McKinsey Global Institute

The Emerging Global Labor Market: Part II—The Supply of Offshore Talent in Services

June 2005

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The Emerging Global Labor Market: Part II—The Supply of Offshore Talent in Services

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Preface

The *Emerging Global Labor Market* series is the end product of a year-long project by the McKinsey Global Institute (MGI), working in collaboration with our colleagues in McKinsey offices and practice groups around the world. This research builds on our extensive work on offshoring, global industry restructuring, and the impact of multinational company investment in developing countries. It spans detailed cases of eight industry sectors (automotive, health care, insurance, IT services, packaged software, pharma, retail, and retail banking) and an analysis of the available talent pool in 28 low-wage countries and another 8 mid- to high-wage ones. It also includes the Location Cost Index, a tool for companies to evaluate location attractiveness based on six groups of criteria: labor cost, vendor landscape, market potential, risk profile, business environment, quality of infrastructure.

MGI Fellows Martha Laboissière from McKinsey's São Paulo Office and Jaeson Rosenfeld, previously from McKinsey's Boston Office, worked closely with me to provide leadership to this project. The project team also included MGI Fellows Robert Pascal from McKinsey's North America Knowledge Center in Boston, Charles de Segundo from McKinsey's London Office, Sascha Stürze from McKinsey's Berlin Office, and Fusayo Umezawa from McKinsey's Tokyo Office.

We have benefited enormously from the extensive input received from McKinsey's global network of industry and functional experts, especially Ajay Dhankhar, Detlev Hoch, Chris Ip, Noshir Kaka, Krish Krishnakanthan, Glen Mercer, and Anupan Sahay, and from our external Academic Advisory Board, which included Martin Baily, senior advisor to MGI and senior fellow at the

Institute for International Economics and formerly Chairman of the Council of Economic Advisors to President Clinton; Olivier Blanchard at the Massachusetts Institute of Technology; and Richard Freeman at Harvard University.

Tim Beacom, MGI's dedicated research and information specialist, Nitin Seth from McKinsey's India Knowledge Center and Vivien Singer from McKinsey's North America Knowledge Center in Boston provided essential research support. Susan Lund and Gina Campbell provided thoughtful input and editorial support. Morever, Deadra Henderson, MGI's Practice Administrator, Terry Gatto, our Executive Assistant and Rebeca Robboy, MGI's External Relations, supported the effort throughout.

As always, the findings and conclusions draw from the unique perspectives that our colleagues bring to bear on the sectors and countries researched here. These perspectives are a product of intensive client work with the world's leading firms. They are supplemented by in-depth analytical work and extensive interviews and dialogues with executives, government officials, and other leading thinkers. As with all MGI projects, this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution.

Our aspiration is to provide a fact base to the public debate on offshoring and the emerging global labor market to enable policy makers and business leaders to make more informed and better decisions.

Diana Farrell
June 2005

Additional Acknowledgements

Beyond the project contributors already mentioned in the preface, we would also like to explicitly acknowledge McKinsey colleagues, executives and experts around the world who contributed specifically their industry, local market insights and knowledge to this study. To those who chose to remain anonymous we also extend our gratitude. McKinsey & Company's unparalleled network is an essential component of any McKinsey Global Institute effort.

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Auto

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Additional Acknowledgements

Pharmaceutical

Michael Bloch, Vikash Daga, Ruth De Backer, Ajay Dhankhar, Raj Garg, Indranil Ghosh, Linda Gleason, Maria Gordian, Judith Hazlewood, Tom Hensey, Elizabeth Laws, David Lennon, Ahmed Mitwalli, Shankar Narayanan, Eckhard Niemeier, Paul Oppold, Chandrika Pasricha, Peter Pfeiffer, Ron Piervincenzi, Miguel Schmidt, Navjot Singh, Ramesh Srinivasan, Lara Sullivan, Takashi Takenoshita, Yujiro Tsutsumi, Hema Viswanath, Arthur White, Kristin Yarema, Rachel Zhang

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Additional Acknowledgements

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Dr. Zsolt Ekler, Peter Fröhlich, Beata Fürjesz, György Györfi, Laszlo Hadi, Adam Homonnay, Gabriella Kiszely, Peter Lukacs, Kristian Merenyi, Anthony Radev, Varga Zoltan

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Contents

Guiding Principles

Any job that is not confined to a particular location has the potential to be globally resourced, or performed anywhere in the world. Broadly speaking, this includes any task that requires no physical or complex interaction between an employee and customers or colleagues, and little or no local knowledge.

Such jobs can be performed wherever a company deems most attractive. A company may choose to have a particular location insensitive job performed in the demand market (that is, in the market in which the resulting output is sold), in a border zone (nearshore), or remotely (offshore). Therefore, not all location insensitive jobs will move offshore.

We evaluate only service sector jobs. Although manufacturing jobs may be insensitive to their location as well, this study focuses on service jobs, whether they are in service sectors or in a back-office service function (e.g., accounting) in a manufacturing sector.

We focus on the demand for low-wage employment from high-wage countries. To estimate potential demand for globally resourced labor, we treat countries as neither inherently on the supply side nor inherently on the demand side in the global labor market. However, since cost is a major determinant of companies' location decisions, developed countries are most likely to provide the bulk of demand for offshore labor, and developing countries the bulk of supply. When we evaluate the actual rate of offshoring today and how fast it will grow, we examine only the demand for low-wage labor from high-wage countries.

We assume that demand for labor for a particular activity is the same onshore and offshore. In reality, capital/labor tradeoffs and increased service levels may cause high-wage countries to seek more labor in low-wage countries than they would for performing the same activity in the demand market. Productivity differences between the original location and the new location may also influence demand for labor. Since these effects can be either positive or negative and tend to level over time, our default assumption is that the number of FTEs[1] needed for an activity is the same whether located onshore or offshore.

For the demand evaluations we do not consider any supply constraints. All evaluations are made under the assumption that global supply will be able to meet demand. Actual supply conditions are examined in the second report in this series, "The Supply of Offshore Talent in Services".

1 Full time equivalent

Introduction

Offshoring has rapidly become part of the everyday social lexicon. Conflicting and sensational reports of developed-world companies moving jobs to emerging markets like India and Brazil are now a staple of the news media and political debate.

The trend alarms many observers. Some believe that almost any job is subject to dispatch abroad, and that soon the developed world will lose even high-paid, professional service jobs that previously were not at risk: "If you can describe a job precisely, or write rules for doing it, it's unlikely to survive. Either we'll program a computer to do it, or we'll teach a foreigner to do it."[1] Others claim that offshoring white-collar jobs in R&D and elsewhere will erode one of the main sources of competitive advantage for developed countries, and eventually reduce their standard of living. They point to offshoring as a key cause of weak employment growth in the United States, maintaining that jobs lost abroad will not return soon. Swayed by such arguments, policy makers on both sides of the Atlantic have adopted or are now considering legislation that would penalize companies for offshoring jobs and prohibit any state-funded projects from being performed abroad.

But there are equally forceful proponents of offshoring. They argue that offshoring increases company productivity and profits, bringing benefits to their home economies. They say it represents a well-functioning global free market in

1 David Wessel, "Barbell effect—the future of jobs: new ones arise, wage gap widens," *Wall Street Journal*, April 2, 2004.

labor: "arguing that [offshoring] hurts is arguing that free trade hurts."[2] They also suggest it affects only a tiny proportion of jobs in developed countries, and accelerates economic growth in the countries hosting offshore employment.

A big problem in this debate has been the shortage of hard facts with which to resolve conflicting arguments and reach a clearer understanding of offshoring's potential impact on the global economy. The purpose of the research described in this report is therefore to provide this fact base and help bring more clarity to the discussion.

For reasons described below, our research has concentrated on the offshoring of service jobs rather than jobs in manufacturing, and on jobs offshored from the United States and Western Europe to low-wage markets. The report's findings should help companies and policy makers in both developed and emerging markets to address the different issues raised for them by offshoring.

This introduction examines the context for our research, defines terms used in the report, explains the report's scope, and introduces the questions covered by each of the report's three sections.

CONTEXT FOR THE RESEARCH

Relocating jobs is nothing new. As communications have improved, companies have migrated jobs in high-labor-cost areas to cheaper and less restrictive labor markets. Initially they moved jobs within countries. For example, many manufacturing plants in the Northeastern United States shifted to the South and Southwest during the 1980s to take advantage of lower infrastructure costs, a less unionized workforce, and tax incentives. Then improving information and communication technologies made it possible for companies to disaggregate the value chain and outsource either entire processes or pieces of them to other companies in the same country. Numerous companies now provide other firms with technology support, software development, transactions processing, accounting, human resources management, and other tasks.

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2 Timothy Aeppel quoting Haseeb Ahmed in "Leadership (A special report) — Offshore face-off: moving jobs overseas can cut a company's costs; But is it bad for the U.S. economy? Two economists debate the issue," *Wall Street Journal* May 10, 2004.

Recently, a confluence of factors has made it possible for companies to relocate or outsource their service activities even farther afield, to lower-wage locations offshore. These factors include further liberalization, improvements in information technology, a decrease in the perceived risk of operating in developing countries, and a shortage of labor in developed countries.

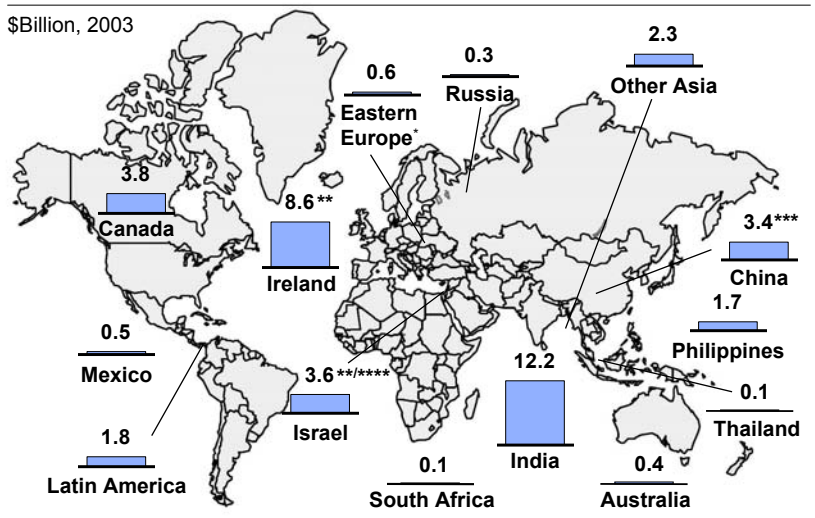
Ireland was one of the first offshoring locations, but emerging markets such as India and the Philippines were fast followers. Exhibit 1 shows the approximate value of offshore services in countries that supply them.

When companies decide where to locate a particular activity, they have to weigh the feasibility of performing it in a different location, away from the home market, against the benefits offered by performing it in that specific location, such as economies of scale and low labor costs.

Exhibit 1

INDIA AND IRELAND ARE THE DOMINANT PRODUCING COUNTRIES

Offshored services market size (BPO and IT, captive and outsourced)



* Includes Poland, Romania, Hungary, Ukraine, and Czech Republic.
** Primarily composed of MNC captives.
*** Estimate, based on total Chinese BPO and IT services revenue (7.8) minus domestic demand for IT services (4.4).
**** Estimate, based on 2001 market size of 3.0 and assumed growth rate of 20% p.a.
Source: Software Associations; U.S. country commercial reports; press articles; Gartner; IDC; Country government Web sites; Ministry of Information Technology for various countries; Enterprise Ireland; NASSCOM; McKinsey Global Institute analysis

In the 1990s the lowering of bandwidth and telecommunications costs made many services less sensitive to their location. Manufacturing was similarly affected—better communication made it easier to operate a remote manufacturing location—but to a lesser extent, because cheaper communications didn't do much to help manufacturers with the costs of transporting their physical inputs and outputs. At the same time, the risks, both real and perceived, of locating service activities in developing countries, were lowered. The successes of early movers and supporting measures taken by governments in emerging markets, for example, to protect intellectual property, made other companies more confident of moving their services to these locations.

As companies continue to learn how to manage globally dispersed processes, the exact location of many functions will matter less and less. Already, a great many business processes can be performed remotely, and several can be performed anywhere in the world. A customer service call can be answered, an MRI can be read, and R&D can take place remotely. But how many such processes are performed remotely today? How fast is that number growing? To begin answering such questions, we need to define more precisely the options facing the companies driving this trend.

DEFINITIONS

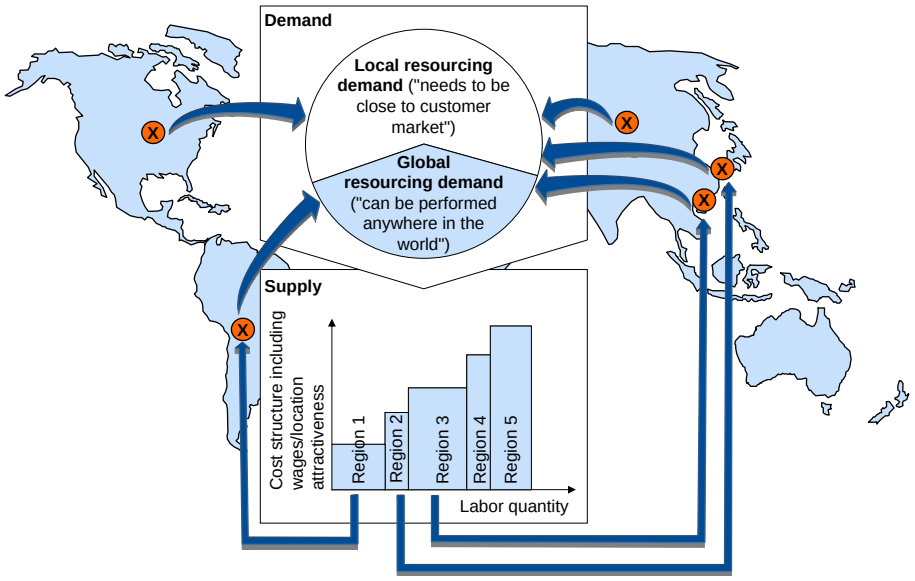
We define as "global resourcing" the process a company goes through to decide which of its activities could be performed anywhere in the world, where to locate them, and who will do them.

Any activity that is not constrained by the need for customer contact or local knowledge or by complex interactions is subject to global resourcing: it can be performed wherever a company deems most attractive (Exhibit 2). An obvious example of such an activity is answering customer service calls for a bank; these calls can be answered just as easily in Chicago, Dublin, or Manila.

Having identified services that could be performed remotely, a company faces two sets of decisions illustrated in the matrix in Exhibit 3. First, should it "offshore" those services, by which we mean perform them in another country outside the market where they are sold? Or should it perform them "onshore,"

Exhibit 2

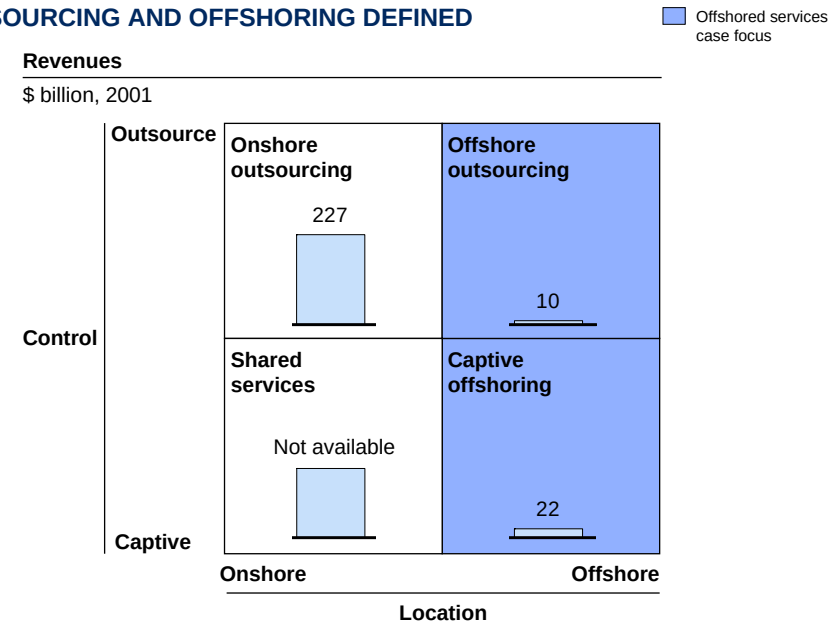
GLOBAL RESOURCING ENTAILS CHOOSING THE OPTIMAL LOCATION TO PERFORM PROCESSES THAT COULD BE LOCATED ANYWHERE



Source: McKinsey Global Institute analysis

Exhibit 3

OUTSOURCING AND OFFSHORING DEFINED



Source: Gartner; IDC; Aberdeen Group; UBS Warburg; Nasscom; U.S. import-export data; McKinsey Global Institute analysis

in the same market in which it sells them?[3] And, second, should the company perform those activities in a wholly-owned "captive" unit? Or should it "outsource" them, by which we mean buy them from a third party?

The following are examples of location decisions that fall into each quadrant of the matrix:

- Wells Fargo operates call centers for its business units in several locations in the United States, including Utah and California. This is a captive onshore activity.
- Halliburton outsources software applications management to Accenture in the United States. This is an outsourced onshore activity.
- DHL, a German company, locates its European ITservices center in Prague. This is a captive offshore activity.
- The South African Depository System has its software application development performed by TCS, an Indian firm. This is an outsourced offshore activity.

The main focus of our study will be to understand the shift from "onshore" to "offshore" locations, although we will also touch on the "captive" versus "outsourced" decision. We also limit our attention to jobs that are relocated from high-wage to low-wage countries, even though the reverse process also occurs. For instance, R&D centers are often located in the United States even though they serve many countries, including developing ones.

Many service activities are labor intensive, so companies would benefit if they could offshore them to places with lower labor costs. But not all services can be offshored: some are much more sensitive to their location than others. Computer programming, for example, is relatively location insensitive. It can be done just about anywhere, because computer code can be cheaply and instantaneously "shipped" via the Internet to and from virtually any location in the world. At the other end of the spectrum comes services like haircuts, which have to be done close to the customer.

It is not necessarily rational for companies to transfer all location insensitive

[3] The term "nearshoring" means offshoring to a country near the home market.

activities offshore. Consider server maintenance for United States companies. Even though server maintenance could be relocated elsewhere, that may not make sense because the United States has in place a better infrastructure and lower risk levels for server maintenance than other locations (this example will be explored in more detail in our IT services case).

Regulatory or organizational factors may also prevent a company from relocating services offshore. For instance, an insurance company might want to relocate its US property and casualty operation to a developing country; however, industry regulations require some of these services to be performed by a registered insurance agent. Since it is not possible to gain certification as a US agent in a foreign country, the activity has to remain in the US. Organizational factors play a part in the decision too. A software company might achieve lower wage costs by offshoring certain lower-end elements of its software development process. However, the company's process is well-developed and understood within the organization, and its smooth working depends on all members of the development team being in the same place.

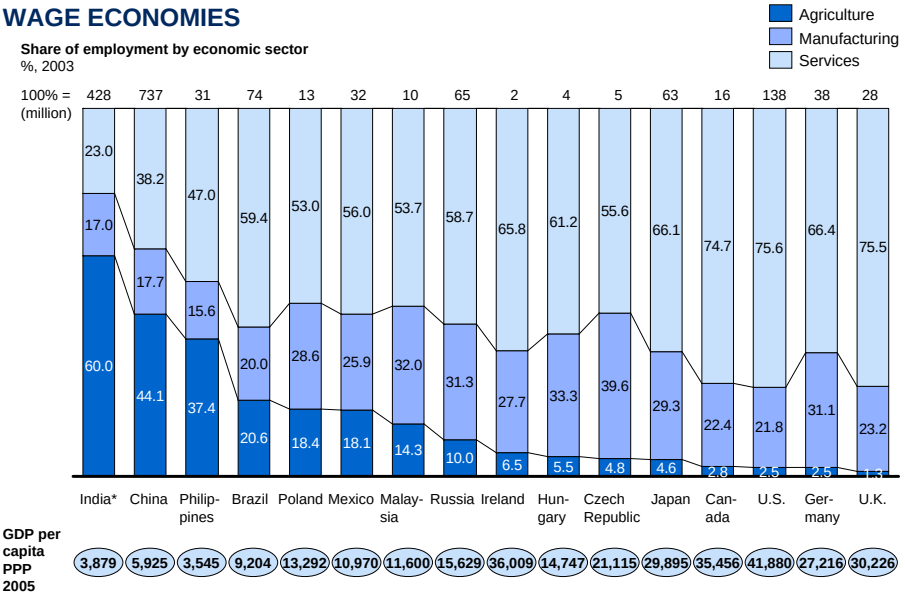
WHY WE FOCUS ON OFFSHORING SERVICES TO DEVELOPING COUNTRIES

Within the universe of jobs that are not constrained to one location, the focus of this report is the offshoring of service jobs from developed economies to developing markets. This is the issue that has dominated both the media and political debate, and for good reason. The service sector in developed countries supplies most jobs and the bulk of many countries' positive trade balances, and the trend toward offshoring jobs is growing fast. An additional reason for our focus on this area is the absence of data on its effects on the individuals, companies, and countries that provide offshored service labor.

The service sector is the biggest source of employment in developed countries (Exhibit 4), because they have already experienced the gradual shift in employment from agriculture to services that occurs as a country grows its GDP per capita. And while world trade has been growing at a brisk 6.9 percent annually for both services and manufacturing from 1980 to 2002, the offshoring of services to emerging markets, though still small, has been growing even faster (Exhibit 5). It is projected to grow at 30 percent annually from 2003 to 2008 (Exhibit 6). This

Exhibit 4

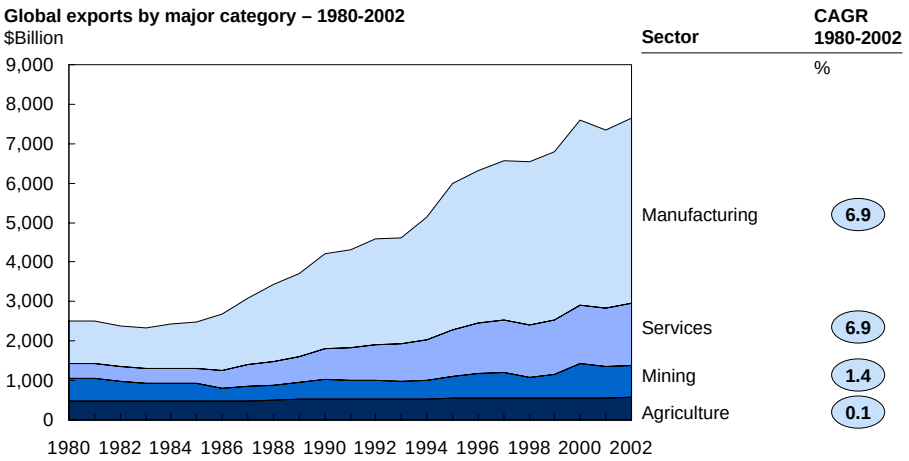
THE SERVICE SECTOR PROVIDES THE BULK OF EMPLOYMENT IN HIGH-WAGE ECONOMIES



* Shares as of 1999.
Source: ILO; Global Insight WMM; CIA World Factbook

Exhibit 5

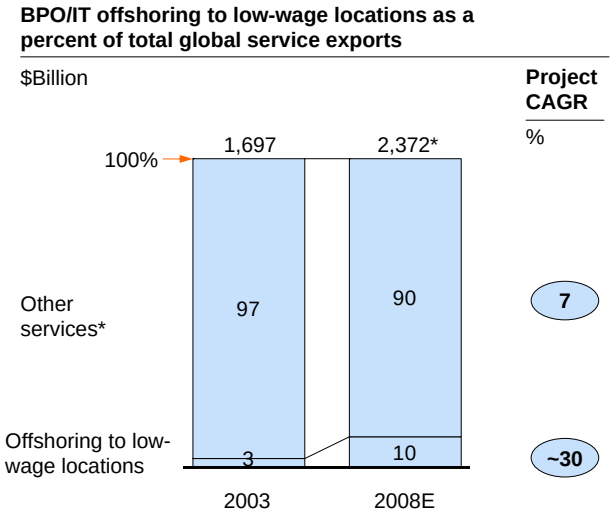
GLOBAL SERVICES AND MANUFACTURING TRADE HAVE GROWN RAPIDLY OVER THE LAST 20 YEARS



Note: Exports were used to measure global trade. In addition, the data are in nominal dollars since no deflators were available from the WTO for services trade.
Source: WTO; "International Trade Statistics 2003"

Exhibit 6

OFFSHORING REPRESENTS AN EVEN FASTER GROWTH SEGMENT OF TRADE



* Estimated at 6% annual growth from 2002 figure.
Source: WTO; McKinsey Global Institute analysis

would increase its share of services trade from 3 percent to 10 percent, making it a significant subcomponent of services trade. To put this in perspective, travel represents approximately 30 percent of services trade the Organization for Economic Co-operation and Development (OECD) countries, while transportation represents 20 percent.

