capital employed for Asia's listed food companies



Source: Company accounts.

One measure of an industry's dynamism is the number of companies in the sector. An increasing number of companies suggests a market of opportunity and change. In food, the number of listed companies in Asia has risen over the period of this study, albeit modestly, from 349 in 2005 to 373 in 2011. Private companies are clearly going public in order to raise the capital they need to address the opportunities they see unfolding before them. However, while a small handful of companies in sector are very large, it's also clear that the vast majority of Asia's food businesses remain small, privately-

Table 1: The ten largest listed food companies in Asia (ranked by revenues in 2011)

	Revenue in 2011 (US\$ bn)	Revenue as % of total revenue of all Asia's listed food companies in 2011
Wilmar International Ltd	45.14	17.27
Uni-President Enterprises Corp	12.90	4.94
San Miguel Corp	12.22	4.67
New Hope Liuhe Co Ltd	11.37	4.35
China Agri-Industries Holdings Ltd	10.71	4.10
Shanghai Friendship Group Co Ltd	7.39	2.83
Charoen Pokphand Foods PCL	6.54	2.50
Henan Shuanghui Investment & Development Co Ltd	5.95	2.28
Inner Mongolia Yili Industrial Group Co Ltd	5.91	2.26
Fraser & Neave Ltd	5.09	1.95

Source: Company accounts



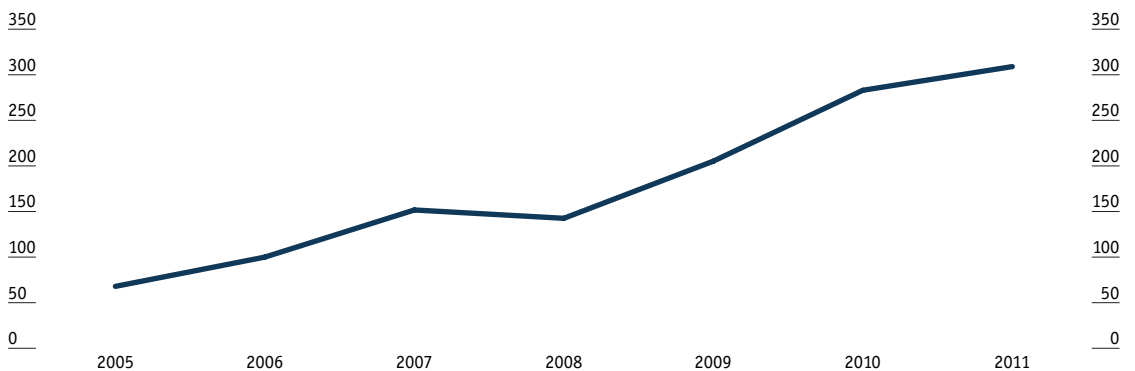
Asia Rising – Industrial Dynamism Barometer: Food processing

held organisations, with tremendous potential for consolidation. (See Table 1.)

As the number of companies rises, so competition gets more intense. While this may make life tough for some companies, it suggests a widespread acknowledgement that the market is exciting. “The proliferation of competition in Asia is amazing,” notes Mr Foyston at Goldman Fielder. “Even in a place like Papua New Guinea, the growth of new brands and offerings from local players alongside those from the big international brands is incredible.”

Combining all the various aspects that define “industry dynamism”, the Economist Intelligence Unit has created a “dynamism barometer” that shows how the sector is evolving. This index combines a host of industry measures, such as growth rates, profitability, competition, and investment rates. Setting the index to equal 100 in the year 2006, it shows that the industry is experiencing rising levels of dynamism. By 2011, the barometer had risen to a measure of 309. (See chart 5.)

Chart 5: Food processing barometer of industry dynamism
(2006 equals 100)



Source: The Economist Intelligence Unit.



Where are the opportunities?

With the exception perhaps of Japan, which is a slow-growth, mature market, food consumption is rising in every country in Asia. It is not only growing in quantity, but improving in quality and widening in variety. The opportunities this landscape presents are tremendous. Staple food types such as rice will continue to be in demand. But as incomes rise and diets improve and diversify, the demand for meat, fish, fruit and vegetables will grow especially quickly.

In rural areas, the need to improve supply chain efficiency to meet Asia's growing food demand will be big. Much of the region's agricultural system remains fragmented and inefficient, and agricultural traders and processors have great scope to improve productivity. The need to comply with tightening regulations around food quality and supply chain transparency will also call for heavy investment in upgrading supply chains. As agricultural productivity rises, it will lift rural incomes, fuelling demand for food in these areas in the process.

In cities, the spread of organised retail—supermarkets, hypermarkets and convenience stores—will be especially powerful in building out distribution networks for companies to put their products in front of consumers. In some markets, formal retail channels are still limited. In India, for example, more than 90% of food is still sold in street markets, corner stores, and rural kiosks that lack the trappings and technology of modern retail such as cold cabinets and display lighting. But this picture is changing quickly as supermarket chains spread through the nation's cities.

"The spread of formalised retail in Asia is really helping our growth rate. Chocolate needs a certain amount of infrastructure to keep the product in good condition," say Mr Leuning at Cargill. What's more he adds, "Formalised retail tends to give a high degree of prominence to confectionery."

As formal retail grows, more and more food will need to be packaged properly rather than sold loose. This presents opportunities for many industries that work alongside food companies providing packaging technology, not to mention those with skills providing food logistics services.

At Goodman Fielder, Mr Foyston is excited by the growth in the different types of retail outlets. "It isn't only the number of retail outlets, it's also the variety," he says. "People are using such a wide array of channels. Internet shopping is becoming popular for bulky items. People will visit a hypermarket like Carrefour maybe once a month. They'll visit small-box supermarkets on a weekly basis. They'll go to bakery chains for bread. But the old wet markets are still going strong too. They're culturally important. Even in a rich country like Hong Kong, wet markets still do well."

Among this proliferation of retail options, fast-food and convenience food are becoming ever more important. More and more households exist where both adults work and spend ever longer hours in the workplace. In China, the share of food consumed away from the home has risen from 10% in 1990 to 22% in 2009.⁵ It is a similar story across Asia, all fuelled by rising urbanisation. Take Vietnam, where the number of global fast-food chains is rising sharply. In 2013, McDonald's, Starbucks, Popeye's, and Dunkin Donuts all started their first outlets in the country. The year before, Burger King and Baskin Robbins opened for the first time.

⁵ Australian Bureau of Agricultural and Resource Economics and Sciences



Of course, Asia is an extremely heterogeneous region. Companies need to tailor their food offerings to local tastes, and this tailoring process presents big opportunities. Consider markets with large Muslim populations, such as Indonesia, Malaysia and India. Here, the food needs to be produced according to halal requirements. (See “Box 1: Feeding 1.6 billion Muslims”.)

“Food is always very local, people’s preferences for spices, flavours, saltiness, sweetness are never the same in different places,” says Mr Foyston. “That generates huge potential for food innovation in Asia. You have all these global brands like Starbucks and Oreos, but also this rich pool of local flavours. As those two come together, the results are very exciting.” (See “Box 2: Reinventing Oreos”.)

Moreover, he adds, it isn’t only the global brand owners that are experimenting, the local up-and-coming Asian brands are doing so too. “Both will do well,” predicts Mr Foyston. “There’s plenty of room for both the local brands and the global brands.”

Box 1: Feeding 1.6 billion Muslims

There are around 1.6bn Muslims globally, comprising 23% of the world population. And of these 1.6bn Muslims, almost two-thirds live in Asia.⁶ Indeed, the region is home to the world’s four biggest Muslim population countries: Indonesia (12.9% of the world’s Muslims), Pakistan (11.1%), India (10.3%), and Bangladesh (9.3%).

As such, Asia is home to nearly one billion followers of Islam, all of whom must eat food made in line with halal rules. Certain types of food and ingredients are banned, but halal rules also stipulate how food is processed, stored and prepared. Indeed, some companies are promoting halal food not just on religious grounds, but also because they believe halal food is safer than many alternatives thanks to the strict rules required to produce it.

The World Halal Forum estimates that the global market for halal food is worth nearly US\$700bn today, with 65% of that demand coming from Asia. Additionally, the demand for halal food is growing more rapidly than overall global food demand. This is partly because growth rates of Muslim populations are higher than the global average, but equally because incomes in countries like Indonesia are also growing more swiftly than the global average.

As such, Asia represents a rich opportunity for companies to serve this burgeoning Muslim market. The opportunities exist not only in serving local populations, but in using the capabilities developed locally to serve global Muslim demand too.

Naturally, companies looking at this opportunity must be fully attuned to the requirements of being halal compliant. This is not always easy, because these requirements change from country to country, depending on the interpretation of halal by local religious authorities.

Nonetheless, efforts are underway to set global standards and to harmonise rules across countries. In Malaysia, for example, the government wants the country to be a global centre for halal production, and so has introduced MS1500:2009 Halal Food Certification rules, administered under the Department of Islamic Development Malaysia (JAKIM), to promote quality and consistent standards. These rules have helped Malaysia to become a powerhouse of halal food exports. Nestle, a Swiss food company, has made Malaysia its global centre of excellence for halal food production.

⁶ “Mapping the Global Muslim Population”, Pew Research Institute, October 2009



Box 2: Reinventing Oreos

As one of the biggest food companies in the world, US-based Mondelez (formerly Kraft Foods) thinks of Asia as a priority growth region. But while Mondelez owns many world-famous food brands—such as Cadbury chocolate, Kenco coffee and Philadelphia cheese—the company found that such Western offerings don't always succeed in local Asian markets.

Oreo, the company's premier biscuit brand—which has a layer of sweet "cream" sandwiched between two biscuits—is a case in point. Globally, Oreo is Mondelez's most valuable brand, worth more than US\$2bn in annual revenue. But despite its best efforts, Mondelez struggled to sell the biscuit in China. By 2008, the company was even toying with the idea of giving up, concluding that Oreos were too sweet for Chinese tastes, and that the "sandwich biscuit" concept was too alien.

Fortunately for Mondelez, executives at the company decided on a new strategy for the

brand rather than giving up. Today, Oreo is the country's number one selling biscuit brand.

"We decided to reformat the biscuit with local consumers in mind," says Mike Mitchell, a senior manager at Mondelez. "We recognised that we needed to make it less sweet, and we also introduced new flavours. The most successful has been a green tea ice-cream flavour for the cream part of the biscuit. Then we changed the biscuits too, preferring a wafer format which is more in tune with what local consumers want."

The changes sound quite radical for a brand that prides itself on global consistency, but Mr Mitchell stresses that Oreo's brand values are just as strong in China as they are elsewhere. "For example, the time-honoured tradition of dunking an Oreo biscuit in milk remains the same," he explains. "We've worked with Yao Ming [China's top basketball player] to promote the idea of dunking."

ASIA RISING

Healthcare



An Economist
Intelligence Unit report
commissioned by



Executive summary

Spending on healthcare in Asia is rising at impressive rates, presenting big opportunities for healthcare companies. Capturing this opportunity isn't easy, given rising costs, stiffening regulations, and deepening competition. But a barometer of "industry dynamism" developed by the Economist Intelligence Unit shows that the healthcare sector in Asia is rising to these challenges.

- **Asia stands out as being the most exciting part of the world for healthcare businesses.** Not only does Asia account for more than half the world's population already, but it will add another 800m people by 2040. These people are getting rapidly richer. As their incomes rise, health spending grows even faster. The region's share of global health spending will rise from 21% in 2012 to 24% by 2017. Parts of Asia remain poor, and still require basic health services such as good sanitation. But large parts of the region are getting rich, and increasingly suffering the diseases of affluence, such as heart disease and diabetes. (See Box 2: "Duelling with diabetes", on page 44.)
- **Against a backdrop of rising incomes, the whole healthcare ecosystem in Asia faces a landscape of tremendous possibility, from pharmaceutical companies to makers of medical devices, and from health insurers to companies running hospital chains.** In the hospital sector, for example, Asia will need an additional 180m new hospital beds in the next decade. In pharmaceuticals, Asia's market will grow from US\$214.2bn in 2010 to US\$386bn by 2016, an average annual growth rate of more than 13%. The fact that Asia's demographic profile is starting to age will present big opportunities for companies providing products and services for elderly care and the diseases of old age. (See Box 1: "Silver mining", on page 40.)
- **Asia's growing importance to the healthcare sector is equally evident in research and development.** In 2007, Asia and Oceania together accounted for 18.1% of global biomedical research. By 2012, that share had grown to 23.8%. Much of this increase is due to rising investment from local companies and governments within Asia. However, much also is coming from global companies relocating R&D activities to Asia to avail of the region's deepening talent pool that in many cases remains cheaper than similar talent in richer markets.
- **Asia's home-grown healthcare companies are growing rapidly and profits are improving.** Between 2005 and 2011, revenues at Asia's listed healthcare firms rose by almost 23% a year. Profits rose even more swiftly, by 31% a year. What's more, the number of listed companies in Asia's healthcare sector is growing, rising from 345 in 2005 to 383 in 2011, suggesting high demand for capital to fund new investment to meet Asia's expanding opportunities.
- **While companies in Asia are turning in good financial results, the challenges they face are growing.** Competition is intensifying as the number of firms entering the sector grows. Costs, especially labour-related, are rising rapidly. And regulations are getting much more stringent as a growing middle class demands greater safety, security and consumer protection.



