China’s productivity imperative
Growing Beyond

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Executive summary

Companies in China have generally done well over the past decade. Corporate income has grown very fast, and profitability has also been on the rise. Companies in China have benefited from world-beating productivity gains, an expanding labor force, and rising inflows of foreign direct investment. Demand has been supported by domestic investment in industrial capacity and infrastructure, and until the global financial crisis, steady growth in the world’s major markets. Accommodating government policies have also kept the price of inputs low, thus systematically raising investment returns.

The future, however, looks much less certain and there is an increasing awareness that times are changing. Companies in China now face a very different business environment.

What’s different now?

A gloomy global macroeconomic outlook, particularly for Europe and the United States, has already had considerable impact on the Chinese economy. China’s export growth to key markets in Asia, Europe, and North America has slowed significantly since 2010. The situation is most serious in relation to Europe, where exports have recently started falling. Revenues flowing to China’s industrial sector have slowed as a result.

At the same time, China’s productivity growth has also fallen. Growth in total factor productivity has fallen from an annual average of 4.7 percent in 2001-07 to 2.8 percent in 2008-10. Earlier rounds of market liberalization and privatization have largely run their course, and the mass reallocation of labor from low productivity agriculture to higher productivity manufacturing is coming to an end. The massive expansion of capital investment in recent years has resulted in a decline in capital efficiency, effectively “crowding out” productivity growth.

Implications for the national economy

The experience of other East Asian economies demonstrates that capital-driven growth is not sustainable. Raising productivity is now therefore critical for China’s economic future. China still has a long way to go in this regard. While China’s labor productivity has improved a lot over the past decade, it is still far from the productivity performance of developed countries. This, of course, presents both opportunities and risks.
Productivity on the government agenda

China’s leaders recognize the importance of productivity to China’s economic future. A key objective of the 12th five year plan (2011-15) is shifting the growth pattern toward consumption-led, efficiency-focused growth. Companies can therefore expect increasing pressure to raise productivity in coming years. Industrial policy will give incentives to raise productivity, and increasingly penalize unproductive and wasteful companies.

The government is expected to implement input factor market reforms in line with the current five-year plan’s binding targets to lift average incomes and increase resource efficiency. This will have the effect of making cost inflation a permanent feature in a slowing economy, something that most companies in China have yet to experience first hand.

Understanding cost drivers

Taking a closer look at cost drivers, our analysis shows that both labor and commodity costs have increased substantially in the past five years. Labor costs have increased the fastest, with average wages more than doubling since the beginning of 2007. In the same period, the average price of commodities consumed by China increased by 51 percent: soft commodities rose 60 percent; metals rose 19 percent; and energy prices rose 77 percent.

We expect these cost increases to continue. The introduction of mandatory employer social welfare contributions, accompanied by government targets to increase the minimum wage, rising expectations from employees, and the increasing cost of living, will put continuous upward pressure on labor costs.

The price of commodities, generally lower in China than globally, will rise relative to international levels as the Chinese government removes administrative controls. Plans have already been released to link city-gate natural gas prices with prices of imported fuel oil and liquefied petroleum gas in two provinces.

In addition, the cost of capital for most companies is likely to increase when China embarks on the process of interest rate liberalization. Policymakers signaled in the first half of 2012 that this will occur in the near future.

How these rising costs impact on companies depends on their cost structure. For the manufacturing sector, the predominant inputs are commodities (raw materials, energy) and intermediate goods (equipment, semi-finished goods etc.). In contrast, labor and capital make up a greater share of costs for the services sector.
Implications for companies

The only way to offset the impact of slowing revenue growth and rising costs is by lifting productivity. Companies must therefore view productivity as a strategic imperative. For the economy as a whole, more productivity growth will come from improvements at firm level.

Companies will need to dramatically improve their internal processes to deliver products or services with fewer inputs. At the same time, there will be an increasing focus on targeting customer needs more effectively in order to grow revenue and market share in what is still a rapid-growth market.