QUESTIONS ADDRESSED BY OUR STUDY

Our research sheds light on several key questions:

- What is the total number of jobs worldwide that can be globally resourced? How close will actual demand for offshoring from developed economies to emerging markets come to this potential total? How does the potential for offshoring and its degree of adoption differ among industries?
- What is the current supply of labor suitable to perform offshoring services in developing markets?

- How does supply and demand meet? Which countries will provide offshoring labor? Will different types of offshoring be attracted to different countries? How will offshoring affect employment and wages in developing and developed countries?

The report covers offshoring between a wide range of developed and developing countries (36 countries in all). To assess the situation on the ground, six full-time team members devoted 12 months to this research. In addition we tapped the expertise of consultants at 82 McKinsey offices in 44 countries, as well as conducting nearly one hundred interviews with companies in our focus countries.

We also collected the most comprehensive data available on actual offshoring demand through interviews with companies and from their own and analysts' reports. We collected detailed statistics on labor supply for 16 countries from sources of national statistics—making adjustments for consistency when necessary—to build the most comprehensive view of global labor markets that exists. We also collected data on 50 separate measures of the cost of operating in the 16 focus countries to understand which countries would serve as the most attractive offshore locations.

We determined not only the potential number of jobs that theoretically could be relocated offshore, but also the actual demand to date and how that will grow over the next five years. In addition, we determined both the potential supply of labor in each country as well as the realistic level of supply that is sufficiently skilled to provide services to overseas companies. This analysis allows us to understand the dynamics that bring together supply and demand in the global labor market, including the constraints that might appear and the potential impacts on wages and employment in both developed and developing countries.

We hope that this analysis will ultimately lead to a new way of looking at the range of issues presented by the offshoring of services.

Executive Summary

"What makes this trend so viable is the explosion of college graduates in low-wage nations. In the Philippines, a country of 75 million that churns out 380,000 college grads each year, there's an oversupply of accountants trained in U.S. accounting standards. India already has a staggering 520,000 IT engineers, with starting salaries of around $5,000."[1]

"The quest for workers is creating a talent crunch that some believe might dull India's competitive edge in outsourcing. 'With rising wages, many companies are just not making money here in India, especially in call centers,' says Chiranjit Banerjee, a director for human resources firm Quest Research Ltd."[2]

Today there are conflicting views on the potential for offshoring service jobs to low-wage nations. This report, the second of three to analyze the emerging global labor market, quantifies the supply of talent in 28 low-wage countries and 8 mid- and high-wage ones.[3] The analysis covers a range of occupations that could be performed

1 "The new global job shift; The next round of globalization is sending upscale jobs offshore. They include basic research, chip design, engineering even financial analysis. Can America lose these jobs and still prosper? Who wins? Who loses?" Pete Engardio, Aaron Bernstein, Manjeet Kripalani, Frederik Balfour, Brian Grow and Jay Greene, 3 February 2003. *BusinessWeek*.

2 "Good help is hard to find; Higher wages and lavish perks reign as outsourcing outfits scramble for talent." Josey Puliyenthuruthel and Manjeet Kripalani, 14 February 2005. *BusinessWeek*.

3 Mid- to high-wage countries studied in-depth were: Canada, Germany, Ireland, Japan, the United Kingdom, and the United States; Australia and South Korea were studied by way of extrapolation. Low-wage countries included in the in-depth study were: Brazil, China, Czech Republic, Hungary, India, Malaysia, Mexico, Philippines, Poland, and Russia; other low-wage countries studied were: Argentina, Bulgaria, Chile, Colombia, Croatia, Estonia, Indonesia, Latvia, Lithuania, Romania, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, and Vietnam.

remotely: engineers, finance and accounting professionals, analysts, life science researchers, doctors, nurses, and generalists. The findings have wide-reaching implications for both multinational companies (MNCs) seeking to tap into low-wage labor pools and for countries seeking to attract such investment and spur job creation.

Offshore talent potential exceeds high-wage country potential by a factor of two

We found there are approximately 33 million young professionals[4] (university graduates with up to 7 years of experience) in our sample of 28 low-wage countries. This compares to 15 million in our sample of 8 higher-wage nations (United States, United Kingdom, Germany, Japan, Australia, Canada, Ireland, South Korea) and 7.7 million in the United States alone. Including support staff, doctors, and nurses of all tenure groups, the figures rise to 392.8 million potential workers in low-wage countries, compared to 181.3 million in high-wage countries.

In each of the eight occupations we studied, the total number of young, university-educated talent in low-wage countries like China, India, and the Philippines, surpasses that in our high-wage sample. India alone has nearly as many young professional engineers as the Unites States, and China has more than twice as many; China has twenty times the number of doctors as the United Kingdom; Russia has almost 10 times as many finance and accounting professionals as Germany.

Three factors reduce the potential talent supply in low-wage nations

Although the potential supply of talent in low-wage countries is large and growing rapidly, only a fraction of potential job candidates could successfully work at a foreign company. The reasons are limited suitability, dispersion of the labor force, and domestic competition for talent.

4 Young professionals include engineers, finance and accounting, analysts, life science researchers, and professional generalists. It excludes doctors, nurses, and support staff.

Thirteen percent of the potential talent supply in low-wage nations is suitable to work for multinational companies

Interviews with 83 human resource managers in multinational companies[5] reveal that 13 percent of potential job candidates in degree specific occupations could successfully work at a multinational company. This share rises to 19 percent when taking into account the possibility that many graduates who are unsuitable for their own profession may be found suitable for a generalist position (e.g., an engineer could work as a call center agent or an analyst).

The reasons for low levels of suitability are: lack of necessary language skills; the low quality of significant portions of the educational system and its limited ability to impart practical skills; and a lack of cultural fit, which can be seen in interpersonal skills and attitudes towards teamwork and flexible working hours.

The suitability of job candidates varies by occupation and by country. On average, 15 to 20 percent of the engineers, finance and accounting majors, life science researchers, and analysts could be hired by foreign companies, while only 10 percent of generalists could due to stricter language requirements (Exhibit 1). There is a wide variation among countries, however. While 50 percent of engineers in Poland or Hungary are suitable to work for multinational companies, only 10 percent of Chinese ones and 25 percent of Indian ones would be suitable (Exhibit 2).

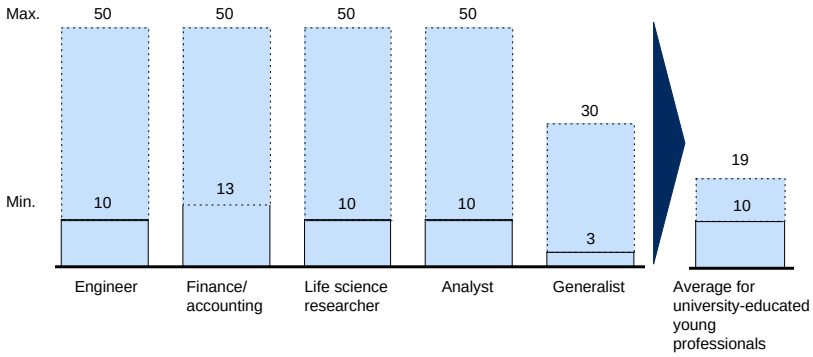
Interviews indicate that, in general, university graduates from Eastern European countries are, on average, well-suited to work for multinational companies. Job candidates from Russia are well-educated but often lack a grounding in practical skills from their university education, while in India the overall quality of the educational system, apart from the top universities, could improve significantly. In China and Brazil, language deficiencies are the most pressing issue.

5 We conducted 83 interviews with HR managers at multinational companies, HR agencies primarily supplying MNCs as well as heads of remote centers in each country. For each occupational group, we asked a quantitative question *("Of 100 random candidates with the correct degree, how many could you employ if you had sufficient demand for all 100?")* and a qualitative question *("What are the main deficiencies of the candidates you turned away?")*. Answers to both questions were surprisingly homogeneous across interviewees in most of the countries.

Exhibit 1

IN LOW-WAGE COUNTRIES, ON AVERAGE ONLY 13% OF UNIVERSITY GRADUATES ARE SUITABLE TO WORK IN A MULTINATIONAL COMPANY

"Of 100 graduates with the correct degree, how many could you employ if you had demand for all?"
%



Weighted average of all low-wage countries studied*	17	19	14	15	10	13

* Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Russia, Romania, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: Interviews with HR managers, HR agencies and heads of global resourcing centers; McKinsey Global Institute analysis

Exhibit 2

SUITABILITY VARIES MARKEDLY BETWEEN COUNTRIES AND SEEMS ESPECIALLY LOW IN NASCENT GLOBAL RESOURCING MARKETS

"Of 100 graduates with the correct degree, how many could you employ if you had demand for all?"
%

	Countries	Engineer	Finance/accounting	Generalist
Eastern Europe	**Russia**	**10**	**20**	**10**
	Czech Republic	50	40	20
	Poland	50	30	15
	Hungary	50	50	30
Asia	**China**	**10**	**15**	**3**
	Philippines	20	30	25
	India	25	15	10
	Malaysia	35	25	20
Latin America	**Brazil**	**13**	**13**	**8**
	Mexico	20 – 42*	25 – 35*	11

All suitability rates are empirically based on a total of 83 interviews with HR professionals working in each country

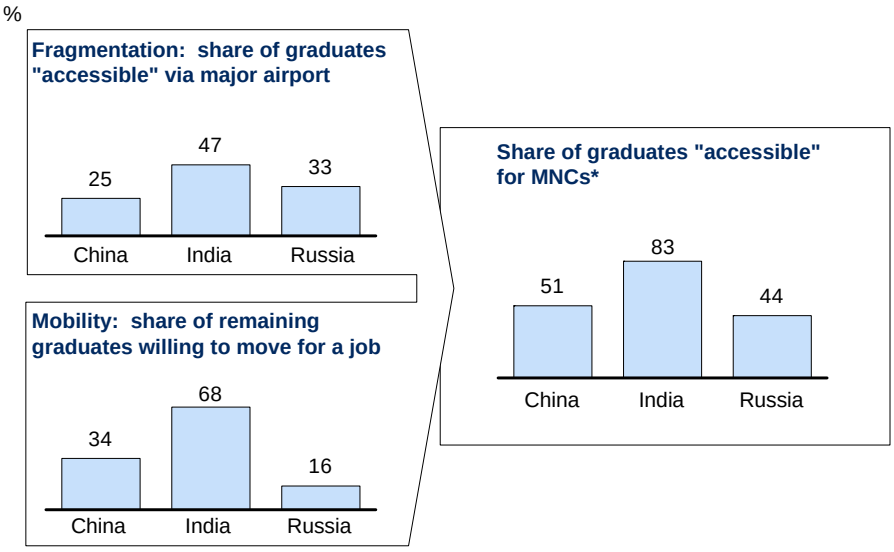
* Mexico is the only country where interview results (higher number) were adjusted since interview base was thinner and risk of misunderstanding high.
Source: Interviews with HR managers, HR agencies and heads of global resourcing centers; McKinsey Global Institute analysis

Dispersion of the labor force reduces the pool of suitable talent further

In large emerging markets, such as China, India, and Russia, the pool of potential talent is further diminished by the fact that many university graduates do not live in major cities with international airline connections (usually a key criteria for multinational companies seeking an offshore location) and are unwilling to relocate. In China, we estimate that just half the potential talent pool is geographically accessible to multinational companies. In Russia, only one-third of students graduate close to a major international airport, and few are willing to relocate. In contrast, nearly half of all Indian students graduated close to a major international hub, such as Mumbai, Delhi, Bangalore, or Hyderabad, and Indian graduates are also the most willing to move (Exhibit 3).

Exhibit 3

RUSSIAN UNIVERSITY GRADUATES ARE LESS FRAGMENTED, BUT ALSO LESS MOBILE THAN CHINESE ONES, INDIA'S ARE MOST "ACCESSIBLE"



* Accesible graduates = Graduates who studied close to a major international airport + (Remaining graduates x Empirical mobility rate)

Source: Country labor & graduation statistics; Surveys on student mobility; McKinsey Global Institute analysis

Competition for talent from non-offshoring companies reduces available supply in China

In China, the suitable labor supply is further reduced by competition for talent from non-offshoring oriented companies within the country (including domestic companies, multinationals meeting domestic demand, and foreign joint ventures).

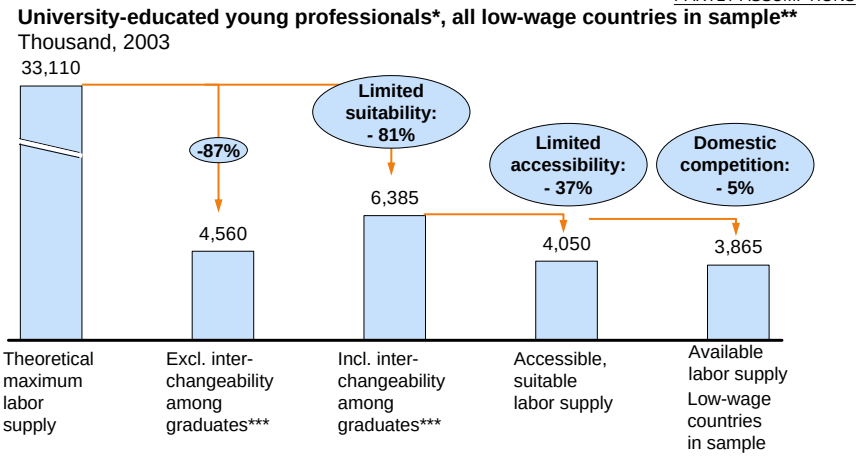
The available talent pool for multinational companies is 8 to 12 percent of the total and is growing rapidly

The three factors described above greatly reduce the pool of talent available for multinational employment. While there are 33 million potential young professionals in emerging markets, 4.6 million are suitable to work for a foreign company. If we include the fact that some professionals unsuitable for positions in their occupations might be suitable for generalist positions, suitable supply increases to 6.4 million. Lack of accessibility and competition from non-offshoring employers reduces these pools further still (Exhibit 4). Altogether, we estimate that 2.8 to 3.9 million—or 8 to 12 percent—of the young professionals in low-wage countries are available for hire by export-oriented service offshoring companies. This compares to 8.8 million in our sample of high-wage countries.

Exhibit 4

SUITABILITY HAS THE STRONGEST IMPACT ON AVAILABLE, UNIVERSITY-EDUCATED LABOR SUPPLY FROM LOW-WAGE COUNTRIES

LOWER BOUNDARY ESTIMATE
PARTLY ASSUMPTIONS



* Engineers, finance/accounting, analysts, life science researchers, generalists; ≤7 years of work experience.
** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
*** Interchangeability refers to (i) unsuitable engineering/life science/finance graduates can still work as analysts when fulfilling suitability criteria of this group or (ii) all unsuitable graduates can still work as generalist when fulfilling suitability criteria of this group.
Source: HR interviews; country labor & graduation statistics; surveys on student mobility; McKinsey Global Institute analysis

But even the 3.9 million is a lower boundary estimate of the potential talent pool in low-wage countries. In reality, the most suitable job candidates are also likely to be the most mobile and to have studied in a major city.

At 6.4 million, the pool of talent available for offshoring is large. In some occupations, such as engineers, finance and accounting, and analysts, it is 75 percent or more of the suitable pool of labor in our sample of high-wage countries. Given their sheer size, India and China dominate the suitable labor supply in many occupations. India accounts for nearly 30 percent of the young professionals,[6] for instance, while China and Russia have 11 percent and 10 percent, respectively.

The large pool of suitable talent in low-wage countries is also growing quickly. The stock of suitable, young professional talent in emerging markets is growing at 5.5 percent annually, while the number in developed countries is growing just 1 percent annually. This growth in stock is fueled by a strong increase in graduates in these countries. Growth is particularly rapid in degrees for which there is high demand from multinational companies. The share of degrees awarded in business and economics jumped from 18 percent to 31 percent in Russia, and from 16 percent to 36 percent in Poland in just five years.

By 2008, we expect the supply of suitable young engineers to be nearly the same between the developing and developed countries in our sample, and suitable finance and accounting professionals will surpass the supply in our high-wage sample.

Middle manager shortage looming in low-wage nations

Middle-manager scarcity is a constraint to growth in offshoring for many countries. India has been developing its export-oriented service sector, especially in IT and call-center businesses, for more than a decade, creating a sizeable pool of experienced middle managers. Nonetheless, India still has a scarcity of managers because growth in the offshoring sector has averaged more than 20 percent per year over the last 10 years, and even more briskly in some cities. Rapidly rising wages for IT project managers, which have increased 23 percent annually over the last four years, signal this scarcity.

6 This includes engineers, finance and accounting, analysts, life science researchers, and professional generalists with less than 7 years of experience. It excludes 3 occupations: doctors, nurses, and support staff.

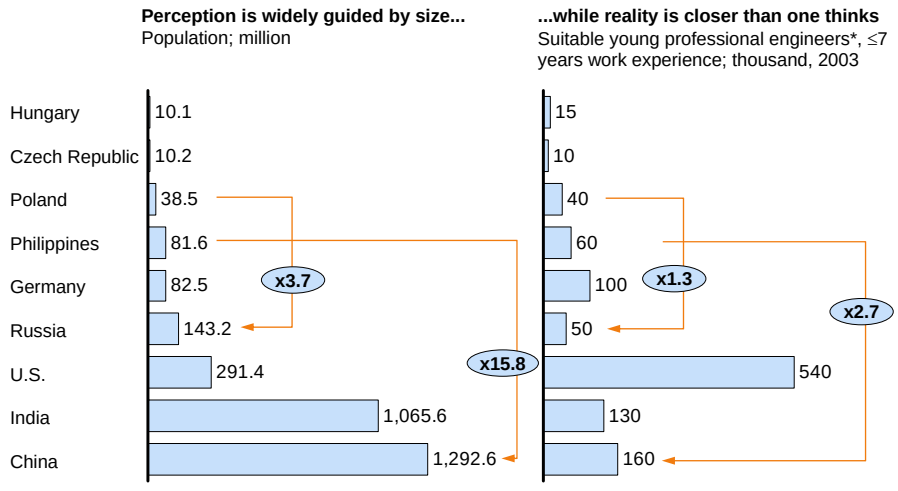
More nascent offshoring markets—like Russia and China—are also growing rapidly and, even worse, they lack India's depth in the market, making manager scarcity even more severe. In fact, some Russian entrepreneurs have tapped India for middle managers.

Many smaller countries have sizable, attractive talent pools and multinational companies should look beyond aggregate numbers

Given differences in the portion of university graduates that could successfully work for a multinational company, many smaller countries can be attractive offshoring locations (Exhibit 5). Even though China's population is 16 times the size of the Philippines, for instance, its pool of suitable young professional engineers is only 3 times the size of the Philippines. Poland has nearly as many qualified engineers as the much more populous Russia. Poland, Hungary, Russia, and the Czech Republic together have as many suitable generalists as India, and nearly as many suitable engineers. As a result, many countries are likely to play a role in the emerging global labor market.

Exhibit 5

POPULATION IS NOT ALWAYS AN APPROPRIATE INDICATOR FOR SUITABLE LABOR SUPPLY



* Including all engineering disciplines (except civil engineering); including all IT and computer science degrees.
Source: Global Insight; Country Ministries of Education/Labor Statistics Offices; HR interviews

Multinational companies should thus focus specifically on the suitable talent supply for the job categories they need, rather than relying on the size of a country's overall population. As we will see in the next report, the "follow the leader" strategy that so many companies have used in choosing an offshore location to date leads to accelerating wages and high turnover. Within countries, companies should size the labor supply at the city level, and explore multiple locations, smaller cities, and telework options to alleviate limited talent accessibility. Multinationals should also consider emigrant talent in other countries to fill middle-manager positions in offshoring operations.

Countries should focus on improving the quality of talent

Countries seeking to play a role in the emerging global labor market should concentrate on improving the *quality* of their talent, not just the *quantity* of educated workers. In many developing countries, a large potential labor supply could be unlocked by improving the suitability of college graduates, particularly their language skills. For instance, if Chinese engineering graduates were to reach the current suitability rate of Indian engineers by 2008, the supply would nearly double, jumping from 212,000 today to 395,000 in 2008. Improving the suitability of graduates is far from simple, but educational improvements can be coordinated closely with domestic and multinational companies to develop practical skills training in universities and external management training programs. Study and work abroad programs can help students gain international experience and create a worldwide diaspora of highly educated and globally minded workers.

Synthesis

INTRODUCTION

The offshoring of service jobs from high-wage countries to low-wage countries is accelerating, and will have important effects on labor markets in both developed and emerging markets. But to date there has been an absence of data and hard facts around several key questions:

- What is the potential supply of labor in low-wage nations and how does it compare to the labor supply in developed economies?
- What makes a job candidate suitable or unsuitable for work in a multinational company, and how does this narrow the low-wage labor supply?
- How is talent spread across emerging markets, and which countries will supply labor for offshoring?

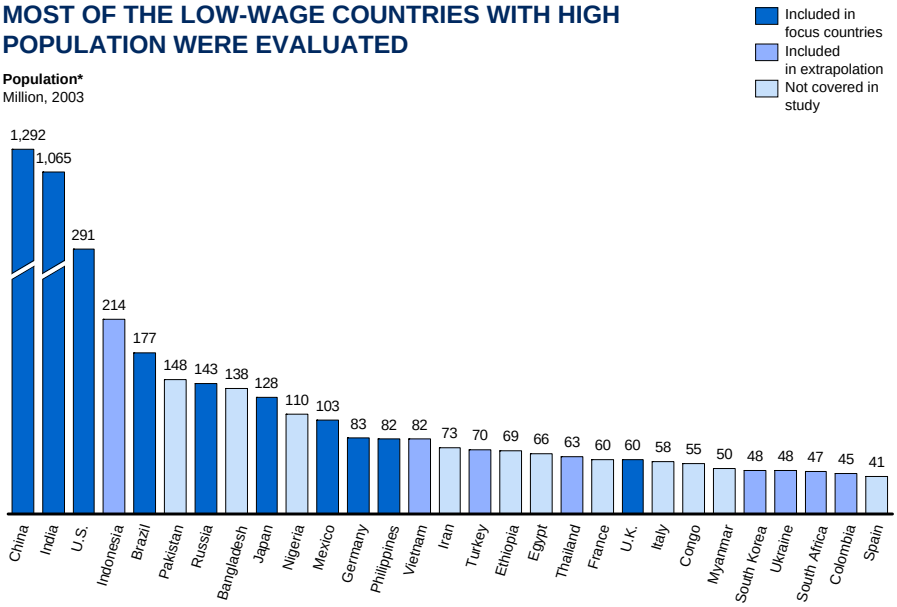
To provide answers to these questions, the McKinsey Global Institute quantified the supply of talent in 28 low-wage countries and 8 mid- to high-wage ones (Exhibit 1).[1] Our analysis covers eight occupations that could be performed remotely: engineers, finance and accounting professionals, analysts, life science researchers, doctors, nurses, and generalists. We focus mainly on

[1] Mid- to high-wage countries studied in-depth were: Canada, Germany, Ireland, Japan, the United Kingdom, and the United States; Australia and South Korea were studied by way of extrapolation. Low-wage countries included in the in-depth study were: Brazil, China, Czech Republic, Hungary, India, Malaysia, Mexico, Philippines, Poland, and Russia; other low-wage countries studied were: Argentina, Bulgaria, Chile, Colombia, Croatia, Estonia, Indonesia, Latvia, Lithuania, Romania, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, and Vietnam.

young professionals with less than seven years of experience, since experienced professionals and middle managers are a more heterogeneous group and the needs of multinational companies for such workers is varied.[2]

Exhibit 1

MOST OF THE LOW-WAGE COUNTRIES WITH HIGH POPULATION WERE EVALUATED



* All countries with a population of ≥40 million are shown here.
Source: Global Insight

This report presents the results of those analyses. It has important implications for how the emerging global labor market will develop, for companies in high-wage economies that seek to locate some activities offshore, and for policy makers in low-wage countries that wish to attract offshoring investment. The report is divided into four sections:

- **Potential labor supply in low-wage countries**: examines the total number and growth rate of university graduates in eight occupational categories in 28 low-wage and 8 mid- and high-wage countries.

2 Our interviews also suggest that multinational companies mostly do not consider hiring experienced workers in low-wage countries because they are not considered a viable alternative to recent graduates. (This view radically changes when the need arises for extremely specialized professionals, such as nuclear physicists.) Many HR professionals thought college graduates of older age groups were much less suitable than today's graduates, especially in Eastern Europe and Russia. This is true for generalists—mainly because many more lack language abilities—as well as for specialist degree holders such as life science researchers.