Asia's importance to healthcare companies

Spending on healthcare is highly correlated with income levels. The richer a country becomes, the more it spends on managing and improving its health. But the relationship isn't one-to-one. As incomes rise, spending on health rises at a faster rate. This is partly because rising incomes create greater discretionary capacity to spend on health. Equally, however, as incomes rise, education levels also improve, creating much greater awareness of health issues. In rich countries like Australia and Japan, for example, health spending is 9% of GDP. In poor countries such as Pakistan and Laos it is less than 3% of GDP.¹

Asia as a region is the fastest growing part of the global economy. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. And most observers expect Asia's share to keep rising for the foreseeable future. Per capita

Box 1: Silver mining

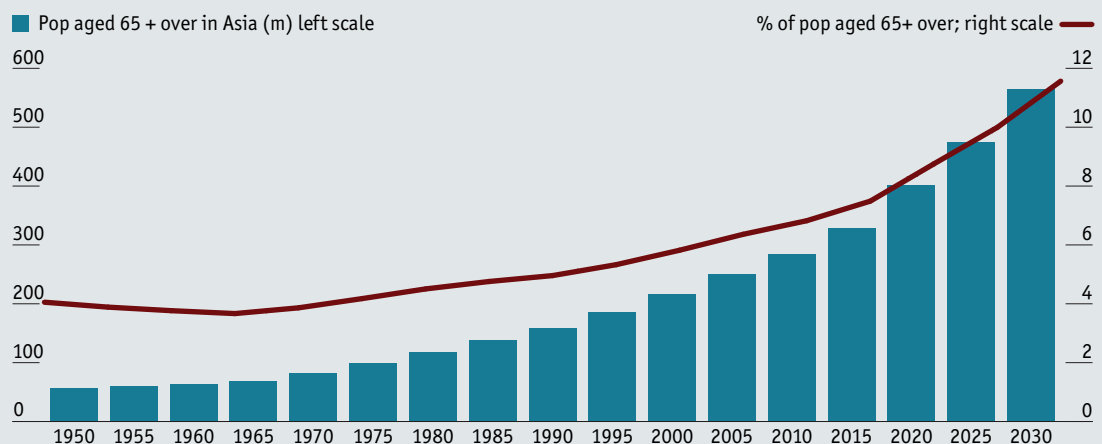
One of the most attractive opportunities for healthcare companies in Asia centres on the region's changing age profile. Rich countries like Japan are experiencing tremendous ageing as baby boomers from earlier years reach retirement age. Improvements in medicine mean that life expectancy for these retirees keeps rising.

While this situation presents challenges to an economy, especially in terms of maintaining economic growth, it also presents huge opportunities for industries that provide products and services to the elderly. Among

the industries most geared up to serve this so-called "silver market" is the healthcare sector.

In 2010, Asia had 264m people aged 65 and over, or 6.4% of the population. By 2030, the elderly population will number 565m people, or 11.6% of the population. (See chart 7.) The challenges of ageing are already afflicting Asia's rich countries, but will rapidly spread to less well-off places too. China, for example, will see a tremendous rise in its elderly population—the median age in the country will increase by roughly 6 months every year between now and 2030, rising from 34 to 42.

Chart 7: Number of people aged 65 and over in Asia Pacific in millions and as a % of the total population



Source: United Nations World Population Prospects: The 2012 Revision.

¹ Data from The World Bank for 2011

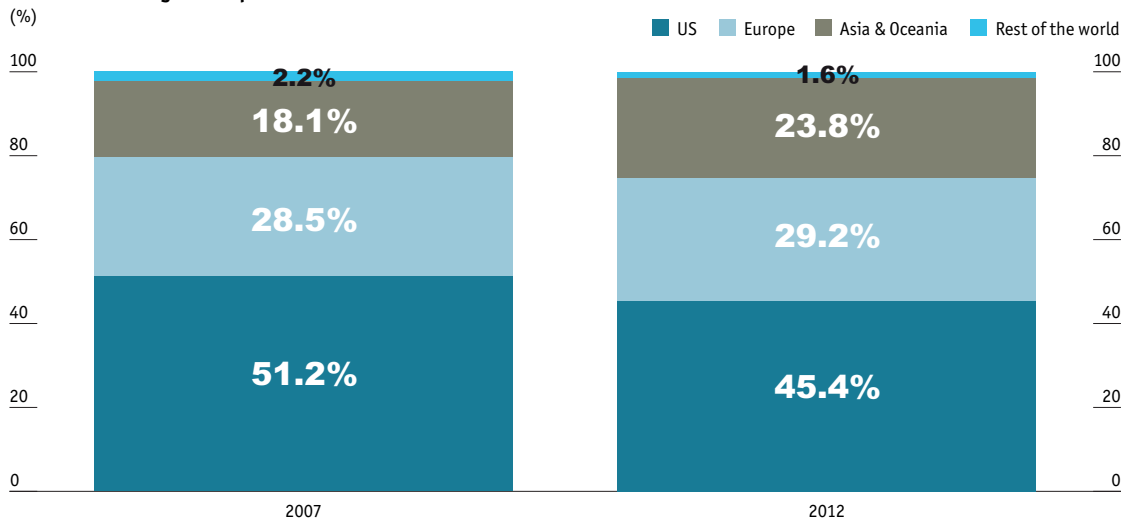


incomes in Asia are rising faster than in any other region of the world.

This picture of rapid income growth means that healthcare spending in the region is also growing faster than anywhere else. Clearstate, a healthcare data provider, estimates that health expenditure in Asia Pacific stood at US\$1.5trn in 2012, or 21% of the global total. By 2017, Clearstate forecasts this to rise to US\$2.1trn, or 24% of the global total. This comes to an annual growth rate of 7.1%, compared to a global annual growth rate of 4.6%.

Much of this spending growth is fuelled by private money, but much also comes from public sources. As countries grow richer, governments are more able to roll out health insurance policies. In Indonesia, for example, the government is introducing a universal coverage health scheme called Jaminan Kesehatan Nasional. Currently, around 65% of the nation’s 250m people are covered by some

Chart 1: Share of global expenditures on biomedical research in 2007 and 2012



Source: The New England Journal of Medicine.

form of health insurance. The government’s aim is to raise this level to 100% by 2019.

Naturally, spending levels and growth rates vary widely between countries. The mature markets such as Japan and Australia have high per capita health spending, but are showing little growth. By contrast, India’s spending is growing by 17% a year, China’s by 14% a year, Indonesia’s by 12% a year, and Malaysia’s by 10% a year.

The character of healthcare spending also varies widely across the region. For rich countries, the challenges of development loom large in the form of lifestyle diseases. Diabetes, cancer, cardiovascular illnesses, and obesity are rising as populations become more urban, jobs become more sedentary, people can afford richer—often less healthy—food, life expectancy rises and populations get steadily older. This proliferation of rich world health issues presents a compelling market for healthcare firms. Rich countries also face the health burden of rapidly ageing populations. (See “Box 1: Silver mining”.)

Poor countries such as India and Cambodia face a different set of challenges. The issues are often about providing basic health infrastructure such as good sanitation and clean water, as well as

² “Asia’s Ascent – Global Trends in Biomedical R&D Expenditures”, Justin Chakma, Gordon Sun, Jeffrey Steinberg, Stephen Sammut, Reshma Jaggi, The New England Journal of Medicine, January 2014



Asia Rising – Industrial Dynamism Barometer: Healthcare

building clinics and hospitals that remain in short supply. Many of the health conditions such as infant mortality, and contagious diseases like tuberculosis are related to poverty

In between the rich and poor extremes lie middle-income countries such as Thailand and Indonesia that are facing a double burden. Here, the diseases of rising wealth and ageing are arriving before the problems of poverty have been fully addressed. In Indonesia, for example, heart disease—typically a rich country condition—is now the biggest killer. Yet malnutrition and stunting—typically associated with poor countries—remain serious issues (as recently as 2008, the World Health Organisation estimated that 37% of children under the age of five in Indonesia suffered from stunted growth).

But it isn't only health spending that is rising in Asia. The value of medical research is also growing swiftly too. A study published in *The New England Journal of Medicine* shows that Asia's share of global expenditure on biomedical research and development rose from 18.1% in 2007 to 23.8% in 2012.² (See chart 1.)

Some of this growing share of global R&D is due to the efforts of Asia's home-grown healthcare companies. But some of it is also owes to global multinationals re-focusing their research efforts into Asia. As the authors of the study write: "One explanation for the shift in global R&D expenditures may be the attractive cost of conducting R&D in Asia-Oceania, where labour is cheaper and greater government subsidies are available."

This landscape presents a tremendous opportunity for healthcare companies. "Asia is the most exciting healthcare opportunity in the world," says Sanjay Prabhakaran, president of the Greater China

Table 1: The ten largest listed healthcare companies in Asia (ranked by revenues in 2011)

	Turnover in 2011 (US\$bn)
Sinopharm Group Co Ltd	16.28
Shanghai Pharmaceuticals Holding Co Ltd	8.84
Themis Medicare Ltd	3.06
Nanjing Pharmaceutical Co Ltd	2.72
Shanghai Industrial Holdings Ltd	2.48
China National Accord Medicines Corp Ltd	2.40
Harbin Pharmaceutical Group Co Ltd	2.13
North China Pharmaceutical Co Ltd	1.92
Ranbaxy Laboratories Ltd	1.92
Dr Reddy's Laboratories Ltd	1.91

Source: Company accounts

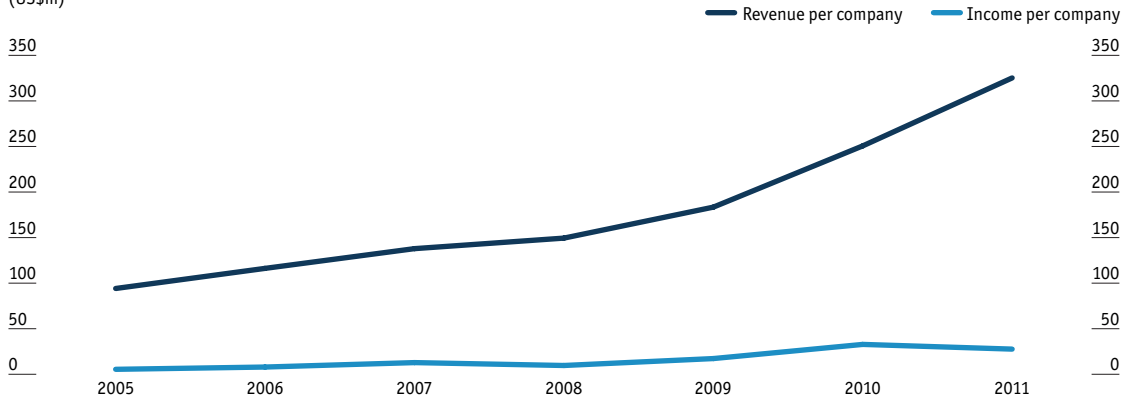
³ Countries included in the analysis were: China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand

region at Baxter, a US medical devices company. "Incomes are rising, life expectancy is rising, and the aspirations of the people for better healthcare are rising."

Ian Martin, vice president and head of commercial operations in Asia Pacific for molecular diagnostics and life sciences at Qiagen, a Dutch medical devices company, is equally excited. "What I love about Asia is the buzz you get doing your daily job," he says. "Our business in the region is growing

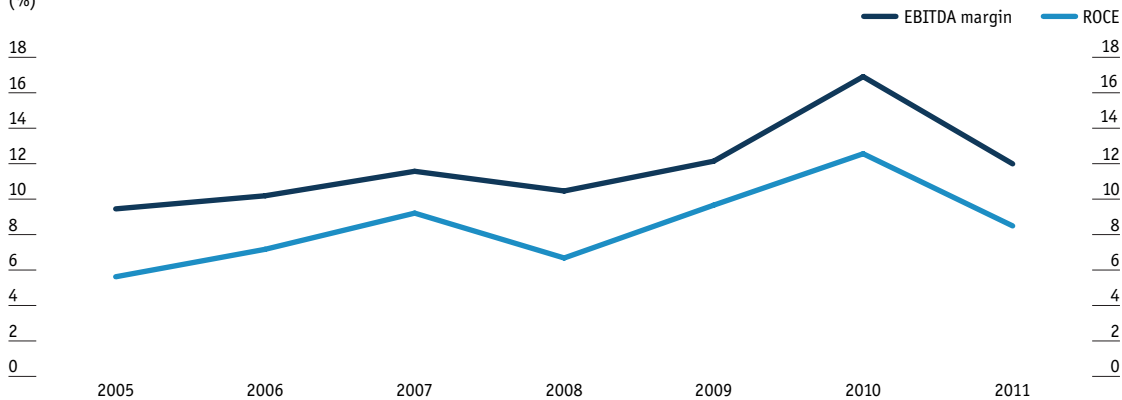


Chart 2: Average revenue per company and average income per company for Asia's listed healthcare firms
(US\$m)



Source: Company accounts.

Chart 3: EBITDA margin* and return on capital employed for Asia's listed healthcare companies
(%)



*EBITDA = earnings before interest, tax, depreciation and amortisation.
Source: Company accounts.

very quickly, and at the same time we're delivering value to the world's biggest developing economies. You don't get that same buzz in a rich market in the West."

How dynamic is Asia's healthcare sector?

Given the economic and demographic picture in Asia, the region clearly represents an exciting market for the healthcare sector. But how dynamic are Asia's healthcare companies in responding to this landscape of opportunity? How vibrant is the sector?

Dynamism as a concept is about activity and progress. The term implies high levels of change, development and movement. Are companies in a particular sector growing? How quickly? Are more companies entering the market? Are rates of investment rising? How profitable is the industry? Are businesses investing in research and development (R&D) and innovation?

To answer these questions, the Economist Intelligence Unit analysed the performance of almost



Box 2: Duelling with diabetes

As Asia grows wealthier it is rapidly encountering some of the diseases that go hand-in-hand with higher incomes and longer lifespans. Among them is Type II diabetes.

“Lifestyle diseases in Asia Pacific are exploding,” says Andreas Amrein, head of the diabetes care division in Asia at Abbott Laboratories, a US healthcare company. “In China 92m people have diabetes, in India 61m have the condition and the numbers are growing.”

