LATIN AMERICAN PRODUCTIVITY

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PREFACE

This report is an end product of a 9-month project by McKinsey's Latin American practice and the McKinsey Global Institute on productivity in Latin America. This work follows the McKinsey Global Institute's previous projects on service sector productivity and manufacturing productivity in the leading industrial economies.[1]

Progressive economic reform in Latin America has led to strong economic growth and particular emphasis on productivity improvements. Productivity improvement, of course, is the fundamental mechanism through which per capita income levels can increase over time. Productivity improvement provides increased outputs of goods and services from existing enterprises and releases labor resources that can be applied to the production of new goods and services. Thus, through productivity improvement, both economic output and per capita income increase. Healthy levels of employment can also be maintained through this process if product and labor markets are sufficiently flexible.

For these reasons, we believe that we need a good understanding of current levels of Latin American productivity and the challenges Latin American corporations face to rapidly improve productivity towards best practice levels. The purpose of this project has been to develop this understanding.

This report consists of three chapters and an executive summary. Chapter 1 describes our objectives and approach for the project. Chapter 2 includes our four industry case studies. Each case study gives the results of our productivity calculations and discusses the reasons for the differences between those levels and global best practice. Chapter 3 presents a synthesis of our findings including our overall conclusions and their implications for policy and corporations.

The undertaking of this project is part of the fulfillment of the McKinsey Global Institute's mission to help business leaders: (1) understand global economic developments, (2) improve the performance of their corporations and (3) work for better national and international policies. The working team for this project consisted of a core group of five McKinsey consultants from our Latin American practice. The McKinsey consultants and their areas of specialization were: Mauricio Camargo (Caracas) – steel; Maria Rosa García-Otero (Buenos Aires) – telecommunications; Armando Gomes (São Paulo) – retail banking; Salvador Malo (Mexico) – steel, telecommunications, retail banking and processed food; and Aleksander Wieniewicz (São Paulo) – processed food. Gustavo Lopetegui (Buenos Aires) was the day-to-day project manager.

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1 Service Sector Productivity, October 1992, McKinsey Global Institute; Manufacturing Productivity, October 1993, McKinsey Global Institute

In addition, McKinsey sector experts in Latin America provided guidance for the case study work. These sector experts were: Luis Andrade (São Paulo) – food, banking; Horst Beck (São Paulo) – banking; Heinz-Peter Elstrodt (São Paulo) – steel; Juan Ferrara (Mexico) – banking, processed food, telecommunications, steel; Ricardo Haneine (Mexico) – banking; Alejandro Preusche (Buenos Aires) – telecommunications, steel; A. C. Reuter (Caracas) – banking. Furthermore, Les Bourne, Ronni Brownlee, Kathryn Huang, Erika Shepherd, Rebecca Wright and Eric Zitzewitz provided editorial support, and the graphics production team was led by Anthony Hudson.

Heinz-Peter Elstrodt (São Paulo) conceived the idea for this project and was responsible for its overall direction. Charles Shaw (New York), the Chairman of McKinsey's South American practice, and I assisted in the review of the results of the project.

Throughout the conduct of this project we benefited from the unique perspective and knowledge of McKinsey consultants on economic performance in the industries investigated in our case studies for Latin America.

Bill Lewis
Director, McKinsey Global Institute
June 1994

TABLE OF CONTENTS

CHAPTER 3: SYNTHESIS

CASE STUDY RESULTS

Labor productivity in Latin America in three out of the four industry cases analyzed is extremely low. In steel, productivity averaged 37 percent of the U.S.[1] level, 31 percent in the food processing industry, and 29 percent in the retail banking industry. There are some marked differences between countries and between industrial sectors; for instance, the poor performance of the Argentina retail banking sector (19 percent of U.S. levels) and Colombian steel industry (15 percent of the U.S. level). Others industries show better results: steel in Brazil (44 percent) and food processing in Argentina (52 percent).

The best results occurred among telecommunications companies in Latin America. Surprisingly, Colombia's performance in terms of total factor productivity, equals that of the U.S. if quality differences are ignored; Brazil and Venezuela also show relatively good results, while Mexico and Argentina lag behind with lower 67 percent and 55 percent productivity rates respectively. This generally favorable performance could be better explained by the lower competitive intensity in parts of the U.S. telecommunications environment. This system worsens the U.S. carriers' performance relative to U.S. companies in the other industries analyzed.

Overall, our analysis shows that for all the cases studied, Latin American companies have lower productivity levels than their U.S. counterparts

That said, in recent years productivity has increased significantly in at least two industries in the region, telecommunications and steel. The trend is especially noted in Mexico, Brazil and Argentina where, since the late 1980s steel producers have been rapidly closing the productivity gap with the U.S. (Exhibit 2). Telecom carriers in Argentina, Colombia and Mexico have also been improving relative labor productivity performance (Exhibit 3). All these achievements are remarkable since productivity of the steel mills and telecom carriers in the U.S. was also increasing substantially during that same period. In Venezuela, however, both of these industries have stood out as a glaring exception to improve performance found elsewhere in the region.

In one sector, food processing, labor productivity shows itself to be also low but stable (Exhibit 4).

We have not been able to measure the evolution of productivity over time in retail banking because of the difficulty in finding good historical data on physical output in the sector. In any case, stable or even growing employment levels and, to

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1 We have used the U.S. as the main benchmark since this country's productivity leads the other developed economies in all the industries analyzed with the exception of the steel industry, in which Japan holds leadership. Nevertheless we provided comparisons with other developed economies. (See McKinsey Global Institute's "Service Sector Productivity" and "Manufacturing Productivity" reports.)

a certain extent, the apparent stagnation of certain physical indicators of output, suggest that no major productivity gains have been achieved.

To understand the implications of our findings, we first analyzed the reasons for the productivity differences from best practice at the company level (i.e., the production process); second, we examined the nature of competition that conditions managers' business decisions; and finally, we identified the external factors that affect the intensity of competition (Exhibit 5). The relative importance of the potential causes for the differences found is shown in Exhibit 6.

The section that follows explores how Latin American companies' operations differ from best practice to cause such differences in labor intensity.

CAUSES OF PRODUCTIVITY DIFFERENCES AT THE PRODUCTION PROCESS LEVEL

Looking at the production process we found that in three of the industries studied – telecommunications, banking and steel – organization of functions and tasks was mostly responsible for the lower levels of productivity existing in Latin America. In two other industries examined – banking and food processing – another factor responsible for the differences was the decreased level of automation in these industries in the region. Interestingly, scale appeared to be a significant determinant of productivity in food producing only. Other possible causes of lower productivity that we analyzed – output mix, variety and quality, and labor skills – were actually found to have little impact on the phenomenon.

Organization of Functions and Tasks

In at least three of the four industries studied, the way managers organize their labor force largely explains the lower levels of productivity encountered in Latin America versus the U.S. Labor force organization deals with the effectiveness and efficiency with which a workforce and other inputs are utilized in the production process. The way industries organize their functions and tasks is also an important factor in employee motivation since this creates different working environments and leadership styles to which employees respond to by working more or less efficiently.

In Latin America, we have found that many companies have rigid and hierarchical organizational structures. These have created an internal need for complex bureaucratic procedures, riddled with redundant and unnecessary tasks. The number of organizational layers in Latin American businesses also tends to be higher than in developed countries. Consequently, communication flows are slow and mainly go from top to bottom, not horizontally or bottom to up.

The recent reorganization of functions and tasks among <u>steel makers</u> in Latin America provides a good example of how a new managerial approach can improve productivity levels. These firms were able to cut payrolls while maintaining or increasing levels of output. In fact, total steel employment in the countries studies dropped 30 percent in the last 3 years, while production increased 10 percent without any major capital investment programs taking place (Exhibits 7 and 8). In spite of the productivity gained by reorganizing the use of labor, even higher levels of productivity are possible as valid benchmarkings indicate (Exhibit 9 and 10).

Telecommunications companies have gone through a similar reorganization process. In the past 4 years, Argentina's two telecommunications companies, Telecom and Telefónica, cut the workforces by 40 percent while increasing the number of installed lines by 60 percent. In the same period, in Mexico, the number of telephone lines jumped 60 percent while employment levels remained constant. Colombian carriers increased their lines by 55 percent while cutting employment by 5 percent (Exhibit 11).

In retail banking, the organization of labor also played a prime role in determining the level of productivity. For instance, we found productivity differences of greater than 50 percent between branches of the same bank, all explained by how the branch's staff and the tasks they were required to perform were organized. The relatively inefficient organization of banks' workforces found in Latin American countries are caused in part by heavy bureaucratic procedures; self- or government-imposed. These can mean, for instance, that the approval of a mortgage can take up to 2 months in the region, compared to less than a week in the U.S. One factor that reduces the effectiveness of the retail banking labor force in the region is the virtual none use of part-time employees – a practice that is common in the U.S. and is used to cope with peak customer demand periods.

Generally, we found that private sector entities showed more efficient use of their labor forces that translated into higher productivity levels. The web of state-imposed rules and regulations encountered in Latin America is also present in the state-owned companies, generating overemployment and unnecessary tasks. The government-owned Telecomunicações Brasileiras (Telebras), reaches only 59 percent of the U.S. level. In comparison, CTBC, a private telecommunications carrier in Brazil has a level of labor productivity equal to 103 percent. Moreover, CTBC's service level is higher than Telebras' (Exhibit 12). Yet, both companies operate under the same regulations and tariffs, in the same economic environment, and with the same type of labor.

Private banks in Argentina showed a very low productivity level (just 25 percent of the U.S.), but state-owned ones were even worse with a 15 percent level compared to the U.S. They both operate in the same environment and are able to employ the same kind of labor. In Brazil we found that state-owned banks pay employees almost three times what private banks do. With this huge differential, the state-owned banks should be able to recruit the best available labor, but they are still half as productive as private banks (Exhibit 13). The only plausible explanation we found for these differences is the way companies organize themselves. Managers of these companies explained that these productivity gaps were caused by extra employment and unnecessary tasks.

Capital (Intensity, Vintage, and Technology)

Capital, in this study, means physical assets excluding land. These include machines, equipment, plant and buildings, as well as the technology they embody and the information system hardware used to run them. If a company works with higher capital intensity with more modern equipment and better technology, then we would expect it to show higher labor productivity.

We found that the amount and type of capital invested is an important determinant of productivity in Latin America in two of the industries studied – food processing and retail banking. In food processing in the region, very labor-intensive, craft-based techniques are common. Industrial-scale producers (either multinational or locally-owned firms) represent only a small fraction of total output in this industry, but we discovered that even these tend to utilize more labor intensive processes than their counterparts in the U.S. (Exhibit 14).

In retail banking, the effective use of automation and information technology is a major productivity driver. Again, we have found a positive relation between the terminals installed and the productivity level. Computer terminals (either at the branch or back office level) and ATMs are much less common in Latin America than in the U.S. (Exhibits 15 and 16). Productivity in Latin America is consequently less.

In two other industries, steel and telecommunications, however, we have discovered that the amount and quality of capital invested plays only a less significant role in determining productivity. While productivity in Latin America's steel industry is lower than in developed countries, steel plants in Latin America are actually relatively new. They were mostly constructed in the late 1960s and 1970s; at the same time Japan built its steel plants. The U.S., on the other hand, still has a number of steel making facilities built before World War II, and Germany's steel industry dates from its rebuilding period right after the war. To improve productivity levels in this industry, only minor investments in de-bottlenecking and process automation should be needed. Telecommunications networks' average age is much higher in Latin America than in the U.S., but this fact affects mainly capital productivity (bottlenecks that slow traffic), and only in a minor way does it affect labor productivity (only more maintenance and operators are necessary due to the older technology).

In sum, lower levels of capital investment do explain part of the productivity gap in the two industries (food processing and retail banking) where productivity increments appear to have stagnated. But, in two dynamic industries that are gaining in productivity (steel and telecommunications) capital appears not to be an important factor.

Scale

"Economies of scale" or "scale effects" describe a situation in which a firm can increase output with less than a proportional increase of inputs. If scale economies exist, then a larger establishment is more productive than a smaller one. But, we have found that in Latin America scale is a relevant factor in explaining productivity differences between this region and the U.S. in the food processing industry only.

Food processing plants are much smaller in Latin America than in the U.S. and this largely explains the productivity gap for several reasons. In Latin America, 20 to 30 percent of total processed food labor work in firms with less than 20 employees. In the U.S., less than 5 percent are employed in such small firms (Exhibit 17 and 18). In Latin America, being small means that costs can be kept disproportionately low. Small businesses can escape fiscal oversight facing less of a tax burden than their larger counterparts. They can also skirt sanitary controls which means they can use cheaper low quality ingredients compared to larger firms. Small firms also pay lower wages and provide only minimal benefits. Consequently, their payrolls are also disproportionately smaller. The lower costs means they can remain competitive despite their small scale. Moreover, small firms have little or no access to financial capital. Therefore, they cannot invest in productivity enhancing automation equipment.

Economies of scale play only a secondary role in determining the level of productivity in Latin America's steel industry. Most plants (with the exception of Colombia) are already of sufficient size to theoretically capture the benefits that scale would provide. In the two service industries analyzed (retail banking and telecommunications) economies of scale do not in any way account for the gap in productivity with the U.S.

All told, all these countries have the critical mass needed to capture the potential economies of scale. In the only case found where they were not achieving them (the tiny unproductive food processors) external factors (e.g., fiscal and sanitary evasion and lack of access to capital) have made the existence of these small inefficient players possible.

Basic Labor Skills
and Intrinsic Motivation

We uncovered no evidence to show that intrinsic motivation and basic labor skills were major explanations for the productivity differences observed in the cases studied. This conclusion is based mainly on the fact that companies with much higher productivity than the national average employ the same kind of labor.

Although we believe labor skills do not represent a major obstacle to productivity increases in Latin America, two observations should be made.

On the one hand, we should differentiate between the type of skills needed. In many cases, inefficient management represents a bottleneck in the turn-around process needed to achieve productivity gains. Historically, management in Latin America has not focused on constant improvement, instead, it has focused on other issues which affected their companies' profitability to a greater extent. High inflationary environments put finances as the first priority and also mask internal inefficiencies. Profligate regulation leads to intense lobbying efforts, since a government decree can radically change companies' performance. Finally, state-owned companies' managers are not only interim; they are also politicians, more concerned with their political interests than in creating value for their societies. To be able to take the measures needed to capture improvement opportunities, managers have not only to be convinced that, today, this is the only way to survive in the long term, but they must acquire the new skills required. Consumer focus, technology, cost containing efforts, international capital markets, partnership with suppliers and distribution channels, will constitute the managers' vocabulary, but skills in these areas must be learned.

On the other hand, we do not see basic labor skills as an impediment to closing the significant productivity gap which exists. But, actual labor qualifications might begin to be a constraint as companies get close to their best practice counterparts.

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In sum, at the individual company level, the way firms organize themselves is one of the two main causes of the productivity gap observed. Overstaffing, heavy and hierarchical organizations, and the presence of cumbersome processes reflect a bureaucratic instead of a "business-oriented" managerial approach. The second causal factor is the low level and quality of capital invested, although this was only present in food processing and banking.

Why do managers in Latin America choose these less productive methods? Why are firms in the telecommunications and steel sectors rapidly improving their productivity levels while those involved in food processing and retail banking are not? These questions will be examined in the section that follows.

PRODUCTIVITY DIFFERENCES AND THE NATURE OF COMPETITION

Our findings show a clear relationship between the competitive intensity and productivity in at least three industries studied – telecommunications, retail banking and steel. Because intensity of competition has been weak in these areas, businesses have felt little pressure to make improvements. The lack of competition is clearly reflected in the high concentration in retail banking in Latin America, where large banks control 46 to 95 percent of total banking assets, against only 22 percent in the U.S. (Exhibit 19).

A number of factors contribute to the less competitive environment in retail banking in the region. Entry restrictions have prevented the emergence of new competitors, the opening of new branches, and even the launching of new banking products. Limits to growth have motivated banks to concentrate on serving the wealthier segment of the market which can afford the high prices charged. Also, unproductive but large state-owned banks have established a comfortable price umbrella in the markets they operate.

The low level of competition is manifested in the very high income earned by banks throughout the region. Income in the Latin American countries examined equals 6 to 11 percent of assets against 4 percent or less in the U.S. These huge margins allow them to afford their heavy organizational structures (Exhibit 20).

Similarly, high import barriers have shielded steel producers from international competition. The naturally large scales inherent in this industry coupled with relatively smaller markets does not allow for significant domestic competition, perhaps with the exception of Brazil. The top four producers of each Latin American country account for 61 to 100 percent of respective national output, in comparison to 34 percent in the U.S. and 59 percent in Japan (Exhibit 21). If concentration is analyzed by product category, clear nationwide monopolies emerge for these subsectors in each country.

Telecommunications industry monopolies have not been limited to Latin America. It was not until recently that international calls have been open to competition in the U.S. and Japan. The historical existence of monopolies in this industry in advanced countries in part explains why the productivity gap with Latin America is not as large in this industry as in the other three sector cases analyzed.

Competition has been intense in food processing, the remaining industry analyzed. Despite high import barriers and geographically fragmented players owing to poor infrastructure, the presence of hundreds of rival companies in each of the industry's subsector suggest that, although not perfect, competition is more intense in this sector compared to the others analyzed. The fact that productivity is so low has to do with external factors (i.e., wage levels and price controls) discussed in the next section.

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Strong competitive pressures induce firms to seek the most productive methods available in order to stay in business. But, producers in Latin America have faced relatively weak competition and thus felt little pressure to continuously improve their unproductive methods and processes since these have never posed a threat to profitability nor future survival.

But, why has competition not been intense in Latin American countries and how is it changing?

EXTERNAL FACTORS AFFECTING COMPETITION

We have identified two key types of external factors influencing the degree of competitive pressures found in a market:

1. Market conditions. These are dictated by market elements in which a business operates (i.e., suppliers, customers, competitors and the relative prices of labor, capital, raw and semifinished materials, energy) and;

2. Policies and regulations, which are the rules that governments, various regulatory bodies and trade unions impose on the market.

MARKET CONDITIONS

We found that "relative input prices" was the single most important factor determining the production processes utilized in all the cases analyzed. Competitive pressure from upstream-downstream industries has only been a secondary factor (telecom, processed food and steel).

Relative Input Factors/ Factor Availability

Differences in relative cost of inputs incites management to substitute among these inputs to reach the optimal (lowest) cost of production. In cases where labor costs are relatively cheap, for instance, the incentive is to utilize labor-intensive production processes.

Cheap labor, combined with relatively expensive capital, in Latin America have stimulated management to opt for more labor intensive processes in the food processing and retail banking industries. The cost of an ATM in Brazil (U.S.$45,000), for example, is fourteen times the annual salary of a human teller (U.S.$3,200). The same relation in the U.S. is less than one (Exhibits 22). A food industry production worker in Mexico, Colombia, Venezuela and Brazil, is paid less than U.S.$5,000 a year compared with an annual salary of U.S.$31,000 in the U.S. Equipment prices in these Latin American countries, however, were much higher because of the import barriers that used to protect the tiny local machinery industry. Still, the very low labor costs more than offset the huge productivity differences observed (Exhibit 23). Low labor costs in the telecommunications industry in Brazil, Colombia and Venezuela have also put less pressure on these companies to increase efficiency.

The type of technology employed by steel makers in the region is directly related to the ready availability of inexpensive iron ore, energy and labor, especially in Brazil and Venezuela. These two countries use integrated steel making technologies, which are, by nature, more labor intensive than the alternative "minimills." Latin America's steel producers can remain internationally competitive, even with lower productivity levels, because of these low labor costs. Low labor costs have also, not surprisingly, slowed down the adoption of automation processes in this industry (Exhibit 24).

Pressure From Other Industries

Interrelated industries (down and upstream) have been an important driver of productivity in highly industrialized countries. But this has not been the case in Latin America since they have also operated in a less competitive environment.

Protected telecommunications equipment makers have charged higher prices for their products sold to carriers in Brazil and Argentina, and to a lesser extent even in Mexico. The result was that telecommunications companies in these countries slowed their expansion since investments bought fewer lines compared to developed markets.

Latin America's still strongly protected automotive industry has had a direct impact on steel makers in the region. Vehicle manufacturers in developed countries placed tremendous pressure on steel producers to improve output quality and lower prices. Such pressures have been much less intense in Latin America since vehicle makers themselves have been shielded from international competition.

Finally, the nascent supermarket industry in Latin America has not influenced food processors in the region as it has in the U.S. and Europe. The balance of power has been in favor of the producers (Exhibit 25).

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As we have seen, differing market conditions have affected the performance of the industries analyzed. The availability of relatively cheaper labor and raw materials has prompted managers in Latin America to select more labor-intensive processes and has put less pressure on them to increase productivity. Protected steel users and weaker supermarkets have also lessened pressures on steel and food producers to improve efficiency.

In some of these circumstances, relatively cheaper input prices for example, will not change significantly in the coming years. Others, however, are beginning to change. For instance, the influence of supermarkets as they are consistently increasing their share of total food retail sales. More dramatic shifts, however, are taking place in the whole area regarding rules and regulations that govern operating conditions.

POLICIES AND REGULATIONS

Latin American countries are typically heavily regulated societies where almost every action must be foreseen by the law. The inclination for state intervention has been expressed in the second half of this century by government ownership of the largest companies in what were considered to be "strategic" economic sectors (e.g., transportation, public utilities, banks, heavy industry and at times even consumer goods). We found that different forms of government intervention have greatly contributed to diminishing competitive intensity, thereby decreasing managers' motivation to improve productivity. State ownership has proven to have a negative impact on competition in the telecommunications, steel and retail banking industries. Import barriers shielded local competitors in the two manufacturing industry cases – steel and food processing. Strict rules of competition halted productivity improvements in both service sector cases – telecommunications and retail banking. In addition, price controls distorted competition in the food processing and telecommunications sectors.

Labor rules and trade union demands have played a less significant role since labor markets in the region are relatively more flexible than in the developed world. Lack of major impediments to hire and fire, extremely low minimum wages and the absence of unemployment and other fringe benefits, have produced relatively more efficient labor markets in Latin America. On top of that, underground or undocumented activities provides a "de facto" flexibility to a large part of the economy. On the other hand, rigid job specifications have hindered productivity improvements in certain industries. The imposition of trade union demands has served to distort employee compensation in certain industries as well, creating small groups of privileged employees at the expense of the majority of the population.

State Ownership

The damaging effect of state ownership became clearly visible once the region embarked on a far-reaching privatization program. Although it is still too early to assess the full impact of privatization, abundant evidence indicates that the wholesale nationalization of industries that took place this century throughout the region seems to have been unable either to deliver the services required or earn appropriate returns. Fortunately, these countries reacted by privatizing at the same speed they nationalized 40 years ago.

Newly privatized <u>telecommunications</u> companies in Mexico, Argentina and Venezuela are growing at 15 percent per year, trying to satisfy enormous demand accustomed to waiting years for a phone at many times the international price. Conversely, Brazil's state-owned Telebras is growing at only 6 percent, using twice as much labor per line as a Brazilian private carrier (Exhibit 26).

Colombian state-owned telecommunications companies are an exception, They are performing as well as privatized ones while being the only country in the region that has allowed competition among carriers for international calls.

Privatization in the <u>steel</u> industry has been aggressive. Only one company in the countries studied, Sidor in Venezuela, remains state owned. The productivity improvement after privatization is so significant and widespread that it is difficult to argue against it. State-owned steel companies not only misuse labor, but also waste capital, a very scarce and expensive resource in developing countries. Examples include a rolling mill and a seamless pipe plant bought at three times their market prices or two heavy plate mills purchased but never installed.

State-owned banks dominated the retail banking business in all the countries studied, with the exception of Venezuela. Their negative impact is not only reflected in a very low productivity level for the sector as a whole, but also in the misappropriation of scarce financial resources, which can put the entire financial system in jeopardy. State-owned banks in Brazil pay their employees almost three times the private sector levels, but their employees are only half as productive as the private sector banking employees. The U.S.$10 billion a year difference in wages is equivalent to the amount this country pays in interest on its foreign debt.

Import Barriers

High tariff and nontariff barriers that have kept competitors at bay have caused years of inefficiency in the region's steel and food processing industries.

The steel sector was especially affected. Until very recently, Latin American steel imports were negligible because of protectionism. Just how protected these markets were can be glimpsed from the fact that in one country a single producer dominated every segment of the industry, charging monopoly prices while providing lower product and service quality than would be true in an openly competitive economy.

Today the industry is turning around. With countries increasingly open to international trade, producers in Latin America have now started to specialize in specific product categories, and international steel trade has grown substantially both within the region and with the rest of the world as a result (Exhibit 27). The size of the Brazilian industry allowed this country, to a certain extent, to diminish the deleterious effects of protected markets once local competition existed.

International trade in processed food – a local industry by nature – does not represent a significant share of total output in many countries. However, regional competition can prove effective in raising quality and lowering prices, which has occurred as import barriers fell and trade within the region jumped.

Rules of Competition and Industrial Concentration

The retail banking and telecommunications industries have been strongly affected by strict rules of competition, substantially diminishing internal rivalry.

In Latin America's retail banking industry, government regulators have typically controlled interest rates, restricted entry of foreign-owned institutions, limited branch expansion, restricted the activities of universal banks and imposed high cash reserve requirements. As a result, banks offer the same array of products and services to the same limited share of the population that can afford the high prices charged. Retail banking services' penetration is much lower in all the Latin American countries than in the U.S., with the exception of Brazil where a very sophisticated system has been developed as a defense against high inflation levels (Exhibit 28).

Previously, concentration in the telecommunications industry was considered "natural" throughout the world. However, the advent of new technologies and deregulation brought the alternative of cellular phones, the possibility of competition in international calls and the positive effects of regional monopolies instead of national ones. State-owned monopolies in Latin America have only recently begun to experience any kind of competition.

Fiscal Policy, Price Controls, Pricing Schemes

Several other types of regulations have harmed the productivity of Latin America's industries. These include fiscal policy and price controls for the processed food sector, and more recently, generous price schemes in the telecommunications industry.

The food processing industry has experienced price controls in all the countries studied. Controlled prices represent a serious threat to producers' survival since they often do not cover input costs. To overcome the threat producers often took two courses of action: (1) smaller, informal companies avoided government controls by selling through "under the counter" channels; (2) many larger companies, not willing or able to participate in the "underground" market, began to produce lower quality products using cheaper raw and packaging materials, as well as looser sanitary controls and lower quality standards. The result has been a growing "non-regulated" sector of the economy that was able to maintain prices aligned to costs and gain market share since it did not need to sacrifice quality.

The position of the "official" sector of the economy with access to capital and enough volume to justify investments in automation, has been enormously hurt by price controls to the point that some international companies have reduced their presence in the region. Moreover, consumers have also been negatively affected by the general quality degradation caused by price controls.

This industry has also suffered a relatively heavier fiscal burden in Brazil and Argentina (Exhibit 29), affecting the industry in at least two different ways: (1) relatively higher taxes are reflected in higher final prices, constraining export growth (processed food exports in Brazil and Argentina are not trivial, owing to their competitive advantage built on inexpensive raw materials), (2) taxes affect only those who pay taxes. The higher the tax level the bigger the competitive advantage of "unregulated" establishments who are also the most unproductive.

Price controls and fiscal policy, have increased the poorly regulated small firm producers at the expense of large/legitimate companies, diminishing the possibility of productivity/quality gains through automation.

The telecommunications industry has also been affected by price schemes, but in a very different way from that in food processing. Telecommunications experts complain that government-mandated low rates have been the reason for the lack of investment and, ultimately, for the supply shortages in the region. The huge rate increases that took place just before Mexico and Argentina sold their telecommunications companies to the private sector seem to support the argument, as well as the tariff comparisons that show lower prices for some Latin American countries when measured in dollars per minute. However, since at least 70 percent of the total cost of these companies are local labor costs, the relation between prices and local labor costs may be more important. The price/labor cost relation is favorable to all the Latin American countries, but especially to Argentina, Mexico and Venezuela, the three that recently privatized their telecommunications industries. To justify employing one person, a U.S. carrier needs to "sell" 223,000 calls per year. In Venezuela, Argentina and Mexico, companies need to sell less than one-third that amount; in Colombia and Brazil, one-half. Therefore, U.S. carriers experience greater pressure to reduce employment and sell more calls to be more productive (Exhibit 30).

Again, we see that prices not fixed by the market, discourage productivity. Price increases before privatization proved to be useful since they have attracted world class operators and fostered the expansion of the network. These high tariffs have allowed companies to earn good returns and make large investments. However, when the initial investment period following privatization has passed, regulators should implement "price cap" mechanisms that not only benefit telephone users, but put pressure on companies to continue improving productivity.

Labor Rules and Unionism

We found labor regulations, as well as the influence of trade unions to be of secondary importance, although these issues are generally regarded as an impediment to enhancing performance and productivity. Certain labor rules of these countries do hinder the flexibility managers need to optimally allocate human resources. Unions have also vigorously resisted privatization and labor force reductions. Still, when compared to the more developed world, labor rules appear to be much less rigid in Latin America, particularly when compared to European countries. Minimum wages are generally set below market levels, restrictions on employees dismissal are minimal, and unemployment benefits are practically unknown. Lack of regulations actually makes these labor markets more flexible than those of many developed countries.

Even trade union activities are not problematic. Union opposition to privatization was unsuccessful because of the political momentum supporting privatization had gained. One notable exception has been Brazil. The huge layoffs in recent years would still be unthinkable in Europe, Japan and unlikely even in the U.S. Finally, the existence of a large "underground" portion gives a "de facto" flexibility to the economy.

Labor rules did have negative effects, mainly in the creation of labor cost disparities. Comparing the labor cost of each industry by country with the national average of the four industry cases, clearly points to the disparities (Exhibits 31 and 32). Interestingly, the U.S. shows a smaller difference between the best and the worst paid sector, confirming that if markets are free, labor will be compensated more homogeneously, responding to the specific skills required. Still, steel workers in the U.S. get almost twice what their peers in the food processing industry earn, reflecting strong unionization in this industry as well as more specialized skills and perhaps more hazardous working conditions. Telecommunications and banking employees in the U.S. are paid close to the average of the four cases studied.

But, Latin American countries present major differences from one industry to the next. This is especially visible in Mexico, Argentina and Brazil. Telecommunications workers in Mexico cost 273 percent of the Mexican four cases' average wage, or almost U.S.$30,000 a year. By contrast, Mexican food processing workers cost only U.S.$4,300 a year. Not only are the telecommunications workers relatively well paid, but their jobs are more secure; in accordance to the trade union's contract, employment cuts did not take place after the privatization of Telmex (Mexico's telecommunications company). Retail banking employees in Argentina and Brazil receive salaries more than twice their national average. Brazilian state-owned bank employees get 2.5 times what their private colleagues do. Telecom employees in Argentina cost 188 percent of the national average of the four cases studied, while food processing workers get only 59 percent. High financial margins and telephone bills not only finance unproductive organizations but also pay for distorted labor costs.

* * *

Regarding outside factors affecting competition and hence productivity we have reached the following conclusions: the availability of relatively inexpensive raw materials and labor have prompted management in the region to opt for more labor intensive production methods. These factors will not change a great deal in the near future; so the labor productivity gap caused by them, is expected to remain, which explains why the food processing industry, the most affected by them, is not expected to show major improvements.

However, the web of regulations and controls that has had a harmful impact on Latin American societies is changing rapidly all over the region. State-owned telecommunications companies as well as banks have wasted resources and charged high prices while, at same time, delivering poor service. Inefficient steel producers, shielded by import barriers, had been charging customers abusive prices. A very concentrated banking industry continues in some countries to earn large margins that cover up inefficiencies. Price controls and high taxes have rewarded those smaller "non-official" firms. And, the presence of strong trade unions has meant certain industries have accrued benefits but only to relatively few. The overwhelming involvement of the state was largely responsible for the region's worst economic crisis in modern history during the 1980s, an event that fortunately catalyzed the forceful adoption of market-oriented policies by Latin American nations.

IMPLICATIONS FOR POLICY

The preceding section examined the impact of government economic intervention, and general regulatory environment on labor productivity and, by extension, on the well being of Latin American societies. In the section that follows, we look into the impact of the liberalizing changes that have taken place so far.

Three steps have had an immediately beneficial impact on productivity in Latin America. Privatizations of state-owned steel and telecommunications firms in the region provides perhaps the most striking examples of the potential improvement that can be captured from simply adopting a new management approach. These newly privatized companies have improved productivity dramatically, not only by cutting employment but also by aggressively stepping up output. The reduction of import barriers has increased consumer choices forcing domestic producers to lower their prices and improve the quality of their products. Deregulation of businesses has broken former cartels and fostered the expansion of profitable companies. One clearly visible impact of this change has been the ensuing foreign lending and investment boom many countries in the region are now experiencing. Still, delayed deregulation of banking systems coupled with the large government presence in this sector, explain why banks are not improving productivity levels faster.

Despite this aggressive effort to follow more market-oriented policies, there are big opportunities for deepening and consolidating the task already begun. However, possible social unrest and future governments could threaten not only the deepening of the reforms but their very existence. To appropriately address this topic, we would need to consider a variety of factors that are beyond the scope of this report such as the efficiency of public spending, the inequities provoked by fiscal evasion or the effectiveness of the educational system. Instead, the focus of our analysis has been on two related issues within the sphere of our original objective: (1) What can governments do to enhance productivity and consequently, the living standards of their people?; (2) What is the relationship between productivity and employment?

POLICY AND REGULATION FOR THE FUTURE

Despite the improvement in the operating environments in Latin America in recent years, its economies are still highly bureaucratic and regulated – a phenomenon that rewards small specific groups with special privileges, rather than the society at large, and ultimately limits economic and social development.

Privatization

In the industries analyzed there are still state-owned companies that are good candidates for privatization; they are: telecommunications firms in Brazil, large banks in Brazil as well as in Argentina, and the Venezuelan steel giant, Sidor. All these companies are much less productive than their privately-owned counterparts.

On the other hand, we cannot justify the need for privatization of the telecommunications company in Colombia within the sphere of our analysis. Although state owned, it is managed as well as other recently privatized carriers in the region. Its productivity indicators, growth rates, tariff levels and efficiency of the investing process show no need to turn it over to the private sector.

Import Barriers

Actual tariffs in Latin America are higher than in many developed or developing countries. However, the main threats to free trade are not in the 5 to 10 percentage points differential in tariff levels between this region and developed countries, but the bureaucratic customs and the proliferation of persistent non-tariff barriers. Further, regional trade pacts, such as Mercosur and the Andean Pact, should be careful to avoid the trap of establishing regionwide oligopolies in certain industries. The setting of a high common outer tariff and the establishment of strict rules of origin would certainly make this a distinct possibility.

Fiscal Policy

Solving the enormous problem of tax evasion in the region should be seen as a great opportunity for improving productivity. Reducing fraud in this area will open the way to cutting the heavy fiscal burden some industries are bearing. It will also attack the "unofficial" unproductive business sector. Authorities can really commit to reducing tax evasion by implementing cost effective information technology to tract evaders. Argentina's impressive and successful campaign is an example where a wider taxpayer base today allows treasury to reduce tax levels.

Price Schemes

We have seen that comfortable tariffs reduced the urgency for the communications companies to improve their productivity. Governments have to be cautious when fixing price policies for newly privatized utilities, keeping tariff levels consistent with an efficient cost structure.

Trade Unions

Huge labor cost disparities between the industries analyzed are only a few examples of the distorted labor market in Latin America. Liberalization and decentralization of salary negotiations is one path to a more equitable and fair labor compensation. These should be based on specific skills required, performance and working conditions, instead of the powerful unions' demands. More flexible job categories would also help managers in the reallocation of human resources in the process of enhancing productivity.

Foreign Direct Investment

Perhaps one of the most important ways in which productivity can be increased is through the entry of companies into these economies that already utilize best practices for their operations. Until recently, certain countries in the region viewed foreign direct investment as a threat to national sovereignty since foreign-owned companies, it was reasoned, were less likely to act in the interest of the home economy and were less subject to national policy control.

Fortunately, this is no longer the common view in the region, where policy makers have not only changed the legal framework to equally treat foreign and domestic investors, but actively promote their countries abroad as good investment sites. Local governments have welcomed foreign participation in the privatization process not only because of the capital they invest, but to ensure competent management of the ventures. We think that voters should question what they are really getting when politicians propose laws to defend domestic companies against either transplants or takeovers. It is often a special interest that is at stake and not a national interest.

Possible Different Evolutions
In the Formal and Informal Sectors

If our case findings can be generalized, these economies will witness two different paths of development. The formal sector will rapidly close the

Exhibit 4

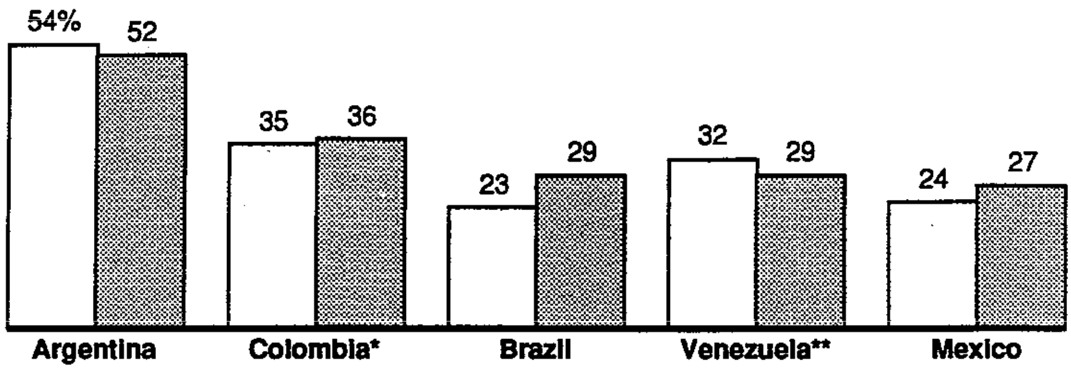
LABOR PRODUCTIVITY EVOLUTION IN THE LATIN AMERICAN FOOD PROCESSING INDUSTRY

Monetary output at U.S. prices per employee

Index: U.S. = 100

1987 (1988 for Mexico)

1992



* Plants with more than 10 employees

** Plants with more than 5 employees

Note: Between 1989 and 1993 the U.S. food processing industry increased its own labor productivity level by 5%

Source: Food producers associations; IICA; Census of Manufactures

Exhibit 5

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES

External factors

- Market conditions
  - Demand factors
  - Relative input prices/factor availability
  - Other industries
- Policy and regulation
  - Import barriers
  - Competition and concentration rules
  - Labor rules and unionism
  - State ownership
  - Other (fiscal policy, price control and schemes)

Nature of competition

Production process

- Output mix, variety, quality
- Production factors
  - Capital (intensity, vintage, technology)
  - Scale
  - Labor skills
  - Organization of functions and tasks

Exhibit 6

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES FROM BEST PRACTICE

● Important
○ Secondary
X Undifferentiating

	Telecom	Retail banking	Processed food	Steel
External factors				
• Market conditions				
– Demand factors	○	X	X	X
– Relative input prices/factor availability	●	●	●	●
– Other industries	○	X	○	○
• Policy and regulation				
– Import barriers	○	○	●	●
– Competition and concentration rules	●	●	○	○
– Labor rules and unionism	○	○	X	○
– State ownership	●	●	X	●
– Other (fiscal policy, price control and schemes)	●	X	●	X
Nature of competition	●	●	○	●
Production process				
• Output mix, variety, quality	○	○	X	○
• Production factors				
– Capital (intensity, vintage, technology)	○	●	●	○
– Scale	X	○	●	○
– Labor skills	X	X	X	X
– Organization of functions and tasks	●	●	○	●

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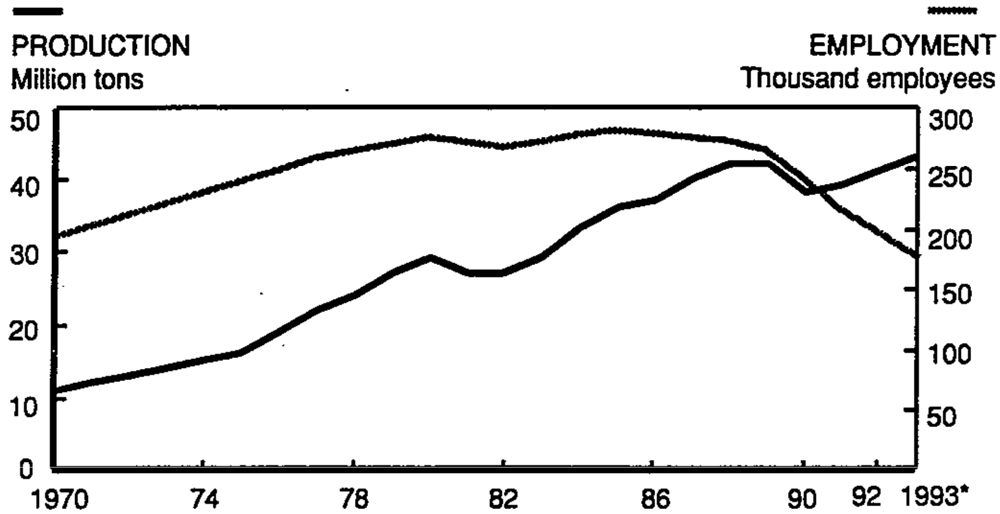
Exhibit 7

EVOLUTION OF LATIN AMERICAN RAW STEEL PRODUCTION AND EMPLOYMENT

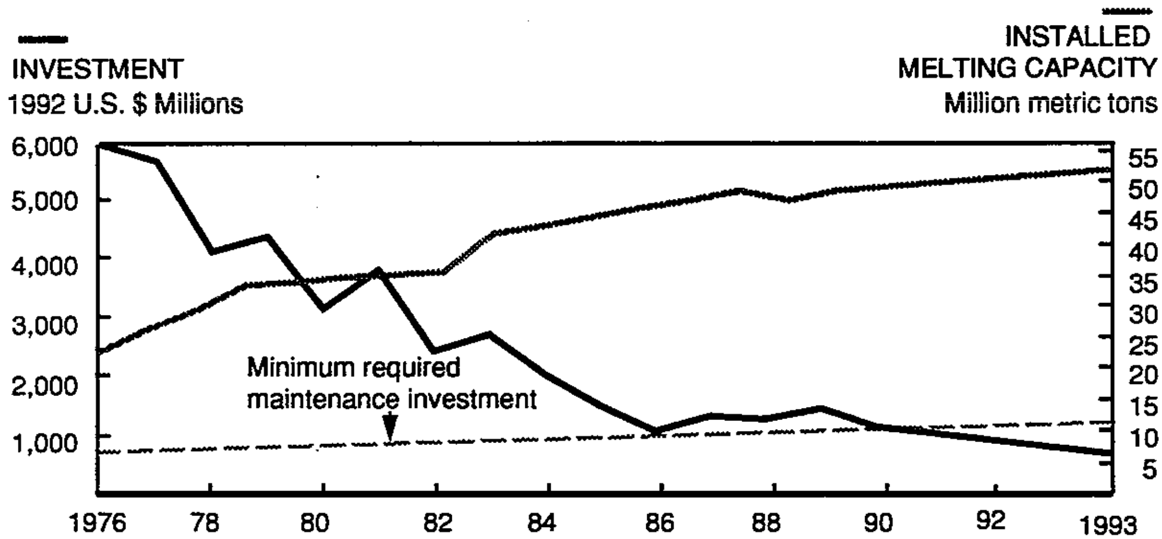


* Estimated

Source: IISI, ILAFA; McKinsey analysis

Exhibit 8

INVESTMENT IN THE LATIN AMERICA STEEL INDUSTRY



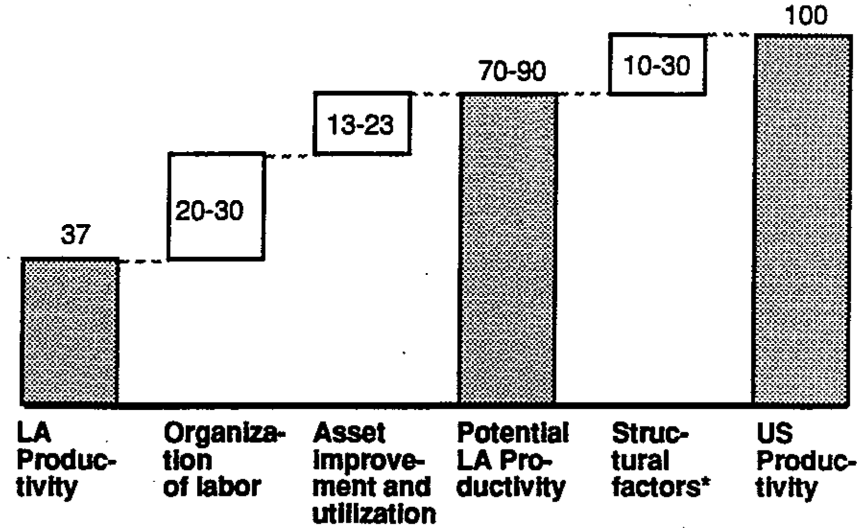
Note: Minimum investment required calculated based on actual production and a requirement of $25/ton for long products and pipes and $40/ton for flat products

Source: ILAFA; IISI; WEFA Group; Mckinsey Steel Practice; McKinsey analysis

Exhibit 9

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES AT THE PRODUCTION PROCESS LEVEL 1992 – STEEL INDUSTRY

Equivalent output per hour worked



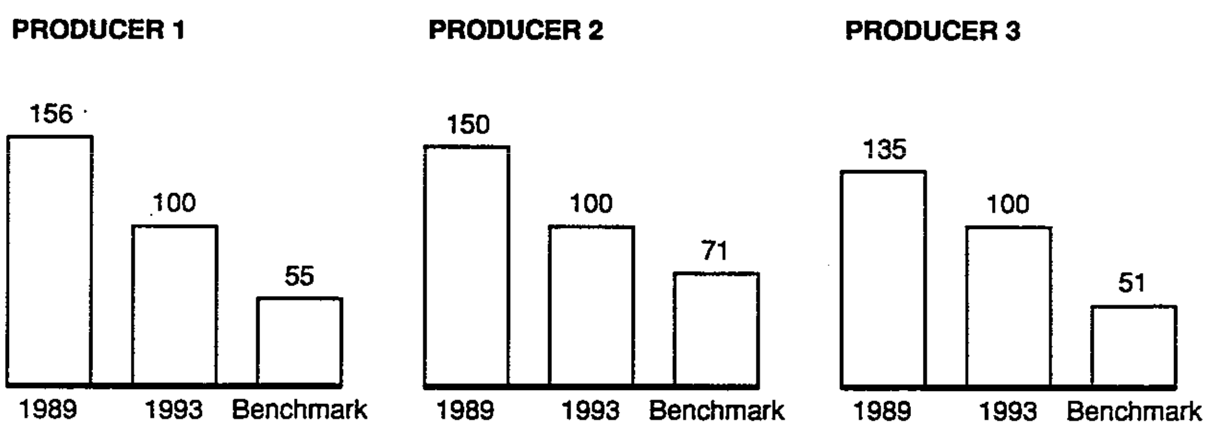
* Include the influence of the technology used as a result of relatively lower input prices and the scale of production