- **Factors reducing the potential labor supply in low-wage countries** discusses the reasons why the majority of university graduates in low-wage countries would not be available to work for multinational companies.
- **Available labor supply for multinational companies** quantifies the actual, available supply of talent in low-wage countries for multinational companies, by occupation and country, given the factors discussed in the first section.
- **Implications for companies and countries** examines what these findings mean for both multinational companies seeking to locate service functions in low-wage countries and for developing countries seeking to attract such investment.

POTENTIAL LABOR SUPPLY IN LOW-WAGE COUNTRIES

Based on workforce size alone, the potential number of workers in low-wage countries would appear to be enormous. Around 1.8 billion people were working or looking for work in our sample of low-wage countries in 2003, and this number is growing fast (Exhibit 2).[3]

But sheer numbers are deceiving. Agriculture is still the largest contributor to overall employment in many developing economies (60 percent and 44 percent in India and China, respectively) (Exhibit 3). For all but one of the occupational groups that we analyzed, a college degree is a prerequisite (the exception is support staff). In developed countries, roughly one-fifth of the workforce has college degrees, while in developing countries, only 7 percent of the workforce has a university degree (Exhibit 4).

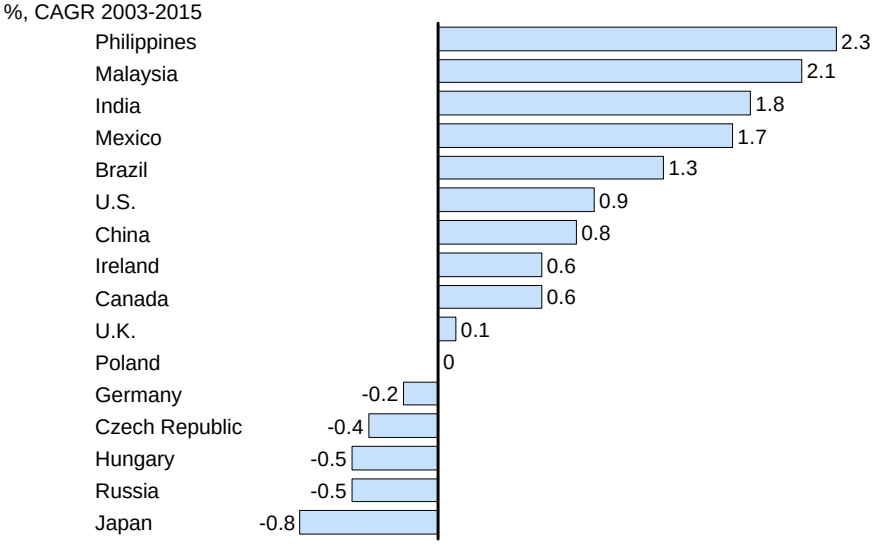
In addition, some job categories in which labor could be resourced globally, such as IT services, require specific knowledge, further narrowing the pool of potential talent for multinational companies. In India, for instance, only 4 percent of the total university-educated workforce has an engineering degree, compared to 20 percent in Germany and 33 percent in China (Exhibit 5).

3 China is one of the countries expected to provide a large potential for low-wage labor for global resourcing, but a rigorous "one child" policy is causing its population to age rapidly. It will reach a median age of 45 by 2050—the same age as in the developed world. In absolute numbers, the number of elderly will jump to 355 million in 2030 and 450 million in 2050, up from 133 million in 2001, while the share of working-age people will shrink.

Exhibit 2

DUE TO CHANGING DEMOGRAPHICS, SOME COUNTRIES WILL FACE A DECLINING WORKING AGE POPULATION

Projected growth of working age population
%, CAGR 2003-2015

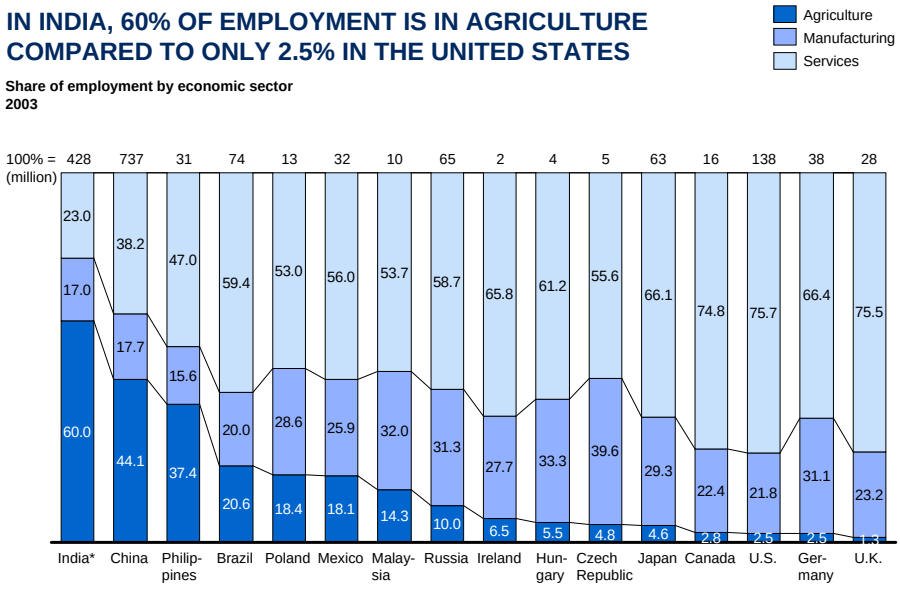


Source: Global Insight; U.S. Census Bureau

Exhibit 3

IN INDIA, 60% OF EMPLOYMENT IS IN AGRICULTURE COMPARED TO ONLY 2.5% IN THE UNITED STATES

Share of employment by economic sector
2003

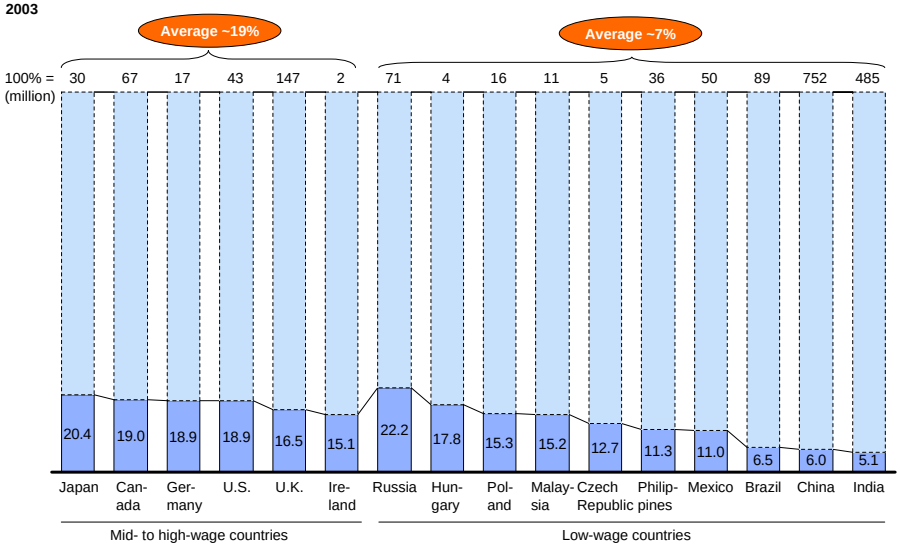


* Shares as of 1999.
Source: International Labor Organization; Global Insight; CIA World Factbook

Exhibit 4

DRIVEN BY CHINA AND INDIA, ONLY ~7% OF THE WORKFORCE IN OUR LOW-WAGE COUNTRY SAMPLE HAS AT LEAST A COLLEGE DEGREE

Share of workforce with university education
2003

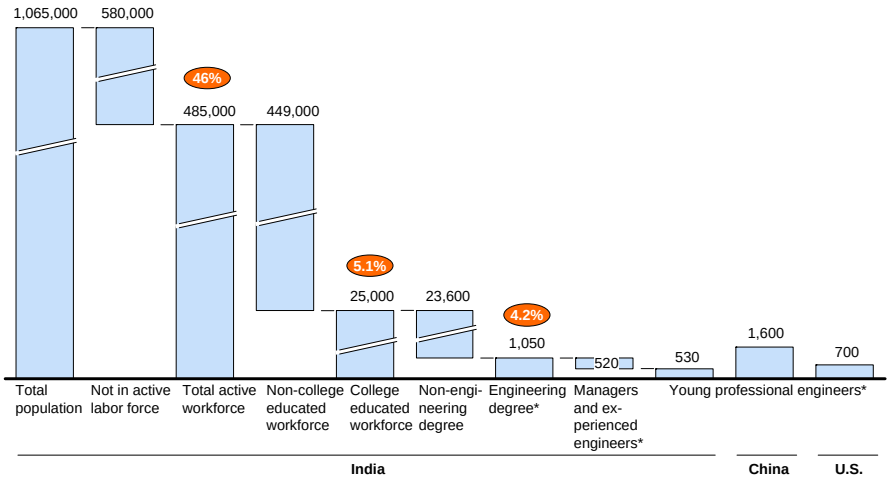


Source: Country statistical offices/labor offices; Global Insight

Exhibit 5

THERE IS A LARGE GAP BETWEEN MACRO-FIGURES AND OCCUPATION-SPECIFIC SUPPLY, BUT LOW-WAGE SUPPLY POTENTIAL IS STILL LARGE

Thousand, 2003



* Including all engineering disciplines (except agricultural and civil engineering); including all IT and computer science engineers; young professionals have ≤7 years of work experience; numbers do not consider variances in talent suitability, accessibility and domestic competition for talent.

Source: Global insight; India Ministry of Education

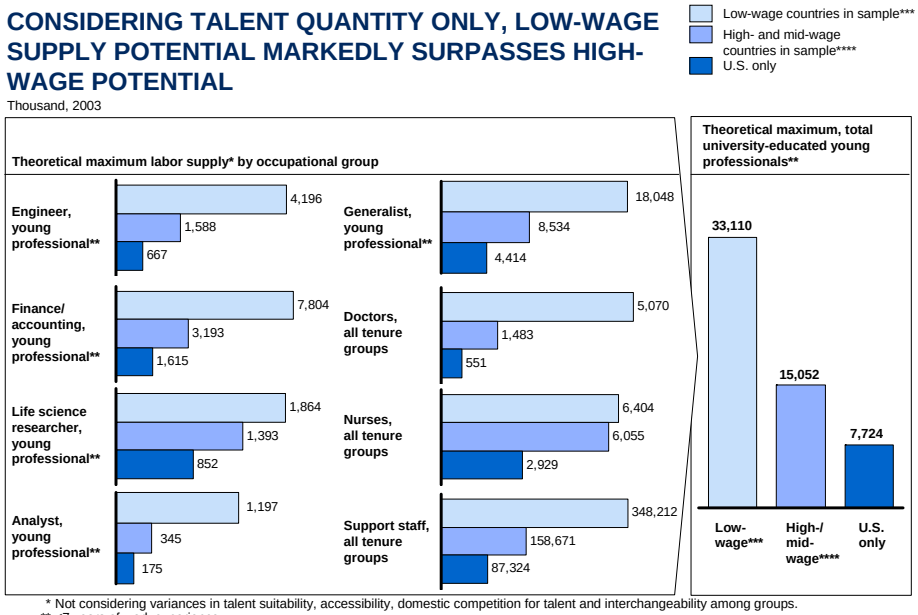
Still, even after taking all these factors into account, the potential supply of labor for offshoring in emerging markets is large. In our sample of 28 low-wage countries, we found that there are approximately 33 million young professionals (university graduates with up to seven years of experience). This compares to 15 million young professionals in our sample of eight higher-wage nations (United States, United Kingdom, Germany, Japan, Australia, Canada, Ireland, South Korea), and 7.7 million in the United States alone. Including support staff, doctors, and nurses, the figure rises to 392.8 million potential workers in low-wage countries, compared to 181.3 million in our sample of high-wage ones.

Exhibit 6 shows that this "theoretical maximum" labor supply in low-wage nations is large in all job categories. India alone has nearly as many young professional engineers as the United States, and China has more than twice as many (Exhibit 7). Russia has almost ten times as many finance/accounting professionals as Germany. China has four times the number of doctors as the United States (Exhibit 8). In terms of sheer size, China, India, Russia, and the United States dominate all job categories.

Exhibit 6

CONSIDERING TALENT QUANTITY ONLY, LOW-WAGE SUPPLY POTENTIAL MARKEDLY SURPASSES HIGH-WAGE POTENTIAL

Thousand, 2003

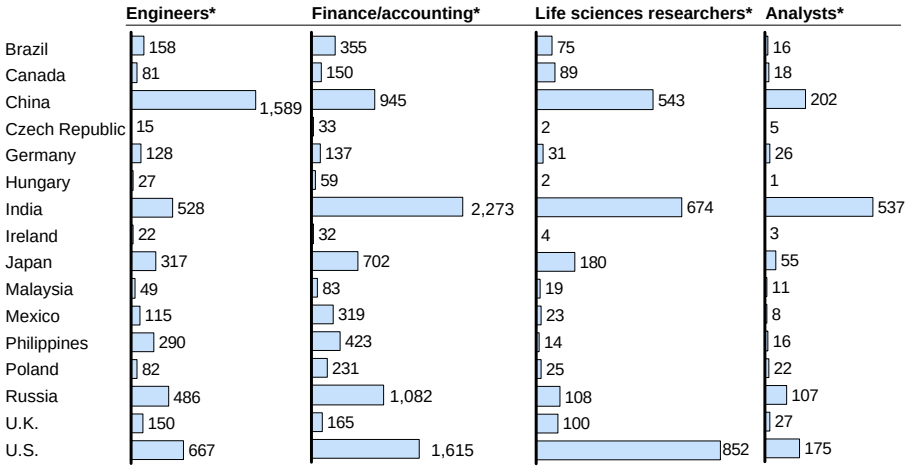


* Not considering variances in talent suitability, accessibility, domestic competition for talent and interchangeability among groups.
** ≤7 years of work experience.
*** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
**** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
Source: Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 7

CONSIDERING TALENT QUANTITY ONLY, CHINA, INDIA & U.S. DOMINATE THE WORLD'S LABOR SUPPLY IN ALL OCCUPATIONAL GROUPS (1/2)

Theoretical maximum labor supply**
Thousand, 2003

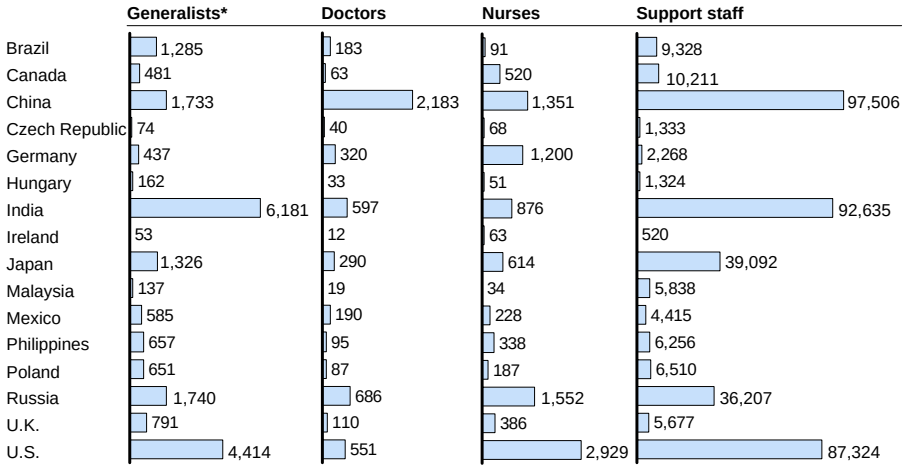


* Young professionals only; work experience ≤7 years.
** Not considering variances in talent suitability, accessibility, domestic competition for talent and interchangeability among groups.
Source: Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 8

CONSIDERING TALENT QUANTITY ONLY, CHINA, INDIA & U.S. DOMINATE THE WORLD'S LABOR SUPPLY IN ALL OCCUPATIONAL GROUPS (2/2)

Theoretical maximum labor supply**
Thousand, 2003

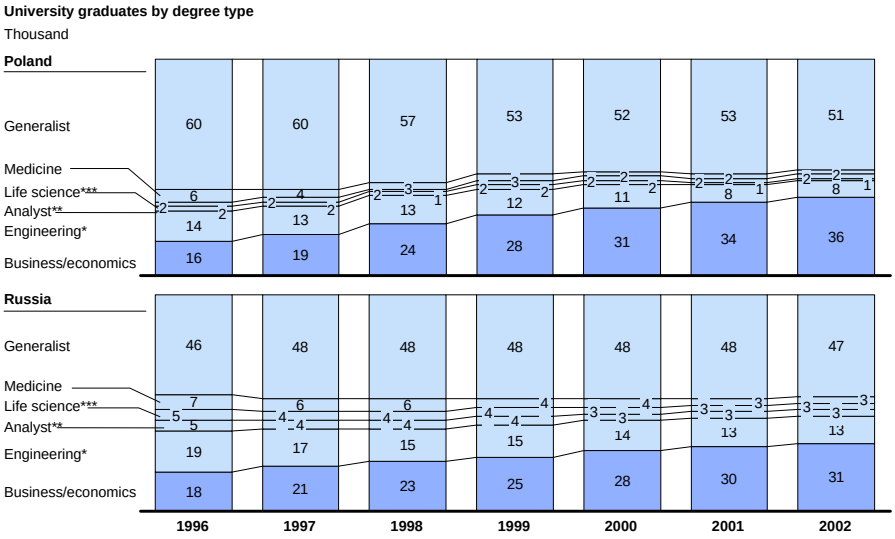


* Young professionals only; work experience ≤7 years
** Not considering variances in talent suitability, accessibility, domestic competition for talent and interchangeability among groups.
Source: Country labor & graduation statistics; McKinsey Global Institute analysis

The number of college graduates in low-wage countries is also growing very quickly (over 5 percent annually) compared to developed economies (around 1 percent). This is particularly true in degrees for which there is high demand from multinational and domestic companies. The share of degrees awarded in business and economics jumped from 18 percent to 31 percent in Russia in just five years, and from 16 percent to 36 percent in Poland (Exhibit 9).

Exhibit 9

SHARE OF BUSINESS/ECONOMICS GRADUATES IN POLAND AND RUSSIA HAS SEEN EXPLOSIVE GROWTH; ANALYSTS AND ENGINEERS DECLINED



* Including all engineering disciplines (except civil engineering); including all IT and computer science degrees.
** Including mathematics, physics, and statistics.
*** Including chemistry, biology and, pharmacology.
Source: Poland Statistical Office; Russian Ministry of Education

THREE FACTORS REDUCE THE POTENTIAL LABOR SUPPLY

Although the potential supply of talent in low-wage countries is large and growing rapidly, only a small fraction of potential job candidates could successfully work at a multinational company. The reasons are limited suitability, lack of accessibility, and domestic competition for talent.

Limited suitability

Interviews with 83 human resource managers in multinational companies[4] reveal that on average, only 13 percent of university graduates in low-wage nations are suitable to work for a multinational company. This share rises to 19 percent when taking into account the possibility that an engineering graduate—while potentially unsuitable for an engineering position—might still be suitable to perform a generalist function.[5]

The portion of job candidates that are suitable varies across occupations. The generalist category, which includes call-center employees and administrative support staff, requires very good language skills and has the lowest suitability rates. Specialist occupations, such as engineers and finance and accounting professionals, are more suitable, with the average being 17 percent and 19 percent, respectively. Engineers require fewer English language skills (apart from the team leader who must communicate with headquarters), and they generally have better English skills anyway because engineering courses in many countries are taught primarily in English (Exhibit 10).

Suitability rates also vary by country. Candidates from Eastern Europe had the highest suitability rates across all occupations. The human resource experts we interviewed said they would see no issue with employing half of the engineering graduates from Czech universities, as compared to only 25 percent in India or 13 percent in Brazil. Russia and China ranked lower on suitability. In engineering, only 10 percent of Russian and Chinese candidates would be suitable to work for a multinational (Exhibits 11 and 12).

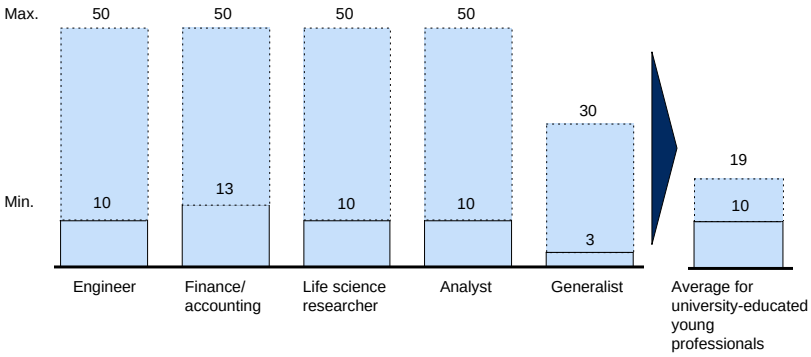
4 We conducted 83 interviews with HR managers at multinational companies, HR agencies primarily supplying MNCs as well as heads of remote centers in each country. For each occupational group, we asked a quantitative question (*"Of 100 random candidates with the correct degree, how many could you employ if you had sufficient demand for all 100?"*) and a qualitative question (*"What are the main deficiencies of the candidates you turned away?"*). Answers to both questions were surprisingly homogeneous across interviewees in most of the countries.

5 For an in-depth discussion of the interchangeability concept, as well as the methodology and assumptions we applied, please refer to the Technical Notes of this report.

Exhibit 10

IN LOW-WAGE COUNTRIES, ON AVERAGE ONLY 13% OF UNIVERSITY GRADUATES ARE SUITABLE TO WORK IN A MULTINATIONAL COMPANY

"Of 100 graduates with the correct degree, how many could you employ if you had demand for all?"
%



Weighted average of all low-wage countries studied*	17	19	14	15	10	13

* Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Russia, Romania, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.

Source: Interviews with HR managers, HR agencies and heads of global resourcing centers; McKinsey Global Institute analysis

Exhibit 11

SUITABILITY VARIES MARKEDLY BETWEEN COUNTRIES AND SEEMS ESPECIALLY LOW IN NASCENT GLOBAL RESOURCING MARKETS (1/2)

"Of 100 graduates with the correct degree, how many could you employ if you had demand for all?"
%

	Countries	Engineer	Finance/accounting	Generalist
Eastern Europe	**Russia**	**10**	**20**	**10**
	Czech Republic	50	40	20
	Poland	50	30	15
	Hungary	50	50	30
Asia	**China**	**10**	**15**	**3**
	Philippines	20	30	25
	India	25	15	10
	Malaysia	35	25	20
Latin America	**Brazil**	**13**	**13**	**8**
	Mexico	20 – 42*	25 – 35*	11

- **All suitability rates are empirically based on a total of 83 interviews with HR professionals working in each country**
- **Only for doctors and nurses, same suitability rate than for life science researchers was assumed due to a lack of interviews**

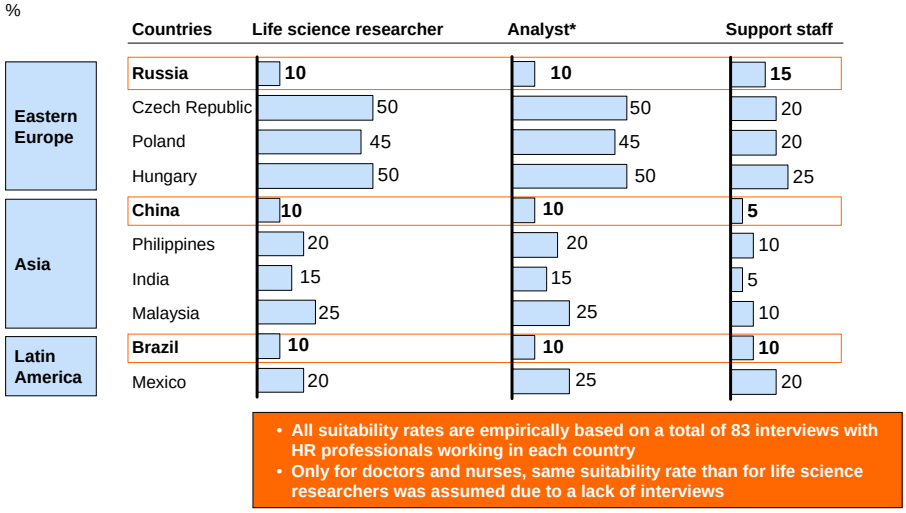
* Mexico is the only country where interview results (higher number) were adjusted since interview base was thinner and risk of misunderstanding high.

Source: Interviews with HR managers, HR agencies, and heads of global resourcing centers; McKinsey Global Institute analysis

Exhibit 12

SUITABILITY VARIES MARKEDLY BETWEEN COUNTRIES AND SEEMS ESPECIALLY LOW IN NASCENT GLOBAL RESOURCING MARKETS (2/2)

"Of 100 graduates with the correct degree, how many could you employ if you had demand for all?"
%



* Used engineers as proxy in some cases.
Source: Interviews with HR managers, HR agencies, and heads of global resourcing centers; McKinsey Global Institute analysis

Three factors limit the suitability of job candidates in low-wage nations:

- **Language proficiency**

  A recurring theme across all low-wage countries was the lack of English-language proficiency, particularly for generalists who need to work closely with the home office and customers. Language barriers are especially prevalent in China and Brazil. But even though English is the official language in India, not every graduate there has good enough English to work for a multinational company. Graduates from Southern India particularly suffer from accent issues, and there have been examples of call centers being relocated from India to the Philippines due to low customer satisfaction ratings.