Abbott makes the blood sugar metres that patients with diabetes use every day to manage their condition. Given the rise of the disease in Asia, the market represents a big opportunity. “Across the region, growth is about 8% to 9% a year, although it varies by market,” says Mr Amrein.

However, despite these attractive fundamentals, capturing the region’s growth is getting harder. Like many other companies in the healthcare sector, Mr Amrein foresees a future of strong volume growth, but little or nothing in the way of price growth.

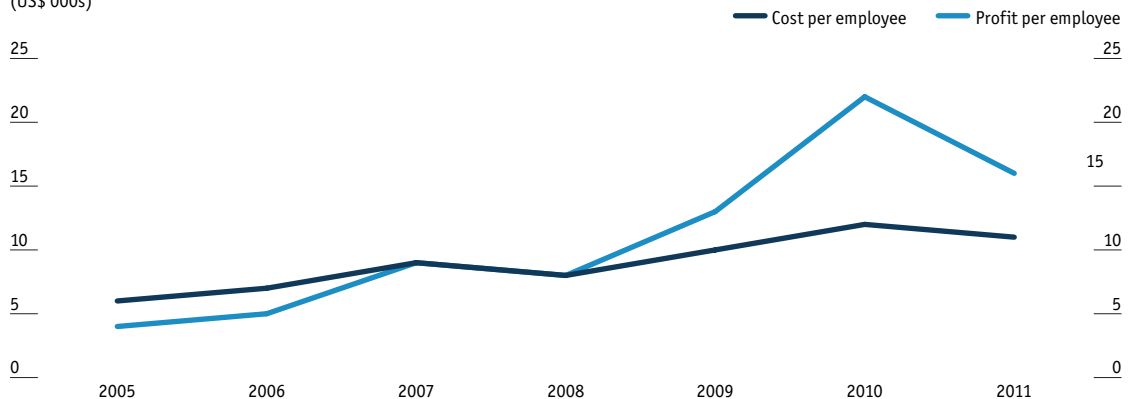
“Government budgets for healthcare are large, and in many countries are getting bigger, but they still aren’t enough to meet the healthcare needs of the people,” he says. “So governments are forcing prices down. The pricing pressure is strong.”

Another issue is human capital. Mr Amrein says that the demand for business managers with the right experience and qualifications is high and often exceeds the supply, forcing up wages. “Around 60% of my SG&A [sales, general and administrative] costs are personnel, so when salary packages go up by 12% a year in a place like China it’s a big challenge.”

Complicating the picture further is stiffening competition. Not only are local competitors emerging in Asia, but global multinationals are investing heavily in the region. Given the low rates of growth in their home markets in the US and Europe, more and more firms are looking to Asia as the source of future growth. Such competition may make life tougher, but ultimately it is a sign of a dynamic industry with large opportunities.

400 healthcare companies listed on stock exchanges in Asia, from 2005 to 2011.³ Their combined performance provides valuable insight into the health of the industry, and whether this is a sector that can be considered dynamic and exciting.

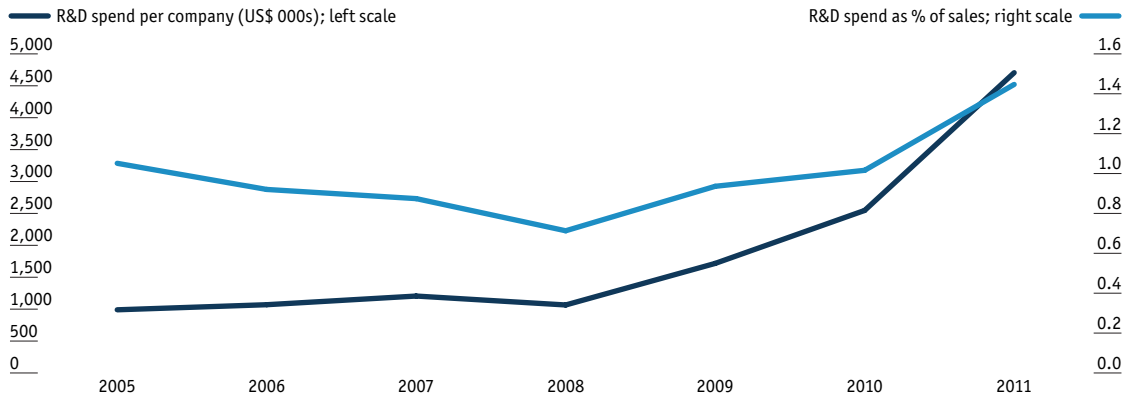
Chart 4: Average labour cost per employee and profit per employee for Asia’s listed healthcare companies
(US\$ 000s)



Source: Company accounts.



Chart 5: Investment in research and development (R&D) by Asia’s listed healthcare companies, and R&D spend as a % of sales



Source: Company accounts.

What is immediately clear is that the industry is enjoying high rates of growth. Back in 2005, companies in the sector had average revenues of US\$94m. By 2011, this had risen to US\$325m—giving an annual growth rate of almost 23%. Some of this growth came from acquisitions, but most of it has come through organic growth as Asia’s healthcare spending has grown. The high rate of growth is also because many of these companies are still small by global standards, and it is generally easier to show impressive expansion when the revenue base is still relatively low. (See Table 1.)

But Asia’s healthcare companies aren’t showing just healthy revenues. They are also posting strong profits, rising from an average of US\$5.4m per company in 2005 to US\$27.6m per company in 2011—an annual growth rate of 31%. (See chart 2.) As a result, profitability ratios for the sector have improved. Back in 2005, the sector as a whole had an EBITDA margin of 9.5%, and a return on capital employed (ROCE) of 5.6%. By 2011, the EBITDA margin had risen to 12%, while the ROCE had grown to 8.5%. (See chart 3.)

Profitability has not seen a linear increase. Some years, notably 2010, were better than others, but the underlying trend has generally been one of improving profitability. The performance of Asia’s economy has doubtless played a part in these fluctuations. The year 2010, for example, saw particularly strong economic growth as the global economy rebounded from the financial crisis of 2008 and 2009 on the back of huge government stimulus programmes, both in Asia and around the world.

But will this trend of improving profitability continue? Some in the industry feel that margins may come under pressure, although with ever increasing revenues, profits will still keep growing in absolute terms. “There is distinct margin pressure in China,” notes Mr Prabhakaran at Baxter. “The government recognises that the cost of providing healthcare is rising and they are making a big effort to manage that cost. So volume growth is still very robust, but there is strong pressure on prices.” This observation is found right across the Asia Pacific region. (See “Box 2: Duelling with diabetes”.)

As well as efforts by governments to keep prices down, companies are also experiencing rising costs, especially regulatory costs. Indeed, regulators themselves are rapidly adopting global standards and enforcing them in their home markets. By way of example, consider membership of the Pharmaceutical Inspection Co-operation Scheme (PICS), a network of global health authorities

⁴ “Escaping the sword of Damocles: Toward a new future for pharmaceutical R&D”, Ajay Dhankhar, Matthias Evers, and Martin Møller, McKinsey & Co, 2012

⁵ Company accounts



that aims to raise standards in the medical manufacturing industry. Currently Asia has six countries enrolled in the scheme—Australia, Taiwan, Indonesia, Malaysia, New Zealand and Singapore—with three of them joining in the past three years.

“Everywhere in Asia the regulatory environment is getting much tighter,” notes Mr Martin at Qiagen. “That can make it much more expensive getting your products into a market. But it has a positive side too in that it keeps out competitors who offer lower quality products at lower cost.”

At Baxter, Mr Prabhakaran agrees. “The regulatory landscape can change at tremendous speed,” he says. “In China, after the scandal of tainted baby milk, the rules changed almost overnight. That’s a positive thing. Some of the new safety rules in China are more stringent now than in many other parts of the world.”

Labour costs are also going up. Indeed, many healthcare companies report that they struggle to find the human capital they need, especially managerial talent. Between 2005 and 2011, costs per worker rose by an average of almost 11% a year. However, while costs certainly rose, profit per worker rose even faster, by 26% a year, suggesting a dramatic improvement in productivity for Asia’s listed healthcare companies. (See chart 4.) However, this impressive productivity performance may stall if governments strengthen their efforts to bring down healthcare costs and labour costs keep rising.

One measure of an industry’s dynamism is the number of companies in the sector. More new firms entering the market suggests greater opportunity and change. In healthcare, the number of listed companies in Asia has risen over the period of this study, from 345 in 2005 to 383 in 2011. Private companies are clearly going public in order to raise the capital they need to address the opportunities they see unfolding before them.

Another important indicator of industry dynamism is investment in research and development (R&D). The absolute quantity of R&D is rising, from an average of US\$1m per company in 2005 to US\$4.7m per company in 2011. But as a percentage of sales, these figures are still low. In 2011, for example, R&D spending was just 1.5% of revenues. (See chart 5.)

A study by McKinsey & Co, a consultancy, shows that globally the pharmaceutical industry invested 16% of sales in R&D in 2010. However, the study also reveals that the returns on this investment are diminishing. For the world’s 10 biggest pharmaceutical firms, the return on R&D investment in the early 1990s was around 15%. But by 2010, the return on R&D spending had dropped to just 5%.⁴

Given these figures, perhaps the low R&D figures for Asia’s healthcare sector are understandable. Rather than invest heavily in new science, many of them are choosing instead to develop generic versions of drugs whose patents have expired, and to compete by being the lowest-cost producer of such generics. Given the risk and cost of developing new drugs, this strategy makes sense.

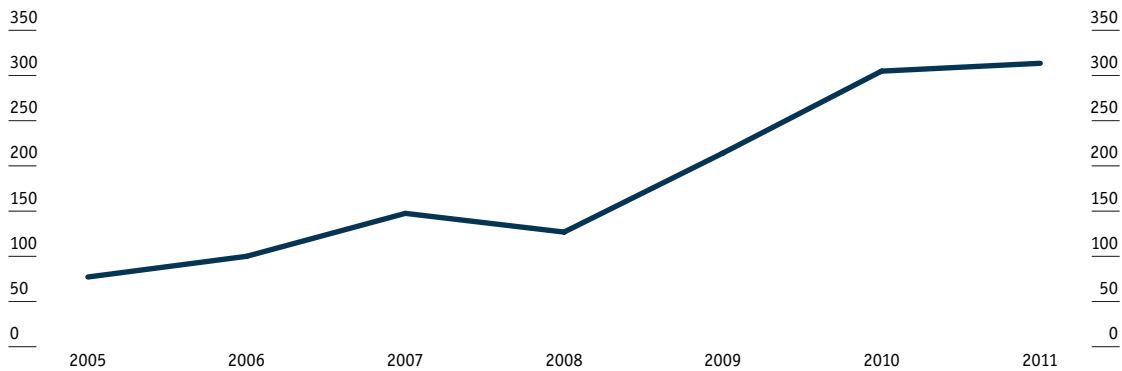
Of course, Asia is also producing companies that are driven by new R&D rather than copying and modifying existing products, and the number of such firms is rising. Mindray, a Chinese maker of medical devices based in Shenzhen, has rapidly emerged as a major force in areas such as medical imaging systems. The company has a string of R&D centres around the world, including in China, the US and Sweden, and invests around 10% of its revenues each year in R&D.⁵ Mindray is also buying



R&D. In July 2013, for example, it bought Zonare Medical Systems, a provider of high-end ultrasound technology in the US, for US\$105m.

Combining all the various aspects that define “industry dynamism”, the Economist Intelligence Unit has created a “dynamism barometer” that shows how the sector is evolving. This index combines a host of industry measures, such as growth rates, profitability, competition, and investment rates. Setting the index to equal 100 in the year 2006, it shows that the industry is experiencing dramatic improvements in its dynamism. By 2011, the barometer had increased to a measure of 314. (See chart 6.)

Chart 6: Healthcare barometer of industry dynamism
(2006 equals 100)



Source: The Economist Intelligence Unit.



Where are the opportunities?

For almost all companies working in healthcare, Asia is the biggest opportunity in the world. For a start, it has more than half of the world's people, and the population is growing. In 2010, Asia's population stood at 3.8bn people. By 2040, it will rise to 4.6bn. These people are getting wealthier, and as their incomes rise they are spending ever more on healthcare. Against this backdrop, the whole healthcare ecosystem faces a landscape of tremendous possibility, from pharmaceutical companies to makers of medical devices, and from health insurers to companies running hospital chains.

Naturally, the exact character of opportunity will depend on what product or service a company is providing. In the hospital sector, for example, Asia will need an additional 180m new hospital beds in the next decade, according to Frost & Sullivan, a healthcare data provider. In pharmaceuticals, sales have more than doubled from US\$97bn in 2001 to US\$214.2bn in 2010. By 2016, the EIU expects sales to hit US\$386bn, reflecting an annual average growth rate of more than 13%.

Opportunities such as these will not be limited to Asia's local populations, but will also feature the region's growing medical tourism industry. In Malaysia, for example, the number of medical tourists arriving from overseas seeking treatment has risen from 75,210 in 2001 to 583,296 in 2011, an annual growth rate of almost 23%.⁶ Transparency Market Research, a market research group, forecasts that the value of Malaysia's medical tourism industry will grow by 25% every year between 2013 and 2019. Similar stories are unfolding in other countries such as Thailand.

Alongside the growth of the healthcare market, Asia will also see an explosion of investment in research and development. As mentioned earlier in this report, Asia is rapidly gaining a bigger share of the world's biomedical research expenditures. This will keep rising in future, as global pharma companies move their R&D centres to Asia, both to get closer to the opportunity in the region, as well as to avail of the region's expanding pool of researchers and scientists, and their relatively lower costs compared to similar workers in Europe or North America.