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 10

OVEREMPLOYMENT IN SOME LATIN AMERICAN STEEL PRODUCERS*

Index: 1993 employment = 100%



* Output remains constant or increases for producers during period analyzed

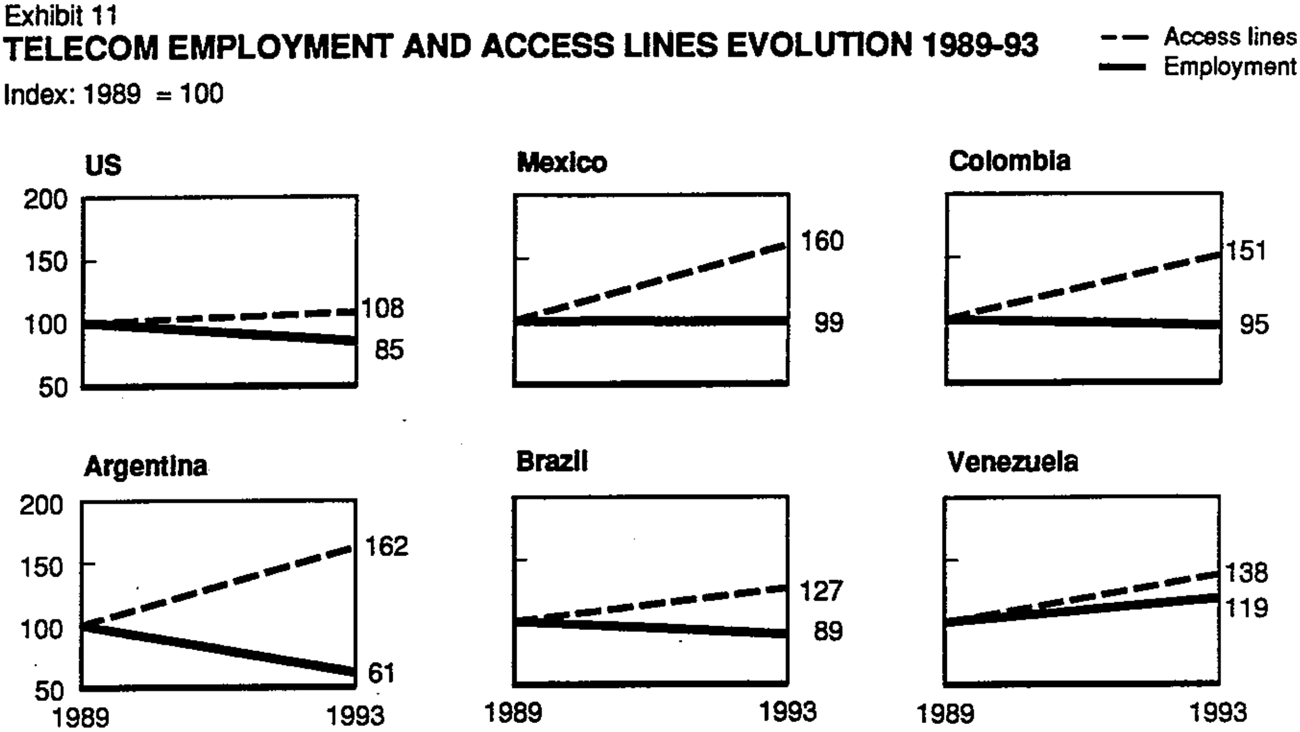
** Benchmarks were determined based on comparable processes and technologies, adjusting for structural factors

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 11

TELECOM EMPLOYMENT AND ACCESS LINES EVOLUTION 1989-93

Index: 1989 = 100

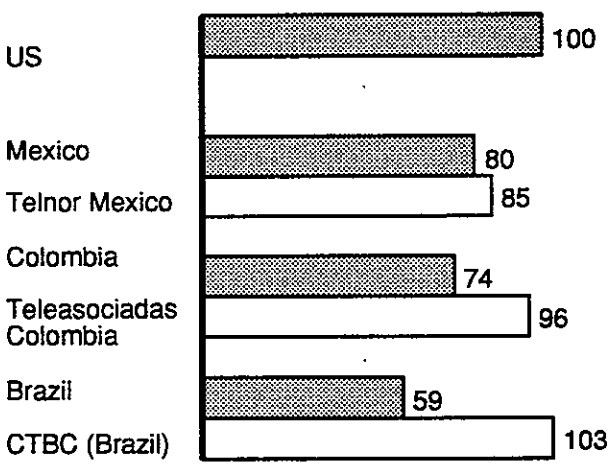


Source: ITU, Annual reports

Exhibit 12

MORE PRODUCTIVE TELECOM COMPANIES WITHIN LATIN AMERICA

Access lines per employee, Index U.S. = 100

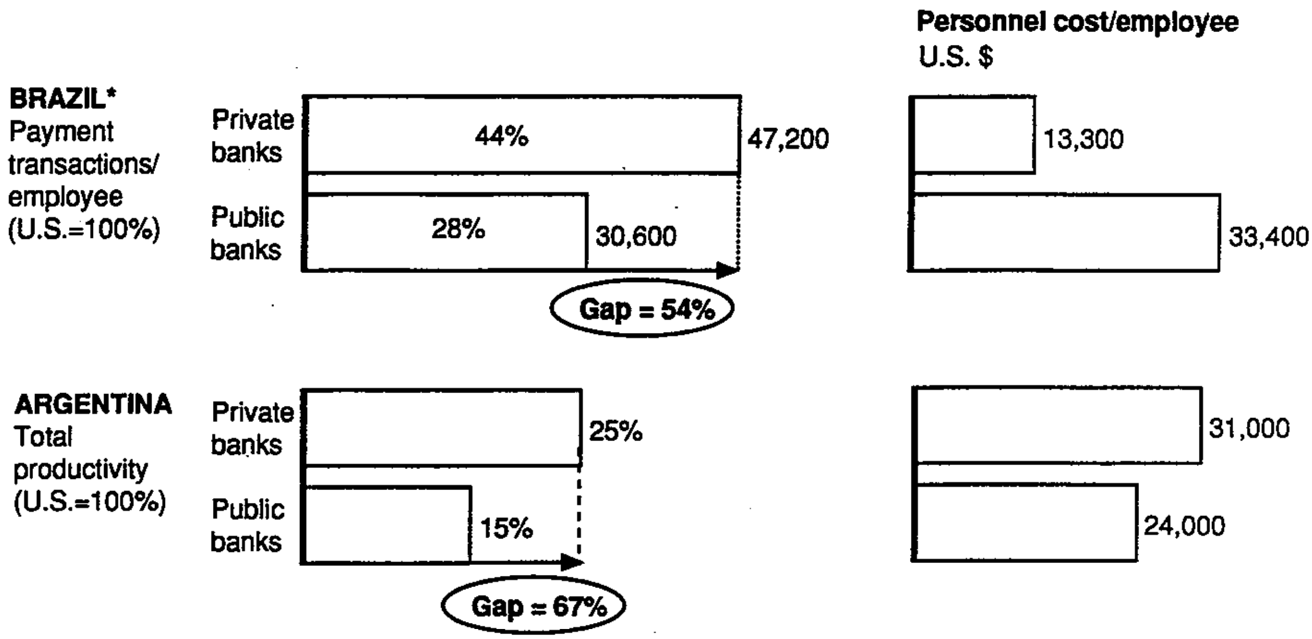


	CTBC	TELEBRAS
Lines – Thousands	280	10,500
Lines per inhabitant	13	8
Repair requirements/100 lines	2.5	4.5
Rural phones (index)	100	25

Source: Exame, Nov 93; annual reports, sectorial studies' McKinsey analysis

Exhibit 13

COMPARISON OF SOME INDICATORS BETWEEN PUBLIC AND PRIVATE BANKS



* Sample of 19 banks including the major public and private banks

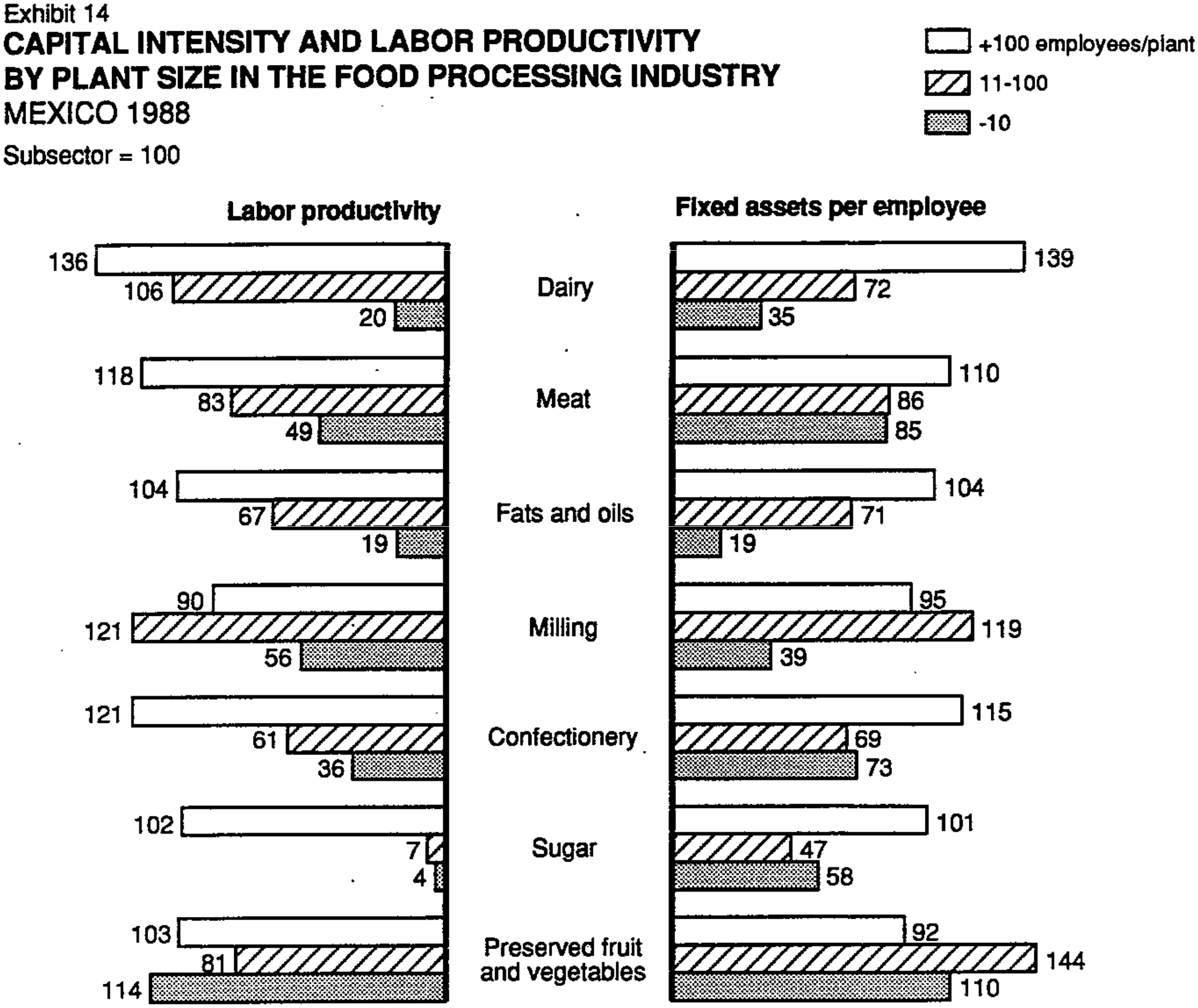
Source: Questionnaires; Febraban; Financial Statements; Banco Central de la Republica Argentina

Exhibit 14

CAPITAL INTENSITY AND LABOR PRODUCTIVITY BY PLANT SIZE IN THE FOOD PROCESSING INDUSTRY

MEXICO 1988

Subsector = 100

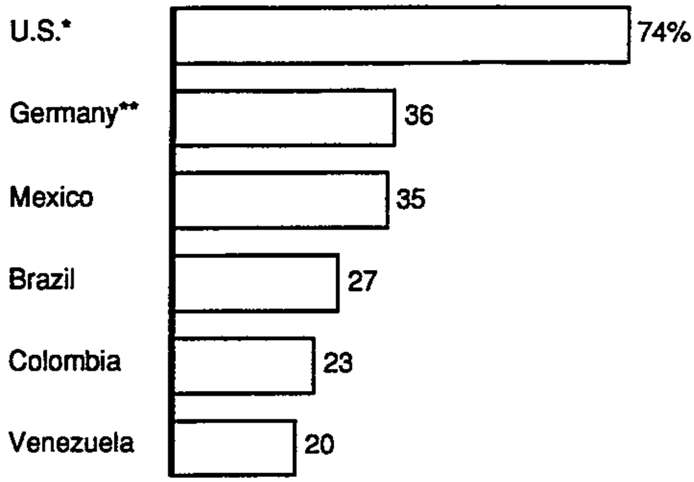


Source: Census of Manufactures; McKinsey analysis

Exhibit 15

RETAIL BANKING ON-LINE TERMINALS PER 100 EMPLOYEES 1992

Percent



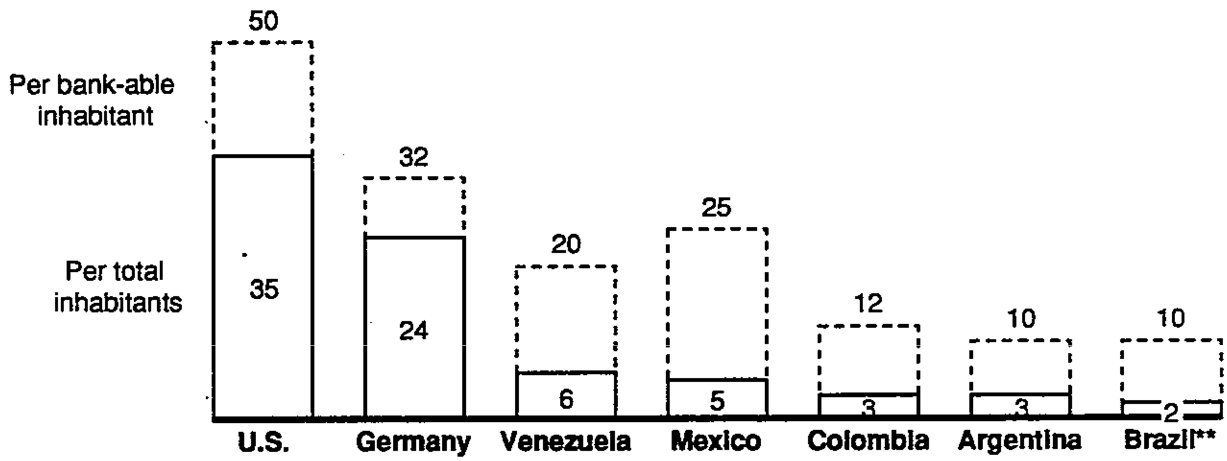
* U.S. figure for 1989

** Figure for savings banks - 1991

Source: ABA National Operations/Automation Survey; annual report Sparkassen; MACE; questionnaires; McKinsey analysis

Exhibit 16

ATMs/100,000 BANK-ABLE INHABITANTS 1992



* Average for Banco Mercantil (30% market share)

** Average for Itaú, Bradesco and Tecnologia Bancária

Source: McKinsey analysis

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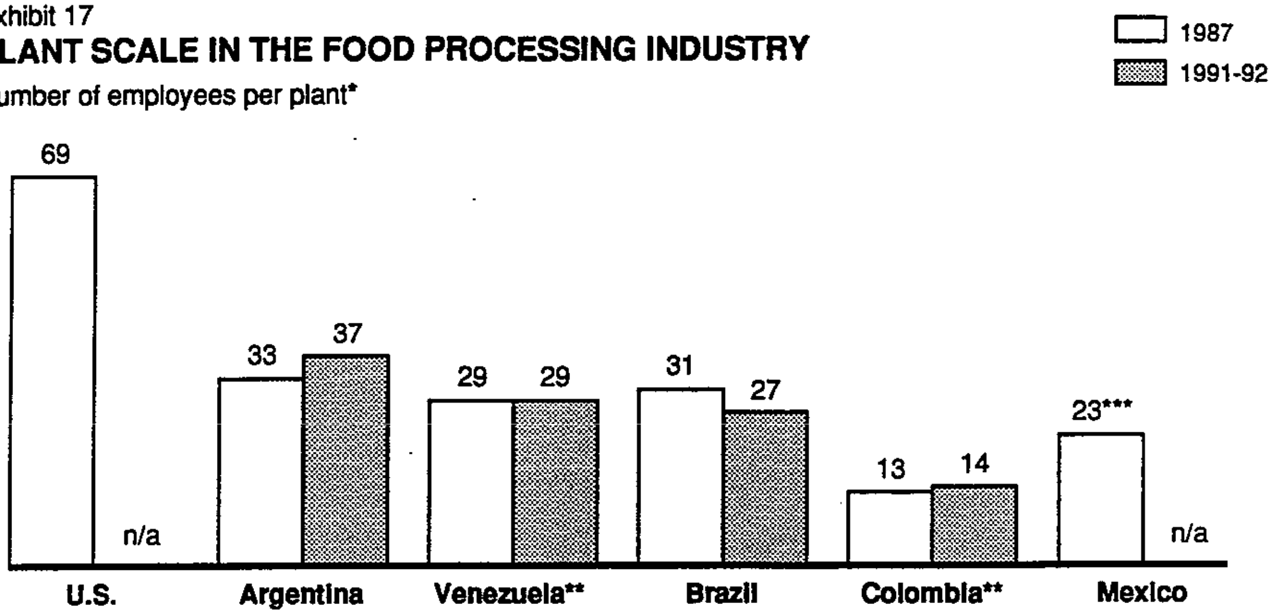
Exhibit 17

PLANT SCALE IN THE FOOD PROCESSING INDUSTRY

Number of employees per plant*



* Excludes bakery/cakes (and pasta/noodles in Argentina)

** The number of plants and employees for establishments with less than 10 employees in Colombia and less than 5 employees in Venezuela was estimated based on Mexico's figures

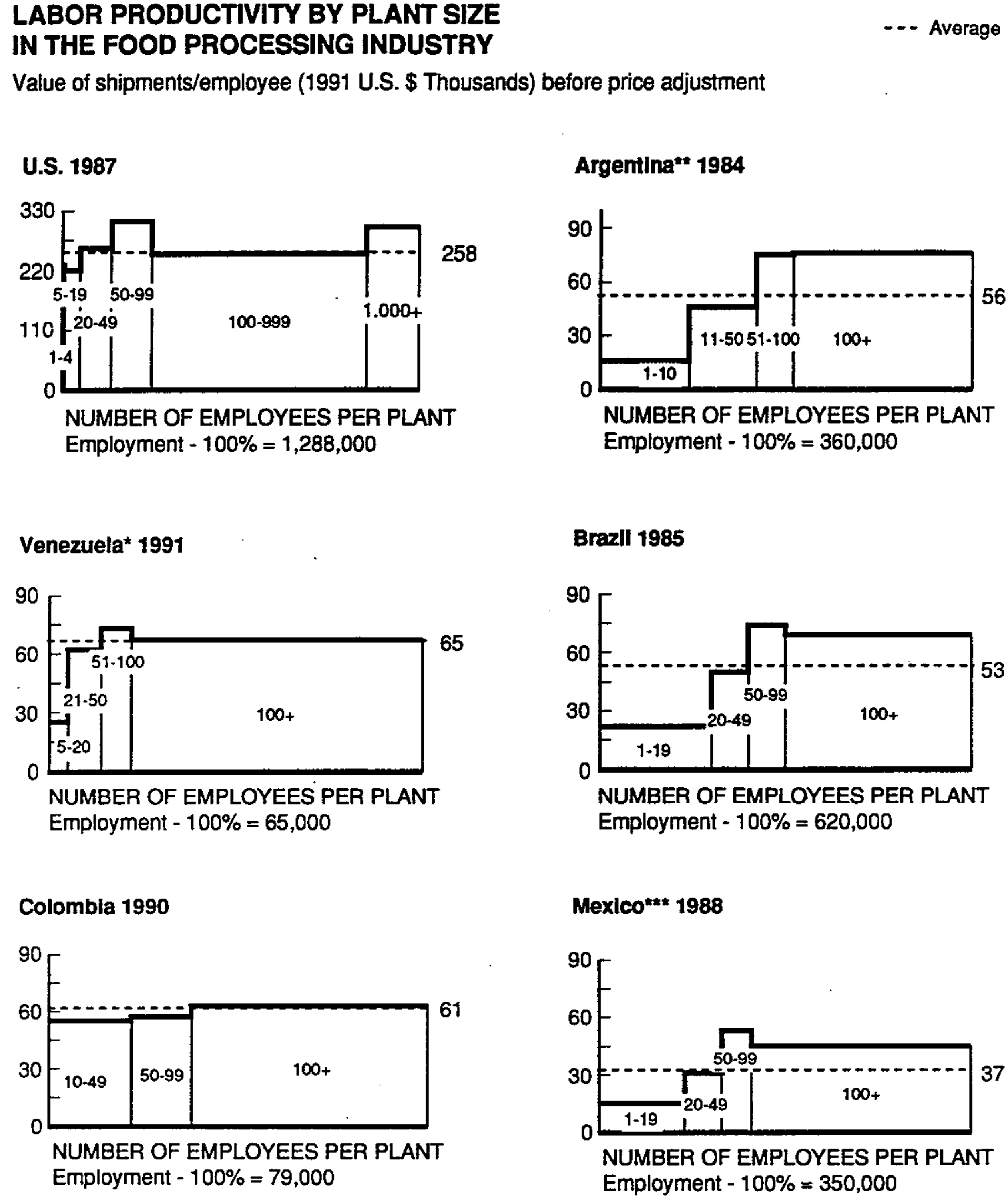
*** 1988 figures

Source: Census of Manufactures (U.S. and Mexico); Survey of Manufacturing Firms (Colombia and Venezuela); Food Producers Associations (Argentina and Brazil)

Exhibit 18

LABOR PRODUCTIVITY BY PLANT SIZE IN THE FOOD PROCESSING INDUSTRY

Value of shipments/employee (1991 U.S. $ Thousands) before price adjustment



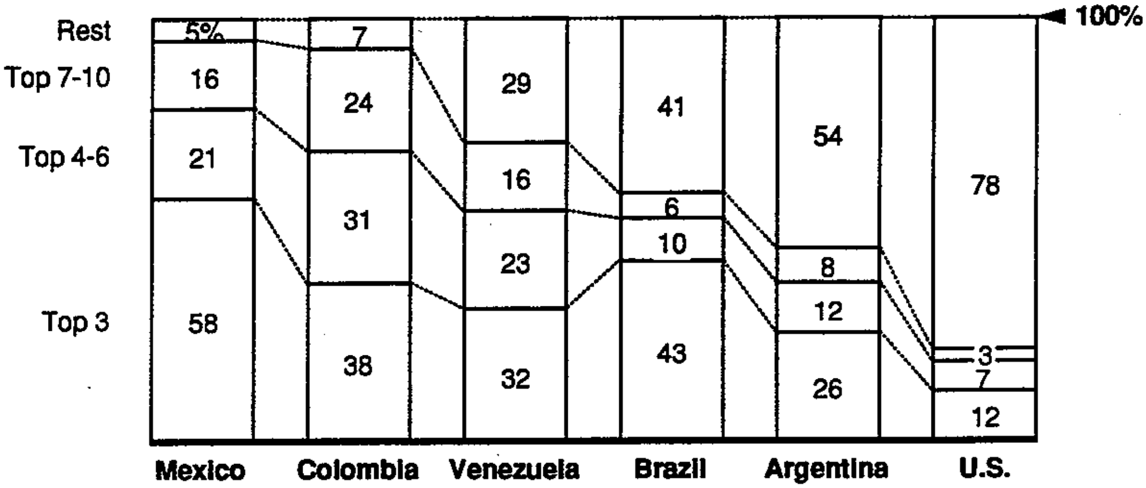
* Excludes bakery/cakes

** Includes beverages and tobacco

*** Excludes "tortillerias"

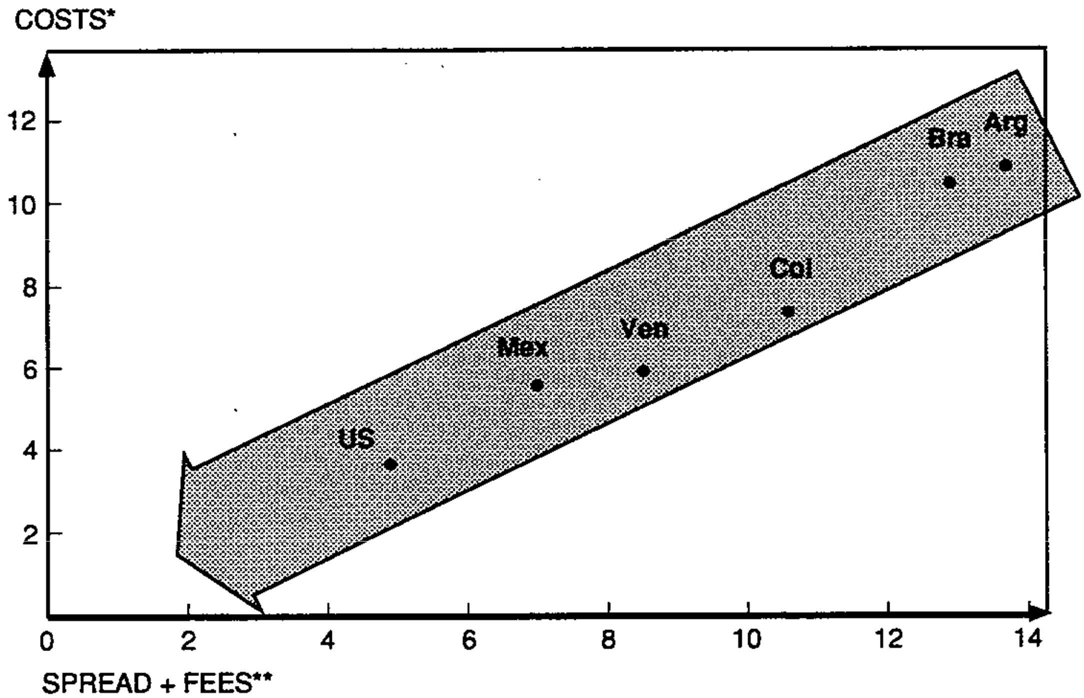
Source: Census of Manufactures; McKinsey analysis

Exhibit 19
CONCENTRATION OF BANKING IN LATIN AMERICA 1992
Percent of total assets



Source: McKinsey analysis

Exhibit 20
SPREAD AND FEES VS. COSTS OF FINANCIAL INTERMEDIATION
Percent of assets



* Costs = operations expenses
** Spread + fees = net interest income + noninterest income

Source: McKinsey analysis

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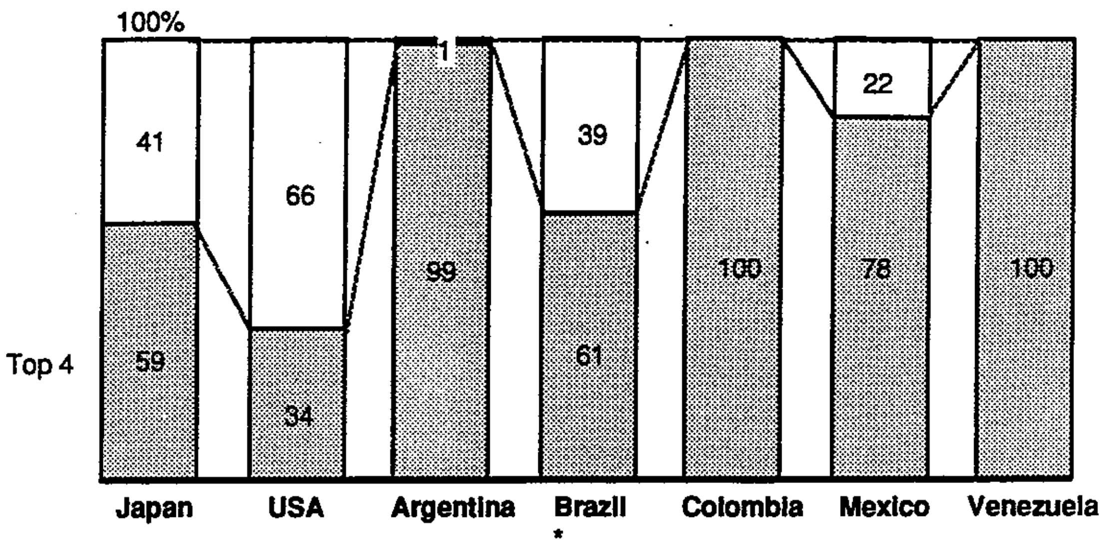
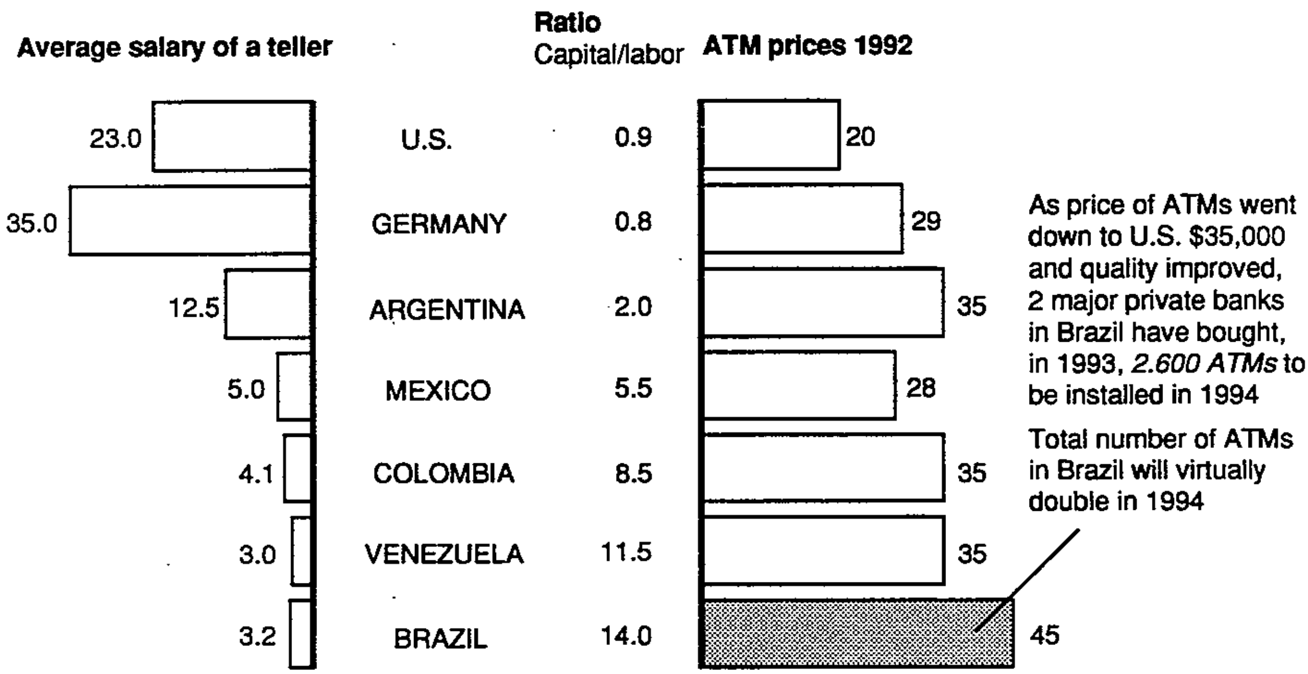
Exhibit 21
MARKET CONCENTRATION IN THE LATIN AMERICAN STEEL INDUSTRY
Percent



* As of 1993, Brazil has a top four concentration of 75% because of merger activity
Source: IVES, IBS, CIS, Interviews; McKinsey analysis

Exhibit 22
ATM PRICES AND TELLER SALARIES
U.S. $ Thousands



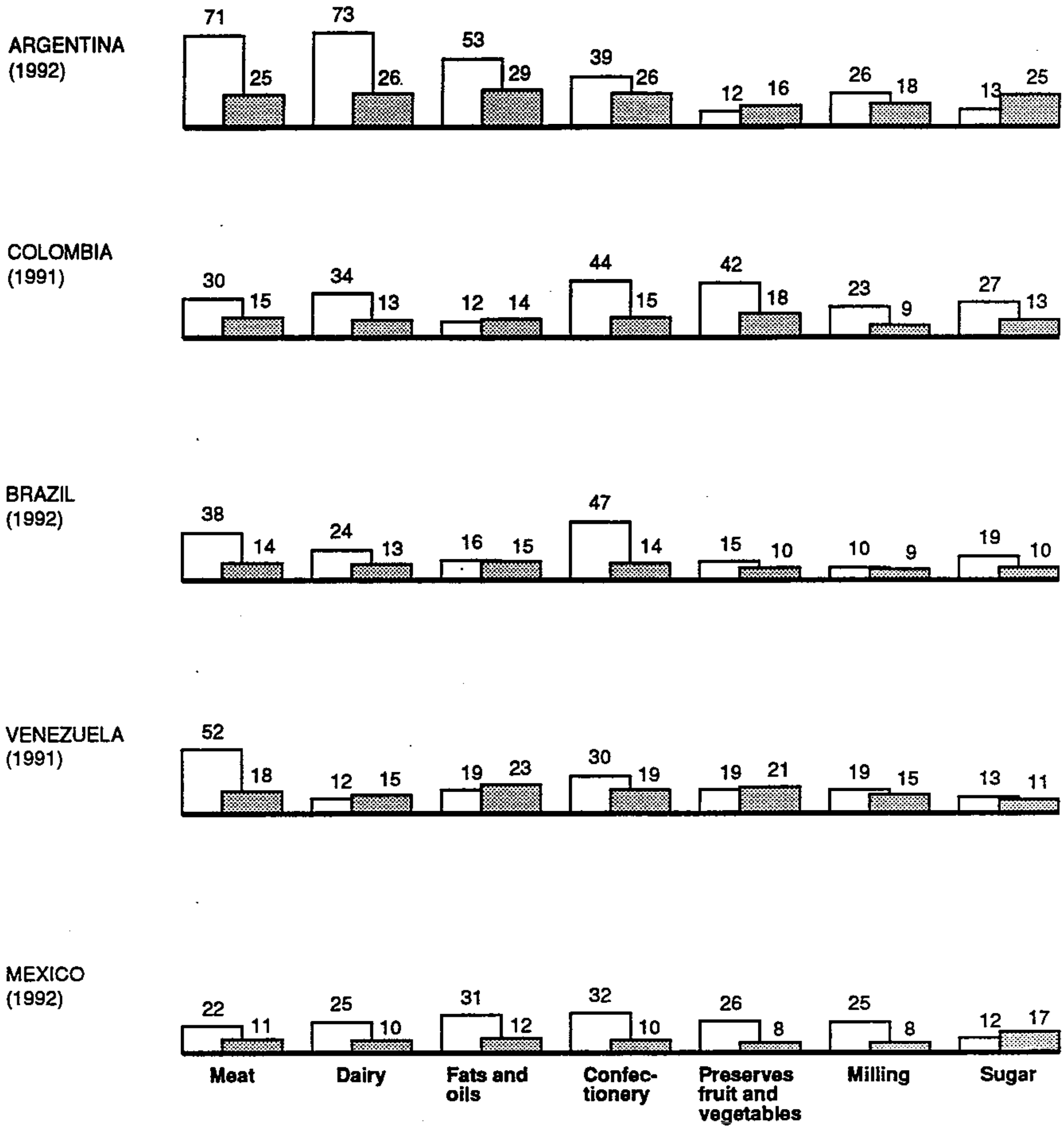
* Salary without social security benefits
Note: ATM = Automatic teller machine
Source: NCR; Datapro reports; interviews; McKinsey analysis

Exhibit 23

LABOR COST AND LABOR PRODUCTIVITY

Index: U.S. = 100

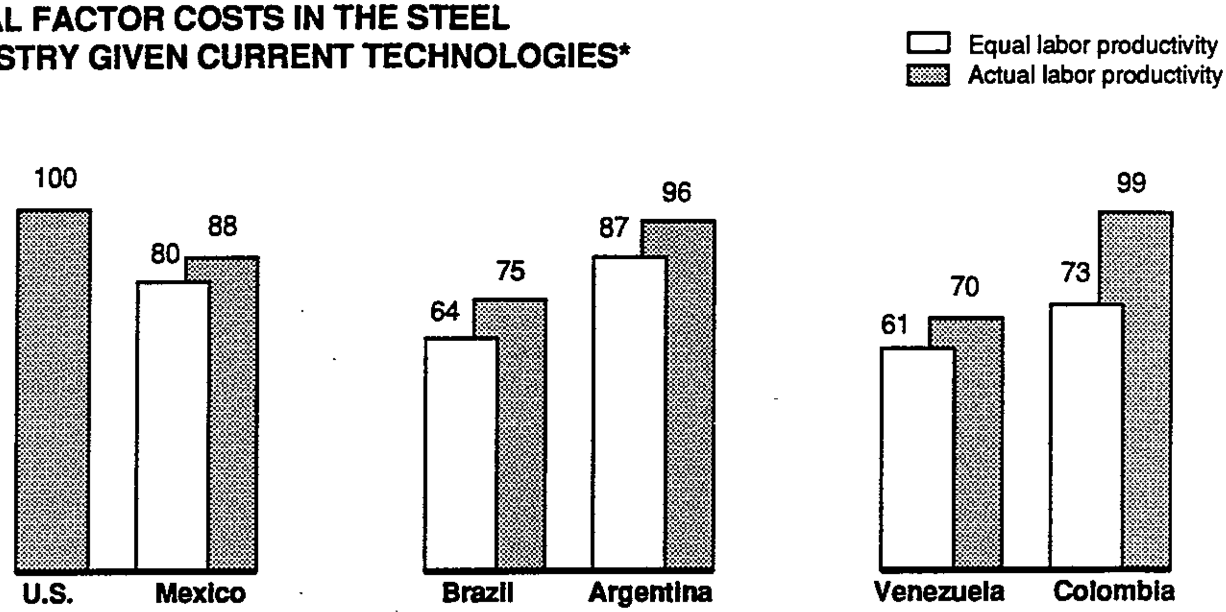
Labor productivity
Labor cost



Source: UNIDA; McKinsey analysis

Exhibit 24

TOTAL FACTOR COSTS IN THE STEEL INDUSTRY GIVEN CURRENT TECHNOLOGIES*



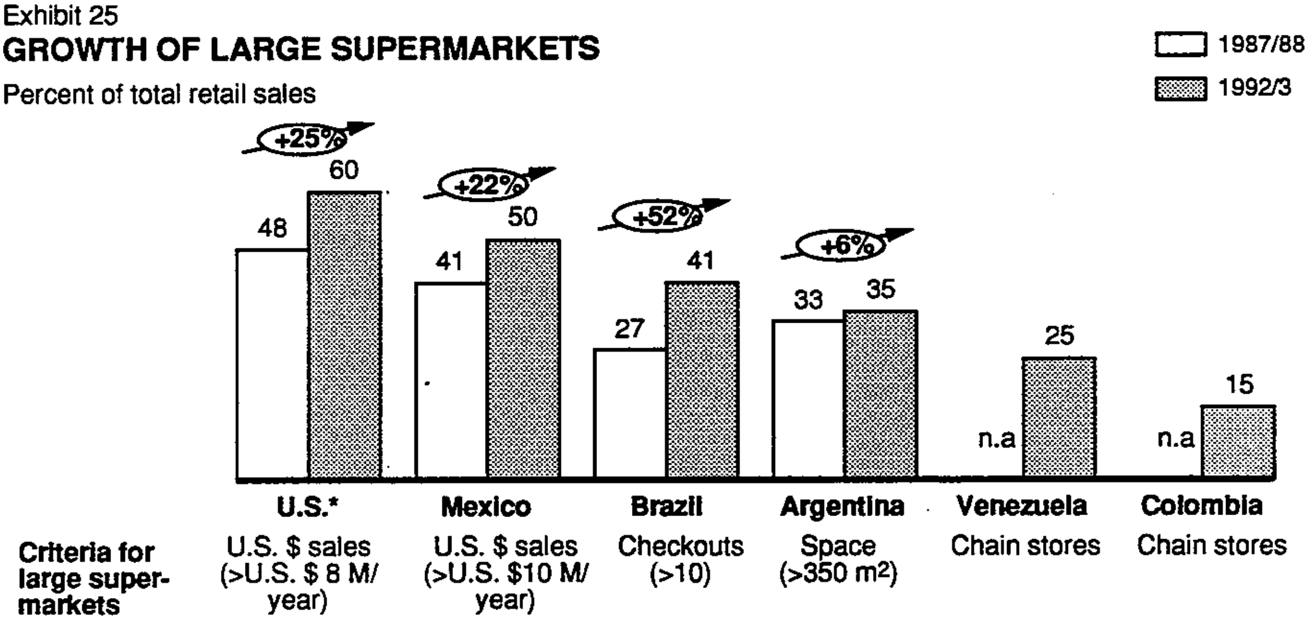
* Weighted by actual technology present in each country

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 25

GROWTH OF LARGE SUPERMARKETS

Percent of total retail sales



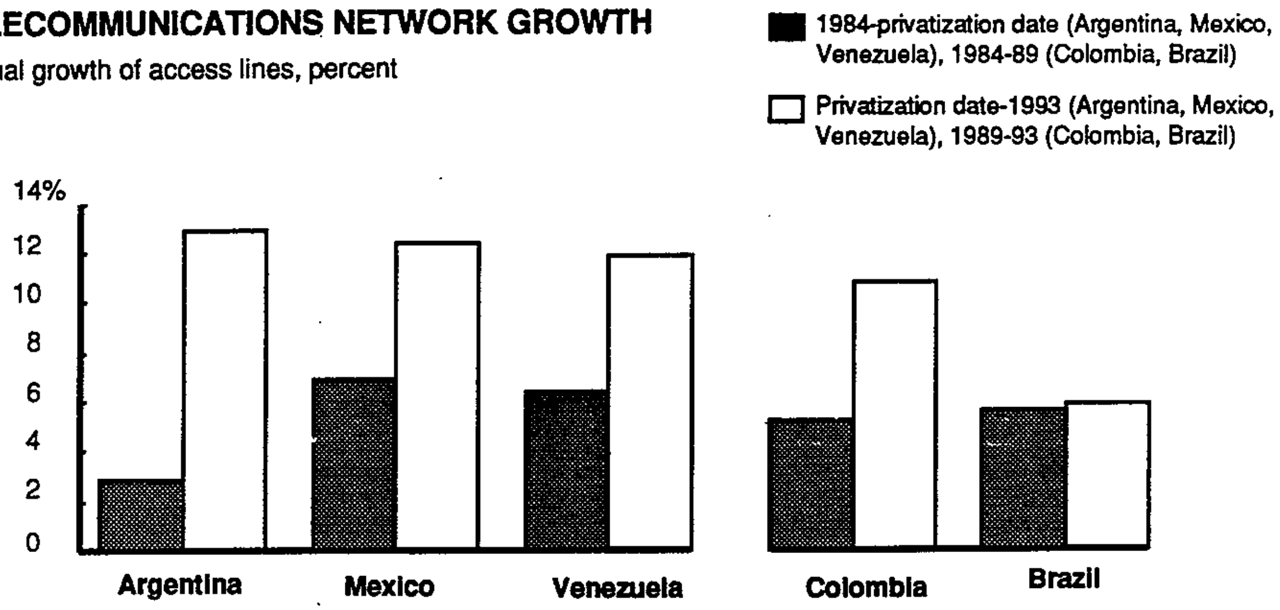
* Includes wholesale club stores

Source: Progressive Grocer (U.S.); Nielsen (Argentina, Brazil, Colombia); Supermarkets (Venezuela); Commercial Census and ANTAD (Mexico)

Exhibit 26

TELECOMMUNICATIONS NETWORK GROWTH

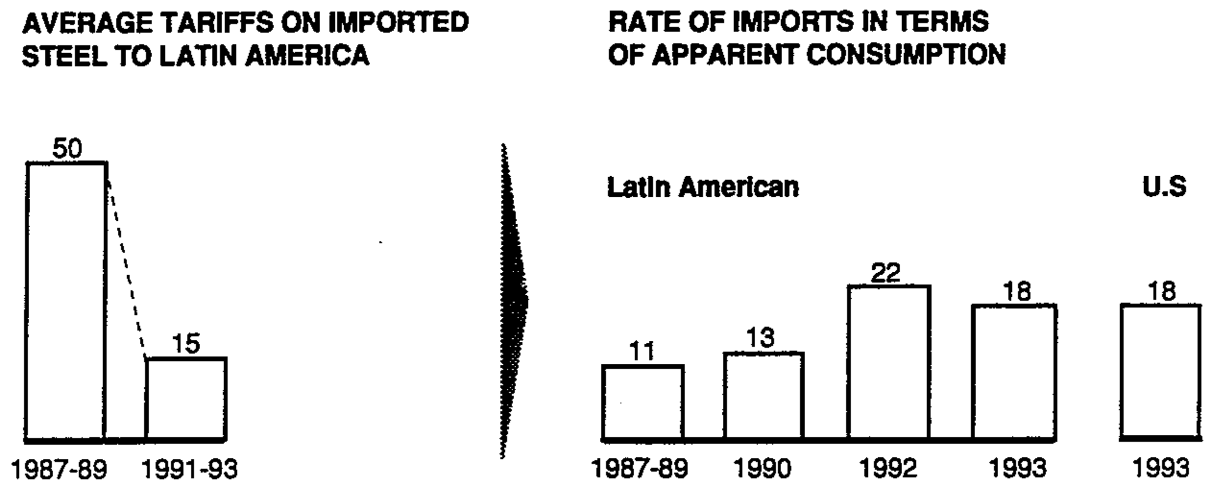
Annual growth of access lines, percent



Note: Privatization took place in 1990 in Argentina and Mexico, and in 1992 in Venezuela

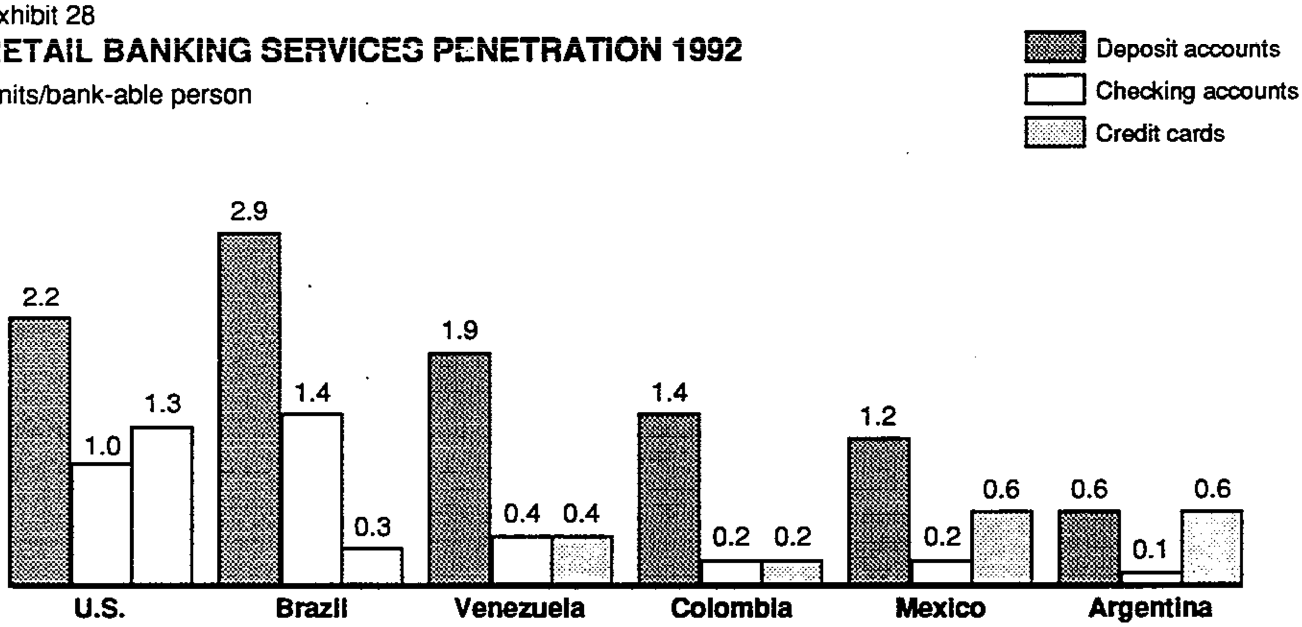
Source: Annual reports; McKinsey analysis

Exhibit 27
EFFECT OF TARIFFS ON REGIONAL STEEL TRADE
Average percent



Source: ILAFA; McKinsey Steel Practice; McKinsey analysis

Exhibit 28
RETAIL BANKING SERVICES PENETRATION 1992
Units/bank-able person



Source: McKinsey analysis

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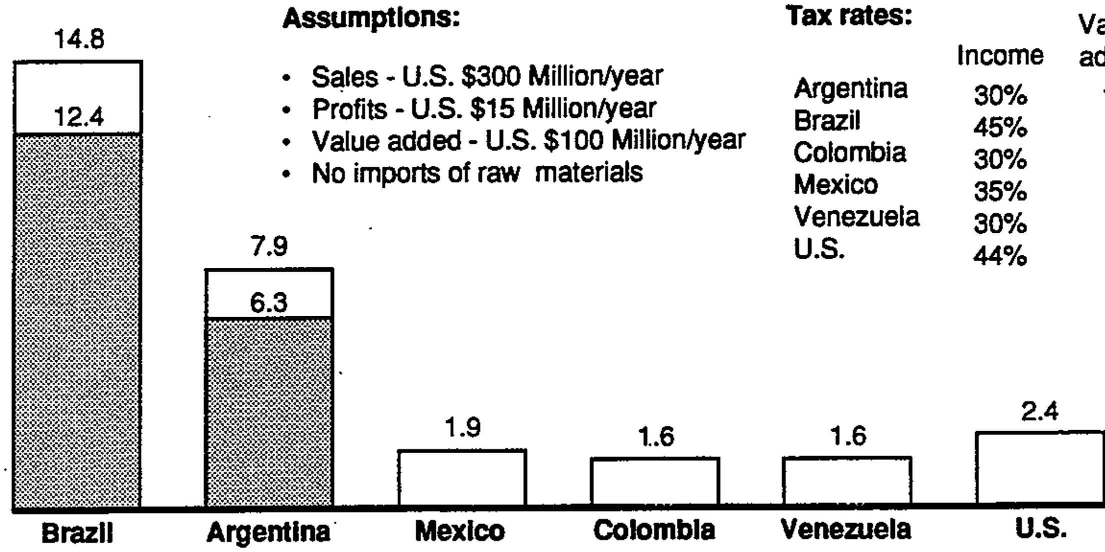
Exhibit 29