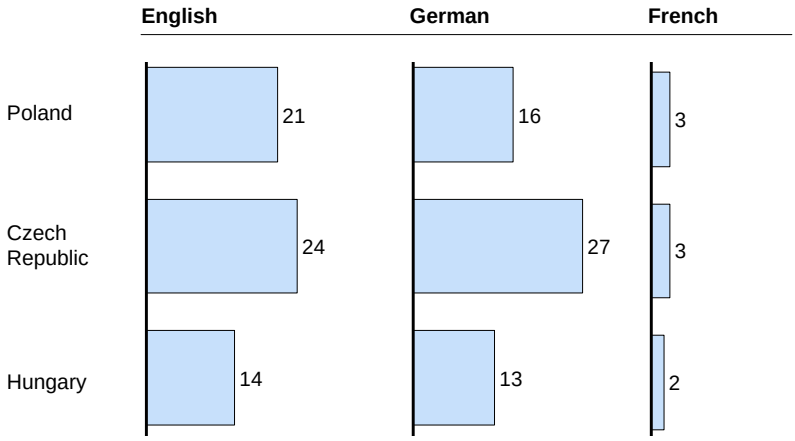
  Many European and Japanese companies, of course, require different foreign language skills. European companies therefore look toward Eastern Europe, where the share of German-speaking graduates can be as high as the number of English-speaking ones (French is much less common) (Exhibit 13). Japanese companies look to northeastern China for offshore labor when Japanese language abilities are important.

Exhibit 13

THE SHARE OF GERMAN VS. ENGLISH LANGUAGE SPEAKERS IN EASTERN EUROPE SEEMS FAIRLY EQUAL

Share of population who can carry out a conversation in a foreign language*

%



* Across all occupations and age groups; language ability for recent university graduates higher.
Source: European Commission, 1999

Interviewees report that many companies underestimate the level of language training required of their offshore workers. "They think that three hundred words of German are sufficient to handle an invoice, which is clearly wrong," said one HR expert we spoke to.

- **Educational system**

The quality of a country's educational system also affects the suitability of offshore talent. Eastern European job candidates were given high marks in this aspect, and many interviewees said their education rivals that in western Europe and the United States. Brazilian graduates were seen as especially strong in engineering. Russian and Chinese graduates are held back by the theoretical nature of their education, even though they are praised for being able to grasp new concepts very quickly.

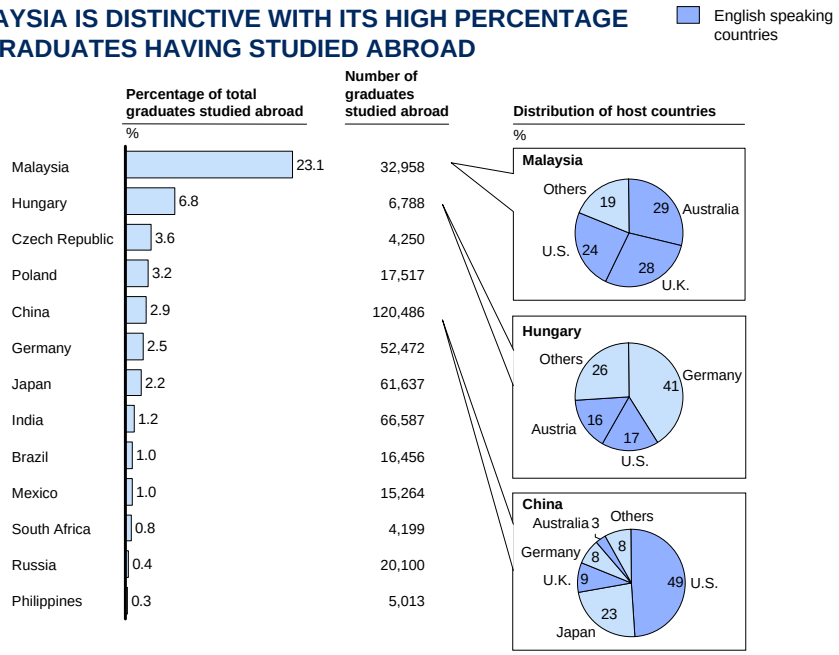
In India, graduates from the top schools rank excellently but there is a steep decline in quality beyond the top-tier schools. "Many so-called 'degrees' just do not have the right fundamental education behind them," one interviewee said. This wide variance in the quality of universities explains why the

average suitability rate for Indian engineers is only 25 percent. High emigration rates further depressed the high-quality supply of suitable graduates from top schools.

Similarly, a talent perception problem regarding the quality of the Philippines' educational system limits its ability to attract specialist offshoring beyond call centers. In Malaysia, more than 20 percent of all graduates have studied abroad, mostly in the United States, United Kingdom, and Australia, which raises suitability (Exhibit 14).

Exhibit 14

MALAYSIA IS DISTINCTIVE WITH ITS HIGH PERCENTAGE OF GRADUATES HAVING STUDIED ABROAD



Source: Atlas of student mobility, 2003

- **Cultural issues**

The potentially large cultural distance between applicants from low-wage countries and multinational employers is often underestimated, and can be seen in interpersonal skills, attitudes toward teamwork, flexibility in working hours, and ability to work with a hierarchical management structure. "Many find the working hours and the competitive environment in a multinational company shocking," said one expert we interviewed.

Hiring managers generally saw a stronger cultural fit in countries which have close, historical links with the home countries of many multinational companies, such as the Czech Republic with Germany or the Philippines with the United States. Our interviewees uniformly praised the cultural fit and favorable work ethics of Indian workers: "They have an American attitude toward work," said one person. Cultural differences are more prevalent in Malaysia and China.

Job candidates from Eastern Europe sometimes suffer from a different problem: inflated expectations, fueled in part by the offshoring boom over the last 15 years. Part of the problem seems to have been a failure of multinationals to communicate work content clearly and honestly. Many companies recruited top talent with superior skills in finance and accounting and provided them with only limited responsibilities and career options.

Lack of accessibility

The pool of potential talent in low-wage nations is further diminished by the fact that many university graduates are not geographically accessible to a multinational. We estimate that only 45 percent to 80 percent of all graduates are currently accessible for multinational companies to hire.[6] Two factors limit accessibility: dispersion of the labor supply and mobility. These play different roles in each country, although Indian workers rank well in both categories (Exhibit 15).

Chinese graduates are most dispersed across the country. In 2003, the 1.7 million college graduates in China had studied at 1,683 colleges and universities and only 30 percent studied in one of the top ten university cities (Exhibit 16). Only 25 percent of Chinese graduates lived in a city or region close to a major international airport, a key requirement for most multinational companies to set up offshore facilities. Given that some graduates would be willing to move, roughly half of China's graduates are accessible (Exhibit 17).

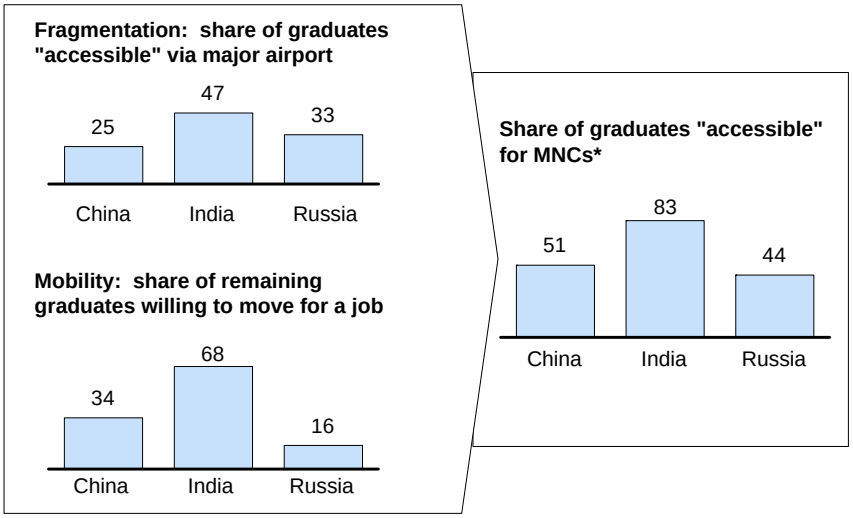
In Russia, more than a quarter of Russian graduates studied in the Moscow and St. Petersburg regions alone. Still, across the country, only 33 percent of Russian

6 This analysis is based on the three largest countries: China, India, and Russia.

Exhibit 15

RUSSIAN UNIVERSITY GRADUATES ARE LESS FRAGMENTED, BUT ALSO LESS MOBILE THAN CHINESE ONES, INDIA'S ARE MOST "ACCESSIBLE"

%



* Accessible graduates = Graduates who studied close to a major international airport + (Remaining graduates x Empirical mobility rate)

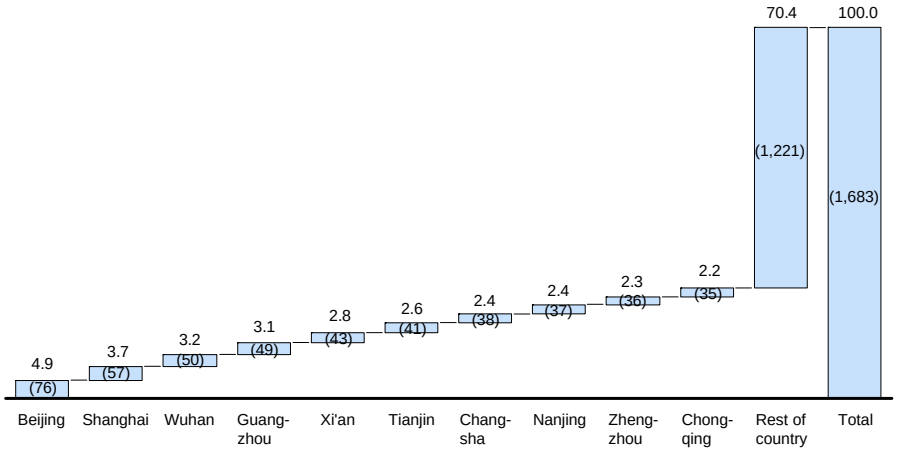
Source: Country labor & graduation statistics; surveys on student mobility; McKinsey Global Institute analysis

Exhibit 16

GRADUATES IN CHINA ARE VERY FRAGMENTED ACROSS 1,683 UNIVERSITIES AND COLLEGES

Share of graduates by city*/(number of universities and colleges)

2003



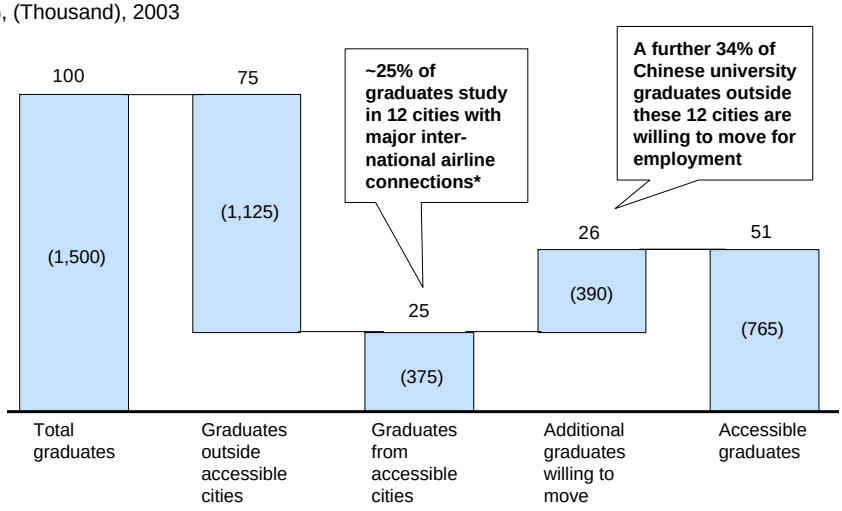
* Share of graduates by city was approximated based on the city's population and its share of colleges.

Source: China Ministry of Education

Exhibit 17

APPROXIMATELY HALF OF CHINA'S UNIVERSITY GRADUATES ARE CURRENTLY ACCESSIBLE BY MNCs

University graduates
%, (Thousand), 2003



* Beijing, Shanghai, Guangzhou, Xi'an, Nanjing, Chongqing, Harbin, Kunming, Dalian, Qingdao, Xiamen, Shenzhen.

Source: Institute of Education Economics, Beijing University

graduates studied close to a major international airport. Almost half of Indian students graduated close to a major international hub, such as Mumbai, Delhi, Bangalore, or Hyderabad.

Indian graduates are the most mobile, both nationally and internationally. By contrast, Russian graduates outside Moscow and St. Petersburg mostly prefer to work in their university or native city, rather than to move for employment (Exhibit 18).[7]

Competition for talent from non-offshoring companies

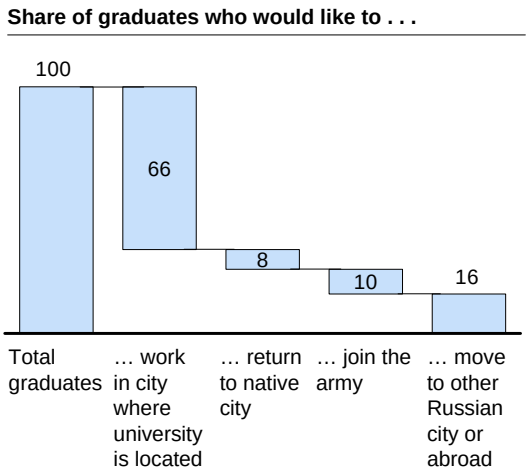
Finally, the potential labor supply in emerging markets is reduced because some suitable job candidates will choose to work for companies serving the domestic market, whether they are nationally owned, foreign multinationals, or foreign joint ventures. This is especially true for China. The employment demand from multinational companies is growing rapidly, while successful domestic companies, such as Lenovo, Haier, or TCL, are increasingly attractive options for

7 Two similar surveys among graduates were used to determine mobility assessments for China and India.

Exhibit 18

APPROXIMATELY 6% OF RUSSIAN GRADUATES OUTSIDE MOSCOW AND ST. PETERSBURG ARE WILLING TO MOVE FOR A JOB

%*, 2003



* Average of survey results from Ekaterinburg, Smolensk, and Ufa.
Source: Demoscope weekly, 2003, No. 19

the same high-quality talent pool. We estimate that half of the suitable, accessible labor pool in China is choosing to work at multinationals and domestic companies that do not serve offshoring demand instead of an offshoring multinational (Exhibit 19).

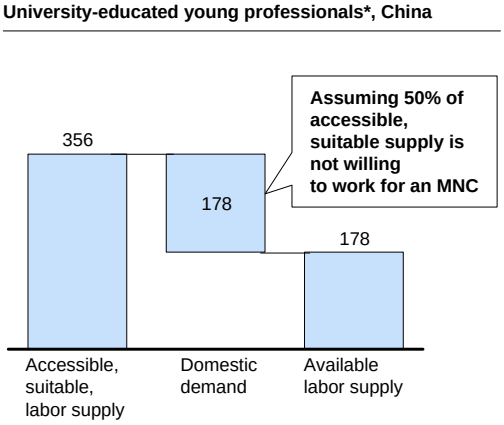
In coming years, this will create a shortage of labor for firms seeking to set up offshoring operations in China. In 2002, large foreign-owned companies and foreign-Chinese joint ventures employed 2.7 million people in China, and employment grew annually at 12 percent and 23 percent, respectively, from 1998 to 2002 (Exhibit 20).[8] If these growth rates persist, multinationals and joint ventures in China alone will need an additional 750,000 university graduates from 2003 to 2008 (Exhibit 21)—nearly three-quarters of the 1.1 million suitable graduates that our labor supply model predicts China will produce over the same period. Excluding workers who live outside the areas of peak demand, the supply of suitable graduates will barely meet multinational demand alone (Exhibit 22).

8 We only considered companies with greater than one thousand employees. Foreign-owned companies from Macao, Taiwan, and Hong Kong were excluded as well.

Exhibit 19

DOMESTIC LABOR DEMAND IN CHINA COULD HAVE AN ADDITIONAL IMPACT ON SUITABLE, ACCESSIBLE LOW-WAGE SUPPLY

Impact of domestic competition on accessible, suitable, low-wage labor supply
Thousand, 2003

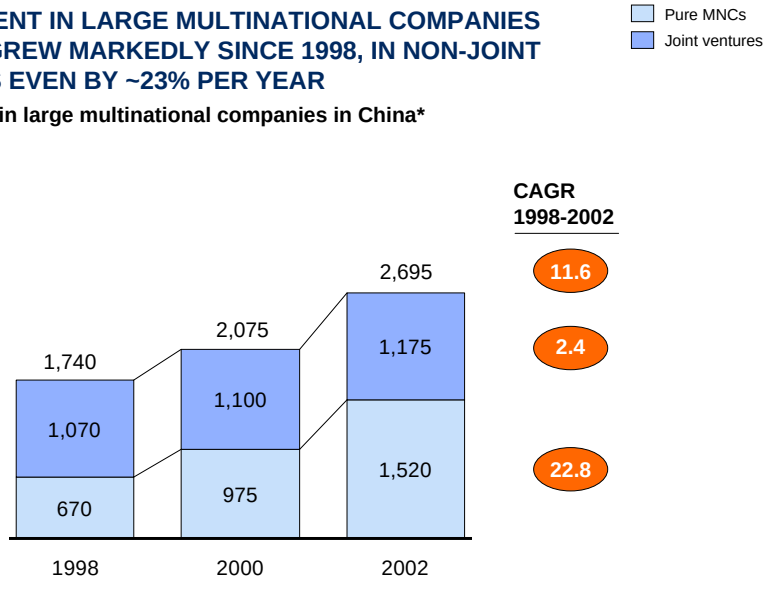


* Engineers, finance/accounting, analysts, life science researchers, generalists; work experience ≤7 years.
Source: HR interviews; country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 20

EMPLOYMENT IN LARGE MULTINATIONAL COMPANIES IN CHINA GREW MARKEDLY SINCE 1998, IN NON-JOINT VENTURES EVEN BY ~23% PER YEAR

Employment in large multinational companies in China*
Thousand

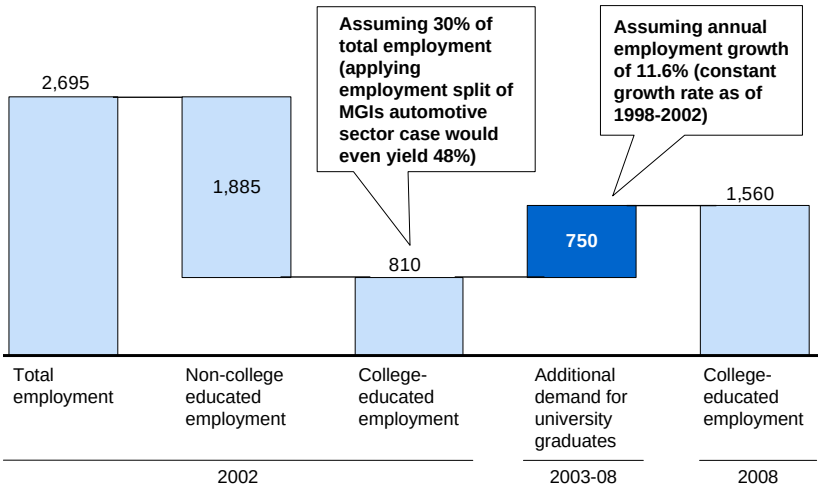


* Enterprises with revenue over $ 604,000 in 2002 and employment of >1,000 FTEs; excluding employment in Hong Kong/Macao/Taiwan owned enterprises.
Source: China statistical yearbook

Exhibit 21

THESE LARGE MNCs IN CHINA, MOSTLY ACTIVE IN MANUFACTURING, WILL DEMAND ADDITIONAL UNIVERSITY GRADUATES FROM 2003-08

Employment in large multinational companies in China*
Thousand

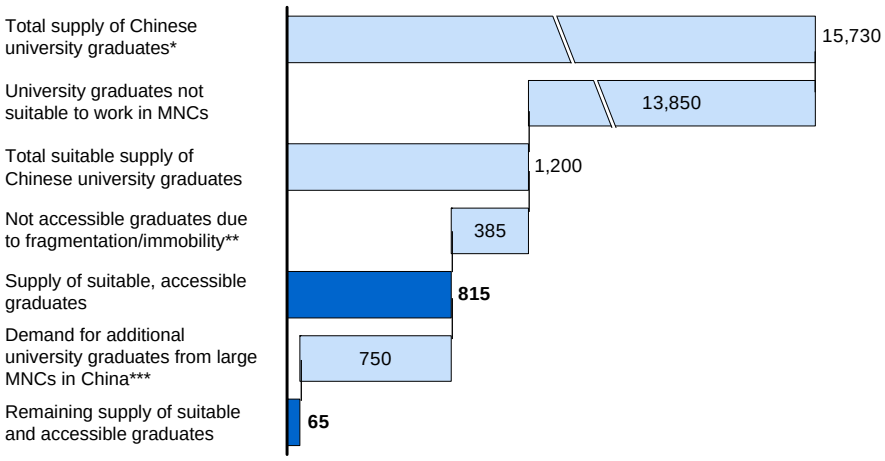


* Enterprises with revenue over $ 604,000 in 2002 and employment of >1,000 FTEs; excluding employment in Hong Kong/Macao/Taiwan owned enterprises.
Source: China statistical yearbook; McKinsey Global Institute analysis

Exhibit 22

SUITABLE SUPPLY OF UNIVERSITY GRADUATES WILL BE BARELY ENOUGH TO SUFFICE DEMAND OF LARGE MNCs IN CHINA

Thousand; 2003-2008



* All university courses except doctors.
** Assuming strong growth of accessibility from currently 51% to 83% in 2008 (India's current level).
*** Enterprises with revenue over $ 604,000 in 2002 and employment of >1,000 FTEs; excluding employment in Hong Kong/ Macao/Taiwan owned enterprises.
Source: McKinsey Global Institute labor supply database

THE AVAILABLE TALENT POOL FOR MULTINATIONAL COMPANIES IS LARGE AND GROWING

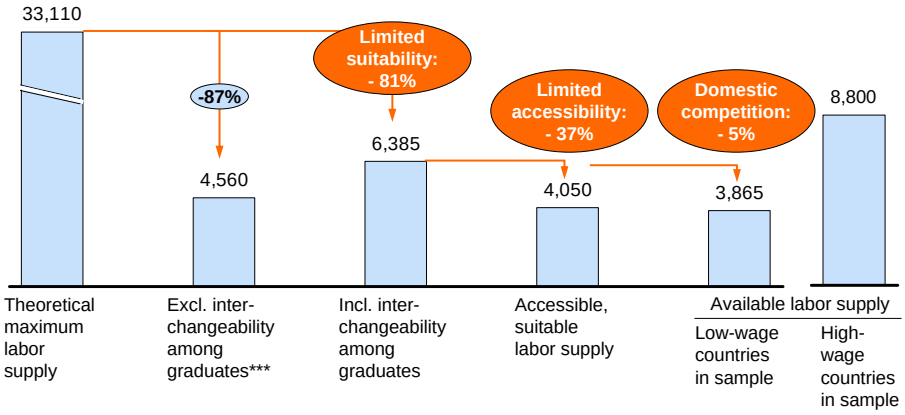
Taking into account these three factors—suitability, accessibility, and competition from other non-offshoring companies—dramatically reduces the pool of talent available for multinational employment, but it is still large and it is growing quickly. While there are 33 million potential young professionals in emerging markets, 4.6 million are suitable to work for a foreign company. If we include the fact that some professionals unsuitable for positions in their occupations might be suitable for generalist positions (interchangeability), suitable supply increases to 6.4 million. Lack of accessibility and competition from non-offshoring employers reduces these pools further still (Exhibit 23). Altogether, we estimate that 2.8 to 3.9 million—or 8 to 12 percent—of the young professionals in low-wage countries are available for hire by export-oriented service offshoring companies. This compares to 8.8 million in our sample of high-wage countries.