Between 2004 and 2011, fDi Markets, a data provider, recorded 653 cross-border investment projects in Asia in the pharmaceutical and biotechnology sector, worth a total of US\$28.6bn. Of these deals, R&D accounted for 200 projects (31%), compared to manufacturing with 175 (27%), and marketing and support with 168 (26%).

Among Asia's local players, the focus of R&D will be on developing generic drugs and biosimilars. The costs of developing blockbuster new drugs will remain beyond the reach of many Asian healthcare businesses. However, developing an efficient production system for generic drugs represents an alternative path that is already being pursued. Many of Asia's healthcare firms are developing these drugs on their own, but equally, many are partnering with bigger global multinationals. These partnerships often include providing research services, running clinical trials, and contract manufacturing.

The arena of biosimilars is a step up from the production of generics. Biotechnology is about developing complex molecules (mostly proteins) that are produced by living organisms such as



bacteria rather than by chemical synthesis. Once a successful molecule has been developed that is proven to treat a medical condition safely, it's then possible to develop similar molecules that use the original one as a reference. Identifying and growing these biosimilars is considered by some to be a less expensive way for Asia's home-grown pharmaceutical companies to produce new treatments.

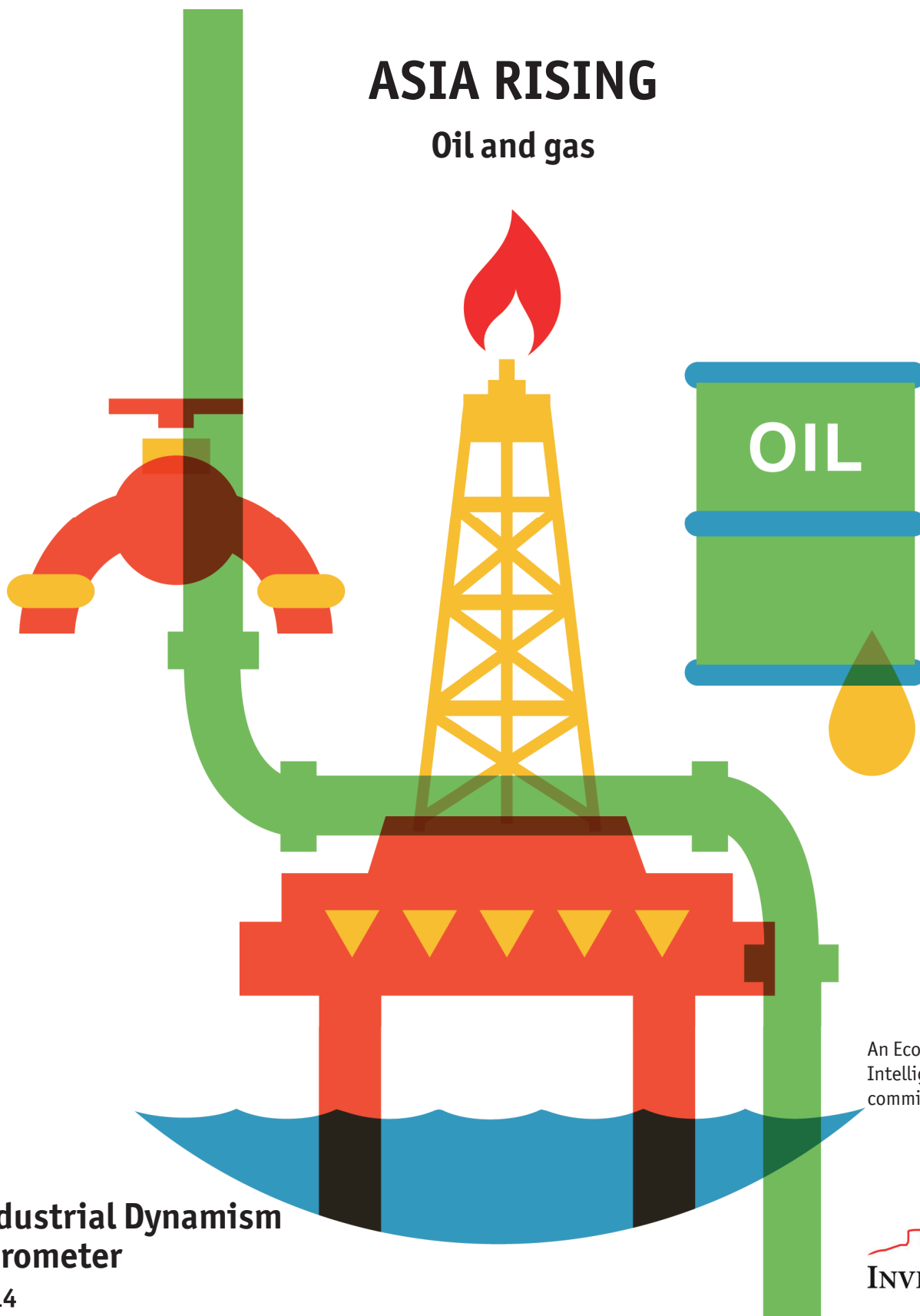
In China, for example, Shanghai Fosun Pharmaceutical and Tonghua Dongbao, both local producers, have each developed a biosimilar insulin product which together account for more than 15% of the Chinese insulin market, by volume. In India, market leaders such as BioCon and Wockhardt are also producing biosimilar insulin.⁷

⁷ www.manufacturingchemist.com

A report from The Economist Intelligence Unit

ASIA RISING

Oil and gas



An Economist Intelligence Unit report commissioned by

**Industrial Dynamism
Barometer**
2014





Executive summary

Given Asia's high economic growth rates and expanding population, the oil and gas sector faces a landscape of rapidly rising demand. Meeting this demand will be challenging, given that the region's reserves of fossil fuels are getting harder to extract. But a barometer of "industry dynamism" developed by the Economist Intelligence Unit shows that the oil and gas sector in Asia is rising to these challenges.

- **Asia stands out as being the most exciting part of the world for energy companies.** ExxonMobil, a petrochemical giant, reckons that Asia's share of global energy consumption will rise from 38% in 2010 to 45% by 2040. As energy consumption rises, the fuel mix in Asia will change. Growth in the demand for gas will outstrip all other fuels, given its cleaner environmental characteristics, and superior flexibility. Alongside energy consumption, demand for oil and gas will also grow as industrial inputs, with Asia's rising wealth fuelling demand for manufactured goods.

- **Meeting the rising demand for oil and gas in Asia will be challenging.** While some countries, notably Malaysia and Brunei, are net energy exporters, most countries import more than they produce. BP, an oil and gas giant, calculates that Asia produced 8.3m barrels of oil a day in 2012 (9.6% of global production), but consumed 29.8m barrels of oil a day, (33.5% of global consumption). It is a similar story for gas.

- **Despite being a net energy importer, the Asia Pacific region still has plenty of potential for upstream development.** The biggest opportunities exist in new gas fields, such as in Myanmar and Papua New Guinea. However, alongside these opportunities are many gas fields that have been ignored until now because they are much harder to develop, either because the gas reserves lie far offshore, or else under complicated geology. Many viable fields were also initially ignored because they are relatively small, but are now being developed. (See box 1: "Making money at the margin", on page 59.)

- **In order to extract gas from Asia's more complicated fields, regional oil and gas companies are investing ever more heavily in new technologies.** Back in 2004, Asia's 50 listed oil and gas firms spent US\$368m on R&D. By 2011, this had grown to US\$2.13bn. Some of this R&D spending is directed at Asia's shale gas reserves, which remain largely untouched so far. Another area of heavy investment is in developing new floating LNG ships that can extract gas far offshore and convert it to liquid for transport without the need for expensive undersea pipes. (See box 2: "Floating a new idea", on page 61.)

- **Given the landscape of opportunity in Asia, the region's listed oil and gas companies are reporting strong revenue growth.** In 2004, revenue per company in the sector stood at US\$2.9bn. By 2011 that had grown to US\$10.2bn, an average annual growth rate of 20%.

- **But while growth is rapid, the industry also faces significant challenges in the form of rising competition, rising costs, and shortages of talent.** Reflecting these issues, the return on capital employed for Asia's listed oil and gas sector fell from 19% in 2004 to 8.3% in 2011.



Asia’s importance to oil and gas companies

Energy demand is driven by two things: population size and per capita GDP. The more people a country has, the more energy it needs. And the richer that people become, the more energy they consume. All of which makes Asia the most important region in the world when thinking about the future of the oil and gas industry.

For a start, Asia has more than half of the world’s people, and the population is growing. In 2010, Asia’s population stood at 3.8bn people. By 2040, it will rise to 4.6bn.

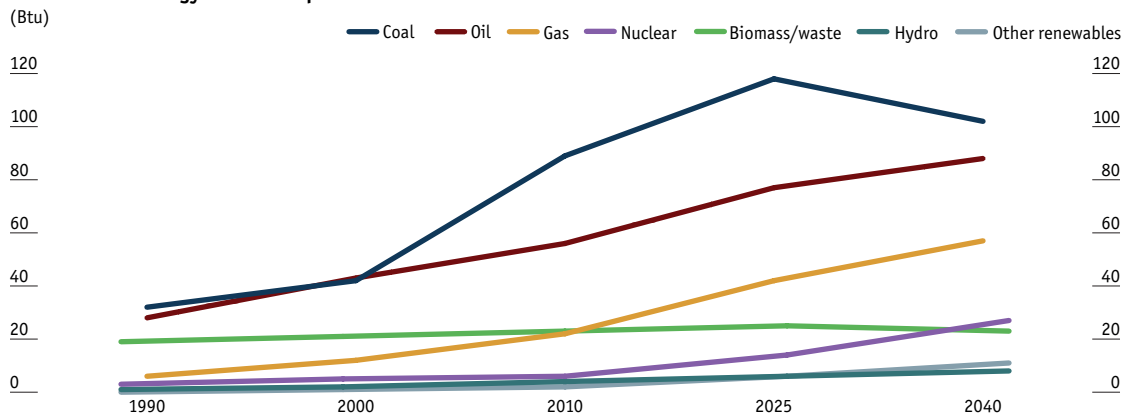
Asia is also the fastest growing part of the global economy. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2010, that share had risen to 33.8%. And most observers expect Asia’s share to keep rising for the foreseeable future. Per capita incomes in Asia are rising faster than in any other region of the world.

Given its giant share of the global population, and given its fast growing incomes, it’s little surprise that Asia’s share of global energy consumption is also rising. ExxonMobil, a petrochemical giant, reckons Asia’s share of global energy consumption will rise from 38% in 2010 to 45% by 2040.¹

Forecasts for which fuels will meet this growing energy demand vary, but everyone agrees that oil and gas will play a significant role. Using 2010 as the base year, ExxonMobil believes that Asia’s demand for oil will grow by 38% by 2025, and by 57% by 2040. In gas, Asia’s demand will grow by 91% by 2025, and by 159% by 2040.

In terms of the share of the overall energy mix in Asia, oil’s share will stay steady at 27% between now and 2040. With gas, however, the share rises quite sharply, from 11% in 2010 to 18% by 2040. (See chart 1.)

Chart 1: Asia’s energy demand in quadrillion British thermal units



Source: ExxonMobil “2013 Outlook for Energy: A view to 2040”.

¹ ExxonMobil “2013 Outlook for Energy: A view to 2040”

Rising demand for oil will be driven primarily by transport needs. As Asia grows wealthier, people will own more cars, raising demand for diesel and petrol. Asia will also consume more goods. This rising consumption will demand oil not only for transporting the goods, but for making them too—oil



is a key raw material for making chemicals, fertiliser, plastics, fabrics, and is an ingredient for making countless consumer goods.

In the case of gas, electricity producers will contribute significantly to rising demand. Today, Asia's power sector is heavily reliant on coal—roughly 60% of Asia's electricity comes from coal compared to 40% globally, and in China the figure is 80%. Most observers expect the use of coal to keep growing for at least a decade. Over time, however, gas will begin to replace coal.

This is partly because gas is cleaner than coal, releasing between 30% to 50% fewer carbon emissions per calorie of energy, as well as fewer pollutants such as sulphur. Just as important, gas offers greater flexibility because it can be turned on and off at short notice. This flexibility helps to manage not only fluctuations in demand, but also fluctuations in supply from unreliable energy sources such as solar and wind. By contrast, coal power stations take a long time to start up and to shut down.

Alongside electricity production, natural gas will also find growing demand from industry, both to provide power and as feedstock for the petrochemical sector. Consumer demand for gas for heating and cooking will rise, fuelled by Asia's continuing process of urbanisation. Interestingly, gas may also start to compete with oil as a transport fuel, especially for commercial vehicles such as buses, lorries and ships.

Importantly, however, Asia does not produce enough of its own oil and gas to meet its demand. The region as a whole is a net importer of both commodities. With one or two exceptions, such as Malaysia and Brunei, almost all countries in Asia are net importers of oil and gas.

BP, an oil and gas giant, calculates that Asia produced 8.3m barrels of oil a day in 2012 (9.6% of global production), but consumed 29.8m barrels of oil a day, (33.5% of global consumption). It's a similar story for gas. In 2012, Asia produced 490bn cubic metres of natural gas (14.5% of world production), but consumed 625bn cubic metres (18.8% of global consumption).²

² "BP Statistical Review of World Energy", June 2013



How dynamic is Asia’s oil and gas sector?

Given rising demand for energy and for industrial inputs, Asia clearly represents an extremely exciting market for the oil and gas sector. But how dynamic is the industry in responding to this landscape of opportunity? How vibrant is the sector?

Dynamism as a concept is about activity and progress. The term implies high levels of change, development and movement. Are companies in a particular sector growing? How quickly? Are more companies entering the market? Are rates of investment rising? How profitable is the industry? Are businesses investing in R&D and innovation?