By harnessing the following sources of productivity, we consider that companies can maximize efficiency gains in their organizations and drive a new round of profitable growth across the economy:

► Take advantage of structural changes such as reforms to lower market barriers and the opening up of new industries to investment.
► Maximize the benefits of information technology by making better use of data, improving communication, and enhancing speed and flexibility.
► Exploit technological catch-up by combining different existing technologies and adapting them for China’s needs.
► Increase the pace of talent development, deploy talent to the highest-value opportunities, and improve the way workers engage with each other.
► Pursue mergers and acquisitions to drive scales of economy and add value through creative partnerships.
► Undertake overseas direct investment to gain experience and import advanced technologies.
It is now customary, when writing about China, to start with a recitation of the country’s impressive economic achievements. At an average of 9.9 percent annual GDP growth since 2001, China is now the world’s largest exporter and manufacturer, boasting 73 of the Global Fortune 500 companies and 6 of the world’s top 10 container ports. By any criteria the ten years since China’s accession to the World Trade Organization have been nothing short of momentous.

Companies in China have done very well over the past decade. Corporate income has grown very fast, and profitability has been on the rise. The winners have been import- and export-competing industries — those companies that provide what China needs but doesn’t produce (metals, energy, high-tech products) and those that have created manufacturing bases in China for export (machinery, consumer electronics, textiles). Other winners include China’s coastal provinces, energy providers, the real estate and construction industries, and China’s banks.

The industrial sector, the largest part of the economy, reported average return on equity (ROE) of 13.8 percent in the period 2001 to 2010. Private domestic enterprises have been the strongest performers, outpacing foreign multinationals from 2005 onwards (Figure 1). State-owned enterprises (SOEs) reported the lowest ROE, but even they saw a substantial improvement over the decade.

Companies in China have benefited from world-beating productivity gains, an expanding labor force, and rising inflows of foreign direct investment. Demand has been supported by domestic investment in industrial capacity and infrastructure, and until the global financial crisis, steady growth in the world’s major markets. On the supply side, accommodating government policies have kept the price of inputs low, thus systematically raising investment returns.

There is a general awareness though that the times are changing. Companies in China now face a very different business environment.
What’s different now?

The global outlook remains gloomy

The outlook for Europe and United States, which together take almost 40 percent of China’s exports, remains gloomy. Europe is afflicted by falling confidence and escalating financial stress. The Eurozone saw its GDP contract in 2011 and prospects for the next two to three years are not encouraging, with unemployment likely to remain high through 2013. The US economy is slightly more positive, with consumption and inventory investment strengthening in 2011, although political division on the question of fiscal consolidation remains worrying.

The effect of these global economic conditions on China is considerable. China’s exports collapsed dramatically during the global financial crisis, and then quickly recovered in early 2010. Since then, however, growth in exports to China’s key markets in Asia, Europe, and North America has slowed significantly (Figure 2). The situation is most serious in relation to Europe, where exports have already started falling. As a result, new orders in manufacturing have begun to shrink while inventories have started to build.

Figure 2 Export growth by geography

In 2008-09, the Chinese government unleashed a massive fiscal stimulus to make up for a fall in global demand, but this is unlikely to be repeated this time. The industrial sector is afflicted by overcapacity issues, and there are legitimate concerns that another major round of stimulus may exacerbate troubled local government balance sheets and an expanding property bubble.

Source: General Administration of Customs, Ernst & Young analysis.
Productivity growth is slowing

An exercise in growth accounting shows that the factors that once drove China’s growth are running out of steam (Figure 3). Our analysis breaks down the economy’s GDP output into the contribution of different factors: the increase in the amount of capital and labor, plus growth in productivity.

Box 1

How we define productivity

Productivity was defined as the efficiency of production (i.e. the ratio of production output to input). For the purposes of analyzing productivity’s contribution to China’s economic growth, we estimated the economy’s Total Factor Productivity (TFP). TFP measures the change in output relative to change in labor and capital. It is a better measure of productivity than labor productivity or capital efficiency because it assesses the efficiency with which both these inputs are used.

TFP can be taken as a measure of an economy’s long-term technological progress, broadly defined. Improvements in managerial capabilities, organizational competence, research and development, allocation of resources, and diffusion of technology all contribute to TFP growth.

