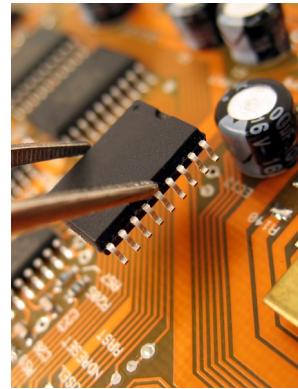


McKinsey Global Institute



March 2010

# How to compete and grow: A sector guide to policy



## The McKinsey Global Institute

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MGI is funded by the partners of McKinsey & Company, and our research is not commissioned by any business, government, or other institution. Further information about MGI and copies of MGI's published reports can be found at [www.mckinsey.com/mgi](http://www.mckinsey.com/mgi). Comments or inquiries are welcome at [mgi@mckinsey.com](mailto:mgi@mckinsey.com).

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# How to compete and grow: A sector guide to policy

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## Preface

*How to compete and grow: A sector guide to policy* builds not only on McKinsey & Company's industry expertise but on nearly two decades of sector-level analysis by the McKinsey Global Institute (MGI) in more than 20 countries and 28 industrial sectors. The report is part of a broader ongoing MGI research effort on the topic of growth and renewal. In the latest research, we have studied competitiveness and growth in six industries (retail, software and IT services, tourism, semiconductors, automotive, and steel) across eight countries in each case, including both emerging and high-income economies. Many governments have signaled their intention to become more proactive in the market in pursuit of sustainable growth and enhanced competitiveness. Our aspiration is to provide a fact base for such efforts and to inform the private sector's dialog with policy makers around the world.

Jaana Remes, MGI senior fellow, led this project, with guidance from James Manyika, Lenny Mendonca, Vitaly Klintsov, and Jörg Schubert. The project team comprised Kuntala Karkun, Stefan Klußmann, Christina Kükenshöner, Mikhail Nikomarov, Tilman Tacke, and Antti Törmänen. The team also benefited from the contributions of Janet Bush, MGI senior editor, who provided editorial support; Rebeca Robboy, MGI external communications manager; Vilas Kotkar, team assistant; and Marisa Carder and Therese Khoury, visual graphics specialists.

We are grateful for the vital input and support of numerous McKinsey colleagues around the world. These include Ruslan Alikhanov, Andreas Baumgartner, Frank Bekaert, Philippe Bideau, Stefan Biesdorf, Urs Binggeli, Francois Bouvard, Harry Bowcott, Dirk Breitschwerdt, Stefan Burghardt, Justin Byars, V. Chandrasekar, Michael Chui, John Dowdy, Karel Eloot, Christoph Eltze, Luis Enriquez, Daniel Feldmann, Christophe François, Steffen Fuchs, Christian Gschwandtner, Toralf Hagenbruch, David Hajman, Stefan Heck, Russell Hensley, Michael Herter, Martin Hjerpe, Scott Jacobs, Noshir Kaka, Osamu Kaneda, Axel Kalthoff, Martin Kolling, Stefan Knupfer, Axel Krieger, Kevin Krogmann, Sigurd Mareels, Tim McGuire, Sarah Monroe, Nicolai Muller, Yuji Nakahara, James Naylor, Bettina Neuhaus, Becca O'Brien, Loralei Osborn, Andreas Pecher, Tom Pepin, Niels Phaf, Luiz Pires, Philipp Radtke, Stefan Rehbach, Sergio Sandoval, Vishal Sarin, Yasushi Sawada, Sven Smit, Robert Stemmler, John Strevel, Yeonkyung Sung, Mourad Taoufiki, Fraser Thompson, Davide Vassena, Ruben Verhoeven, Sanjay Verma, Uma Vohra, Bill Wiseman, Dilip Wagle, Jonathan Woetzel, Jiajun Wu, Simei Wu, and Andreas Zielke.

Distinguished experts outside McKinsey provided invaluable insights and advice. We would particularly like to thank Martin N. Baily, a senior adviser to McKinsey and a senior fellow at the Brookings Institution; Dani Rodrik, professor of International Political Economy at the John F. Kennedy School of Government, Harvard University.

This report contributes to MGI's mission to help global leaders understand the forces transforming the global economy, improve company performance, and work for better national and international policies. As with all MGI research, we would like to emphasize that this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution.

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March 2010



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# Executive summary

As we emerge slowly from the first global recession since World War II, governments and businesses share an overarching aim—to steer their economies toward increasing competitiveness and growth. Many business leaders advocate a greater role for government in this effort. Intel Corporation's former chairman Craig Barrett has urged governments to implement policies “to grow smart people and smart ideas.”<sup>1</sup> Rolls-Royce chief executive Sir John Rose has argued for the credit crunch to be a catalyst for a sharper focus on industrial competitiveness.<sup>2</sup>

Many governments are already being more proactive in trying to boost growth and competitiveness. Given the fragility of the business and economic climate—and strained public coffers—the responsibility to get policy right, and thereby and create a solid foundation for long-term growth, is acute.

Fostering growth and competitiveness is a perennial challenge among policy priorities, but past experience shows that governments have, at best, a mixed record in this regard. There have been solid successes but also damaging failures—ineffective interventions that have proved costly to the public purse, and even regulation that has had negative, unintended consequences for the conduct of business.

An important reason why government intervention in markets has been hit or miss is that action has tended to be based on academic and policy research that has looked through an economy-wide lens to understand competitiveness—in other words, whether one country is “more competitive” than another.

The top-down analysis has all too often failed to capture the fact that the conditions that promote competitiveness differ significantly from sector to sector—and so therefore do the most effective potential regulations and policies. The McKinsey Global Institute (MGI) has analyzed the performance of more than 20 countries and nearly 30 industry sectors (see box 1 “Defining sector competitiveness and growth”). On the basis of our experience, we believe that effective policy making needs a new approach.

Only by analyzing what drives growth and competitiveness in different sectors of the economy—and then tailoring the policy response and executing policy in close collaboration with the private sector—can governments boost their odds of intervening effectively. This paper seeks to provide fact-based insights to help governments make the right decisions and trade-offs, drawing on MGI's bottom-up, sector-based approach.

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1 *Davos: Craig Barrett on the post-crisis world*, January 29, 2009  
<http://blogs.intel.com/csr/2009/01/>.

2 “Made in Britain,” *World in 2009 edition*, *Economist*, November 19, 2008.

### **Box 1. Defining sector competitiveness and growth**

Competitiveness is a fuzzy term used to mean many different things. For each sector, MGI defines competitiveness as a capacity to sustain growth through either increasing productivity or expanding employment.<sup>3</sup> A competitive sector is one in which companies improve their performance by increasing productivity through managerial and technological innovations, and offer better quality or lower-priced goods and services, thereby expanding demand for their products. This approach enables us to shed light on the microeconomic dynamics behind growth in each sector, to identify variations in the relative competitive performance of different sectors, and to analyze the impact of different policy choices on growth and employment.

MGI's definition applies equally to sectors that produce tradable products, like cars, and those that produce nontradable services, such as retail.

**Capturing global market share.** For tradable goods and services, competitiveness makes intuitive sense as the attractiveness of a location for new investments and the capacity of local operations to compete regionally or globally, generating growth in their sector overall. For example, Brazil has become the largest poultry exporter in the world by combining global best-practice processes with low factor costs; the poultry industry created jobs and growth in the host economy as a result.

**Growing domestic market.** For local services, we also interpret competitiveness as the capacity to generate growth. However, in these sectors, growth comes from the creation and expansion of a domestic market. Those service sectors that offer appealing services and products at attractive prices to local consumers and businesses will create jobs and boost productivity. For example, a higher-cost and more limited restaurant and hotel offering in Sweden explains why consumers spend less than half as much of their consumption on these services as in the United Kingdom.

## **PATTERNS IN SECTOR CONTRIBUTIONS TO GROWTH CHALLENGE CONVENTIONAL WISDOM**

To reach a better understanding of the underlying drivers of competitiveness, and the policies that empirically have been successful in promoting it, we studied the competitiveness and growth of six industries (retail, software and IT services, tourism, steel, automotive, and semiconductors) across eight or more countries in each case, including both emerging and high-income economies. Drawing on national account data and McKinsey's global industry expertise, we measured differences in sector growth performance across countries and assessed what factors have been critical for explaining the competitiveness in each industry (e.g., skills and scale in semiconductor products; access to low-cost raw materials and energy, and efficient operations in steel). We then studied how different government policies have influenced the competitiveness levers and growth performance of different countries.

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3 By sector growth, we mean increases in sector value added—the contribution of a sector to overall GDP growth. The economy-wide growth impact across sectors is a function of both individual sector growth contributions and the changes in shares of above- and below-average productivity sectors.

This report shares some of the key findings from the research. We believe that the lessons that emerge from our case studies are applicable to other sectors, both existing and emerging, and countries across different income levels.

By analyzing competitiveness at the sector level, we reach conclusions that run counter to the way many policy makers think about the task in hand. Many governments worry about the “economic mix”—and assume that if they achieve the “right” mix, higher competitiveness and growth will follow; our analysis finds that solving for mix is not sufficient. To avoid wasting their effort and resources, policy makers cannot take a one-size-fits all view, proposing identical policy solutions for globally competed sectors—whose competitiveness is not easy for governments to influence directly—and largely domestic sectors where regulation is often decisive. While many policy makers see innovative technologies as the answer to the challenge of job creation, our analysis indicates that governments are likely to be disappointed in such hopes. It may not capture the popular imagination but the quest for new jobs is much more likely to bear fruit in large local business and household-services sectors. Policy makers also need to take account of the stage of development of their economy. Sector contributions to GDP growth vary at different stages of a country's economic evolution and policy makers need to learn different skills sets in their efforts to enhance growth and competitiveness.<sup>4</sup>

Some of the key insights arising from our research are:

### **The competitiveness of sectors matters more than the mix**

Some governments worry about the “mix” of their economies but our research finds that countries that outperform their peers do not have a more favorable sector mix that propels them to higher growth. Instead, their individual sectors are more competitive. The sectors that fuel growth by performing exceptionally strongly vary by country. What above-average growth countries have in common is that their existing large employment sectors—such as retail and restaurants; food processing; and construction—pull their weight by posting strong growth.

### **To generate jobs, service-sector competitiveness is the key**

Many governments are looking to manufacturing sectors as a new source for growth and jobs in the aftermath of the financial and real-estate sector bust. But our research finds that services will continue to be critical for job creation. Productivity improvements are a key factor in all sectors but most job growth has come from services. In high-income economies, service sectors accounted for all net job growth between 1995 and 2005. Even in middle-income countries, where industry contributes almost half of overall GDP growth, 85 percent of net new jobs came from service sectors. So policy makers should ensure that domestic service sectors also continue to pull their weight.

### **Policy impacts nontradable sector competitiveness directly—in tradable sectors, getting policy right is more complicated**

Policy makers should take into account the fact that their influence on largely nontradable “domestic” sectors is more direct than it is in those sectors that compete globally. In nontradable sectors, sector performance correlates closely with the local

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4 In the early post-agricultural phase, the industrial sectors of middle-income countries tend to peak and then decline. In these economies, goods-producing sectors contribute almost half of economic growth, with services accounting for the rest. As incomes rise, the share of services continues to grow. Almost 90 percent of overall GDP growth in developed countries came from services between 1995 and 2005.

policy environment that sets the “rules of the game” for competitive market dynamics. Whether in telecommunications or retail, MGI case studies show that the employment and productivity outcomes of countries reflect the incentives to companies set by regulation. Regulation that facilitates business entry tends to increase competition and productivity, while flexible hiring laws, lower minimum wages, and part-time employment arrangements correlate with higher employment and more rapid adjustment to change. Policy changes can impact sector performance in two to three years.<sup>5</sup>

In traded sectors, where success requires local companies to be competitive in the regional or global marketplace, policy requires broader understanding of the global industry landscape. Some regulations can unexpectedly halt sector growth—as obscure national security review requirements did for Russian software exports. In addition, financial incentives to failed initiatives can cost governments billions—as many semiconductor ventures have done around the globe. For the best odds for sustained growth, efforts to enhance competitiveness should target those activities with a realistic potential for competitive advantage and be based on solid business logic.

### **Competitiveness in new innovative sectors is not enough to boost economy-wide employment and growth**

Many policy makers are pinning their hopes today on innovative new sectors such as cleantech as the answer to the challenges of competitiveness, growth, and jobs. Yet the innovative emerging sectors themselves are too small to make a difference to economy-wide growth. Take the case of semiconductors. With employment of 0.5 percent or less even among mature developed economies, the sector’s direct contribution to GDP is limited. But ongoing innovations in the sector have contributed to the IT adoption that has improved business processes and boosted productivity in many other sectors—and therefore made a difference for economy-wide growth. Yet these broad user benefits often don’t require local suppliers. In fact, policy efforts to protect local sector growth—such as Brazil’s unique television standards—can halt growth if they increase costs and reduce the adoption and use of new technologies. For instance, low-tech, green jobs in local services—such as improving building insulation and replacing obsolete heating and cooling equipment—have greater potential to generate jobs than the development of renewable technology solutions. For policy makers concerned with abating carbon emissions in the near term, pushing the adoption and diffusion of low-carbon solutions is likely to make a bigger difference than technology production alone.

### **GOVERNMENTS NEED TO TAILOR POLICY TO EACH SECTOR**

Tailoring policy for the myriad of different sectors in an economy is a complex task. For this reason, MGI has produced a new framework that we hope will help bring some clarity to government approaches to growth and competitiveness and streamline the necessary analysis.

We have identified six sector groups that share characteristics and respond to similar approaches to enhancing competitiveness: (1) infrastructure services; (2) local services; (3) business services; (4) research and development (R&D)-intensive manufacturing; (5) manufacturing; and (6) resource-intensive industries (Exhibit E1).

In each of these groups, we document how competitiveness levers vary and how policy has influenced competitiveness in each. We believe that these six categories

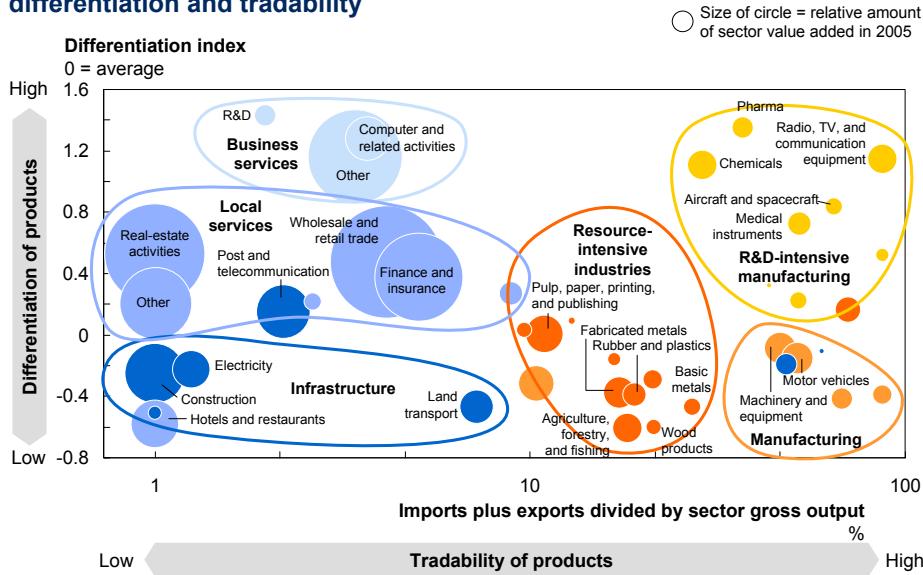
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5 William Lewis, “The Power of Productivity: Wealth, Poverty, and the Threat to Global Stability,” Chicago University Press, new edition October 21, 2005.

provide a useful framework for understanding what determines competitiveness in different kinds of industries and what tangible actions governments and businesses can take to improve competitiveness.