TAX BURDEN COMPARISON FOR A MEAT PRODUCER*

Percent of sales

EXAMPLE

Indirect taxes



Assumptions:

- Sales - U.S. $300 Million/year
- Profits - U.S. $15 Million/year
- Value added - U.S. $100 Million/year
- No imports of raw materials

Tax rates:

	Income	Value-added	Sales
Argentina	30%	18	0
Brazil	45%	0	12.4**
Colombia	30%	0	0
Mexico	35%	0	0
Venezuela	30%	0	0
U.S.	44%	0	0

* Excludes taxes on labor

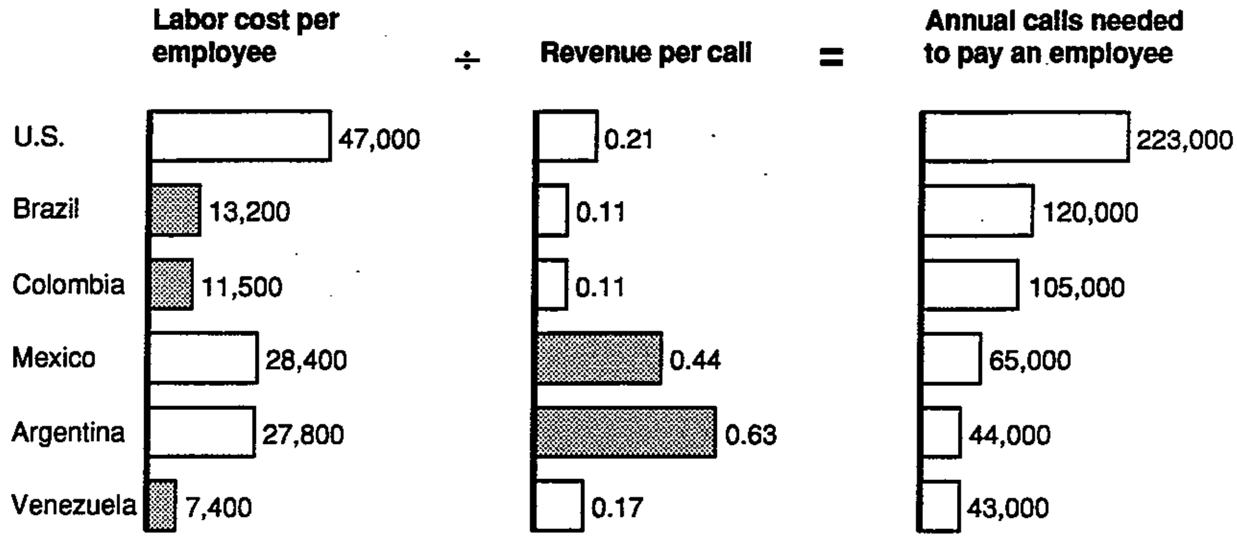
** Due to an exemption to raw materials producers, the value-added ICMS tax becomes a tax on sales of 7%

Source: McKinsey analysis

Exhibit 30

REVENUES AND LABOR COST IN THE TELECOMMUNICATIONS INDUSTRY 1992

U.S. dollars

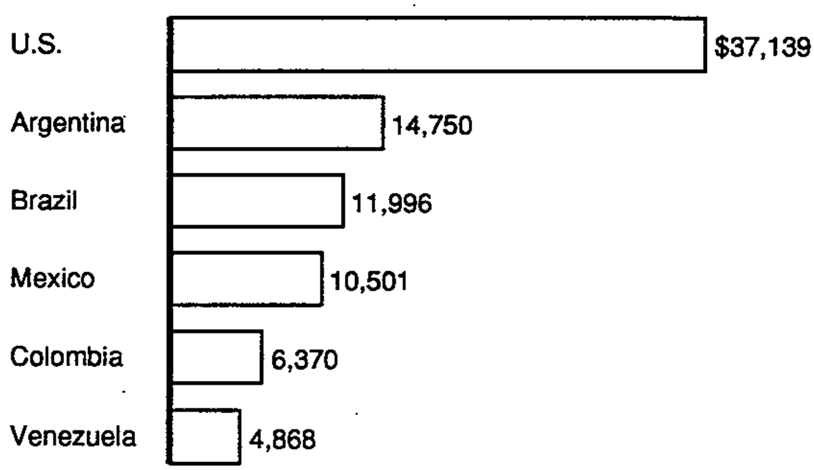


Source: Annual reports, McKinsey analysis

Exhibit 31

AVERAGE LABOR COST FOR THE 4 CASES ANALYZED 1992

US$ per year per employee

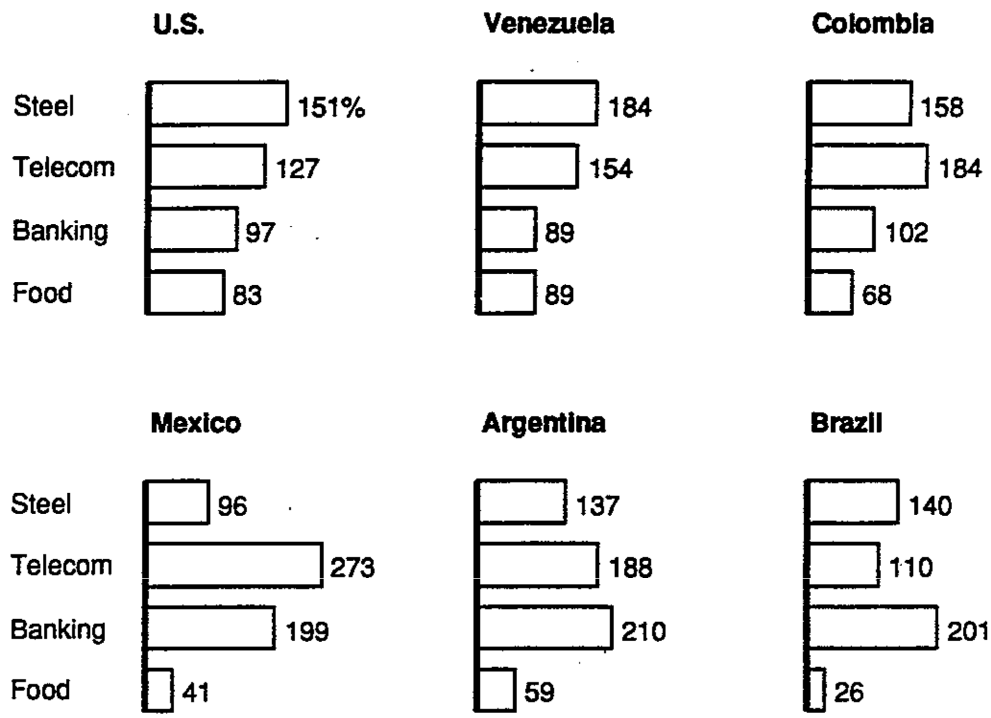


Source: McKinsey analysis

Exhibit 32

LABOR COST DISPARITIES

Labor cost per sector as percentage of the country's 4 cases average



Source: McKinsey analysis

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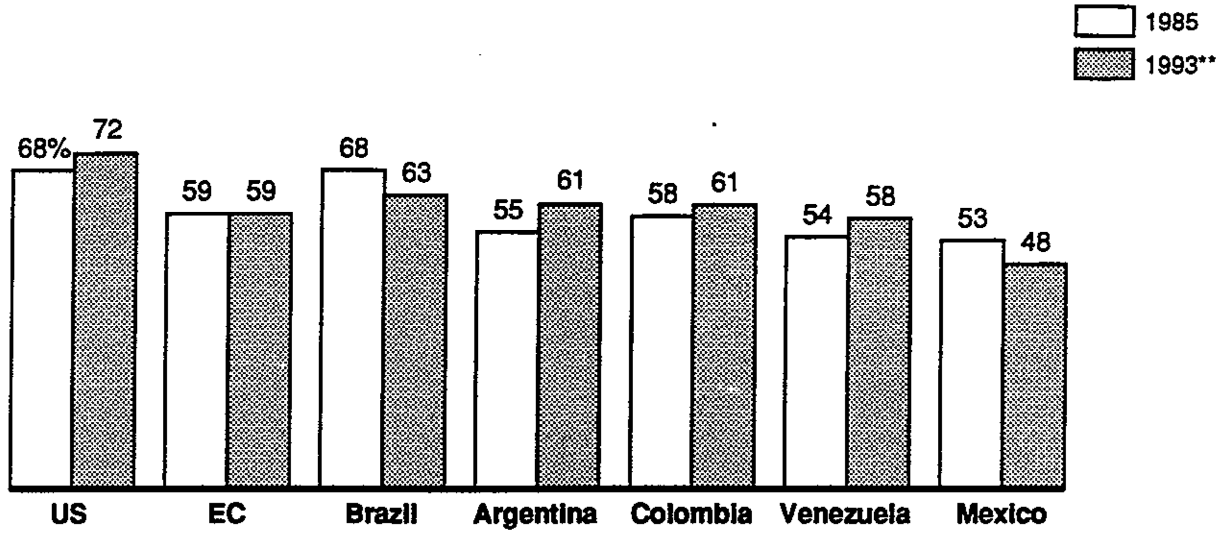
Exhibit 33

EMPLOYMENT AS PERCENT OF WORKING AGE* POPULATION 1985-93



* Ages 15-64

** Mexico = 1990

Source: Government statistics

EXECUTIVE SUMMARY

Since the late 1980s, Latin American countries have begun a major shift toward more market-oriented economies. After decades of protectionism, government intervention and high inflation, one country after another is following the path of fiscal discipline, deregulation and privatization. Progressive economic reform has led to economic growth and, in particular, productivity improvements which are the fundamental mechanisms through which standard of living can increase over time.

The McKinsey Global Institute has conducted a study on labor productivity in four industries – steel, food processing, telecommunications and retail banking – in the five largest Latin American economies – Argentina, Brazil, Colombia, Mexico and Venezuela. Our goal was to find out how economic reform actually affected productivity and, more importantly, to determine realistic aspiration levels for these countries and the companies operating in them. In addition, we wanted to identify the most important changes companies need to make to achieve these goals.

PRINCIPAL FINDINGS

Although productivity is low, there are no insurmountable barriers to achieving substantially higher levels of productivity, and thereby improving the standard of living of the population. Recent developments have proven this process is feasible in the region.

¶ Productivity is only 30 to 40 percent of the world-class level in three of the four cases analyzed (steel, food and banking), but it is closer to best practice in the telecommunications case.

¶ Productivity is increasing rapidly in the steel and telecommunications industries where aggressive privatization programs and lower import barriers have set the right incentives. However, productivity is moderately increasing in the food and banking industries where external factors or barriers to competition continue to hinder improvements.

¶ Neither labor skills nor the scale of production represent obstacles in achieving higher productivity levels. In particular, the investment level will be a critical factor in the food processing and retail banking industries.

¶ Corporate managers could significantly close the huge productivity gap by adopting "best practice" in the way that they organize the functions and tasks of their operations. To capture the potential opportunities, corporations must develop the new management skills necessary, focusing on the long term improvement of the core functions of the business. Managers will have incentives to do so as long as regulations do not restrain competition and governments provide a stable macroeconomic environment.

PRODUCTIVITY RESULTS

Exhibit 1 summarizes our productivity measurements.

¶ Labor productivity in the steel industry is very low in all the countries analyzed. Brazil out-performs in the region with 44 percent of the U.S. level, while the tiny steel industry in Colombia comes last with only 15 percent.

¶ The same pattern appears in the food processing industry, where Argentina is the regional leader at 52 percent of the U.S. level.

¶ Retail banking labor productivity is also very low in all the countries. Argentina's 19 percent represents the worst performance in the industry.

¶ The relatively high productivity levels of the telecommunications industry in every Latin American country could be better explained by the relatively lower performance of the U.S. carriers; vast portions of this industry also enjoy low competitive intensity in the U.S.

For the three cases which we were able to measure, Exhibit 2 shows the evolution of labor productivity when the countries shifted toward market-oriented economies. Relative improvements in the steel and telecommunications industries are striking, especially considering that the U.S. has also aggressively increased productivity in these industries. No major gains have occurred in the food processing industry. Although it was not possible to find comprehensive historical data on physical output of the retail banking industry, stable employment and some indicators of stable output suggest that productivity has not changed a great deal in this industry.

All the countries except Venezuela show similar patterns of evolution with improved performance after liberalization. Venezuela, however, had declining relative productivity in telecom and processed food, and constant relative performance in steel.

WHY THIS HUGE PRODUCTIVITY GAP EXISTS

Protectionism and regulation have prevented competition. Thus, managers have not felt the pressure to improve performance or the risk of going out of business. Moreover, other external factors, such as low wages or cheaper raw materials, have allowed managers to select more labor-intensive processes. Consequently, large and hierarchical organizations, full of complex processes and unnecessary tasks, are common in Latin American companies. The existence of very inefficient state-owned participants has exacerbated this phenomena. However, many of the factors that hinder productivity are disappearing, although in varying degrees from one industry to the other (Exhibit 3).

Steel

The current low productivity levels of steel firms in the region point to a past characterized by a weak competitive intensity, state ownership, and strong protectionism that allowed managers of these companies to pay little attention to increasing efficiency. Latin America's steel makers have a high level of overemployment, hierarchical organizational structures and very complicated procedures and processes.

The quality of their assets, though, has been fairly good and has not set back productivity since many of the region's steel making facilities were actually built in the late 1960s and 1970s – among the newer ones in the world. However, the way these assets are used and maintained explains part of the productivity gap with developed country producers.

Throughout the 1990s, governments in the region have carried out aggressive privatization programs and the opening of local economies to international competition, while domestic demand began to recover. The advent of new and tougher competition has already triggered important productivity improvements which today have become a matter of survival for all steel makers in the region.

The economic and industrial restructuring process under way will push Latin America's steel makers to continued higher levels of productivity. We estimate that through reorganization of functions and tasks as well as certain minor investments in de-bottlenecking and automation, Latin America's producers can reach easily up to 80 percent of the productivity levels encountered in the U.S. Relatively lower input prices in the region (iron ore, labor, energy) determine the technology used, and allow these countries to be internationally competitive without achieving higher productivity levels.

More stable economies in Latin America over the coming years, coupled with stronger projected economic growth, will ensure growing demand for steel. In large part, this demand will be created by fulfilling the evident need for infrastructure and appropriate housing. The region's steel makers are consequently in a good position to serve this growing market with the only caveat being that they continue to improve the efficiency of their operations.

Food Processing

The differences in productivity are directly attributable to the use of craft versus industrial mode production techniques. The use of mass production and labor-saving technologies in the U.S. are factors behind this country's high level of productivity, something that is found only among Latin America's largest food processing companies. The proliferation of small, somewhat underground food processing establishments in Latin America utilize extremely low productivity methods.

Strongly contributing to this phenomenon is the high cost of equipment in the region owing to years of high import barriers and prohibited financing costs while labor is much cheaper than the U.S. and well below other industries in the region. This negative incentive to implement more productive techniques has been aggravated in the thousands by tiny "informal" food processors of the region. These very small companies pay below industry average labor costs, since they often avoid paying mandatory benefits, and long-term financing is normally out of their reach.

Without the enforcement of fiscal and sanitary controls by the government upon these small producers, concentration – badly needed in this industry to improve productivity – will not take place. Still changes in some external influences will help somewhat. These include lower import tariffs for food stuffs as well as the growing bargaining power of supermarkets that will increase competitive pressures throughout the entire industry.

Expected continued economic growth will also increase the consumption of processed foods, since a big share of the population still eat non-processed food or less calories than required. There is the need to produce higher volumes at a constant quality, a phenomenon that already took place in the U.S. which will cause firms to increase automation levels. The growing presence of international food processing firms in Latin America will facilitate this evolution.

Retail Banking

The low level of productivity found in this industry is the result of limited competition, itself a product of regulatory controls and the strong presence of government-owned institutions. Legal restrictions have prevented or limited the entrance of new competitors in many countries, while less efficient state-owned banking establishments typically set an umbrella price for services that protect private banks. The result has been expensive and scarce banking services which delivered by costly structures.

Latin American banks appear to have hierarchical, rigid and large organizations, needed to deal with a complicated web of bureaucratic internal procedures. The use of part-time workers which increases flexibility, is practically non-existent. Automation and information technology have only started to become more widely used. Such costly structures entail high fees and margins for banking services.

Some countries have begun to privatize banking institutions and liberalize activities in the industry. Mexico recently privatized all the banking sector, and beginning in 1994, authorities will allow foreign banks to set up operations. Colombia is in the midst of a strong privatization effort. Argentina has started to deregulated and open its banking sector to new entrants. However, inefficient state-owned banks still represent more than half of the market in Brazil and Argentina.

As competition intensifies and the economies consolidate their new found stability, banks in Latin America will increasingly explore the high level of potential demand for banking services not yet served through the region. It is like for the development of a virtuous circle in which increased competition will reduce spreads and fees, to lead to deeper penetration of banking activities. Private sector lending, especially consumer credits and home mortgages are the areas showing the greatest potential for growth. However, to serve this potential demand, banks need to acquire new management skills and adjust their costs through productivity improvements. More flexible organizations, simpler processes and automation will be the drivers to achieve efficiency.

Telecommunications

The relatively narrow productivity gap between Latin America and the U.S. is due, in part, to the still low competitive intensity found among the later. Performance varies substantially from country to country; Colombia, for instance, shows a very high level of productivity brought about by a combination of excellent capital utilization and continuous improvements in labor productivity. Brazil's network utilization and Venezuela's efficient investment help their otherwise poor labor performance. Mexico and Argentina's lower productivity ratios are the result of long-term inefficiency in both labor and capital utilization that still have not been offset despite their good performance in recent years.

The existence of state-owned telecommunications monopolies has resulted in overstaffed organizations that invested inefficiently in building their networks while never matching potential demand. The prevalence of powerful trade unions in this sector has contributed in the preservation of the status-quo at the expense of telephone potential users. The advances that have taken place since privatization as well as the few historically privately-owned carriers in the region, are a living proof of the impact that a new approach to management can have on this industry.

Deregulation and privatization has dramatically changed the environment in most of the countries studied. The 1990s have seen faster growing networks in the newly privatized carriers and in the efficiently state-owned Colombian company, together with substantial productivity increases in Argentina, Colombia and Mexico. Venezuela's productivity is not growing at the same speed as that of its network, it is not even matching the U.S. improvement, thus deteriorating its relative productivity level. Brazil's network presents much slower growth than the other countries studied and its relative productivity gains have been smaller. Network expansion is a critical issue due to the present low telephone penetration.

Deregulation so far has shown that, if correctly priced, ownership of a telephone does not have to be a luxury enjoyed by only a minority of Latin America's population. To enhance a wider access, regulatory bodies should begin fixing rate schemes in accordance with local cost structure as well as continue liberalizing competition.

IMPLICATIONS FOR POLICY

The Initial Success

The liberalizing changes that the region has experienced so far have had an immediate impact beneficial to productivity. Privatization of state-owned steel and telecommunications firms provides perhaps the most striking examples of the potential improvement which can be achieved by simply adopting a new management approach. The lowering of import barriers has increased consumer choices, thus forcing domestic producers to lower their prices and improve the quality of their products. Initial deregulation of the retail banking business stimulated the expansion of the services delivered and contributed to the increase of capital availability to consumers and companies.

The structural factors that hinder productivity in the informal sector – much lower labor costs and lack of financing – have only begun to change. Thus, productivity increases in this large part of Latin American economies will be modest and income disparity will possibly increase.

Work to be Done

Despite the impressive improvements already achieved, Latin American economies are still highly bureaucratic and regulated – a phenomenon which continues to reward small, special interest groups with privileges rather than the society at large, thus ultimately limiting economic development.

¶ Delayed deregulation of banking systems, coupled with the large government presence in this sector, explain why banks are not improving their productivity levels faster.

¶ There are still inefficient state-owned companies in steel (Venezuela), telecommunications (Brazil) and retail banking (Argentina and Brazil).

¶ Current import tariffs are higher in Latin America than in many developed or developing countries. In addition, bureaucratic customs and the proliferation of non-tariff barriers make international commerce difficult. If regional pacts introduce high, common outer tariffs or strict rules of origin, these countries run the risk of converting national monopolies into regional oligopolies.

¶ Tax evasion is still common in Latin America, indirectly promoting the "unofficial," less productive sector, while "formal" firms have to bear a heavy fiscal burden.

¶ Generous tariffs, set by the regulatory bodies in the telecommunications industry, reduced the urgency to improve productivity. Governments must be cautious when fixing price policies for newly privatized utilities, keeping tariff levels consistent with an efficient cost structure.

¶ Liberalization and decentralization of salary negotiations is one path to a more efficient and effective labor market. More flexible job categories would also help managers in the reallocation of human resources to enhance productivity.

Even if the previously mentioned measures were implemented, we do not foresee fast improvements in the food processing industry (dominated by the informal sector), where very low labor costs and lack of access to capital hold back consolidation and modernization.

¶ If our case findings can be generalized, these economies will witness two different paths of development. The formal sector will rapidly close the gap with the developed world as the right incentives are put in place. This process, however, will occur more slowly in the large informal sector.

¶ These possible diverging paths in productivity evolution would result in larger income disparities. Policy makers should attempt to diminish the impact of the structural factors on the informal sector. They should aggressively attack unpaid mandatory benefits and make the capital markets as efficient as possible for lending to that sector.

Productivity and Total Employment

The far-reaching restructuring process which Latin America is orchestrating certainly has triggered huge layoffs at both newly privatized companies, and formerly protected private ones. But evidence does not suggest that total employment has plummeted because of these big labor reductions. Quite the contrary, total employment has actually grown in at least three of the countries analyzed (Argentina, Colombia and Venezuela). Such growth shows that these economies have been able to create an extraordinary amount of new jobs, more than offsetting the rationalization process as well as the natural growth of the labor force.

The low penetration of basic goods and services in the region presents growth opportunities that will be the source of the new jobs needed to maintain and increase the employment level. Governments must be careful not to over-regulate to prevent layoffs. The relative good job creation performance of these countries suggests that market forces have been working well. There is probably an optimal degree of job security, high enough to reduce resistance to innovation and productivity increases, but not so high as to make innovation unprofitable or impossible. This may be too difficult to define precisely, but the important idea is that both extremes are undesirable.

IMPLICATIONS FOR CORPORATIONS

Managers in Latin American corporations have significant room to make large improvements in productivity for their firms. They have a great opportunity to improve their competitive position, their growth prospects and their profitability. They can do this primarily by adopting world class best practices in organizing the functions and tasks of their operations.

Global best practices can be readily transferred to the Latin American countries studied in this report, because labor forces possess the basic skills and intrinsic motivation necessary. We observed dramatic productivity improvements once work forces were reorganized in a more efficient fashion, for instance, in the telecommunications carriers in Argentina and the steel producers in Mexico. We have also seen huge differences between companies in the same country, such as those between the public and private telecom carriers in Brazil. All the evidence suggests that operations in every country analyzed are capable of achieving best practice levels of productivity with the current work force.

Yet closing this gap may not be so easy for many Latin American managers. The skills and strategies which ensured success in the past will not suffice in the new more competitive environment. Formerly, it was required to excel in operating under high inflation, skirting through a tight web of government regulations, dealing with volatile financial markets, compensating for price controls and abrupt changes in government policies, and managing a fine-tuned treasury system. Unfortunately, these skills have little to do with managing and improving a firm's core operations. Today's reality demands an understanding of consumer desires, improving productivity, establishing efficient relations with suppliers and distribution channels, researching for the most suitable technology, in addition to dealing with banks and financial markets.

Today Latin America is challenging executives with a wholly new operating geometry. The shift is anything but trivial; the willingness to change is the most difficult step. However, once taken, companies must focus on developing the new critical skills needed to carry out the process.

For those companies not willing or unable to improve productivity, survival in a new globalized Latin American marketplace will become exceedingly difficult, because the environment of protected markets, high import barriers, price controls and lavish government subsidies is mostly a thing of the past.

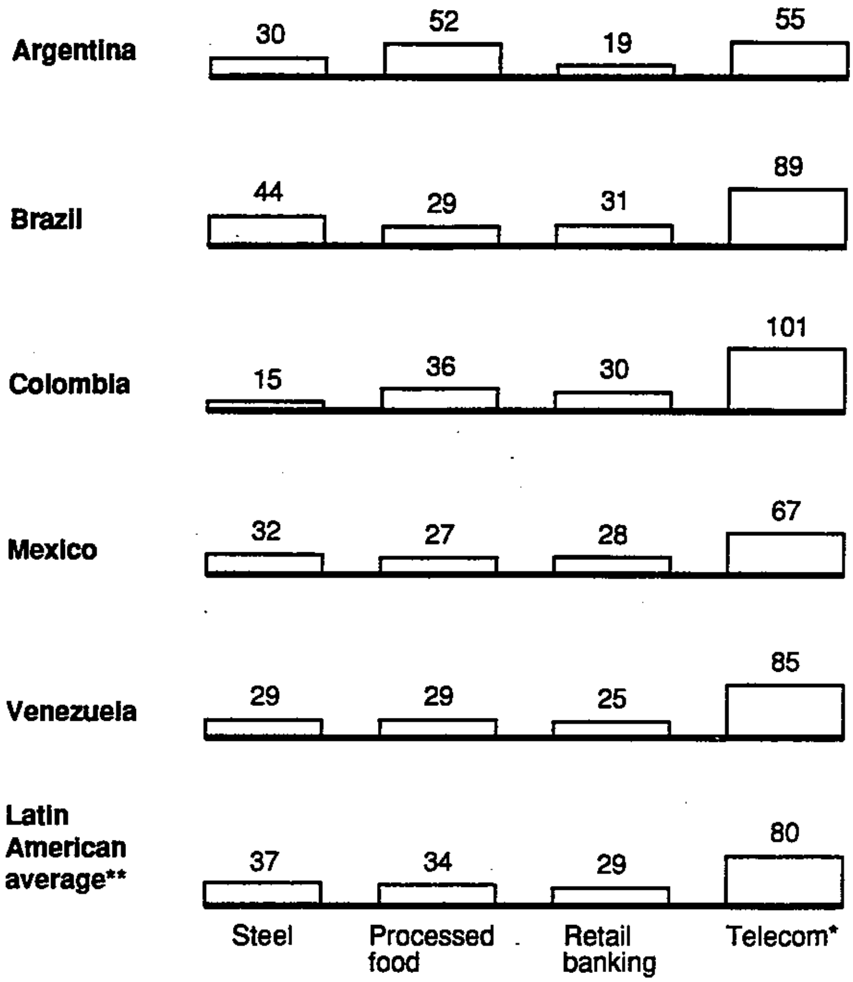
For world productivity leaders, the message is that they should look at Latin America as a growing region where their know-how can be transferred in a profitable way. The wave of acquisitions of local companies by multinationals points precisely in this direction. There are a number of ways to facilitate the transfer or acquisition of new management processes including benchmarking, transferring management, acquisitions, minority investments, joint ventures and licensing.

For example, our industry cases suggest that companies should benchmark their operations against the leading global companies, not just their competitors in local markets. Few companies are aware of the extent of their productivity disadvantage until new players begin competing in their home markets. In some cases, transferring management from one country to another is an important vehicle for transferring knowledge and management abilities (e.g., the newly privatized telecommunications companies in Latin America). We believe that the improvement of management practices will be the critical factor for success in this vital region of the world.

Exhibit 1

LABOR PRODUCTIVITY COMPARISON

Index: U.S. = 100, 1992



* Total factor productivity shown for telecommunications, unadjusted for quality differences

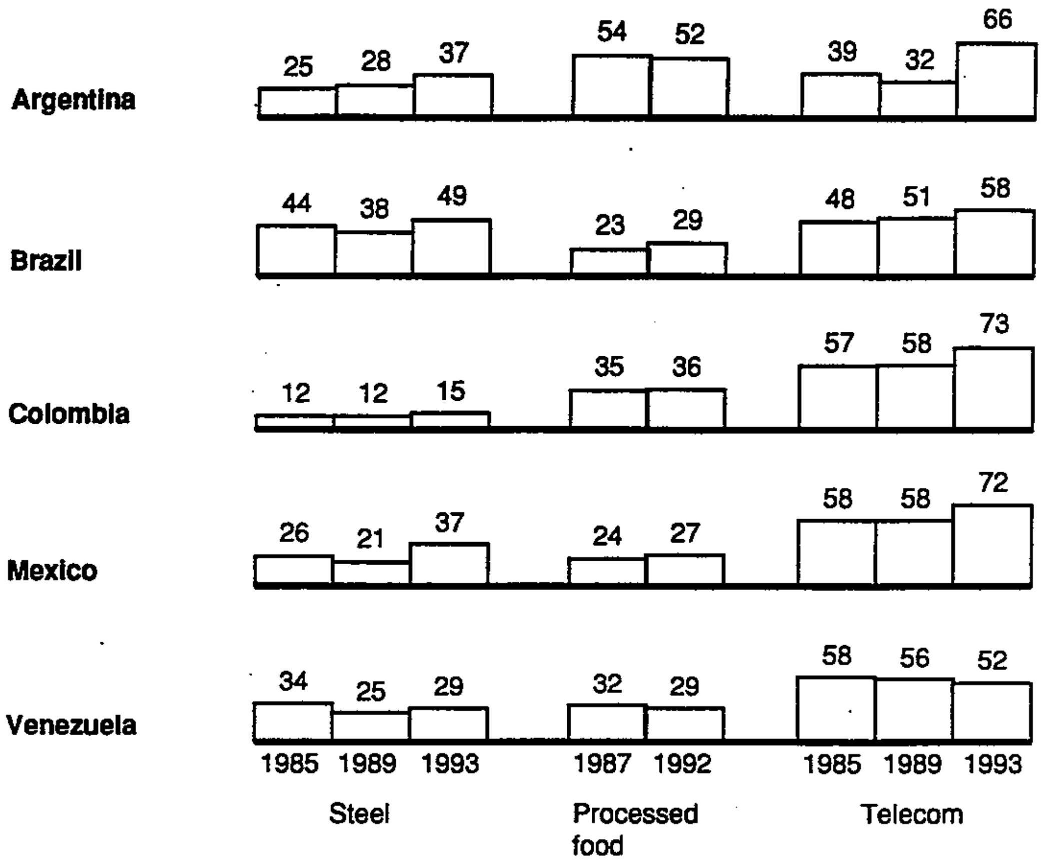
** Weighted by employment

Source: McKinsey analysis

Exhibit 2

LABOR PRODUCTIVITY EVOLUTION

Index: U.S. = 100



Note: During the period analyzed the U.S. industries increased their labor productivity as follows: Steel: 42% (1985-89) and 27% (1989-93); Telecommunications: 19% (1985-89) and 28% (1989-93); Processed food: 5% (1987-92)

Source: McKinsey analysis

Exhibit 3

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES FROM BEST PRACTICE

● Important
○ Secondary
X Undifferentiating

	Telecom	Retail banking	Processed food	Steel
External factors				
• Market conditions				
– Demand factors	○	X	X	X
– Relative input prices/factor availability	●	●	●	●
– Other industries	○	X	○	○
• Policy and regulation				
– Import barriers	○	○	●	●
– Competition and concentration rules	●	●	○	○
– Labor rules and unionism	○	○	X	○
– State ownership	●	●	X	●
– Other (fiscal policy, price control and schemes)	●	X	●	X
Nature of competition	●	●	○	●
Production process				
• Output mix, variety, quality	○	○	X	○
• Production factors				
– Capital (intensity, vintage, technology)	○	●	●	○
– Scale	X	○	●	○
– Labor skills	X	X	X	X
– Organization of functions and tasks	●	●	○	●

CHAPTER 1: OBJECTIVES AND APPROACH

WHY STUDY PRODUCTIVITY IN LATIN AMERICA NOW?

During the last few years, the world witnessed one of the most radical changes in the economic history of Latin America. After decades of protectionism, heavy regulations, the "debt crisis," and almost 10 years of recession and decreasing standards of living, market-oriented policies began to emerge with varying speed and depth in one country after another in the region.

Privatization, deregulation, lower trade and capital barriers have started to replace state monopolies, private cartels, mercantilism and hyperinflation (Exhibit 1). The region has been one of the most aggressive privatizers in the world. Per capita proceeds from the massive sale of state assets are relatively bigger in Latin America than in any other developing region of the world. Even when compared to industrial countries, privatization revenues in relation to the GDP are much higher in Latin America. As a result, privatization is one of the key drivers of the modernization process that these economies are experiencing, since a bigger share of the economy is under a radical turnaround (Exhibit 2).

Latin American countries have been known by their lax monetary and fiscal policies. Big deficits were financed by printing money, the consequence being high inflation rates and chronic devaluations. Tight and responsible monetary policies inspired by the IMF have considerably reduced formerly huge fiscal deficits (Exhibit 3). However, not all the countries are following the same path. Chile, Argentina, Colombia and Mexico are consolidating their fiscal equilibrium, trimming down their inflation; while Venezuela and Brazil have reverted to substantial deficits that are again fueling inflation since 1992 (Exhibit 4). Trade barriers have fallen dramatically, from an average of 50 percent to less than 15 percent in the last 5 years. Non-tariff restrictions have also been reduced substantially (Exhibit 5). International commerce has surged in these formerly isolated economies. Imports have tripled and exports have doubled since the opening of the borders (Exhibit 6). Exports of manufactured goods to the developed world have been growing at an even faster rate, beginning to change the historical pattern of Latin America as a supplier of only raw materials (Exhibit 7). This virtuous behavior allowed the region to capture a significant part of the increasing flow of capital to economically emerging countries. On a per capita basis, Latin America is receiving more money than any other developing area in the world, reflecting the intensity of the process (Exhibit 8).

Not all the countries in the region have implemented their reforms at the same time or to the same degree. Chile and Mexico led the pack in the early 1980s, and today are open, more deregulated economies. Argentina and Colombia began the process later but aggressively. Brazil, the giant of the region, and Venezuela slowed down its reforms after a couple of years of rapid change due to political instability fueled by corruption scandals. However, all the economies present very positive changes. We would expect the results of these positive changes to show up in significant improvements in productivity.

Productivity is the ratio of the output of goods and services to the input of resources used to produce them. On the national level, productivity is an important indicator of economic strength; for any level of employment: the higher a nation's productivity, the higher the population's material living standards. At the company level, productivity is one of the key factors that enhances competitiveness.

At the aggregate level, productivity in Latin America lags far behind the developed world; GDP per capita, in every country of the region, is much lower than in the OECD countries (Exhibit 9). However, we have not found explanations for these big productivity differences at the company level in the economic literature and recommendations on what a realistic goal should be – given structural differences – or how to close the gap were not found either.

OBJECTIVES OF OUR STUDY

In this study, we attempted to answer one basic question: do structural barriers constrain the "micro" performance of the Latin American economies now that the macroeconomic environment is healthier? In other words, will the region be able to catch up with the best practices of the developed world, and thereby consistently improve the standard of living of its population? Can corporations in Latin America set their aspirations at global best practice levels? (McKinsey's previous work on productivity within the OECD showed that case studies were likely to be required to explain the observed productivity differences. Only at the industry level do we find causes that could be helpful to policy makers and managers.)

We chose the five biggest economies of the region (Argentina, Brazil, Colombia, Mexico and Venezuela), which account for 75 percent of the total population of the region and more than 80 percent of its GDP; and conducted four case studies (steel, food processing, telecommunications and retail banking), comparing their performance against that of the world leaders (U.S., Germany and Japan).

The cases were selected to cover a variety of circumstances:

- Services industries (telecom, banking) and manufacturing (food, steel)
- Concentrated industries (telecom, steel) and fragmented ones (food, banking)
- Private (food, banking) and state-owned (telecom, steel).

We studied these industries following a three phase analysis:

(1) Understand the relative performance of the industry in Latin America versus the developed economies

(2) Identify the causes of the observed differences in the countries studied

(3) Draw implications for policy and corporate strategy.

We used the case study method to develop our understanding of the aggregate productivity differences. We focused on labor productivity (with the exception of the telecommunications case in which we calculated total productivity). However, given that labor productivity is not a complete measure of productivity, we have also provided discussions on capital intensity and its impact on productivity.

HOW WE MEASURE PRODUCTIVITY

Labor Productivity as a Key Measure

Labor productivity is common in the literature of productivity analysis because it is closely connected to living standards, and labor is the primary factor in creating value added in most industries and for GDP as a whole. The compensation of labor represents about two-thirds of GDP. A different measure of productivity is total factor productivity. This is computed as the ratio of output to an index of both capital and labor inputs rather than just labor alone. Its advantage is that it explicitly incorporates the contribution of capital to the production process. Its disadvantage is that it is much harder to compute, as finding consistent data on capital and its contribution to output for several countries is tricky. Latin America's high inflationary environment and the poor statistics available aggravate this common problem.

We focused on labor productivity. Other input factors, including capital, were treated as causal factors. We made estimations of the capital invested in each industry, and treat it as a causal factor at the production process level ("capital, intensity, vintage and technology"). Only in the telecommunications case do we include capital as an input in our productivity measure. This is due to the particular nature of this industry, in that service delivery and quality depend mainly in the technology used to build the network (Exhibit 10).

The Measurement of Output

Productivity reflects the efficiency and effectiveness with which resources are used to create value in the marketplace. It is measured by computing the ratio of output to input. Difficulties in measuring productivity arise both from the output and input sides. As such, it is often necessary to use different variants of productivity, to reflect the peculiarities of each industry and the availability or the accuracy of data.

With respect to the output, there are three basic measurement approaches which can be taken: physical units, value added, and gross output. Physical output is normally the preferred measure, and especially in Latin America where chronic high inflation rates distort any analysis which uses monetary values. However, it is not always feasible to compare physical output due to product variety, differences in quality and, in Latin America, lack of information. We have been able to overcome these barriers in three of the four cases analyzed.

In steel, where volume of production is available, we built an "equivalence ton" that reflects the differences in product mix, considering the differences in value added of 15 major product categories.

In the telecommunications case, the statistics of physical output are also available (i.e., number of access lines and number of calls). Minor adjustments were needed to have "homogenous calls" which incorporate the duration and type (local, long distance, international) of the calls.

The retail banking case presents a more difficult challenge, since only a few physical indicators (i.e., number of deposits and checking accounts or number of transactions per credit card) are easily available in these countries. To gather the complete physical output of the retail banking system, we developed a questionnaire following the methodology used by the U.S. Bureau of Labor Statistics (BLS) for making international comparisons and used it through the Latin American banking associations. By combining the information obtained through the questionnaires, together with publicly available data, interviews with industry executives and the experience of McKinsey consultants in the region, we were able to arrive at a reliable measurement of the physical output in these countries.

Obtaining an appropriate measure of the output of the food processing industry was the most difficult task we faced during this project. Product variety and quality differences made it impossible to obtain a single physical unit as output. Lack of adequate information also made it impossible to have a reliable measure of value-added. We concluded that we would have to measure the monetary output of each subsector and the industry as a whole, but always adjusting for the price differences that can distort the "real output." We had to create our own basket of "international prices" or "Purchasing Power Parity (PPP)" exchange rates for each subsector of the food processing industry. (We followed the methodology used by the OECD, matching at least 150 products between each Latin American country and the U.S.) The effect of this adjustment is the same as if one were to multiply the production volume of each country by the price of the corresponding products in the U.S. Thus, all output is then valued at the same price, and distortions caused by different price levels are eliminated. After finding this "monetary output" we checked its consistency, both with the data on physical output we got from some of the subsectors, and with the prices at different points in time. The objective was to have the monetary values supplied by one source checked against the result of the multiplication of volumes and prices supplied by other sources.

The Measurement of Inputs

Output per unit of labor is a common measure of labor productivity, and is the one we adopted in this report, either using output per hour worked (steel), output per full-time employee (telecom) or output per employee (banking and food). We also checked the level of tasks subcontracted to third parties. We found the level of tasks subcontracted to third parties to be homogenous between countries, and when this was not the case we made the relevant adjustment.

We do compute total factor productivity for telecommunications, recognizing its relative importance and the fact that the very existence of the telecommunications service and its quality depend almost entirely in the capital invested and the technology used. Capital stock was calculated by accumulating the capital expenditures for plant and equipment from 1983 to 1992 (without depreciation) and converting it into 1992

U.S. dollars. This capital stock was also adjusted for differences in the price of equipment. (We built the "International Prices" or "PPP" for telecom investment for the last 10 years, so as to arrive at the real physical investment companies have made in their networks.)

Framework for Explaining Productivity Differences

In order to identify and explain the causes of observed productivity differences, we developed a framework that captures all major possible causes and reflects their relationships to each other within a given hierarchy. This framework proved useful and applicable in studying each of our four industries and in structuring our discussion of causality.

In constructing this framework, we distinguished three hierarchical levels of causality (Exhibit 11). First, we concluded that the observed productivity differences must have some proximate causes, meaning that operations in Latin America must do something different that makes output per worker lower relative to their counterparts in the U.S. The production process, which has the most immediate and direct impact on labor productivity, includes the output (mix, variety and quality), the production factors (capital, scale and basic skill of labor), and the way in which the production factors are put together in operations (the organization of functions and tasks). Second, we concluded that the differences at the production process level were the result of past and present industry structure and behavior which is captured under the nature of competition. Third, we judged that competition and the behavior of managers are heavily influenced by the external forces confronting and constraining managers, in both the market and policy environment. We call this third layer of causality "external factors."

The external factors include those elements which indirectly influence productivity: market conditions (demand factors, relative input prices/factor availability and other industries) and policy and regulation (import barriers, competition and concentration rules, state ownership, labor rules and unionism, and other regulations).