Figure 3

Accounting for China’s growth

Source: National Bureau of Statistics; Ernst & Young analysis.
Total factor productivity

Ernst & Young estimates show that China’s productivity growth gradually climbed following China’s accession to the WTO in 2001, achieving an average of 4.7 percent in the period 2001-07. Productivity growth fell dramatically, however, during the global financial crisis, and improved only marginally in 2010. From 2008-10, the economy managed productivity growth of 2.8 percent, remaining well below the 2001-07 average.

What has caused this slowdown in productivity growth? In general terms, China has exhausted gains from first-generation policy reforms.

The mass reallocation of labor from low productivity agriculture to higher productivity manufacturing is coming to an end. Growth in the number of migrant workers looking for work in the cities has slowed since 2005. Although there are 320 million laborers still in agriculture, perhaps as few as 20 million have the potential to migrate to the cities.5

Earlier rounds of market liberalization and privatization have largely run their course. Those reforms raised competition between companies, and allowed both labor and capital investment to be allocated to more efficient firms and industries. Now productivity growth is limited by a sub-optimal financial system and state enterprise domination in a number of protected sectors of the economy.

Labor

In the same period, labor’s contribution to economic growth is shrinking. Growth in the size of the labor force has fallen since 2005, declining from an annual average of 1.7 percent in the period 2000-05 to 1.05 percent in 2006-11.6 Demographers forecast that the size of China’s workforce will begin a long-term decline from 2015.7

Capital

Worryingly, capital has played a progressively larger role in the Chinese economy. Since 2008, China has made up for the fall in net exports by expanding investment. The government took the lead with a CNY 4 trillion stimulus package that saved the country from the worst of the global financial crisis. In 2009 capital accumulation contributed more than two-thirds of aggregate growth.

You can have too much of a good thing though. The result of so much investment is that capital efficiency is falling. China’s capital to output ratio has risen from 3.79 in the 1990s to 4.25 in 2000-07 and to 4.89 in 2008-09.8 The expansion in capital, in other words, looks to have ‘crowded out’ productivity growth.
Economists have long recognized the importance of productivity in economic growth. The experience of other East Asian economies demonstrates that capital-driven growth is not sustainable. Very rapid growth in capital stock without productivity growth leads to a decline in the marginal product of capital, and eventually inhibits growth. As Barry Eichengreen remarked, “Growth slowdowns are almost always TFP growth slowdowns.”

Raising productivity is now therefore critical for China’s economic future.

Whilst it is true that China has succeeded in creating indigenous national champions in a number of high technology industries, a close examination of China’s aggregate economy in a global perspective shows that China still has a long way to go in terms of productivity improvement. Our construction of the world technological frontier (see Figure 4 on the following page) shows China’s productivity relative to 36 comparable economies. The graph plots output per worker and capital per worker for each economy. The technological frontier is ‘best practice’, representing the greatest output per worker possible at any given level of capital per worker (as observed in the world today). Distance from the frontier shows how much less is produced at a given capital intensity compared with actual potential.

China’s labor productivity has improved a lot over the past decade, but it is still far behind the productivity performance of developed economies. Indeed, after some thirty years of economic reform, China’s labor productivity is still behind such countries as Thailand, Colombia, and Morocco. In addition, (as the inset to the figure shows) the economy has actually moved further away from the technological frontier because of its growing capital inefficiency.
Figure 4

World technological frontier, 2010

Source: World Bank, Ernst & Young analysis.
Critical among the objectives of the 12th five-year plan (2011-2015) is shifting the growth pattern toward more consumption-led, efficiency-focused growth (Figure 5). China’s leaders have long recognized that a growth model that depends disproportionately on exports and capital investment is not sustainable.

Although similar themes have been echoed in past five-year plans, there is a recognition that lifting productivity is more urgent now. Companies can therefore expect increasing pressure to raise productivity in coming years. Industrial policy will give incentives to raise productivity, and increasingly penalize unproductive and wasteful companies.