### Exhibit E1

#### MGI categorizes sectors into six groups according to degrees of differentiation and tradability

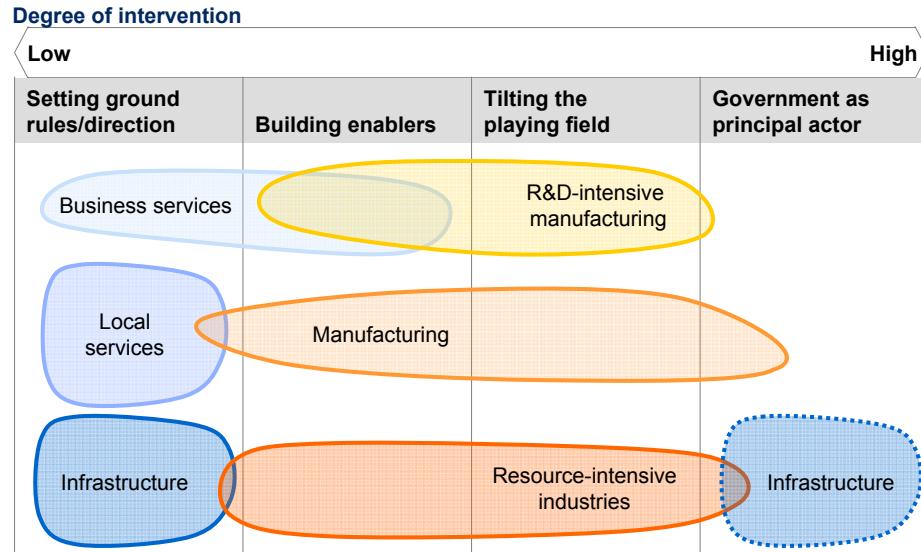


SOURCE: EU KLEMS growth and productivity accounts; OECD input-output tables; McKinsey Global Institute analysis

The spectrum of public policy interventions ranges from a hands-off approach limited to creating the necessary market institutions to being a central operator in a sector. We analyzed the policies used in different sectors in four categories that demonstrate an increasing intensity of intervention:

- 1. Setting the ground rules and direction.** Governments can limit sector policies to setting the regulatory environment including labor and capital-market and general business regulation, and setting broad national priorities and roadmaps.
- 2. Building enablers.** Without interfering with the market mechanism, governments can support the private sector by expanding hard and soft infrastructure; educating and training a skilled workforce; and supporting R&D.
- 3. Tilting the playing field.** Governments can choose to create favorable conditions for local production, typically through trade protection from global competition; through the provision of financial incentives for local operations; or by shaping local demand growth through public purchasing or regulation.
- 4. Playing the role of principal actor.** At the interventionist end of the policy spectrum, governments may play a direct role by establishing state-owned or subsidized companies; funding existing businesses to ensure their survival; and imposing restructuring on certain industries.

We found clear patterns linking sector competitiveness levers and effective policy, which governments need to factor into their design of competitiveness policies (Exhibit E2).

**Exhibit E2****Government policy tools need to be tailored to suit sector competitiveness drivers**

SOURCE: McKinsey Global Institute/Public Sector Office Competitiveness Project

In domestic sectors like telecommunications or retail that have limited trade, local regulation can directly determine the rules of the game and therefore guide both competitiveness and performance—yet in radically different ways in the various local sectors.

1. In **infrastructure services like telecommunications**, large economies of scale require that the regulatory environment finds the right balance between the cost savings available from single large-scale operators (who can amortize network build-out costs at a lower cost per customer and save on other fixed operating costs) with the incentives created by competition to offer new, attractive, and affordable service packages to the consumer. Early on, the United States auctioned wireless spectrum licenses for relatively small geographic areas with the aim of promoting competition. As a result, the 50-plus fragmented operators that emerged had much smaller subscriber bases and higher per-user costs shortly after they won licenses than mobile operators in France or Germany—that had three and four operators, respectively. The goal of competitive infrastructure services is typically not only to boost sector growth but also to ensure the broad penetration of high-quality infrastructure services that can raise productivity and output growth elsewhere.
2. In a **local service sector such as retail**, business turnover tends to be high and growth comes from more productive companies gaining share or replacing less productive ones. Competitive intensity is a key driver, providing an incentive for ongoing innovation and the adoption of better practices and ensuring that productivity gains are passed on to consumers in the form of more attractive products and lower prices. These more appealing offerings in turn boost demand, creating a virtuous cycle of expanding domestic demand and sector growth.

Productivity and employment in retail sectors around the world vary widely—largely due to regulation, MGI research shows. Regulation that allows the expansion of more modern retail formats raises productivity. After opening the sector to foreign investors, Russian retail productivity has more than doubled in the past ten years from 15 percent of the US level to 31 percent on the back of

gaining share of modern retailers. In Sweden, the liberalization of opening hours and zoning regulation unleashed competition, and productivity increased at an average of 4.6 percent for ten years after 1995. In contrast, France introduced more restrictive rules on the size of retail outlets in the 1990s, halting the sector's productivity growth. Flexible hiring laws, lower minimum wages, and part-time employment arrangements tend to boost retail employment and service levels, as we have seen in the United States and the United Kingdom.

In innovative, globally competing sectors such as software and semiconductors, global industry dynamics and competition between companies are the key factors driving overall performance. In such sectors, it is harder for governments to have as direct an influence. What matters more is creating a strong enabling environment for private-sector success. Yet actions to boost competitiveness and the odds of success vary widely depending on the underlying industry economics. For instance, despite sustained public support for the development of local semiconductor clusters in several countries in recent years, the strong winner-takes-all dynamic of this sector has been prohibitive to new entrants.

**3. In business services like software and IT services**, access to talent—at the right cost—is a necessary condition for competitiveness. India, the Republic of Ireland, and Israel, all countries with exceptionally rapid IT services export growth, had a pool of skilled engineers available at a globally competitive cost. Favorable demand conditions—through strong local industry links (e.g., wireless in Finland), or public defense or other contracts (as in the United States)—have also helped nurture growth in these sectors. However, while many regions provide tax incentives for inbound software multinationals, MGI research suggests that such incentives are less critical and often unnecessary. And direct public ventures have failed to sustain competitiveness in the global market.

**4. In R&D-intensive manufacturing such as semiconductors**, the right enabling environment is as important as it is in software, but the capital intensity and very large economies of scale change the competitive dynamic. All sustained semiconductor clusters have benefited from public support. Such support has included early defense contracts in the United States and the provision of public capital in South Korea and Taiwan, hosts respectively to the world's leading companies in the memory and foundry segments. Yet because of the very large economies of scale in new fabs and technology in today's mature industry, there have been no new semiconductor clusters in the past 15 years that have generated sustained growth—despite efforts in Singapore, China, Germany, and many other regions. Large public investment incentives have led to very low returns to capital in the industry overall.

In industrial sectors like automotive and steel, competitiveness depends on a broad set of factors that collectively determine the “value for money” delivered. The competitive advantage of a location varies depending on the subsegment or even step in the value chain. As a result, there is a much broader array of policy tools available. Even so, policy has a mixed track record. The odds of success depend on whether the efforts are targeting activities that can have an inherent competitive advantage in the location, and on the execution of policy.

**5. In manufacturing sectors like automotive**, sector performance relates to the capacity of locally based companies to continue to offer attractive products at a competitive cost. Yet government policy has fundamentally shaped the sector both through trade policies that have created the regionalized industry and through increasingly high industry subsidies that have encouraged investment and capacity

expansion globally. Experience shows that while trade protection has helped create local industries in many countries, it leads to low productivity. But when India, for instance, removed trade and investment barriers, productivity more than tripled. A range of other policies—from export promotion to state-owned car companies—have had mixed success and have been expensive. Host governments' subsidies of more than \$100,000 per job are provided in developed and developing countries alike, contributing to today's global overcapacity.

- 6. In resource-intensive industries like steel,** government intervention has played a role in most countries, but the policy tools employed have evolved over time. In a sector's early development phase, governments have supported growth through trade barriers and financial support including subsidized funding and public investments. While most protected industries lag behind global best-practice productivity as a result, South Korea's Pohang Iron and Steel Company (POSCO) managed to develop from being a supported state-owned steel company into a leading global company today. In all cases, sustained competitiveness after the initial developmental phase has required increasing exposure to global competition. When the sector is mature, government's main role has been helping coordinate the downsizing of the industry. In the late 1970s and 1980s, the European Community (EC) responded to the sector's crisis by trying to protect it—a strategy that failed. When another steel crisis hit in the 1990s, the European Union (EU) rejected protection and was successful in supporting restructuring, helping more than half a million displaced workers to retrain and find work in other industries.



MGI's work over the last two decades shows that, in country after country, getting regulation right has been the key to boosting productivity and competitiveness. Moreover, we think policy makers will boost their odds of success if they take a sector view and draw on experience to learn what kinds of approaches to improving competitiveness have been effective—and which have not—in different sectors and situations. This is the analytical route MGI has taken in this report. By design, this approach generates detailed, actionable recommendations for public policy. Understanding the microeconomic barriers to competitiveness and growth allows MGI to identify the policy changes needed to improve performance, as well as to highlight critical regulatory constraints affecting specific sectors. Neither of these sets of insights is available through more traditional aggregate economic analyses.

# 1. Looking at sectors is the key to understanding competitiveness and growth

Most classical academic and policy research has looked through an economy-wide lens to understand the issue of competitiveness. Yet such aggregate perspectives fail to capture the drivers of competitiveness that vary from sector to sector—as well as the different impact that regulation and policy in the broader sense can have in various settings. It is no surprise that top-down econometric assessments of what drives competitiveness have often proved inconclusive and that government intervention in markets has tended to be hit or miss.<sup>6</sup>

We offer a new approach. Over the course of nearly two decades, MGI has used sector-level research in more than 20 countries and 28 industrial sectors, employing microeconomic intelligence to build a picture of macroeconomic outcomes.<sup>7</sup> We believe that this micro-to-macro approach is vital in answering the question of enhancing competitiveness. To be able to explain differences in sector growth rates across countries, we need to understand the key drivers of competitiveness in each sector; how countries differ in their initial conditions; and the impact of a particular policy environment (see box 2, “The role of government in market economies”).

## Box 2. The role of government in market economies

Policies have a strong impact on the competitiveness of all types of sector—but in radically different ways. For government policy, it is useful to think of sectors in three categories, each of which presents different challenges.

**Competitive markets** account for about 50 to 60 percent of economic activity. In this category, private-sector companies provide goods and services in competition with each other. These sectors include manufacturing (e.g., automotive and food processing) and services (e.g., food retail, retail banking, and construction). Government has a dual role in setting the institutional structure that facilitates those transactions that underpin a market economy, and in crafting regulation so that

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- 6 Economic growth is analyzed from a macroeconomic perspective in the Solow growth model (1956); in the New Growth models in the 1980s and 1990s by Paul Romer, Robert Barro, and Robert Lucas Jr. among others; in the Schumpeterian growth models highlighting the role of innovation and creative destruction by Gene Grossman and Elhanan Helpman among others; as well as in the recent institutional and geographic growth literature introduced by Daron Acemoglu and others. In the past decade, economists have started to look for sector patterns behind aggregate economic growth. Prominent analyses include the OECD's program *The Sources of Economic Growth in OECD Countries*, 2003 ([http://www.oecd.org/dac/ictcd/docs/otherdocs/OtherOECD\\_eco\\_growth.pdf](http://www.oecd.org/dac/ictcd/docs/otherdocs/OtherOECD_eco_growth.pdf)). Also see the European Commission's EU KLEMS sector-level data-collection effort: Mary O'Mahoney and Bart van Ark, eds., *EU Productivity and Competitiveness: An Industry Perspective*, European Commission, 2003 ([http://www.ggdc.net/databases/60\\_industry/2006/papers/eu\\_productivity\\_and\\_competitiveness.pdf](http://www.ggdc.net/databases/60_industry/2006/papers/eu_productivity_and_competitiveness.pdf)). This work has focused largely on understanding how different sectors have contributed to overall economic growth. Our work goes further in seeking to understand through case studies how sectors differ in the ways that various external and policy factors explain their competitiveness and growth.
- 7 See Martin Neil Baily and Robert M. Solow, “International productivity comparisons built from the firm level,” *Journal of Economic Perspectives*, Volume 15, Number 3, summer 2001, pp. 151–72. For those interested in reading MGI reports on productivity and competitiveness in different countries, regions, and sectors, visit <http://www.mckinsey.com/mgi/rp/CSProductivity/>.

there is minimal unintended distortion to market incentives.<sup>8</sup> These roles include establishing clear property rights and rules governing contracts; ensuring legal and fiscal reporting requirements are not unnecessarily costly and are evenly enforced; and implementing pro-competitive regulation and antitrust laws. Beyond these core tasks, governments tend also to take a broader approach that includes correcting for market imperfections (e.g., externalities such as pollution and information asymmetries), ensuring consumer health and safety, and meeting other strategic and social objectives (e.g., maintaining heritage sites through zoning laws).

**Noncompetitive sectors** account for some 10 to 20 percent of economic activity.

The nature of these sectors means that there is no effective competitive dynamic among private-sector companies due to natural monopoly economics related to high-scale economics (e.g., utilities or telecommunications) and/or exclusive access to critical natural resources such as oil, coal, and wireless spectrum. In these sectors, government sets the rules of competition and incentives for private-sector players or, in the case of many countries, for state-owned enterprises.

**Nonmarket activities** account for around 25 to 35 percent of activity. These sectors include both pure public-sector services, such as defense, as well as health care and education. These sectors tend not to lend themselves well to purely market-based transactions because of long time lags between service and resulting benefits and their lack of easily observable metrics for quality. These are sectors where government has a more direct role as a regulator or operator.<sup>9</sup>

MGI's in-depth sector analysis demonstrates that there is no one-size-fits-all explanation for the growth performance of sectors and that the key factors driving different degrees of performance vary by type of sector. To streamline our analysis of a complex picture, we have defined a new framework for analyzing competitiveness of sectors that divides the full range of sectors into six groups that share certain characteristics and respond to particular policy approaches.

## MGI'S NEW FRAMEWORK IS BASED ON SIX SECTOR GROUPS

To arrive at our six group classifications, we use two major factors (Exhibit 1):

1. **How tradable is a sector and therefore how subject to international competition is it?** Sectors with significant imports and exports compete with international suppliers, and their performance relative to their counterparts in other regions matters for growth and employment performance. In contrast, sectors that largely focus on domestic markets—local services such as retail, for instance—tend to reflect local demand and the national regulatory environment directly.