Exhibit 23

SUITABILITY HAS THE STRONGEST IMPACT ON AVAILABLE, UNIVERSITY-EDUCATED LABOR SUPPLY FROM LOW-WAGE COUNTRIES

LOWER BOUNDARY ESTIMATE
PARTLY ASSUMPTIONS

University-educated young professionals*, all low-wage countries in sample**
Thousand, 2003



* Engineers, finance/accounting, analysts, life science researchers, generalists; ≤7 years of work experience.
** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
*** interchangeability refers to (i) unsuitable engineering/life science/finance graduates can still work as analysts when fulfilling suitability criteria of this group or (ii) all unsuitable graduates can still work as generalist when fulfilling suitability criteria of this group.
Source:HR interviews; country labor & graduation statistics; surveys on student mobility; McKinsey Global Institute analysis

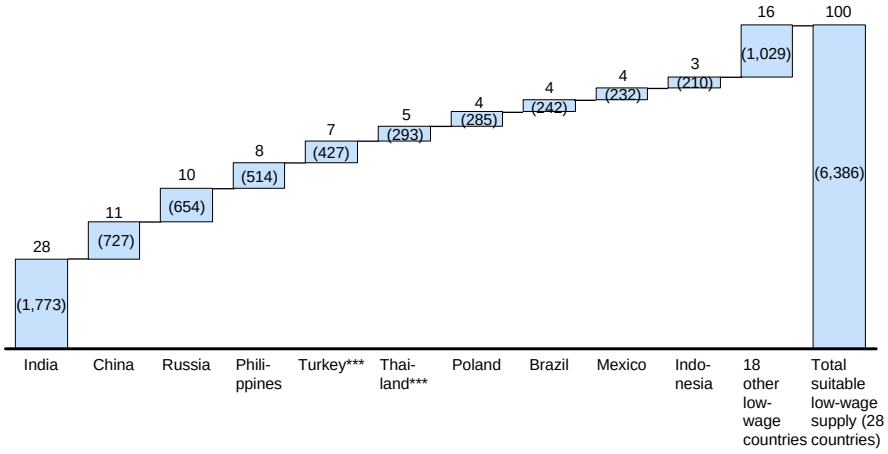
This is a lower boundary estimate, however, of the available labor supply in low-wage countries. In reality, the most suitable job candidates are also likely to be the most mobile and to have studied in a major city. Because of this, we focus on the suitable supply of labor (ignoring accessibility) below.

In both absolute and relative terms, 6.4 million is a large pool of talent available for offshoring. In some occupations, such as engineers, finance and accounting, and analysts, it is 75 percent or more of the suitable pool of labor in our sample of high-wage countries. Given their sheer size, India and China dominate the low-wage labor supply in many occupations. India accounts for nearly 30 percent of the suitable young professionals,[9] for instance, while China and Russia have 11 percent and 10 percent, respectively (Exhibit 24).

Exhibit 24

INDIA IS DOMINATING SUITABLE, LOW-WAGE SUPPLY; REMAINING SUPPLY IS FRAGMENTED AMONG MANY COUNTRIES

Suitable quantity*, total university-educated young professionals**
%, (Thousand), 2003



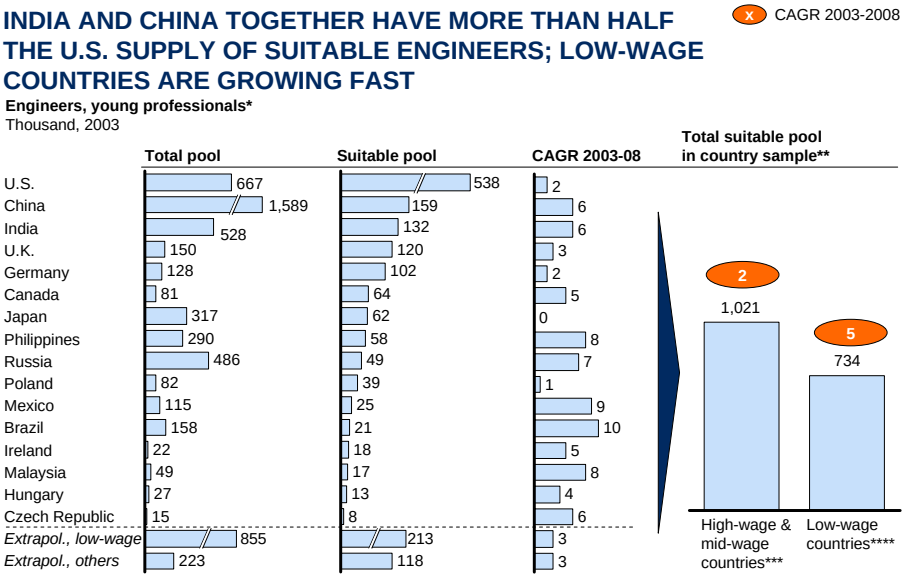
* Accessibility and willingness of talent are tackled as sensitivity issues and are not included here.
** Engineers, finance/accounting, analysts, life science researchers, generalists; ≤7 years of work experience.
*** Number derived via extrapolation.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

9 This includes engineers, finance and accounting, analysts, life science researchers, and professional generalists with less than seven years of experience. It excludes three occupations: doctors, nurses, and support staff.

The suitable supply of labor varies by occupation and country (Exhibits 25 to 32). Several findings stand out. Given that some unsuitable engineers might be suitable as analysts, the supply of analysts in low-wage countries today is already twice as large as that in our high-wage sample. Low-wage nations today also have large pools of suitable, available engineers and finance and accounting professionals. They have a relatively small supply of available life science researchers (the United States alone accounts for 70 percent of the supply in this category) and nurses. Both high-wage and low-wage nations have many suitable support staff workers. In addition, these exhibits make clear that the available pool of talent is dispersed across many countries.

Exhibit 25

INDIA AND CHINA TOGETHER HAVE MORE THAN HALF THE U.S. SUPPLY OF SUITABLE ENGINEERS; LOW-WAGE COUNTRIES ARE GROWING FAST

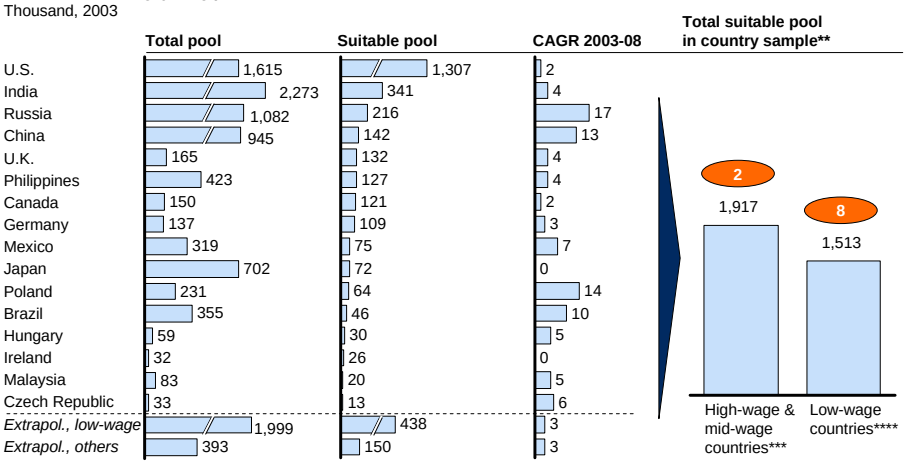


* University degree in engineering (except civil and agriculture) and computer science/IT; ≤7 years of work experience.
** Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
*** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
**** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 26

THE U.S. HAS BY FAR THE MOST FINANCE/ ACCOUNTING PROFESSIONALS; RUSSIA, CHINA, AND POLAND ARE GROWING RAPIDLY

Finance/accounting, young professionals*
Thousand, 2003

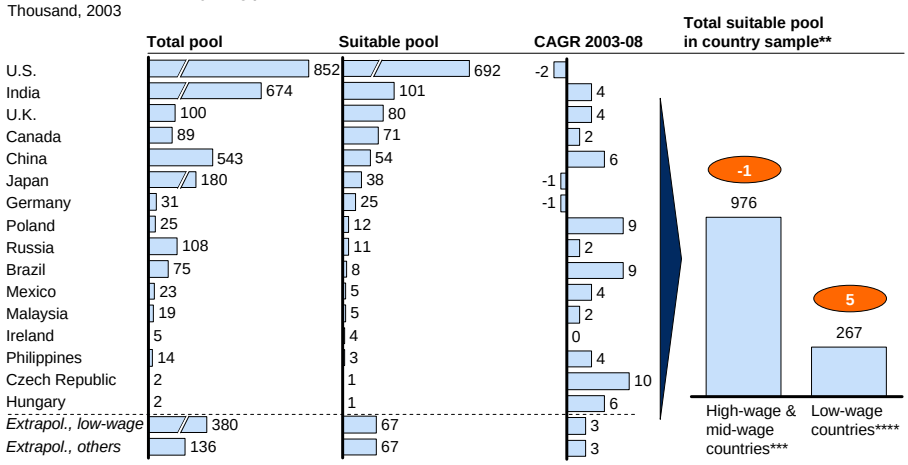


* University degree in finance, accounting, economics, business; ≤7 years of work experience.
** Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
*** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
**** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 27

THE U.S. HAS BY FAR THE MOST LIFE SCIENCE RESEARCHERS, BUT SUPPLY IS SHRINKING IN HIGH-WAGE COUNTRIES

Life science researchers, young professionals*
Thousand, 2003



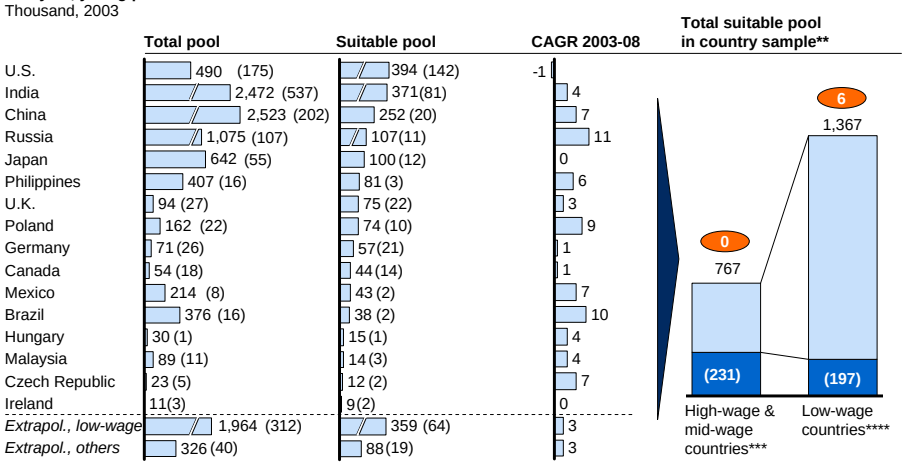
* University degree in biology, chemistry or pharmacology; ≤7 years of work experience.
** Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
*** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
**** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 28

INDIA HAS ALMOST AS MANY SUITABLE ANALYSTS AS THE U.S.; POLAND HAS MORE THAN GERMANY

(X) = Pure analyst degree holders, not accounting for interchangeability
x CAGR 2003-2008

Analysts, young professionals*
Thousand, 2003



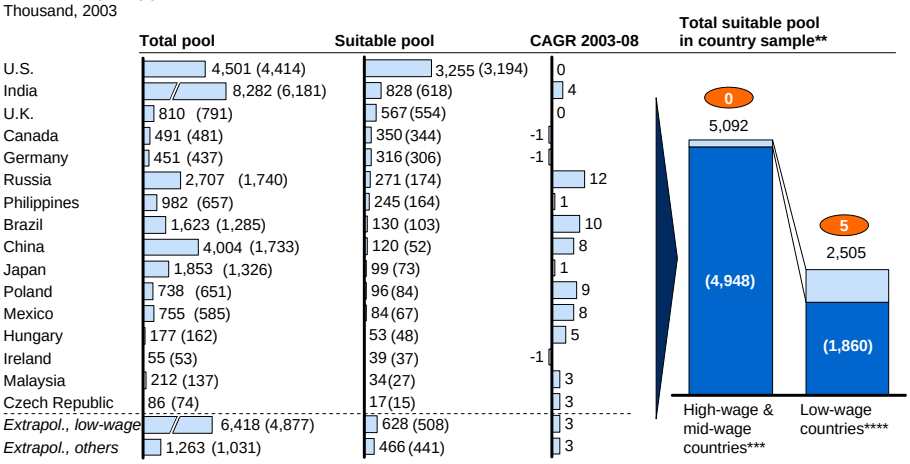
* University degree in mathematics, physics, statistics plus some candidates unsuitable for engineering, finance, and life sciences to account for interchangeability; ≤7 years of work experience.
** Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
*** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
**** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 29

RUSSIA HAS MORE SUITABLE GENERALISTS THAN THE PHILIPPINES AND IS GROWING STRONG

(X) = Pure analyst degree holders, not accounting for interchangeability
x CAGR 2003-2008

Generalists, young professionals*
Thousand, 2003

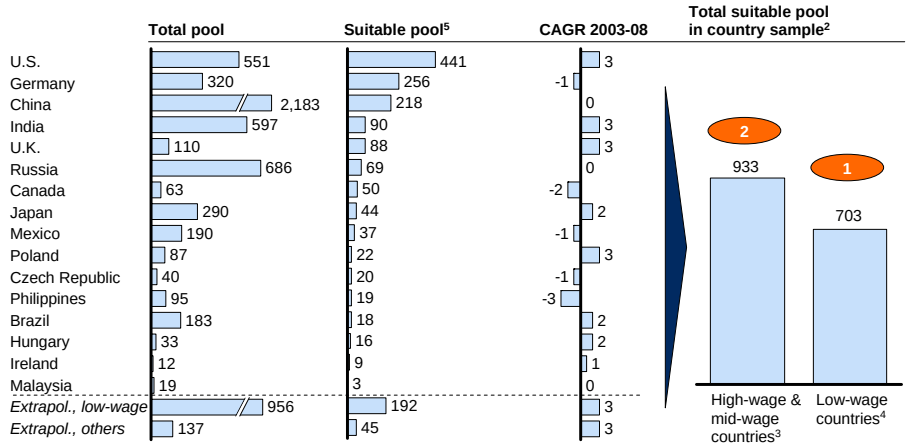


* University degree in any non-specialist field (e.g., sociology) plus some candidates unsuitable for engineering, finance, and life sciences. to account for interchangeability; ≤7 years of work experience
** Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
*** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
**** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 30

CHINA HAS MORE THAN TWICE THE NUMBER OF SUITABLE DOCTORS AS INDIA

Doctors[1]
Thousand, 2003

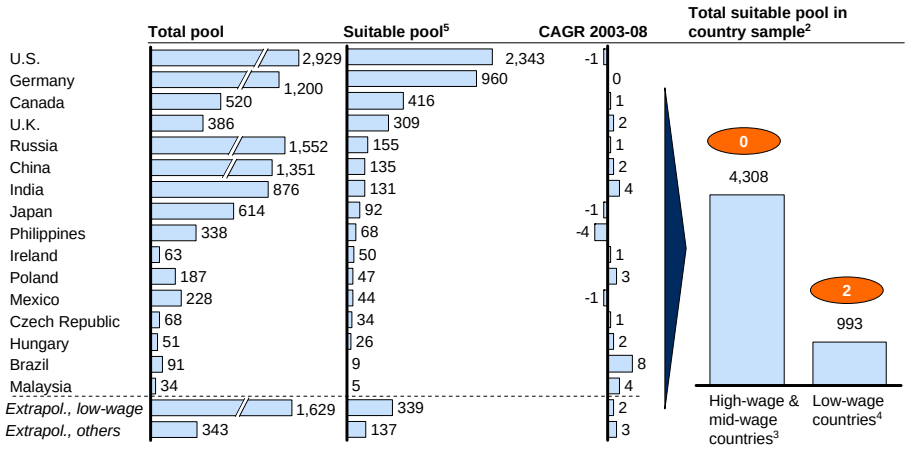


[1] Registered medical doctors, no dentists.
[2] Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
[3] Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
[4] Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
[5] For doctors and nurses, the suitability of life science researchers has been assumed due to lack of interviews on these two occupations.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 31

LOW-WAGE COUNTRIES HAVE MUCH FEWER SUITABLE NURSES THAN HIGH-WAGE COUNTRIES

Nurses[1]
Thousand, 2003

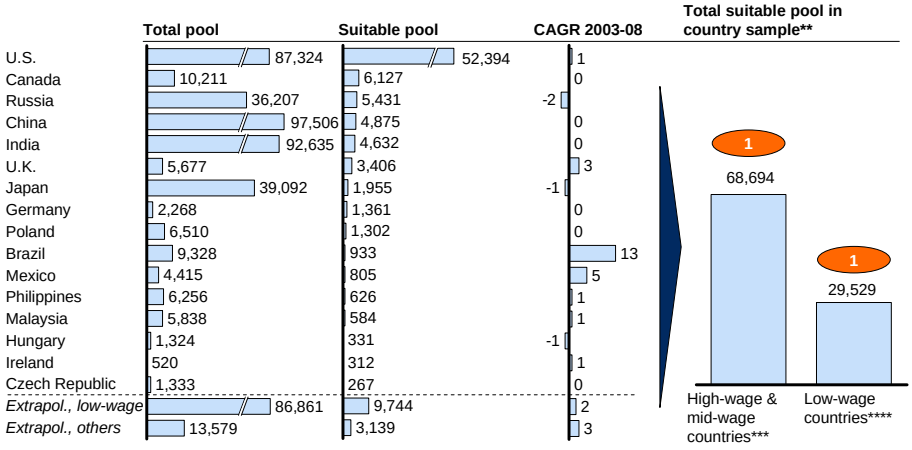


[1] Registered nurses.
[2] Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
[3] Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
[4] Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
[5] For doctors and nurses, the suitability of life science researchers has been assumed due to lack of interviews on these two occupations.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 32

SUPPLY IN SUPPORT STAFF IS ABUNDANT IN HIGH- AS WELL AS LOW-WAGE COUNTRIES

Support staff, young professionals*
Thousand, 2003

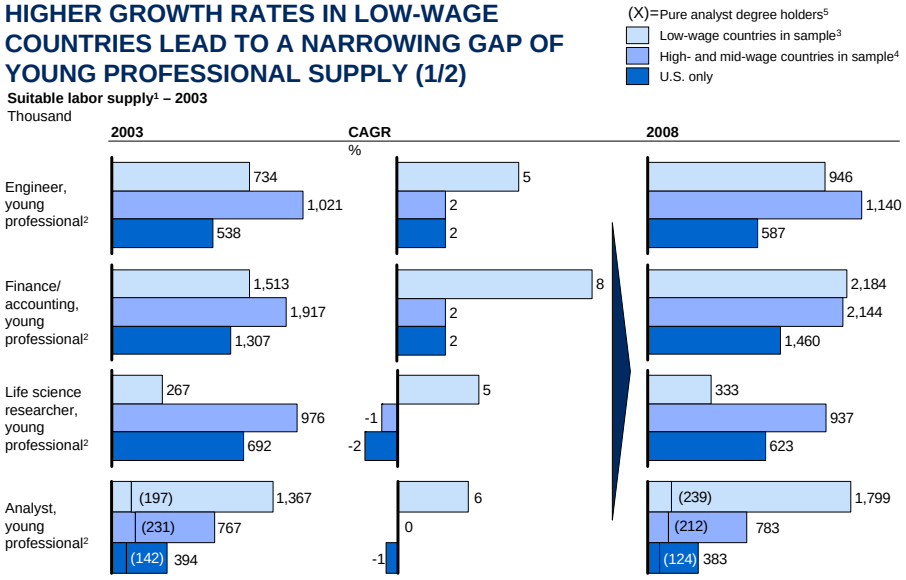


* High-school degree; any work experience.
** Sample includes 36 developed and developing countries, covering 74% of worldwide non-agricultural labor supply.
*** Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
**** Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

The suitable pool of talent in low-wage nations is growing faster than in high-wage ones. This holds true for each of the eight occupations we examined, except doctors (Exhibits 33 and 34). The supply of young finance and accounting professionals is growing 8 percent annually in low-wage countries but 2 percent in high-wage ones; the figures for life science researchers is 5 percent in low-wage countries but negative 1 percent in high-wage ones. This divergence in growth rates will narrow the gap between developed and developing labor supply in many occupational categories. The supply of engineers, for example, will become fairly equal between the developing and developed countries in our sample by 2008.

Exhibit 33

HIGHER GROWTH RATES IN LOW-WAGE COUNTRIES LEAD TO A NARROWING GAP OF YOUNG PROFESSIONAL SUPPLY (1/2)

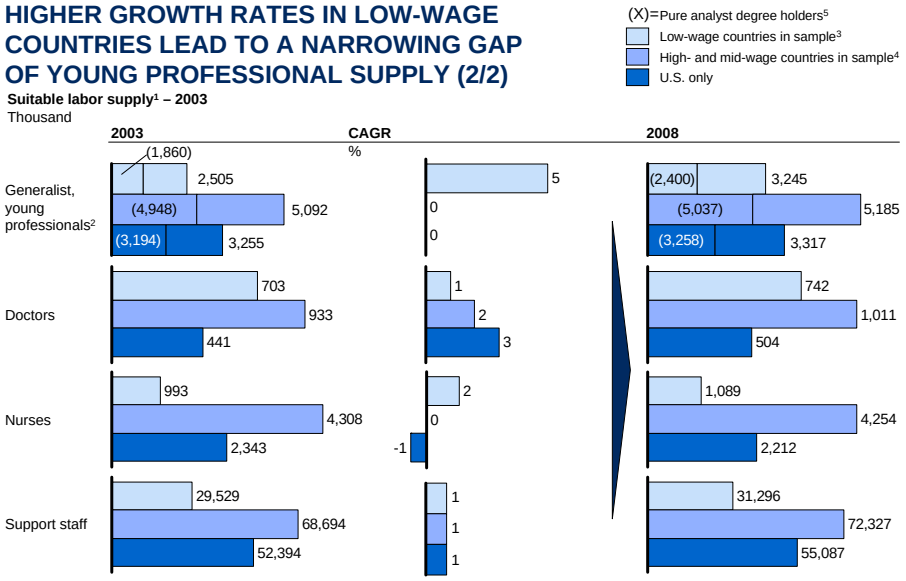


[1] Accessibility and domestic competition for talent are tackled as sensitivity issues later.
[2] ≤7 years of work experience.
[3] Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
[4] Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
[5] Only considering university degrees in mathematics, physics, statistics and not considering interchangeability from engineering, finance, and life sciences.

Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

Exhibit 34

HIGHER GROWTH RATES IN LOW-WAGE COUNTRIES LEAD TO A NARROWING GAP OF YOUNG PROFESSIONAL SUPPLY (2/2)



[1] Accessibility and domestic competition for talent are tackled as sensitivity issues later.
[2] ≤7 years of work experience.
[3] Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
[4] Australia, Canada, Germany, Ireland, Japan, South Korea, U.K., U.S.
[5] Only considering university degree in any non-specialist field (e.g., sociology) but not considering interchangeability from unsuitable for specialist fields.

Source: HR interviews; Country labor & graduation statistics; McKinsey Global Institute analysis

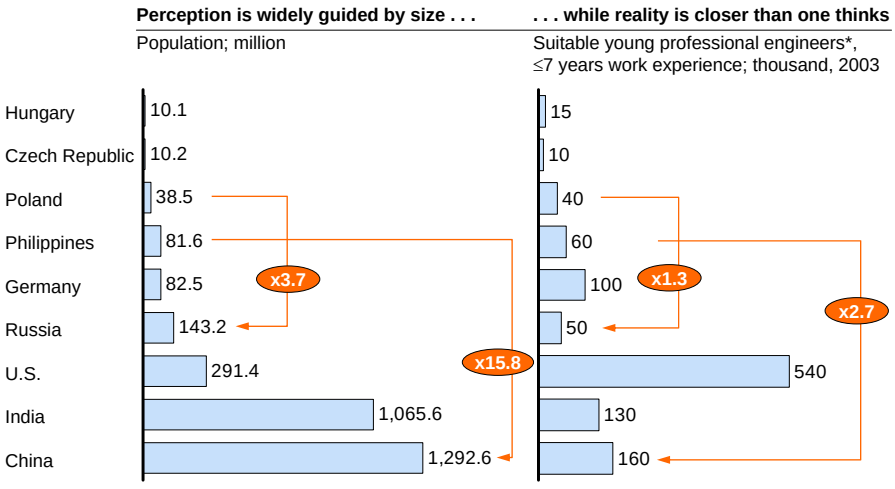
Many smaller countries have sizeable, attractive talent pools

Given differences in the portion of university graduates that are suitable and available to work for a multinational company, many smaller countries can be attractive offshoring destinations and have sizeable, attractive talent pools.

Even though China's population is 16 times the size of the Philippines, for instance, its pool of suitable young professional engineers is only 3 times the size of the Philippines. Poland has nearly as many suitable engineers as the much more populous Russia, and the Philippines has more than Russia (Exhibit 35). By 2008, Poland, Hungary, Russia, and the Czech Republic together will have as many suitable generalists as India, and nearly as many suitable engineers (Exhibit 36). As a result, many countries beyond China and India are likely to play a role in the emerging global labor market.