**Figure 5**

### 12th five-year plan targets

<table>
<thead>
<tr>
<th>Category</th>
<th>2010</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>GDP growth</td>
<td>10.3%</td>
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<td>Urban disposable income</td>
<td>19,109 CNY</td>
<td>26,810 CNY</td>
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<td>Energy consumption per GDP (TCE/CNY millions)</td>
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<td>R&amp;D as percentage of GDP</td>
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<td>Service sector value-added output as percentage of GDP</td>
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<td>Minimum wage standard (CNY)</td>
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<td>1,603</td>
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<td>CO₂ emissions (billion tonnes)</td>
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<td>6.91</td>
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<tr>
<td>Strategic industries as percentage of GDP</td>
<td>3.0%</td>
<td>8.0%</td>
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</table>

**Source:** National Bureau of Statistics; Ministry of Human Resources and Social Security; Xinhua; Reuters; Ernst & Young analysis.
Growth

The five-year plan targets a lower growth rate of 7 percent per annum. The intention is that growth will be more sustainable and efficient. More growth is to come from domestic consumption, from 35.1 percent of GDP to 40 percent by 2015. The share of services in total GDP is also expected to increase by 4 percentage points. The underlying assumption has to be that government is willing to accept a somewhat lower growth rate provided that the growth is of higher quality.

Labor productivity

The five-year plan specifies that income per capita will rise by at least an annual average of 7 percent in real terms per year. Urban disposable income will increase from CNY19,109 in 2010 to CNY26,810 in 2015. Reaching this goal means year-on-year wage raises and gradual increases of minimum wages. The result is a burgeoning middle class – with the demand that this will generate – but also more pressure on companies to increase labor productivity to offset wage inflation.

Resource efficiency

Binding targets have been set to reduce energy and carbon intensity, to eliminate the loss of arable land, reduce water consumption per unit of industrial value added, and increase forest coverage. The proportion of fossil fuels and energy consumption to GDP is targeted to decline. Industrial policy is expected to gradually bring Chinese commodity prices in line with the rest of the world, to compel companies to raise the efficiency with which they use resources, especially energy.

Innovation-driven industrial policy

Seven strategic industries have been selected - non-fossil energy, environmental technology, new fuel-powered vehicles, new materials, high-end manufacturing, biotech pharmaceuticals, and information technology. Their contribution to GDP is set to rise from 3 percent in 2010 to 8 percent in 2015, and to 15 percent by 2020. This will be supported by increased research and development spending from 1.75 percent to 2.20 percent of GDP. Industrial policy will provide incentives for companies to upgrade their technologies and move up the value chain.

The government agenda and costs

Costs will continue to rise in coming years as cheap sources of inputs are exhausted, and the government undertakes reforms of input factor markets. The government is expected to gradually remove administrative controls that have in the past kept input cost increases muted. Steps have already been taken in the past few years, but the process is likely to accelerate in line with the 12th five-year plan's binding targets around income per capita and resource efficiency.

This process will probably take place over the next decade or so, and will be hard to reverse. In our view, the phenomenon of rising costs will therefore likely be a permanent feature of the Chinese business environment, with both near and long term implications for all companies. It will occur in a gradually slowing economy, something which most companies in China have yet to experience first hand.
Costs impact companies differently

How rising costs impact on companies depends on their cost structure (Figure 6). Comparing the manufacturing and services sectors shows that input cost shares vary considerably. For manufacturing, the predominant inputs are commodities (raw materials, energy) and intermediate goods (equipment, semi-finished goods etc.). Compared with manufacturing, labor and capital make up a greater share of costs for the services sector.

Our analysis of 17 industries showed that there was even greater variation in cost structures at subsector level. For example, labor’s share ranges from a low of about 5.3 percent in coking, coal gas and petroleum processing to a high of 55 percent in agriculture. Capital's share of total cost also varies considerably across industries, ranging from 4.1 percent in agriculture to 53.6 percent in real estate, leasing and commercial service.

Generally, labor’s share of total cost, with a few exceptions, is less than capital’s share. Intermediate inputs (raw materials, intermediate goods, energy, and services) on the other hand, have the largest share in total cost in almost all sectors and industries.
Labor

Companies in China have long known that the low wage growth model was coming to an end. Average labor costs have more than doubled since the beginning of 2007 (Figure 7). Wages have been pushed up by a long-term decline in the aggregate labor force, combined with a rapid depletion in rural surplus labor that has until recently provided an unlimited source of cheap labor. Even the global financial crisis managed to slow wage inflation only marginally. In 2011, average wage growth rebounded to 14.4 percent.