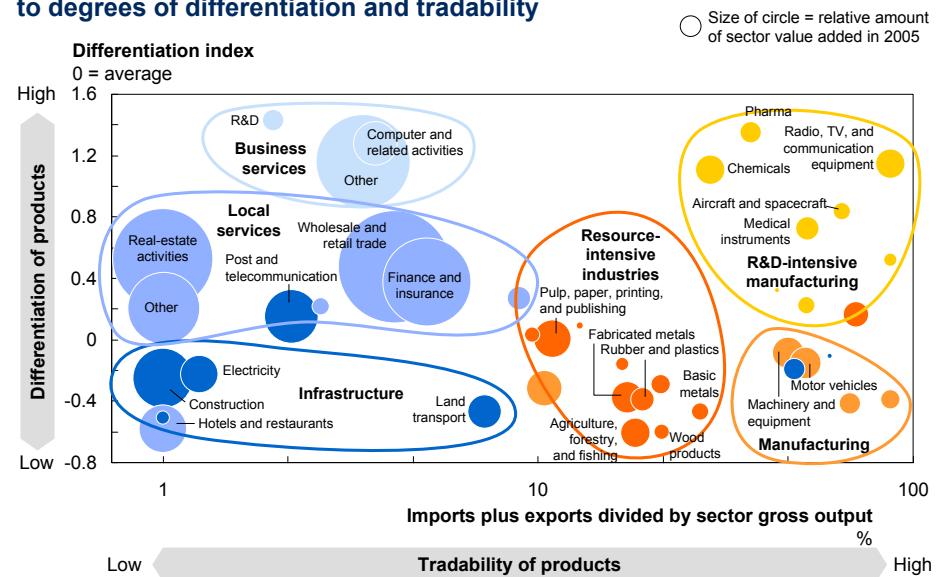
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- 8 Scott C. Beardsley and Diana Farrell, "Regulation that is good for competition," *McKinsey Quarterly*, 2005 Number 2 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)).
  - 9 This research focuses on private-sector performance but not that of the public sector. In the latter, competitiveness as we define it is difficult to measure because of a lack of reliable output measures or clear causality between sector expansion and underlying productivity and cost performance. McKinsey has addressed sectors including public services, health care, and education in other publications, including Tony Danker et al., *How can the American government meet its productivity challenge?* McKinsey & Company, July 2006; and Thomas Dohrmann and Lenny T. Mendonca, "Boosting government productivity," *McKinsey Quarterly*, November 2004 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)). For those interested in health care, please see reports published by MGI at <http://www.mckinsey.com/mgi/rp/healthcare/>. For an analysis of education, see Michael Barber and Mona Mourshed, *How the world's best-performing school systems come out on top*, McKinsey & Company, September 2007 ([http://www.mckinsey.com/clientservice/Social\\_Sector/our\\_practices/Education/Knowledge\\_Highlights/Best\\_performing\\_school.aspx](http://www.mckinsey.com/clientservice/Social_Sector/our_practices/Education/Knowledge_Highlights/Best_performing_school.aspx)).

## 2. What degree of differentiation—or standardization—does a sector display?

For commodity products, cost is the critical competitiveness driver. In sectors with more variance in quality, design, and so on, noncost factors such as expertise, innovation, and brand are key factors. Policy design needs to take account of these differences. For instance, policies that help to create scale or reduce transportation costs may be critical for commodity sectors, while education and R&D policies may matter more in sectors where differentiation is a significant feature.

### Exhibit 1

#### MGI categorizes sectors into six groups according to degrees of differentiation and tradability



SOURCE: EU KLEMS growth and productivity accounts; OECD input-output tables; McKinsey Global Institute analysis

Each of the six groups comprises sectors with similar underlying economics and industry dynamics. Depending on the development stage or income level of a country, these sector groups have different degrees of importance for the overall economy (Exhibit 2).

### 1. Infrastructure services

Infrastructure services comprise sectors such as utilities, telecommunications, and railroads—industries with large fixed costs for the construction of network infrastructures. Because of the large economies of scale in these sectors, unregulated markets do not lead to an effective competitive dynamic among private-sector companies. Instead, industry regulation needs to set the rules of competition and incentives for efficient company operations. Regulation can change behavior—a classic example being electric utilities regulation that can pay companies to expand the volume they deliver or alternatively reward companies that promote higher energy efficiency among their customers.<sup>10</sup> Or take mobile telecoms. The regulatory environment needs to find the right balance between the cost savings available from single large-scale operators (who can amortize network build-out costs at a lower cost per customer and save on other fixed operating costs) with the incentives created by competition to offer new, attractive, and affordable service packages to consumers.<sup>11</sup>

<sup>10</sup> For more detail, see *Curbing global energy demand growth: The energy productivity opportunity*, McKinsey Global Institute, May 2007, as well as reports on energy productivity in the United States, the EU, and China (<http://www.mckinsey.com/mgi/rp/energymarkets/>).

<sup>11</sup> In wireless telephony, McKinsey estimates show that the economic benefits to users exceed three times the sector value added in emerging Asian economies. See Kushe Bahl et al.,

## 2. Local services

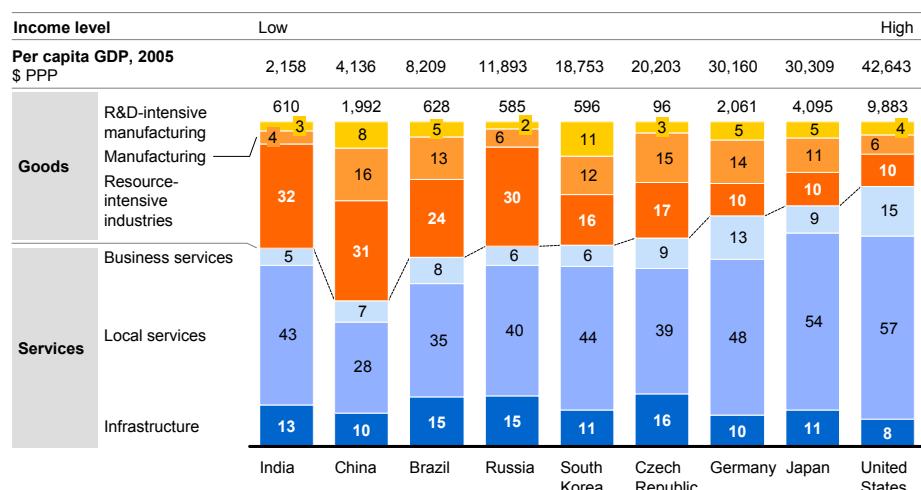
This group provides services to local households and businesses, including wholesale and retail trade; hotels and restaurants; and finance and insurance. This group accounts for the largest employment among most middle- and high-income countries.<sup>12</sup> Business turnover tends to be high and growth comes from more productive companies gaining share or replacing less productive ones. Competitive intensity is a key driver of growth in this group of sectors by providing an incentive for ongoing innovation and the adoption of better practices. In addition, competitive pressure ensures that companies pass productivity gains on to consumers as more attractive products and lower prices.<sup>13</sup> The more appealing offerings in turn boost demand, creating a virtuous cycle of expanding domestic demand and sector growth. Government's key role is to create the right policy environment to boost competition among private companies.

### Exhibit 2

#### Service sectors constitute ~75 percent of the economy in developed countries and more than half in most middle-income countries

Total value added by sector group for select countries, 2005

%, \$ billion



SOURCE: Global Insight; Economist; McKinsey Global Institute analysis

## 3. Business services

Business services including computer and related activities, R&D, and professional services can be either domestic or tradable and are the fastest-growing sector group globally. Competitive business services require a regulatory environment that enables effective competition among private companies, including sufficient intellectual property (IP) rights that are important in software, digital media, and similar sectors. Because business services typically require a skilled workforce, the quality of education and research funding also matters for competitiveness. The capacity of governments to influence sector competitiveness therefore includes not only setting the right regulatory environment (as in local services) but also creating a talent pool through basic and university education. Government can help ensure

*Wireless unbound: The surprising economic value and untapped potential of the mobile phone*, McKinsey & Company and GSM Association, December 2006.

12 The World Bank defines middle-income economies as those with per capita GNI in 2003 between \$766 and \$9,385, measured using the average exchange rate of the past two years.

13 For descriptions of how IT use diffused across retail and retail banking companies in the United States as a result of competitive pressure, see *How IT enables productivity growth*, McKinsey Global Institute, October 2002 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

sufficient skills by supporting local research capabilities through government contracts (e.g., defense contractors or technical consultants) or through R&D subsidies to the private sector (e.g., public innovation funds or research grants).

#### 4. R&D-intensive manufacturing

In these fast-moving, globally traded sectors such as pharmaceuticals or radio, television, and communication equipment, the capacity to deliver differentiated products swiftly to market is critical. Global industry dynamics and competition between companies determine the growth of local industries. Success requires a skilled workforce that can continuously deliver competitive products for new generations of technology, keeping pace with a changing marketplace. Low-cost production capacity is also important if companies are to compete on price, as is the case with more established products.<sup>14</sup> Intense global competition explains the rapid productivity growth in these sectors and ensures that benefits from innovation pass on to consumers in the form of lower prices.<sup>15</sup>

The rapidly changing nature of industries in this group has made it hard for governments to influence competitiveness and performance directly. Government efforts to set the direction of technological development, for instance, have largely failed.<sup>16</sup> It is true that public policy makers can strengthen the attractiveness of their location by acting as an enabler—for example, training a skilled workforce, a necessary condition for any R&D-intensive activity; supporting R&D activities through universities or other research funds; and creating domestic demand for emerging new solutions (e.g., feed-in tariffs for wind or solar power). Some governments have played a useful enabling role but, in general, the odds of successful public interventions in these sectors are low and often expensive. Indeed, collectively government support across countries can lead to global overcapacity and low returns to investors, as we have observed in the semiconductor industry.

#### 5. Manufacturing

Manufacturing sectors such as motor vehicles, cloth and apparel, and food, drink, and tobacco are tradable and compete on both cost and the capacity to differentiate on quality and brand. Competitiveness depends on a broad set of factors that together determine the “value for money” delivered. Because the importance of different factors varies according to the specific activity, countries’ competitiveness needs to be assessed for specific products and/or steps in the value chain. For instance, the roles of technical expertise, logistics, and labor costs vary between different automotive or computer components.

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14 In many segments, product-related services can be a very important part of a differentiated offering. Services represent more than 50 percent of revenues for computer companies IBM and HP as well as elevator supplier Otis and Rolls-Royce’s engine division. These service sectors range from customized software services to elevator and airplane engine maintenance contracts.

15 The example of semiconductor and computing products illustrates how lower prices for better products has helped grow the market by expanding the user base. However, these lower prices also mean that investment in productivity improvements in these sectors may not be captured by companies in the sector itself (e.g., despite the semiconductor sector being a major contributor to US productivity growth over the past 15 years, its share of GDP and employment has actually declined).

16 Examples include France’s Minitel program, a publicly supported precursor to the Internet, and Brazil’s unique TV standards. For more detail on the latter, see *New horizons: Multinational company investment in developing economies*, chapter on consumer electronics, McKinsey Global Institute, October 2003 (<http://www.mckinsey.com/mgi/reports/pdfs/newhorizons/Consumer.pdf>); also see E. Luzio and S. Greenstein, “Measuring the performance of a protected infant industry: The case of Brazilian microcomputers,” *Review of Economics and Statistics*, 77, 622–33, 1995.

Because they see manufacturing as an important source of attractive jobs and export revenues, governments frequently use policy to foster emerging local production or to support ongoing operations. The policy tools used have varied widely, ranging from protecting local production from global competition (typically through trade barriers or local market regulations) to providing incentives for exports (through favorable financing to local companies or incentives to foreign investors) or providing financial backing for ailing local players. In some sectors like automotive, policy has not only shaped global trade and production patterns but also contributed to expanding the world's capacity through investment incentives, changing the global industry economics. Our research shows that there is no one-size-fits-all policy—a wide variety of approaches have helped establish a local manufacturing industry in different regions. A government's capacity to boost growth depends on whether it targets policy at activities with real potential for comparative advantage, as well as how it executes those policies.

## **6. Resource-intensive industries**

Resource-intensive industries such as oil, coal, and basic metals, as well as agriculture and forestry, are typically tradable-commodity businesses that require substantial up-front capital investment. Cost is the major purchase factor, and measuring sector competitiveness in these sectors relies on understanding the cost position relative to other suppliers.<sup>17</sup> Cost-competitive regions usually have access to natural resources, sufficient scale and operational efficiency, and logistical network to access major markets.<sup>18</sup> Yet the large costs and the time it takes to adjust capacity make these sectors susceptible to large swings in price and capacity utilization when demand trends change.

Government role in these sectors is typically much broader than solely establishing an efficient market environment. First, policy needs to decide who has access to natural resources and under what terms, determining industry incentives and the capacity for growth and efficiency.<sup>19</sup> Second, many of these industries go through an inverted-U development cycle. Governments help shape the evolution of the industry structure, which, because of large fixed costs, typically adjusts more slowly than is the case in services. Early in a sector's development, governments have helped fund new capacity either directly through state-owned enterprises or by providing trade protection or favorable financing to private investors. In the mature phase, governments tend to focus on coordinating downsizing and restructuring to reduce overcapacity.

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17 For a description of McKinsey's cost-based supply-curve methodology for understanding the competitiveness of different suppliers, see Carter F. Bales et al., "The microeconomics of industry supply," *McKinsey Quarterly*, June 2000.

18 The relative importance of these factors varies by industry. For extractive industries such as oil or natural gas, access to the resource is critical. For more processed basic metals like steel and aluminum, scale, technology, and operational efficiency are also very important. The role of logistics depends on the value-to-bulk ratio of products and whether industries (such as oil and natural gas) compete globally or are more narrowly bound to a particular region (as in coal or flat steel).

19 See *Unlocking economic growth in Russia: Oil sector*, McKinsey Global Institute, October 1999 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)); and *Productivity-led growth for Korea: Steel sector*, McKinsey Global Institute, March 1998 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

## 2. Patterns in sector contributions to growth challenge conventional wisdom

A granular analysis of competitiveness in each sector, rather than simply looking at the aggregate, macroeconomic level, reveals important insights. Our research has found three key patterns that we believe should inform efforts to promote competitiveness:

- 1. The competitiveness of sectors matters more than the sector mix.** Some governments worry about the “mix” of their economies, but our research finds that countries outperforming their peers do not have a more favorable sector mix propelling higher growth. Rather, their individual sectors are more competitive than their counterparts elsewhere.
- 2. To generate jobs, service-sector competitiveness is the key.** In economies as a whole, increasing productivity is essential to overall GDP growth. But patterns of growth differ between sectors. A sector’s growth—defined as its contribution to aggregate GDP growth—can come from expanding employment or boosting productivity. Productivity improvements are a key factor in all sectors, but services have accounted for all net job growth in developed economies and 85 percent of net new jobs in middle-income countries.
- 3. Competitiveness in new innovative sectors is not enough to boost economy-wide employment and growth.** Although innovations in niche sectors can enable business process improvements in other sectors, growth in “cutting-edge” emerging sectors such as cleantech alone will not boost economy-wide competitiveness. Such sectors are too small.

As a starting point to any effort to boost growth and competitiveness, governments need to take account of the stage of development of their economy, which matters for the role different sectors play in overall GDP growth. Expertise honed during the industrial stage of development is likely to prove inappropriate when an economy has entered its mature phase and the challenge is to boost the competitiveness of service sectors.