To answer these questions, the Economist Intelligence Unit analysed the performance of the 50 or so oil and gas companies listed on stock exchanges in Asia from 2004 to 2011.³ Their combined performance provides valuable insight into the health of the industry, and whether this is a sector that can be considered dynamic and exciting.

The first observation to make is that the industry is growing rapidly in size. Back in 2004, companies in the sector had average revenues of US\$2.9bn. By 2011, this had risen to US\$10.2bn—giving an average annual growth rate of almost 20%. While impressive, some of the performance must be attributed to Petrochina, by far Asia’s largest oil and gas company. Its revenues in 2011 stood at US\$318bn, four times larger than the next biggest listed company in the sector. Its revenue growth has also exceeded the wider industry, averaging 29% a year between 2005 and 2011. (See Table 1.)

Table 1: The ten largest listed oil and gas companies in Asia (ranked by revenues in 2011)

	Revenue in 2011 (US\$bn)
Petrochina Co Ltd	318.28
Indian Oil Corp Ltd	79.94
PTT Public Co Ltd	77.15
Hindustan Petroleum Corp Ltd	36.27
Formosa Petrochemical Corp	26.55
Sinopec Shanghai Petrochemical Co Ltd	14.23
Thai Oil Public Co Ltd	14.16
Manalore Refinery & Petrochemicals Ltd	10.51
Chennai Petroleum Corp Ltd	7.97
IRPC Public Co Ltd	7.79

Note: Asia has a number of very large unlisted oil and gas companies too, such as Sinopec in China (annual revenue of US\$398bn in 2011) and Petronas of Malaysia (annual revenue of US\$70bn in 2011)

Source: Company accounts

³ Countries included in the analysis were: China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand

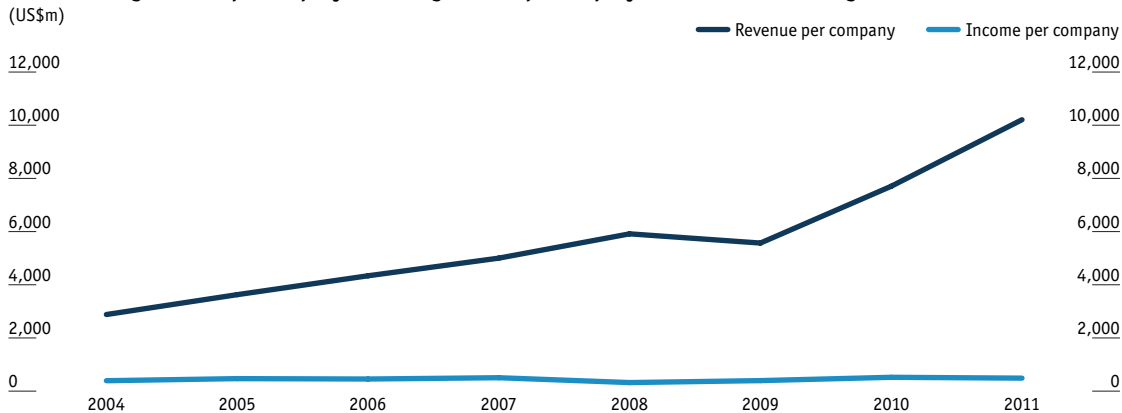
⁴ <http://www.resources-quarterly.com/china-and-its-rush-for-foreign-oil/>

Much of the sector’s growing revenue has come through acquisitions of assets all over the world. Chinese companies in particular have been highly active buyers of foreign assets, in part fuelled by the government’s determination to improve the nation’s energy security. Since 2008, Chinese oil and gas companies have spent around US\$95bn on acquisitions, and spent US\$35bn in 2012 alone.⁴



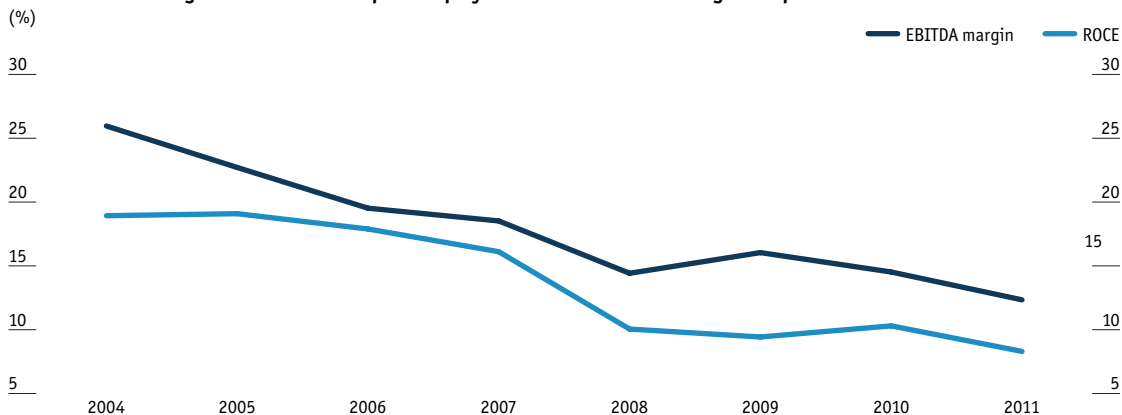
And yet, despite the dramatic increase in revenue at Asia’s oil and gas companies, profits across the period have remained almost flat. While revenues have grown by 20% a year, profits have grown by only 3% a year. (See chart 2.) As a result, profitability ratios for the sector have fallen. Back in 2004, the sector as a whole had an EBITDA margin of 26%, and a return on capital employed (ROCE) of 19%. By 2011, the EBITDA margin had fallen to 12.3%, while the ROCE had dropped to 8.3%. (See chart 3.)

Chart 2: Average revenue per company and average income per company for Asia’s listed oil and gas firms



Source: Company accounts.

Chart 3: EBITDA margin* and return on capital employed for Asia’s listed oil and gas companies



*EBITDA = earnings before interest, tax, depreciation and amortisation.

Source: Company accounts.

Fluctuating commodity prices have an important impact on the profits of the sector. The period under analysis includes the global financial crisis of 2008 and 2009. The price of a barrel of Brent crude oil fell from an average of US\$97.7 in 2008 to US\$61.9 in 2009, and remained relatively low in 2010 at US\$79.6. However, prices recovered in 2011, averaging US\$111 per barrel. And yet, profitability at Asia’s listed oil and gas companies failed to recover.



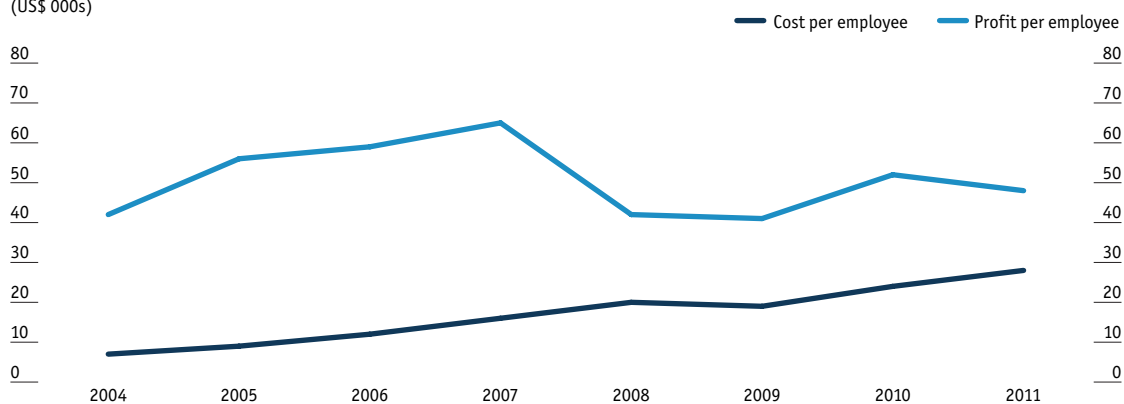
Asia Rising—Industrial Dynamism Barometer:

Oil and gas

Costs for the industry are clearly rising, and many factors are responsible. For a start, many firms have already developed their easy-to-access fields and increasingly have to look at oil and gas deposits that are much harder to access, such as offshore and deepwater fields. These assets are more complicated to develop and require higher capital expenditure. Alongside this broad trend, many other operating costs are also rising rapidly, such as insurance.

One notable issue is the rising cost of labour. Back in 2004, the average listed oil and gas firm in Asia spent US\$7,000 on wages per employee, while earning profits of US\$42,000 for each worker. By 2011, the average labour cost per worker had risen to US\$28,000, but profit per employee had only risen to US\$48,000. (See chart 4.)

Chart 4: Average labour cost per employee and profit per employee for Asia's listed oil and gas companies
(US\$ 000s)



Source: Company accounts.

Another factor contributing to falling profit margins has been rising competition. The number of listed oil and gas companies in Asia has risen from 45 in 2004, to 54 in 2011.

But, while rising competition might make life tougher for the industry, it also suggests rising dynamism. More companies are listing their equity in order to raise capital because they see opportunities worth investing in. Given that the oil and gas industry is highly capital-intensive, requires deep knowhow, and is populated by very large competitors, the fact that the industry has ever more companies listed on the region's stock markets suggests a bright outlook for the sector.

Another important indicator of industry dynamism is investment in research and development (R&D). Spending by the sector has risen sharply in absolute terms—up from US\$368m in 2004 to US\$2.13bn in 2011. R&D expenditure has also risen as a share of revenue—up from 0.27% of revenue in 2004 to 0.39% of revenue in 2011.

This rise in R&D spending will become ever more important if the sector is to thrive. As mentioned already, the region's existing oil and gas fields are starting to mature. For companies to keep growing, they will need to develop and adopt new technologies for prolonging the life of existing assets. And they will need to harness new techniques for reaching oil and gas deposits that are in ever harder places such as deepwater sites.



“The low-hanging fruit for oil and gas in Asia have already been picked,” notes Dr Tilak Doshi, senior research fellow at the King Abdullah Petroleum Studies and Research Centre in Saudi Arabia. “New fields have harder geology, are in deeper water, or contain more pollutants like carbon dioxide.”

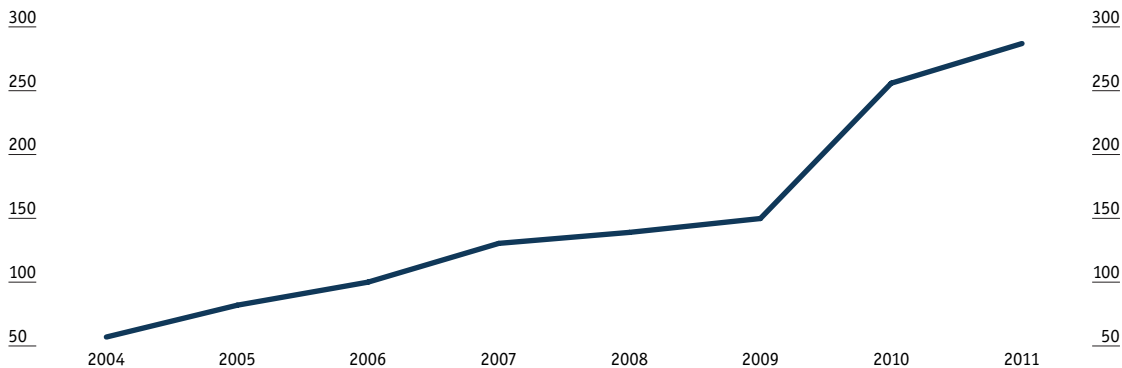
Just as important, Asia’s oil and gas firms will need to upgrade their skills for extracting oil and gas from unconventional sources such as oil sands and shale rock. Shale deposits offer a particularly exciting opportunity. China, for example, is reckoned to have only 3trn cubic metres of conventional gas, but 50trn cubic metres of shale gas—the largest such reserves in the world. But they are not easy to reach.

Conventional gas is often trapped in large reservoirs beneath a layer of non-porous rock, enabling drillers to bore a well and extract the gas relatively easily, as if through a straw. Shale gas, however, is trapped in countless tiny pockets within layers of shale rock. To get it out, drillers must resort to hydraulic fracturing, whereby they pump a mixture of water, grit and chemicals into the rock at high pressure, breaking up the structure and thereby allowing the gas to escape.

“A lot of Asian players don’t have the technology and experience yet to tap into unconventional deposits,” says the regional head of a Western oil and gas group. “For now, many of them are relying on the technical skills of global companies to help them.”

Combining all the various aspects that define “industry dynamism”, the Economist Intelligence Unit has created a “dynamism barometer” that shows how the sector is evolving. This index combines a host of industry measures, such as growth rates, profitability, competition, and investment rates. Setting the index to equal 100 in the year 2006, it shows that the industry is experiencing rising dynamism. By 2011, the barometer had increased to a measure of 287. (See chart 5.)

Chart 5: Oil and gas barometer of industry dynamism
(2006 equals 100)



Source: The Economist Intelligence Unit.



Where are the opportunities?

The sector's rising dynamism in Asia is driven by high rates of revenue growth, which in turn is indicative of a landscape of rich opportunity. Some of this opportunity lies at the upstream end of the industry—exploration and production (E&P).

“The opportunities are much more exciting for gas than they are for oil,” says the regional head of a Western oil and gas services group. “Oil is really mostly about the active maintenance of brownfield sites and trying to prolong the life of existing assets. But in gas there is a lot of potential for developing new sites.”

He notes that wellhead capital expenditure for E&P activities in Asia has been growing by 25% a year for the past three years. In future, he sees this growth slowing to a rate of around 10% a year. “It's not quite as glamorous but nonetheless still attractive,” he says. In terms of the number of new wells being drilled, he estimates the figure for China is around 35,000 a year. For the rest of Asia, including Australia, the number is smaller, at just under 5,000 wells a year.