Over the period 2007-2010, there has been significant and persistent wage inflation across all sectors (Figure 8). Labor costs rose fastest in the banking and insurance (18.7 percent); mining (16.4 percent); wholesale, retail and accommodation (16.3 percent); and agriculture sectors (15.9 percent). The banking and insurance sector was a clear outlier, reporting the highest labor costs and wage increases by a large margin.
There are still measures the government can take to free up the pool of rural labor, such as further reforms to the hukou system, but these are unlikely to reverse the current trends. For one thing, recent rapid wage growth has been accompanied by rising expectations among employees. The increasing cost of living, especially in terms of food and accommodation, has inevitably added to employee expectations. Among migrant workers there is an increasing willingness to mobilize for industrial action if wage demands aren't met.\textsuperscript{14}

The government has committed to raising the income of the lowest paid workers. The 12th five-year plan targets a 13 percent annual increase in the minimum wage. The introduction of mandatory employer social welfare contributions, when they are fully rolled out, will add another 35-40 percent to payroll costs. This includes contributions to pensions (20 percent of payroll), unemployment benefits (2 percent), medical insurance (6 percent), work injury insurance (1 percent), maternity insurance (0.8 percent), and housing entitlements (5-10 percent).\textsuperscript{15}

Rising labor costs are most significant for primary producers and services industries (see Figure 8). Labor takes up the largest share of total costs for the agriculture sector (at 55 percent), followed by other services (33 percent), banking and insurance (31 percent), mining (19 percent), and wholesale, retail and accommodation (17 percent).
Capital

Capital is still relatively cheap in China. The People’s Bank of China (PBOC) administratively sets the ceiling for bank deposit rates and a floor for lending rates. Although market mechanisms have started to play an increasingly important role in financial intermediation, the actual lending rates have always been very close to the benchmark rates. This ensures minimal interest rate spreads for banks, and also keeps the cost of capital low for companies. Between 2000 and the end of 2009, the average loan interest rates was only 5.84 percent, compared with 9.41 percent in the period 1990-99.\(^1\)

In recent months, policymakers have signaled that China is moving toward interest rate liberalization. PBOC Governor Zhou Xiaochuan wrote in March 2012 that conditions were “basically ripe” for liberalizing China’s interest-rate policies.

The government has also moved to legalize the underground banking sector, introducing reforms to Wenzhou on a trial basis. Private investors in that city will be encouraged to buy into local banks and to set up financial institutions such as loan companies and rural community banks. The expectation is that this pilot program will be the first step towards nation-wide financial reform.

Box 2

The road to interest rate liberalization

December 2010
Zhou Xiaochuan says China will make “obvious progress” in interest rate liberalization during the 12th five-year plan period.

March 2012
Zhou Xiaochuan writes that conditions are basically ripe for China to forge ahead with interest rate liberalization. The State Council approves plans to set up a pilot zone in Wenzhou to regulate private financing activities.

May 2012
The Wenzhou branch of the PBOC announced its first “monitoring rate” for private lending in the city.

June 2012
The PBOC expands the bands within which lending and deposit rates can float.

As with most reforms in China, interest rate liberalization is likely to occur incrementally, but it will have far-reaching consequences. Experience shows that liberalization in emerging economies typically raises domestic interest rates by a couple of percentage points.\(^1\) Simulations by the International Monetary Fund have shown that liberalization results in a higher cost of capital, and a lower volume of lending.\(^1\)

Since marginal lending is discouraged, there is likely to be a boost to the efficiency of investment. Sectors that are currently underserved, such as households and small and medium enterprises, may actually find it easier to get credit.

Companies which are currently highly leveraged, on the other hand, will need to adjust to a tighter lending environment. Many SOEs fall into this group. The average debt/equity ratio of SOEs is substantially higher, exceeding 230 percent.\(^2\) SOEs also pay much lower average interest rates for their debt than other borrowers such as private firms and cooperatives. These companies may face difficulties in financing their investments if the financial system is liberalized, leading to a deteriorating financial situation and possibly insolvency.
Commodities

After a steep correction during the global financial crisis, commodities prices have rebounded in recent years. An index of domestic commodity prices shows that the costs of commodity inputs continue to rise in China (Figure 9).\(^1\) In the past five years (2007-2011), the average price of commodities consumed by China increased by 51 percent.\(^2\) Soft commodities rose 60 percent, metals rose 19 percent, and energy prices rose 77 percent.