The evolution of sector contributions to value added as economies develop is one of the most consistent economic patterns observed. Essentially, the share of agriculture tends to decline in the early stages of economic development. Then, in the middle-income stage, an inverted-U shape is typical as industrial sectors peak and then begin to decline. Services grow continuously as a share of GDP as we move along the income and economic development curve (Exhibit 3).<sup>20</sup>

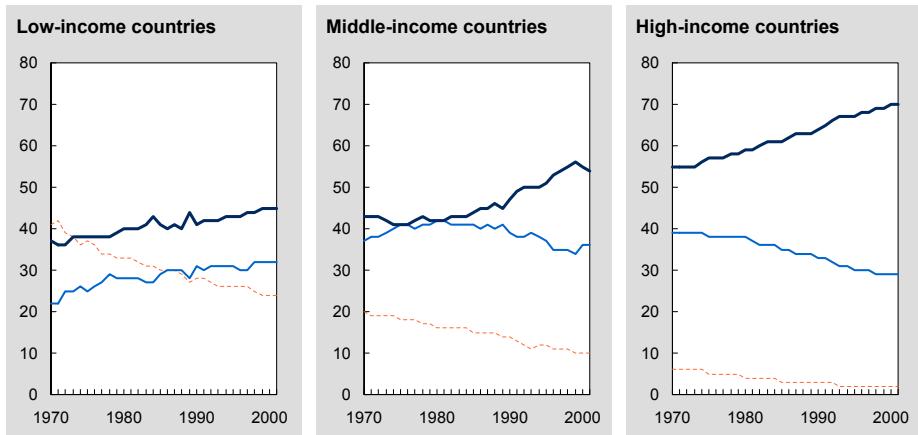
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20 Many early development economists have recognized this pattern, including A. G. B. Fisher in *The Clash of Progress and Security*, London: MacMillan, 1935; C. Clark, *The Conditions of Economic Progress*, London: MacMillan, 1940, revised and reprinted in 1951; Simon Kuznets, *Modern Economic Growth: Rate, Structure and Spread*, New Haven and London: Yale University Press, 1966; P. Kongsamut, S. Rebelo, and D. Xie, “Beyond balanced growth,” *Review of Economic Studies*, 2001, 68, 869–82; and V. R. Fuchs, *The Service Economy*, New York and London: Columbia University Press, 1968.

**Exhibit 3****Advancing through the developmental stages,  
the relative importance of sectors shifts**

% of GDP, 1970–2001

— Services<sup>1</sup>  
 — Industry<sup>2</sup>  
 - - - Agriculture



<sup>1</sup> Industry: manufacturing, mining, and construction; services: personal, professional, and public-sector services and utilities.

<sup>2</sup> The World Bank defines middle-income economies as those with per capita GNI in 2003 between \$766 and \$9,385 measured with average exchange rate over past two years.

SOURCE: World Development Indicators, World Bank; McKinsey Global Institute analysis

Because of these patterns, the stage of development of an economy matters to the role different sectors play in overall GDP growth. In low- and middle-income economies, the performance of expanding industrial sectors is critical. We are not aware of any emerging economy that would have sustained rapid growth without a substantial contribution from its industrial sector.<sup>21</sup> While there is growing interest in finding more carbon-light growth paths for emerging economies to “leapfrog” over their industrial phase, the past doesn’t provide us with any models to follow. Among middle-income economies, industry has contributed a little less than half of all growth (46 percent) while the contribution of services has been just over half (54 percent). On average, this broadly reflects the share of these two sectors in the economy (Exhibit 4).

In high-income economies, services represent about three-quarters of value added and have contributed 87 percent of GDP growth since 1985, a trend we expect to continue (Exhibit 5). At this stage of development, the biggest challenge is how to downsize mature, increasingly labor-light industrial capacity, and to replace lost jobs in high-skilled and service-sector activities. In the latter case, well-functioning domestic markets become an increasingly important factor determining the overall performance of an economy.<sup>22</sup> As these economies move through this cycle of creative destruction, policy makers need to learn new skill sets. Expertise learned in direct industrial support

<sup>21</sup> Also see Dani Rodrik, “Industrial development: Some stylized facts and policy directions,” in *Industrial Development for the 21st Century: Sustainable Development Perspectives*, Department of Economic and Social Affairs, United Nations, 2007 ([http://www.un.org/esa/sustdev/publications/industrial\\_development/full\\_report.pdf](http://www.un.org/esa/sustdev/publications/industrial_development/full_report.pdf)); and John Weiss, *Export Growth and Industrial Policy: Lessons from the East Asian Miracle Experience*, ADB Institute Discussion Paper No. 26, February 2005 (<http://www.adbi.org/files/2005.02.dp26.eastasia.govt.policy.pdf>).

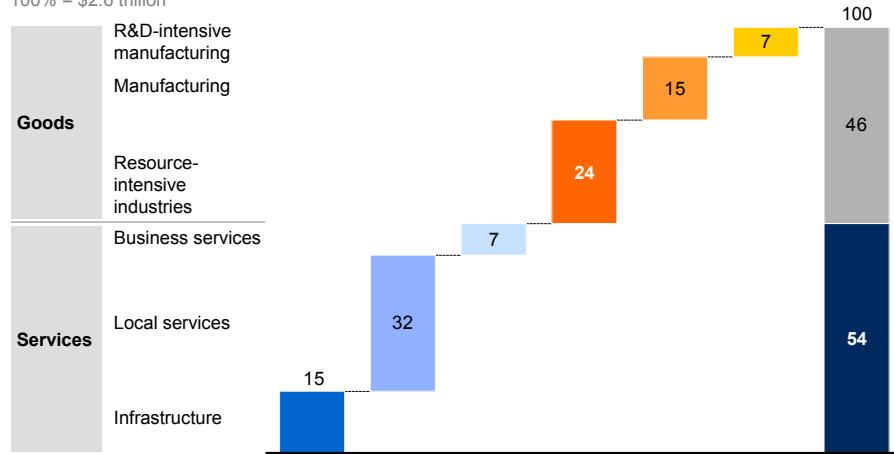
<sup>22</sup> South Korea and the Republic of Ireland are both examples of countries that have been phenomenally successful in their goods-producing sectors, but at a cost to the competitiveness of local services. This will be the next frontier for both. For more details on the Republic of Ireland, see Diana Farrell, Jaana Remes, and Conor Kehoe, “Service sector productivity: The tiger’s next challenge,” chapter 2 of *Perspectives on Irish Productivity*, Forfas, March 2007 ([http://www.forfas.ie/media/productivity\\_chapter2.pdf](http://www.forfas.ie/media/productivity_chapter2.pdf)). Also see *Productivity-led growth for Korea*, McKinsey Global Institute, March 1998 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

is inappropriate for service sectors where governments can be most effective when playing a more indirect role in enabling private-sector-driven growth.

#### Exhibit 4

##### In middle-income countries, services have contributed just over half of overall growth, and goods-producing sectors the rest

Sector contribution to growth of value added and employment in middle-income countries<sup>1</sup>, 1985–2005  
100% = \$2.6 trillion



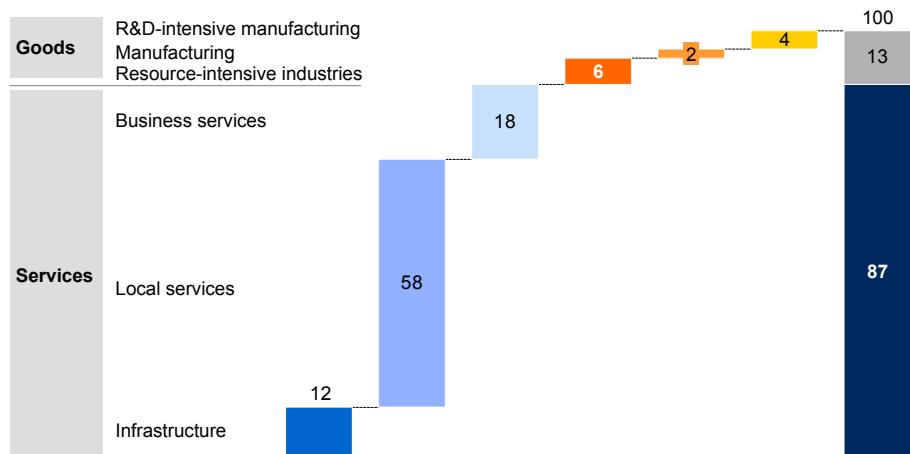
<sup>1</sup> World Bank defines middle-income countries as countries with 2008 per capita GNI from \$976 to \$11,905. Value-added and employment data available in Argentina, Bolivia, Brazil, Bulgaria, China, Colombia, Costa Rica, Egypt, Hungary, Jordan, Malaysia, Peru, Philippines, Poland, Romania, Slovakia, Sri Lanka, Thailand, Turkey, and Uruguay.

SOURCE: Global Insight; International Labor Organization; National Statistics; McKinsey Global Institute analysis

#### Exhibit 5

##### Services have contributed 87 percent of GDP growth in high-income countries in the last decades

Sector contribution to growth of value added and employment in high-income countries<sup>1</sup>, 1985–2005  
100% = \$10.4 trillion



<sup>1</sup> World Bank defines high-income countries as those with 2008 per capita GNI of \$11,906 or more. Value-added and employment data available in EU-15, Australia, Canada, Hong Kong, Japan, South Korea, New Zealand, Norway, Singapore, Switzerland, and the United States.

SOURCE: Global Insight; International Labor Organization; National Statistics; McKinsey Global Institute analysis

In the next three sections, we discuss the three major patterns that emerge from our analysis.

## 2.1 The competitiveness of sectors matters more than the sector mix

Some observers argue that countries can outperform their peers because they have a mix of sectors that has a more favorable growth momentum. Our analysis clearly indicates that this is not the case. In fact, the mix of sectors does not explain differences in the growth performance of countries with similar income levels at all.<sup>23</sup> The mix of sectors is surprisingly similar across countries at broadly equivalent stages of economic development. Most countries—and large regions—have a large share of comparable activities including retail and other local services, local manufacturing like food processing, as well as construction, transportation, and other infrastructure services. The small deviations in these sector shares matter less than their performance relative to their peers.<sup>24</sup>

Over the past decade, overall GDP growth in developed countries has ranged from 0.4 percent annually in Japan to 3.3 percent in the United States (see the left column of Exhibit 6). Taking into account that every country has its own mix of sectors—within a broadly similar pattern—we calculated how much each country would have increased its value added if each sector had grown at the average rate in these countries. This growth—predicted by a country’s specific sector mix or “growth momentum”—actually shows a very narrow distribution of between 1.8 percent for South Korea and 2.3 percent for the United States, France, and Germany (see the middle column of the exhibit). By contrast, the difference between the real growth rate and this growth momentum is much larger, ranging from 0.9 percent in the United States to minus 1.7 percent for Japan (see the column to the right).

This illustrates that it is not the mix of sectors that decides the growth in developed economies but rather the actual performance within the sectors compared with their counterparts in peer economies.<sup>25</sup>

This exercise produced a similar pattern in developing countries (Exhibit 7). There was a slightly wider variation in terms of the growth predicted by a country’s specific sector mix—the growth momentum—from 5.2 percent for India to 6.7 percent in Russia. This is largely as a result of differences in shares of agriculture and manufacturing in the early stages of economic development. Nevertheless, the exhibit again demonstrates that it is the variation in the actual performance of the countries highlighted within their given sector mix—from 3.4 percent in the case of China to minus 4.1 percent for South Africa—that explains overall differences

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23 In the very early stages of economic development, the shift of labor from agriculture to more productive industries and services is a major contributor to growth. We focus on economies where this sector transition has largely occurred. Our findings are consistent with Bart van Ark, “Sectoral growth accounting and structural change in post-war Europe”, in B. Van Ark and N. F. R. Crafts, eds., *Quantitative Aspects of Post-War European Economic Growth*, pp. 84–164, Cambridge, MA: CEPR/Cambridge University Press; and Florence Jaumotte and Nikola Spatafora, “Asia rising: Patterns of economic development and growth,” chapter 3, *World Economic Outlook*, International Monetary Fund, September 2006. Also see Diana Farrell, Antonio Puron, and Jaana Remes, “Beyond cheap labor: Lessons for developing economies,” *McKinsey Quarterly*, 2005 Number 1 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)).

24 Furthermore, the current size of a sector may not be a good predictor of a sector’s capacity to grow in the future. Germany and South Korea have a larger share of manufacturing in their economies than the United States or Singapore—yet the contribution of the manufacturing sector to overall growth will depend on the capacity of these countries to outperform their peers.

25 Our sector categories included more than 100 sectors found in McKinsey’s sector-growth database. The results hold if we limit the sectors to two-digit International Standard Industrial Classification (ISIC) categories.

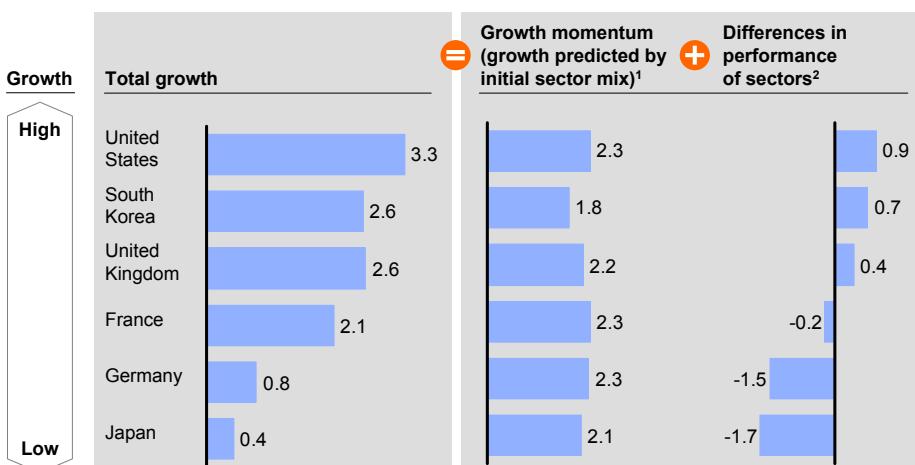
in growth. China displayed the lowest growth momentum but the highest actual growth. South Africa had the highest growth momentum but the lowest overall growth. This demonstrates the fact that, even if they started with a less favorable sector mix, the fastest-growing countries outperformed their peers in terms of their sector competitiveness.<sup>26</sup>

### Exhibit 6

#### Sector performance has mattered more than the mix of sectors for overall GDP growth in developed countries

Contribution to total value added, 1995–2005

Compound annual growth rate, %



<sup>1</sup> Country growth rate calculated as if all sectors would have grown with sector-specific growth rate average across all developed countries.

<sup>2</sup> Actual country growth minus growth momentum of initial sector mix.

SOURCE: Global Insight; McKinsey Global Institute analysis

### Exhibit 7

#### Sector performance matters more than sector mix in developing countries as well.

Contribution to total value added, 1995–2005

Compound annual growth rate, %



<sup>1</sup> Country growth rate calculated as if all sectors would have grown with the sector-specific growth rate average across all developing countries.

<sup>2</sup> Actual country growth minus growth momentum of initial sector mix.

SOURCE: Global Insight; McKinsey Global Institute analysis

26 There are many reasons that explain the differences in sector performance across countries, including the general macroeconomic and policy environment, sector-specific regulation, and various starting points. Understanding the role of these different factors is the key focus of this research project.

## 2.2 To generate jobs, service-sector competitiveness is the key

Not all growth is created equal. In other words, the drivers of growth differ from sector to sector. As we have noted, sector growth can come either from expanding sector employment or by increasing productivity. Policy makers seeking to expand employment opportunities need to differentiate between those sectors where growth is largely a productivity story with a flat or declining employment trend and sectors where new job generation largely fuels growth—focusing their efforts on the latter.

As we have noted, growth patterns vary by level of income. In developed economies, almost 90 percent of value-added growth comes from services and only 10 percent from goods-producing industries. And in goods-producing sectors, growth has come from productivity growth as overall employment has declined. Productivity gains in these sectors have contributed 0.6 percent a year to economy-wide productivity growth in developed economies, while declining employment shaved 0.3 percent annually off total employment in these economies between 1995 and 2005. At best, a handful of successful countries—including Finland—have been able to replace lost manufacturing jobs with new ones, thereby keeping overall manufacturing employment stable.