Exhibit 35

POPULATION IS NOT ALWAYS AN APPROPRIATE INDICATOR FOR SUITABLE LABOR SUPPLY

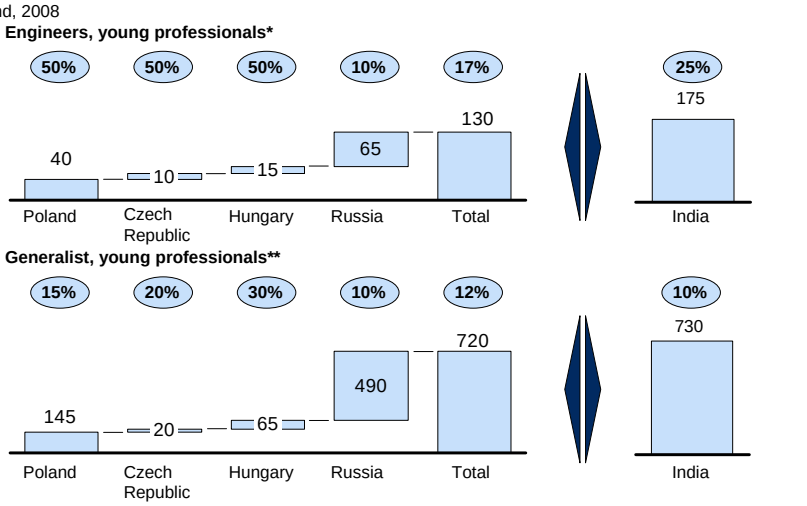


* Including all engineering disciplines (except civil engineering); including all IT and computer science degrees.
Source: Global Insight; Country Ministries of Education/Labor Statistics Offices; HR interviews

Exhibit 36

DIFFERENCES IN GRADUATION RATES AND SUITABILITIES SUGGEST ATTRACTIVE ALTERNATIVES TO LARGE LOW-WAGE COUNTRIES

Thousand, 2008



* University degree in engineering (except civil and agriculture) and computer science/IT; ≤7 years of work experience.
** University degree in any non-specialist field (e.g., sociology) plus some candidates unsuitable for engineering, finance and life sciences to account for interchangeability; ≤7 years of work experience.
Source: HR interviews; Country labor and graduation statistics; McKinsey Global Institute analysis

Middle managers are scarce

Although we did not quantify the supply of suitable middle managers in low-wage countries, our interviews clearly indicated that middle manager scarcity is a constraint to growth in offshoring for many countries. It depends on four factors:

- **Size and growth of offshoring sector**. India has been developing its export-oriented service sector, especially in IT and call-center businesses, for more than a decade, creating a sizeable pool of experienced middle managers. More nascent offshoring markets—like Russia and China—lack this. In fact, some Russian entrepreneurs have tapped India for middle managers.

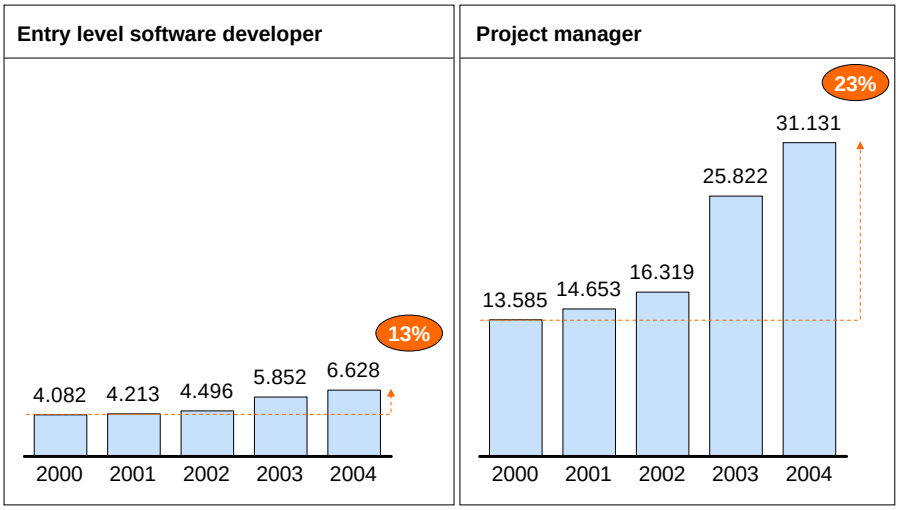
  However, India still clearly has a scarcity of managers, because growth in the offshoring sector has been so rapid. Employment in the sector has grown more than 20 percent per year over the last ten years, and even more briskly in some cities. New entrants often poach the qualified managers from existing business instead of investing to train their own, and middle manager scarcity in India is intensified by the efforts of other countries to recruit managers from established

operations in India. Rapidly rising wages signal their scarcity: Annual wages for project managers in India's export-oriented IT sector have increased 23 percent annually over the last four years, while programmer wages increased 13 percent (Exhibit 37).[10]

Exhibit 37

WAGES OF IT JOBS IN INDIA HAVE INFLATED DRASTICALLY

Annual wage
US$



Source: Press release

- **Maturity of the domestic economy**. Countries with more mature economies generally have a larger suitable management supply than younger emerging markets.
- **Dominance of large corporations**. Employment in some countries, such as the Philippines, tends to be concentrated in small- and medium-size enterprises. These businesses typically have limited number of management layers, and multinationals usually do not consider them as a major source of suitable middle-management talent.

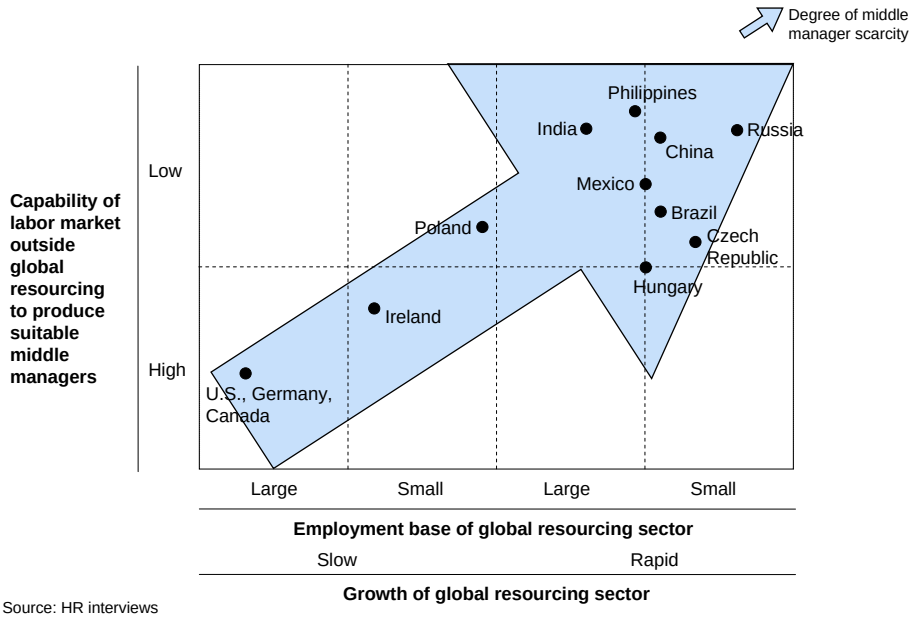
10 J. Puliyenthuruthel and M. Kripalani, "Good help is so hard to find - higher wages and lavish perks reign as outsourcing outfits scramble for talent," *BusinessWeek*, February 14, 2005.

- **The diaspora**. Immigrants who spend time abroad and return home can be a valuable source of management talent. India and China are particularly well suited to benefit, given the number of emigrants they send abroad. In 1998, a stock of 400,000 highly skilled Chinese and 300,000 highly skilled Indians had emigrated to the United States. Our interviews suggest that multinational companies frequently transfer Chinese managers in their home countries back to China in order to set up operations there.

Exhibit 38 summarizes our assessment of manager scarcity for the ten low-wage countries we studied in depth. We focused on the first two factors that influence manager scarcity, given their relative importance. Our interviews suggest that middle manager scarcity is most prevalent in Russia, China, and the Philippines, due to their relatively young but quickly growing offshoring sectors. Manager scarcity is still problematic in India. Given the rapid growth of its offshoring sector, companies with sufficient management layers to produce experienced middle managers have yet to evolve in significant numbers. Manager scarcity was less of an issue in Poland and Brazil, where the existing supply of managers is able to fill the much smaller need there.

Exhibit 38

CURRENTLY, MIDDLE MANAGEMENT SCARCITY IS A CONSTRAINT TO GROWTH IN MANY LOW-WAGE COUNTRIES



Source: HR interviews

IMPLICATIONS FOR COMPANIES AND COUNTRIES

These findings have far-reaching implications for multinational companies that need to select the best locations for their global activities and for the countries that want to attract such investment.

Companies should look at the suitable labor supply, not aggregate figures

With globalization increasing in speed and complexity, companies need to fully understand the actual available labor supply for their activities in a variety of low-wage nations. Simply following where other companies have set up shop will often not be the best strategy. Given labor supply constraints and rising wage and attrition rates in some cities, and the sunk costs incurred once a location is chosen, managers should consider the following:

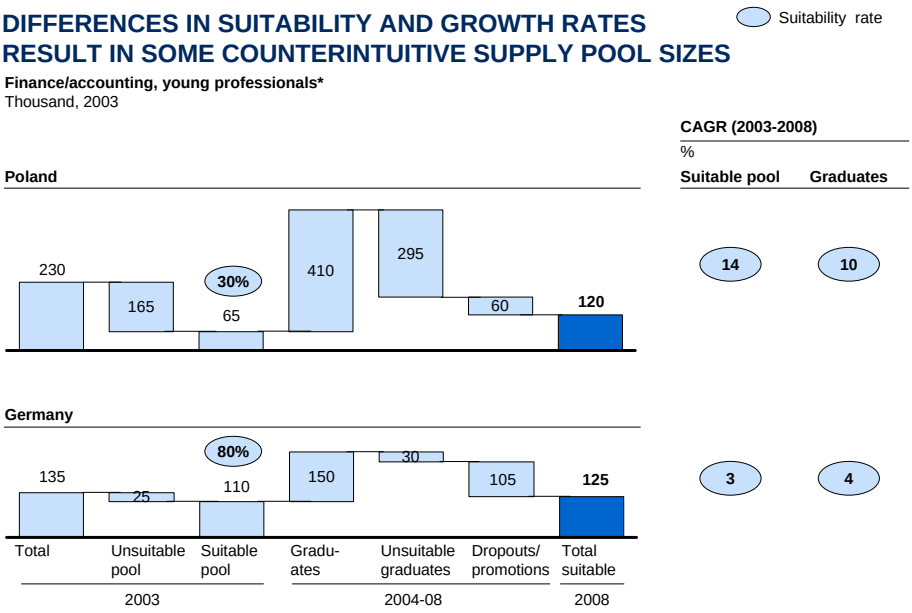
- **Macroeconomic figures alone should not guide labor supply assessment**. Companies should instead focus their quantitative assessment on specific occupations that are most crucial to sustain their operations, and also judge the suitability, or quality, of the labor pool. There are many attractive countries—at least from a labor supply perspective—besides the ones that appear to be the most attractive based solely on their large population. As graduation rates grow much faster in Poland than in Germany, for instance, Poland is likely to almost match Germany's supply of finance/accounting young professionals by 2008 (Exhibit 39). Companies should also keep in mind that countries with a high level of suitable workers are also likely to have lower talent acquisition costs and be easier places to replace talent in case of attrition.

- **Increase the suitability of the labor supply**. Suitability is hardest for companies to influence, since they are mostly the domain of educational institutions, but not impossible. Private initiatives and joint company-university efforts have been successful in increasing the quality of talent in several developing countries. In India, NASSCOM—the IT industry association—is working to increase scope and scale of India's prestigious Indian Institute of Technology (IIT) and the National Institute of Technology (NIT). In Russia, software company associations have provided additional practical and management education to engineering students. In China, Microsoft has established partnerships to fund a private software engineering academy and provide electronic learning platforms.

Exhibit 39

DIFFERENCES IN SUITABILITY AND GROWTH RATES RESULT IN SOME COUNTERINTUITIVE SUPPLY POOL SIZES

Finance/accounting, young professionals*
Thousand, 2003



* University degree in finance, accounting, economics, business; ≤7 years of work experience.
Source: HR interviews; country labor and graduation statistics; McKinsey Global Institute analysis

- **Look at multiple locations**. It is perhaps simpler for companies to address issues of limited accessibility, and they can substantially increase their available pool of labor by doing so (Exhibit 40). Given the fragmented labor supply in many labor markets, companies have three main options to improve the accessibility of workers:

  – *Explore second-tier cities and/or multiple locations*. Companies should monitor graduation rates on a city rather than country level, in order to access second-tier cities with potentially large labor pools. Pune, for example, is an Indian city with two-thirds the population of Bangalore, but reportedly has twice the number of college graduates.[11] Many experienced IT services providers in India are already following a multiple-location strategy to address potential labor shortages in top-tier cities.

11 G. Bhagowati, "Why Indian suppliers are moving to tier 2 cities," Everest Research, www.outsourcingBPO.com

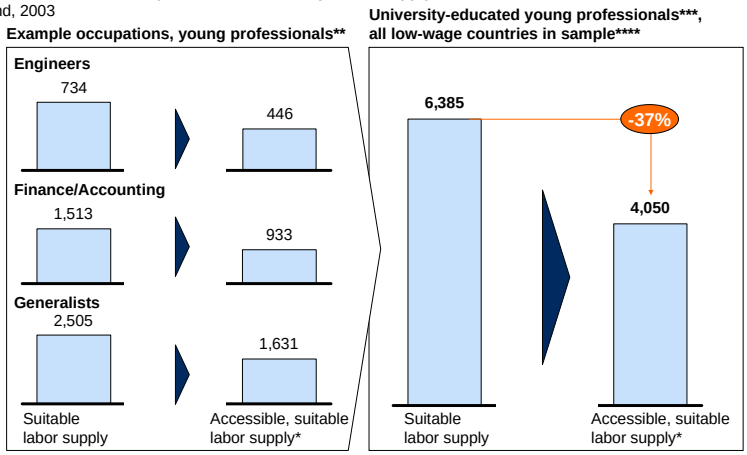
Exhibit 40

LIMITED ACCESSIBILITY OF GRADUATES WITHIN COUNTRIES COULD DEPRESS SUITABLE, LOW-WAGE LABOR SUPPLY BY UP TO 37%

LOWER BOUNDARY ESTIMATE

Impact of limited accessibility on suitable, low-wage labor supply*

Thousand, 2003



* Applying empirical accessibility rates to India (83%), China (51%), and Russia (44%) and average of these to rest of low-wage supply; applying estimated 90% accessibility to high-wage supply.
** Work experience ≤ 7 years.
*** Engineers, finance/accounting, analysts, life science researchers, generalists; work experience ≤ 7 years.
**** Incl. Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, South Africa, Thailand, Turkey, Ukraine, Venezuela, Vietnam.
Source: HR interviews; country labor & graduation statistics; McKinsey Global Institute analysis

– *Evaluate telework options*. The same technological advancements that allowed offshore service delivery to emerge might now offer a way around accessibility issues. JetBlue Airways does not require its eight hundred reservation agents to move for call-center employment. Agents work from home, their computers connected to the airline's servers; they stay connected to customers via voice-over-IP phones. ODesk offers customers the service of individual IT professionals in 15 countries around the world; all work as contractors and none comes to an oDesk office.

– *Increase the attractiveness of mobility*. Our interviews revealed more than one example in which companies attracted talent from remote locations by offering non-monetary incentives to move. One US company purchased land in India, built family houses, and rented them to their employees.

- **Consider your competition**. An assessment of labor supply is not meaningful without considering the demand from other companies for the same labor pool at the same location. An annual growth rate of 6 percent in the low-wage

supply of young professional engineers does not guarantee a sustainable supply, nor does it moderate wage increases if demand grows stronger than the supply. In general, companies are facing a tradeoff when making similar location decisions as their competitors: They have to weigh the positive effects of "agglomeration," which includes the establishment of superior infrastructure and an experienced vendor base against potential labor shortages in key occupations, and therefore rising wages and attrition rates.

Countries should boost the quality, not quantity, of university-educated labor

Low-wage countries seeking to attract offshoring face a host of issues as well. As they work to improve the supply of suitable labor, countries should prioritize labor quality enhancements over increases to labor quantity alone. This yields higher returns and would improve most country's prospects more dramatically.

On the surface, improving the quantity of university-educated labor might seem to produce big results. For example, if India were able to gradually increase its share of college-educated people in the workforce from the current 5.1 percent to 10 percent, its absolute number of university-educated people in the workforce would jump from 25 million to almost 50 million (not including any population growth). However, this would require a massive investment in new educational institutions. And still, only 10 percent to 25 percent of the additional graduates would qualify for a job in India's export-oriented services sector. The remaining 75 percent to 90 percent of graduates would swamp India's nascent domestic economy.

South Korea's educational policy in the early 1980s offers a case study on the effect of a forced increase of college enrollment. The South Korean government intervened to increase the number of college graduates by nearly three times over the five years from 1975 to 1980. By the 1980s, Korea had the third-highest college enrollment in the world, behind Canada and the United States, "which may be considered as a case of over-education in view of the level of Korea's development," two Korean researchers concluded. "It drastically reduced the availability of the labor force by retaining larger numbers of [the] economically active population in the educational system. While there are severe shortages in semi-skilled and skilled manpower, about one-half of all college graduates are still seeking employment."[12]

12 H. Choo and K. Cheong, "Some lessons from Korean experiences in human resource development," Kangwon National University, http://cc.kangwon.ac.kr/~kimoon/papers/hr-lessn.htm.

A less distorting way to improve the quantity of labor is to direct the mix of graduates toward professions in the greatest demand by offering educational grants. However, market forces of supply and demand usually work to produce the same changes, as the profusion of private IT institutions in India shows. And these measures would still need to address the qualitative deficiencies many multinationals are seeing.

Rather than seeking to increase the raw number of college graduates, large developing economies with low suitability rates like China, India, and Russia can produce the greatest impact by improving the *quality* of their college graduates. Government and industry initiatives targeted specifically at the main deficiencies identified earlier in this report could unlock a huge labor supply potential.

For instance, if Chinese engineering graduates were to gradually reach the current suitability rate of their Indian counterparts by 2008, China would be able to provide nearly twice the supply of suitable young professional engineers for multinational companies as India. The primary areas to focus on are language education and practical skills training (Exhibit 41, scenario 1).

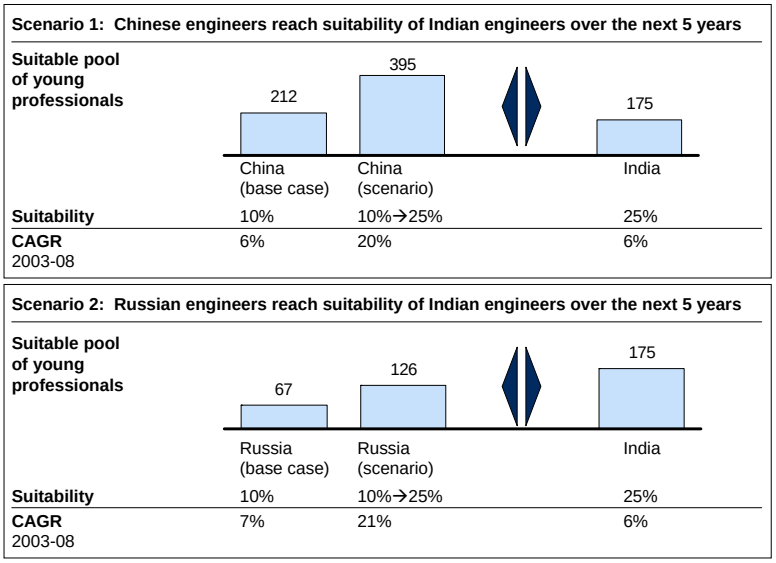
Similarly, Russia would be able to provide almost the same number of suitable young professional engineers as India does if it were to reach a comparable suitability rate by 2008. The main issue in Russia is the highly theoretical nature of the university system—a great opportunity for industry leaders to supplement the university curriculum with free courses on topics with direct practical relevance, especially project management (Exhibit 41, scenario 2).

Quality enhancements should be undertaken in collaboration with industry leaders—and their efforts should start with language education. Throughout large developing countries, and in particular China and Brazil, our research shows that foreign language education is in the most urgent need for improvement. Since a large share of offshoring activity currently originates in English-speaking countries, and because the occupation most active in offshoring—information technology—relies heavily on English as its lingua franca, it seems logical to concentrate any language education efforts there. In Eastern European countries—where language abilities seem to be very strong already—another competitive advantage of graduates is their good knowledge of German and French, which should be further nurtured.

Exhibit 41

POTENTIAL SUITABILITY IMPROVEMENTS WOULD UNLOCK A LARGE SUPPLY POTENTIAL

Thousand, 2008



Source: India/Russia Ministry of Education; China Education Yearbook; HR interviews

Other deficiencies vary by country and occupation, and countries need to tackle them systematically. It is essential that private-public partnerships play a vital role in overcoming problems, with such measures as:

- *Understanding key deficiencies*. Educational institutions in developing countries should work in close collaboration with domestic and multinational employers to regularly assess their graduates' success rate and the reasons for any deficiencies. We believe that the types of interviews we conducted with industry experts could provide a relatively easy-to-implement way to gain such feedback. In addition, most of our interviewees were committed to giving hands-on advice about what to improve.

- *Overcoming deficiencies*. We found examples in developing countries that show how private engagement and joint company-university efforts successfully increased the quantity and quality of available talent, some of which have already been mentioned. Governments and educational institutions should seek out these types of public-private partnerships, while companies should do their part to build them since multinationals benefit the most from high-quality talent.

- *Fostering study abroad*. We found that studying abroad was extremely effective for the educational institutions that strongly fostered it. Governments can help by offering grants for students to learn away from their home country. Our interviews indicate that management and entrepreneurial skills are an extremely critical catalyst for global resourcing growth. Students who gain experience abroad, or who return from foreign studies, understand best the requirements of both worlds. Research proves that this was the case in Ireland, where the return of skilled emigrants has increased the domestic supply of skilled workers. There, 66 percent of the founders of software firms had worked abroad.[13]

- *Leverage the diaspora*. Besides being a pool of management talent, emigrants can play a powerful role as ambassadors in their new home countries when location decisions are made. Indeed, our interviews about the ways in which actual location decisions happen support this notion. Moreover, research supports the anecdotal evidence of the favorable impact this experience had on the success of the Indian IT export industry.[14]

13 A. Sands, "Eye of the Tiger: Evolution of the Irish Software Industry," in *The Rise and Growth of the Software Industry in Some Emerging Economies*, ed. A. Arora and A. Gambardella (Oxford: Oxford University Press, forthcoming).

14 D. Kapur and J. McHale, "Sojourns and Software: Internationally Mobile Human Capital and the Software Industry in India, Ireland, and Israel," in *The Rise and Growth of the Software Industry in Some Emerging Economies*, ed. A. Arora and A. Gambardella (Oxford: Oxford University Press, forthcoming).

Technical Notes—Labor supply

The objective of these technical notes is to provide an overview of our analytical approach. We have not attempted to be exhaustive; we aim instead to highlight the principal inputs and assumptions on which our methodology is built. This chapter has 10 sections:

- **Scope of the study** discusses the objectives of the overall study and the areas it covers.
- **Guiding principles** outlines the high-level guidelines that govern our supply-side approach.
- **Country selection for labor supply analyses** provides the rationale for selecting the 16 focus and 20 extrapolation countries.
- **Occupational grouping** explains the occupational categories we used and the assumptions on their career paths.
- **Quantification of suitable supply** defines the macroeconomic indicators we used and describes the process of determining the current workforce and the additional supply for the occupational groups we quantified.
- **Suitability assessment** outlines the empirical methodology we followed to derive the suitability rates of graduates.
- **Interchangeability of talent** outlines our assumptions limiting the mutual exclusivity among the graduate groups.

- **Accessibility of talent and domestic competition** discusses the assessment of talent fragmentation/mobility as well as the domestic labor demand.
- **Labor supply extrapolation** explains the process of extrapolating supply data from 16 to 36 countries.
- **Sources**, finally, provides the data sources we used for each focus country.