![Weighted domestic commodity price indices, China](image)


Although there will no doubt be periodic volatility, it’s likely that industrialization, urbanization, and income convergence in China and in other emerging economies will continue to support commodity prices over the long term. In per capita terms, convergence growth in China still has some way to go, and this will underpin demand for global natural resources. For instance, China is not expected to reach peak steel consumption per capita until 2024.\(^3\)

At the same time, the Chinese government is taking steps to remove administrative controls on domestic commodity prices, in line with the goals of increasing energy and carbon efficiency. These reforms will gradually allow prices to move to their real market levels.

Energy, which have risen the most of all commodities, is a case in point. In December 2011, a pilot scheme was launched in Guangdong and Guangxi provinces to link city-gate natural gas prices with prices of imported fuel oil and liquefied petroleum gas. This will inevitably boost gas prices, which in some major Chinese provinces are still 30-50 percent below crude oil-linked prices for liquefied natural gas or pipeline gas from Central Asia. Price reforms are likely to gradually work their way across China, and will come sooner for industrial and commercial users.

As a result, commodity-intensive industries such steel, cement, chemical, power, transport, and manufacturing sectors, will come under more pressure to boost efficiency.
Box 3  The (in)ability to pass on rising costs: the case of the industrial sector

The impact of input price increases on a company depends on how much can be passed on to the customer. Our comparison of input prices and output prices (factory gate prices) in the industrial sector shows that while output prices rose for most industries, they generally lagged behind input prices. In other words, most companies were able to pass only a portion of rising costs to their customers.

In manufacturing, input prices have risen consistently faster than output prices. The gap between the two has increased from an average of 4.5 percent in 2009 to 10.0 percent in 2011 (Figure 10). This reflects both the rising cost of commodities on the one hand, and also the problem of overcapacity on the other, whereby production capacity has grown faster than consumption. As revenue growth now declines, companies are cutting prices, resulting in pressure on profit margins.

The state-owned utilities sector was also under pressure, impacted by soaring energy prices but bound by administrative directives not to pass on the full weight of input cost increases to industrial and residential users. As a result, at the end of 2011 the utilities subsector’s input prices outpaced output prices by 17.9 percent.

An exception was the mining subsector, where output prices actually rose faster than input prices. In 2011, output prices rose 11.2 percent faster than input prices, almost a mirror image of what occurred in manufacturing in the same period.

Figure 10  Input/output price ratio growth

Manufacturing

Utilities

Mining

Source: National Bureau of Statistics, Ernst & Young analysis.
As for China overall, it is hard to escape the conclusion that, as a result of the above analysis, companies in China must view productivity as a strategic imperative. The reason is simple: the only way to offset the impact of slowing revenue growth and rising costs is by lifting productivity.

Raising and securing productivity growth should be characterized by short, iterative performance improvement cycles focused on realizing year-on-year productivity gains. Long term organizational productive capacity will take time to build, but it will also be a key source of long term competitive advantage.

The productivity gap between well managed and poorly managed companies in China is very large. In contrast to developed countries, Chang-Tai Hsieh and Peter Klenow have found that there exists in China a large left tail of very poorly managed firms. The average company in China at the 90th percentile of the productivity distribution generates almost five times as much output with the same measured inputs as the 10th percentile plant.

Improving processes

Companies will need to work on dramatically improving their internal processes to deliver products or services with fewer inputs. This means aggressively managing costs across the organization, but also boldly incurring expense to upgrade operations where the return on investment is sufficiently high. Operational excellence is a bulwark against rising costs - it improves margins and gives the company pricing power in the market.

With several decades of experience under their belt, many Chinese companies are already becoming world leaders in mass production and logistics. For younger, rapidly growing companies, more can be done to exploit economies of scale through consolidation of supply chains and integration of national operations. There are also large productivity gains to be had in non-tradeable services such as education and healthcare, where process-related advances in technology could lead to breakthrough outcomes.

Improving products

It is important to remember that China remains a fundamentally important market. Even with slower growth, China is likely to outpace developed economies by a large margin. China is already the most important market globally for cars and mobile phones, and will likely overtake the United States in the near future as the largest consumer market in the world. Companies should therefore also focus on targeting customer needs more effectively in order to grow revenue and market share in what is still a rapid-growth market.