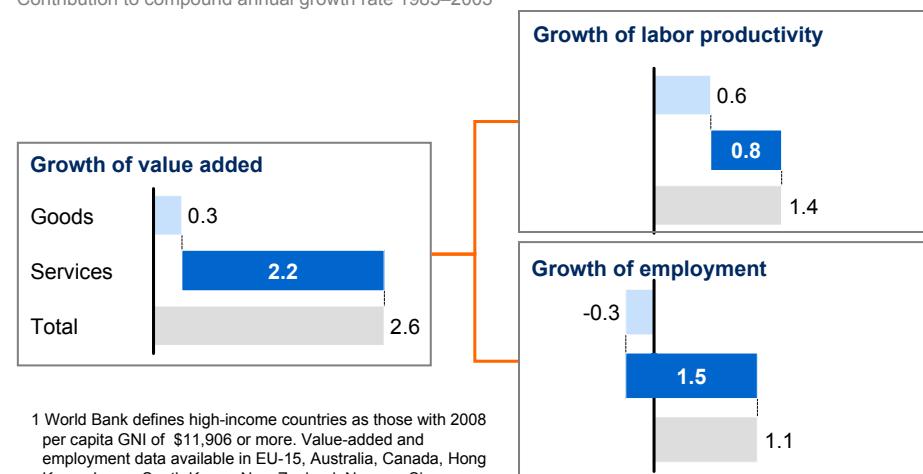
The large contribution of services to overall GDP growth in developed economies is due to both net employment and productivity growth. Service sectors have been the source of all net job creation in developed economies. Differences in domestic service-sector job creation explain most of the overall variation in job generation among developed economies. In addition, productivity growth across all kinds of services, including local services where process innovations can be important, has been a major contributor to overall sector growth (Exhibit 8).

### Exhibit 8

#### In high-income countries, services generated more than 100 percent of net job growth, and productivity grew across the board

Sector contribution to growth of value added, labor productivity, and employment for high-income countries<sup>1</sup>

Contribution to compound annual growth rate 1985–2005



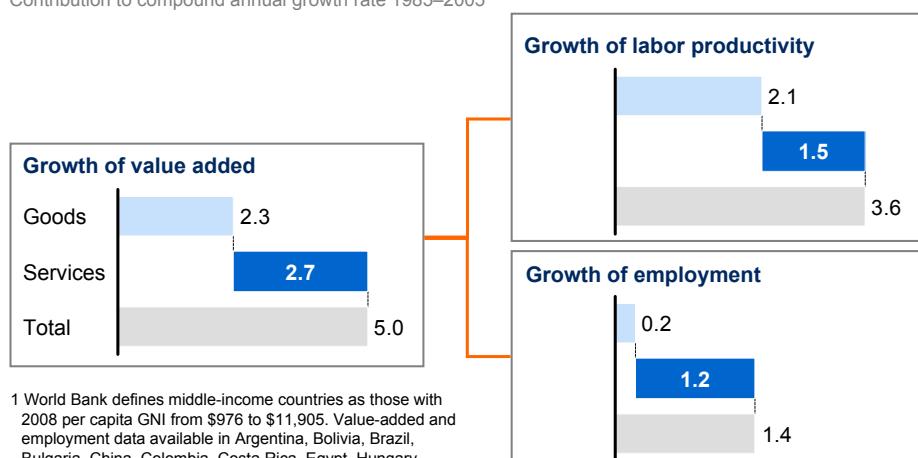
SOURCE: Global Insight; International Labor Organization; National Statistics; McKinsey Global Institute analysis

In middle-income countries, the story is more mixed as both goods-producing sectors and services have expanded employment and boosted productivity. Productivity improvements deliver more than 70 percent of value-added growth. Goods contribute almost 60 percent of overall productivity growth, and services contribute the rest. However, service sectors are responsible for 85 percent of all net growth in employment in these countries (Exhibit 9).

### Exhibit 9

#### In middle-income countries, productivity and job growth across a broad range of sectors explains overall GDP growth

Sector contribution to growth of value added, labor productivity, and employment for middle-income countries<sup>1</sup>  
Contribution to compound annual growth rate 1985–2005



SOURCE: Global Insight; International Labor Organization; National Statistics; McKinsey Global Institute analysis

## 2.3 Competitiveness in new innovative sectors is not enough to boost economy-wide employment and growth

Engaged in the art of the possible, many governments are tempted to focus on emerging, innovative sectors as the key to their economies' future competitiveness. Green or cleantech is all the rage with governments around the world as they seek ways to promote renewable energy technologies including solar and wind power and biomass. This aspiration is consistent with the past when governments saw the development of high-tech clusters including semiconductors as the route to economy-wide competitiveness.

It is true that cutting-edge new growth sectors—often in the vanguard of technological change—can make a critical difference to a smaller region or a city (e.g., the town of Oulu in Finland, home to a mobile-communications cluster). However, governments looking to these sectors as new sources of economic activity and jobs will largely find themselves disappointed. Boosting the competitiveness of such sectors alone is not sufficient to sustain economy-wide growth in large, diversified economies, simply as a matter of arithmetic (Exhibit 10).

Even if emerging innovative sectors offer high levels of value added per worker and grow quickly, they are simply not big enough to make a significant difference to a large economy's overall growth rate, even taking into account potential linkages through

their suppliers. For instance, the phenomenally successful US semiconductor industry currently generates only around 0.4 percent of US value added, down from 0.6 percent in the boom year of 2000. India's software sector is one of the most dynamic industries in one of the fastest-growing economies in the world—yet it only accounts for 0.7 percent of GDP (including both the broad IT-services sector and packaged software) and 0.1 percent of overall employment. Compare this with Indian manufacturing industries that collectively contribute 16 percent of GDP and employ 11 percent of the country's workforce.

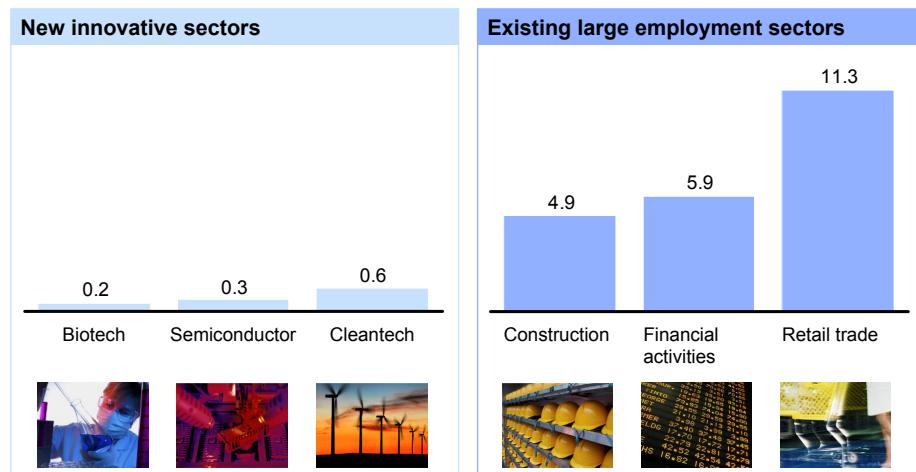
### Exhibit 10

#### Even in the United States, innovative new sectors make a very small economic contribution compared with large, established sectors

Share of US employment, August 2009

Percent of nonfarm employment

100% = 130 million



SOURCE: *The Clean Energy Economy*, PEW, 2009; Bureau of Labor Statistics; Haver analytics

While emerging sectors are small, their innovations can have much larger spillover effects in the broader economy if they enable business-process improvements in other sectors. For example, the semiconductor and software industries have helped to increase labor productivity in securities trading substantially by facilitating the move to online trading systems. Increasingly sophisticated retail supply-chain management software has contributed not only to lower logistical costs but also to more accurate product stocking and selection. Yet these user benefits are not guaranteed; most productivity benefits require organizational and business-process changes that require much more than enabling technology solutions.<sup>27</sup> Nor do these user benefits typically require local suppliers, as imported software solutions or computers can generate similar outcomes. So, even taking into account the spillover benefits generated by innovative sectors, the fact remains that these sectors alone cannot fuel economy-wide growth.

Governments therefore need to pursue policy efforts across the broad swathe of existing industrial and service sectors. This stands to reason. The large employment base of many of these activities means that even small differences in productivity growth can make a big difference for overall GDP growth—much bigger than even double-digit growth in a small niche segment. Take US retail as an illustration. To produce the same overall GDP growth as a 1 percent increase in the productivity of the substantial retail sector, the United States would have to increase productivity in its successful, but smaller, semiconductor sector by almost 15 percent.

27 See *How IT enables productivity growth*, McKinsey Global Institute, October 2002 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

### 3. Governments need to tailor policy to each sector

To boost the odds of success, governments need to tailor policies and the range of available policy tools to suit each sector and then implement policy in close collaboration with the private sector. The spectrum of available public-policy intervention ranges from a hands-off approach limited to creating the necessary market institutions to being a central operator in a sector.

We analyzed the policies used in different sectors in four categories that demonstrate an increasing intensity of intervention:

- 1. Setting the ground rules and direction.** Governments can limit sector policies to setting the regulation covering labor and capital markets as well as the general business environment, and setting broad national priorities and road maps.
- 2. Building enablers.** Without interfering with market mechanisms, governments can support private-sector activities by expanding hard and soft infrastructure, helping to ensure adequate skills through education and training, and supporting R&D.
- 3. Tilting the playing field.** Governments can choose to create favorable conditions for local production, typically through trade protection from global competition, the provision of financial incentives for local operations, or by shaping local demand growth through public purchasing or regulation.
- 4. Playing the role of principal actor.** At the interventionist end of the policy spectrum, governments may play a direct role by establishing state-owned or subsidized companies, funding existing businesses to ensure their survival, and imposing restructuring on certain industries.

The nature of the sector matters for the kinds of policies that are effective in promoting competitiveness. Exhibit 11 demonstrates what experience teaches us are likely to be the most impactful policy approaches for each of the six sector groupings in our framework.<sup>28</sup>

In nontradable sectors, sector performance correlates closely with the local policy environment that sets the “rules of the game” for competitive market dynamics. MGI case studies of the telecommunications and retail sectors show that the employment and productivity outcomes of countries reflect the incentives to companies set by the regulatory environment—and that policy changes can impact sector performance in two to three years.

In traded sectors, where success requires local companies to be competitive in the global marketplace, it is harder for government policy to impact performance as directly and there is less room for error. Some regulations can unexpectedly halt

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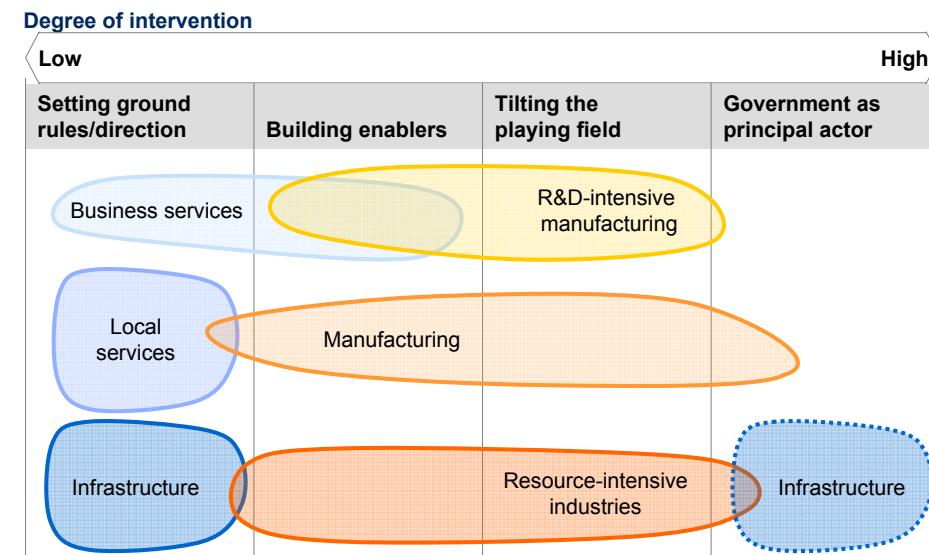
28 We synthesize our findings from more detailed case-study findings into patterns for the six broad sector groupings we use as a framework for action in the chart. Governments should also be more granular in their approach, tailoring policies for each sector, subsector, and step in the value chain.

sector growth—as obscure national security review requirements did for Russian software exports. In addition, financial incentives to failed initiatives can costs governments billions, as many semiconductor ventures have done around the globe. The best odds for sustained growth come with efforts to enhance competitiveness that target those activities with a realistic potential for competitive advantage.

Beyond sector-specific policies, government can plan a positive coordinating role across private-sector activities in a sector such as tourism (see box 3, “The importance of government as coordinator in tourism”).

### Exhibit 11

#### Government policy tools need to be tailored to suit sector competitiveness drivers



SOURCE: McKinsey Global Institute/Public Sector Office Sector Competitiveness Project

### Box 3. The importance of government as coordinator in tourism

Many governments have been proactive in their efforts to boost the growth of tourism in their regions.<sup>29</sup> Becoming an attractive location for tourists requires a wide range of services, from the construction of large-scale airport and road infrastructure to the provision of fragmented hotel and restaurant services. Experience shows that government efforts to orchestrate consistency between visitor expectations and this range of services have been important for success.

Competitive tourism regions need to satisfy some basic necessary conditions that depend directly on the government. These conditions include adequate transportation infrastructure, as well as safety, security, and sanitation. Often a thriving tourism sector needs government to create the right zoning and partnership models to deliver other services, including hotel zones and “flagship”

29 Tourism is an attractive sector for many governments because it is both labor intensive (unlike the other sectors we studied, overall sector growth is driven by employment rather than productivity growth) and has large local linkages and spillover effects. In the case of linkages, we refer to backward multiplier effects when workers in the tourism sector spend their wages on local stores, restaurants, and so on. By spillover effects, we mean economic benefits beyond those direct linkages, including the lower cost of transportation for other sectors when airports and roads are improved and the benefits to local consumers from the “beautification” of the environment.

tourist attractions. Government also has a role to play in ensuring a consistent brand and the effective communication of tourism opportunities.

The experience of growing tourism industries in different countries demonstrates the importance of these government roles. For instance, Mexico's development of the upmarket Riviera Maya beach resort area relied on broad, cross-sector, coordinated public-sector efforts based on a good understanding of target tourism segments. The government used zoning to ensure the development of exclusive hotels, upscale restaurants, and boutiques that enabled average hotel rates double those of Cancun, a more tightly built beach resort with a deteriorating image 65 kilometers to the north. In Morocco, the highest level of government (including the king) committed to developing the country as a tourism destination. Government acted as coordinator, designing the strategy and setting up an agency to manage the project, fund marketing, monitor progress, and collaborate closely with the private sector. Together with tax exemptions in favor of the industry, this high degree of coordination from the center has almost doubled international arrivals in six years. In both cases, government acted as a "strategic architect" of private-sector investments rather than making direct public interventions.

Insufficient coordination in other countries has led to less than optimal results. In the United Kingdom, the historic lack of a hotel grading system that is common in other countries, as well as inconsistent and overly complicated planning, has inhibited the competitive intensity of its hotels sector compared with France, for instance.<sup>30</sup>

We now offer summaries of some of the lessons we have learned from the experience of policy making in each of the six sector cases we have studied.