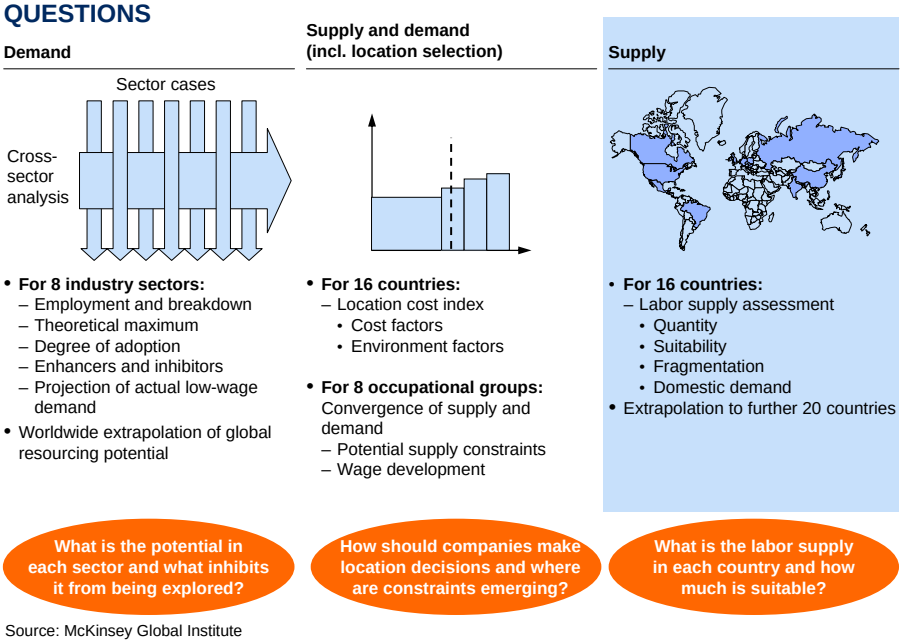
SCOPE OF THE STUDY

Overall study methodology

This study evaluates the worldwide global resourcing of services and its impact on companies, industrial sectors, national economies, and labor markets. The methodology is based on the evaluation of demand for global resourcing and supply of suitable labor available for global resourcing (Exhibit 1). These evaluations were ultimately performed on a per *occupation* basis (described below in the section on "Occupational grouping"). Our approach is as follows:

Exhibit 1

GLOBAL RESOURCING PROJECT ANSWERS DEMAND AND SUPPLY QUESTIONS



Source: McKinsey Global Institute

- We analyze representative sectors of the economy (financial services, IT services, packaged software, retail, auto, healthcare, and pharmaceutical sectors) to evaluate the theoretical maximum demand for employment on a functional and subfunctional level and to determine what occupations within these functions, and what fractions thereof, are amenable to global resourcing. We also evaluate the current degree of adoption toward low-wage resourcing by the players in the sectors.

- We analyze labor supply data in 16 high-wage and low-wage countries and extrapolate to a further 20. We evaluate the suitable labor/talent pool available on a per occupation basis and assess their accessibility and the competition from local demand.

- Finally, we bring together demand for low-wage labor and the supply of suitable talent from low-wage countries on an occupational basis. First, this is done on a global, aggregated level. Second, the concrete process by which companies make decisions between supply countries is incorporated and matched against a database of the location cost in the different countries. This database determines a location cost index (LCI) along six dimensions: cost (including wages), market location, vendor landscape, risk profile, environment, and quality of infrastructure. (Consequently, LCI is occupation independent, but labor supply is expressed in per occupation terms.)

This technical notes document refers exclusively to the labor supply evaluations.

GUIDING PRINCIPLES

No country is inherently a supply or a demand country

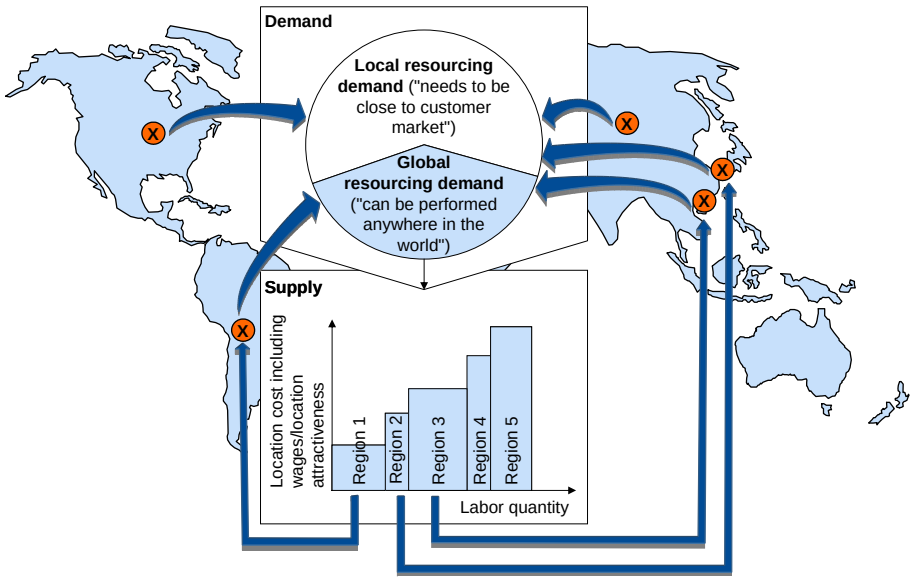
Even though, most of the current location decisions are made in favor of low-wage countries, our methodology supports any direction of global resourcing. We applied all of the supply methodology equally to high-wage and low-wage countries (Exhibit 2).

Two distinct elements determine the attractiveness of a location

Quantity of suitable labor (representing the x-axis of the supply curve) and the location cost (an index based on multiple location cost criteria including wages;

Exhibit 2

NO COUNTRY IS DEFINED AS INHERENTLY A SUPPLY OR A DEMAND COUNTRY BY OUR SUPPLY METHODOLOGY



Source: McKinsey Global Institute

this determines where a country appears on the supply curve and therefore represents its y-axis) are treated as separate entities. Therefore, the x-axis represents the available, suitable talent while the y-axis represents the "price" to access this talent pool (Exhibit 3).

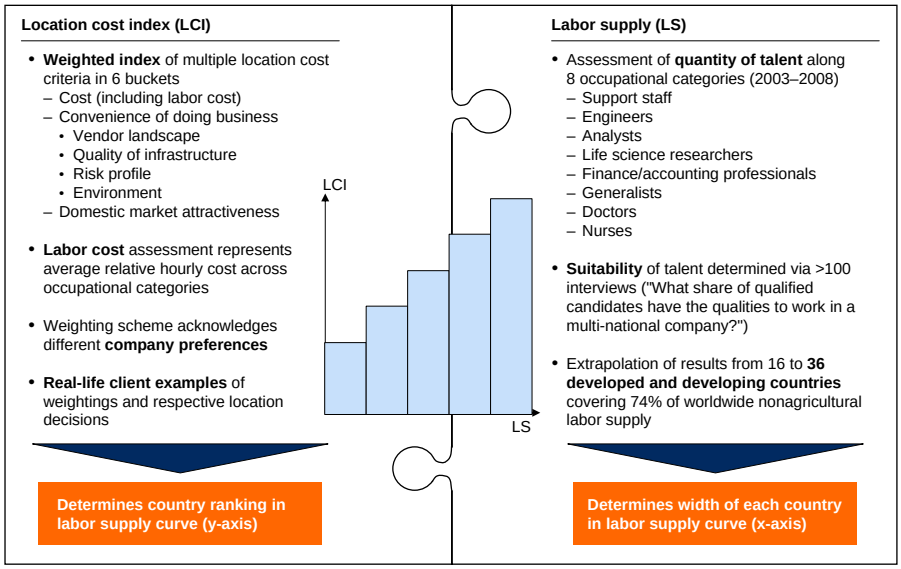
COUNTRY SELECTION FOR LABOR SUPPLY ANALYSES

Focus countries

For an in-depth study of both labor supply and location cost, we initially selected a set if 16 focus countries: Brazil, Canada, China, Czech Republic, Germany, Hungary, India, Ireland, Japan, Malaysia, Mexico, Philippines, Poland, Russia, UK, United States. In selecting these, we aimed to be representative of the world's labor pool for a most accurate picture and to allow for a later extrapolation (see the next section) with the highest level of confidence. The following criteria were used to select the 16 focus countries:

- **Exhibit 3**

ASSESSMENT OF LOCATION ATTRACTIVENESS HAS TWO DISTINCT ELEMENTS



Source: McKinsey Global Institute

Mix of high-, medium-, and low-wage countries. To fulfill our guiding principle of not inherently implementing a sending-receiving view, we aimed at including a mix of countries with highly different wage levels.

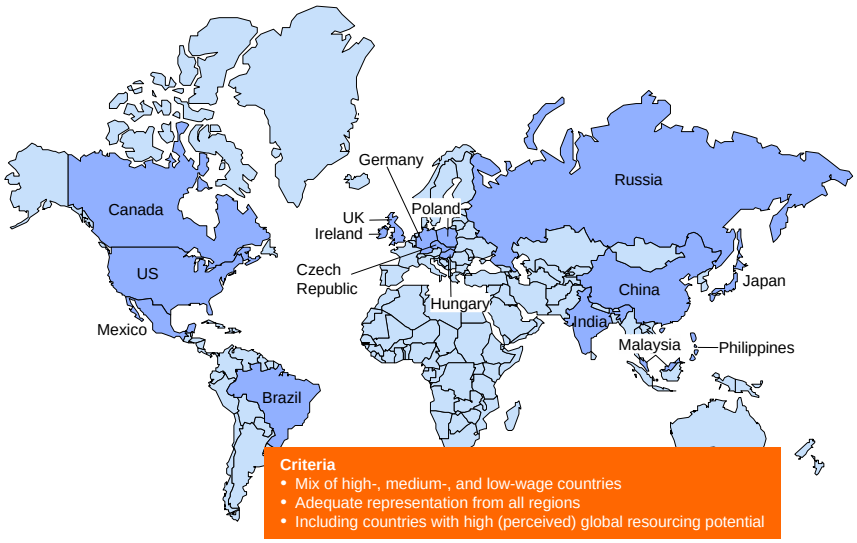
- *Adequate representation from all regions.* Mostly for reasons of being representative and for adequately supporting our supply extrapolation, countries in all continents were included.[1]

- *Include countries with high (perceived) global resourcing potential.* For the sake of being relevant to the public debate, a press search was conducted to include most of the countries that reportedly showed significant global resourcing activity (Exhibit 4).

1 Even though South Africa was only added during extrapolation, the same in-depth process as in focus countries was applied to derive its suitable labor supply.

Exhibit 4

16 REPRESENTATIVE COUNTRIES WERE SELECTED FOR IN-DEPTH STUDY OF SUITABLE LABOR SUPPLY AND LOCATION COST*



* Extrapolation to neighboring countries covers a further 20 low-wage countries and therefore 74% of worldwide nonagricultural employment.

Source: McKinsey Global Institute

Extrapolation countries

To enable a meaningful comparison of global resourcing demand with labor supply, we extrapolated the results from the focus country analysis to an additional 20 countries (see "Labor Supply Extrapolation" later in this chapter for extrapolation methodology). Exhibit 5 shows the list of selected countries. In addition to the preceding selection criteria, the following two objectives guided the extrapolation country selection:

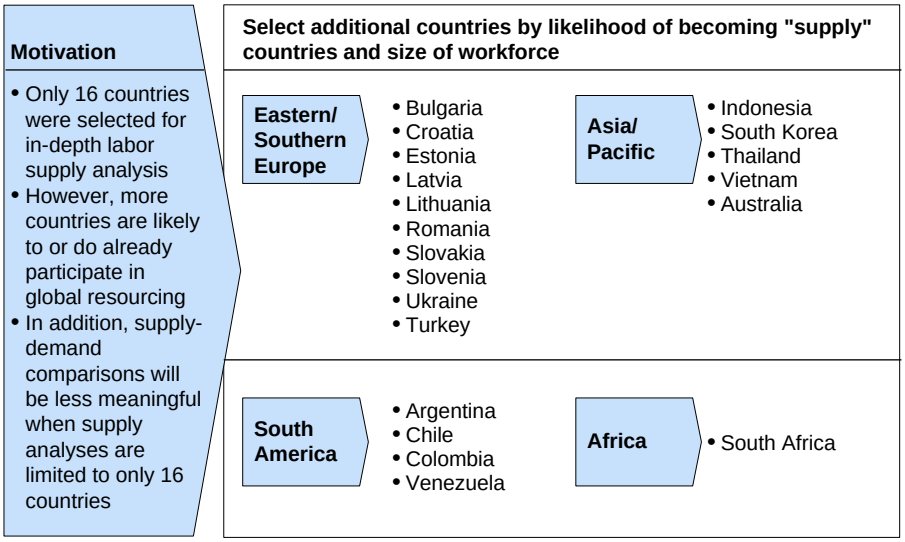
- *Coverage of world employment*. As more highly populated countries were selected, we now cover 74% of worldwide nonagricultural employment in 2003 within the supply part of our study.[2]
- *Ease of reference country selection*. We also included multiple smaller countries for extrapolation (especially in Eastern Europe) as it seemed

[2] Our selected occupational groups do not account for the full nonagricultural employment in each of the countries.

appropriate to apply our focus country results from Poland, the Czech Republic, and Russia to a multitude of neighboring countries and therefore increase our coverage further.

Exhibit 5

SUPPLY EXTRAPOLATION INCLUDED A FURTHER 20 COUNTRIES, NOW TO COVER 74% OF WORLDWIDE NONAGRICULTURAL EMPLOYMENT



Source: McKinsey Global Institute

OCCUPATIONAL GROUPING

Occupational categories

For the purpose of allowing a later combination of our demand and supply analyses, nine broad occupational categories have consistently been used on the demand and supply side. To allow for a unique identification, these categories have not primarily been defined by the activities they perform but rather by the educational background they possess:

- *Support staff*. Positions that do not require a college degree (e.g., housekeeping, security). Employees in this occupation have completed a high school diploma and may have any level of work experience. Traditional functions that employ support staff in high volumes are the customer-facing functions in retail.

- *Finance and accounting*. Positions that require training in finance and accounting. Employees in this occupation hold a college degree in accounting, finance, business administration, or economics. Functions that employ finance and accounting professionals are the relevant departments within G&A and the back offices of banks.

- *Engineer*. Positions that require training in engineering research, computer science, IT, and related disciplines. Employees in this occupation hold a university degree in any engineering discipline (except civil engineering and agricultural engineering) or computer science and IT. Functions that employ engineering professionals are the internal IT departments in any sector and the R&D departments in packaged SW, IT services, and automotive.

- *Life science researcher*. Positions that require life science researching capabilities. Employees in this occupation hold a university degree in biology, chemistry, life sciences, or pharmacology. The functions that employ life science researchers are the R&D departments in pharmaceuticals and a portion of the medical professionals in health care.

- *Analyst*. Positions that require strong analytical skills. Employees in this occupation possess a university degree in mathematics, physics, or statistics. The functions that employ analysts are marketing research, software R&D, and some back-office functions (e.g., in insurance).

- *Medical doctor*. Positions that require a university degree in human medicine. The functions that employ medical doctors are located in health care.

- *Nurse*. Positions that require a nursing qualification. The functions that employ nursing professionals are found in the health care sector.

- *Generalist*. Positions that do not require any specific training but require a university degree. Employees in these occupations hold a university degree in any field except the aforementioned specialist degrees. Several functions employ generalists, including sales and marketing, G&A, and customer service functions.

- *High-level manager*. High-level management positions. No specific university degree is required. All functions have high-level managers in the form of the

head of the function. CEO, CFO, CIO, COO, CRO, VP (sales, marketing, product development, etc.), and managers of larger or multiple research projects in packaged SW are examples of high-level managers.

Tenure groups

- Generalists, finance and accounting professionals, engineers, life science researchers, and analysts are further divided into the following tenure groups:
  - *Young professional*. Professionals with up to seven years of work experience.
  - *Experienced professional*. Professionals with more than seven years of work experience who are not involved in any managerial function.
  - *Middle manager*. Professionals with more than seven years of work experience who are managing other groups of employees but do not belong to the high-level management group.
- High-level managers are required to have a minimum work experience of 15 years. A further subdivision of their tenure has not been considered.
- Support staff, doctors, and nurses were quantified independent of their tenure (Exhibits 6 and 7).

Occupational categories/tenure groups not quantified on supply side

Even though we make qualitative statements about middle managers and experienced professionals in the main labor supply document, a quantification was not feasible for the following occupational categories and/or tenure groups:

- *Experienced professionals* were not quantified in our supply assessment because of a very high specificity to the activity and sector the professionals are working in. Therefore, any supply assessment would be less meaningful due to the necessary generalization it requires.
- *Middle manager* supply was evaluated in the most important low-wage countries based on multiple interviews conducted in each country. However, a quantification of the suitable number of middle managers turned out to be not feasible given the multitude of necessary assumptions (span of control, career path from experienced professional to middle managers and back, etc.)

Exhibit 6

19 OCCUPATIONAL CATEGORIES HAVE CONSISTENTLY BEEN USED ON DEMAND AND SUPPLY SIDE (1/2)

Job categories quantified on supply side

		Educational background	Work experience	Language skill
Support staff		• High school degree • Associate university	• Any work experience	• Limited English
Generalist	Young professional	• College degree in any field other than mentioned in specific categories (e.g., sociology)	• ≤7 years	• Fluent English
	Experienced professional		• >7 years	• Fluent English
	Middle manager			
Finance and Accounting	Young professional	• College degree in accounting, finance, business administration, or economics	• ≤7 years	• Intermediate English
	Experienced professional		• >7 years	• Intermediate English
	Middle manager			
Engineer	Young professional	• College degree in any engineering course (except for civil engineering or agricultural engineering)	• ≤7 years	• Intermediate English
	Experienced professional		• >7 years	• Intermediate English
	Middle manager			

Source: McKinsey Global Institute

Exhibit 7

19 OCCUPATIONAL CATEGORIES HAVE CONSISTENTLY BEEN USED ON DEMAND AND SUPPLY SIDE (2/2)

Job categories quantified on supply side

		Educational background	Work experience	Language skill
Life science researcher	Young professional	• College degree in biology, chemistry or pharmacology	• ≤7 years	• Intermediate English
	Experienced professional		• >7 years	• Intermediate English
	Middle manager			
Analyst	Young professional	• College degree in mathematics, physics or statistics	• ≤7 years	• Intermediate English
	Experienced professional		• >7 years	• Intermediate English
	Middle manager			
High-level manager		• Any university degree	• >15 years	• Fluent English
Doctors		• University degree in human medicine	• Any work experience	• Limited English
Nurses		• Completed nursing degree	• Any work experience	• Limited English

Source: McKinsey Global Institute

- *High-level managers* were also not quantified for supply assessment because of the high variability of career paths leading to this position and therefore an inability to model these paths accurately. Moreover, we consider this position not very limiting for global resourcing due to the possibility of migration. Therefore, a supply assessment would not enable us to detect any supply constraints.

Career path assumptions

As highlighted above, the high variability of real career paths only allowed us to quantify young professional positions, support staff, doctors, and nurses with the required accuracy, as a generic upward mobility model could be applied to these functions:

- *Young professional positions* require a specific educational background that is assumed to be equal across countries but no previous work experience. Therefore, the existing pool is increased by fresh graduates and decreased by dropouts for various reasons. One of these reasons is upward mobility: 98.5% of a class of new graduates are assumed to be promoted and leave the supply pool over time (starting with 65% of a class five years after graduation). Promoted young professionals have the choice between two career paths: a professional track and a managerial track (Exhibit 8).
- *Support staff, doctors, and nurses* were evaluated independent of their tenure, as their initial education should equip them with the required set of skills. Therefore, it is straightforward to determine the existing pool, increase it via fresh graduates, and reduce it via dropouts.

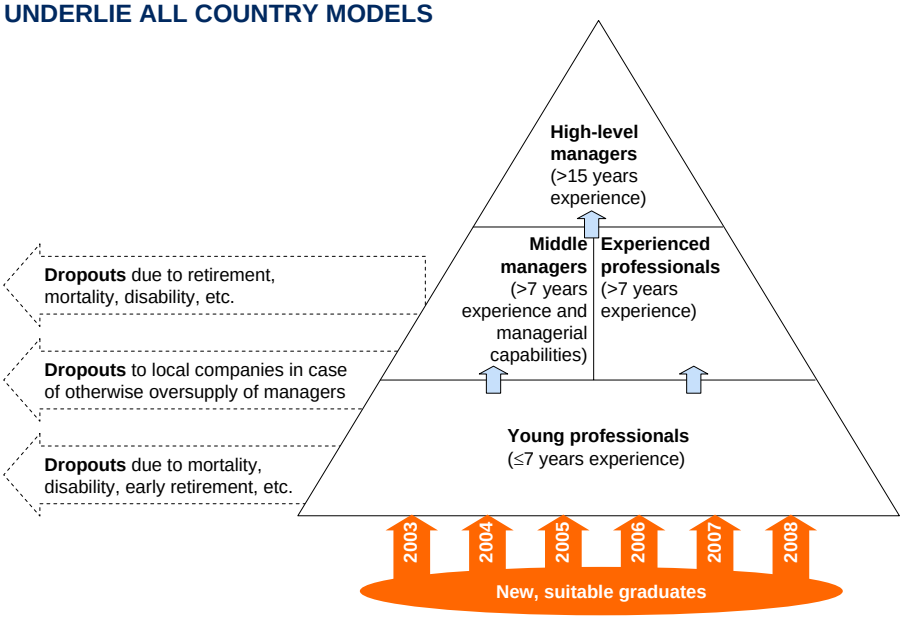
QUANTIFICATION OF SUITABLE SUPPLY

Macroeconomic indicators

To determine the labor supply along the previous occupational categories and tenure groups, we used a combination of macro- and micro-level analyses (Exhibit 9). For the young professional groups we relied purely on microeconomic data and interview results, while macroeconomic data became relevant to determine the total supply, the extrapolation model, and overall country

Exhibit 8

KEY PRINCIPLES OF UPWARD MOBILITY EQUALLY UNDERLIE ALL COUNTRY MODELS

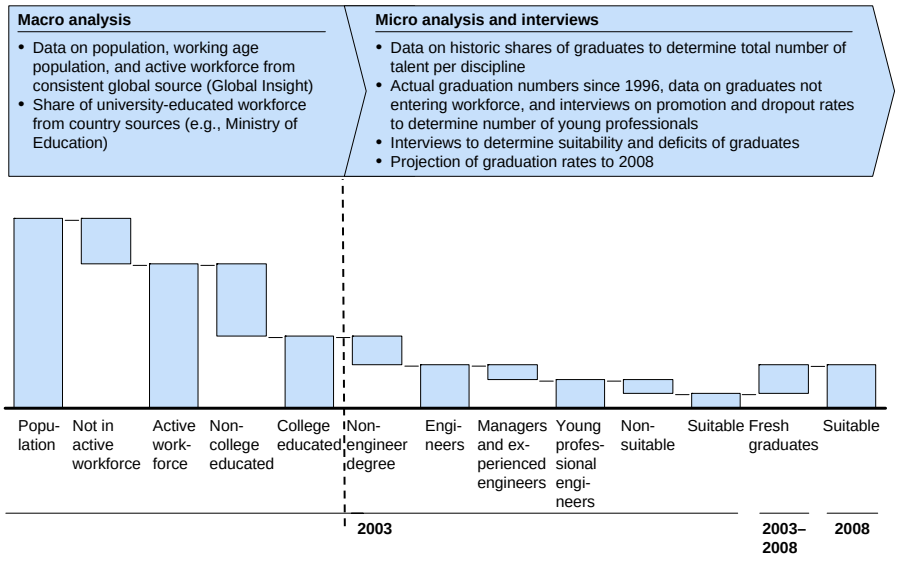


Source: McKinsey Global Institute

Exhibit 9

LABOR SUPPLY WAS DETERMINED USING A COMBINATION OF MACRO-DATA, MICRO-DATA, AND INTERVIEWS

CONCEPTUAL



* 83 interviews for 10 low-wage countries alone.
Source: McKinsey Global Institute

statements. On the macro level, we collected data on the following indicators for 1995–2003 as well as projections to 2015 from one consistent source (Global Insight) for all 36 country models. It is indicated in the following definitions where we deviated from using this prime source:

- *Population*. This represents the full population of each country.
- *Working-age population*. This is defined as the part of the population between 15 and 64 years of age. For the Czech Republic and Russia, these data were sourced from the Census Bureau because of unavailability from Global Insight.
- *Active labor force*. This is defined as the part of the working-age population that is either working or looking for work. Explicitly included are unemployed individuals who want to work. Excluded are disabled individuals or people who choose not to work (e.g., homemakers). A considerable share of the active labor force can be comprised of people who are working but are not officially employed, i.e., "the shadow economy." These individuals are also included in the numbers. The active workforce for Brazil was sourced from EIU Viewswire, again due to unavailability from our prime source, Global Insight.
- *Total employment*. All numbers except the one for China were sourced from Global Insight; China's was derived from the International Labor Organization (ILO).
- *Share of employment by sector*. The ILO was also used as a source for the segmentation of the employment in each country along the major economic sectors: agriculture, manufacturing, and services. Here, only the numbers for India had to be sourced from the CIA World Factbook, which provided data for 1999.

Determination of labor supply for young professional groups

For each of the university-educated, young professional categories, the same process was followed to determine current labor force in 2003 as well as additional labor force for 2003 to 2008:

- *Current labor force:*

  - Starting point are the historical graduation numbers for each focus country from 1996 to 2003 based on the educational background required for that occupation (see previous explanation). Both bachelor and master graduates are taken into account.