Outside of China, one of the most exciting opportunities is Myanmar. Having been closed off from the world for several decades, the country's oil and gas fields are relatively unexplored. The country has some production already and supplies both China and Thailand with pipeline gas. However, the country is reckoned to have big offshore gas fields that are not yet even mapped out, let alone close to being developed. The head of liquid natural gas (LNG) supply for a Western oil and gas major reckons it will be about 10 years before Myanmar is able to start producing from these fields, given the current state of the country's infrastructure, regulatory regime and knowhow.

Thailand, Bangladesh, Vietnam and Cambodia are all also believed to have gas potential, although territorial disputes, such as between Vietnam and China, and between Thailand and Cambodia, mean that some of these assets will be hard to develop. Australia has vast reserves of gas, much of it in the form of coalbed methane and shale gas, as well as significant offshore fields. However, Australia is proving to be an extremely high-cost environment in which to develop gas projects, with soaring labour and environmental costs proving especially troublesome. A number of high-profile projects in the country are running dramatically over budget, causing several future projects to be mothballed for now.

Malaysia and Indonesia are both big producers of gas, and both have large reserves that have yet to be developed. However, many of them are in tough offshore locations, or are too small to attract the attention of the global majors. But this doesn't mean they aren't exciting for smaller players.

For example, Petronas, Malaysia's national oil company, recently set up a subsidiary called Vestigo Petroleum to launch partnerships with oil service groups to develop small and marginal fields. Petronas itself is too big to work on these smaller fields, but hopes it can attract other partners to get involved. (See “Box 1: Making money at the margin”.)



Box 1: Making money at the margin

Almost all Asian countries are net importers of energy. One notable exception, however, is Malaysia. Ever since 1910, the country has been a producer of oil and gas, both for its domestic needs and for export, and the sector has played a huge role in the country's development. Even today, it contributes about 20% to the country's GDP, and almost 40% to the government's revenues.

However, the days of easily-accessible petroleum reserves are drawing to a close in Malaysia. Just as in many other parts of Asia, the best fields have all been developed. That leaves existing reserves that are either harder to extract (such as deepwater assets), or are small in size.

Undaunted, the Malaysian government has implemented a set of policies to encourage the oil and gas industry to tackle these tougher, smaller reserves. For companies operating in oil and gas, these policies present interesting opportunities.

Of particular note are efforts to develop marginal oil and gas fields. Petronas, Malaysia's national oil company, considers a field to be marginal when it has less than 30m barrels of oil equivalent, with a 20% to 30% recovery factor. Experts reckon there are 106 such fields in the country, with a combined 580m barrels of oil equivalent in reserves. These fields are too small for Petronas to develop itself. And so it has set up a subsidiary, Vestigo Petroleum, to oversee their development.

"Vestigo is intended to be a fully-fledged development and production oil and gas company for marginal and mature fields," says Keith Collins, the firm's CEO. "By having Vestigo focus on these fields, it allows Petronas to concentrate on developing the bigger, but much more challenging fields."

In order to develop these marginal fields, Vestigo is aiming to work with partner organisations such as small oil and gas companies and oilfield services groups via 'risk service contracts' (RSCs). Unlike a traditional 'production sharing contract' that governs a large oil and gas field, an RSC is structured so that Vestigo maintains ownership of the reserves, and pays the partner companies a fixed fee for their services in extracting the oil or gas.

The contractor provides the investment to develop the field, and is responsible for operating and maintaining the asset. In return, they receive a fee for each unit of oil and gas produced. RSCs also bring other benefits, such as reduced rates of tax (25% instead of the usual 38%). The key to success, says Mr Collins, is "a focus on costs and short development cycles".

RSCs mean that contractors are unable to book a field's reserves as their own. Moreover, contractors don't benefit from rising oil and gas prices thanks to the fixed fee arrangements. Nonetheless, executives in the industry suggest that the arrangement is alluring, with the potential of attractive, guaranteed rates of return.



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Oil and gas

Papua New Guinea is another country that has decent-size gas reserves. ExxonMobil is developing a big gas project there that will start producing towards the end of 2014, and many in the industry believe the country has potential for new projects.

Huge opportunities exist both in exploring these gas fields and in developing them. Just as important, big opportunities exist in supplying services to the oil and gas sector, be it running seismic mapping exercises, building rigs, supplying equipment, offering legal services, environmental consultancy, and so on. In South-east Asia, Petronas in Malaysia, Pertamina in Indonesia and PTT in Thailand all act as magnets for a vast array of service providers and partners. One interesting success story centres on a Malaysian company called PACC Offshore Services Holdings (POSH), which listed its shares in April. POSH provides offshore vessels for the oil and gas industry, and is a major provider of “floatels”, or ships that dock permanently alongside oil rigs in order to provide accommodation for oil workers.

Many companies are excited about the opportunities to build out Asia’s LNG infrastructure. Given that much of Asia is not a contiguous landmass, a lot of the gas that the region produces and consumes will be transported by ships rather than through pipelines. To do so requires liquefaction plants that compress natural gas by 600 times until it becomes a liquid. It also requires re-gasification terminals that enable the gas to be unloaded. And, of course, it requires LNG ships to transport the gas.

Building big LNG facilities is an expensive business, but companies are now developing much smaller-scale LNG infrastructure that is more affordable. For countries like Indonesia and the Philippines, which are made up of thousands of islands, LNG offers a new energy source that is much cheaper than the diesel that many of them currently use. With small-scale LNG receiving terminals, many of which are now designed as floating facilities to receive the gas offshore, it is possible to bring natural gas to places where pipelines aren’t possible or economically viable. (See “Box 2: Floating a new idea”.)

On the downstream side of the oil and gas industry as well, the opportunities are great. Once again, they centre more on natural gas than on oil. Consumer use of natural gas for cooking and heating will rise steadily. And the use of gas as a transport fuel is already rising. Tony Regan, principal consultant at Tri-Zen, an energy consultancy, believes “The penny is only just dropping in Asia about the use of gas for transport”. Natural gas, says Mr Regan, is not only cheaper than diesel, but cleaner too, which is an important consideration for Asia’s increasingly polluted cities. Small vehicles such as cars use compressed natural gas, while trucks, buses and ships use LNG, which is compressed many times smaller.

Use of gas for transport is growing across Asia. In India, for example, the number of gas-powered vehicles rose from 10,000 in 2000 to 1.1m in 2011. In China, the number more than doubled from 450,000 in 2010 to 1m in 2011 on the back of an aggressive push by the government to promote clean energy vehicles. In pilot cities such as Chongqing, Chengdu, Shanghai and Xi’an, more than 90% of all buses use an LNG engine. The supporting infrastructure is also developing—for instance, in 2011, China had 2,120 natural gas filling stations.⁵

⁵ Natural Gas Vehicle Knowledge Base



Box 2: Floating a new idea

Given that most of Asia's easy-to-reach gas fields have already been developed, much of the future supply will come from offshore deposits. In many cases, these are not just offshore, but far out at sea, making it tough to get the gas back to land.

In the past, offshore gas fields had to pipe the gas onshore to a land-based liquefaction plant in order to convert the gas to liquid natural gas. Once converted to LNG, the gas would then be pumped onto ships for transport around the world.

These days, however, gas companies are building floating liquefaction plants that sit directly above the offshore gas fields and load LNG into ships directly alongside them. These floating LNG (FLNG) plants are expensive, complicated and still at an early-stage of development. Nonetheless, given the profile of its gas fields, Asia is proving to be a centre for investment into this new technology.

Royal Dutch Shell is the first oil and gas company to commission such a facility for its Prelude gas field, 475km off the coast of Western Australia. Work began in October 2012 and when completed, the facility will be the largest floating construction ever built—almost half a kilometer long, covering an area bigger than five football fields, and weighing more than six aircraft carriers.

Such facilities do not come cheap—the Prelude project is estimated to cost around US\$12bn—but are nonetheless much cheaper than building long

undersea pipelines to an onshore liquefaction plant. Many other companies have announced intentions to embark on similar projects.

In Indonesia, Inpex Masela, which is jointly owned by Shell, PT EMP Energi Indonesia, and Inpex, a Japanese oil and gas company, is developing a FLNG platform for its Abadi gas field in the Arafura Sea. Media reports suggest the cost of this FLNG platform will be around US\$10bn.

In Malaysia, Petronas, the national oil company, has a number of FLNG ships under construction. The first is expected to be deployed in 2015, with an annual capacity of 1.2m tonnes a year of LNG. The ship will be positioned above the Kanowit gas field, 180km offshore from Bintulu in Sarawak.

But FLNG's potential stretches to more than just offshore liquefaction. It also includes offshore re-gasification plants. These re-gas terminals are far cheaper to build, and can be constructed at a small scale, making them suitable for settlements on remote islands, such as those in Indonesia and the Philippines. The floating re-gas plant can be towed to its destination, hooked up to the land, and then supply local power stations with LNG delivered by ship.

Many companies in Asia are excited by the prospects of building these FLNG facilities. Companies in Malaysia, Indonesia and the Philippines are already winning construction contracts.



Image - © Shell

ASIA RISING

Wholesale and retail



An Economist
Intelligence Unit report
commissioned by



Executive summary

Consumer spending in Asia is rising at impressive rates, presenting big opportunities for retail and wholesale companies. Capturing this opportunity isn't easy, given rising costs and intensifying competition. But a barometer of "industry dynamism" developed by the Economist Intelligence Unit shows that the retail sector in Asia continues to do well.

- **Asia stands out as being the most exciting part of the world for retail businesses.** Between 2013 and 2018, the Economist Intelligence Unit forecasts that retail sales in Asia Pacific will grow by 10.2% every year, whereas globally retail sales will grow by only 6.9% a year.
- **Asia's rising retail sales are driven by expanding populations and rapidly rising incomes.** In 2010, Asia's population stood at 3.8bn people. By 2040, it will rise to 4.6bn, creating an additional 800m consumers. The average wealth of these consumers is rising too. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. Asia's economic outperformance will continue for the foreseeable future.
- **Retail sales in Asia are being fuelled by increasing levels of urbanisation and deepening penetration of modern retail formats.** In 2013, Asia had 80m square metres of modern retail space, but this will rise to 135m square metres by 2018, dramatically increasing the opportunities for retailers.
- **Against this positive backdrop, the retail opportunities are highly varied, from mass market grocery chains and fast-food outlets to high-end fashion stores and luxury boutiques.** The opportunities for online retail look especially potent, with growth rates of close to 17% a year. (See Box 1: "Online opportunity" on page 72.) In more affluent market segments, retailers will see strong opportunity in the blossoming of travel in Asia by selling at airports and hotels and targeting Asia's deepening tourist flows. (See Box 2: "Travel: The country in the sky", on page 73.)
- **Asia's homegrown retail companies are growing rapidly.** Between 2005 and 2011, revenues at Asia's listed retail and wholesale firms rose by an average of 21% every year. Most of this growth was organic in character. Indeed, Asia's retail sector remains highly fragmented, suggesting opportunities for consolidation and acquisitive growth in future.
- **But while topline growth is exciting, a number of structural issues are making profits growth harder to achieve.** Human capital with retail skills is in short supply, forcing companies to invest heavily in training. Wages are rising, with staff costs up from 3.5% of operating revenues in 2005 to 5% by 2011. In some markets, rents are high. And everywhere competition is getting ever more intense as both local players and global retailers are drawn to Asia's strong growth outlook. In some cases, foreign retailers have struggled to develop local knowhow in order to compete effectively.



Asia’s importance to retail companies

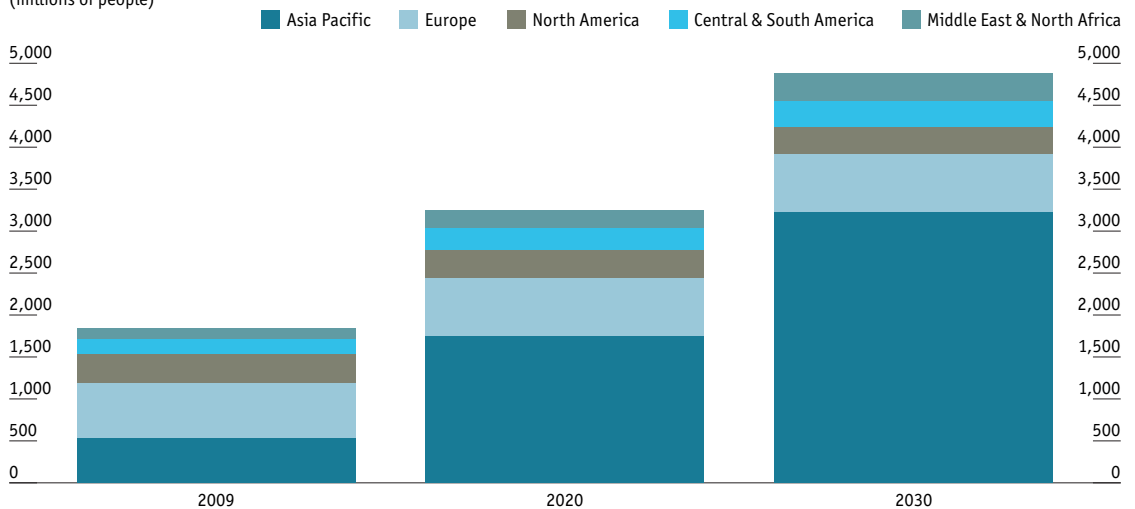
The opportunities for retail and wholesale companies are determined in large part by rising purchasing power. Large populations in which incomes are rising rapidly present the best opportunities for the retail sector. In this regard, Asia stands out globally as a region of tremendous potential.

For a start, Asia has more than half of the world’s people, and the population is growing. In 2010, Asia’s population stood at 3.8bn people. By 2040, it will rise to 4.6bn, creating an additional 800m consumers, an average of 27m extra people every year.