Exhibit 1
STRUCTURAL CHANGES IN LATIN AMERICA

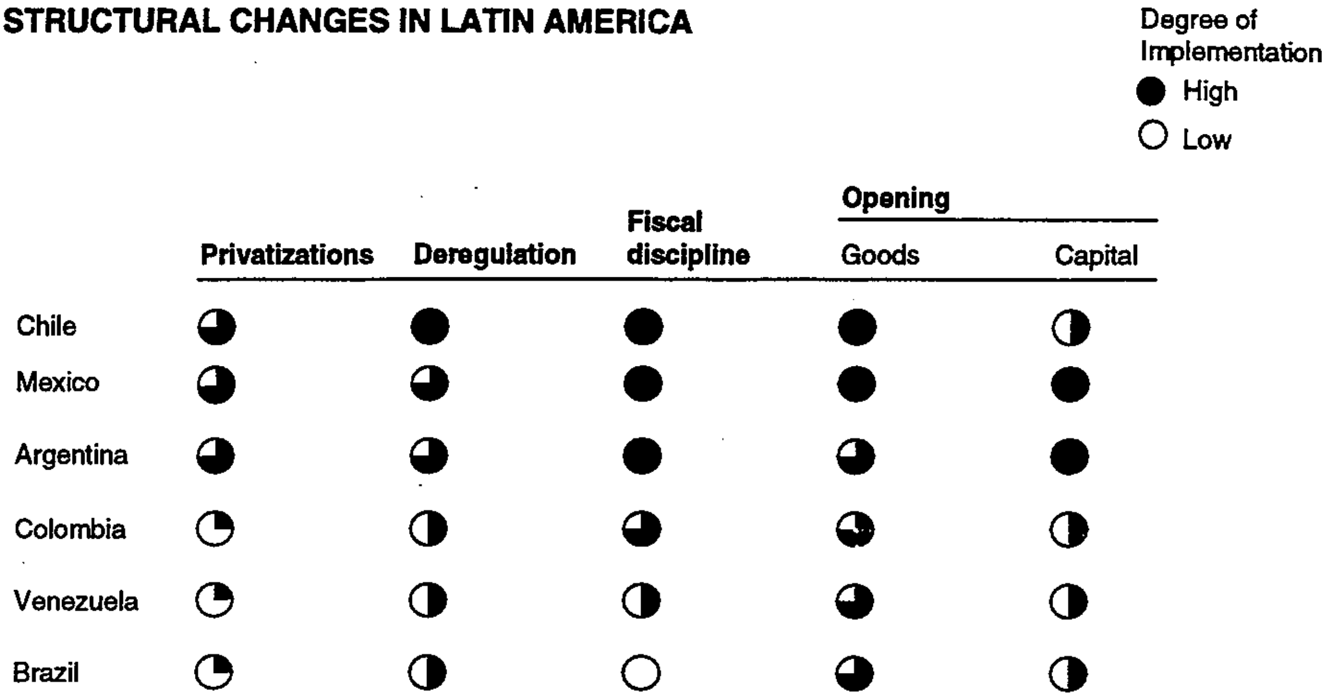
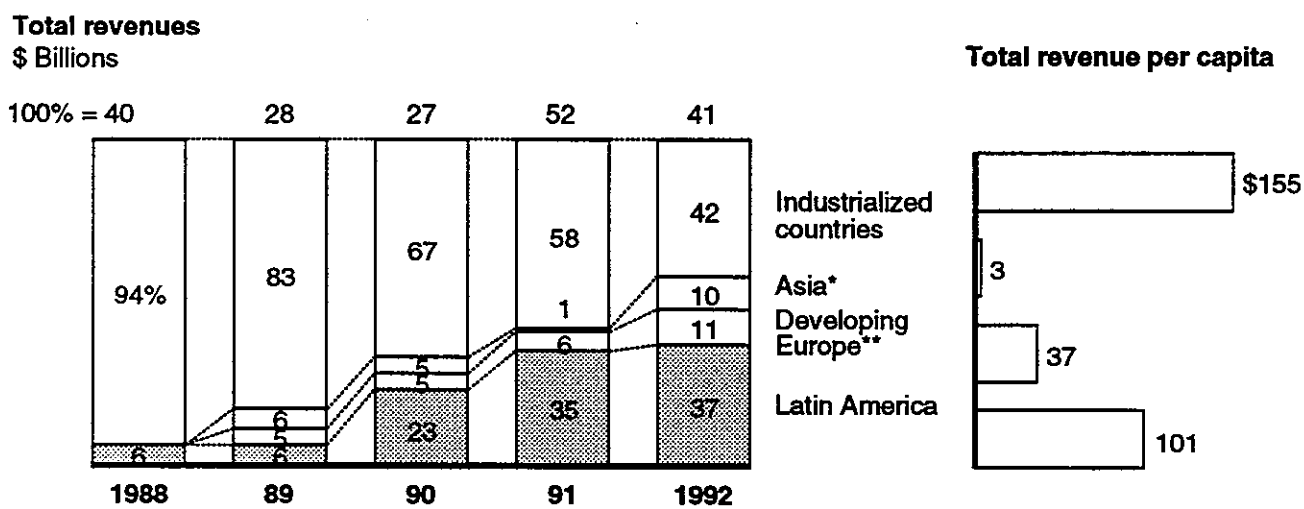


Exhibit 2
PRIVATIZATIONS BETWEEN 1988-92

U.S. dollars

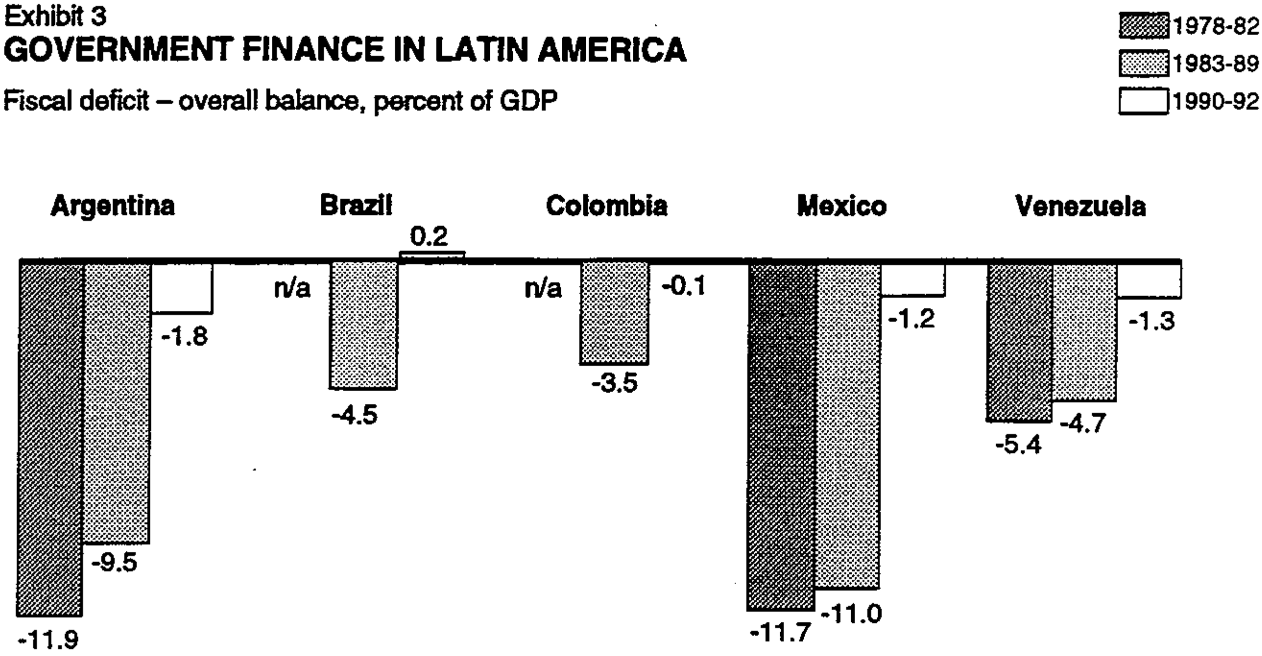


* Excluding Japan
** Eastern Europe and Turkey
Source: World Bank

Exhibit 3

GOVERNMENT FINANCE IN LATIN AMERICA

Fiscal deficit – overall balance, percent of GDP

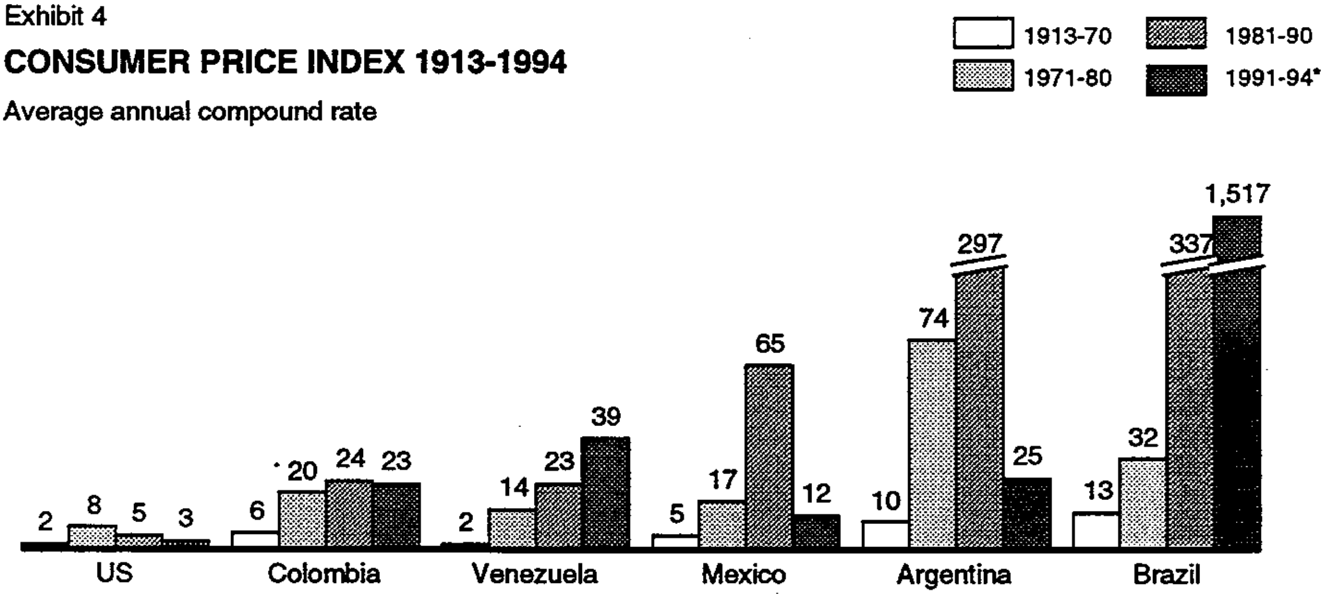


Source: IMF; CEPAL (United Nations)

Exhibit 4

CONSUMER PRICE INDEX 1913-1994

Average annual compound rate



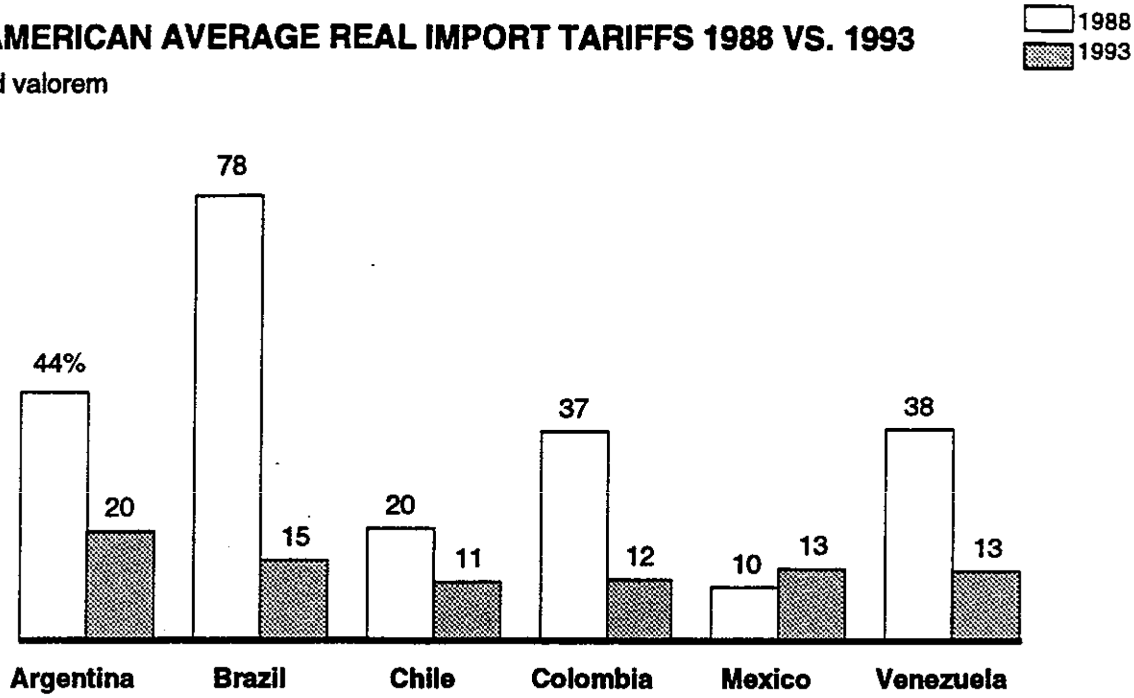
* First quarter annualized for 1994

Source: World Bank, V.J. Elias, "Source of growth", International Center for Economic Growth, ECLAC (UN)

Exhibit 5

LATIN AMERICAN AVERAGE REAL IMPORT TARIFFS 1988 VS. 1993

Percent ad valorem



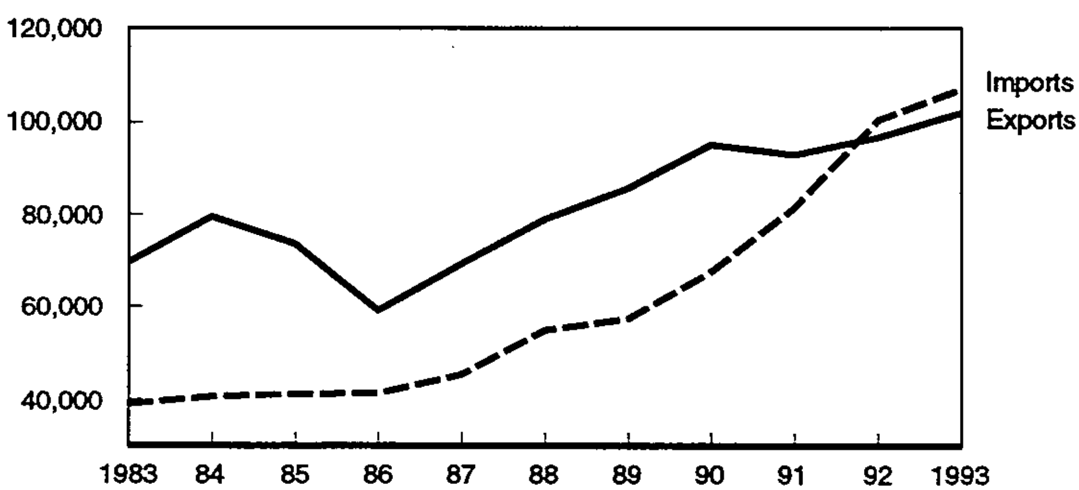
Source: LAIA

Exhibit 6

INTERNATIONAL TRADE

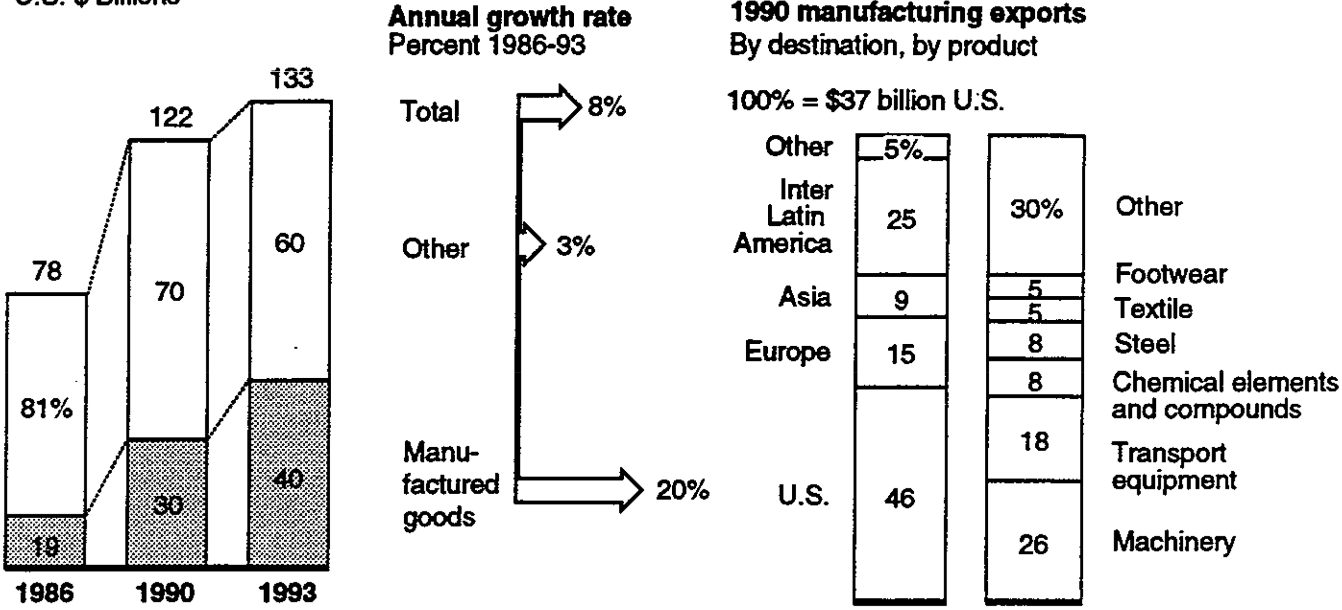
ARGENTINA, BRAZIL, COLOMBIA, MEXICO AND VENEZUELA

U.S. $ Millions



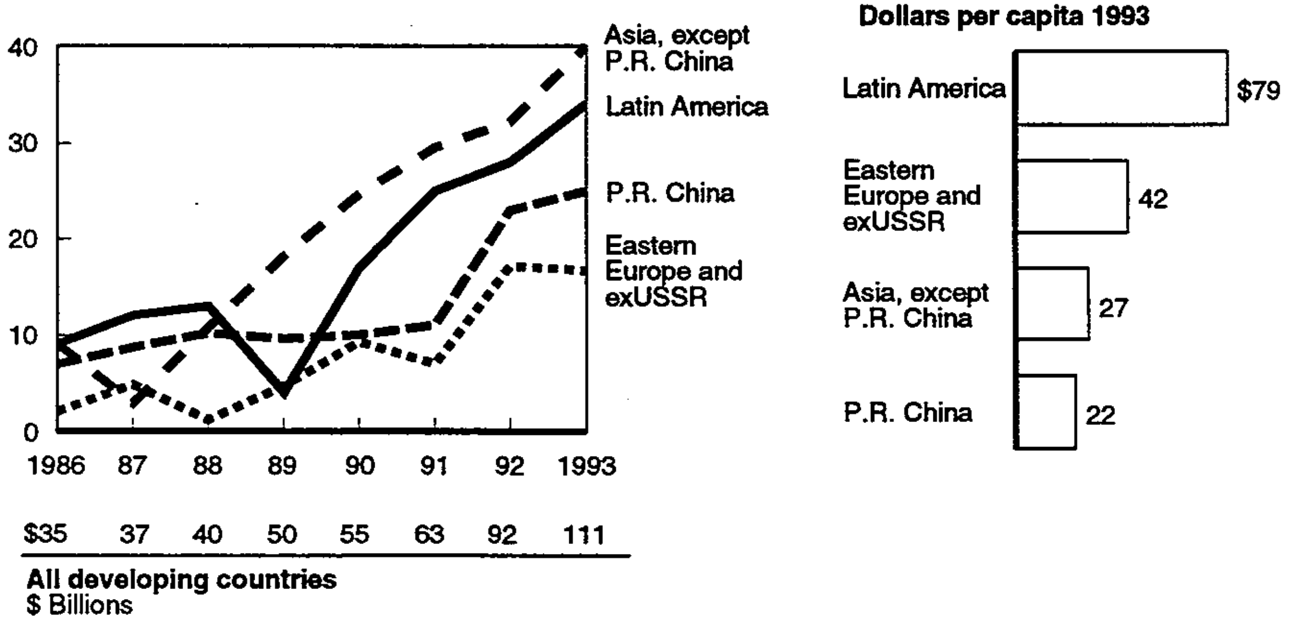
Source: IDB

Exhibit 7
LATIN AMERICAN EXPORTS
U.S. $ Billions



Source: Inter-American Development Bank

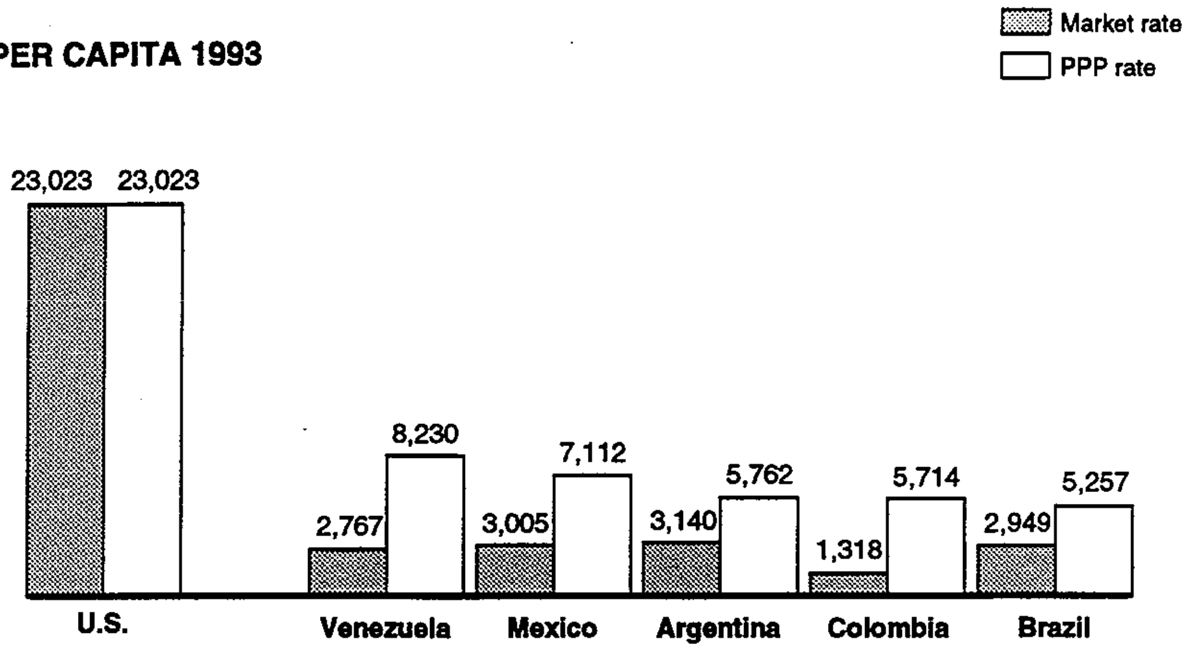
Exhibit 8
NET PRIVATE FLOWS TO THE DEVELOPING WORLD
U.S. $ Billions



Source: World Bank

Exhibit 9

GDP - PER CAPITA 1993



Note: PPP = Purchasing Power Parity
Source: World Bank; United Nations; IMF

Exhibit 10

PRODUCTIVITY MEASUREMENT IN THE FOUR CASES ANALYZED

	Output	Input	Productivity index
Steel	**Equivalent tons** (Physical tons adjusted by differences in value added of 15 major product categories)	**Hours worked** (Total employees by the number of hours worked)	**Equivalent ton per hour worked**
Food	**Monetary output** (Domestic monetary output priced at "international prices") (Consistency checked with production volume by subsector)	**Employees** (Subsector employment weighted to calculate aggregate productivity)	**Monetary output per employee** (By subsector and aggregate)
Banking	**Physical output** (Three major functions: transactions, deposits and credits obtained through questionnaires to the banks, interviews, public information and McKinsey expertise in the region)	**Employees** (Functional employment weighted to calculate aggregate productivity)	**Physical output per employee** (Functional and aggregate)
Telecom	**Number of access lines and numbers of calls** (Calls adjusted by their type-local, long distance, international - and duration)	**Employees** (Adjusted to equalize the level of subcontract work to third parties)	**Labor** = Combined index of access lines (85%) and calls (15%) per employee **Capital** = Calls per U.S. dollars invested in the network **Total factor** = Combined index of labor and capital weighed by their relative importance in the cost structure

Exhibit 11
CAUSES OF LABOR PRODUCTIVITY DIFFERENCES

External factors

- Market conditions
  - Demand factors
  - Relative input prices/factor availability
  - Other industries
- Policy and regulation
  - Import barriers
  - Competition and concentration rules
  - Labor rules and unionism
  - State ownership
  - Other (fiscal policy, price control and schemes)

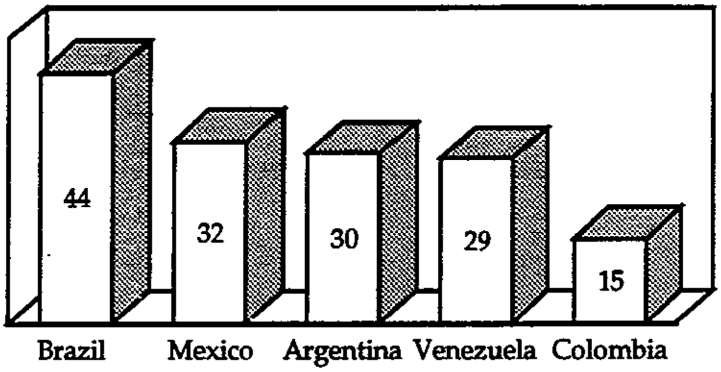
Nature of competition

Production process

- Output mix, variety, quality
- Production factors
  - Capital (intensity, vintage, technology)
  - Scale
  - Labor skills
  - Organization of functions and tasks

STEEL INDUSTRY CASE STUDY SUMMARY

Steel Labor Productivity 1992
Equivalent output per hour worked
Index: U.S. = 100



A massive privatization effort and recently reduced import barriers are changing the face of Latin America's steel industry by bringing about higher levels of productivity and making local firms more internationally competitive.

The current low productivity levels of steel firms in the region point to a past characterized by a weak competitive intensity, state ownership, and strong protectionism that allowed managers of these companies to pay little attention to increasing efficiency. Latin America's steel makers have shown themselves to have a high level of overemployment, hierarchical organizational structures and very complicated procedures and processes.

The quality of their assets, though, has been fairly good and has not set back productivity since many of the region's steel making facilities were actually built in the late 1960s and 1970s - among the newer ones in the world. However, the way these assets are used and maintained explains part of the productivity gap with developed country producers.

Throughout the 1990s governments in the region have carried out aggressive privatization programs and the opening of local economies to international competition, while domestic demand began to recover. The advent of new and tougher competition has already triggered important productivity improvements which today have become a matter of survival for all steel makers in the region.

The economic and industrial restructuring process under way will push Latin America's steel makers to continued higher levels of productivity. We estimate that through reorganization of functions and tasks as well as certain minor investments in de-bottlenecking and automation, Latin America's producers can reach easily up to 80 percent of the productivity levels encountered in the U.S. Relatively lower input prices in the region (iron ore, labor, energy) determine the technology used, and allow these countries to be internationally competitive without achieving higher productivity levels.

More stable economies in Latin America over the coming years, coupled with stronger projected economic growth, will ensure growing demand for steel. In large part, this demand will be created by fulfilling the evident need for infrastructure and appropriate housing. The region's steel makers are consequently in a good position to serve this growing market with the only caveat being that they continue to improve the efficiency of their operations.

STEEL INDUSTRY PRODUCTIVITY IN LATIN AMERICA

INDUSTRY OVERVIEW

The world's steel industry has undergone tremendous changes over the last 20 years. Originally, it formed the backbone of Europe, Asia and North America's industrial development. Beginning in the 1960s, it began to play a major role in the economies of Latin American countries, such as Argentina, Brazil, Mexico, and Venezuela. In the early 1970s, Europe and the U.S. began to face slower local demand growth and increased competition from Asia (Exhibit 1). While Europe and the U.S. struggled to restructure, Japan and Korea established themselves as the world's dominant producers. Protectionism shielded the Latin American steel industry from these outside competitive pressures, and the industry experienced slow but steady growth.

Three distinct periods mark the development of Latin America's steel industry (Exhibit 2). The first period, from the 1960s through the 1970s, was the startup era when several governments, eager to industrialize, created national steel industries virtually overnight. They followed the "import substitution" model then recommended by the UN's Economic Commission on Latin America, which called for the substitution of manufactured imports with the output of state-encouraged industry. The premise of this model was that development required becoming less dependent on developed countries for manufactured imports. Local leaders viewed these home-grown steel industries as centerpieces of their development strategy, which was relying increasingly on government ownership and control. Production and demand grew rapidly throughout the 1960s and 1970s, and in the 1970s governments began borrowing heavily from international creditors to expand capacity and update technology to keep pace with local demand. The newly constructed state-owned steel plants became economic hubs and important employment generators, and success in these years was defined in terms of jobs created and material produced for other industries.

The second stage, during the 1980s, was marked by economic instability and decreasing domestic demand. The Latin American debt crisis and resulting recession caused a substantial decrease in demand in the early 1980s, and the slight recovery in the late 1980s did not allow demand to reach 1980 levels. The recession left steel companies with substantial over capacity in their local markets, forcing them to export low value-added products to maintain production. Volatile demand, uncertain government economic policies, and a lower availability of foreign credit caused investment to fall significantly during this period.

It is only during the current third stage that Latin America's steel sector has begun to turn around. The recognized need to abandon the protectionism and subsidies associated with the "import substitution model" has prompted Latin American governments to adopt new market-oriented development strategies. This new approach is premised on expanding international trade and competition, relying more on the private sector, and using radical measures to eliminate inflation. This approach has created a new and more competitive industrial dynamism for Latin America that will continue to strengthen throughout the 1990s.

The 1990s has been characterized by a recovery in domestic demand, aggressive privatization of state-owned enterprises (Exhibit 3), and the opening of local economies to international competition. In the countries studied, only Sidor in Venezuela has not yet been privatized. Steel producers are now becoming an integral part of the global market, and as such, recognize the need to modify their behavior to be successful in the long term. The 1990s will mark the restructuring of the Latin American steel sector in an effort to become world class competitors.

While the three periods accurately summarize developments in the Latin American steel industry, the five countries studied show distinct peculiarities. Argentine producers, for instance, enjoyed an oligopoly that allowed margins to soar above international ones, mainly in flat products. On the contrary, Brazilian producers faced government price controls that were consistently below full production costs and constituted a net transfer of revenues to consumers. Both Brazil and Venezuela developed similar industry structures with large scale, state-owned mining firms and iron-based (non-minimill) steel producers very integrated with one another. Mexican producers were among the first to face external competition as a result of gradual economic liberalization starting in 1983. Colombia is the only country studied where the government did not play a major role in steel production, but the industry there is very small and still benefits from protectionism during its development. Together, the five countries account for 94 percent of Latin America's steel production in 1992 (Exhibit 4).

Overall, the outlook for the Latin American steel producers is positive. Recovery in domestic demand will allow producers to replace exports of low value-added products with domestic sales of higher value-added products. Recovery will also help companies to complete the major restructuring efforts currently under way in most countries. Recent structural economic reforms and post-privatization management changes at many companies have prompted significant restructuring and increased competitiveness. Beginning in the late 1980s, employment in the industry has been decreasing while production has continued to grow (Exhibit 5), substantially increasing labor productivity in the process.

MEASURING PRODUCTIVITY IN THE STEEL INDUSTRY

In this study we have concentrated on measuring the steel industry productivity for the year 1992, but have also examined trends over the past 5 years and attempted to measure the effect of the significant changes which took place during 1993. Our productivity comparisons are based on comparable production and employment data from the Latin American Iron and Steel Institute (ILAFA). Using this production data, we have analyzed the fabrication of steel products in both integrated facilities and minimills. These products include semifinished products, such as billets and blooms; flat products such as steel plates and sheets; and long products, such as H-beams and rails. Steel tubes and pipes are included as well. Further processed products such as coated sheets and welded tubes are not included.

Two main process types are used to make steel products: integrated production and minimill production (Exhibit 6). The integrated process gets its name from the fact that it integrates both iron-making and steel-making activities, thereby covering production processes that run all the way from ore to finished products. In iron making, raw materials such as coal and iron-ore are processed into coke and sinter/pellets. These materials are then combined in blast furnaces to produce pig iron. The iron is then sent to the steel mill where it is converted into steel in basic oxygen furnaces (BOF) and cast into ingots or continuously casted into semifinished products such as billets, blooms, or slabs. Slabs are transformed into flat products in hot-rolling mills, where they are made into plates or sheets, which are then coiled. This coil can then be cold rolled, coated, and finished. Some of the sheets will be processed further into tube and pipes. Billets and blooms are transformed into long products such as heavy sections, I-shapes, and rails in structural mills, or into bars, light sections and wire rods in bar or wire-rod mills.

The minimill process gets its name from its small size. Whereas, the capacity of integrated mills typically ranges from 2 million to 10 million tons per year; their minimum efficient scale is usually in the range of 3 to 4 million tons. Minimills, on the other hand, can operate efficiently with a capacity as low as 250,000 tons, although most are in the range of 300,000 to 600,000 tons. Minimills rely on scrap steel rather than pig iron, and they have higher labor productivity than integrated mills (Exhibit 7). They normally constitute a single production line and require much simpler organizations.

In Latin America, it is also common to find an alternative technology to the traditional coke oven/blast furnace reduction process. This technology consists of reducing high quality iron ore using natural gas into a directly reduced iron (DRI) which is then used as a substitute for scrap steel in the minimill process. The DRI technology is used only where gas prices are low because it is less energy efficient than the other technologies. It is also a less capital-intensive option and can operate efficiently at smaller scales (350,000 tons to 1 million tons).

Methodology

Finding a correct measure of steel output was critical to accurately determine industry productivity in Latin America. Two measures were investigated but rejected as inadequate. The first, using estimates of total tonnage was discarded since it did not reflect differences in product mix, quality and value, and would therefore penalize higher value-added producers. (Raw steel estimates are useful for making physical output comparisons between national steel industries, however.) We also rejected the approach used by the McKinsey Global Institute in its study of developed country steel productivity that measured output using value added adjusted by an industry

Purchasing Power Parity (PPP) factor. This approach proved to be unworkable given the lack of value-added statistics for the countries under study. Consequently, we adopted a third approach based on "equivalent ton" figures which did allow us to capture the differences in product mix, assuming that the quality of the products within any one category was similar.

The productivity for Latin American producers was calculated as follows :

1. Calculate steel output in tons

2. Adjust for differences in product mix by multiplying by an equivalence factor which captures the differences in value added for 15 product categories

3. Calculate employment in industry

4. Adjust employment numbers for product imports and exports at the intermediate steps of the production process

5. Multiply employment numbers by hours worked in each country

6. Calculate productivity in terms of equivalent output per hour worked.

For comparison purposes, U.S. productivity was calculated using this same approach (Exhibit 8).

Productivity Results

In 1992, the productivity level of steel operations in Latin America, measured in terms of equivalent tons per hour worked was equal to 37 percent of the productivity levels of operations in the U.S. (Exhibit 9). Brazil was the most productive country with a productivity 44 percent of the U.S. level while Colombia was the least productive with a productivity 15 percent of the U.S. level.

Since 1985 all of the countries except Venezuela have improved their productivity with respect to the U.S. (Exhibit 10), even though U.S. productivity was also increasing rapidly in that period. The major improvements in Latin American productivity took place over the last 4 years. Not by coincidence, this is the same time period when privatization programs began and when the first efforts were made to promote the private sector's competitiveness in world markets. Latin American steel producers can be expected to continue closing the productivity gap with respect to world leaders as they continue their restructuring efforts further.

CAUSES OF PRODUCTIVITY DIFFERENCES

Using the general framework of this study, we attempted to account for the lower levels of productivity observed in Latin America by examining three important areas (Exhibit 11): (1) production process, (2) industry structure and competitive behavior, and (3) external factors.

¶ Production process. This involved looking at the way firms in the industry structured themselves to do business and how efficiently they used labor and capital. At the production process level, differences in organization, assets and processes explain the lower levels of productivity in Latin America compared to more industrialized countries.

¶ Industry structure and competitive behavior. If such differences existed, we wanted to know why and how they got that way. We suspected we would find the answers by looking at how national steel industries were structured and how intensively they competed both in and outside their national boundaries.

¶ External factors. Finally, we examined factors outside the industry that were influenced by its development, chiefly local government policies, rules of competition and the market environment.

Causality at the Production Process Level

At the production process level, the difference in productivity between Latin America and the U.S. can largely be explained by: (1) the high level of employment in Latin America and the way in which these employees are organized, (2) the differences in the efficiency with which the existing assets are used, maintained and updated, and (3) other minor factors which may become more important as the productivity differences are lessened. With its present asset base and without major investments, the Latin American steel industry can jump from its present 37 percent of U.S. labor productivity to some level between 70 and 90 percent, depending on the country. Reorganization of labor could cut 30 percentage points, and asset improvement and better utilization through minor investments can supply between 13 and 23 additional points (Exhibit 12). There are additional structural factors inherent in the region which condition productivity, and which will be further analyzed.

¶ Organization of labor as a causal factor. The main factor explaining productivity differences in the Latin American and developed country steel industries is simple over-employment. A long and steady growth period, roughly between 1960 and 1980, allowed steel makers in the region to increase employment levels as needed. Even when the mid-1970s crisis forced steel companies in more industrialized countries to cut costs and increase efficiency, Latin America's producers – facing less pressure because of trade protection, growing local demand, and government ownership – kept expanding their personnel base (Exhibit 13).

The process, however, was not identical in all countries. In both Venezuela and Brazil, for instance, steel output jumped threefold in 1975 to 1993. In Venezuela, steel firms added 20 percent more employees to their payrolls during this period, but in Brazil, employment levels actually dropped 40 percent during the time. By the late 1980s, however, all of the region's producers had begun to make badly needed improvements in efficiency (Exhibit 14).

Years of government ownership and protectionism have still left a legacy of over-employment especially visible at the company level. Most steel firms in Latin America are overstaffed across their direct production and administrative divisions (Exhibit 15) and overburdened with organizational redundancies and bureaucracy. This over-employment was the result of a lack of management attention to cost effectiveness and productivity during the output expansion in the 1960s and 1970s.

We have selected several company examples that illustrate the above points and can be considered typical of the region (Exhibit 16). In each example, firm management took significant steps to reduce labor costs once exposed to a more competitive environment. But further examination revealed potential areas for improvement when these firms' organization and processes were compared against international benchmarks, taking into account differences in technology. An indication of the high degree of over-employment that had been sustained by Latin America's steel industries is that they have been able to maintain and in some cases increase output levels in face of important reductions in employment levels.

Improvements in efficiency can be achieved in most areas of the organizations by better managing the resources available. Specifically, Latin American steel producers can become more efficient with marginal investments, if any, by:

- <u>Reducing complexity of operations</u>. Complexity considerably reduces efficiency and increases costs. It is common for Latin American producers to offer full product lines and serve all potential clients without considering the costs and inefficiencies created by this complexity. This problem is accentuated when we consider that the costing systems for most steel producers are undependable and use inadequate criteria to allocate costs. Using activity base costing (ABC) or similar costing techniques allows management to concentrate their efforts on those products and clients that provide the greatest contributions.

  The effect of managing without concentrating on the contribution margin provided by individual customers or product groups led producers to misallocate resources. For example, in one case a Latin American steel producer received 95 percent of its contribution from just 29 percent of its types of steel (Exhibit 17). With this type of complexity, the company had high inventory costs and used up vital productive capacity because of increased set up times and higher yield losses given lack of continuity.

- Simplifying processes. The processes that are in place nowadays within organizations are the result of many years of company evolution. These processes are not necessarily focused on the tasks at hand and are often bureaucratic and ineffective. By redesigning these processes with the goal of adding value to the organization in the most efficient way, vast improvements have been accomplished (Exhibit 18).

- Optimizing logistics. Managing organizational logistics with a systemic view and concentrating on the key variables which determine a coordinated and effective operation is also a way of having substantial short-term impact on effectiveness.

- Meeting customer needs. By improving steel producers' offer to the market, they can increase their revenues in the short term. The producer's proposition can be improved by increasing service and customer assistance levels and/or by better matching their products with the most attractive business segments.

- Changing management culture. Cultural factors within organizations also affect productivity. The corporate organizations in Latin America today reflect the management culture and the economic environment from past decades. Old-style human relations and employee management techniques still in use in Latin America contrast highly with those countries that are incorporating the most sophisticated concepts in personnel management. By shifting management culture, Latin American steel producers could improve their productivity.

  Managing in Latin America can be defined as traditional, focusing mostly on products and production rather than on clients and processes. The work environment is characterized by individual rather than team efforts and management style is autocratic instead of participatory.

  The Latin American organizational culture and management style contrasts with that of leading producers in the developed world. Japanese companies, for instance, are considered to be the leaders in human relations and employee management. Below we outline two approaches to management in steel-making operations that have contributed significantly to improved productivity. In integrated mills, the key organizational elements that characterize integration of functions and tasks in Japanese operations follow:

  - Strong corporate cultures highlighted by: (1) corporate planning departments that provide higher levels of management capacity and leadership to the mills; (2) strong technical development and control functions that maintain basic operating principles, solve problems, and integrate mill functions; (3) cross-functional teamwork for problem solving, learning, and internal competition.

- Excellent labor relations characterized by: (1) successful efforts to recruit and permanently retain some of the best students from Japanese universities and technical schools; (2) high levels of work force flexibility manifest in multicrafting (e.g., in maintenance), the use of operators for routine maintenance, and the use of subcontracted work as a buffer for adjusting capacity to meet demand; (3) worker-led self improvement programs or *jishu kanri* (JK) activities such as total quality management (TQM), total productivity management (TPM), continuous improvement (*kaizen*), etc., some of which is unpaid work.

- A resulting ethic of continuous improvement on quality and non-labor costs.

The Japanese work ethic functioned very well while producers participated in a rapidly growing economy. However, with the bursting of Japan's "bubble economy" in the late 1980s, producers began facing slow domestic demand growth and increased competition from other Asian countries in international markets. These new circumstances are starting to severely affect company culture in Japan. It is difficult to predict how companies will adjust to the new environment.

In minimills, it is the Americans who are recognized for having the most innovative organizational focus. The leading minimills in the U.S. share several characteristics which make them high performance organizations:

- Leadership. Driven by very strong-willed, sometimes "unreasonable" CEOs, top management has set itself very clear objectives regarding organizational performance, and it can convey its vision to the micro level of the business operations.

- Simplicity. These organizations maintain simplified structures that have clear lines of reporting and accountability. They have minimum management layers, and responsibilities reach as far down into the organization as possible.

- Strategy. These high performing organizations are driven by a relentless pursuit of their strategy and vision. Managers know their customers, understand their competitors as well as their own capabilities. They can, therefore, react quickly and decisively when the situation so requires.

- Skills. While these organizations are very good in several areas, there are always specific skills underpinning their overall strategy.

- Environment. These organizations are completely focused on performance. Performance is used to evaluate employees and to measure success. The environment is intense, demanding and competitive.

- People systems. The organizations give high priority to people selection and training. Top managers are permanently involved in personnel development and employees are provided a high degree of mobility and opportunity.

¶ Characteristics of assets as a causal factor. While the quality of the asset base of Latin America's steel industries does not explain the lower productivity levels found there compared to developed countries, how these assets are utilized and how they are maintained does help account for the differences. Scale also explains part of the productivity gap in some of the countries analyzed.

An examination of Latin America's steel sector assets reveals the following:

– Plant scale is similar to that of the developed world. The scale of steel producers is an important factor in determining productivity. In the earlier steps of the steel-making process, most of the employment requirements are determined by the type of process and the number of furnaces used rather than by their size. The differences in the size of the furnaces used account for only 10 to 20 percent differences in labor levels. Therefore, companies with larger scale production (i.e., higher capacity furnaces) will have higher productivity than companies with smaller capacities.

  For integrated producers, full-scale benefits are realized at a production level of 3 million tons per year. With the exception of Japan, there are few producers in the countries analyzed which have such a large scale. However, there are marked differences in scale across countries (Exhibit 19). On average, producers in Brazil and Mexico are similar in scale to U.S. producers and have much higher scales than found in Argentina and Colombia. In minimills, full-scale benefits are captured at about 250,000 tons per year. Both the U.S. and Venezuela, on average, are close to this scale and, therefore, have a productivity advantage over the other countries.

– Plants in the region are relatively new. Latin America constructed most of its integrated facilities at precisely the same time that Japan did in the late 1960s and 1970s. In the U.S. and Germany facilities are even older. The U.S. maintains a number of plants built before World War II, and

Germany rebuilt virtually its entire steel industry in the years immediately following the War. Latin America's asset base appears to be competitive when compared to the developed countries (Exhibits 20a and 20b).

- Latin America has maintained adequate investment levels. Capital investment figures confirm that the region has kept pace with the investment levels of more developed countries (Exhibit 21). All the industries studied except Colombia's have invested more capital per ton of output than the U.S. Venezuela stands out as having the most capital investment in the region, but those investments have surprisingly not translated into increased output. Despite investing as much as Brazil in steel over the past 15 years, Venezuela's output today is only 20 percent of Brazil's.

  Neither the age of Latin America's asset base, nor its levels of investment, offer insight into why the region's productivity is lower than developed countries. A closer look at how capital is utilized in both developed countries and Latin America does provide an explanation.

Developed-country steel industries' facilities are continuously improving, but in Latin America little of this is seen. In Japan, for instance, much of the installed asset base is being continuously redesigned to incorporate more automated systems (e.g., for materials handling, coil binding and wrapping), continuous systems (e.g., continuous casting, pickling, cold rolling, and annealing and temper rolling) and electronic control processes. Improvements have gone so far that Japan has redefined the state of the art in process technology and scale; a good example is the scale of its blast furnaces.

The U.S. and Germany were also able to improve productivity levels through brownfield investments in contrast to Japan where investments were mostly greenfield. While retrofitting can be more costly than new plant design, this option proved to be cost effective in Germany and the U.S. because of the fully amortized asset base which yields higher capital efficiency than those obtained by revamping existing facilities.

Despite high levels of investment in Latin America, productivity has not improved largely because of the inefficiency of the investment process itself. In the course of our study we have documented several cases of this inefficiency. A few examples follow.

- In Brazil, a rolling mill was purchased in 1978 but never completed. To date, $700 million has been invested in the facility and an additional $450 million is needed to finish it. Ironically, a newer plant with better technology can be purchased today for just $400 million.

- In Venezuela, a seamless pipe plant will have cost $1.2 billion once construction is completed. A plant with equivalent technology can be purchased today for only $350 million.

- In Argentina, officials purchased a heavy plate mill in 1974, but the plant was never installed.

- In Mexico, a heavy plate mill was purchased in 1982 and never installed.

Latin America's foreign debt repayment burden has limited recent investment in the steel sector. As early as the late 1970s, the region's producers were already cutting investment below the minimum needed to maintain their plants in top running condition in order to service their debts (Exhibit 22). The lack of maintenance related investment did not become critical until the 1990s. Considering investment inefficiencies it is quite possible that Latin American firms have been under investing as far back as 1985.

The shrinking of the capital expenditures is mostly reflected in the lack of automation and process control systems and the lack of environmental control equipment.

Investment in steel plants should now recover because of the privatizations that are taking place. New owners have committed themselves to making investments as part of the bidding process, and most will do so anyway to make these operations internationally competitive. The investments will be directed at improving quality and efficiency.

One area especially in need of improvement across the region is the casting process technology. While the regional average level of continuous casting is similar to that of developed countries, levels in Brazilian and Mexican operations are significantly below those of their Japanese counterparts (Exhibit 23).

Also, improvements are needed in the following areas:

- De-bottlenecking. By improving the performance of the critical processes we have seen in several cases improvements in output of 10 to 20 percent.

- Process automation. Automation of the critical processes throughout the operation is needed to increase process control and quality. This will optimize the processes and reduce the amount of rework necessary because of quality problems. Automated systems should also be used to facilitate data collection and analysis, and to improve the quality of the management information systems.

- Optimizing batch sizes. Batch sizes throughout the steel process can be optimized to obtain the minimum efficient scale operation throughout the production chain.

By making these improvements, steel producers can achieve important gains in productivity without major capital expenditures.

¶ Other causal factors. There are other factors that have an impact on labor productivity, but given the current gaps, are not as important as those we have discussed. It is possible that as the labor productivity gap between the Latin American producers and those of the developed world narrows, factors such as capacity utilization and the skills of the labor force will become more important.

- Capacity utilization. Capacity utilization has been similar over time in the countries studied. However, gradually replacing low value-added products with higher value-added products will raise productivity in terms of equivalent ton output (Exhibit 24).

- Skill level of labor. Skill level differences, independent of management influences on training, recruiting, multicrafting and continuous improvement are negligible among Latin American countries. The effect of the differences between these and the developed countries is very hard to quantify.

Through a combination of improvements in organizational performance and capital management, Latin American steel producers could see substantial increases in productivity without substantial investments. The measures needed to be taken by each company vary widely but fall under one of the categories described above (Exhibit 25).

The gains in efficiency and productivity are becoming necessary for survival as Latin American markets open up to international competition. Many steel producers as they stand today will not fare well in this new environment. However, if they act promptly, not only will they consolidate their position in the market, but will be able to generate substantial value for all the stakeholders involved (Exhibit 26).

External Factors and Industry Behavior

The observed differences in productivity result from management decisions at the production level. This section will attempt to describe the conditions that led management to make the decisions they did in Latin America and not take other steps that could have led to higher productivity. There was a lack of incentives to improve productivity caused by both structural and operating environment factors. The industry in the region enjoyed low factor costs, reduced scales of production, strong government protectionism, and state ownership; these factors combined to produce a less competitive environment. However, some of these structural differences will not disappear in the near future, and will allow Latin American producers to be internationally competitive, even with lower labor productivity levels than in the developed countries. These factors explain 10 to 30 percentage points of the productivity gap (depending on each country) so it is foreseeable that labor productivity will continue to grow to a level between 70 to 90 percent of the U.S. level (Exhibit 27).

¶ Effects of low factor costs. Most of the inputs of the steel industry are less expensive in Latin America than in the developed countries (Exhibit 28). Labor costs in Argentina and Brazil are one-third of U.S. costs, and in Colombia, Mexico and Venezuela less than one-sixth. Iron ore is extremely cheap in Brazil, Venezuela and Colombia. Scrap and coking coal are not low cost because they need to be imported in its majority. The lower cost of labor and iron ore encouraged the use of integrated instead of minimill technology despite the productivity disadvantage.

The technology used for raw steel production in Latin America varies considerably from country to country (Exhibit 29). Not surprisingly, Brazil and Venezuela, which have huge iron ore reserves, concentrate mostly on integrated technologies. In addition to the integrated producers, Brazil has minimills that reduce pig iron produced by small charcoal-powered blast furnaces. Venezuela, in particular, uses the DRI technology intensively because of the high quality of its iron and low cost of its gas. Colombia stands out as having the highest scrap-based production out the countries studied. This is due mostly to their limited iron reserves and also to the small scale of their production. While Argentina and Mexico have scrap utilization similar to the developed countries, their higher use of DRI technology again reflect the availability of the input factors.

The costs of using the three alternative technologies differ depending on the cost and quality of the input factors to which each country has access. We have calculated the cost of using each technology for the countries studied by taking the domestic input factor cost and assuming the same process and factor utilization productivity (Exhibit 30). Our results show that Latin American steelmakers have a clear incentive to use integrated technologies rather than scrap-based technologies because of lower raw material costs in the region.

To better understand the impact of the low factor costs on domestic competitiveness, we weighted the production cost per ton of steel for each type of technology (DRI, integrated and minimill) by the intensity of use of each technology (Exhibit 31). Our results showed that two countries, Brazil and Venezuela, have clear international competitive advantages in this industry – advantages that stem from the lower cost of available raw materials.

When we introduced the actual labor productivity for each country, the factor costs increased in every case. However, even with the actual labor productivity adjustment, Brazil and Venezuela still have substantial international cost advantages in steel. On the other hand, Mexico, Argentina and Colombia are at a disadvantage in international competition. Their industries face a significant threat as they enter free trade agreements with the more highly productive steel producers in the U.S., Brazil and Venezuela, respectively.

Our investigation revealed substantial differences in operating costs between Latin America's more efficient steel-producing countries and their developed counterparts. We found, for example, that Brazil has a unit cost advantage of $90 per ton over U.S.-integrated producers and $40 per ton over U.S. minimills (Exhibit 32). Venezuela can also be expected to have similar cost advantages over the U.S. producers. Low factor costs have allowed these two countries to export excess production into international markets without being under any pressure to improve productivity since their products were already cost competitive. Through the same mechanism, the high cost of production factors in Japan contributes to their high level of labor productivity. High productivity is the only way that Japanese firms can compensate for their cost disadvantages and compete in international markets.

We have seen how the cost of the input factors drives the choice of technology in the steel industry. Since each technology is inherently different, the choice of process used has an impact on productivity (Exhibit 33). Part of the productivity gap between Latin America and the developed world can, therefore, be explained by the industry's reliance on integrated and, to a lesser extent, DRI technologies rather than minimill production. Minimills require less labor per unit of output, and, since they are newer than most integrated facilities, they tend to be installed with more efficient equipment in their downstream activities, e.g., continuous casting.

The higher productivity of minimills compared with integrated facilities does not come just from better technology, but also from a simpler overall production process. Minimills use simpler inputs, scrap iron for the most part, and have simpler outputs, mostly commodity long products. Minimill products have mostly been limited to a narrow range of long products because of quality problems with flat ones. This concentration on a narrow range of product combines with the new technology results in a less complex production process, a more flexible use of human resources, and a reduction in overhead.

Lower levels of automation are another cause of lower productivity in Latin America's steel industries. Lower labor costs in the region reduce pressures for producers to automate their operations. Investment in automation will have much longer payback periods and lower returns than equivalent investments in the developed world. Countries in Latin America where labor costs are relatively higher do, however, feel relatively stronger pressure to automate their operations. Our evidence shows that both Argentina and Colombia are in an unfavorable labor cost position vis-à-vis their productivity levels. Mexico, on the other hand, is under very little pressure to automate its processes because of low labor costs (Exhibit 34).

¶ Effects of protectionism. The protectionist model in these countries was intended to stimulate domestic growth by shielding local industries from international competition. This was accomplished by high tariffs, import license requirements, and other complex import procedures. Local industries were developed, but they did not face world class competitive pressure because of protection and the small size of their domestic markets. The only partial exception was Brazil which, due to the large size of its domestic market, was able to foster a certain amount of internal competition.

It was not until the economic reforms of the late 1980s, when local producers began feeling the pressure of international competition, that they were forced to improve their efficiency. Tariffs fell on average from over 50 percent to about 15 percent, and most of the complex import procedures were eliminated. The result has been a substantial increase in imports (Exhibit 35), which has given buyers a wider choice of products. Latin America's steel product imports today are equal to that of the U.S. – a country considered to have an open economy.

Along with the surge of imports, domestic prices have been converging toward international prices. Domestic producers now face more volatile markets and have less opportunities to control prices.