## 1. INFRASTRUCTURE SERVICES: WIRELESS TELECOMMUNICATIONS

Designing a regulatory environment that maximizes the penetration of telecommunication services at the lowest cost requires a good understanding of the industry's underlying economics. Focusing on achieving scale by having a single supplier can lead to weak incentives to reduce prices below monopoly levels. Yet focusing too much on creating competition can lead to fragmentation and a higher cost base. The case of the US digital wireless sector illustrates the latter. The United States auctioned spectrum licenses for relatively small geographic areas, and more than 50 fragmented operators resulted. In the early period after they won licenses, these operators had much smaller subscriber bases and higher per-user costs for fixed marketing and human resources than did French and German mobile operators—three and four operators respectively.<sup>31</sup>

The most effective regulatory approach also varies by level of income. In many low-income countries, a key consideration is to ensure access to capital for the large network infrastructure investments that are necessary. For this reason, overly fragmented

30 See Nicholas C. Lovegrove et al., "Why is labor productivity in the United Kingdom so low?" *McKinsey Quarterly*, 1998 Number 4 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)); and *UK productivity report case study: Hotels*, McKinsey Global Institute, October 1998 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

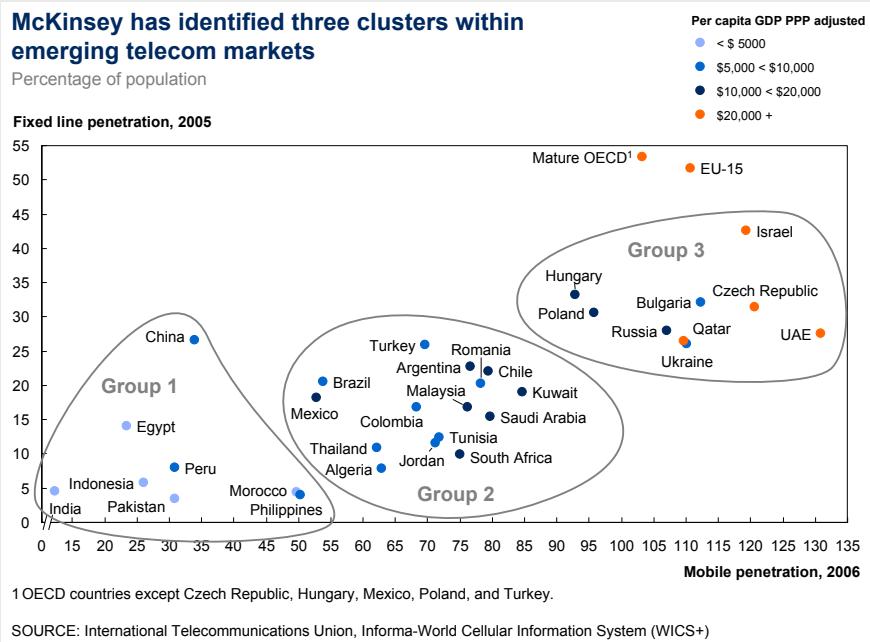
31 For more detail, see Thomas Kneip, Eric Labaye, and Jürgen Schrader, "Telecom: Advantage France, Germany," *McKinsey Quarterly*, February 2003 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)).

markets or too stringent coverage requirements may delay a sector's growth because license holders cannot raise the capital for expansion. As incomes increase and wireless penetration broadens, the regulatory focus should shift to increasing competition and prices (see box 4, "Evolving regulatory priorities in wireless telecommunications").

#### **Box 4. Evolving regulatory priorities in wireless telecommunications**

McKinsey has discerned three types of emerging markets with distinct starting points and characteristics and therefore differing optimal regulatory approaches (Exhibit 12):

**Exhibit 12**



**Group 1. Underpenetrated and low-income emerging markets**—in this group of countries (per capita GDP at PPP below \$5,000; low fixed and mobile service penetration), policy should focus on providing incentives for potential stakeholders (for example, incumbents, cable operators, mobile operators, and new players entering the market) to make necessary investments. The aim should be to stimulate the provision of universal voice access largely through increasing mobile penetration secured by universal coverage obligations. Once voice access starts reaching levels close to 50 percent (as in the Philippines and Morocco), policy makers can also focus on fixed networks in order to promote broadband penetration. A secondary objective in this group should be to promote lower prices by increasing competition and imposing tight regulation on operators.

**Group 2. Transition economies with high mobile penetration**—policy for this group (per capita GDP at PPP of \$5,000 to \$20,000; moderately high mobile penetration) should mainly focus on increasing broadband penetration by encouraging investment in fixed networks including fiber broadband, and through financial and regulatory incentives. Policy makers should also begin regulating to increase the level of competition in a mobile sector that will be seeing maturing levels of penetration. However, given the continued need for investment to increase the capacity and quality of the network, regulators in these countries should not at this stage engage in a more aggressive value shift from operators to consumers through, for example, providing open access to virtual network operators.

**Group 3. Mobile leaders with high income per capita**—in this group (per capita GDP at PPP of \$20,000 or higher; moderately high fixed penetration), policy should aim to increase broadband penetration. Simply correcting regulation to offer a more even playing field can be effective. At the same time, policy needs to establish fair competition between mobile and fixed operators to promote lower prices and the fast adaptation of new services. Direct or indirect financial support for the rollout of such networks may also be necessary.<sup>32</sup>

Similar to the case of telecommunications, regulation fundamentally impacts the evolution of other regulated industries. In electric utility sectors around the world, the traditional regulatory focus has been to reward utilities for the volume of electricity they deliver. Instead, regulators could adjust these incentives to encourage utilities to boost more efficient energy use among their customers.<sup>33</sup> In the United States, California has kept its per capita energy consumption roughly constant for more than 30 years even while per capita consumption has grown by 50 percent in the rest of the United States. California has achieved this stability in consumption largely due to the fact that the state changed utility incentives and established more stringent energy efficiency policies including appliance and lighting standards.

## 2. LOCAL SERVICES: RETAIL

MGI research shows that regulation alone can largely explain wide variations in the productivity and employment of retail sectors around the world (Exhibit 13). Because sectors like retail are so large, policy choices there can have a significant impact on an economy's overall GDP growth. In the United States, the combination of flexible, low-minimum-wage labor regulation and intense competition enabled by liberal zoning regulation has led to high productivity and employment.<sup>34</sup>

A regulatory environment that allows the expansion of more productive modern supermarkets and convenience stores raises productivity because larger chains can profit from scale benefits in purchasing, merchandizing, and store operations. Yet many countries have chosen to protect small-scale stores through barriers to foreign direct investment, zoning laws, or restrictions on the size of stores. In Japan, laws limiting the entry of large supermarkets and providing incentives for small retailers to stay in business explain the high share of family retailers and low productivity.<sup>35</sup> In 1990s France, the introduction of more restrictive regulation over the size of retail outlets halted the sector's productivity growth.<sup>36</sup>

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32 For the full analysis, see Scott Beardsley et al., "Rethinking regulation in emerging telecommunications markets," chapter 1.7, *The Global Information Technology Report 2007-2008*, World Economic Forum, 2008 World Economic Forum.

33 *Curbing global energy demand growth: The energy productivity opportunity*, McKinsey Global Institute, May 2007 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

34 Retail and wholesale sectors alone contributed just over half of the US productivity acceleration in the late 1990s, an acceleration that ended decades of European catch-up and increased Europe's income gap with the United States. See *How IT enables productivity growth*, McKinsey Global Institute, 2002 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)); and *US productivity growth 1995–2000*, McKinsey Global Institute, 2001 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

35 *Why the Japanese economy is not growing: Micro barriers to productivity growth*, McKinsey Global Institute, July 2000 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

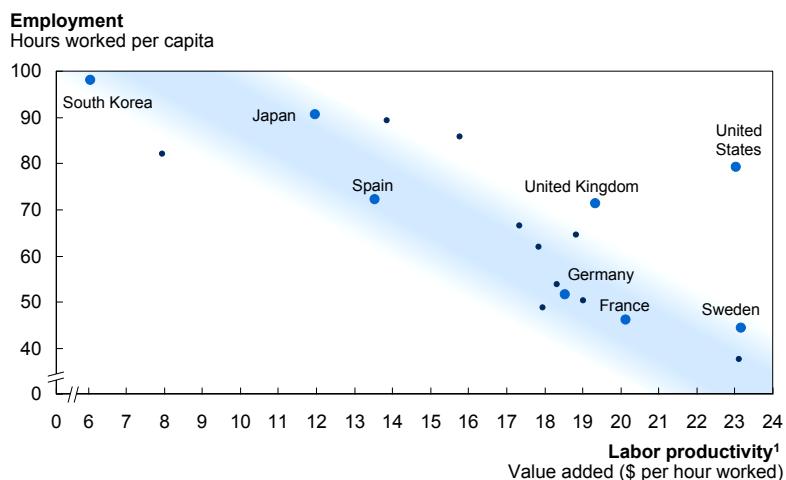
36 *Reaching higher productivity growth in France and Germany*, McKinsey Global Institute, October 2002 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

Conversely, policy changes that facilitate the entry of new retail competitors lead to higher productivity growth. In Sweden, the liberalization of opening hours and zoning regulation unleashed a greater degree of competition in retail, boosting its productivity by an average of 4.6 percent for ten years starting in 1995, more than 2 percentage points quicker than in the average developed country.<sup>37</sup> In Russia, retailing has more than doubled in the past ten years from 15 percent of the US level to 31 percent largely due to an increasing share of modern retail formats that are three times as productive as traditional ones.<sup>38</sup> In Mexico, opening up the food retail sector internationally led to increasing competition and lower prices (see box 5, “Retail in Mexico”).

### Exhibit 13

#### Comparing countries shows a trade-off between employment and labor productivity in retail sectors

Retail employment and labor productivity in developed countries, 2005



<sup>1</sup> Labor productivity: value added converted with single-deflated expenditure, side-value added-specific PPP to \$ divided by hours worked. Levels converted for 1997; 2005 comparison extrapolated using growth in real value added and hours worked.

SOURCE: EU KLEMS; McKinsey Global Institute analysis

Differences in the level of retail employment correlate closely with labor-market regulations—another example of how regulatory ground rules explain sector outcomes in services. Flexible hiring laws, lower minimum wages, and part-time employment arrangements tend to boost retail employment. Differences in labor regulation account for the large difference in the level of employment in the retail sectors of France and the United Kingdom. Swedish retail has not had a good record on job creation despite rising productivity because the sector continues to suffer from labor inflexibility. For instance, agreements between employers and trade unions mean that the cost of labor increases by 70 percent on weekday late evenings and 100 percent on weekends, resulting in shorter, less customer-friendly business hours, and limiting job creation. Moreover, high social employee taxes make retail employees particularly expensive to hire, helping explain the very low employment and service level in the sector.

37 *Sweden's economic performance*, McKinsey Global Institute, September 1995 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)); and *Sweden's economic performance: Recent development, current priorities*, McKinsey Global Institute, May 2006 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

38 *Lean Russia: Sustaining economic growth through improved productivity*, McKinsey Global Institute and McKinsey & Company, April 2009 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

### **Box 5. Retail in Mexico**

The most important operational factor explaining differences in productivity in retail is format mix—the share of modern supermarkets or convenience stores relative to mom-and-pop stores and other traditional formats. In 1996, 92 percent of food retail employees in Mexico worked in the traditional segment including *mercados* and bakeries. Although Mexico had some modern formats at that stage and these were on average three times more productive than traditional stores, their small share in overall employment significantly diluted their impact on the overall performance of the sector.

But when Mexico opened up its food retail sector to foreign companies, including Wal-Mart, which acquired a local supermarket operator Cifra in the mid-1990s, the sector began a period of dramatic change. Wal-Mart introduced many operational practices common in US retail including the concentration of delivery in large-scale distribution centers. This led to suppliers having to compete for national, or at least regional, contracts, and they came under strong pressure to improve performance. The response of Femsa and Grupo Modelo, volume suppliers of soft drinks and beer, was to expand to retailing itself by investing in rapidly growing convenience store chains. Mexico saw an explosion in the number of convenience stores from a little more than 1,000 to more than 6,000 in five years, and this development was a major contributor to continuing employment growth in the food retail sector. The Mexican consumer has been an outright beneficiary with increased competitive intensity, meaning that food prices have grown significantly less rapidly than other prices.<sup>39</sup>

## **3. BUSINESS SERVICES: SOFTWARE AND IT SERVICES**

Knowledge-intensive business services such as software and IT services require broadly market-friendly regulation to support strong growth as well as reliable electricity and telecommunications services and sufficient IP rights. In India, the country's inadequate infrastructure severely delayed the growth of its IT services sector.<sup>40</sup> In China and Russia, widespread software piracy has been a major barrier to growth in the packaged-software sector.<sup>41</sup> By introducing and enforcing criminal antipiracy laws and educating small and medium-sized companies about the legal risks of software piracy, the Czech government cut piracy rates by half to below today's French levels.<sup>42</sup>

Beyond these aspects, government can play a useful role in enabling the broadening of the pool of technically skilled labor. India, the Republic of Ireland, and Israel—all

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39 *New horizons: Multinational company investment in developing economies*, chapter on retail, McKinsey Global Institute, October 2003 ([www.mckinsey.com/mgi/reports/pdfs/newhorizons/Food.pdf](http://www.mckinsey.com/mgi/reports/pdfs/newhorizons/Food.pdf)).

40 *New horizons: Multinational company investment in developing economies*, chapter on technology/business offshoring, McKinsey Global Institute, October 2003 ([http://www.mckinsey.com/mgi/reports/pdfs/newhorizons/IT\\_BPO.pdf](http://www.mckinsey.com/mgi/reports/pdfs/newhorizons/IT_BPO.pdf)).

41 The Chinese government has responded by committing to relying on legal software in government agencies and requiring computers produced or imported to China to be preloaded with legal software. For more on the case of the Russian software sector, see *Unlocking economic growth in Russia*, McKinsey Global Institute, October 1999 (<http://www.mckinsey.com/mgi/reports/pdfs/russia/Softie.pdf>).

42 For BSA and IDC *Annual Global Software Piracy Studies*, see [http://global.bsa.org/idcglobalstudy2007/studies/2007\\_global\\_piracy\\_study.pdf](http://global.bsa.org/idcglobalstudy2007/studies/2007_global_piracy_study.pdf).

countries with exceptionally rapid software or IT services export growth—had a pool of skilled engineers available at a globally competitive cost.<sup>43</sup> Public policy can enhance the talent pool. The United States, Sweden, and South Korea have also helped fund software research activities through public innovation funds or research grants.

Because local demand is the main driver of growth in IT services growth, government software purchasing can be a source of that demand growth, at least in the sector's initial stages (Exhibit 14). In the United States and Israel, public defense spending has been a major source for expanding software capabilities in these countries. Both Norway and Singapore have relied on local suppliers for e-government solutions, while Brazil has used a local provider to deliver an electronic voting system. In China, national and local governments use Chinese vendors for both operating systems and applications. And in the Republic of Ireland, international companies were an important source of IT services demand (see box 6, "Software in the Republic of Ireland").

#### **Exhibit 14**

#### **Linkages with other sectors have been the key driver for software demand growth**



SOURCE: Arora and Gambardella *Globalization of the Software Industry*, 2004; McKinsey Global Institute/Public Sector Office Sector Competitiveness Project

Many regions provide tax incentives for inbound software multinationals, but MGI research suggests that such incentives are less critical and often unnecessary. Financial incentives rank low in software companies' decisions about location—far below high-quality infrastructure and available skills.<sup>44</sup> Many business executives we interviewed in emerging economies would prefer public money to be spent on infrastructure or general improvements to the business environment—as long as their competitors are not receiving subsidies either.

43 See Ashish Arora and Alfonso Gambardella, *The globalization of the software industry: Perspectives and opportunities for developed and developing countries*, NBER working paper 10538, May 2004; and *The emerging global labor market*, McKinsey Global Institute, April 2007 ([www.mckinsey.com/mgi/publications/emerginggloballabormarket/index.asp](http://www.mckinsey.com/mgi/publications/emerginggloballabormarket/index.asp)).

44 See Diana Farrell, Jaana K. Remes, and Heiner Schulz, "The truth about foreign direct investment in emerging markets," *McKinsey Quarterly*, 2004 Number 1 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)).