But not only is Asia’s population expanding, the average wealth of the population is also rising. In 2001, the region accounted for 26.8% of global GDP (measured using purchasing power parity). By 2013, that share had risen to 36.6%. And most observers expect Asia’s share to keep rising for the foreseeable future. Per capita incomes in Asia are growing faster than in any other region of the world.

Given this positive demographic and income picture, the size of the middle class in Asia is growing at a rate that the world has never experienced before. In 2009, the size of Asia’s middle class stood at 525m individuals, or 28% of the global middle class. By 2020, Asia will be home to 1.74bn middle class citizens, equal to 54% of the global total. (See chart 1.)

Chart 1: Size of the global middle class*
(millions of people)



Source: World Bank.

*Households with daily expenditure between US\$10 and US\$100, measured using PPP.

As people join the middle class, their spending habits change. Rather than buying only necessary items such as food and fuel, they start to buy discretionary items too, such as smartphones, motorbikes, televisions and fashion goods. They become more open to branding, more understanding of how products differ from one another, and more willing to pay premium prices for branded goods.

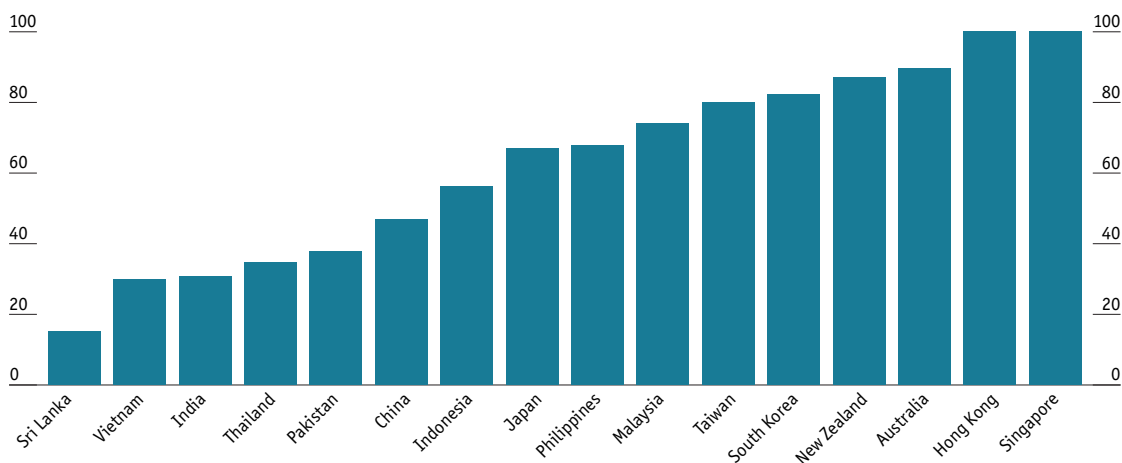
In some countries in Asia, such as Japan and South Korea, the population is already largely middle class. But in others, such as Thailand and Indonesia, income levels today are such that vast swathes



of people are joining the ranks of discretionary spenders every year. In Indonesia, for example, the number of households earning more than US\$5,000 a year (widely regarded as the lower boundary for discretionary spending) will rise from 16m in 2012 to 33m in 2016. Right across emerging Asia, especially in South-east Asia, similar patterns are playing out.

Just as important as rising spending power are levels of urbanisation. Not only do urban dwellers earn more than their rural counterparts, but they are much more concentrated in dense settlements. This makes them easier to reach than dispersed communities in the countryside. Cities also have a much more developed retail infrastructure, be it shopping malls, distribution centres, or even basic roads and electricity. In Asia, urbanisation is progressing swiftly, but still has a long way to go. In Sri Lanka, only 17% of the population is urban. In Vietnam the figure is 25%. (See chart 2.)

Chart 2: Urbanisation rates for Asia
(% of population living in cities)



Source: The Economist Intelligence Unit.

As a consequence of rising incomes and ongoing urbanisation, the quality of retail space is changing rapidly. Jones Lang Lasalle, a real estate consultancy, calculates that Asia had 80m square metres of prime retail space in 2013. Within just five years, that figure will climb to 135m square metres—an increase of 69%. In China, the Ministry of Commerce says the country had 3,000 shopping malls in 2013, but will have 4,000 by 2015—a 25% increase in two years. Of the world’s 20 biggest shopping malls, 14 are now in Asia, including four in China, four in Malaysia and four in the Philippines.

The spread of shopping centres and malls drives an ongoing penetration of formal, organised retail in Asia. Such developments mean that retailers don’t have to build their own shops and so can avoid regulatory and real estate concerns as they expand. Malls also help to drive footfall by attracting shoppers from a wide area, something that retailers struggle to do in standalone retail stores. As these malls get built, the share of retail conducted in a modern, organised environment is rising. Some countries have barely started on this journey, such as India where modern retail only accounts for around 7% of all consumer purchasing. But everywhere the picture is changing, creating an alluring backdrop for retail businesses.

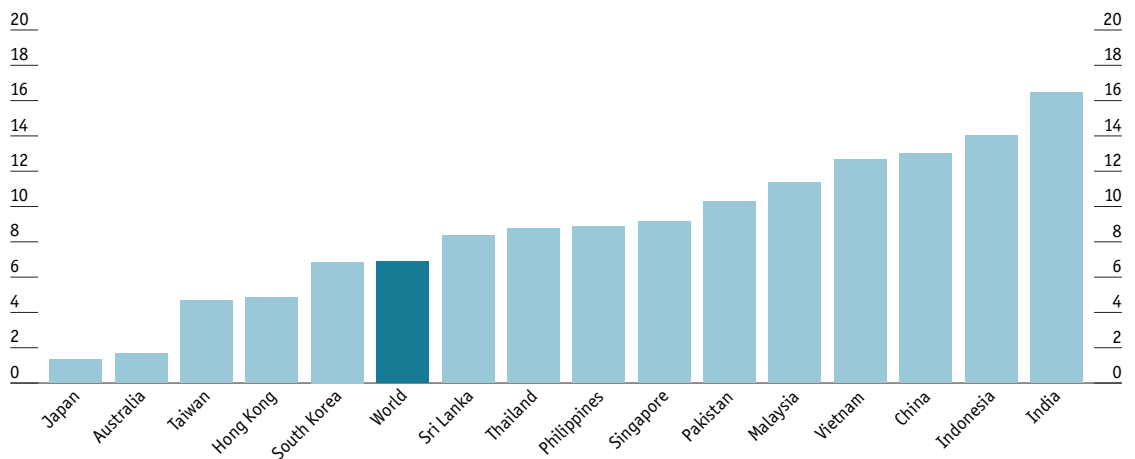


Asia Rising – Industrial Dynamism Barometer:
Wholesale and retail

“In South-east Asia, the growth of the middle class has surged along with the levels of disposable income,” says Eugene Ho, head of consumer business advisory in South-east Asia at Deloitte, a consultancy. “Complementing this is the recent completion of high quality retail space in markets such as Manila and Bangkok, which will draw retailers to the region with the new supply of prime retail space.”

The net result of all these trends is mouth-watering rates of growth in retail spending. The Economist Intelligence Unit forecasts that with the exception of mature economies such as Japan and South Korea, most of Asia will see retail spending grow far in excess of the global average over the coming five years. While retail sales at a global level are forecast to grow by 6.9% a year for the next five years, in Asia they will grow by 10.2% annually. (See chart 3.)

Chart 3: CAGR in retail sales, 2013-18
(%)



Source: The Economist Intelligence Unit.



How dynamic is Asia’s retail sector?

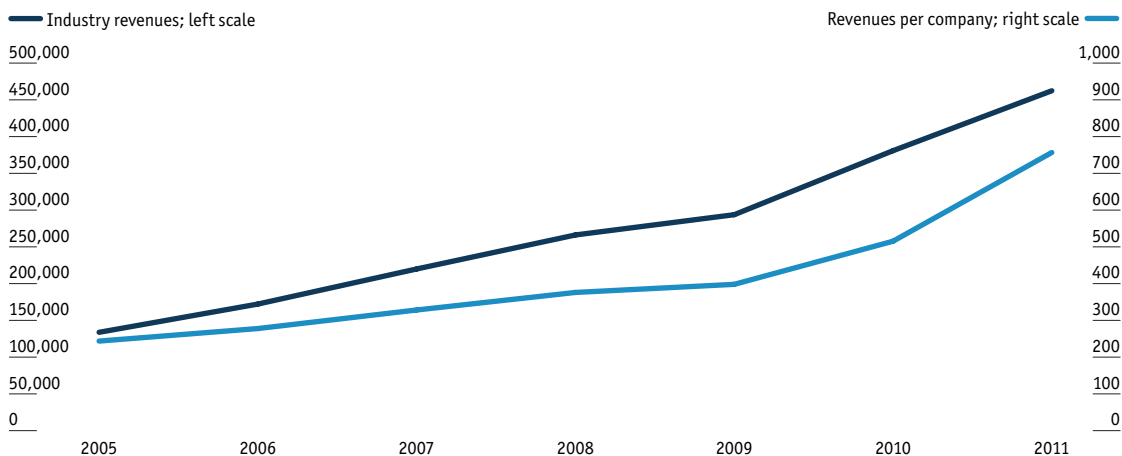
Given the economic picture in Asia, the region clearly represents an exciting market for the retail sector. But how dynamic are Asia’s home-grown retailers in responding to this landscape of opportunity? How vibrant is the sector?

Dynamism as a concept is about activity and progress. The term implies high levels of change, development and movement. Are companies in a particular sector growing? How quickly? Are more companies entering the market? Are rates of investment rising? How profitable is the industry? Are businesses investing in research and development (R&D) and innovation?

To answer these questions, the Economist Intelligence Unit analysed the performance of almost 700 retail and wholesale companies listed on stock exchanges in Asia from 2005 to 2011.¹ Their combined performance provides valuable insight into the health of the industry, and whether this is a sector that can be considered dynamic and exciting.

What is immediately clear is that the industry is enjoying high rates of growth. Back in 2005, companies in the sector had average revenues of US\$244m. By 2011, this had risen to US\$757m—giving an annual growth rate of almost 21%. Growth rates slowed a little in 2008 and 2009, during the global financial crisis, but never fell, suggesting an industry with a high degree of resilience. (See chart 4.) Doubtless this was due to the solid economic fundamentals in Asia. While the crisis revealed the state of indebtedness of households in the West, the balance sheets of Asia’s consumers were far healthier. Their rate of spending growth may have eased somewhat, but it never went into reverse. Household incomes continued to climb, and so too did retail sales.

Chart 4: Industry revenues and revenues per company
(US\$m)



Source: The Economist Intelligence Unit.

Acquisitions are part of this growth story in company revenues. Indeed, some of Asia’s retailers have been expanding globally, such as AS Watson, a health and beauty chain in Hong Kong that is one of Asia’s biggest retailers. The group operates 3,500 stores and more than 900 pharmacies across 12

¹ Countries included in the analysis were: China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand



Asia Rising – Industrial Dynamism Barometer:
Wholesale and retail

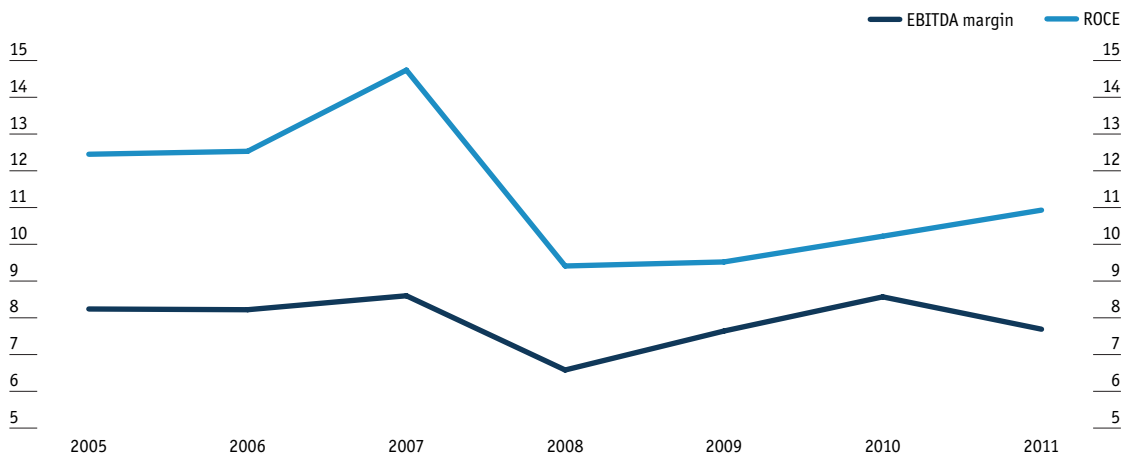
markets, including acquisitions of Superdrug in the UK and Marionnaud in France.

However, the real growth story has been organic, with companies capitalising on the region’s fast-rising spending power. Consequently, says Tobias Wasmuht, international retail director at Spar International, a Dutch supermarket group, the sector remains highly fragmented. “In most Asian markets, the market share of the top five grocery retailers is less than 10%,” he says. In the UK, by comparison, the top five grocery retailers had a market share of 66% in 2010.²

This fragmentation suggests huge scope for consolidation in the sector in the years ahead. For Mr Wasmuht, it also presents significant opportunity. Spar International runs a different model to most global supermarket chains. Rather than owning and operating its own stores, it works with local retailers. These companies join Spar and gain access to the group’s technology, purchasing power, distribution systems, knowhow, and training. As such, many independent grocery chains operate alongside each other under the Spar brand, achieving global economies of scale while remaining locally owned.