¶ Effects of state ownership. State ownership alone may be a strong factor negatively influencing productivity. While most state-owned steel firms in Latin America have been privatized (Sidor in Venezuela is the exception), the legacy of government ownership in many cases still permeates their organization and culture. Not all state-owned firms suffer from mismanagement, but there is evidence showing that government-owned businesses manifest problematic features, the most serious of which are:

- Political influence. In many cases, state-company management is accountable to government bodies where political interests, rather than the company's interests, are at stake. It is difficult for these organizations to have the appropriate planning when operating budgets and funding have to be approved by a legislative body.

- Lack of continuity. State-owned firms in all industries tend to suffer from lack of managerial continuity. Top positions in these firms are normally politically appointed and consequently change with political cycles.

- Unqualified management. Middle management levels, brought in with each change in senior management, often lack a firm understanding of the industry or business.

- Wrong strategic focus. Most state firm management focuses on volume rather than profits. They often lack the control mechanisms needed to ensure efficiency throughout their operations.

- Centralized and bureaucratic structure. Many state-owned companies maintain a tightly structured and centralized decision making process.

- Low level of motivation. In state-owned companies, it is difficult to cultivate and retain high performing individuals. Lack of employee mobility, responsibility and decision-making authority lead such individuals to seek more attractive opportunities elsewhere. Incentives for aggressive management and for a risk-taking mentality do not exist.

- Entrenched trade unions. Most state companies are highly unionized environments where employees are among the highest paid in the industry. Often, management at state-owned firms is reluctant to adopt a strong negotiating position in fear of political implications. Often the result is management commitments that compromise the health of the firm, and a continually antagonistic relationship with employees.

¶ Effects of local competition. Latin America's steel industry has never been competitive within local markets. Steel producers essentially enjoyed a privileged position owing to a high level of concentration in the industry (Exhibit 36) and increased government protection from outside competition. This situation led to the creation of oligopolies and even monopolies in terms of products produced or regions served.

Demand structure in local markets did little to provide pressure for higher productivity and quality. Local demand for steel concentrated on low value-added products and was extremely fragmented, leaving customers at the mercy of producers. The only significant imports were for high-end steel products which could not be manufactured locally.

The situation contrasts sharply with what occurred in the advanced industrialized countries. Steel buyers constantly pressed producers for better quality and more competitively priced products. For example, Japan's car makers played a pivotal role in helping steel producers in that country attain high productivity levels, placing substantial pressure on steel producers to develop new and better products. At the same time, however, they have allowed producers to keep a part of the productivity gains generated. Each year steel prices for the whole economy are decided in negotiations with the automotive, construction, and transportation industries.

As for the future, Latin America's competitive landscape is already changing. The reduction in trade barriers is opening up the region's markets for steel products from abroad. Local producers will have to compete locally and internationally on global market terms. Buyers of steel products will have increasingly more influence on quality and price. They themselves are facing tough competition to improve costs and quality of output.

¶ Other structural factors. There are other structural factors which handicap the productivity of the Latin American companies, especially when they are competing in international markets. These factors are:

- Infrastructure. Latin American producers have a substantial handicap versus the developed countries because of the lack of appropriate infrastructure, mainly transportation systems.

- Logistics. Some of the Latin American producers originally located their plants in distanced regions so they could serve as regional development centers. The criteria used for selecting these locations was mostly political rather than economical. These producers now face the handicap of being located far from urban centers and having to deal with complex logistics and distribution issues.

- Macroeconomic environment. The instability of the macroeconomic environment in each of the Latin American countries has had an impact on industries such as steel over time. This handicap comes from conditions such as regulations and tariffs on the flow of goods and capital, and high levels of inflation.

In summary, the difference in productivity between Latin America and the developed countries can be explained mostly by the lack of incentives the Latin American producers had over time to increase their efficiency. The structural and external factors predominant in the region over the last decades allowed these producers to survive with very low levels of productivity. However, this environment has been changing and will continue to change towards the future. Today, producers no longer have the advantages they used to enjoy in the past and are continually being challenged by international competition. Productivity and competitiveness have now become a necessity for survival.

OUTLOOK

The world steel environment continues to adapt to the major restructuring efforts that were initiated in the mid-1970s and which should continue into the next decade. In recent years, the reforms in Latin America, the expansion of Asia, and the incorporation of the former USSR and Eastern European countries into the world economy, have reinforced the challenges faced by the industry worldwide. Steel making is now more global than ever before, and the standards for cost and quality are being set by the world class producers.

Latin American steel producers are well positioned for the years ahead. The opening of protected economies has created the need for changes in corporate structures, and producers are beginning to react accordingly. The ability with which these companies are able to change will be the determining factor of their success.

Demand is expected to grow throughout the region (Exhibit 37) at levels that will exceed GDP growth. This growth will be derived from the investment needs in infrastructure required by increased trade, housing needs, and domestic consumption. Consumption per capita in the region is estimated to reach 103 kilograms by the year 2000, an increase of 4.5 percent from 1992 levels. This consumption is still 7 kilograms below the maximum historical level of the year 1980, and less than one-third the current North American consumption.

This additional demand will be met in different ways depending on the country. Given the current relation between imports and exports for the Latin American countries (Exhibit 38), we believe Brazil will meet its internal demand by decreasing its export levels, while producers in the other countries will be forced to specialize in those products in which they can compete and import the rest. This, in fact, has already been occurring in Argentina and Mexico over the last few years (Exhibit 39). Argentinean exports today are mostly derived from seamless tubes, and it has become a net importer of semifinished products. Mexico, on the other hand, has substantially increased its exports of semifinished products while becoming an important importer of higher value-added products.

Overall, trade will play an increasingly important role in the Latin American steel market. In the last few years it has increased substantially (Exhibit 40), a trend which can be expected to continue because of the many economic integration initiatives currently being discussed. Among the most important trade initiatives are NAFTA (North American Free Trade Agreement involving the U.S., Canada and Mexico), the Andean Pact (Colombia, Venezuela, Peru, Ecuador and Bolivia), the Group of Three (Mexico, Colombia and Venezuela), and Mercosur (Brazil, Argentina, Paraguay and Uruguay). In addition, most of the Latin American countries have initiated bilateral and multilateral discussions on further trade agreements with each other and with the U.S. and the European Community.

Several trends are clear in Latin America's steel industry. Domestic market prices have converged towards international prices plus transport costs. As long as the gradual reduction in tariffs continues, we expect the asymmetries in prices still existing in the countries to dissipate. Pricing will then reflect the competitive international markets for steel instead the highly distorted national markets.

How producer input costs evolve in Latin America in the coming years will, to a great extent, influence the steel industry's competitiveness. Today, as has been pointed out, Brazil and Venezuela show substantial cost advantages compared to advanced industrialized countries. In Brazil, this is because of low labor and iron ore costs. In Venezuela, it is due to low energy costs as well. The extent to which these low costs are due to government subsidization remains unclear. Since producers providing the inputs will likely themselves undergo privatization in the near future, it will be important to see whether input factor prices rise.

Labor costs, on the other hand, can be expected to remain low compared with developed nations. The intensity of the economic restructuring process continues to contain wages. As productivity increases in the steel producers, labor as a percentage of revenue will decrease and the companies will increase their competitiveness (Exhibit 41).

While it is difficult to predict how these variables will interact, a few factors are clear. Latin American producers will continue to face stiff competition from international competitors. Trade will play a much greater role and lead to regional specialization in the type of steel products produced. Demand for steel will remain stable in the advanced industrialized countries, but will increase in the developing world. Growing demand in Latin America will absorb more and more of the region's exports. Demand in the rest of the developing world (e.g., Africa, South Asia) will likely still be served by local producers (Exhibit 42).

The best option for Latin American producers given the situation described above is to concentrate on efficiently supplying their regional market. Higher price premiums are possible because of the region's natural trade barriers (transportation costs and market logistics) in this industry. They should concentrate on products and markets within Latin America where they are highly competitive or can easily become competitive. Local producers need to understand their markets and concentrate production on a mix of products and services that will cost effectively meet the market needs. In this way, steel producers can maximize their output and maintain an efficient division of production among the several producers. In addition, they need to bring these products to market through the most efficient and appropriate channels.

At the same time, Latin American steel makers need to concentrate efforts on improving global competitiveness. Management efforts should be aimed at cost containment to remain competitive with imports. Companies need to embark in major change programs and radically redesign their culture to fit the new competitive environment.

SUMMARY AND POLICY ISSUES

Our findings on the causes of productivity differences in the steel industry between the Latin American producers and those of the developed world are summarized in Exhibit 43. At the production process level, organization of functions and tasks is the most important explanatory factor, accounting for approximately 25 percentage points of the gap. Reducing the complexity of operations and processes and simplifying the organizational structure appear to be the most relevant changes to be implemented. Through minor investments in de-bottlenecking and automation, utilization of assets can be improved and increase labor productivity by 20 additional percentage points. These improvements can put labor productivity at approximately 80 percent of the U.S. Neither the actual labor skills, nor the asset base are an impediment to this quantum leap.

In the last few years Latin American producers have been gaining productivity on the U.S. by addressing the main drivers of their productivity differences.

Our findings indicate that Latin American producers can continue to substantially increase their productivity levels. To consolidate this process, however, they need stable domestic environments conducive to growth and investment. Governments need to dictate clear fiscal and monetary policies which will allow companies to invest with confidence. Governments also need to invest in infrastructure and commercial practices to make domestic exports more competitive.

The recent trends in economic liberalization should continue. Governments should culminate the steel privatization process (Venezuela) and monitor the privatized companies to make sure that they carry out their acquired investment commitments. In addition, by continuing the privatization of the rail and harbor systems, governments can considerably contribute to the reduction of some of the greatest cost handicaps that Latin American companies face, e.g., the high costs of logistics.

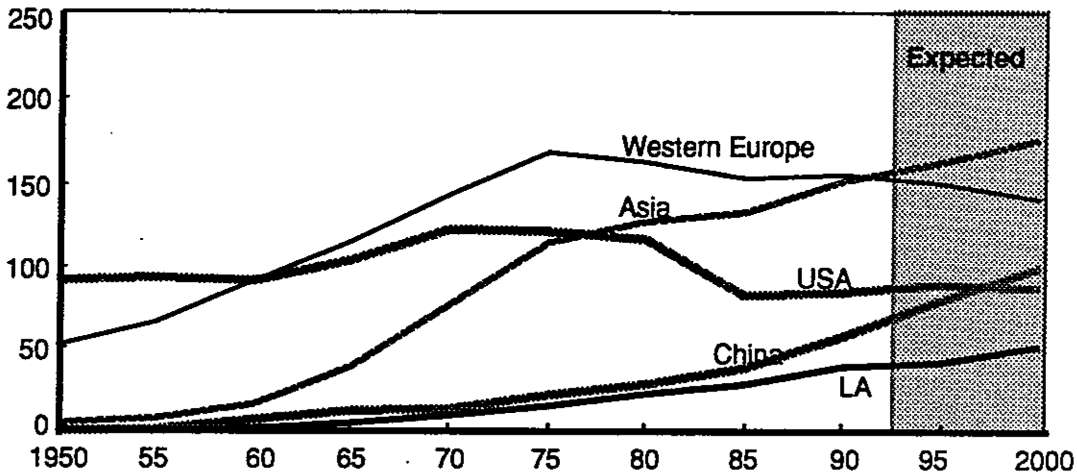
The level of competition needs to be maintained in order to prevent the shift from national, state-owned monopolies to regional, private oligopolies. In addition, labor markets need to be more flexible to allow companies to make the necessary adjustments in the new competitive environment.

Given the current trends in the Latin American countries, the steel industry in Brazil has the most potential for becoming highly successful and profitable, and it is already moving in that direction. The industry in Venezuela, despite its potential, has avoided aggressive restructuring and, given the current trends in the country, it is doubtful that any major changes will take place in the near future. The Argentinean, Mexican, and Colombian industries need to understand the implications of their cost position and seek downstream markets through forward integration or through targeted marketing and sales operations. Their success depends greatly on how aggressively their management will react to the threats and opportunities brought about by the new environment.

Exhibit 1

EVOLUTION OF WORLD CRUDE STEEL PRODUCTION

Million tons



Source: International Iron and Steel Institute; McKinsey analysis

Exhibit 2

EVOLUTION OF LATIN AMERICAN STEEL PRODUCTION AND CONSUMPTION

Million tons of raw steel

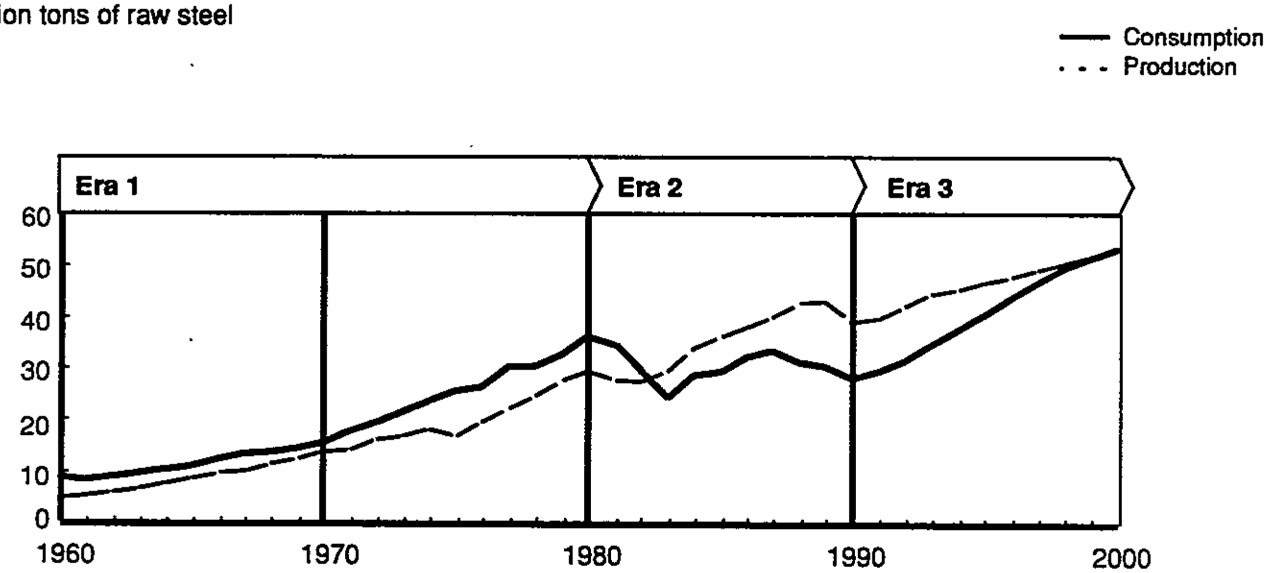
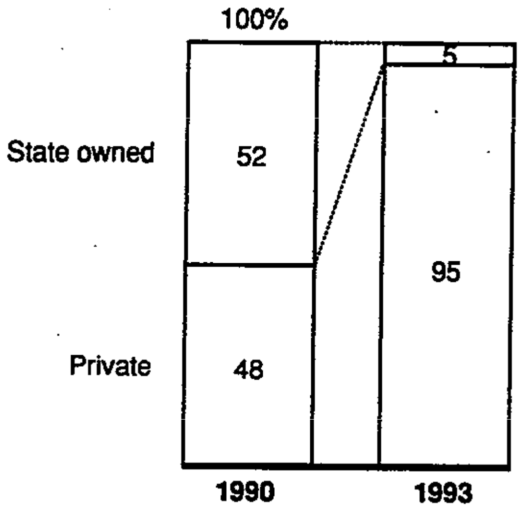


Exhibit 3

OWNERSHIP IN STEEL INDUSTRY IN LATIN AMERICA

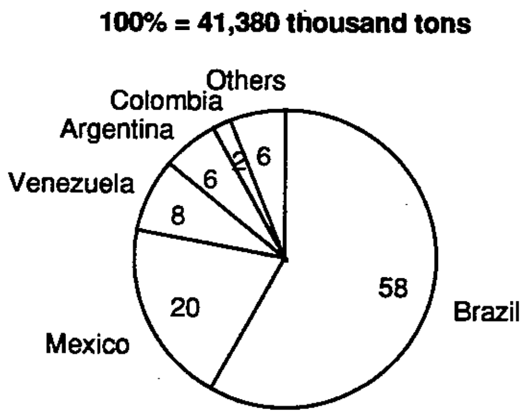
Percent of raw steel production



Source: Trade Press; ILAFA; McKinsey analysis

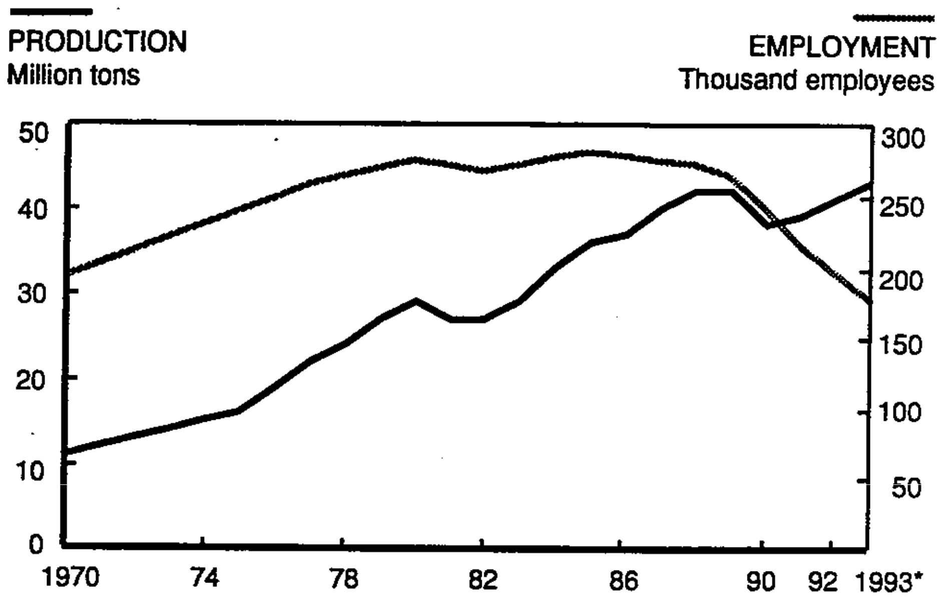
Exhibit 4

LATIN AMERICAN CRUDE STEEL PRODUCTION IN 1992



Source: ILAFA; McKinsey analysis

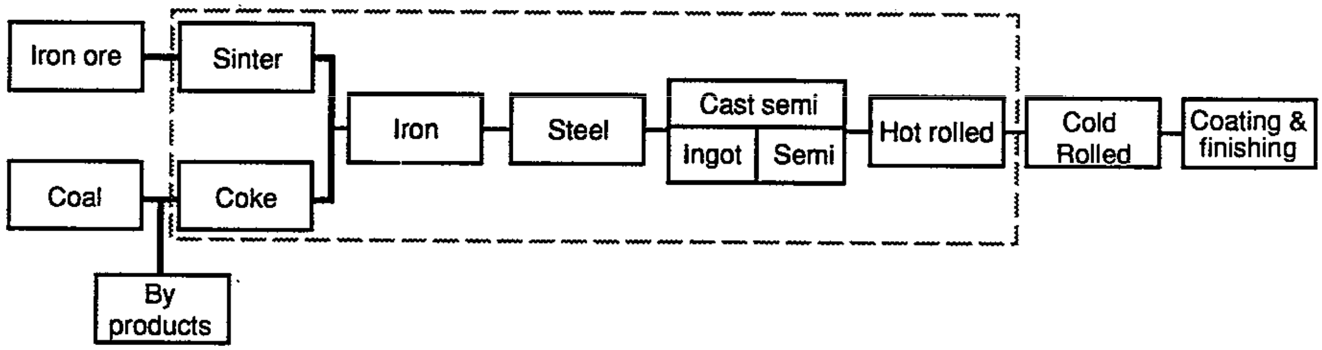
Exhibit 5
EVOLUTION OF LATIN AMERICAN RAW STEELPRODUCTION AND EMPLOYMENT



* Estimated
Source: IISI, ILAFA; McKinsey analysis

Exhibit 6
RUDIMENTARY STEEL-MAKING PROCESS FLOW

Integrated bar process: 6-7 steps



Minimill bar process: 3 steps

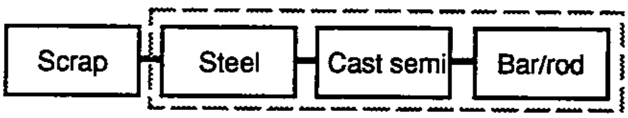


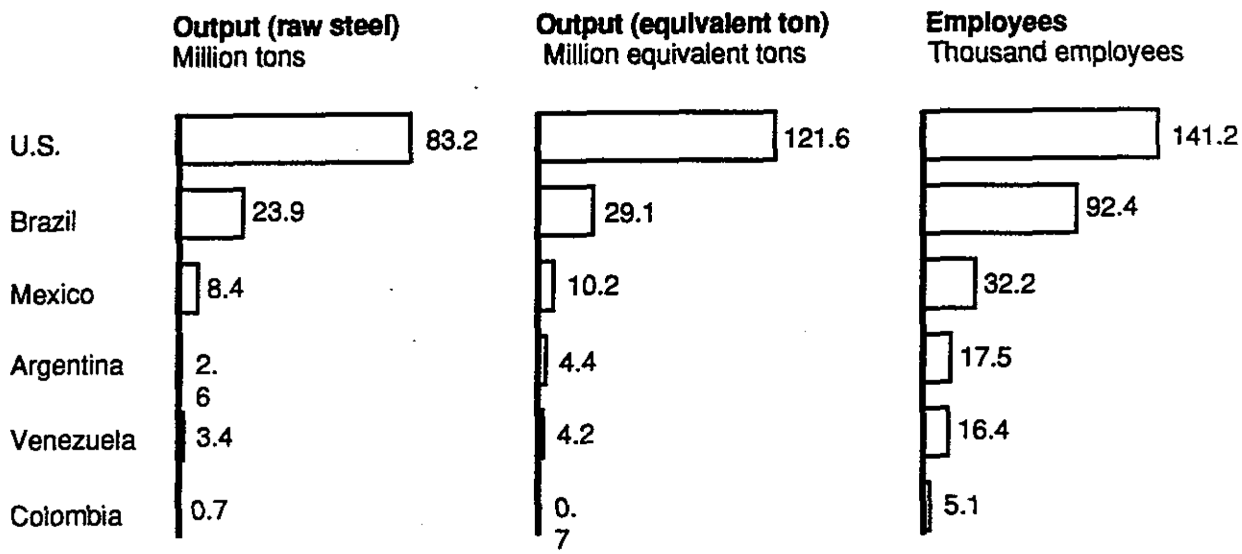
Exhibit 7

MAIN TYPES OF PLAYERS

	Integrated mills	Minimills
Raw materials	Iron ore, coke	Scrap
Production/ capacity	2 to 10 million tons	100,000 to 1 million tons
Technology/ equipment	Complex production flow (blast fumace → BOF → ingot/ continuous casting, hot rolling → cold rolling/finishing)	Single production line (EAF → continuous casting → hot rolling)
Product range	Wide variety in flat and long products including higher value added products	Limited product mix in commodity long products (wide rods, bars, section, normally in common and lower quality steel grades); now penetrating flat-products in U.S.
Markets	Domestic and global markets	Mainly domestic and local markets
Investment level	Requires high investments (2-3 times per unit of capacity more than minimills)	Medium investments to install and maintain
Philosophy	Relatively risk adverse and hierarchical due to complexity and asset-intensity of process; typically inward focused	Entrepreneurial, nonhierarchical and typically market-focused

Exhibit 8

DATA USED IN CALCULATING LABOR PRODUCTIVITY 1992

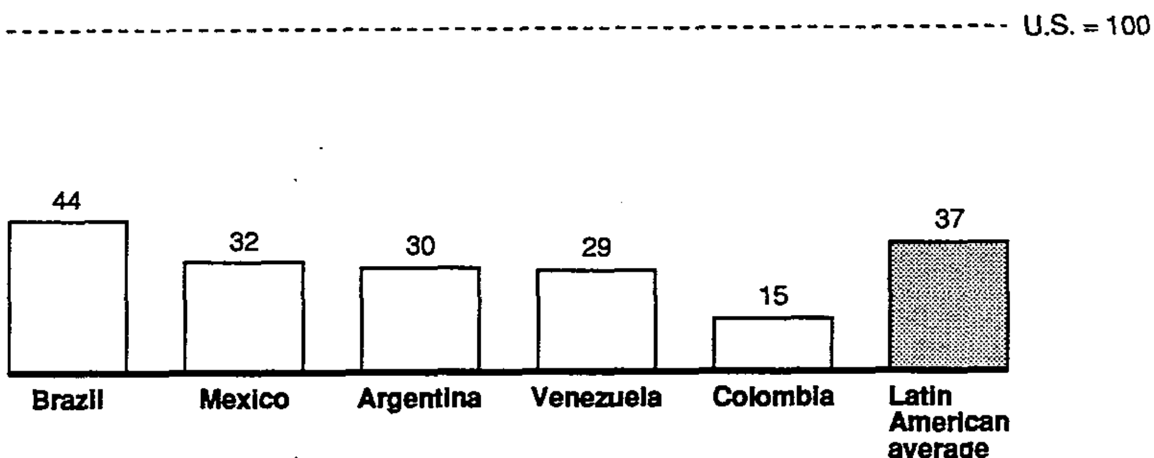


Source: IISI; ILAFA; CIS; IBS; IVES; CANACERO; FEDEMETAL; McKinsey analysis

Exhibit 9

LABOR PRODUCTIVITY RESULTS 1992

Equivalent output per hour worked



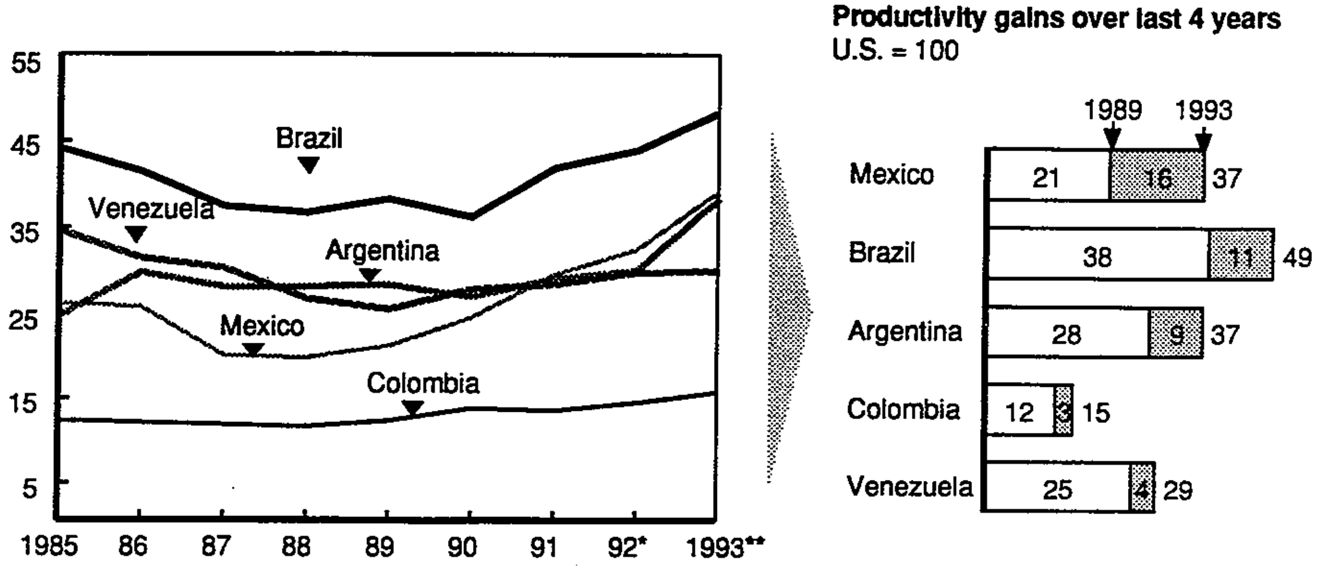
* Weighted average

Source: IISI, ILAFA, CIS, IBS, IVES, CANACERO, FEDEMETAL; McKinsey analysis

Exhibit 10

EVOLUTION OF LABOR PRODUCTIVITY IN THE LATIN AMERICAN STEEL INDUSTRY

Index: U.S. = 100



* Preliminary

** Estimated

Note: Between 1989 and 1993 the U.S. steel industry increased its own labor productivity level by 27%

Source: IISI; ILAFA; CIS; IBS; IVES; CANACERO; FEDEMETAL; McKinsey analysis

Exhibit 11

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES FOR LATIN AMERICAN COUNTRIES 1992

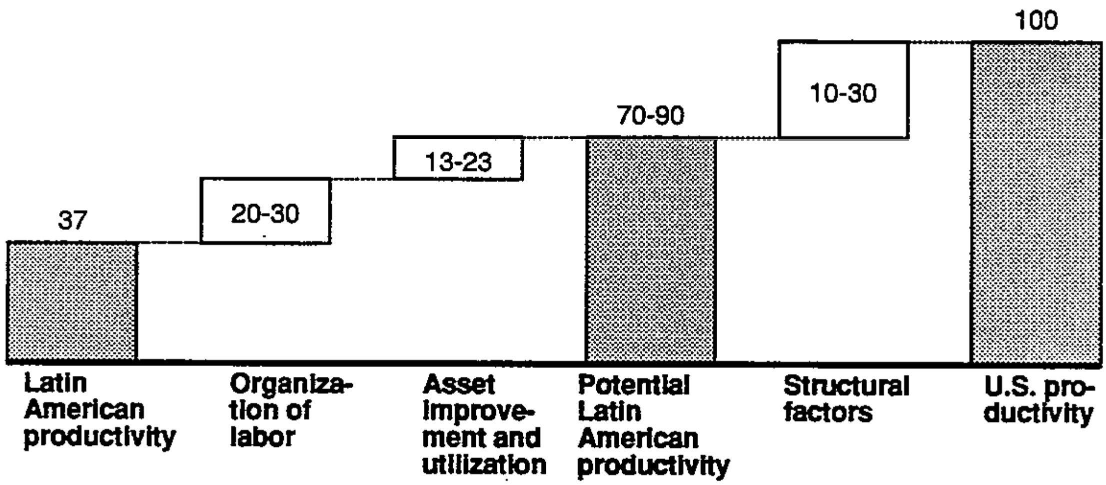
STEEL INDUSTRY

External factors	Nature of competition	Production process	Labor productivity
All countries: • High levels of protectionism • State ownership (except Colombia)	All countries: • High concentration of domestic players • No pressure for improvement from the fragmented demand	All countries: • Organization of labor: High overemployment and high potential for organizational improvement • Asset base: Acceptable asset base but need investments in operation improvements • Structural factors: - Argentina: scale - Brazil: high percentage integrated, low-factor costs - Colombia: scale, low labor costs - Mexico: low labor costs - Venezuela: low-factor costs, high percentage of ore-base minimills	U.S.= 100 Brazil: 44 Mexico: 32 Argentina: 30 Venezuela: 29 Colombia: 15

Exhibit 12

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES AT THE PRODUCTION PROCESS LEVEL1992

Equivalent output per hour worked

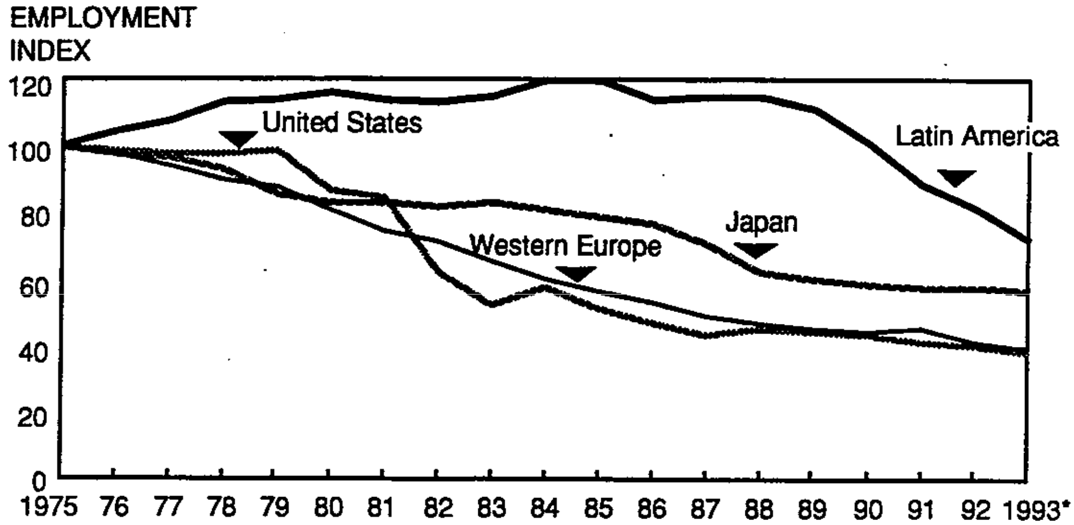


Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 13

EVOLUTION OF EMPLOYMENT IN STEEL INDUSTRY

Index: Country employment, 1975 = 100



* Estimated

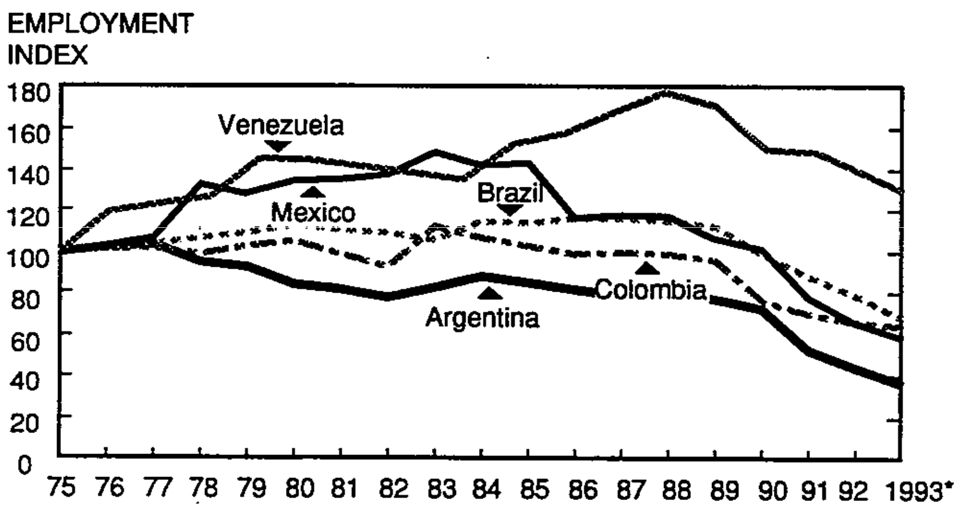
Source: IISI; ILAFA; McKinsey analysis

Exhibit 14

EVOLUTION OF EMPLOYMENT IN THE STEEL INDUSTRY

LATIN AMERICA

Index: Country employment, 1975 = 100



* Estimated

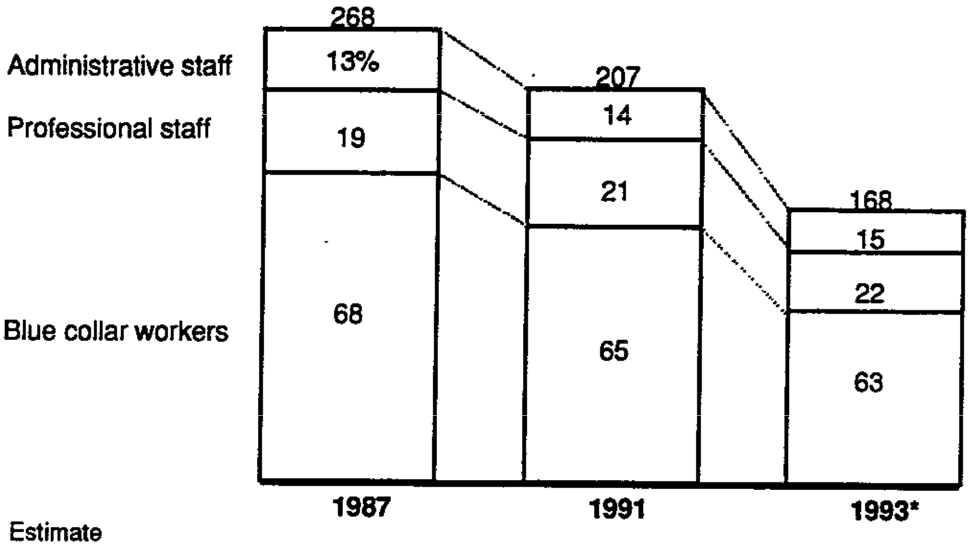
Source: IISI, ILAFA; McKinsey analysis

DC 062494 ZXO-550.4

Exhibit 15

PERSONNEL REDUCTIONS IN THE LATIN AMERICAN STEEL INDUSTRY

Thousand employees



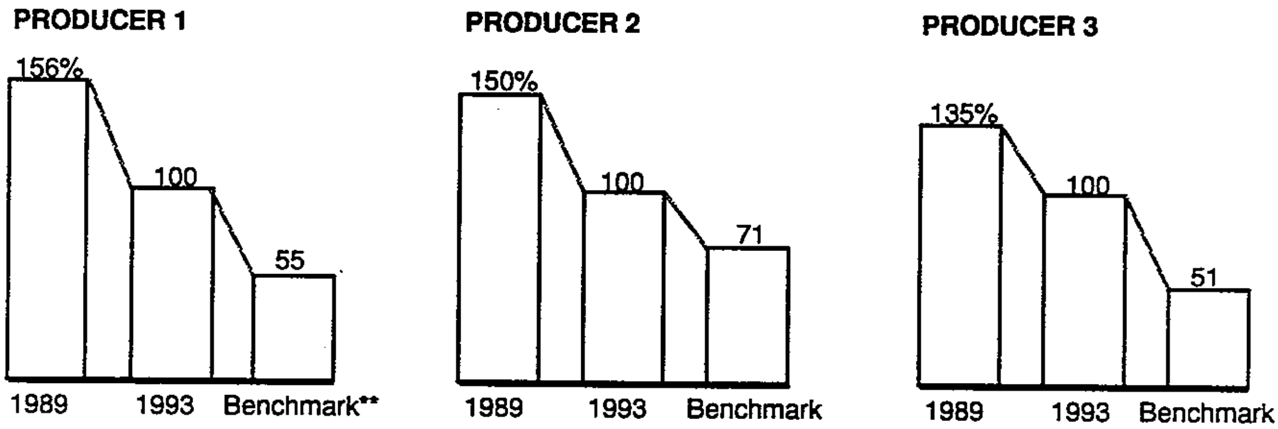
* Estimate

Source: ILAFA; McKinsey analysis

Exhibit 16

OVEREMPLOYMENT IN SOME LATIN AMERICAN STEEL PRODUCERS*

1993 employment = 100%



* Output remains constant or increases for producers during period analyzed

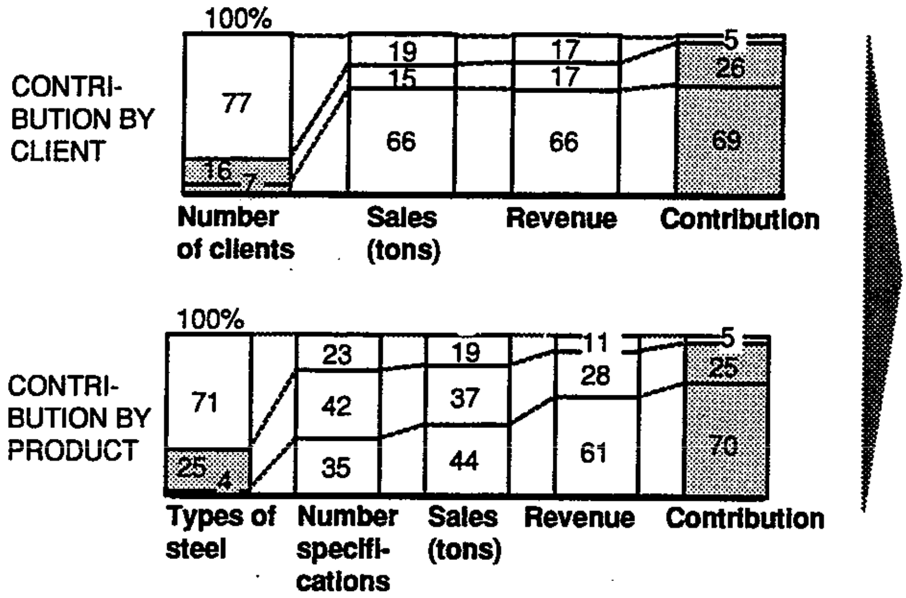
** Benchmarks were determined based on comparable processes and technologies, adjusting for structural factors

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 17

COMPLEXITY IN OPERATIONS FOR A LATIN AMERICAN STEEL PRODUCER

Percent



Complexity in steel operations brings about hidden costs and inefficiencies

- Inventory space is suboptimized
- Setup times take up capacity
- High yield losses and lack of continuity
- Additional administrative resources to manage small batches
- Sales and marketing efforts are not targeted

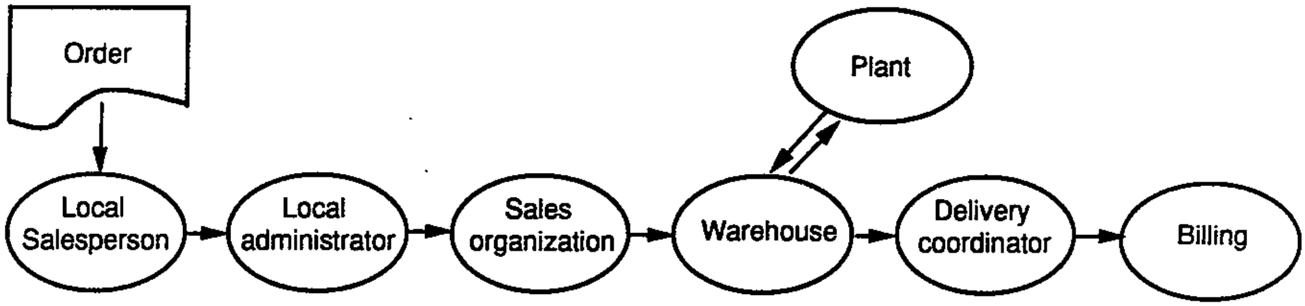
Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 18

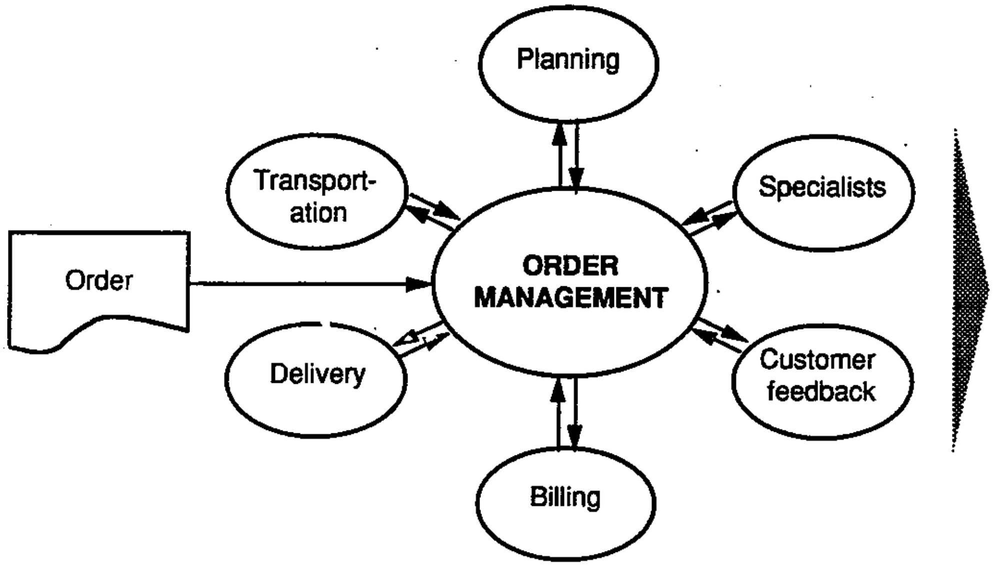
CORE PROCESS REDESIGN IN THE STEEL INDUSTRY

ILLUSTRATIVE

ORIGINAL ORDER TAKING PROCESS



REDESIGNED ORDER TAKING PROCESS



- One person is accountable for each order and coordinates all shipping issues
- Increased customer feedback through centralized channels
- 50% cost reduction on activity

Source: McKinsey Steel Practice; McKinsey analysis

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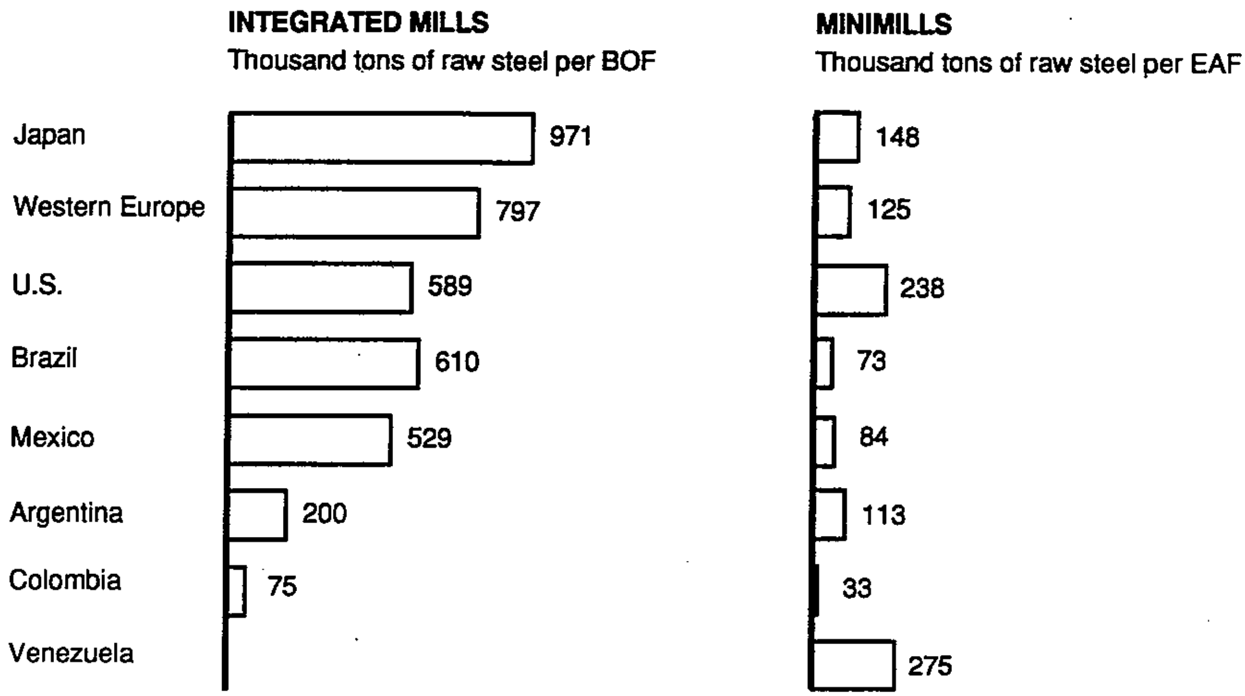
Exhibit 19

SCALE DIFFERENCES IN THE STEEL INDUSTRY

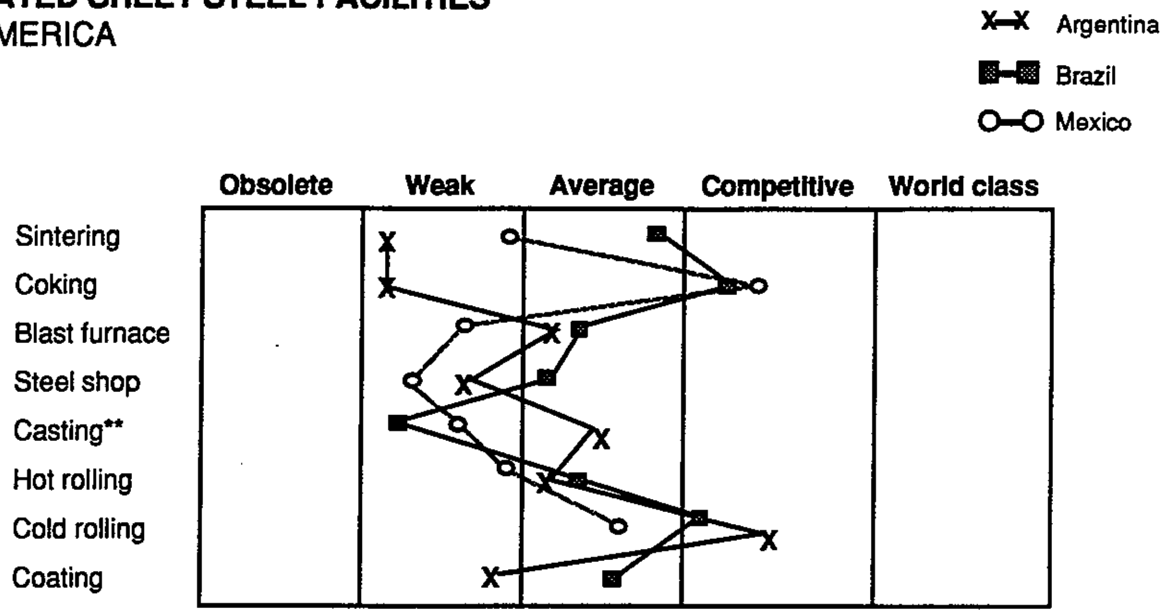


Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 20a

TECHNOLOGICAL RANKING OF INTEGRATED SHEET STEEL FACILITIES*

LATIN AMERICA



* Evaluation of Latin American installations based on year of construction and annual capacity