  - For each class of fresh graduates in any given year, we deducted specific shares of graduates who are assumed to not enter the workforce. These numbers were derived from country-level data (e.g., Ministries of Education), from press releases, or as a side-product from our interviews on the suitability of the candidates. For some country models, additional triangulations were performed using available data from a neighboring, comparable country. Bachelor and master graduates were treated separately because their total share of graduates not entering the workforce varies naturally. The following factors were incorporated:

    · *Continued education*. This category especially applies to bachelor graduates, of whom a certain share is not available for work immediately but continues to study in order to obtain a graduate degree or PhD. Country-level data could mostly be collected since enrollment numbers for graduate study in the same year are available.

    · *Emigration*. We found that this is mostly a factor for nurses in low-wage countries; numbers on yearly emigration were gathered via press releases.

    · *Intentional decision or forced to stay out of workforce*. Reasons for this might be, for example, a disability or a decision by the graduate to become a homemaker.

  - The remaining number of fresh graduates in any given year was multiplied with the average suitability rate for the specific occupational group. This was acquired in a set of interviews for each country market (see section "Suitability assessment"). It is noteworthy that no change was implemented in the suitability rate observed in 2003 versus the one that would have been observed in 1996—suitability rates are assumed constant over the period of 1996–2008 (except for sensitivity analyses).

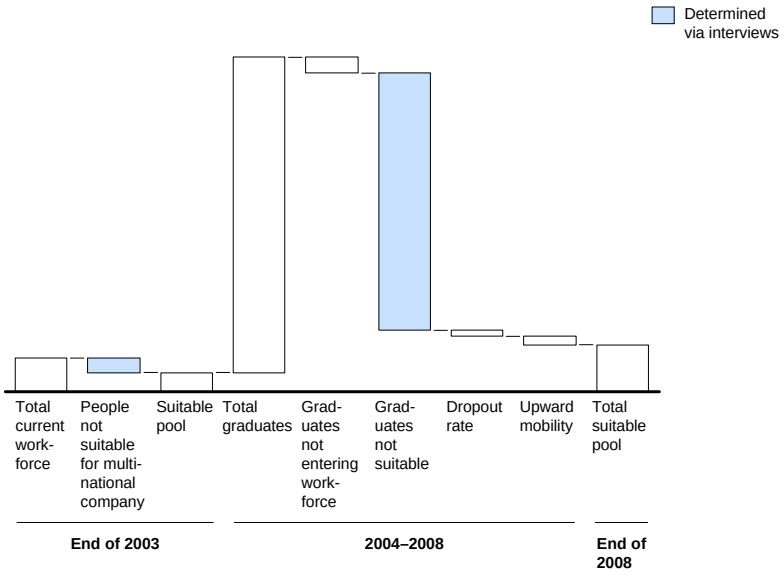
- Finally, in 2002 and 2003, parts of the young professionals of the classes of 1996 and 1997 have already been promoted to an experienced or middle-manager position (following the career path assumptions stated earlier). As these were deducted from the stock, we arrived at the total suitable young professional labor force for each occupational category at the end of 2003.

- *Additional labor force*. The additional labor force for each young professional group was determined by applying the exact same process as highlighted above. Starting point is the statistical projection of historical graduation numbers to the period 2004–2008 for each country market. Again, in the base model, interview-based suitability rates are assumed to remain constant over the 2004–2008 period (Exhibit 10).

Exhibit 10

DERIVATION OF SUITABLE SUPPLY IS DONE BASED ON HISTORICAL GRADUATION RATES COMBINED WITH INTERVIEWS

CONCEPTUAL



Source: McKinsey Global Institute

Determination of labor supply for doctors, nurses, and support staff

- *Current labor force*. The labor force in 2003 for these three occupational categories was determined via census or industry association data, which provide for each country:
  - The total number of registered nurses and doctors
  - The total number of people in the workforce with high school as their highest degree attained (support staff).
- *Additional labor force.* The additional labor force was determined based on statistical projections of the respective graduation rates. Furthermore, deductions were applied in line with the ones described in the young professional section. However, since there is no tenure disaggregation for these three occupational categories—that is, there are no "young professional" versus "experienced" nurses—no promotion to the experienced or managerial level was considered.

SUITABILITY ASSESSMENT

Suitability rates in low-wage countries

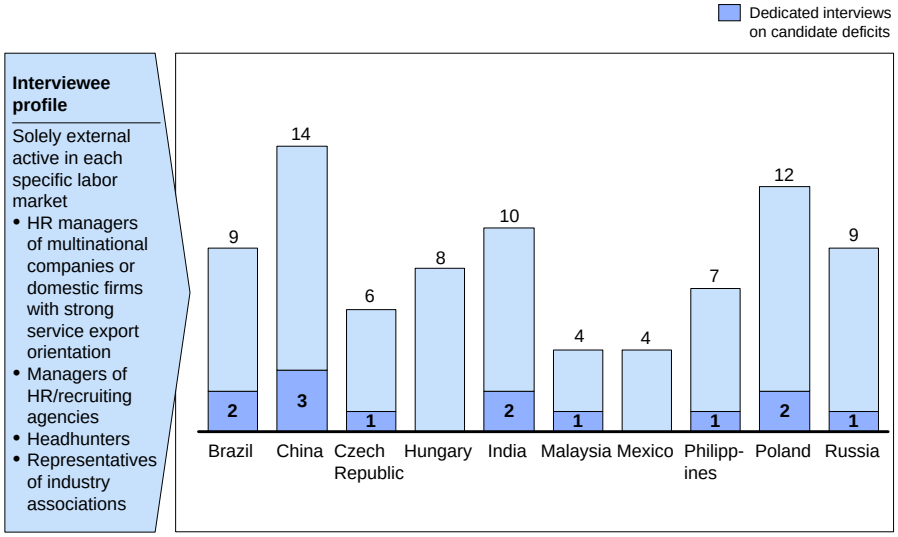
The suitability of young professionals in our 10 low-wage focus countries was determined by interviews. In our model, it is also the concept that accounts for productivity differences among workers of different countries in the same occupational markets. It is a percentage figure that states what share of a country's young professional talent of a fixed educational background would be suitable to work in a multinational company based on their language or analytical deficiencies and their cultural proximity:

- The suitability rates for each occupational category in each low-wage country market were determined using 83 two-hour interviews with HR experts who were working in the respective country and were familiar with the respective occupational group. Among our interviewees were heads of global resourcing centers, managers in HR agencies, and HR managers in multinational companies (Exhibit 11). In each case, the same question was asked: "Of 100 random candidates from throughout the country with the correct degree,

how many could you employ if you had sufficient demand for all 100?" The interviewees were able to answer this question based on their own statistics of accepted versus rejected candidates and their own recruiting experience.

Exhibit 11

83 INTERVIEWS WERE CONDUCTED IN 10 LOW-WAGE COUNTRIES TO DETERMINE SUITABILITY RATES AND DEFICITS OF CANDIDATES



Source: McKinsey Global Institute

- The empirical suitability rates derived in each country market and for each occupation turned out to be fairly homogeneous, especially in Eastern European countries, Brazil, and India. We calculated the straight average of these suitability rates for each occupational category to be used in determining the current and additional labor force (as previously discussed).
- In some instances, triangulations had to be made for an occupational group that could not be covered due to a lack of interviews in a specific country market. This refers only to life science researcher and analyst groups; in these cases, the empirical suitability rate for engineers was applied.
- Since we could not conduct a statistically relevant number of interviews on the suitability of doctors and nurses, the empirical suitability rates of life science researchers were applied in each country market.

- Finally, it is worth noting again that our country models—at least in the base case—do not account for changes in these average country suitability rates. The share of young professionals that is suitable to work in a multinational company is assumed to remain constant from 1996 to 2008.

Suitability rates in high-wage countries

No suitability interviews were conducted in mid- to high-wage countries. In these, constant suitability rates across countries were assumed:

- For high school graduates: 60%
- For generalist college graduates: 70%
- For generalist master graduates and all other college graduates as well as doctors and nurses: 80%
- For all other master graduates except generalists: 90%.

Deficiencies of candidates

At the same set of 83 interviews the reasons for unsuitability in low-wage countries were explored asking the following question: "What are the main deficiencies of the candidates you turned away?" There was a wide spectrum of answers. Therefore, we tried to determine a limited set of categories to allow for comparison across countries. The categories we determined are as follows:

- Language issues
- Lack of logical skills/limited overall quality of education system
- Lack of practical skills/theoretical style of education system
- Limited communication skills/confidence
- Lack of other soft skills (teamwork, energy level, cultural clash).

The role of language abilities

The assessment of language proficiency in the majority of our interviews was based on the requirements for one language only—English:

- Our sector cases suggest that most of the globally resourced demand for labor in low-wage countries stems from large multinational companies. Even though there are ways to overcome any language barrier or to decouple the actual problem solving from translation, these companies need to have one common language in order to operate effectively. This "lingua franca" is mostly English, even more so in functions that are R&D, engineering and IT driven.

- The two prime exceptions we found are language-centric functions relocated by continental European companies and Japanese corporations. In the former case, companies often look to Eastern Europe, where our interviews suggest that the share of English-speaking graduates is almost equal to the share of German speakers; less so for French. Related research by the European commission supports this: it ranks the share of the population that can speak English and German in the three Eastern European countries in our sample (Czech Republic, Hungary, and Poland) as almost equal. In the case of Japan's globally resourcing language-centric activities, it is almost exclusively directed toward China. There, the average suitability of all graduates speaking Japanese is certainly not higher than that for English speakers.

INTERCHANGEABILITY OF TALENT

The young professional groups are not assumed to be mutually exclusive in our labor supply models. This should account for the fact that, for example, an engineer who is potentially unsuitable to perform an engineer function in a multinational company might very well be suitable to perform analyst activities. Therefore, the following rules on interchangeability were implemented equally in all country models:

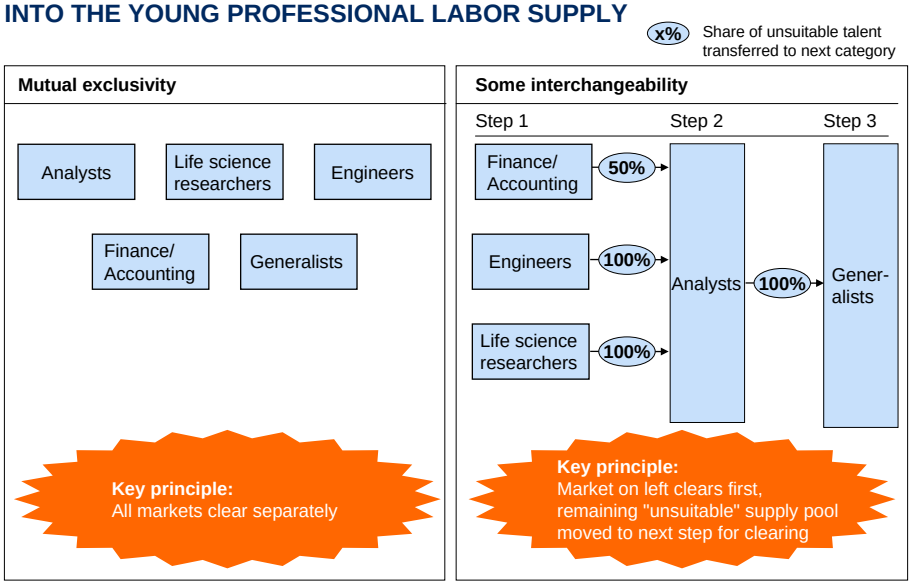
- Half of all unsuitable candidates from the young professional finance/accounting group could potentially work as analysts. The remaining 50% is assumed to have less quantitative business degrees (e.g., marketing). The analyst suitability rate is applied to the 50% that is transferred to the analyst pool.

- All unsuitable candidates from the young professional engineer group could potentially work as analysts. The analyst suitability rate is applied to the group that is transferred to the analyst pool.

- All unsuitable candidates from the young professional life science researcher group could potentially work as analysts. The analyst suitability rate is applied to the group that is transferred to the analyst pool.
- All unsuitable candidates from the analyst group could potentially work as generalists. The generalist suitability rate is applied to the group that is transferred to the generalist pool (Exhibit 12).

Exhibit 12

WE HAVE IMPLEMENTED A LIMITED EXTENT OF INTERCHANGEABILITY INTO THE YOUNG PROFESSIONAL LABOR SUPPLY



Source: McKinsey Global Institute

The acknowledgment of interchangeability thus only increases the suitable supply of generalists and analysts. It also leads to the differentiation between "pure" analysts and other analysts as well as "pure" generalists and other generalists on some exhibits in the main labor supply document.

ACCESSIBILITY OF TALENT AND DOMESTIC COMPETITION

Accessibility of talent

We conducted our analyses on the accessibility of talent in three of the largest low-wage countries: India, China, and Russia. In each of the three country markets, we collected empirical data on the fragmentation of graduates and on their mobility. In terms of fragmentation, we determined the geographical distribution of university graduates in 2003 and considered directly accessible those who graduated close to a city with a major international airport. Finally, we added the graduates from outside these directly accessible markets who appear to be mobile based on empirical studies in each country:

Accessible graduates = Graduates who studied close to a major international airport + (Remaining graduates × Empirical mobility rate)

- **India:**
  - *Fragmentation*. The distribution of graduates by Indian state was sourced from the Indian University Grants Commission (UGC). Graduates from the following states were considered as directly accessible: Maharashtra, Andhra Pradesh, Tamil Nadu, West Bengal, Karnataka, Kerala, and Dheli. The determination of these provinces was based on air traffic data from the Airports Authority India.[3]
  - *Mobility*. Our analyses on the mobility of Indian graduates was based on a study published by the Social Science Research Center Berlin.[4] The study evaluated interviews with a sample of 1,560 IT university students in India just prior to the completion of their studies. Although the study was mostly focused on the international migration decision in India, we used its results based on the assumption that the graduates who are willing to move internationally would also be willing to move within India to work in a multinational company.

3 March 2004 issue of "Traffic Reporter: Information on Air Traffic in India"

4 Mahmood, T. and Schömann, K.: "Assessing the Migration Decision of Indian IT-Graduates: an Empirical Analysis," December 2003

- **China**:

  - *Fragmentation*. The distribution of graduates was derived based on the number of colleges and universities in 284 Chinese cities above the prefecture level. These cities have a nonagricultural population of more than 250,000, an industrial output over $242 million, and a regional budgetary government income over $24.2 million. The data on colleges and universities was sourced from the Chinese Ministry of Education. Graduates from the following cities were considered directly accessible: Beijing, Shanghai, Guangzhou, Xi'an, Nanjing, Chongqing, Harbin, Kunming, Dalian, Qingdao, Xiamen, and Shenzhen. The assessment of the international flights to and from these cities was sourced from Statistical Data on Civil Aviation of China, 2004.

  - *Mobility*. Our analyses on graduate mobility in China are based on an empirical study conducted by Junbo Zhou and Changjun Yue.[5] The study assesses the mobility ratio of graduates by occupational level.

- **Russia:**

  - *Fragmentation*. The national portal on education in Russia[6] provides data on the distribution of university graduates along 78 constituent entities in Russia. Graduates from the following entities were considered as directly accessible via major international airports: Moscow, St. Petersburg, Sverdlovsk (Ekaterinburg), and Krasnodar.

  - *Mobility*. Survey results published in *Demoscope Weekly*[7] were used as basis for our mobility assessment in Russia. The survey provides interview data for graduates from five Russian cities, of which we considered only the results from cities that are not directly accessible, for example, not Moscow and St. Petersburg.

5 "Cost of Labor Hunting and Inter-province Employment", Economics of Education Research, Beijing University, June 2004

6 http://www.edu.ru

7 No. 119; 2003

Domestic competition

Our interviews indicated that domestic competition for talent is predominantly an issue in China; therefore, we limited our analyses on domestic competition on the country. Furthermore, we did not determine direct domestic competition for talent due to a methodological issue: doing so would have involved an assessment of the willingness of suitable graduates to work in a domestic company as opposed to a multinational employer. Therefore, we concentrated on multinational employment in China to assess if the suitable pool is even enough to suffice multinational demand. The analyses proceeded in four steps:

- *Employment in multinational companies in China in 2002*. We sourced data on the total employment in multinational companies in China from the 2003 edition of the China Statistical Yearbook. It provides the number of foreign-owned and joint venture enterprises by employment level (e.g., 7 employees and fewer, 8–19, 20–49). In addition, it differentiates multinational enterprises by their headquarter location (Macao/Taiwan/Hong Kong versus others). For our analyses we only considered multinational companies with more than 1,000 employees that were not Macao/Taiwan/Hong Kong owned. This restriction was based on the assumption that the other companies would not only require suitable talent according to our definition but could, for example, also employ pure Chinese speakers. The total multinational company employment was derived by multiplying the number of establishments by the average employment in each range (e.g., an average of 3,000 employees for the companies in the range of 1,000 to 4,999 employees was used).

- *College-educated share of employment*. We assumed that 30% of the total multinational employment in China is required to have at least a college degree. Since multinational companies in China are dominantly manufacturing-oriented, we used the employment split of our automotive demand case as basis for this estimate, which is considerably higher (48%).

- *Growth in employment demand for 2003 to 2008.* Our employment growth assumption was also based on historical data from *China Statistical Yearbook*. We applied the 1998–2002 annual growth rate and did not incorporate any adjustments.

- *Comparison with total, suitable, and accessible supply*. Finally, the additional employment demand for college-educated young professionals from this group of multinational companies was compared to the total additional graduates from Chinese universities and colleges from 2003 to 2008 based on our China labor supply model. Further comparisons were conducted with the suitable supply and finally with the suitable and accessible supply. For accessibility, we assumed a gradual increase in accessibility of Chinese graduates reaching India's much higher 2003 accessibility level by 2008.

LABOR SUPPLY EXTRAPOLATION

To make more meaningful comparisons of worldwide demand for low-wage labor with suitable, low-wage labor supply, it was necessary to include a larger set of countries in our sample. With this enlarged set, we cover 74% of nonagricultural employment in the world with our set of 36 countries (16 focus countries, 20 extrapolation countries).

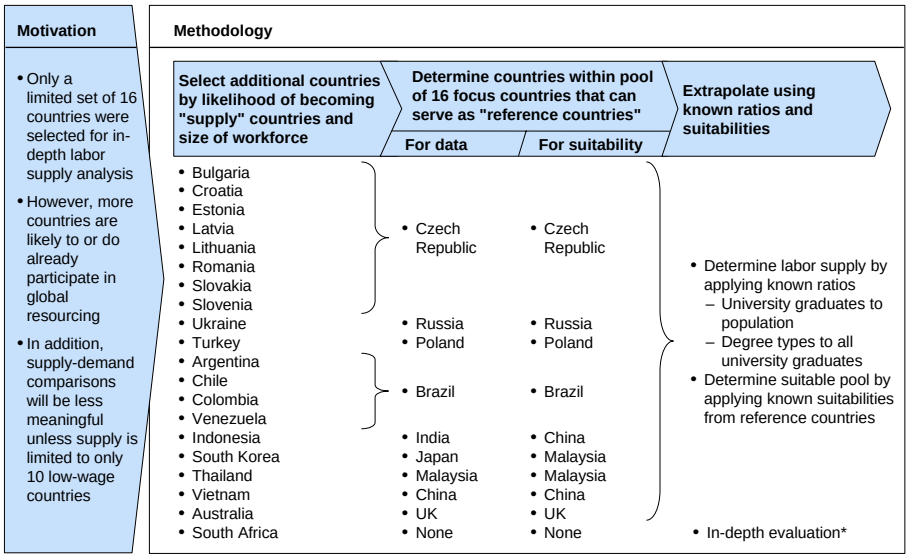
For the additional 18 low-wage and 2 mid- to high-wage countries (see exhibit 5), we performed a detailed analysis of graduate data and suitability rates only for South Africa, since we did not have any country in our set of focus countries to be used for comparison. For the other 17 low-wage locations, the methodology for extrapolation was as follows (Exhibit 13):

- *Collection of macroeconomic data for extrapolation countries*. The following macroeconomic indicators were sourced from Global Insight for each extrapolation country for 2003: population, total workforce, and total employment. Where available, data on the college-educated share of workforce and high school–educated share of workforce were collected from the World Development Indicators and the Global Education Digest.

- *Determination of reference countries*. For each extrapolation country, we determined a pair of countries to be used as "reference countries" for extrapolation. The determination of reference countries was based on regional and cultural proximity and the similarity of educational systems between reference and extrapolation country:

Exhibit 13

EXTRAPOLATION TO A FURTHER 20 COUNTRIES WAS DONE USING DATA FROM REFERENCE COUNTRIES



* Suitability data derived from appropriate McKinsey study conducted in South Africa in 2004.
Source: McKinsey Global Institute

- The first reference country was used as reference for all quantitative ratios. These ratios were required to derive occupation-specific data from the macroeconomic indicators available for each extrapolation country. The ratios used from the reference countries were college- and high school–educated share of workforce (where not available from primary source), share of each discipline in college–educated workforce (e.g., engineers), and growth of total supply per discipline (e.g., growth of engineer pool from 2003 to 2008).

- The second reference country was used as reference for the suitability rates within the respective extrapolation country. In most cases the second reference country was equal to the first reference country.

- *Calculation of suitable supply and its growth by occupation*: Finally, the suitable supply by occupational category and its growth for each extrapolation country was estimated using the quantitative and the suitability data from its respective pair of reference countries.

SOURCES

The following table lists the data sources that we used to derive all quantitative information required to setup the country labor supply models for each of the 16 focus countries. We do not list again the sources for macroeconomic indicators since these were not country-specific. Also, the sources we used to determine accessibility and domestic competition in China were mentioned before and are not repeated here. Should our interview partners for the 83 interviews on suitability not explicitly state that they do not wish to be mentioned, their names will appear in the acknowledgment section of our main labor supply report rather than in this table.

Focus Country	Data Sources
Brazil	• Cadastro Geral de Empregados e Desempregados (CAGED)—General File of the Employed and Unemployed • Instituto Brasileiro de Geografia e Estatística (IBGE)—Brazilian Institute of Geography and Statistics • Instituto Nacional de Estudos e Pesquisas Educacionais (INEP)—National Institute for Educational Research of the Ministry of Education • Ministério da Educação (MEC)—Ministry of Education • Ministério do Trabalho—Ministry of Labor • Relação Anual de Informações Sociais (RAIS)—Annual Record of Social Information, 2000/2001/2002
Canada	• Canada census, 2001 • Statistique Canada
China	• China Education Yearbook, 2003 • China Ministry of Education (MoE) • China Statistical Abstract, 2004 • China Statistical Yearbook, 2002–2003/2004 • Press releases
Czech Republic	• Czech Statistical Office • Labor Force Survey (LFS), 2003

Focus Country	Data Sources
Germany	• Conference of Education Ministers • Federal Labor Office • Federal Statistical Office • Press clippings
Hungary	• Central Statistical Office • Hungary Census, 1980/1990/2001 • Economist Intelligence Unit (EIU)
India	• IndiaStat • Indian Medical Council • Indian Readership Survey • Institute of Manpower Profile • National Association of Software and Services companies (NASSCOM) • Rajya Sabha Questions • University Grants Commission (UGC)
Irland	• Central Statistics Office Ireland (CSO) • Databank Direct • Ireland Census, 2002 • Organization for Economic Co-operation and Development (OECD)

Focus Country	Data Sources
Japan	• Annual report on the Labor Force Survey, 2003 • Japan Census, 2000 • Ministry of Justice, Japan • Shugyo Kozo Kihon Chosa—Employment Status Survey, 2003
Malaysia	• Ministry of Health Malaysia (MoH) • Ministry of Education Malaysia (MoE) • Social Statistics Bulletin, 2000/2002 • UNESCO Institute for Statistics
Mexico	• Población Escolar de Licenciatura, Anuario Estadístico (ANUIES)—National Association of Universities and Institutions of Education • Población Escolar de Posgrado, Anuario Estadístico (ANUIES)—National Association of Universities and Institutions of Education • Instituto Nacional de Estadística, Geografía e Informática (INEGI)—National Institute of Statistics, Geography and Information
Philippines	• Bureau of Labor and Employment Statistics • Commission on Higher Education • Department of Health • Department of Trade and Industry
Poland	• Glówny Urzad Statystyczny w Warszawie (GUS)-Central Statistical Office

Focus Country	Data Sources
Russia	• Economist Intelligence Unit (EIU) • Education in Russia national portal (www.edu.ru) • Federal Service for State Statistics • Russian Education Internet portal (http://db.informika.ru) • Russian Federal Ministry of Economic Development • US Census Bureau
UK	• Higher Education Statistics Agency (HESA) • National Health Service (NHS) workforce survey • Office of National Statistics (ONS)-Labor Force Survey • Oxford Economic Forecasting (OEF)
United States	• Bureau of Labor Statistics-Employment outlook 2010 • Current Population Surveys (CPS), March Supplements, 1996-2004 • Higher Education General Information Survey (HEGIS) • Job Openings and Labor Turnover Survey (JOLTS) • National Center for Education Statistics • US Department of Education

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05/06/15

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