### Box 6. Software in the Republic of Ireland

Between 1995 and 2008, the Republic of Ireland's revenues from software more than tripled from \$1.0 billion to \$3.8 billion. Policy has had a significant impact in encouraging this dynamic growth. In the 1980s, Ireland's Industrial Development Authority (IDA) explicitly decided to set up a program to attract labor-intensive service businesses to Ireland.<sup>45</sup> The IDA shifted its emphasis from tax and financial incentives to an educated workforce and the aspiration of EU membership. As a result, Ireland saw a host of multinational corporations (MNC) arrive, including IBM, Lotus, Microsoft, Oracle, Claris, Corel, Symantec, and EDS. Many successful Irish software companies started as programming houses for the MNC subsidiaries in the IT sector or as software application developers for other non-IT firms. Irish software companies saw the MNCs both as a source of revenue and as an access route to foreign markets.

The presence in the sector of these leading companies that boast the latest product management and marketing techniques has contributed to developing Ireland's local skill base. The government played a role not only in facilitating collaboration between industry and academe but also directly investing in the education system. Total R&D in Ireland more than doubled between 2000 and 2007.

Ireland continues to develop strong strategic links with technology and platform providers as well as with multinational companies and marketing and research partners, and has developed managerial, marketing, customer relationship, and technical skills. In November 2005, the government set up Lero, a dedicated software-research center, to enhance R&D and facilitate talent development.

## 4. R&D-INTENSIVE MANUFACTURING: SEMICONDUCTORS

Many governments have encouraged growth in local R&D-intensive manufacturing sectors—the semiconductor industry being an early example. Public-policy efforts have included creating a favorable, enabling environment through the provision of educational programs and R&D support; tilting the playing field through government contracts or investment incentives; and in some cases, investing directly in local semiconductor players. Public support has played a major role in the growth of all semiconductor clusters—but there are more examples of failure than success in these efforts. As the industry has evolved from the emerging technology phase to the mature sector we see today, the policy tools used by governments have changed. So too have the odds of success—in today's mature phase, new players in the semiconductor industry face an extremely challenging market environment.

In the early days of the emerging US semiconductor industry, government defense and aerospace contracts were a major source of revenues. Fairchild Semiconductor, the predecessor of Intel, received 80 percent of its revenues in the 1950s from direct government or government supplier contracts.<sup>46</sup> Sustained public demand, together

45 See Laura Alfaro, Vinati Dev, and Stephen McIntyre, *Foreign Direct Investment and Ireland's Tiger Economy*, Boston: Harvard Business School Publishing, 2005 ([www.hbsp.harvard.edu](http://www.hbsp.harvard.edu)).

46 John Carter, president of Fairchild, as quoted in a newspaper interview cited in Daniel Holbrook, "Government support of the semiconductor industry: Diverse approaches and information flows," *Business and Economic History*, Volume 24, Number 2, Winter 1995.

with university research and training in electronics, made major contributions to growth. In Japan, the government saw semiconductors as a strategic industry and supported the sector from the 1960s onward by encouraging local procurement for electronics companies, co-investing in large R&D efforts, and providing low-cost financing for investment.<sup>47</sup> By the 1980s, Japanese companies had become the industry's second most important national group of players.

In the two decades that followed, governments in South Korea and Taiwan were similarly successful in creating sustainable local industries—they lead the global memory and foundry segments today, respectively. In both cases, competitive local companies grew with the help of long-term committed support from governments when the sector was still in the relatively early stages of development. South Korea considered the semiconductor industry a priority sector, and the government made available large amounts of favorable financing to help local companies grow. South Korea started out from the basis of less skill-intensive assembly operations, building increasing capabilities over time by acquiring and developing technologies. The plan was also to focus on the dynamic random access memory (DRAM) segment of the market because this suited South Korea's deep manufacturing expertise more than more skill-intensive chip-design activities would have done. Global competition in commodity-like memory chips was fierce. Not only were returns deeply cyclical, but the increasing capital costs of new fabs and rising cost of technology development squeezed profits. Companies like Intel, Texas Instruments, and NEC exited the cyclical, low-margin segment while Samsung eventually emerged as the leader after years of intense competition with Micron.<sup>48</sup>

The success of the Taiwan Semiconductor Manufacturing Company (TSMC) shows that proactive policies with a strong business logic and an execution team that draws on private-sector talent are more likely to succeed (see box 7, “Leveraging private-sector talent: TSMC”).

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47 A number of economists have evaluated the growth of the Japanese semiconductor sector particularly after the late 1970s and 1980s when Japanese companies' share of the global random access memory (RAM) market surpassed that of companies based in the United States. Contrary to the public view at the time, the evidence suggests that direct public subsidies in Japan were not the main factor. In fact, the US government spent more on subsidies to the sector. For further discussion, see Katsuro Sakoh, “Japanese economic success: Industrial policy or free market?” *Cato Journal*, Volume 4, Number 2, Fall 1984; Douglas A. Irwin, *Trade politics and the semi-conductor industry*, Center for the Economy and the State, University of Chicago, working paper 92, January 1994; Richard E. Baldwin and Paul R. Krugman, *Market access and international competition: A simulation study of 16k random access memories*, NBER working paper 1936, 1986; and Richard E. Baldwin, “The impact of the 1986 US-Japan Semiconductor Agreement,” *Japan and the World Economy*, Volume 6, 1994.

48 *Productivity-led growth for Korea*, McKinsey Global Institute, March 1998 ([www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)).

### Box 7. Leveraging private-sector talent: TSMC

TSMC is among the leading (and most profitable) semiconductor companies today, ranking fifth in global sales behind Intel, Samsung, TI, and Toshiba. The company was founded in 1987 with technology that was spun off from the Industrial Technology Research Institute (ITRI), a publicly funded Taiwanese research institute that had acquired and developed the underlying technology. The Taiwanese government, through the Taiwanese Development Fund, was a major investor in TSMC early on, together with private investors such as Philips.<sup>49</sup>

A major contributor to TSMC's success was its new business model—foundry—where TSMC would custom-produce chips that were designed and marketed by other companies. The foundry model sparked a new wave of innovation in the global semiconductor industry, as it reduced barriers to entry for new companies that no longer needed to invest in expensive manufacturing plants. Integrated players (IDMs) could also stop investing in new technology and assets and instead were able to rely on foundries for their more leading-edge products.<sup>50</sup> TSMC executed this model with the leadership of Morris Chang, a semiconductor manager with 25 years of experience at Texas Instruments. A critical success factor for the new business model was Chang's capacity to make confidentiality a core value at TSMC. This meant that the company could gain customers' trust with their most secretive and IP-intensive designs at a time when IP law in the industry was relatively untested. The company also benefited in its early days from collaboration with Philips, an early client.

TSMC was one among several semiconductor ventures emerging from ITRI; United Microelectronics Corporation (UMC), another major semiconductor player today, was launched eight years earlier. Collectively, these companies formed the nucleus around which the Hsinchu Science Park grew. Hsinchu was the first location in Asia to build a cluster of semiconductor businesses close to one another and to leading research institutions.

As the semiconductor industry has matured, it has become increasingly challenging for new players to gain share in an industry that is capital intensive and fast moving with strong winner-takes-all dynamics.<sup>51</sup> Many other countries—including Singapore, Malaysia, Germany, Israel, India, and China (Shanghai)—have attempted to replicate the success of South Korea and Taiwan but have failed to grow sustainable semiconductor clusters. Skilled labor and access to capital are the necessary conditions for competitiveness in this industry, and the costs of entry are very large. Today's semiconductor fabs cost \$3 billion or more to establish, and new players have typically received substantial public subsidies. However, money alone cannot “buy” success because existing semiconductor clusters have real technology and scale advantages that are not easily replicated. Even multibillion-dollar subsidies have not succeeded in ensuring sector growth (Exhibit 15).

49 TSMC became a publicly traded company in 1994, and Philips sold its shares in 2008.

50 Integrated design and manufacture (IDM) companies both design and manufacture their semiconductor products.

51 Japan lost its leadership position in the industry in the 1990s as local players failed to sustain their competitiveness in the continuously evolving industry. Both increasing competition from foundries and a waning share of consumer electronics applications, a traditional Japanese stronghold, contributed to their decline.

### Exhibit 15

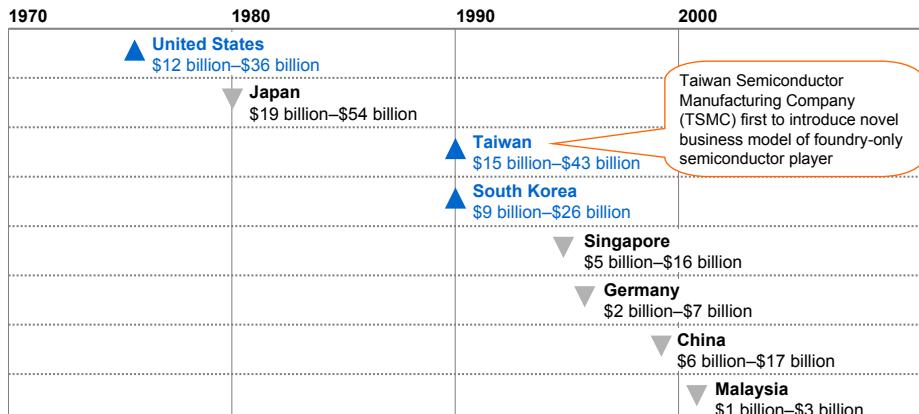
#### The majority of recent attempts to establish local semiconductor industries or clusters have failed

##### Successes and failures of semiconductor clusters

Estimated date of industry reaching significant size<sup>1</sup> and estimated cumulative country-wide government incentives<sup>2</sup>

##### ROUGH ESTIMATES

Sustainable competitive edge  
 ▲ Present  
 ▽ Currently not present



<sup>1</sup> Estimated date of industry reaching significant size = first year in which cumulative country-wide database-listed front-end investments exceeded \$1 billion.

<sup>2</sup> Estimated cumulative country-wide government incentives to 2008 assumes database underestimates investment in semiconductor facilities by factor 1.2–2.0; government incentives account for 20–35 percent of total investment.

SOURCE: SEMI *World Fab Watch*; expert estimates; McKinsey Global Institute analysis

Indeed, collectively, large public subsidies have contributed to expanding production capacity and lowering returns to investment globally, contributing to intense competition in the sector, rapid innovation, and declining user costs.<sup>52</sup> While semiconductor-using companies and households globally have received considerable advantages, it is much less clear whether the economic benefits to local production have justified large public subsidies even in the successful cases.<sup>53</sup>

The semiconductor sector case suggests that the way governments can support the growth of innovative companies depends on the maturity of the sector they are playing in.<sup>54</sup> In new, emerging sectors where there are no existing players, governments should refrain from defining the technology or solution of choice as they are unlikely to be able to pick the right one—both the United States and Japan allowed a number of companies to compete for government financing or contracts. Instead, they should focus on playing an enabling and possibly coordinating role, creating demand for early, innovative activities; ensuring that the regulatory environment provides the right

52 Another contributor to the rapid technological innovation in the semiconductor industry has been the establishment of pooled technology research institutions and other collaborative efforts nationally and globally. To give just two examples, International Technology Roadmap for Semiconductors (ITRS) is a consortium of semiconductor companies from all leading regions collaborating to reduce costs of technology upgrades; and Sematech is a consortium that focuses on speeding commercialization of technology innovation to manufacturing solutions through collaboration among semiconductor companies and equipment and materials suppliers, research institutions, and others.

53 The Japanese policy of favoring local semiconductor suppliers in the 1970s and 1980s helped sustain the local industry but was not welfare-improving for the nation because of higher prices to local suppliers. For more detail on the welfare estimates, see Richard E. Baldwin and Paul R. Krugman, *Market access and international competition: A simulation study of 16k random access memories*, NBER working paper 1936, 1986.

54 We cannot transfer all the implications to other R&D-intensive manufacturing sectors: semiconductor production is exceptionally capital intensive, and some of the winner-takes-all dynamics resulting from the supply-cost economics would not apply for some other high-tech segments. This again suggests that understanding the industry dynamics is critical for the successful design of industrial policy.

incentives for private-sector companies for innovation and growth; ensuring sufficient flow of research findings; and addressing any standards or coordination issues.

Cleantech is an emerging sector where many governments are looking for ways to develop a competitive local industry. However, global markets in this area are already subject to heavy competition—and not all countries will emerge as winners. What is certain is that government policies are shaping the global economics of these sectors and influence who will be the winning companies and regions—the announced stimulus support globally to these sectors alone exceeds more than \$500 billion.

When an industry already exists, there are cases in which government support has helped local companies catch up with leading incumbents. Yet the odds are against the effort, and success requires charting a course based on solid business logic, as TSMC did.

## 5. MANUFACTURING: AUTOMOTIVE

Manufacturing sectors are among the most frequent targets for proactive government industrial policy. In the case of the automotive sector, governments in countries with sufficiently large local markets have on the whole succeeded in creating local industries. They have done so either by allowing multinational car companies to establish local production in the country (as in Mexico, Brazil, China, and South Africa) or by incubating local players by using trade barriers to shield them from international competition or through additional foreign direct investment (FDI) barriers (as in India and Malaysia). Yet protection has almost always led to low productivity and higher costs to consumers.<sup>55</sup> The experience of the automotive industry in India suggests that exposing protected firms to global competition can significantly improve performance (see box 8, “Automotive in India: Protection and liberalization”).

As well as protection, governments have sought to boost the growth of local auto sectors through export promotion, establishing state-owned automotive companies, and the use of more subtle regulatory and demand-management policies to protect established sectors. In South Korea, Slovakia, and Morocco, for example, proactive governments have created a growth strategy aimed at fostering a favorable production environment including incentives to support the creation of an automotive export cluster. Favorable exchange rates are a factor in the growth performance of export-oriented automotive sectors in high- and middle-income countries. Exchange rate regimes impact not only relative costs but also location decisions—manufacturers tend to want to hedge currency risk of largely fixed car prices by locating production within the currency regime of its major sales markets.

Providing incentives for local export promotion can be very expensive. For instance, Brazilian state governments competing to host new automotive plants offered subsidies of more than \$100,000 for each assembly job created—not unusual sums in comparison with recent subsidy levels elsewhere.<sup>56</sup> This led both to overcapacity and very precarious financial conditions for Brazilian local governments. The automotive strategy in Malaysia

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55 These include, but are not limited to, the cases of the United Kingdom, France, the United States, Mexico, Brazil, India, Malaysia, and South Africa. MGI has published 12 detailed case studies on automotive productivity; see [www.mckinsey.com/mgi](http://www.mckinsey.com/mgi) for more detail.

56 For estimates of automotive sector subsidies, see Charles Oman, *Policy Competition for Foreign Direct Investment: A Study of Competition among Governments to Attract FDI*, Development Centre Studies, OECD, 2000.

and China has had publicly owned companies competing with private companies—and public firms in these two countries have grown to significant size. Some developed economies have relied on more nuanced policies to protect local industries, ranging from US tariff protection for the local light-truck segment in the 1990s to “cash-for-clunkers” policies in Germany and in the United States more recently.