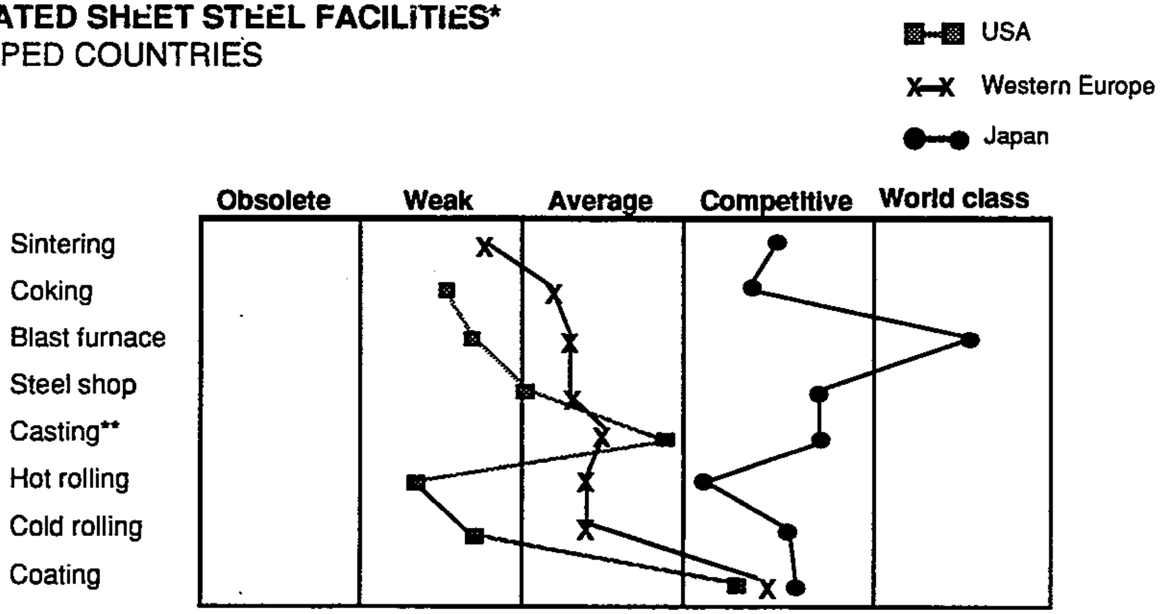
** Continuous casting ratio and quality of casters

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 20b

TECHNOLOGICAL RANKING OF INTEGRATED SHEET STEEL FACILITIES*

DEVELOPED COUNTRIES



* Evaluation of 1200 installations based on year of construction and annual capacity

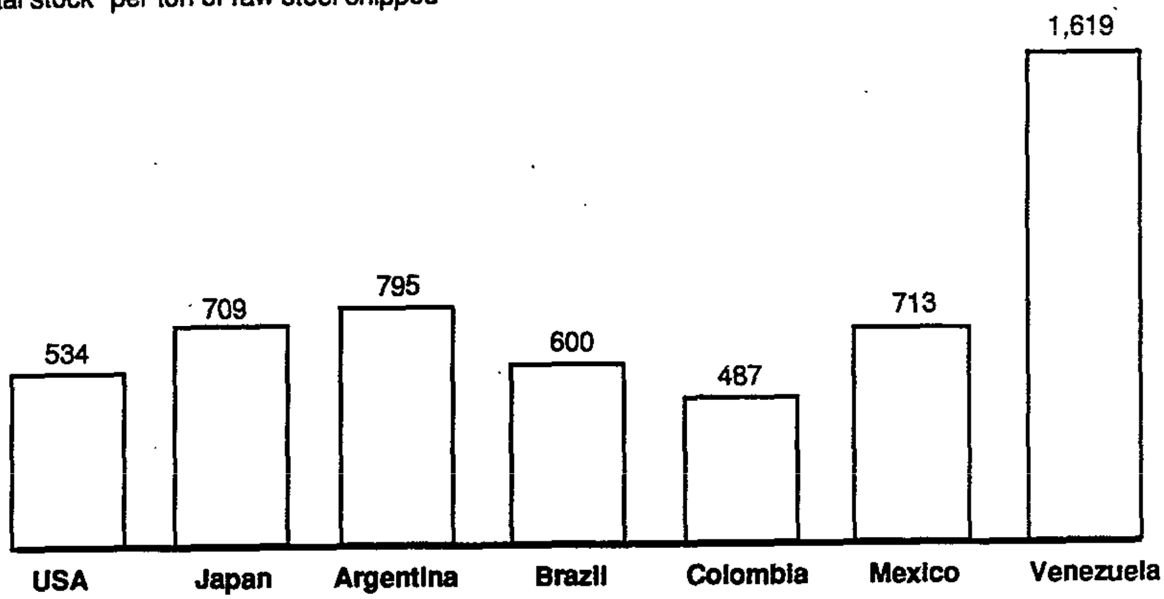
** Continuous casting ratio and quality of casters

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 21

CAPITAL INVESTMENT IN THE STEEL INDUSTRY

Capital stock* per ton of raw steel shipped

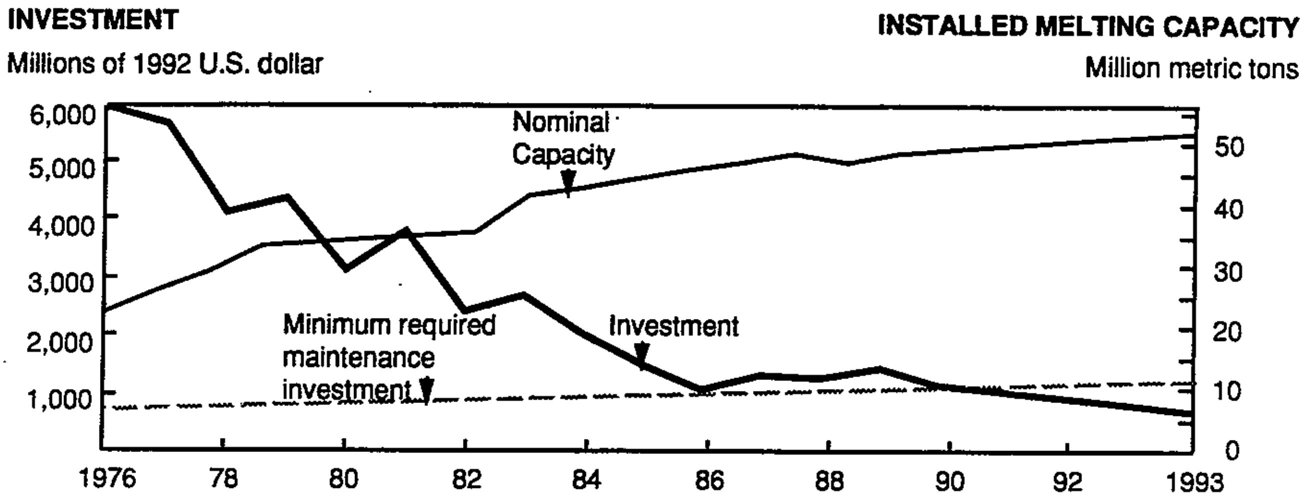


* Stock accumulated from 1976 to 1992 applying depreciation based on a useful life of 35 years Investment numbers are expressed in 1992 dollar; output is taken as the average production for the last 5 years

Source: ILAFA, IISI; McKinsey analysis

Exhibit 22

INVESTMENT REQUIREMENTS FOR THE LATIN AMERICA STEEL INDUSTRY



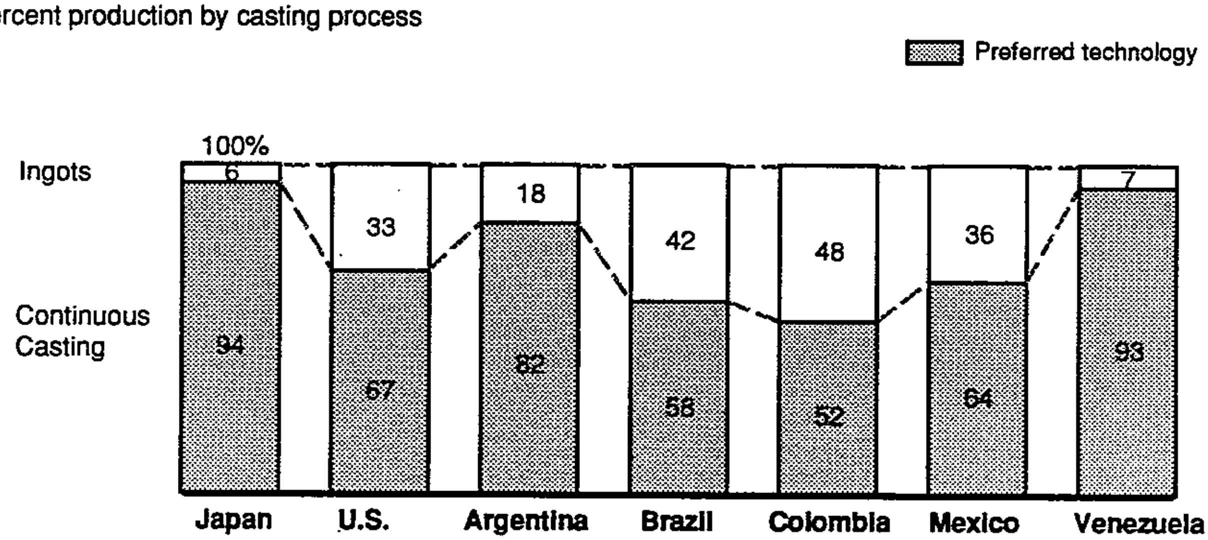
Note: Minimum investment required calculated based on actual production and a requirement of $25/ton for long products and pipes and $40/ton for flat products

Source: ILAFA; IISI; WEFA Group; McKinsey Steel Practice; McKinsey analysis

Exhibit 23

MAJOR INVESTMENTS REQUIRED - CASTING PROCESS

Percent production by casting process



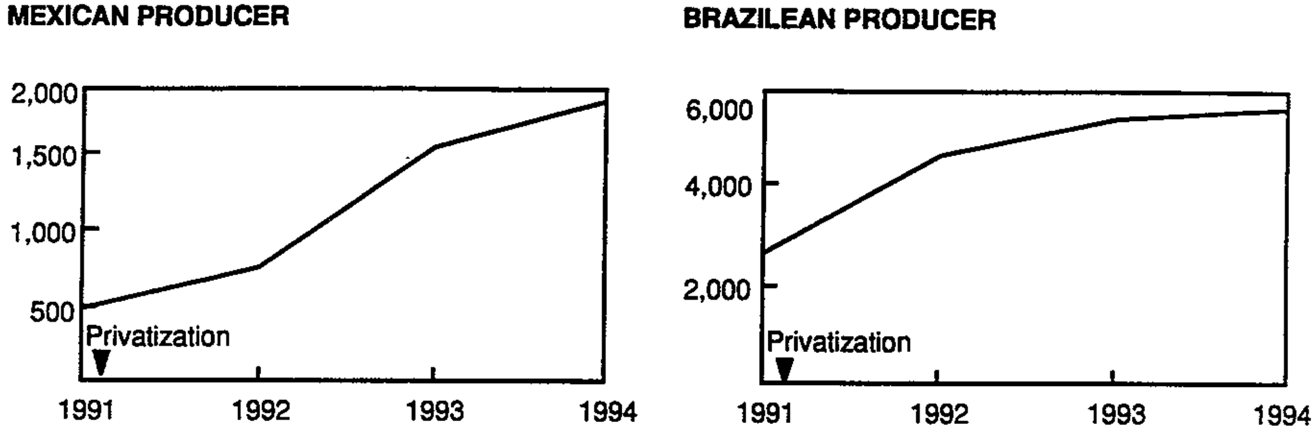
Source: IISI; ILAFA, McKinsey Steel Practice; McKinsey analysis

Exhibit 24

CAPACITY UTILIZATION IMPROVEMENTS IN PLANT EFFICIENCY WITHOUT MAJOR INVESTMENTS

RAW STEEL PRODUCTION

Thousand tons

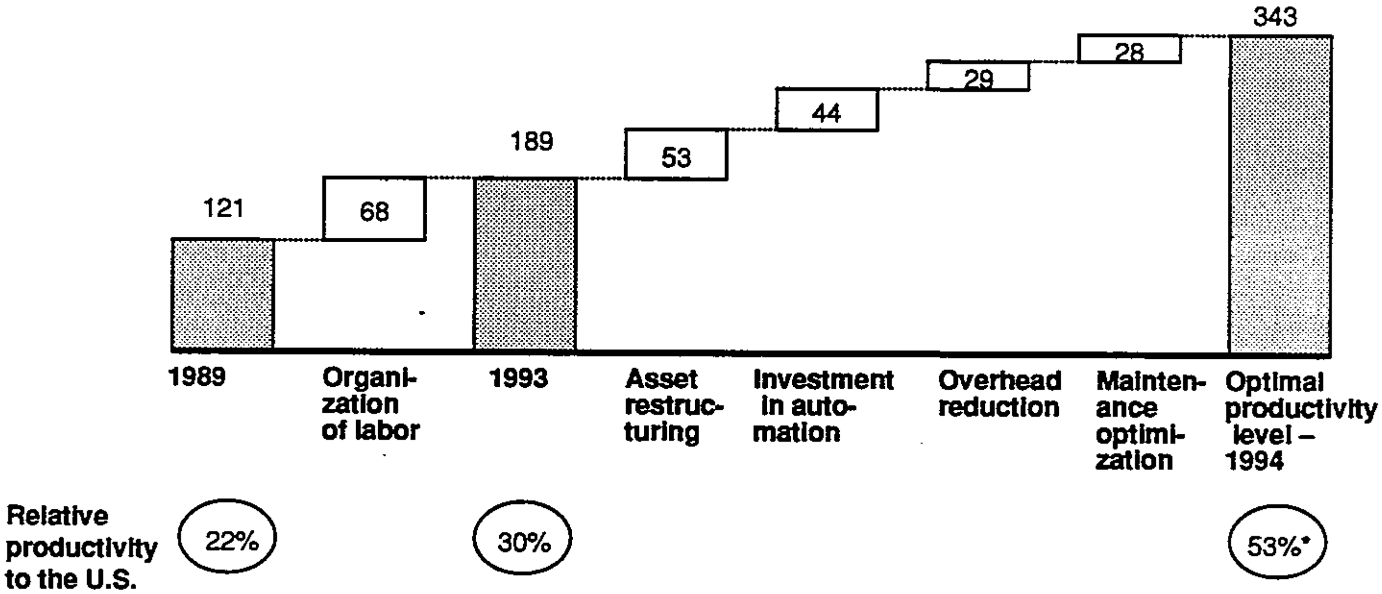


Source: McKinsey Steel Practice

Exhibit 25

POTENTIAL PRODUCTIVITY IMPROVEMENTS FOR A LATIN AMERICAN STEEL PRODUCER

Tons per employee



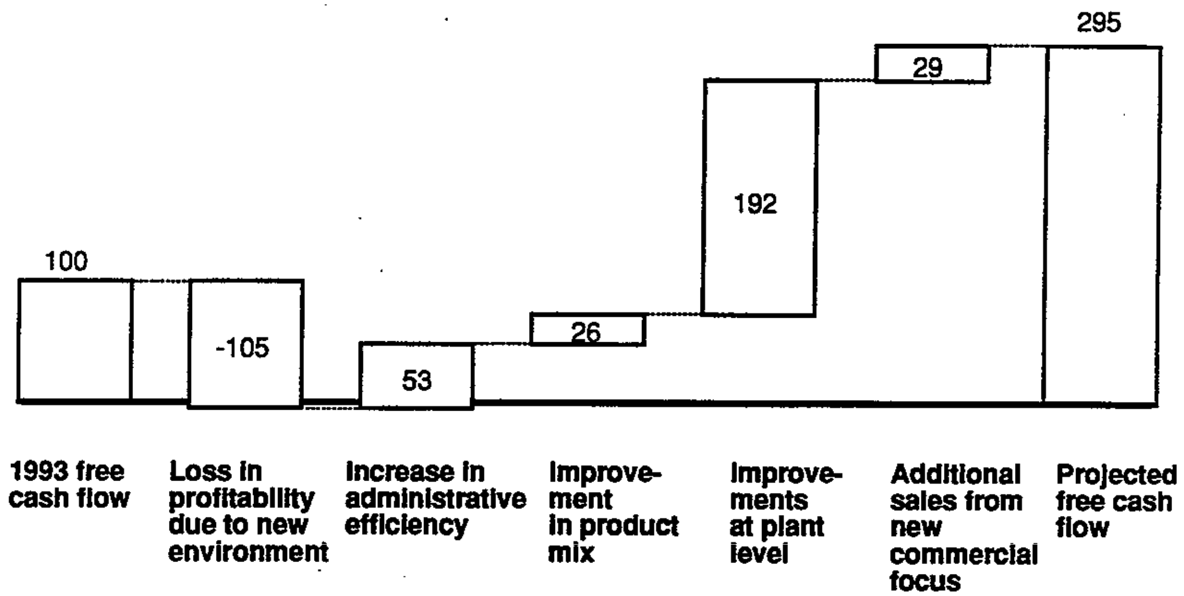
* Assuming the U.S. increases its productivity by 3% in 1994

Source: McKinsey steel practice

Exhibit 26

FINANCIAL IMPACT OF GAINS IN OPERATIONAL EFFICIENCY WITHOUT MAJOR INVESTMENTS

U.S. dollars per year

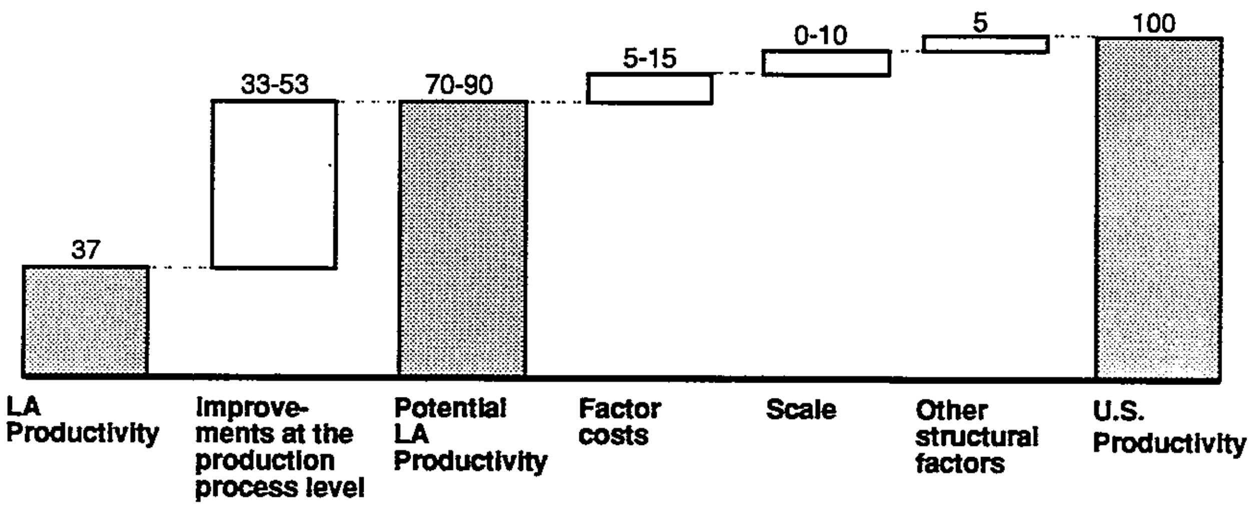


Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 27

EFFECTS OF STRUCTURAL FACTORS ON PRODUCTIVITY

Index: U.S. = 100

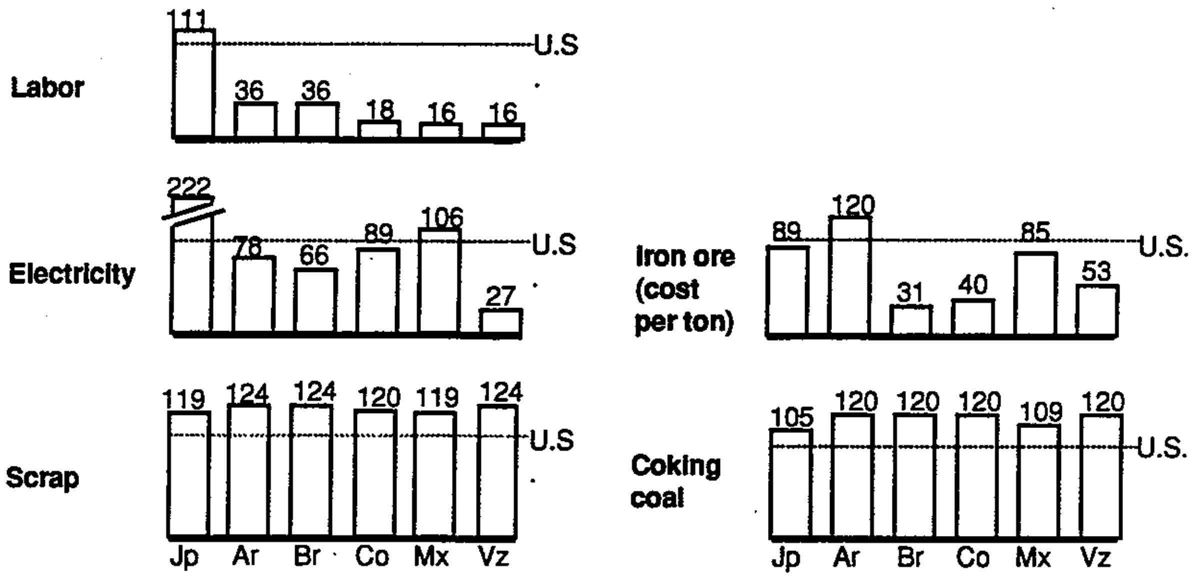


Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 28

RELATIVE FACTOR COST FOR THE STEEL INDUSTRY

Index: U.S. = 100



Source: McKinsey Steel Practice

Exhibit 29

RAW STEEL PRODUCTION BY PROCESS 1992

Percent

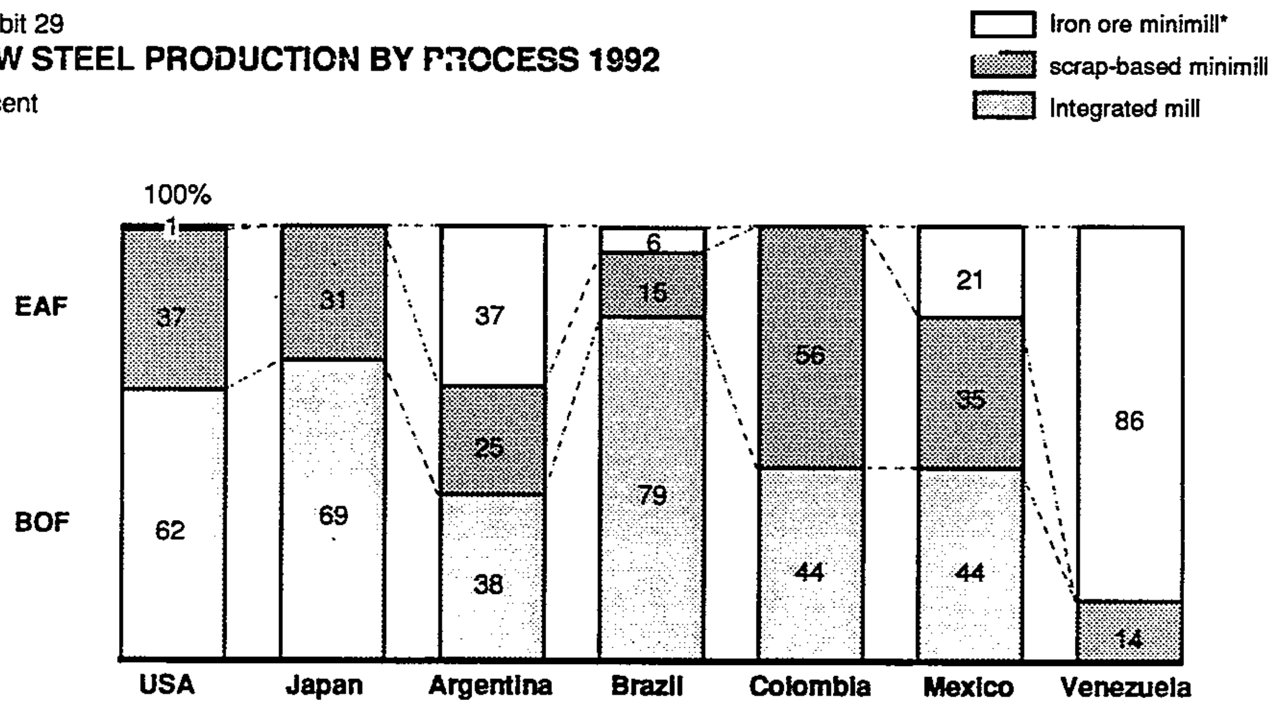
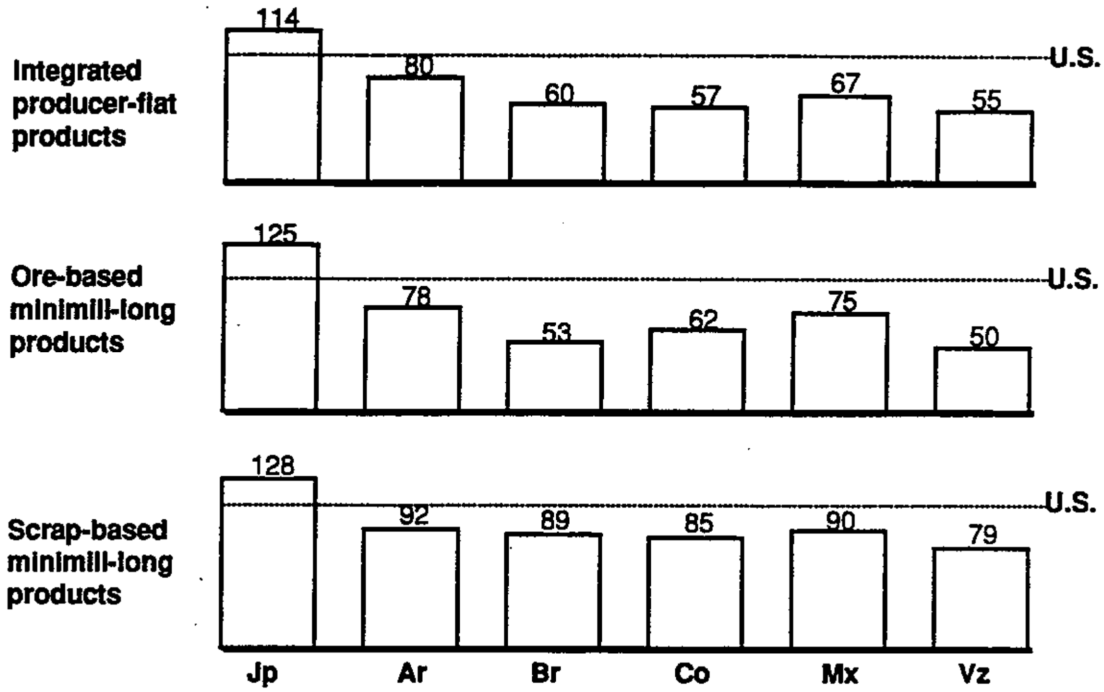


Exhibit 30
RELATIVE COSTS OF USING ALTERNATE TECHNOLOGIES
Factor cost per ton*; Index: U.S. = 100

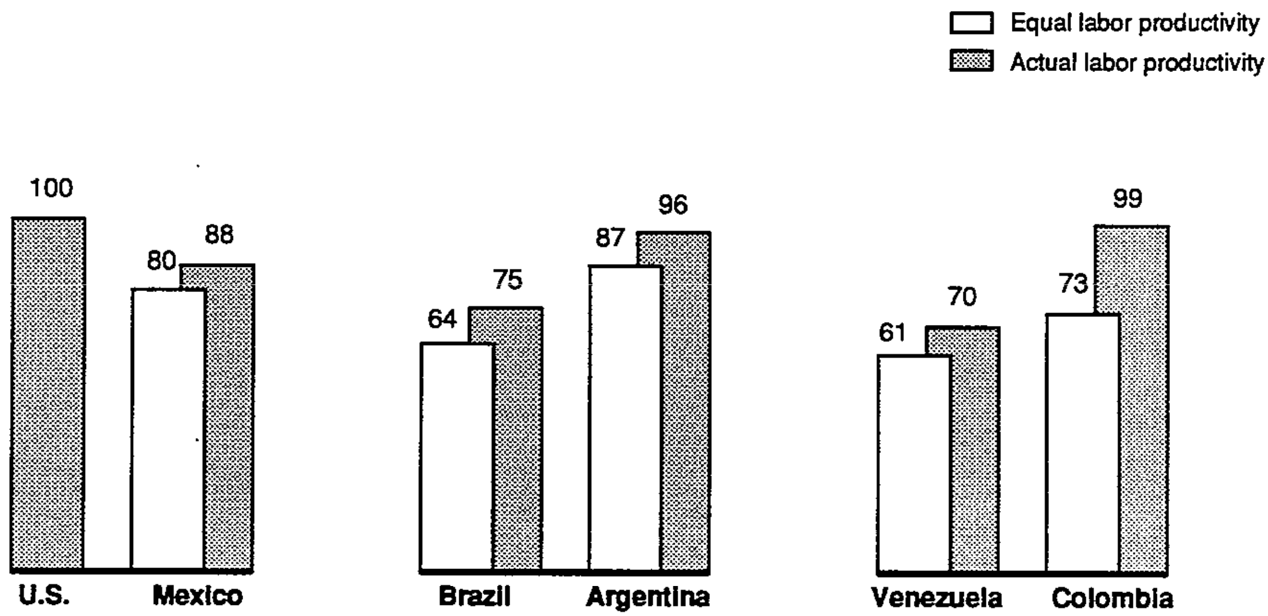


* Each scenario assumes the same technology and the same factor productivity in order to capture the effects of the factor cost differences exclusively

** Weighted by actual technology present in each country

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 31
TOTAL FACTOR COSTS GIVEN CURRENT TECHNOLOGIES*



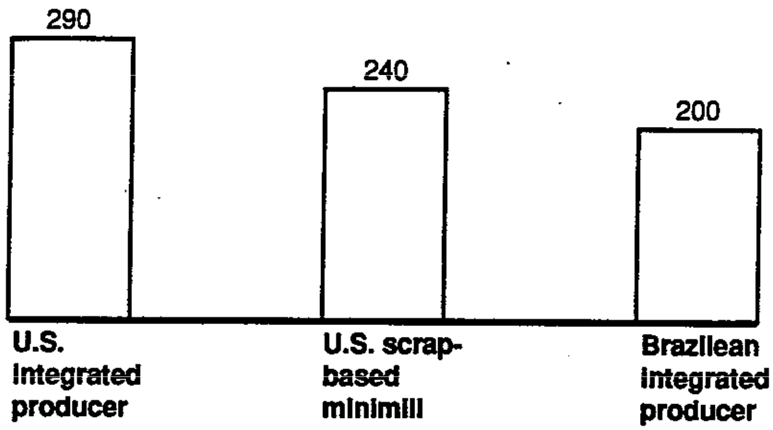
* Weighted by actual technology present in each country

Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 32

FULLY ALLOCATED PRODUCTION COSTS FOR EFFICIENT FLAT PRODUCT PRODUCERS

1993 U.S. dollars/ton

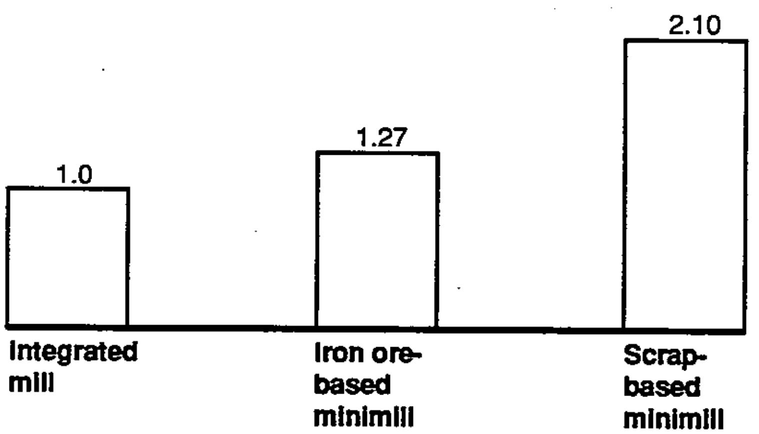


Source: McKinsey Steel Practice; McKinsey analysis

Exhibit 33

PRODUCTIVITY DIFFERENCES BETWEEN TECHNOLOGIES *

Output per hour; Index: Integrated mill = 100



* Assuming efficient producers for each technology

Source: McKinsey Steel Practice; McKinsey analysis

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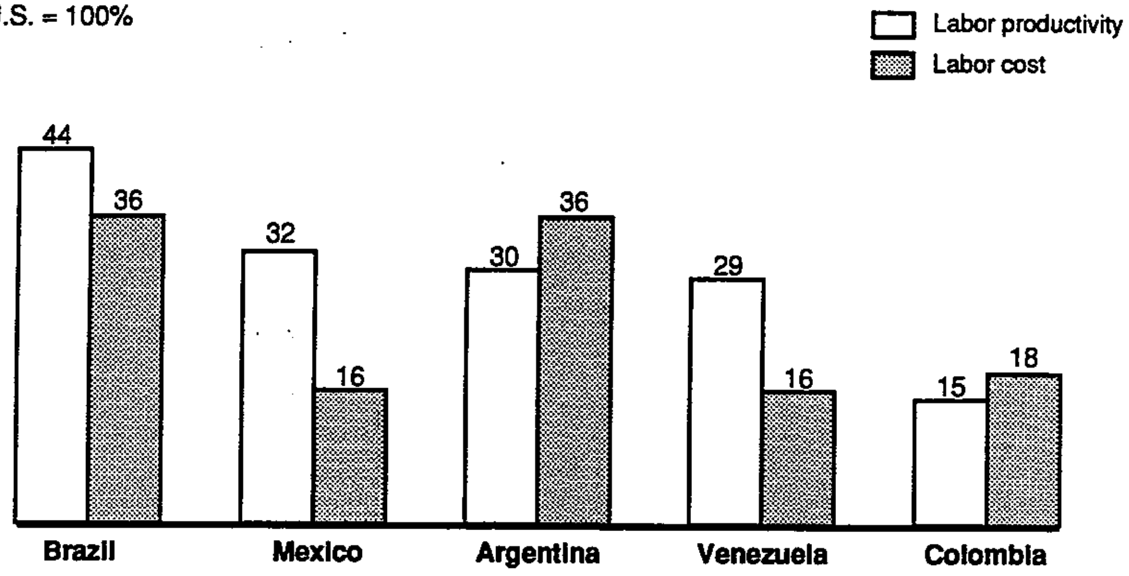
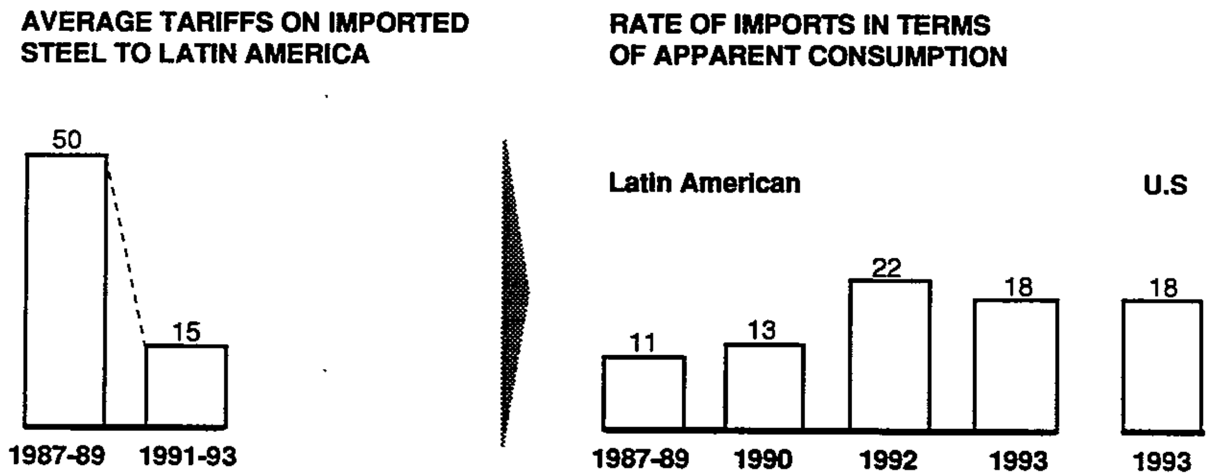
Exhibit 34
LABOR PRODUCTIVITY AND LABOR COST 1992
Index: U.S. = 100%



Source: McKinsey analysis

Exhibit 35
EFFECT OF TARIFFS ON REGIONAL TRADE
Average percent

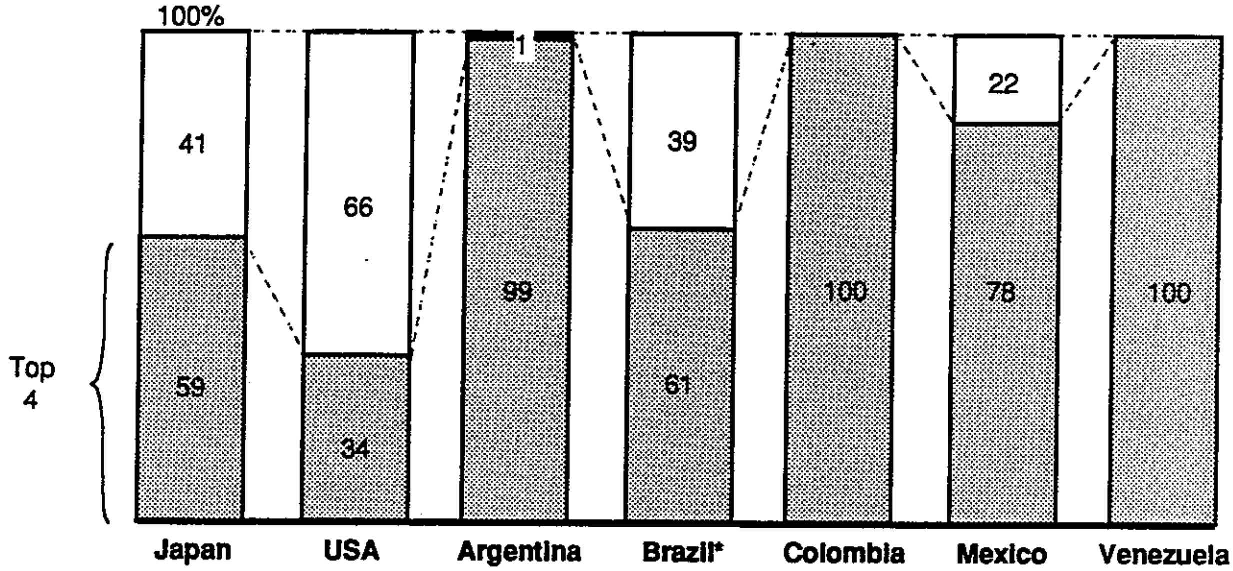


Source: ILAFA; McKinsey Steel Practice; McKinsey analysis

Exhibit 36

MARKET CONCENTRATION IN THE LATIN AMERICAN STEEL INDUSTRY

Percent



* As of 1993, Brazil has a top four concentration of 75% because of merger activity

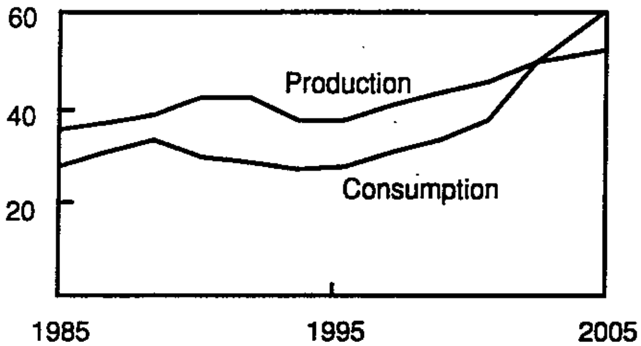
Source: IVES, IBS, CIS, Interviews; McKinsey analysis

Exhibit 37

PERSPECTIVE ON STEEL PRODUCTION AND CONSUMPTION IN LATIN AMERICA

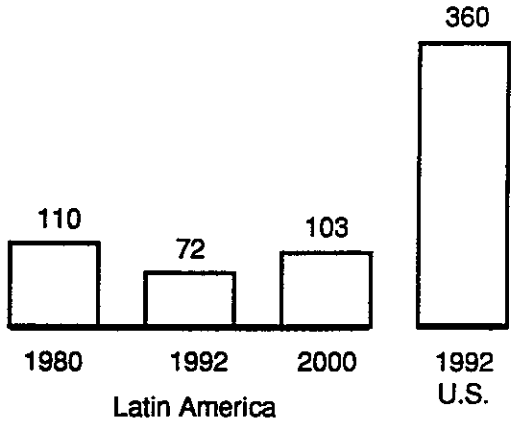
PRODUCTION AND CONSUMPTION OF RAW STEEL

Million tons



CONSUMPTION PER CAPITA

Kgs per capita



Note: Installed capacity installed is assumed to remain at current levels

Source: IBS; ILAFA; McKinsey analysis

Exhibit 38

LATIN AMERICAN STEEL TRADE 1993

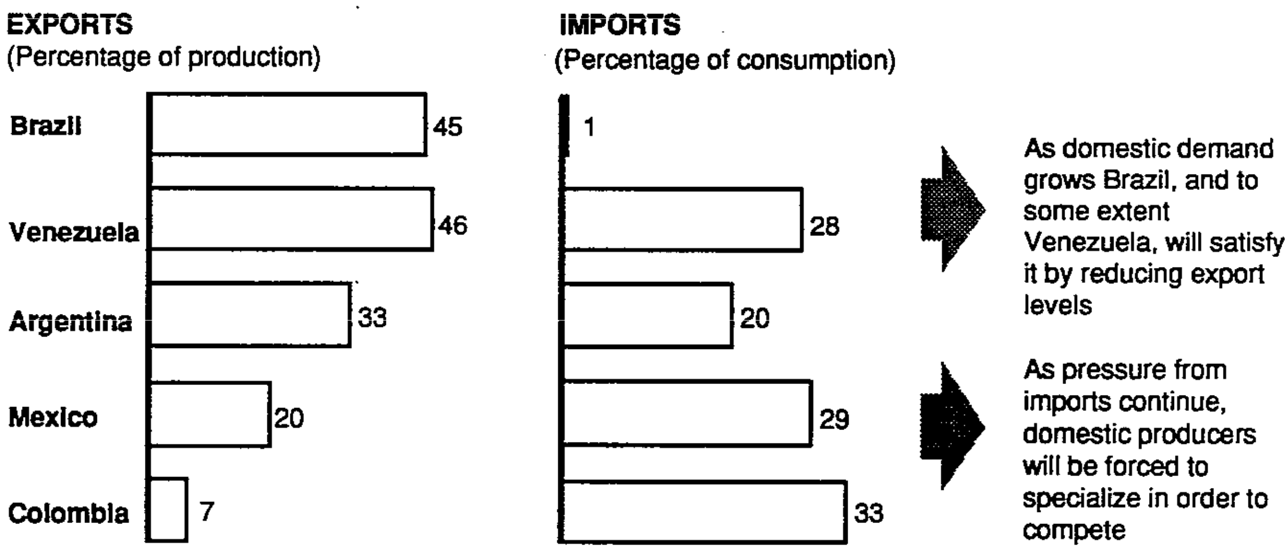
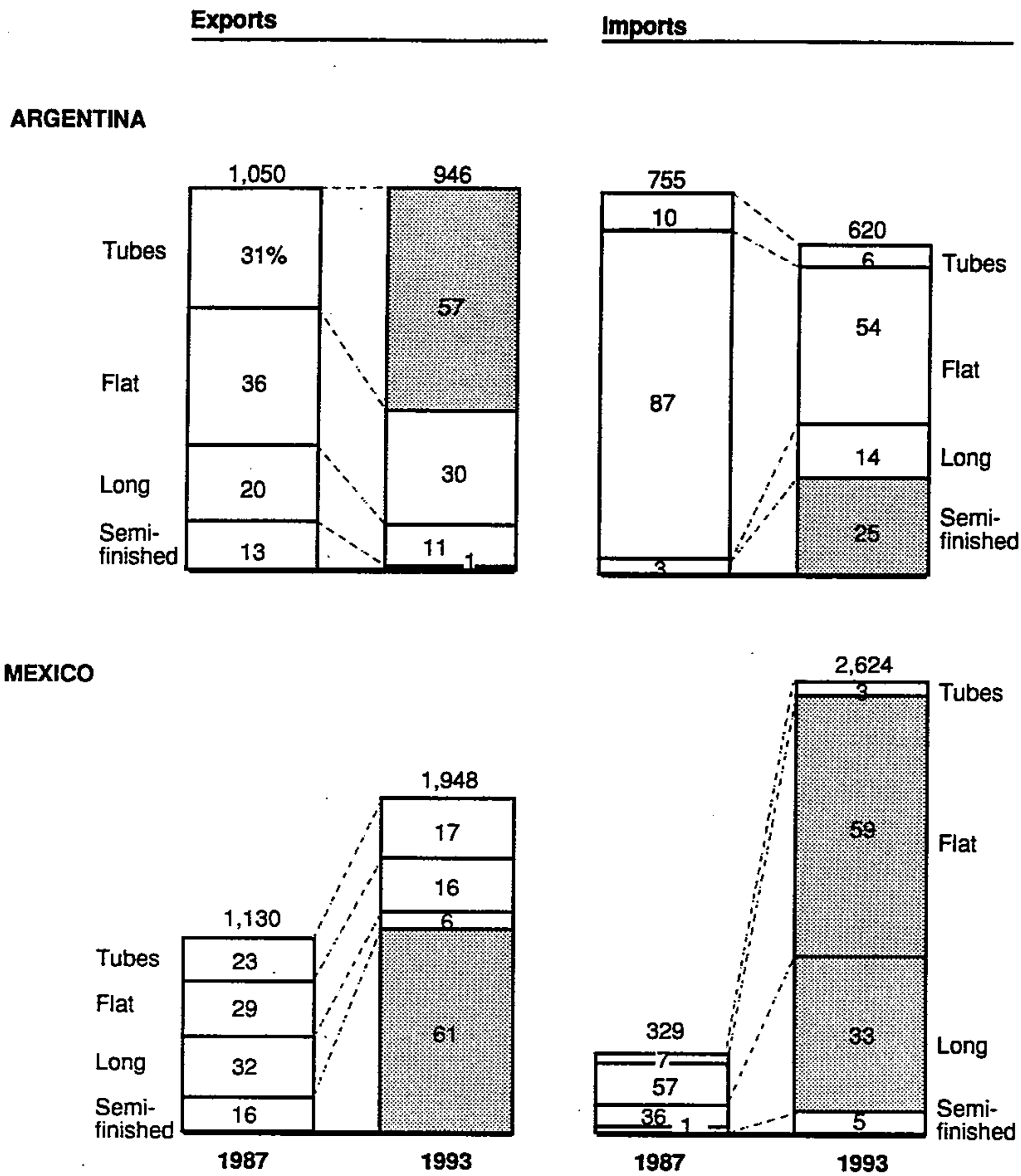