There is a lot of potential for Chinese producers to upgrade and diversify from the range of products China already produces. Chinese manufacturers are already moving from the assembly of standardized components to the design and production of new, differentiated products that generate higher profit margins.
Sources of productivity growth

As the more benevolent conditions of the past decade wane, the key question is where will productivity growth come from in the coming decade? We consider that more will have to come from improvements at firm level - improvements in management and governance, to be precise. By harnessing the following sources of productivity, management can maximize efficiency gains in their organizations, and drive a new round of profitable growth.

Structural changes

Structural changes in the economy will remain important. Reforms to lower market barriers will contribute to economy-wide improvements in productivity growth by intensifying competition. There are suggestions that the government will progressively open up certain protected sectors including railways, financial services, utilities, energy, telecommunications, education services, and healthcare to increased private investment.

Information technology

Information technology played an important role in driving productivity growth in the US in the mid-1990s after twenty years of sluggish growth. It has the potential to do the same in China, by making better use of data, improving communication, and enhancing the speed and flexibility with which new business models can be designed and implemented.

Research and development

China’s level of productivity is still low by global standards, so there is still a great deal of potential to exploit technological catch-up. Efforts should concentrate on combining different existing technologies and adapting them for China’s needs. Original innovation will at this stage play mostly a supplementary function, although its role and importance will grow.

Human resources

As value-added per worker increases, human resources management will become more important. Companies need to consider how to accelerate the pace of talent development, how to deploy the best talent against the highest-value opportunities, and how to improve the way such workers engage with their peers.

Mergers and acquisitions

Industry in China is significantly fragmented, even more so than Japan and Korea in earlier, more comparable, periods. Industry concentration has actually declined since the 1990s. Industrial consolidation through mergers and acquisitions will probably become a major theme of investment.

Overseas direct investment

Overseas direct investment (ODI) will remain an important channel through which to gain experience and to import advanced technologies. This is particularly the case in the services sector, where developed countries retain comparative advantages.
Endnotes

ROE was calculated using the industrial enterprise survey dataset constructed by the National Bureau of Statistics (NBS). It contains management data from more than 300,000 industrial enterprises above a designated size in China.


General Administration of Customs (2012).


Barry Eichengreen, “Escaping the Middle Income Trap” (2011).

The most well known of these industries have been telecommunications, high speed rail transport, information technology, auto assembly, and an emerging civil aviation sector.

Our analysis was based on the method outlined in Anders Isaksson, “Productivity and aggregate growth: a global picture” (UNIDO, 2007). We’ve included all countries with working populations above 10 million.


We adapt the analytical framework outlined by Song-Yi Kim and Louis Kuijs in “Raw material prices, wages, and profitability in China’s industry - how was profitability maintained when input prices and wages increased so fast?” World Bank China Research Paper No. 8 (World Bank, October 2007). Our analysis used data from the most recent available input output tables from 2007.

Chris Buckley, “China rural migrants young, restless and online: report” Reuters (10 October 2011).


“Other services” as defined by the National Bureau of Statistics includes scientific research, technical service and geological; water conservancy, environment and public utility management; residential service and other service; education; healthcare, social security and social welfare; culture, sport and recreation; public management and social organization; information transmission, computer service and software.

People’s Bank of China (2012).

19 Tarhan Feyzioğlu, Nathan Porter, and Előd Takáts, “Interest Rate Liberalization in China” (August 2009).

20 Liu Xiaoxuan and Zhou Xiaoyan “How the financial resources are allocated to the real economy in China - test for relationships between the financial and industrial sector” (2009).

21 We constructed a fixed weight Laspeyres index based on 18 key commodities. Weightings were based on domestic consumption statistics and the index was based in 2001.

22 This contrasts with commodity prices with global consumption weighting. The Thomson Reuters/Jeffries CRB Index, for example, rose just 2.3 percent in the same period (2007-2011).

23 Huw McKay, Yu Sheng, and Ligang Song, “China’s metal intensity in comparative perspective” *China: The Next Twenty Years of Reform and Development* (Canberra, 2010), 73-98.


## Contacts

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<tr>
<th>Name</th>
<th>Position</th>
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