But while topline growth is proving abundant, profit growth has shown itself to be a little harder to achieve for Asia’s retailers. The years of the global financial crisis in 2008 and 2009 saw profit margins fall, particularly in 2008, although the picture has improved somewhat since then. (See chart 5.)

Chart 5: EBITDA margin and ROCE
(%)



Source: The Economist Intelligence Unit.

More broadly, a number of structural challenges are putting profits under pressure for retailers in Asia. In some markets, rents for retail space are high and rising. India stands out in this regard, where mall development is lagging demand thanks to the difficulties of acquiring land and high borrowing costs.

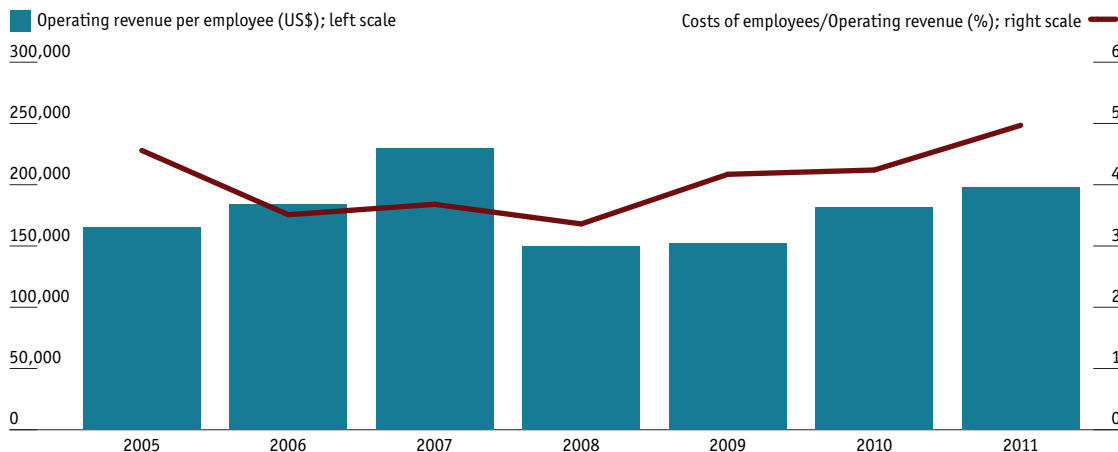
In other markets, staff shortages are a major constraint, from front-line retail staff to experienced retail managers. Indeed, because of the shortages, staff costs are rising. In 2005, staff costs were equal to 3.5% of operating revenues. By 2011, they had risen to 5%. (See Chart 6.)

“Organised retail is a young industry in most of Asia,” notes Mr Wasmuht. “There isn’t a big pool of

² UK Office of National Statistics



Chart 6: Operating revenue per employee and Costs of employees/Operating revenue



Source: The Economist Intelligence Unit.

talent to recruit from, so we have to set up training academies to build our own talent pipeline.”

What’s more, he notes, competition is getting tougher. “The local retailers are growing quickly, but the international retailers are expanding aggressively too. The competition is intense, and it’s hard for some of the players to make money. If you take a place like Southern China, you have a who’s who of global supermarket chains all competing in the same place. I don’t know anywhere else in the world where there is such a concentration of the global top 10 [grocery retailers].”

Indeed, this fierce competition has forced some of these international retailers to re-think their plans. In 2013, Tesco, a UK supermarket chain, announced plans to withdraw from China. In 2012, Carrefour, a French retailer, sold its stores and withdrew from Indonesia, Malaysia and Singapore. Some of these withdrawals were down to a failure to understand the nuances of local demand, and the types of product that would resonate with local consumers.

“Retail is detail,” notes Torsten Stocker, a Hong Kong-based partner at AT Kearney, a management consultancy. “You have to get the product mix right. You have to understand local preferences. You have to adjust your retail strategy to match local shopping habits. It’s not easy, and many retailers have struggled to get it right.”

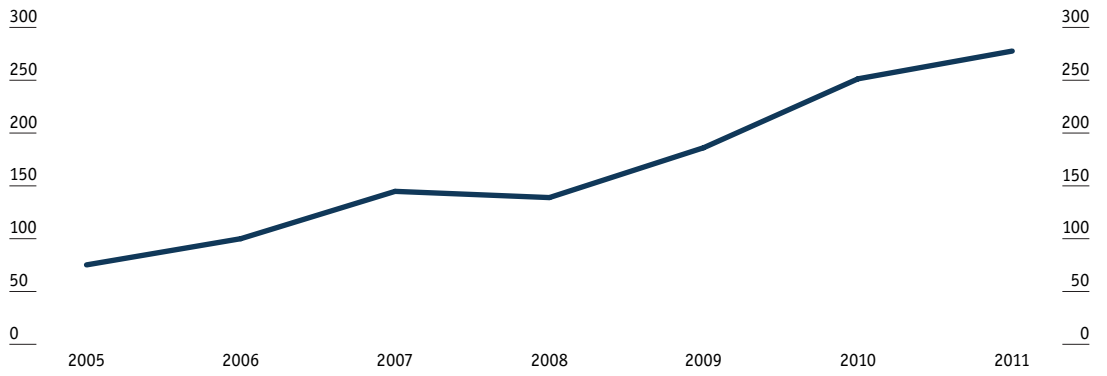
Another measure of an industry’s dynamism is the number of companies in the sector. If the number of companies is increasing, it suggests a market of opportunity and change. In retail, the number of listed companies in Asia has risen over the period of this study, from 549 in 2005 to 611 in 2011. Private companies are clearly going public in order to raise the capital they need to address the opportunities they see unfolding before them.

Combining all the various aspects that define “industry dynamism”, the Economist Intelligence Unit has created a “dynamism barometer” that shows how the sector is evolving. This index combines a host of industry measures, such as growth rates, profitability, competition, and investment rates. Setting the index to equal 100 in the year 2006, it shows that the industry is experiencing rising levels of dynamism. By 2011, the barometer had risen to a measure of 278. (See chart 7.)



Asia Rising – Industrial Dynamism Barometer: Wholesale and retail

Chart 7: Retail Dynamism Barometer



Source: The Economist Intelligence Unit



Where are the opportunities?

Given Asia's rising spending power, the region offers opportunities for every kind of retailer, from petrol stations to convenience stores to supermarkets to high-end luxury goods. Naturally, some markets are more exciting than others. AT Kearney ranks the relative attractiveness of retail markets around the world every year and concludes in its 2013 assessment that China offers the most exciting potential in the region, closely followed by Mongolia, Malaysia, India, Sri Lanka, and Indonesia.³ "Consumer spending growth, continued adoption of modern retail, and solid economic fundamentals keep Asian markets attractive to global retailers," the report concludes.

China, the report says, is a "retail powerhouse" and "remains irresistible to global retailers of every stripe". The country became the world's biggest market for passenger cars in 2010. It is the largest market in the world for smartphones (351m were shipped in 2013, compared to 1bn globally). In art and antiques, China is the second largest market in the world behind the US, accounting for 24% of the US\$65.9bn spent globally in 2013.⁴

But retailers ignore other parts of Asia at their peril, where opportunities are also exciting. For example, Malaysia, the report notes: "Is at the forefront of many international retailers' expansion plans. Tesco expanded in both Malaysia and Thailand [in 2012], and Japanese grocer Aeon acquired Carrefour's Malaysian assets in November 2012, part of a plan to make Malaysia its South-east Asian headquarters... In other areas of retail, Italian jeweler Damaini named Malaysia as one of the brand's most appealing emerging markets."⁵

In luxury goods, Bain & Co, a consultancy, estimates sales are growing at 20% a year in South-east Asia, compared to 7% a year in China. The impressive performance in South-east Asia is "driven by a wave of new store openings, and increasing strength and relevance of second-tier markets".⁵

Indeed, the biggest opportunity for many retailers across Asia is increasingly no longer limited to capital cities and tier 1 metros, where competition is already intense. Many are focusing their attention on tier 2, tier 3 and tier 4 cities that enjoy rapidly rising spending power but much less penetration from modern, organised retail.

True, high-end luxury retail chains will continue to focus on the richest, most developed cities. However, a growing number of retailers that serve lower-income groups will keep pushing deeper into the less penetrated parts of Asia. As this process unfolds, it will generate significant demand for more shopping malls and retail centres. This presents a giant opportunity for property developers and construction companies.

But bricks and mortar retail is only one part of the story. The opportunities in e-commerce and online retail are arguably more exciting. (See "Box 1: Online opportunity.") Just as exciting, rising incomes in Asia will also drive sharp increases in cross-border travel, which opens up another exciting retail market. (See "Box 2: Travel: The 'country' in the sky.")

³ "Global Retail Development Index", AT Kearney, 2013

⁴ "Art Market Nears Record With \$66 Billion in Global Sales", Bloomberg, March 13, 2014

⁵ "Luxury Goods Worldwide Market Study, Spring 2013 Update", Bain & Co, May 2013



Box 1: Online opportunity

As discussed elsewhere in this article, Asia's rates of overall retail growth are exciting. Between 2013 and 2018, the Economist Intelligence Unit is forecasting the value of retail sales in the region will grow by 10.2% every year. However, impressive though these numbers are, they seem positively pedestrian compared to the growth in online retail.

According to McKinsey & Co, a consultancy, online sales in China grew by an annual average of 120% between 2003 and 2012.⁶ In India, FlipKart, the nation's number one online retailer, had sales of just US\$10m in 2011. In 2014, the firm is predicting sales of US\$1bn—a growth rate of 364% a year.

While such impressive growth rates will inevitably come down as markets mature, the future is nonetheless exciting. Forrester Research, an IT consultancy, estimates online sales in Asia will grow by 16.6% every year between 2013 and 2018, with much faster growth in emerging markets such as China than in developed markets such as Japan.

In part, online sales are being driven by the rapid penetration of smartphones and internet access among Asia's populations. Nielsen, a

market research firm, reckons that China had 71 smartphones for every 100 people in 2013. In Malaysia, the figure was 80, in Thailand it was 49.

Naturally, some types of retail are more suited to e-commerce than others. In the grocery segment, for example, the penetration of online sales is much lower than in books and electronics. But even grocery sales are moving online, with consumers choosing to order heavy or bulky items over the internet.

This proliferation of online retail represents an exciting channel for retailers to connect with consumers. It also presents opportunities for many other types of business, be they IT service providers helping with website management, logistics companies and warehouse managers providing fulfillment services, or financial services firms developing new payment options. Consumers in many markets in Asia do not yet trust online payments, and in some cases, do not have credit cards or other means to pay electronically. One of the reasons behind the soaring success of Flipkart in India is its policy of accepting cash payment when goods are delivered, rather than demanding online payment upfront.

⁶ "China's e-tail revolution", McKinsey & Co, March 2013



Box 2: Travel: The ‘country’ in the sky

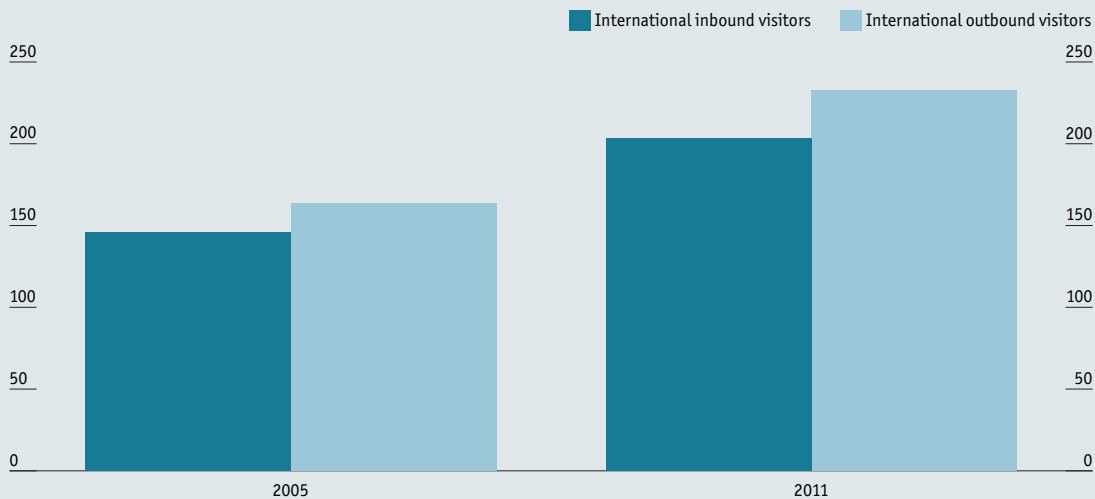
While Asia presents many exciting countries for retailers to expand into, one market doesn’t appear on the map at all: travel retail, or selling goods in airports, on airlines and the like.

As incomes rise in Asia, more and more consumers are travelling overseas, both for business and pleasure. Indeed, figures show that the number of international travelers in Asia is growing by 6% a year. (See Chart 8.) The amount that these tourists spend while travelling is growing by 9.5% a year.

like airports, it’s equal to the size of a large country.”

The growing travel habits of Asia’s local populations also present another interesting consideration for global retailers: the need to build a strong brand image in Asian markets in order to win a piece of Asia’s overseas spending. For example, it is well-known that Chinese consumers spend more on luxury goods outside China than they do inside the country. In part this is to avoid sales taxes at home. Equally,

Chart 8: International inbound and outbound visitors
(number of visitors)



Source: The Economist Intelligence Unit.

“Travel retail is a very big market in Asia,” says Torsten Stocker, a Hong Kong-based partner at AT Kearney, a consultancy. “People who travel tend to have more spending power than average consumers, so it’s important for retailers to address this market. If you add up the retail spending across Asia in places

it reflects concerns around counterfeit goods at home—a risk that is much reduced, for example, when buying luxury goods in Europe. But in order to win this overseas spending power of Asian travelers, retailers must endeavour to build their brand in local Asian markets first.

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