Exhibit 39

IMPORTANT TRENDS IN LATIN AMERICAN STEEL TRADE

Thousand tons of raw steel

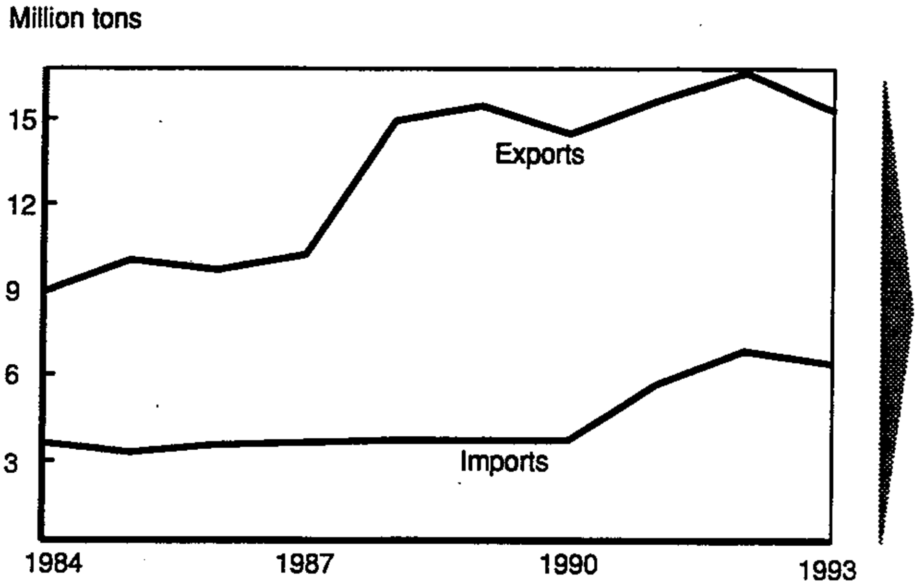


Source: McKinsey Steel Practice

Exhibit 40

STEEL TRADE EVOLUTION IN LATIN AMERICAN

TOTAL TRADE



Major trade initiatives

Global
- GATT
- Multilateral Steel Agreement

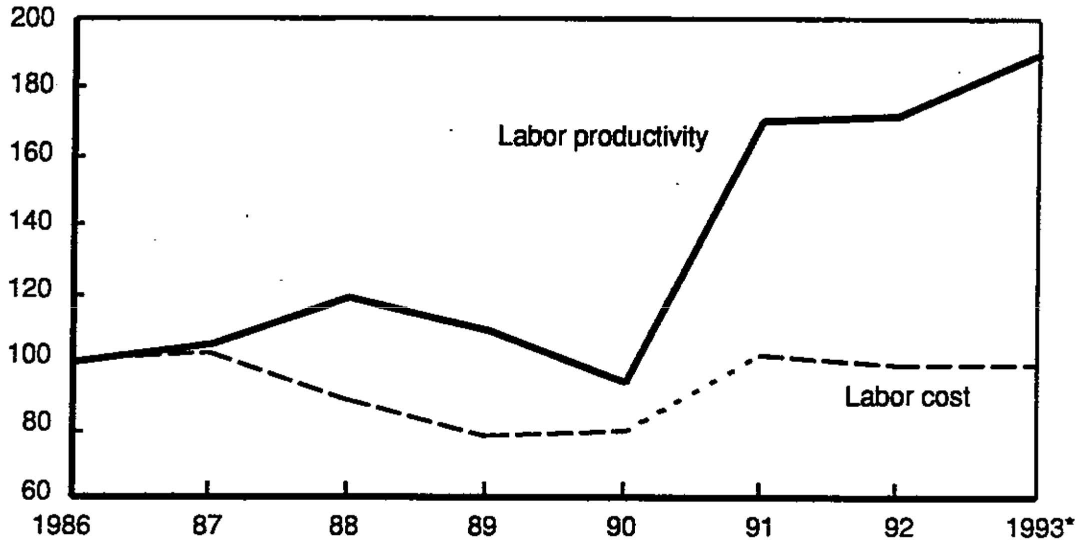
Regional
- NAFTA
- Andean Pact
- Group of Three
- Mercosur

Source: ILAFA

Exhibit 41

LABOR PRODUCTIVITY AND LABOR COST IN A STEEL PRODUCER IN LATIN AMERICA

Index: 1986 = 100



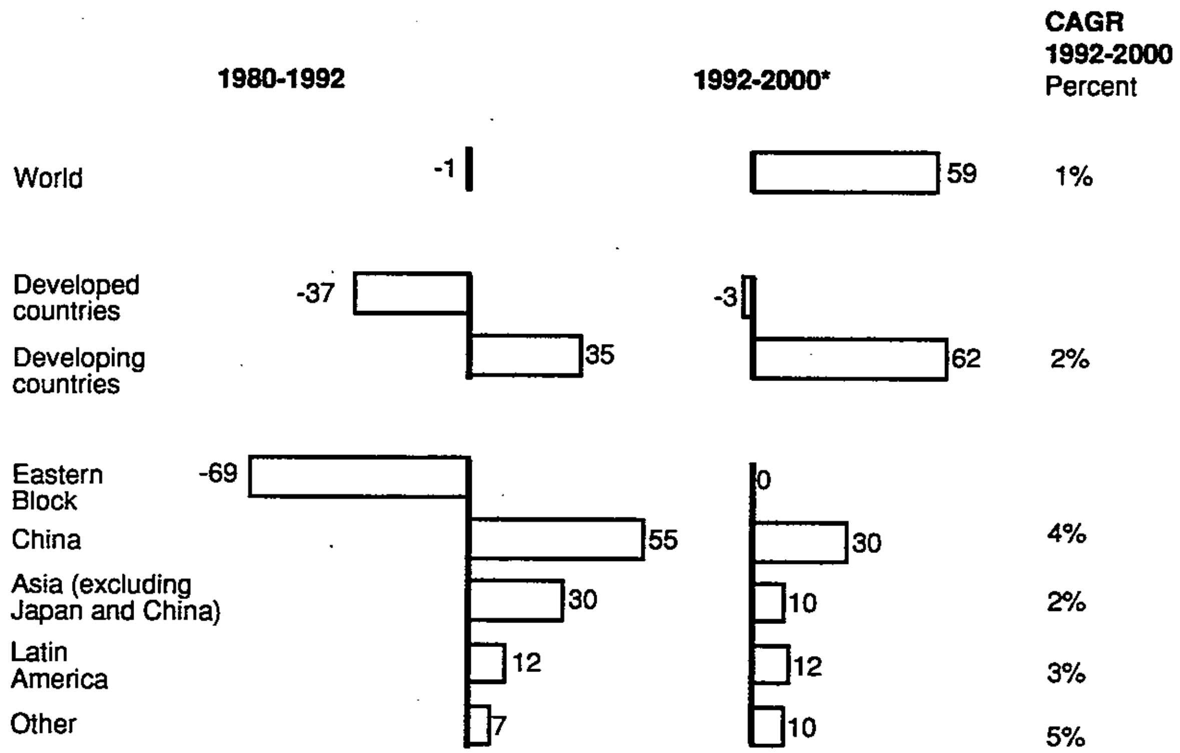
* Estimated

Source: Annual reports

Exhibit 42

CHANGES IN WORLD CRUDE STEEL PRODUCTION

Millions tons



* Forecasted

Source: Annual reports; IISI; McKinsey Steel Practice

Exhibit 43

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES

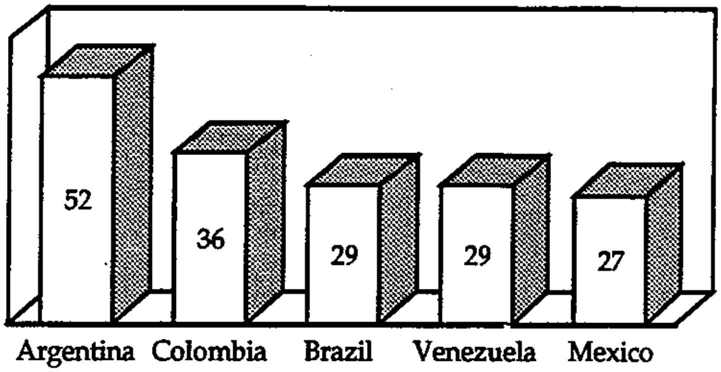
STEEL INDUSTRY

● Important
○ Secondary
X Undifferentiating

External factors	
• Market conditions	
- Demand factors	X
- Relative input prices/factor availability	●
- Other industries	○
• Policy and regulation	
- Import barriers	●
- Competition and concentration rules	○
- Labor rules and unionism	○
- State ownership	●
- Other (fiscal policy, price controls)	X
Nature of competition	●
Production process	
• Output mix, variety, quality	○
• Production factors	
- Capital (intensity, vintage, technology)	○
- Scale	○
- Labor skills	X
- Organization of functions and tasks	●
LABOR PRODUCTIVITY	

PROCESSED FOOD CASE STUDY SUMMARY

Processed Food Labor Productivity 1991-1992
Monetary output per employee; Index: U.S.=100



Persistence of craft-based techniques used by extremely fragmented industries in response to very low labor cost, expensive capital equipment and weak fiscal and sanitary supervision, has kept labor productivity in this industry in Latin America far below of the U.S. No major improvements are foreseen for the near future.

The differences in productivity are directly attributable to the use of craft versus industrial mode production techniques. The use of mass production and labor-saving technologies in the U.S. is the factor behind this country's high level of productivity, something that is found only among Latin America's largest food processing companies. The proliferation of small, somewhat underground food processing establishments in Latin America utilize extremely low productivity methods.

Strongly contributing to this phenomenon is the high cost of equipment in the region owing to years of high import barriers and prohibited financing costs while labor is much cheaper than the U.S. and well below other industries in the region. This negative incentive to implement more productive techniques has been aggravated in the thousands by tiny "informal" food processors of the region. These very small companies pay below industry average labor costs, since they often avoid paying mandatory benefits, and long-term financing is normally out of their reach.

Without the enforcement of fiscal and sanitary controls by the government upon these small producers, concentration – badly needed in this industry to improve productivity – will not take place. Still changes in some external influences will help somewhat. These include lower import tariffs for food stuffs as well as the growing bargaining power of supermarkets that will increase competitive pressures throughout the entire industry.

Expected continued economic growth will also increase the consumption of processed foods, since a big share of the population still eat non-processed food or less calories than required. It will be the need to produce higher volumes at a constant quality, a phenomenon that already took place in the U.S. that will cause firms to increase automation levels. The growing presence of international food processing firms in Latin America will facilitate this evolution.

PRODUCTIVITY IN THE LATIN AMERICAN PROCESSED FOOD INDUSTRY

The food processing sector is important in every country, but it is particularly relevant for developing countries like the Latin American ones analyzed. Its output represents a bigger share of total consumption and the sector employs relatively more people.

To grasp just how important food is to consumers in Latin America, consider the number of hours a person in the region versus someone in the U.S. has to work in order to earn enough income to purchase the same amount of food. For a worker in the food processing industry, for example, the relationship between processed food prices and compensation levels in Latin America means that the Latin American salary earner must work 3 to 7 times longer than his U.S. counterpart to buy an equivalent amount of food. Processed food is cheaper in Latin America (from 15 to 40 percent) but not enough to offset the huge income difference (from 70 to 80 percent) (Exhibit 1). The Argentinean comes closest to the U.S. worker in the industry, but even he must work nearly three times as long. The Brazilian fares the worst of all, having to spend a full 7 days for every day the U.S. worker does to buy as many goods.

Another method to measure the importance of food to consumers is to look at the weights of processed food in the consumer price index of each country. These weights roughly reflect the significance in individual consumption patterns. The weight of processed food within the entire spectrum of products and services consumed is generally much greater in Latin America than in the U.S. In Brazil, for example, the weight of processed food consumed in the average household is 26 percent of the total income, while in the U.S. it is less than 15 percent of the total.

The proportion of people employed in food processing is also significantly higher in Latin America than in the U.S. or Germany (Exhibit 2). Argentina, for example, employs proportionately nearly three times more people than the U.S. does, and nearly five times more than Germany. Mexico proportionately employs over twice the U.S. figure and Brazil nearly 50 percent more. Colombia is an exception, but can be explained by the fact that it has the highest level of agricultural employment (i.e., more consumption of non-processed food) compared to any country in Latin America. The high employment level in this industry in Japan can be explained by the very low productive methods still used in this country to process food.

An Industry Profile

Latin America's food processing industries are a diverse group of varying sized companies and national origins. Large multinational corporations typically compete with each other as well as with large national manufacturers and regionally focused smaller companies. The degree of rivalry among these players varies significantly depending on the industry subsector and the country. Within Brazil, for example, sugar processing is a virtual oligopoly where the top four competitors control 93 percent of the market. On the other hand, in Brazil's fiercely competitive cheese market, the five top players have less than a 15 percent share.

Market Forces Predominate

In contrast to other industries in the region, especially the ones reviewed in this report, the market forces in the processed food industry have always played a strong role in shaping this sector. Among the four cases we have analyzed – steel, retail banking, telecommunications, and food processing – this industry is by far the least affected by government intervention. It even escaped, in a matter of speaking, the import protection granted to other industries since many processed foods cannot be priced competitively if they are shipped long distances.

But Productivity Lags Far Behind

Nevertheless, in spite of these competitive forces, Latin America is very far from the U.S. level of labor productivity. The major factor explaining the productivity gap found is the enormous difference in employee compensation levels between the U.S. and Latin America. It is actually much lower for food processing than for the other three cases analyzed in this report (Exhibit 3). This poses a strong barrier to increased use of automation that would otherwise lead to greater productivity.

Of course, low labor costs in Latin America could lead to a wrong conclusion: cheap labor offsets needs to improve productivity. A comparison of proportional labor costs in the five countries analyzed partially debunks this argument (Exhibit 4). In Argentina, Mexico and Colombia, for instance, labor cost as a percentage of the value of output shipped is similar to that for U.S. food processors. While total labor costs are lower in Venezuela and Brazil, the gap is not so large as to suggest that labor productivity is unimportant for these countries.

The case study that follows carefully examines the causes for the differences in productivity found among Latin American countries, and between these nations and their counterparts in the more developed world. It is divided into four sections. The first provides an overview of the food processing industry in six countries: Argentina, Brazil, Colombia, Mexico, the U.S., and Venezuela. This section is followed by a discussion of the measurement of output and productivity. The last two sections explore the causes for productivity differences among the countries and what implications these have for the future of the industries.

THE FOOD PROCESSING INDUSTRY

Industry Definition

The definition of what constitutes "processed food" is not always clear nor easily agreed upon. For the purposes of this project, however, we have included all food products which do not go directly from the farm to the store. In practical terms, this includes all food categories except fresh produce and dry legumes (Exhibit 5). Beverages, both alcoholic and non-alcoholic, are excluded from the comparisons. In the United States this definition covers most of the products which fall under the heading "Food and Kindred Products" (SIC 20).

A consequence of using such a broad definition as the one chosen here, however, is that no one or even two production processes cover the bulk of the industry. The techniques and machinery used may often be applicable to just one category. However, while processing varies considerably across categories, the majority of final products tend to take one of four forms reflecting the levels of technology needed to produce them: low (e.g., fresh meat), moderate (e.g., milling), high (e.g., canned goods) and very high (e.g., frozen foods, ice cream and packaged bakery goods). The industries with the longest history are the ones where the least amount of processing is involved. Butchering likely dates back to the Ice Ages. Large scale milling can be traced to the late Middle Ages. Industrial food canning is a product of the late 1800s while modern frozen foods and packaged bakery products only emerged in the present century.

The Business System

Food processing represents but one stage in a long food production chain (Exhibit 6) that stretches from farmers to individual consumers. The level of vertical integration in this industry is relatively low, rarely going beyond two stages. A few firms – ADM, for instance – play the role of both agribusiness and food processors, and others, like Godiva, both process and retail their output. But, for the most part, firms restrict themselves to processing or distributing the product.

Over 80 percent of processed food is distributed through retail channels. The remainder goes to a variety of institutions such as restaurants, hospitals, and schools.

Industry Size

Typically, food processing is among the largest industries in an economy. In 1991, the value of U.S. factory food shipments, measured in 1993 dollars, stood at nearly U.S.$350 billion, while in Latin America figures ranged from U.S.$65 billion in Brazil (1992) to U.S.$6 billion in Venezuela (1991) (Exhibit 7).

As for employment in the industry, the U.S., with the largest market, also employs the largest number of workers: 1.3 million in 1991 (representing 7 percent of manufacturing employment). Employment in the other countries varies from 1.0 million in Brazil (1992) to 81,000 in Colombia (1991) (Exhibit 8).

METHODOLOGY USED

Productivity levels for the processed food case were calculated based on factory shipment values, rather than the more typically used value-added figures. This approach was necessary since obtaining accurate input prices in Latin America needed to make a calculation of value added proved to be impossible. Consequently, productivity measurements in the food processing industry case study are stated as factory shipment value per employee. Before making productivity comparisons between countries, it was also necessary to make adjustments to the factory shipment values as reported by the census of manufactures, surveys of manufacturing firms, and food producers associations (see box entitled "Adjustments").

Labor Productivity

Aggregate productivity[1] in Latin America in 1991/1992 was very low: 35 percent of the U.S level. This figure is roughly the same as the 33 percent of the U.S. level found in Japan and less than half of Germany's 76 percent of U.S. productivity. For individual Latin American countries, though, significant differences were noticed. At 52 percent of the U.S. level, Argentina showed the highest level, followed distantly by Colombia, at 36 percent. Brazil (29 percent), Venezuela (29 percent), and Mexico (27 percent) had lower productivity levels (Exhibit 9). Even after examining the subsectors comprising Latin America's food processing industry, productivity in general was found to be significantly lower than in the U.S. Only four subsectors in the region show productivity levels that reach greater than half the U.S. level: meat processing, dairy and fats and oils in Argentina, and meat processing in Venezuela.

Productivity levels vary considerably from subsector to subsector within the same country. In Argentina, for instance, the meat processing, dairy, and fats and oils subsectors have relatively high levels of productivity, while the preserves and the sugar have very low levels. This type of discrepancy is also found to a lesser extent in

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[1] Aggregate productivity for processed food is an average of seven subsectors. The bakery/cakes subsector was purposely left out of the aggregate food sector figures in Latin America to avoid distortions. Production of bread products in the region is not a true industrial activity, but is akin to an artisan craft. Virtually all bread products in Latin America are made in small retail establishments, essentially family owned bakeries ("panaderías" in Spanish or "padarias" in Portuguese), that sell directly to the public. However inefficient this system might be, the perceived higher quality embodied in fresh bread products among Latin Americans will likely maintain small bakeries as a prevalent industrial form in the subsector for the foreseeable future.

Colombia, Brazil, and Venezuela. Productivity in the confectionery subsector is relatively high in the three countries. Meat processing shows relatively higher levels of productivity in Brazil and Venezuela, as does the preserves goods subsector in Colombia. Mexico is an exception. It is the only country where virtually all subsectors (except sugar refining) have similar levels of productivity.

Unlike other industries analyzed in this report, the levels of labor productivity for food processing showed little change over time (Exhibit 10). The most significant shift was seen in Brazil, where relative overall productivity in the industry increased 26 percent between 1987 and 1992. The jump was caused mainly by improvements in the meat processing (up 36 percent) and fats and oils (up 60 percent) subsectors. Other significant changes occurred in Argentina's confectionery subsector which increased productivity levels by 70 percent; Colombia's meat processing up 30 percent; and Mexico's milling subsector, up 32 percent. The overall drop in productivity for bakery and cakes during the 1987 to 1992 period reflects increased employment in this subsector caused by a proliferation of new businesses.

CAUSES OF PRODUCTIVITY DIFFERENCES

This section examines the differences in labor productivity across countries along three specific axes: production processes used, nature of competition within the industry, and external factors affecting the industry (Exhibit 11). While production processes explain the most immediate causes of productivity differences among the countries studied, analyzing the competitive environment and outside factors reveal why the production process is set up as it is. The analysis of production processes takes into account the way companies organize themselves to do business. It also determines the degree to which scale and automation matter within the subsector as well as how efficiently it utilizes resources. The second level looks at differences in the nature of competition of the industry. The third level examines external factors such as government intervention (e.g., regulation) and market characteristics (e.g., relative input prices/factor availability) which can influence the production process.

Causality at the Production Process Level

Extreme differences in levels of automation between food processing plants in the U.S. and Latin America largely explains the wide productivity gap found. A secondary and much less important factor accounting for the productivity differences is the smaller scale of Latin American plants. There is little evidence to suggest that either product mix, variety and quality differences, or organization of functions and tasks of firms operating within the industry play a significant role in influencing productivity in this industry in Latin America. We discuss each of these points below.

¶ Automation

Given the difference in labor compensation levels between the U.S. and Latin America, it comes as little surprise that the level of plant automation in the U.S. is considerably greater than that found in Latin American countries. Using fixed assets per employee as a measure of automation, the level of automation found in the U.S. is two to eight times greater than that found in at least three Latin American countries (Mexico, Venezuela and Colombia) where figures were available (Exhibit 12).

Even for companies considered to be highly automated in the region, levels of automation still fall far below U.S. levels. Take the case of a leading food processing firm in Brazil. Even though this company is a leader in its market, and commands a level of automation well above its competitors, it is still less than 60 percent of the level of automation found in the U.S. The firm's level of productivity is also not surprisingly about 60 percent of the U.S. level.

This correlation between labor productivity and automation is highly visible in most subsectors. In Mexico, the most automated plants in six of the seven subsectors analyzed were also the most productive (Exhibit 13).

¶ Scale

Food processing plants in Latin America are much smaller than those in the U.S. Furthermore, Latin American plants employ, on average, less than half the employees its U.S. counterparts do (Exhibit 14). Considering Latin America's much lower productivity, the average output per plant is less than one fifth of U.S. output.

The penalty on productivity imposed by the smaller scale varies by country (Exhibit 15). In general, when the bakery/cakes subsector is included in the aggregate sector figure, the penalty can be quite significant. In Mexico, for example, the sector productivity would increase by 25 percent if the establishments with less than 10 employees were excluded from the analysis.

However, the best way to evaluate the real impact of scale on productivity is to exclude bakery/cakes and examine individual subsectors to avoid product mix problems. The comparison between the levels of productivity of large companies and the average for their respective subsectors leave little doubt that scale does contribute to greater productivity levels (Exhibits 16, 17, and 18). Out of 26 large firms analyzed, only one was found to be below its national subsector average.

Nevertheless, out of the same sample of companies, only one was better than the subsector average in the U.S. In general, even the largest firms fell far below the U.S. average level of productivity. For the 25 companies below the U.S. productivity level, the gap ranged from 82 percentage points, for a

Venezuelan dairy producer, to 37 percentage points, for a multinational confectionery producer also in Venezuela. The overall average gap was approximately 64 percentage points.

Thus, although scale does seem to have a positive impact on productivity, it explains only a very small part of the total gap. In fact, when we exclude all establishments of 10 employees or less, as well as the bakery and cakes subsector in Mexico, we find that productivity would increase from 27 percent to just 34 percent of the U.S level. A similar simulation for Venezuela, where plants with less than 20 employees were excluded from the sample, yielded an increase of a mere three percent (from 29 to 32 percent).

¶ Product mix/variety/quality

Mix, variety, and quality are three separate issues that can affect the level of productivity found in a country. We have not calculated these impacts, but we firmly believe that if these three factors were correctly addressed, the productivity gap observed would worsen, showing Latin American companies to be less productive:

- Product mix

  A country's product mix can affect productivity levels under two circumstances. One, when a country has a predominant subsector that by its very nature maintains a low level of productivity, ordinarily because of a consumer preference for the subsector's output, therefore, this country's productivity will be lower. A perfect example of such a phenomenon in Latin America is its generally artisan bakery/cakes industry. This subsector employs, on average, 27 percent of the work force in the analyzed countries' food processing industry, as opposed to 16 percent in the U.S where the sector's output constitutes mostly mass produced items. At the same time, bakery/cakes in Latin America is among the least productive of all subsectors for the five countries, with an average of roughly 13 percent of the U.S. level of productivity for the subsector. The second condition that raises the issue of product mix happens when some countries have products unique to the country's particular culture, and consequently not produced extensively elsewhere. A good example of such a product is "tortillas" in Mexico – the most popular food item in the country. However, they are an almost exclusive Mexican product.

Despite the varying country-specific product mixes in Latin America, we have not found that these have generated any distortions to overall productivity levels with the exception of the already noted bakery/cakes subsector.

- Variety

  Variety often has a direct impact on productivity. Available variety within a product type directly relates to the number of stock keeping units (SKUs) of the product category as well as to the number of new product introductions offered by the local industry. Ordinarily, the higher the number of SKUs and the greater the frequency of product introduction there are, the more difficult it is to achieve the critical scale needed to reap the benefits of automation and consequently increase productivity. Even with especially developed flexible equipment, time and capacity losses are always unavoidable.

  The variety of products (measured by the number of SKUs) and the number of new product introductions is notoriously much smaller in Latin America compared to the U.S. Consequently, if any adjustments were to be made to equalize these variables among the countries, the result would be an even lower level of productivity for Latin America.

- Quality

  The issue of quality has to be raised when there are significant differences among the quality of products in different countries. It is true that these differences do exist between Latin America and the U.S., since the ingredients used in the North American products are usually superior to the ones used in the other countries analyzed. For example, in most Latin American countries pasta is not made with the higher quality durum wheat flour that is used in the U.S. Similarly, in the U.S. many products are enriched with vitamins (e.g., milk, flour, bread), a practice that is only now starting to take place in the Southern Cone.

  If international prices were adjusted to reflect these quality differences, again the result would be a drop in the aggregate productivity of Latin America.

¶ Organization of functions and tasks

Overstaffing is not a cause of the lower productivity levels found in Latin America's food processing industry either. Because of the relatively more intense competitive markets in which firms in this sector operate in the region, opportunities to reduce the number of production employees is limited or conditioned by investment in automation.

The ability to reduce administrative staff is also limited. Administrative employees typically represent 20 to 30 percent of employees in a firm, meaning that even a relatively large reduction in this area would do little to narrow the labor productivity gap with the U.S.

The degree of vertical integration in an industry, another factor that could affect productivity, proved not to be significant in the food processing industry in Latin America. For instance, if Latin American companies were found to be more involved in distributing their products than their U.S. counterparts, that could reduce productivity if distribution activities have an inherently lower labor productivity component. But, we have not uncovered by evidence that companies in Latin America are any more or less vertically integrated than U.S. firms. The level of integration is usually determined by a company's distribution strategy, which varies significantly even within companies of the same industry in the same country. Moreover, even if Latin American firms in this industry were more vertically integrated they would then be expected to receive a higher price for their products; they would avoid the discounts normally charged by middlemen. Consequently, the increase in the number of employees should be nearly offset by the revenues from higher prices. Therefore, the net effect on productivity should also be negligible.

Outside Factors and the Nature of Competition

It should be clear by now that the gap in productivity can be attributed almost entirely to the huge differences in automation between the U.S. and Latin America. Scale comes at a distant second as an explanatory factor. So, why is Latin America so far behind in automation?

¶ The nature of competition

Lack of competitive pressure does not appear to account strongly for the gap in automation between Latin America's and the U.S.'s food processing industries. Most food processing subsectors in the region can hardly be considered monopolies or oligopolies. In Brazil, for instance, the average market share of the top five players in the industry was approximately 40 percent in 1992. While this figure indicates a relatively high level of concentration, it is by no means sufficient to prevent competition. In fact, price is the basis of competition in most subsectors. This characteristic is obviously related to the great share of processed food expenditures in consumers' budget in Latin America, making people much more price-sensitive than is the case in high income countries.

In addition to price-conscious consumers and the absence of strong oligopolies, retailer pressure on producers is also a factor that is gradually playing a bigger role in ensuring a competitive market. With the exception of Venezuela and Colombia, the share of large supermarkets in total retail sales has reached a level that is not far from the one in the U.S. (Exhibit 19). Especially in Mexico and Brazil, the growth of this retailing channel has been very significant. Thus, the bargaining power of retailers and the pricing demands that come with it have also helped to pressure producers to keep their costs down.

¶ Labor cost

The difference in labor cost between the U.S. and Latin America is undoubtedly the major external factor behind the low level of automation found in the region, and consequently, the huge gap in productivity. In the processed food industry, this difference is even more pronounced than the ones found in the other case studies as we have shown in Exhibit 3.

The incentive to substitute capital for labor is very small in general, though it is much higher in Argentina. Not surprisingly, Argentina also has the highest productivity of all the countries analyzed in Latin America. The incentives to automate also tend to be stronger for the larger establishments since their cost of labor is higher than that of the smaller firms (Exhibit 20).

The compensation differential between the U.S. and the other countries is really so significant that it more than offsets the differences in labor productivity. Out of seven subsectors analyzed in each of the five countries, for a total of 35 subsectors, the U.S. appeared more competitive in only 7 subsectors because of its total labor costs (Exhibit 21). Moreover, the differences in these cases were so small that the U.S.'s advantage is almost negligible.

Low labor cost and the relatively high cost of investment capital in Latin America penalized capital investments. The ability to secure investment capital whether it be by launching an equity issue, securing a domestic loan, securing an international loan, launching an international bond or equity issue is exceedingly more difficult and more expensive in Latin America than in the U.S. Not only are there less incentives to automate but there is simply less capital available for firms located in Latin America than in the U.S.

OUTLOOK

The conclusion so far is that in spite of the fact that Latin American countries have a huge labor productivity gap with the U.S., lower salaries make them more competitive on a total labor cost basis in 28 of the 35 subsectors examined. Thus, unless labor costs increase, there is not much reason to believe that labor productivity will improve significantly.

Nevertheless, changes in some external factors might help to decrease the current productivity gap slightly. In one way or another, these changes will more likely increase the current level of automation in Latin American plants.

The first of these changes is a reduction in import tariffs. They have fallen in all countries analyzed over the last few years with dramatic reductions especially in Brazil, Colombia, and Venezuela (Exhibit 22). As tariffs continue to fall, competition in the subsectors that are involved with internationally tradable goods should increase. This intensification in competition might increase labor productivity indirectly. In many cases, the pressure to reduce costs leads producers to invest in automation in order to improve raw material yields. These types of investments tend to have a much shorter payback than the ones that are exclusively geared towards labor reduction, since raw materials normally account for 60 to 70 percent of a product's price – as opposed to 5 to 10 percent for labor. Consequently, the improvement in raw material yields through automation would generate higher labor productivity as a by-product. In addition to automation, fiercer competition would force companies that still have opportunities to lay off administrative personnel to reduce costs.

The second change in external factors that could also help in closing the productivity gap is an increase in the bargaining power of retailers. As this trend continues, producers may have to make investments they would have avoided in the past. The example of an Argentinean company illustrates this point well (Exhibit 23). After evaluating the alternatives to reduce personnel, management concluded that the investment in a new and totally automated packaging line was not financially attractive due to a very long payback. However, the pressure from retailers, who demanded that the company switch its packaging to ease distribution activities played a major role in making management decide to install the new line.

A third change in external factors is the growing pressure on governments to reduce fiscal evasion and tighten sanitary controls. Both conditions have a direct impact on the ability of small establishments to compete with the larger ones. In Brazil's meat packing subsector, for example, many of the large players have reduced production capacity and all multinationals have withdrawn by selling to locals because of their inability to compete with the smaller firms. These firms usually succeed by serving markets that operate on a totally informal basis. Fiscal evasion constitutes a significant cost advantage for them, since Brazil has a very high tax burden on producers (Exhibit 24). As these small establishments are gradually put out of business, labor productivity should increase. This is a consequence of the lower level of automation in these firms, made possible by their lower costs of labor and little access to capital.

A fourth change in external factors that might contribute to higher productivity in Latin America is the growth in GDP. The correlation between GDP and food consumption per capita is usually positive and relatively strong (Exhibit 25). The need to produce higher volumes at a constant quality has been one of the factors that triggered many U.S. and European firms to automate. As long as Latin American economies continue to grow, so should the market for processed food. This increase in demand might attract new entrants, especially multinationals, further intensifying the degree of rivalry in the industry. As in the case of lower tariffs, stronger competition might lead to investments to improve raw materials' yields through automation and to layoffs of administrative staff.

Finally, a last change in external factors which can positively impact labor productivity is the growth in exports. As the GATT negotiations evolve and the so-called First World countries gradually reduce their non-tariff barriers for imports of processed food, Latin American companies will have a chance to significantly increase their exports. However, in order to do so, strict quality and sanitary requirements in importing countries might force exporters to invest in automation to gain or maintain access to the foreign market (Exhibit 26). In some subsectors, it is very difficult to meet these requirements and achieve standardization without automation.

In spite of all these changes that might lead to higher productivity levels in Latin America, constraints still have to be overcome in some countries, especially in Brazil. In the biggest of the Latin American nations, macroeconomic instability has had a very negative impact on investments in the processed food industry (Exhibit 27). Another constraint is the tax burden on food items, mainly related to indirect, i.e., non-income – taxes (Exhibit 28). In Brazil, the high tax rates have a negative impact on prices, which are kept at a higher level than otherwise could be. Consequently, both the size of the industry and producers' profitability are smaller than could be if taxes were more in line with what is observed in other countries.

The potential for growth of the food processing industry in Latin America appears huge. For both basic and luxury food products consumption per capita is closely tied to growth of GDP per capita (Exhibit 29). As GDP growth increases, so should consumption. While caloric intake in Latin America is relatively high compared to other developing regions, it is still lower than in the U.S., and consequently has significant room for growth. Population growth is also higher than in the developed world meaning demand for food will continue to increase from this factor alone. Gerber foods, a baby foods producer, just revamped their entire Latin American strategy and is predicting that most growth of the firm in the coming years will come from products sold in Latin America. Growth in process food consumption will come from the substitution of nonprocessed food and the increase in total food consumption. In fact, from 1987 to 1992, only one country (Venezuela) of the five under study showed no growth in processed food output per capita (Exhibit 30).

Consumption of processed food is apparently inversely correlated with agricultural employment (Exhibit 31). This correlation is explained by the fact that as people move away from rural areas, urban life styles tend to force changes in eating habits. The share of nonprocessed food in total caloric intake decreases because self-subsistent food production becomes nearly impossible in an urban setting. Consequently, as agricultural employment decreases, consumption of processed food should increase. According to the World Bank, all Latin American countries will experience significant decreases in agricultural employment until the year 2000.

This potential for growth has not been ignored by many multinationals. In general, they have been quite active in enhancing their share in Latin American markets through acquisitions (Exhibits 32). Parmalat is a good example of a company that has used this strategy to multiply its sales by 13 in 6 years (Exhibit 33). In Brazil, 1992 sales of multinationals were already more than 35 percent of the sales of the top 20 companies in the industry.

SUMMARY AND POLICY ISSUES

The processed food case was chosen as an example of a major consumer goods industry. In Latin America, its importance for employment and consumer welfare is even greater than in more economically developed countries such as the U.S. and Germany. When compared to these countries, however, Latin America's labor productivity is significantly reduced reaching only 35 percent of the U.S. level. Productivity levels vary considerably among countries in the region with Argentina leading the five Latin American nations at 52 percent of the U.S. level, while Mexico comes out last with 27 percent.

This huge gap in productivity is attributable mainly to the proliferation of craft-based production in Latin America, and to the reduced level of automation compared to the U.S. Although the plants are also much smaller than in the U.S., scale comes far behind automation as an explanatory factor for the productivity gap: even the biggest Latin American companies lag significantly behind their U.S. counterparts.

These differences in production processes are primarily the result of the low labor cost in Latin America. In fact, if total labor costs per unit of output was chosen as a performance indicator, Latin America would be more competitive than the U.S. in 28 of the 35 subsectors analyzed throughout the six countries. Other factors, such as the higher cost of capital, loose government control on fiscal evasion and sanitary conditions, a heavy tax burden, and macroeconomic instability (the last two are mainly for Brazil), play a secondary role in explaining the productivity gap (Exhibit 34).

Although this gap will probably not be reduced significantly in the medium-term, since a sharp rise in labor cost is unlikely, it might be reduced as a consequence of changes in external factors. The lowering of import tariffs, the increase in retailers' bargaining power, the growing pressure on governments to tighten control of fiscal evasion and sanitary conditions, the growth in GDP per capita, and the increase in exports to developed economies are all factors that might contribute to higher productivity levels in Latin America.

However, regardless of what actually happens to productivity, there is nearly a consensus on the huge potential for growth of the industry in the continent.

ADJUSTMENTS

In order to compare productivities across countries, two types of adjustments were made to the monetary output figures.

Price Adjustments

The first one was an adjustment to eliminate the impact of different price levels in each country. Ideally, if one wanted to compare productivities, the best indicator would be to use physical output per employee. However, due to a number of restrictions (e.g., different mix of products in each country and difficulty in establishing equivalent units of production), the calculation of this indicator was not feasible. Nevertheless, it is possible to achieve a similar result obtained through physical output by starting with monetary data and then adjusting it by what is commonly called "International Prices " or "Purchasing Power Parity" (PPP). The effect of this adjustment is the same as if one were to multiply the production volume in each country by the price of the corresponding product in the U.S. Thus, all output is then valued at the same price, and distortions caused by different price levels are eliminated (see appendix "International Prices for Processed Food" for a complete report on the methodology and results).

Consistency Check

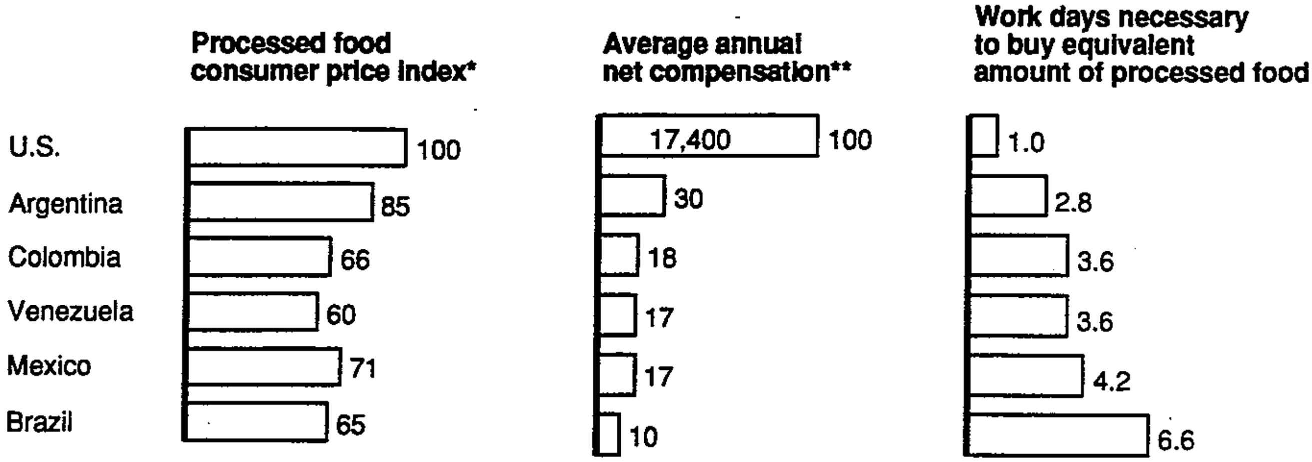
The second adjustment was done to increase the consistency of the monetary output figures, both with the data on physical output and with the prices at different points in time. The objective was to have the monetary values supplied by one source checked against the result of the multiplication of volumes and prices supplied by other sources. This type of check was especially important for Argentina and Brazil, where high levels of inflation occurred during the period under study and caused distortions in the original prices used to value physical output.

The sources used in this adjustment process were numerous: Census of Manufactures (U.S. and Mexico), governmental surveys of manufacturing firms (Colombia and Venezuela), sectorial reports (such as the ones published by the Inter-American Institute for Agricultural Cooperation), market research reports by Nielsen and Datamark, clippings from newspapers/magazines, McKinsey experience in many subsectors, and interviews with both industry experts and companies.

The process of adjustment was relatively straightforward. The first step was to compare physical productivity with monetary productivity. When the difference between the two was significant, the next step was to compare the aggregate figures for the subsector with the data for individual companies. In this way, it was fairly easy to identify which of the two figures was closest to reality. The third step was to calculate production value using a different method. It started by first making sure that the production volume used was consistent with the figures that are well accepted by industry experts and compatible with per capita consumption in each country. Then, the 1993 producer prices, which were collected for the International Price analysis, were deflated to whatever year was appropriate and multiplied by the production volume of that year to find a production value. The deflation index used corresponded to the inflation of the specific product (the number of indices used varied from 8 to 135, depending on the country).

Exhibit 1

PROCESSED FOOD PRICES AND INCOME 1993



* U.S. dollars necessary to buy equivalent amount of processed food (see Appendix for calculation of international prices)

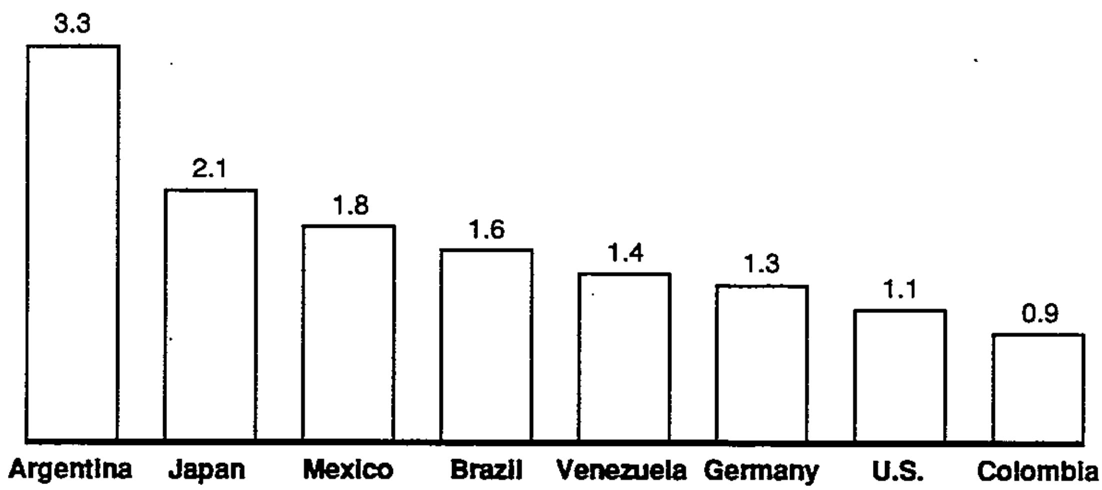
** Average annual net compensation of employee in food processing industry

Source: McKinsey analysis

Exhibit 2

SHARE OF PROCESSED FOOD IN TOTAL EMPLOYMENT

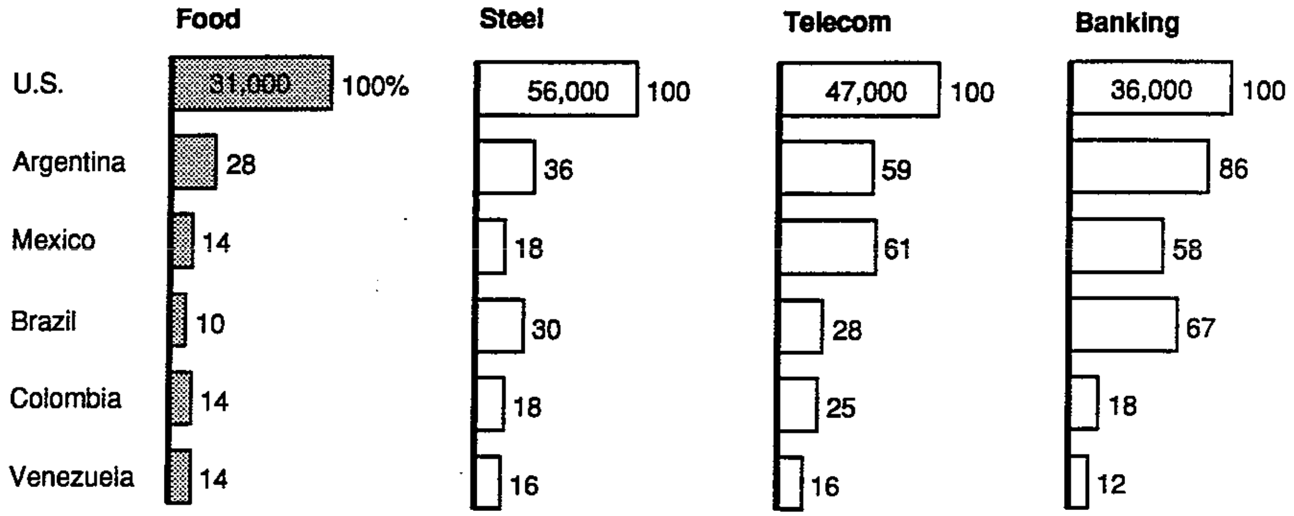
Percent



Note: 1992 figures for Argentina and Brazil; 1991 for Venezuela, U.S. and Colombia; 1988 for Japan, Mexico and Germany

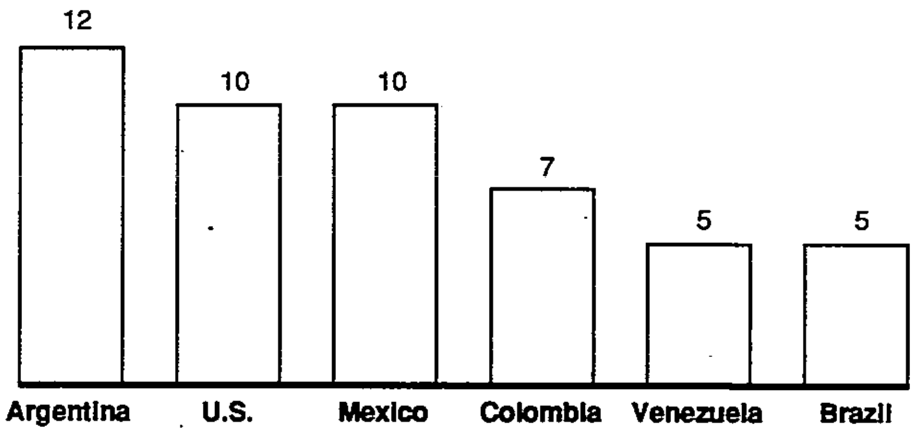
Source: Census of Manufactures; Ministries of Labor; Government reports

Exhibit 3
LABOR COST
U.S. $/employee, Index: U.S. = 100%



Source: McKinsey analysis

Exhibit 4
IMPORTANCE OF LABOR COST
Percent of value of shipments*



* Excludes bakery/cakes (and pasta/noodles for Argentina)
Note: 1992 figures for Argentina, Mexico and Brazil; 1991 figures for the U.S., Colombia and Venzuela
Source: Food Producers Associations (Argentina, Brazil); Government Statistics (Mexico); Census of Manufactures (Colombia, Mexico, Venezuela); UNIDA

Exhibit 5

PROCESSED FOOD INDUSTRY

Percent of total processed food employment

Processed foods

	Meat	Dairy	Bakery/ cakes	Preser-ved fruit & veg's	Milling	Sugar	Confec-tionery	Fats and oils	Other
Argentina	16	7	36	10	4	4	3	3	17
Brazil	33	10	12	5	12	7*	2	4	15
Colombia**	11	12	20	3	12	12	6	12	12
Mexico	6	9	40	7	6	11	5	4	12
Venezuela***	14	11	25	6	9	10	5	6	14
U.S.	29	10	16	15	2	1	5	2	20

* Includes refining for alcohol production

** Plants with more than 10 employees

*** Plants with more than 5 employees

Source: Census of Manufactures; Food Procedures Associations (Brazil and Argentina); Sectorial Reports (Brazil); McKinsey analysis