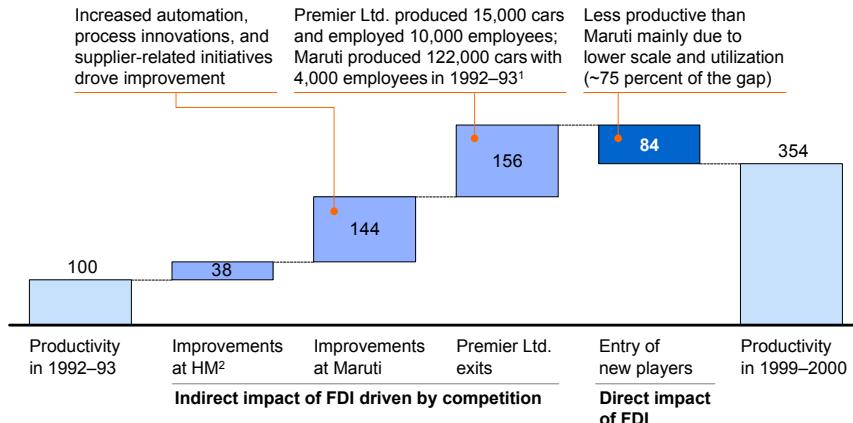
### Box 8. Automotive in India: Protection and liberalization

India combined trade barriers to protect its infant automotive sector with a ban on FDI to encourage the growth of domestic auto companies. This combination helped to create local industries that generated employment but could not close the cost and performance gap with global companies. India’s decision to remove both trade and investment barriers marked the beginning of the sector’s performance surge. Productivity more than tripled in the 1990s and, as FDI barriers came down, a significant shake-out in the sector saw some local players emerge as innovative global competitors (Exhibit 16). With its ultra-low-cost Nano, Tata has the potential to impact not only demand in developing markets but also the entire global automotive value chain.

#### Exhibit 16

##### **Liberalization in India’s automotive sector increased FDI and competition, leading to significant productivity gains**

Labor productivity (car equivalents per employee)  
Indexed to 100 in 1992–93



1 Actual cars and employment (not adjusted).

2 Hindustan Motors Limited.

SOURCE: McKinsey Global Institute analysis

While government trade regulation and incentives have fundamentally shaped the evolution of the global automotive industry, competition between governments to establish or maintain local production has led to large public subsidies being the industry standard for new plants. This in turn has led to global overcapacity. Moreover, experience shows that offering incentives alone is not sufficient for success—a prisoner’s dilemma for policy makers. Being able to attract new players or grow local operations in a sector requires a strong business case too.

How much of this experience in automotive is transferable to other manufacturing? The automotive sector is at one extreme in terms of the fundamental role that

regulation plays in the industry—but it is by no means unique. US government tariff exceptions for products with a large US content virtually created Mexican *maquiladoras*, manufacturing operations commonly located close to the US border. However, this US regulation has led to a peculiar structure of border-based enclave production with limited linkages to the rest of the Mexican economy.<sup>57</sup> As in the case of automotive, protecting local producers usually comes at a cost to consumers. The high prices and limited growth of the Indian and Brazilian consumer-electronics sectors can be attributed largely to unintended consequences of policies such as Brazil's information act that protected the nascent local computer industry, and India's high, yet poorly enforced, national and state-level tariffs.<sup>58</sup>

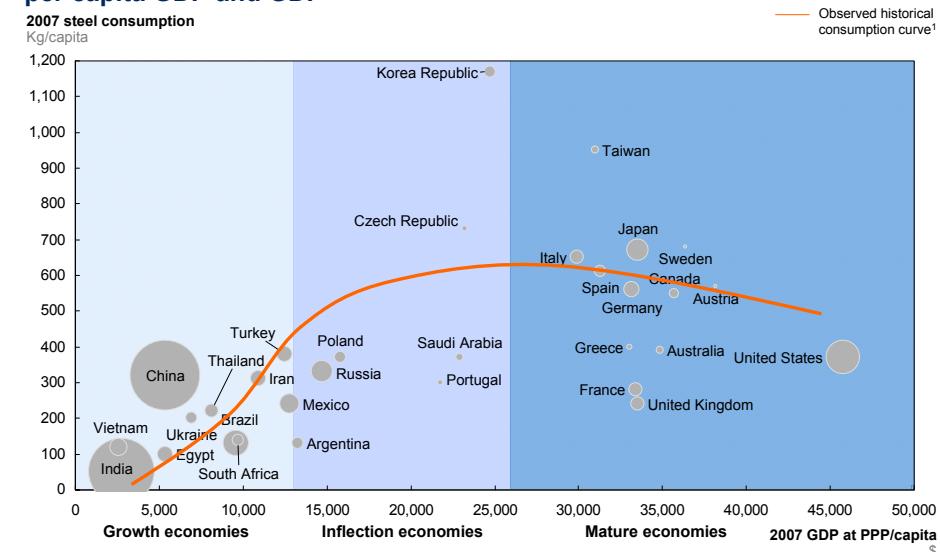
There is no single right policy to boost growth of manufacturing sectors. However, a guideline is that the stronger the business case for local production, the easier it is for industrial policy to succeed. Policy execution, personal passion and drive, and even luck (for example, whether a local supplier contracts with a growing or declining auto company) all play a part. All efforts run the risk of failing or being very expensive sources of growth. To boost the odds of success, policy should target activities with real potential for comparative advantage and excellent policy execution.

## 6. RESOURCE-INTENSIVE INDUSTRIES: STEEL

Steel is a cost-driven, capital-intensive industry where the role of government has been important. Steel exhibits a clear inverted-U-shaped growth pattern as the sector moves through increasing income levels—and policy evolves through the different stages of the sector's development (Exhibit 17).

### Exhibit 17

#### Steel demand is strongly dependent on growth in per capita GDP and GDP



<sup>1</sup> General steel intensity curve based on findings by Louis Schorsch, published in *McKinsey Quarterly*.

SOURCE: J.F. King; World Bank; McKinsey Quarterly; McKinsey Global Institute analysis

<sup>57</sup> A *maquiladora* is a factory that imports materials and equipment on a duty-free and tariff-free basis for assembly or manufacturing and then re-exports the assembled product, usually back to the originating country. See Diana Farrell, Antonio Puron, and Jaana Remes, "Beyond cheap labor: Lessons for developing economies," *McKinsey Quarterly*, 2005 Number 1.

<sup>58</sup> *New horizons: Multinational company investment in developing economies*, chapter on consumer electronics, McKinsey Global Institute, October 2003 ([www.mckinsey.com/mgi/reports/pdfs/newhorizons/Consumer.pdf](http://www.mckinsey.com/mgi/reports/pdfs/newhorizons/Consumer.pdf)).

During the early stages of economic development, demand for steel takes off on the back of expanding infrastructure and commercial and residential buildings. Governments consider steel a strategic industry, and public policy often plays a part in facilitating the steel production take-off.<sup>59</sup> Governments have typically helped finance high industry start-up costs through investing directly in state-owned steel companies and/or providing loans, land grants, tax holidays, and labor training (we have seen such approaches in Europe, South Korea, Brazil, India, Turkey, and many others). Some countries have also chosen to protect emerging local companies through trade barriers (South Korea, India, and Turkey among them) or explicitly permitting an oligopoly of steel producers (the most notable example being South Korea). Although trade protection has helped to incubate local steel industries, it remains the case that most protected or publicly owned steel industries have lagged behind global best practices and often led to high local steel prices.<sup>60</sup> China's steel industry today is in a rapid growth phase, but China has introduced an innovative way to take advantage of the large scale of its capacity expansion in the steel sector (see box 9, "Coordinating the scaling of China's steel industry").

#### **Box 9. Coordinating the scaling of China's steel industry**

Chinese steel capacity has expanded greatly over the past decade, and the Chinese economy now consumes more than 40 percent of global steel. This expansion has allowed China to develop a blueprint for new steel plants that allows for economies of scale not only in their design but also in terms of materials and construction processes. These factors—together with China's low labor costs—have helped to reduce the capital costs of new plants by up to 40 percent compared with Western standards.

The large scale of the sector has also encouraged the Chinese government to step up efforts to play a coordinating role in shaping the industry's development. For instance, the government has promoted the closure of obsolete capacity and recently placed a ban on the construction of new greenfield steel plants to avoid a further build-up of overcapacity.

The government has also encouraged the development of high-value-added steel production through the use of criteria for project approval as well as through trade policy. For example, China has introduced export-tax rebates for high-value-added steel exports, while imposing duties on exports of low-value-added steel. In addition, Beijing is promoting the consolidation of the industry, but progress has been slow due to barriers such as ownership (state versus province versus city) and tax considerations.

To ensure efficient, low-cost steel supply for local industries, the Chinese government has further supported growth in the industry by seeking to reduce raw materials costs (e.g., through encouraging state-owned enterprises to make investments overseas), as well as energy and logistics costs, which collectively represent two-thirds of the overall cost.

59 Because of the low value-to-bulk ratio, particularly in construction-grade long-steel products, most markets are local or regional. Only 13 percent of global long-steel consumption is imported.

60 A notable exception to the pattern is South Korea, where heavily protected state-owned POSCO had a virtual monopoly in the country yet succeeded in reaching global best-practice productivity in its operations and grew to become a leading global steel company. For more on the case of South Korea and other protected steel markets including Brazil, Turkey, India, and Russia, see <http://www.mckinsey.com/mgi/rp/CSProductivity/>.

Once local industries are established, government attention has tended to shift toward improving sector competitiveness. Among others, Poland, the Czech Republic, Turkey, and Brazil have privatized public steel companies and reduced trade protection, helping raise productivity through consolidation and operational improvements.<sup>61</sup> The Brazilian state of Santa Catalina sought to attract leading global steel companies to produce locally.<sup>62</sup> Others have aimed to create a favorable environment for the local industry to transition to higher value added flat-steel products. Examples of this approach include South Korea's explicit policy of providing R&D support for new technologies and support for steel-consuming sectors such as automotive. Today, both the increasing cost of raw materials and energy and the downward trend in global trade barriers has shifted the policy emphasis to improving cost competitiveness through enhancing logistical effectiveness and access to raw materials.<sup>63</sup>

As incomes increase, steel industries tend to mature and the role of government has shifted toward enabling the restructuring and managing declines in employment through the financial support for job losses. The experience of Europe suggests that seeking to protect jobs in inevitably declining sectors like steel is expensive and unproductive. Understanding the market imperatives and creating the competitive incentives for stronger performance, as we have seen in South Korea, has proved much more effective (see box 10, "Steel policies in Europe and South Korea").

#### **Box 10. Steel policies in Europe and South Korea**

In the late 1970s and early 1980s, the EC responded to plunging European demand for steel, a halving of employment in the steel sector, and rampant overcapacity by trying to protect the industry. The EC imposed import restrictions on up to 80 percent of steel goods, minimum prices for major product categories, and production quotas based on 1973–74 levels to prevent efficient producers from gaining market share. Europe nationalized steel companies and supported them directly through subsidies totaling \$40 billion. This was an extraordinarily expensive strategy, costing an average of \$50,000 per steel worker. And it still failed. The European steel industry remained unviable and teetered into another crisis between 1989 and 1993. But Europe learned its lesson. Instead of choosing protectionism, policy makers supported the industry's restructuring, using public money to help more than half a million displaced workers to retrain and find work in other industries.

South Korea steered its steel industry through both its growth and its inflection phases. From 1968 to 1973, the government helped companies secure low-cost and long-term foreign capital, provided discounts on electricity inputs and rail transport, and limited imports of foreign steel. South Korea set up the Pohang Iron and Steel Company (POSCO) as a state monopoly and, while continuing to

61 Both Poland and the Czech Republic implemented these changes as a prerequisite to entry into the EU. For more on Turkey and Brazil, see MGI's steel case studies at <http://www.mckinsey.com/mgi/rp/CSPproductivity/>.

62 The state government of Santa Catalina in Brazil provided tax breaks and land and infrastructure support for ArcelorMittal's new steel plants.

63 Iron ore and energy costs have tended upward in the past eight years as extraction has moved to lower-grade mines where mining costs can be four to six times the cost of lowest-cost sites. As a result, industry cost advantage has shifted in favor of regions such as Russia where low raw material and energy costs outweigh the disadvantage of less efficient, older plants. This illustrates how changes in the global environment can significantly alter the relative cost positions of commodity-like global industries.

give the company financial backing and protecting the domestic market, allowed POSCO's management a degree of autonomy to seek inputs, capital, and knowledge transfer globally. In the late 1980s through 1997, the government leant indirect support to the sector by promoting steel-intensive domestic industry but also gradually introduced competition through mandatory price and trade regulation; productivity started to rise. South Korea finally privatized POSCO, allowing foreign investors to take equity stakes in the late 1990s. However, even today the government continues to support the sector through a long-term commitment to funding R&D, including subsidies for the domestic development of "original technology," such as FINEX, which is claimed to be 17 percent more efficient than blast-furnace technology.

### **EXECUTION OF POLICY IN CLOSE COLLABORATION WITH THE PRIVATE SECTOR BOOSTS THE ODDS OF SUCCESS**

Even after understanding how different kinds of sectors respond to regulation, there is often no single "right" way to proceed that can guarantee success. Like any business venture, growth policies are risky, and aspiring practitioners can learn a great deal from best-practice policy design and implementation in other regions. Governments then need to make their choices of approach explicit and credible to the private sector. Businesses also need to keep pace with government thinking. How policy evolves is vital for them. A December 2009 McKinsey survey found that a majority of those polled expect government involvement in their industry to increase over the next three to five years and one-third of them believe that government policy can impact more than 10 percent of their operating income. Yet a majority of executives polled were not confident that their companies are effective in their engagement with government.<sup>64</sup>

Experience shows that a high degree of interchange between government and the private sector boosts the chances of policy success. Government needs to tap private-sector expertise; businesses need to engage more effectively with government. Finland's globally competitive mobile communications sector is an example of how well public-private collaboration can work. The government played a key enabling role, but it was the leadership of high-quality, private-sector companies in the field that made the running (see box 11, "Public-private collaboration that made Finland's IT sector globally competitive").

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64 Andrea Dua, Kerrin Heil, and Jon Wilkins, "How business interacts with government: McKinsey Global Survey results," *McKinsey Quarterly*, January 2010 ([www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)).

### Box 11. Public-private collaboration that made Finland's IT sector globally competitive

In the 1980s and 1990s, Oulu, a city of 200,000 in Northern Finland, grew into a significant wireless industry cluster thanks to close collaboration among the local government, universities, and the private sector—particularly telecom giant Nokia. All of the stakeholders had a shared mission—to sustain local economic development and keep Oulu competitive.

With a government defense contract for military radios acting as the initial trigger, Nokia and the University of Oulu formed a collaboration to develop a wireless communications system for sparsely populated areas. The Oulu initiative not only kept academic research close to business but also led to policy choices such as expanding wireless engineering education at the expense of other programs. With the municipality playing host, many smaller companies emerged in the same cluster, which helped create a sustainable pool of talent and expertise.

Government played a crucial enabling role both directly and indirectly. In addition to the university education and military contracts, the national government channeled R&D funding to the joint venture through the National Technology Agency (TEKES)—support that enabled Nokia to continue significant R&D efforts during Finland's deep recession in the early 1990s. Indirectly, the regulatory landscape was also an important enabler. The structure of the telecom operator market, both landline and mobile, consisted of a very large number of local cooperatives—rather than a single national monopoly as in many other countries—that helped create dynamic competitive conditions and experiments with new consumer solutions.



Designing and implementing policies to improve growth and competitiveness are not easy. Even if the agenda and the tools are right, poor execution can sink even the best efforts. The hope must be that, despite today's challenging market conditions, governments will learn from the industrial policy missteps of the past. We believe that taking a sector view and tailoring policy accordingly will boost the odds of policy changes having a positive impact.

Although today's business executives are intensely interested in the evolution of government policy, they need to do more to include policy explicitly in their strategy. Companies shouldn't be content with a passive stance toward government activism in the market. They need to alert policy makers to the challenges they face and become thought partners to governments as they seek to calibrate effective competitiveness policies. The more aligned policies are with business priorities, the more likely that governments and businesses will both meet their aspirations.

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