Exhibit 6

PROCESSED FOOD PRODUCTION PROCESS

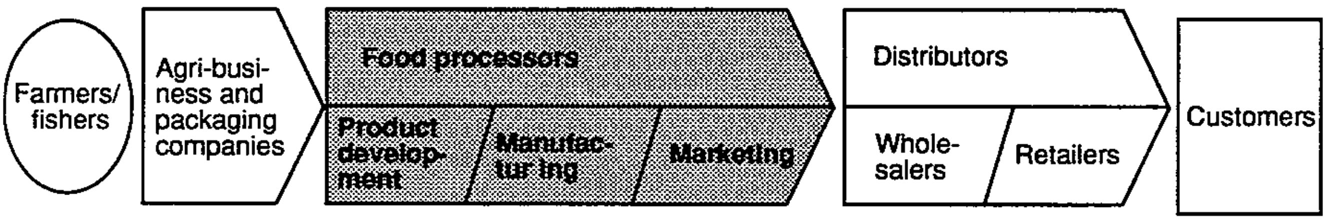
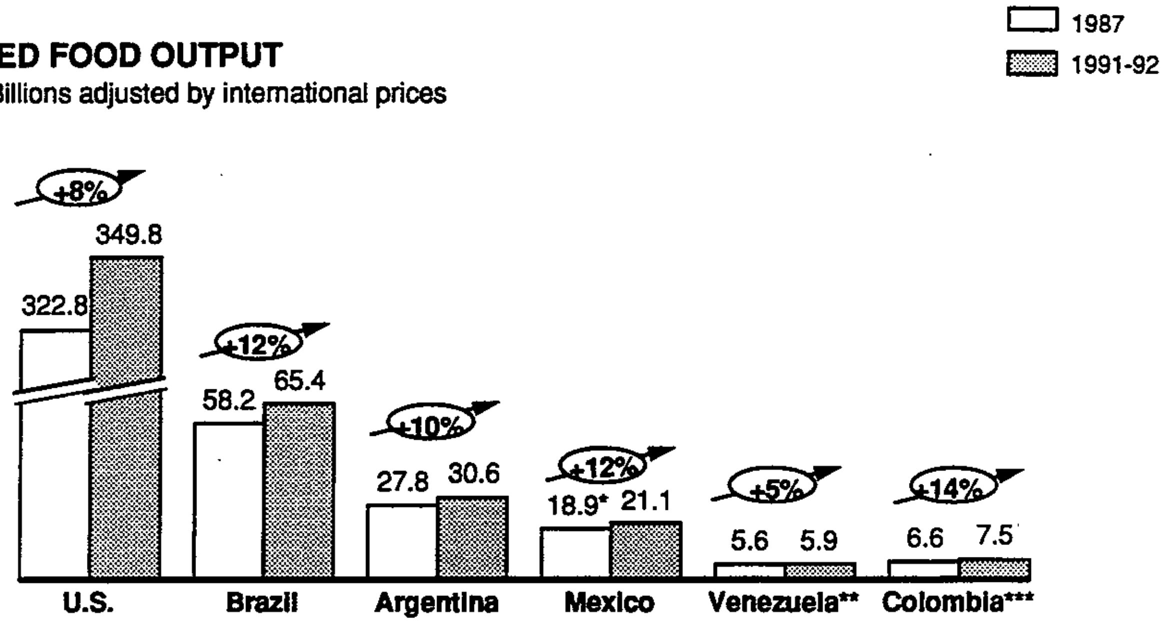
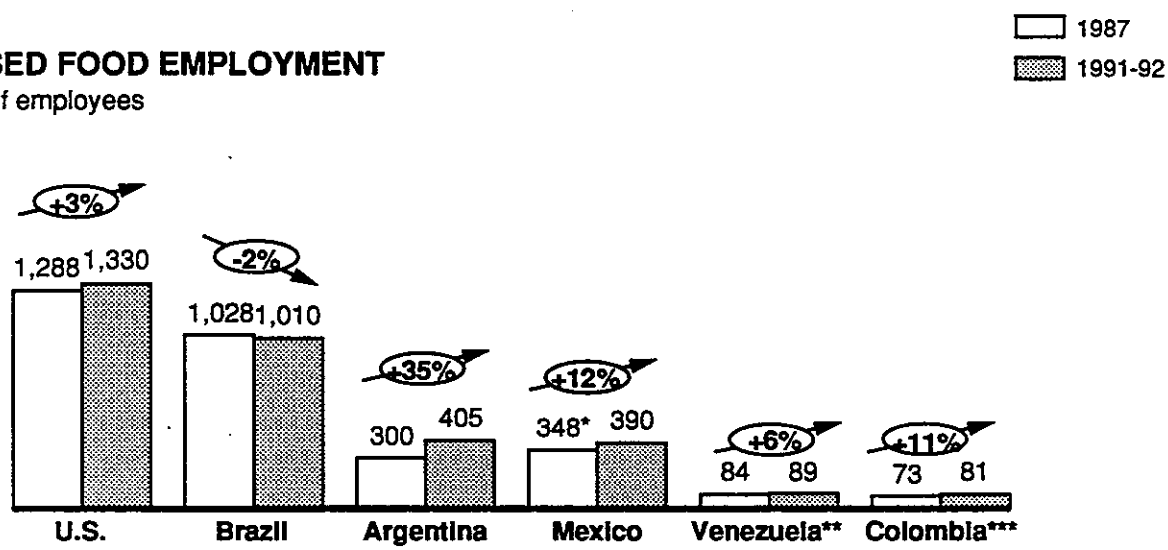


Exhibit 7
PROCESSED FOOD OUTPUT
1993 U.S. $ Billions adjusted by international prices



* 1988
** Plants with more than 5 employees
*** Plants with more than 10 employees
Source: Census of Manufactures (U.S., Colombia, Venezuela, Mexico); Food Producers Associations (Brazil, Argentina); IFS Yearbook; Government Agencies

Exhibit 8
PROCESSED FOOD EMPLOYMENT
Thousands of employees

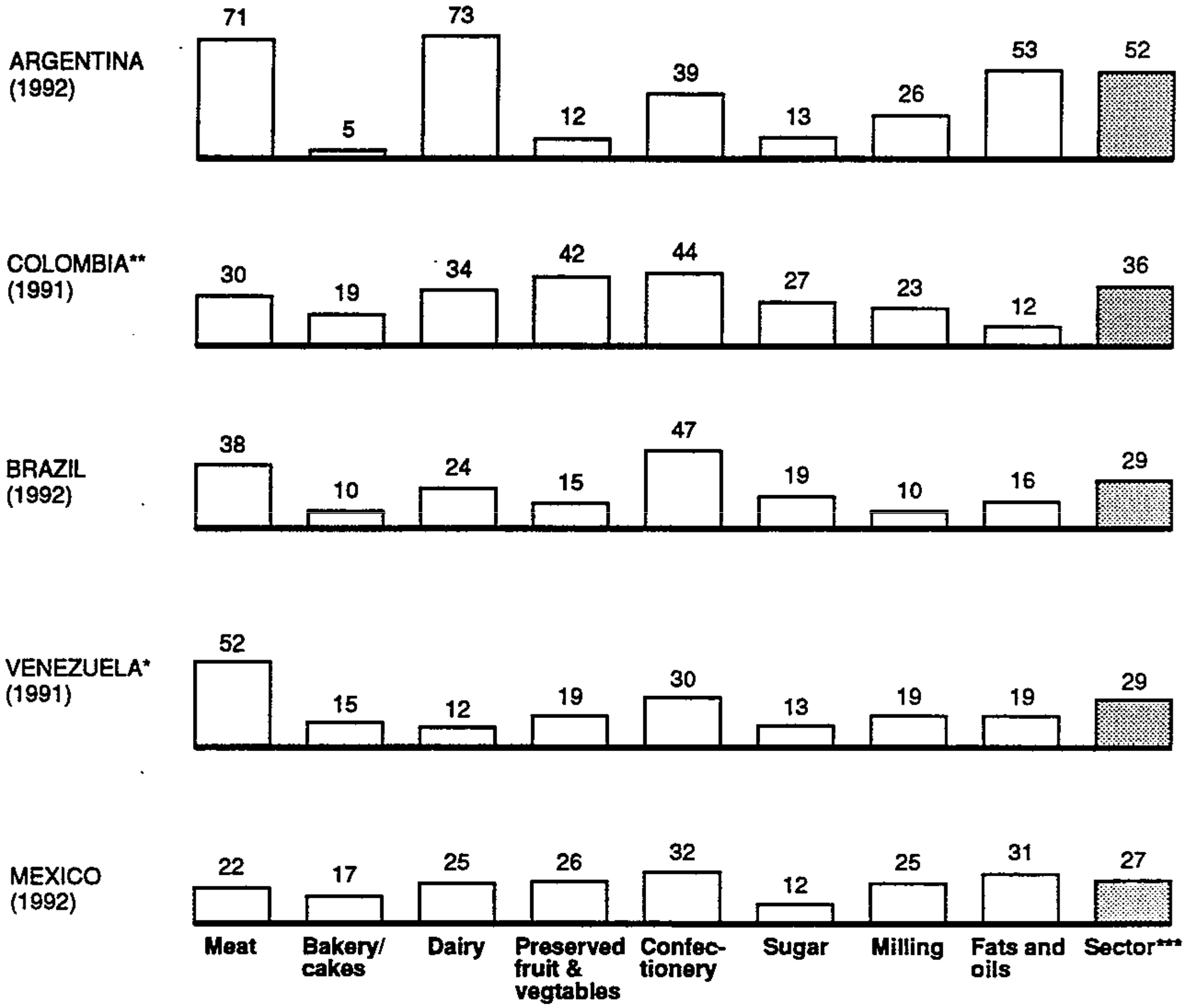


* 1988
** Plants with more than 5 employees
*** Plants with more than 10 employees
Note: Excluding bakery/cakes in Argentina reduces employment growth to 18%; the effect of the exclusion for the other countries is negligible
Source: Census of Manufactures (U.S., Colombia, Mexico, Venezuela); Food Producers Associations (Brazil, Argentina); Government Agencies

Exhibit 9

LABOR PRODUCTIVITY COMPARISONS

Monetary output at U.S. prices, Index: U.S. = 100



* Plants with more than 5 employees

** Plants with more than 10 employees

*** Excludes bakery/cakes

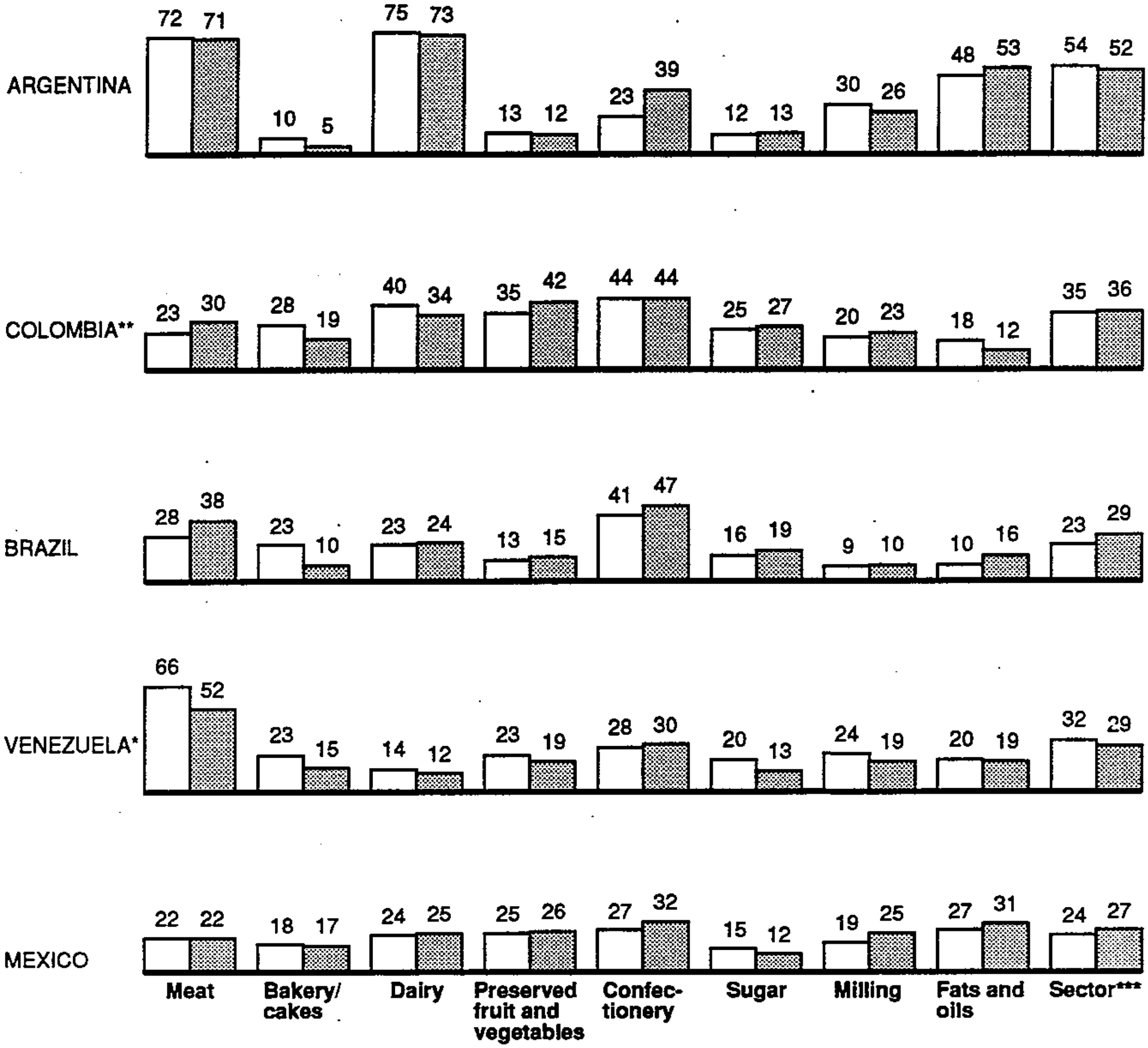
Note: Monetary productivity was adjusted to reflect physical productivity in some subsectors

Source: Census of Manufactures; Food Producers Associations; IICA; McKinsey analysis

Exhibit 10

LABOR PRODUCTIVITY EVOLUTION 1987-92

Monetary output at U.S. prices per employee, Index: U.S. = 100



* Plants with more than 5 employees

** Plants with more than 10 employees

*** Excludes bakery/cakes

Note 1: Monetary productivity was adjusted to reflect physical productivity in some subsectors

Note 2: Between 1987 and 1992 the U.S. labor productivity of the food increasing sector increased by 5%

Source: Census of Manufactures; Food Producers Associations; IICA; McKinsey analysis

Exhibit 11

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES 1991-92

External factors

- Very low labor costs across countries through Argentina's level is twice the average in Latin America
- Capital is in general relatively expensive and not easily available for small companies
- Macroeconomic instability, especially in Brazil, increases the risk of new investments
- For Brazil and Argentina, a heavy tax burden decreases producers' profitability and reduces the size of market by keeping prices higher than they would be otherwise
- Loose government control on fiscal evasion and sanitary conditions creates a competitive advantage for smaller firms that evades regulations and taxes

Nature of competition

Competition focuses mainly on price

Quality and new product introductions play a secondary role

Rivalry is increasing as retailer enhance their bargaining power

Production process

- Low levels of automation due to cheap labor and expensive/scarce capital
- Smaller scale plants are able to compete successfully because of fiscal evasion and lack of compliance with sanitary rules; high transport costs are also a contributing factor to smaller scale

Labor productivity

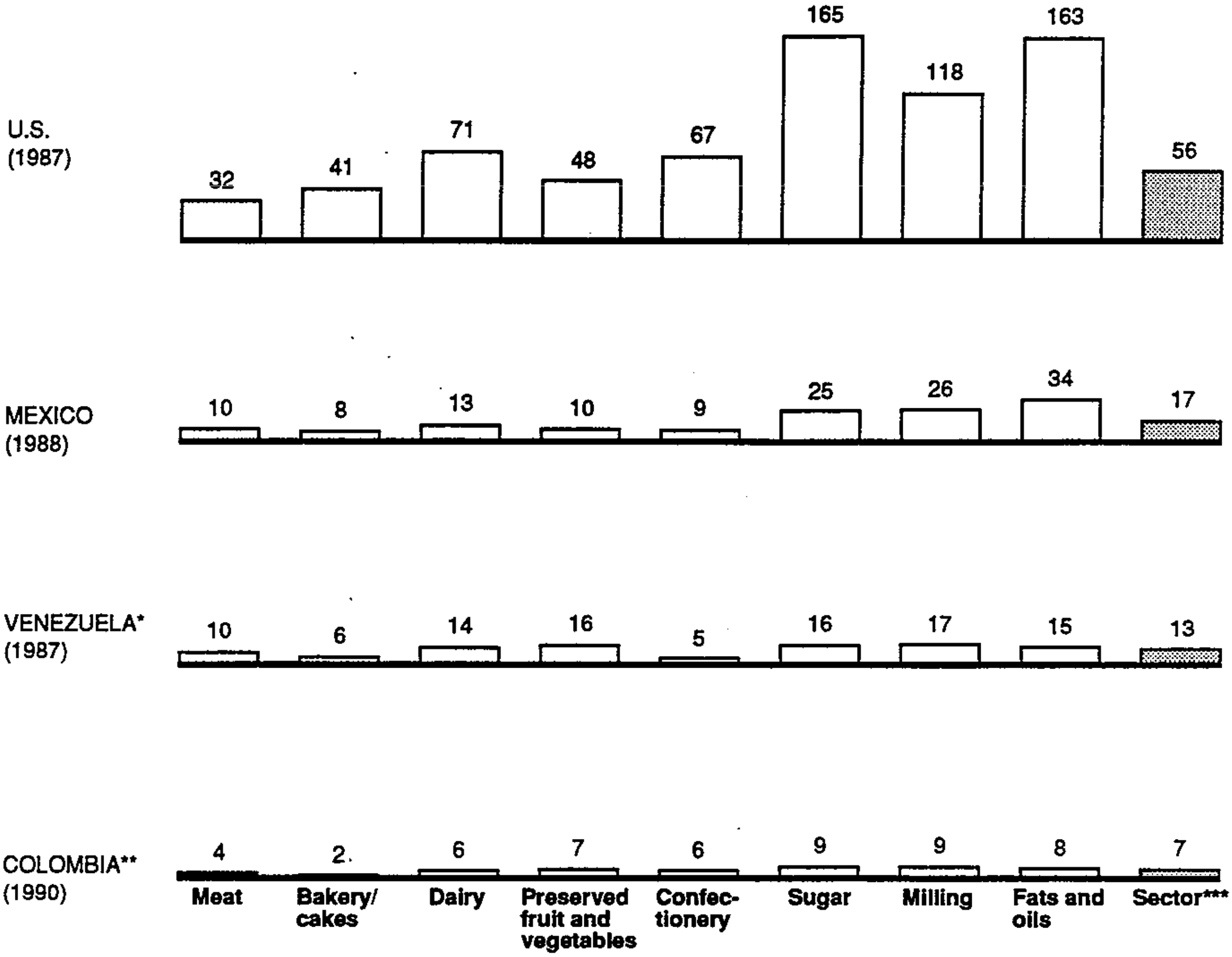
Large productivity gap between the U.S. and Latin America

U.S.	100%
Argentina	52
Colombia	36
Brazil	29
Venezuela	29
Mexico	27

Exhibit 12

FIXED ASSETS PER EMPLOYEE

1993 U.S. $ Thousands



* Plants with more than 5 employees

** Plants with more than 10 employees

*** Excludes bakery/cakes

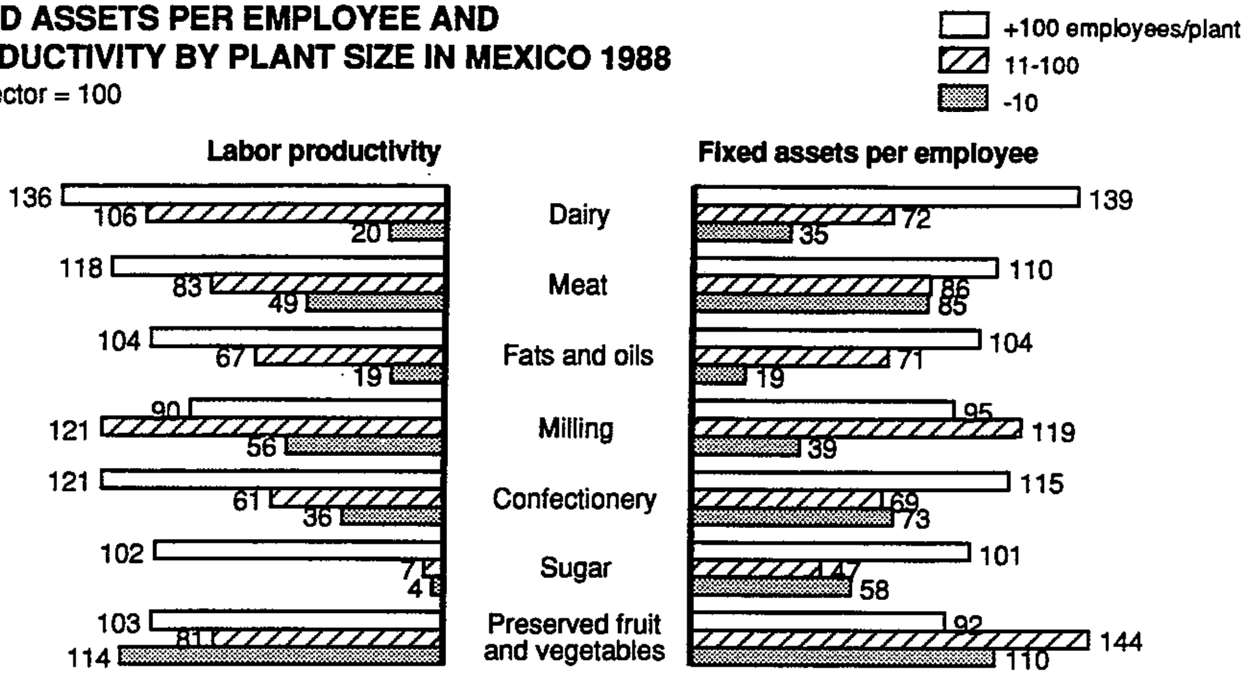
Note: The value of fixed assets reflected in the Census for Mexico reflects the market value; in Venezuela and Colombia there were no standard procedures to adjust the value of fixed assets for inflation until 1992; each company used its own method to make the adjustment, and these are the values showed in the census

Source: Census of Manufactures; McKinsey analysis

Exhibit 13

FIXED ASSETS PER EMPLOYEE AND PRODUCTIVITY BY PLANT SIZE IN MEXICO 1988

Subsector = 100

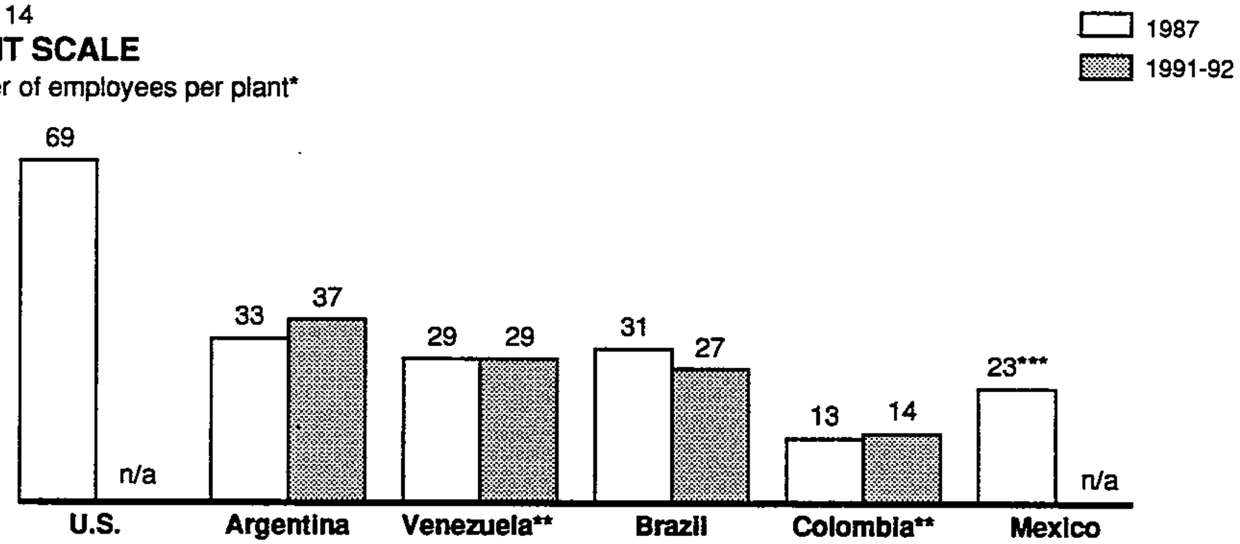


Source: Census of Manufactures; McKinsey analysis

Exhibit 14

PLANT SCALE

Number of employees per plant*



* Excludes bakery/cakes (and pasta/noodles in Argentina)

** The number of plants and employees for establishments with less than 10 employees in Colombia and less than 5 employees in Venezuela was estimated based on Mexico's figures

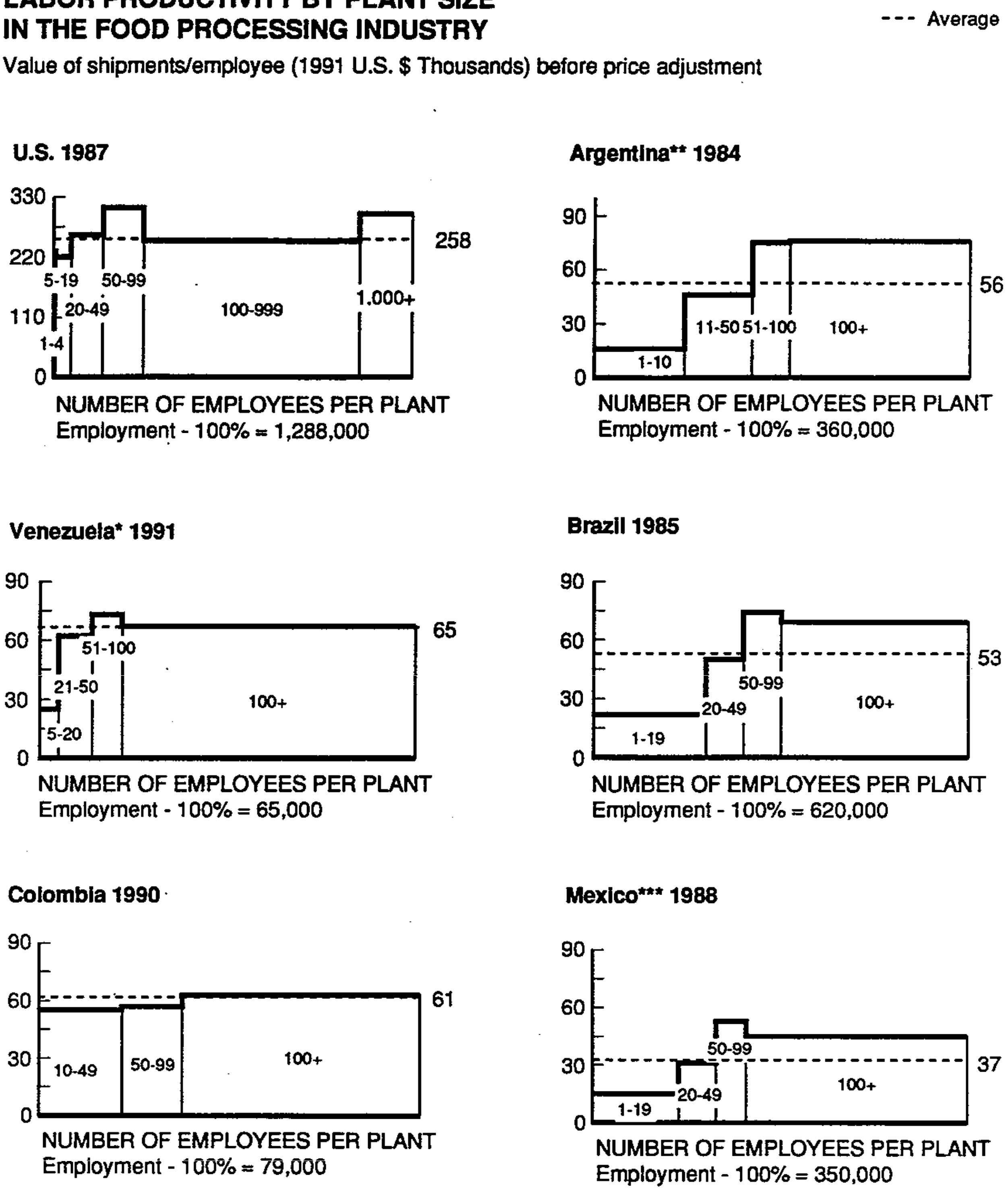
*** 1988 figures

Source: Census of Manufactures (U.S. and Mexico); Survey of Manufacturing Firms (Colombia and Venezuela); Food Producers Associations (Argentina and Brazil)

Exhibit 15

LABOR PRODUCTIVITY BY PLANT SIZE IN THE FOOD PROCESSING INDUSTRY

Value of shipments/employee (1991 U.S. $ Thousands) before price adjustment



* Excludes bakery/cakes

** Includes beverages and tobacco

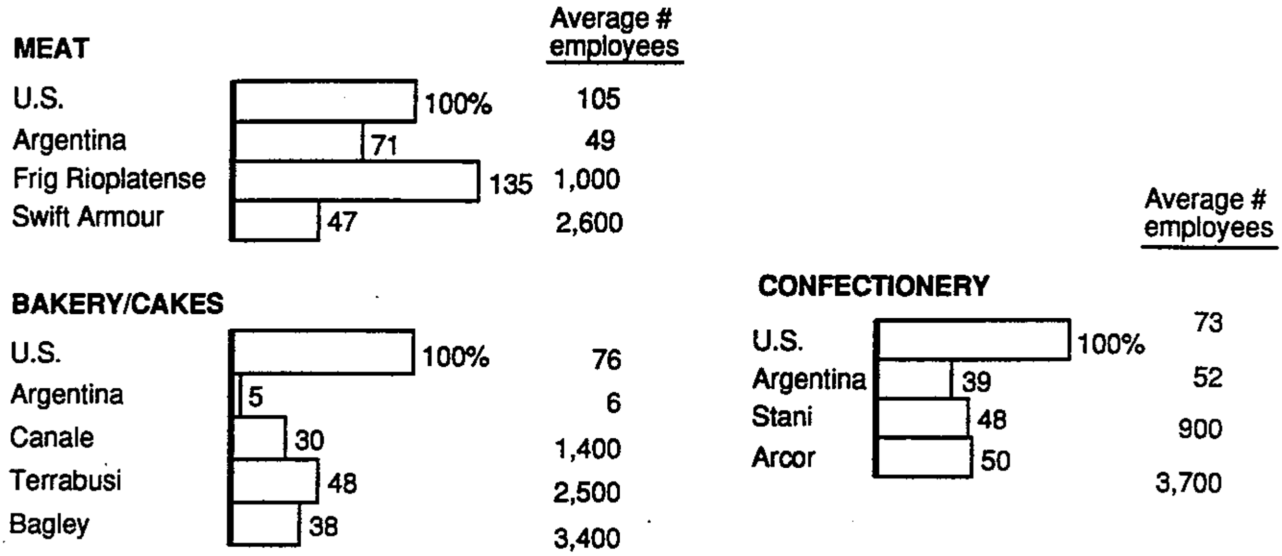
*** Excludes "tortillerias"

Source: Census of Manufactures; McKinsey analysis

Exhibit 16

LABOR PRODUCTIVITY IN THE BIGGEST ARGENTINEAN COMPANIES

Annual output per employee in 1993, U.S. $ adjusted by international prices, Index: U.S. = 100%

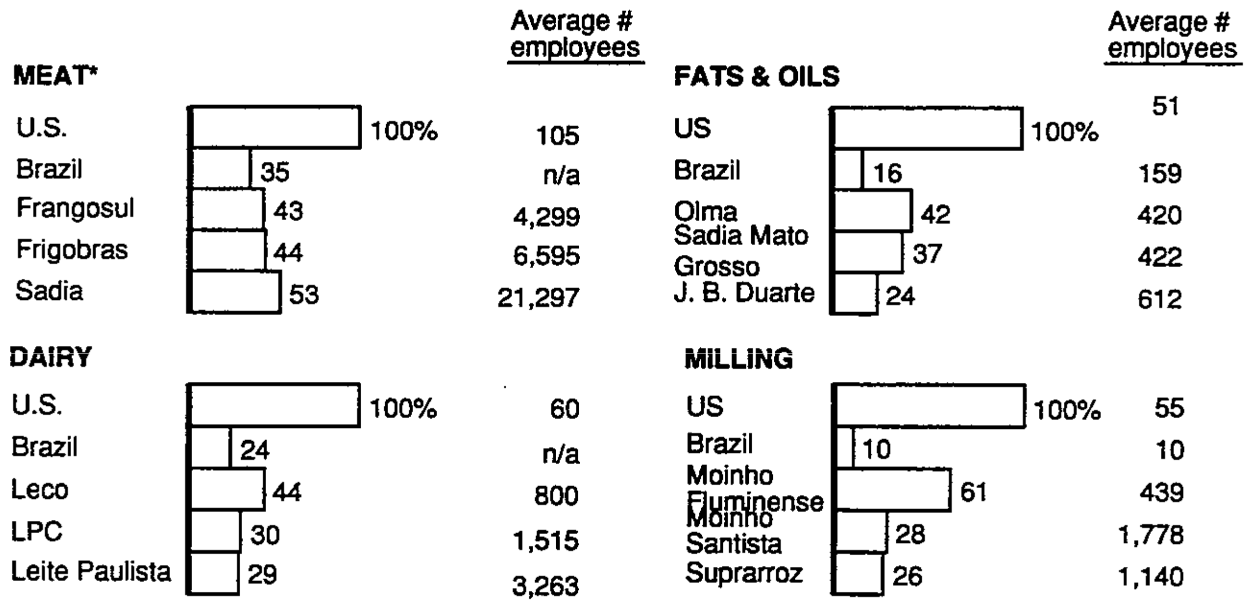


Source: Annual reports, Census of Manufactures, McKinsey analysis

Exhibit 17

LABOR PRODUCTIVITY IN THE BIGGEST BRAZILIAN COMPANIES

Annual output per employee in 1993, U.S. $ adjusted by international prices, Index: U.S. = 100%



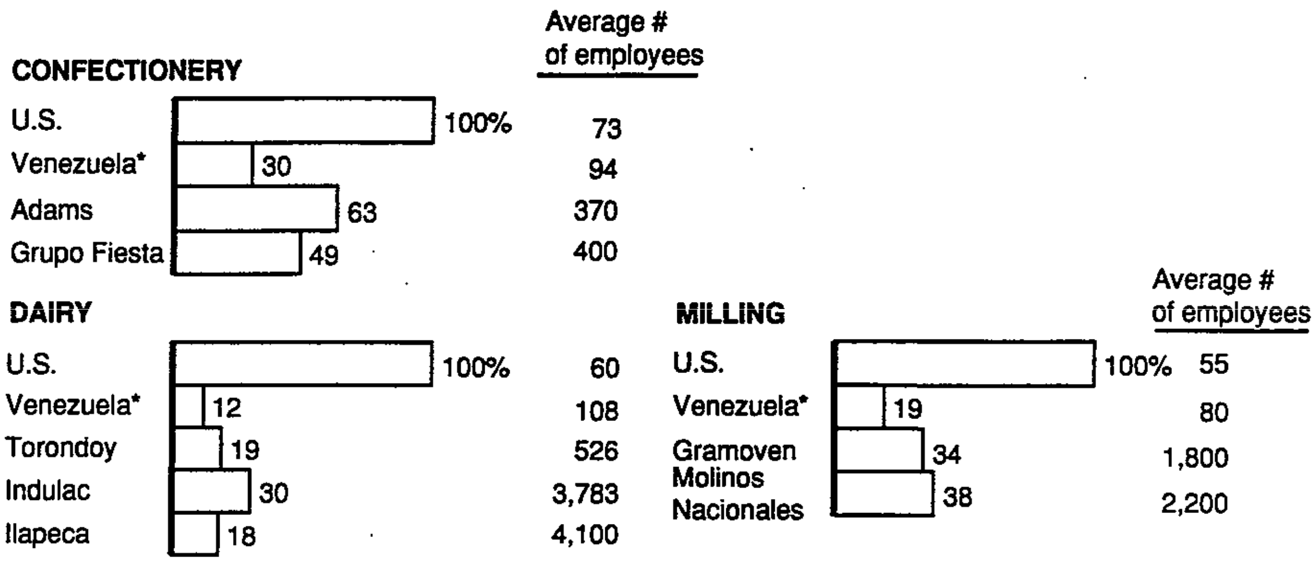
* Physical productivity

Source: Exame; interviews; annual reports; McKinsey analysis

Exhibit 18

LABOR PRODUCTIVITY IN THE BIGGEST VENEZUELAN COMPANIES

Annual output per employee in 1993, U.S. $ adjusted by international prices, Index: U.S. = 100%



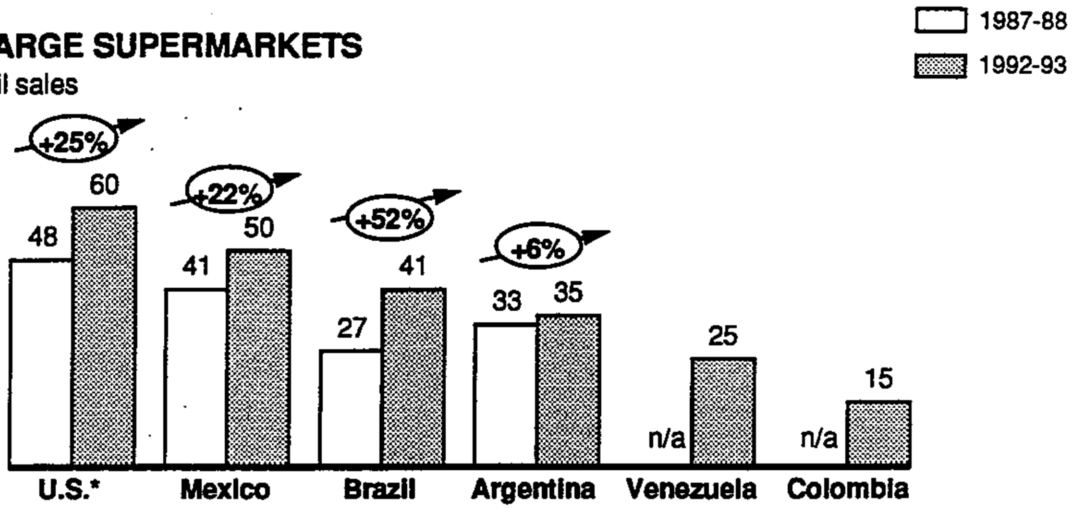
* Establishments with more than 5 employees

Source: Número; McKinsey analysis

Exhibit 19

GROWTH OF LARGE SUPERMARKETS

Percent of total retail sales



	U.S.*	Mexico	Brazil	Argentina	Venezuela	Colombia
Criteria for large supermarkets	U.S. $ sales (> U.S. $8 M/year)	U.S. $ sales (>U.S. $10 M/year)	Checkouts (>10)	Space (>350 m^2)	Chain stores	Chain stores

* Includes wholesale club stores

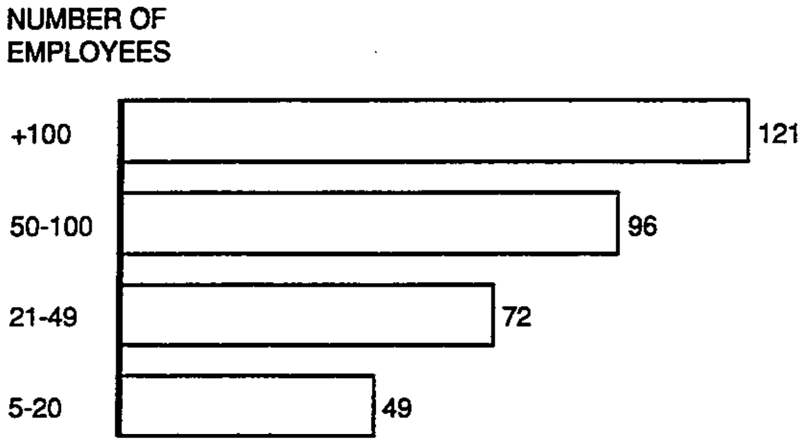
Source: Progressive Grocer (U.S.); Nielsen (Argentina, Brazil, Colombia); Supermarkets (Venezuela); Commercial Census and ANTAD (Mexico)

Exhibit 20

COMPENSATION LEVEL BY SIZE OF ESTABLISHMENT IN VENEZUELA

EXAMPLE

Processed food average = 100

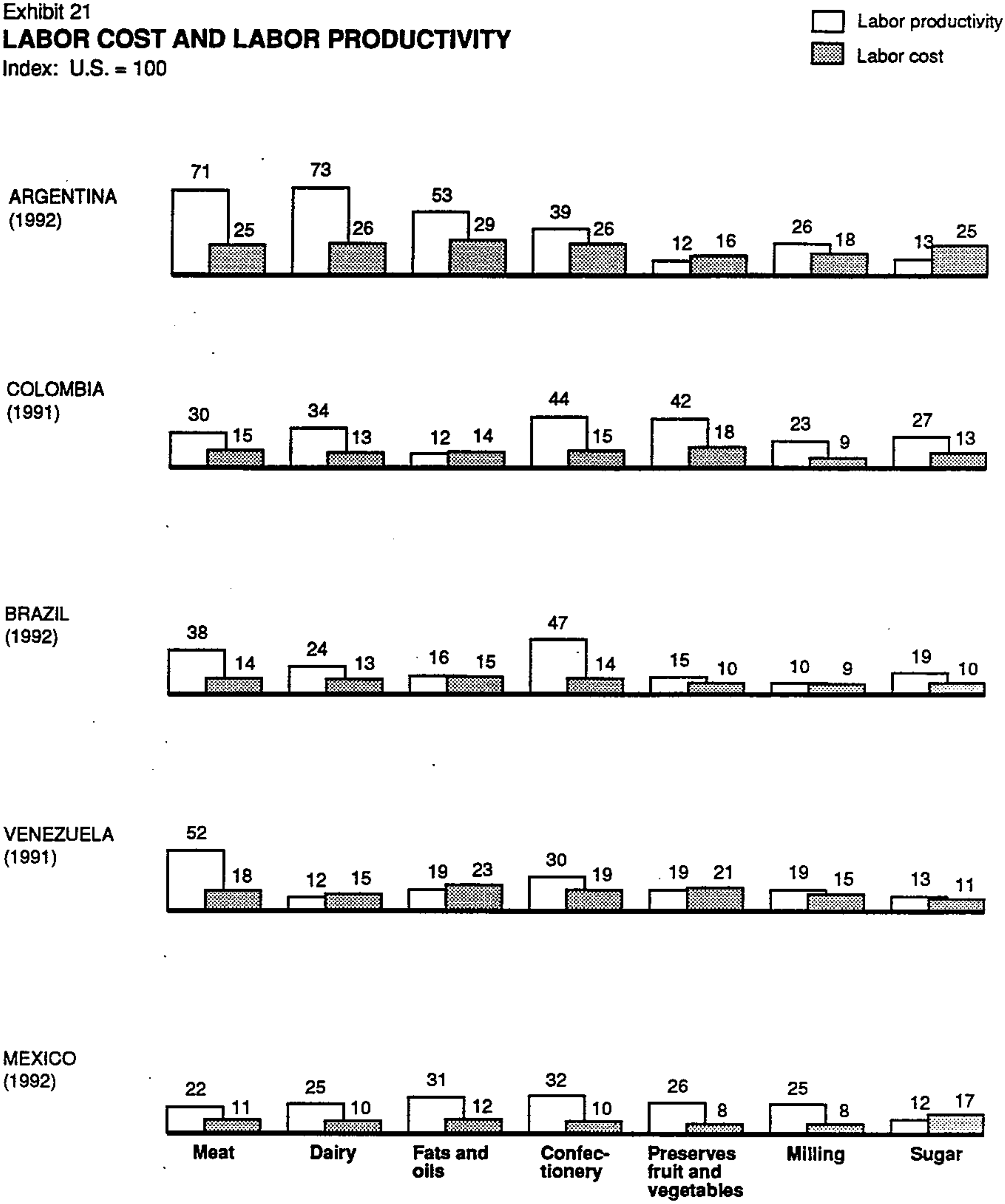


Source: Census of Manufactures; McKinsey analysis

Exhibit 21

LABOR COST AND LABOR PRODUCTIVITY

Index: U.S. = 100

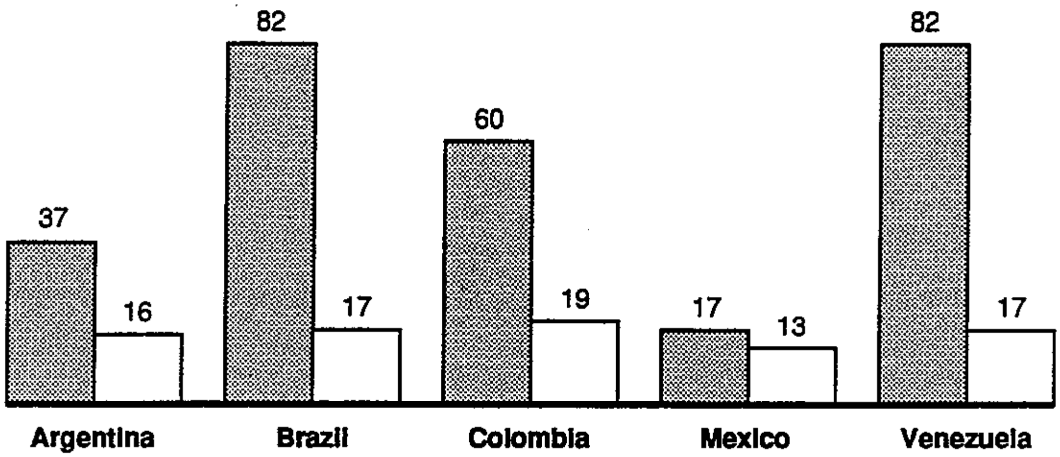


Source: UNIDA; McKinsey analysis

Exhibit 22

IMPORT TARIFFS EVOLUTION FOR PROCESSED FOOD

Percent average ad-valorem



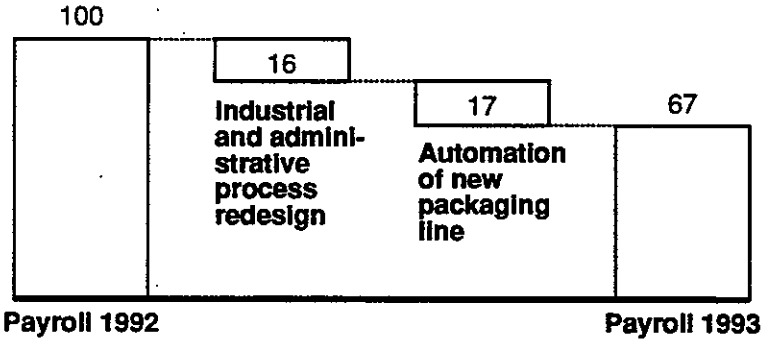
Source: McKinsey analysis

Exhibit 23

LABOR REDUCTION FOR A FOOD PRODUCER IN ARGENTINA

DISGUISED EXAMPLE

Percent



Investment (U.S. $ Millions)		
Lay off costs	2.6	2.7
Equipment	2.3	17.6
Total investment	4.9	20.3
Savings (U.S. $ Millions)	3.6	2.4
Payback (years)	1.4	**8.5**

The new packaging line was installed to enable exports and to avoid a loss of market share, since the payback from labor cost reduction by itself would not have met the company's requirements

Industry players were led to change packaging in response to pressure from distribution channels and consumers

Source: McKinsey analysis

Exhibit 24
TAX BURDEN COMPARISON FOR A MEAT PRODUCER*
Percent of sales

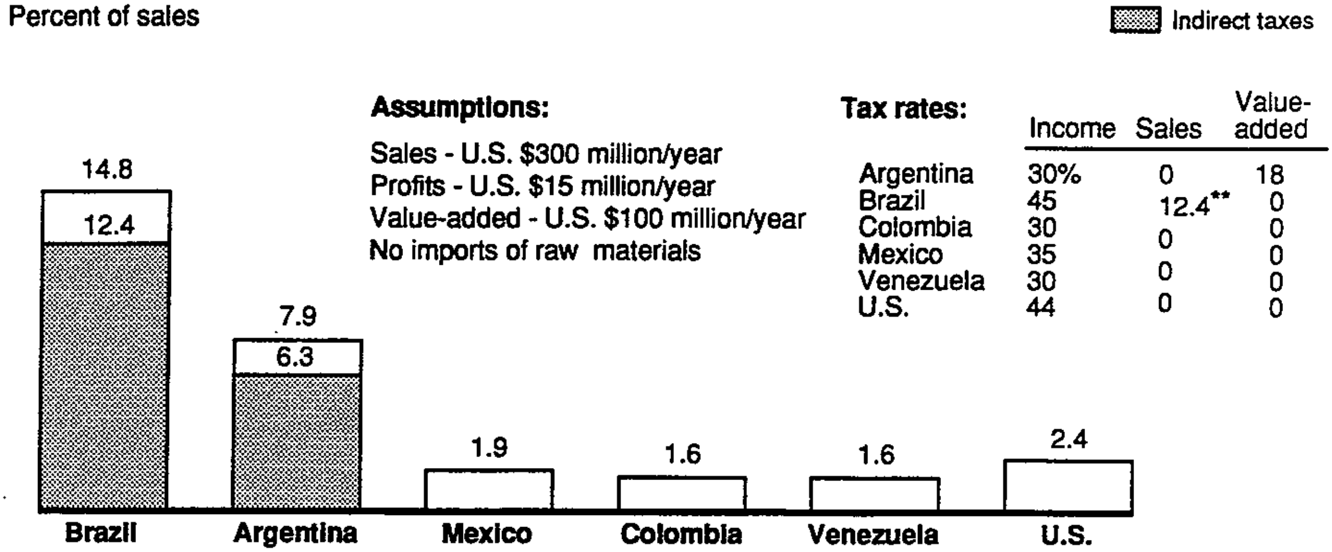
EXAMPLE

Assumptions:

Sales - U.S. $300 million/year
Profits - U.S. $15 million/year
Value-added - U.S. $100 million/year
No imports of raw materials

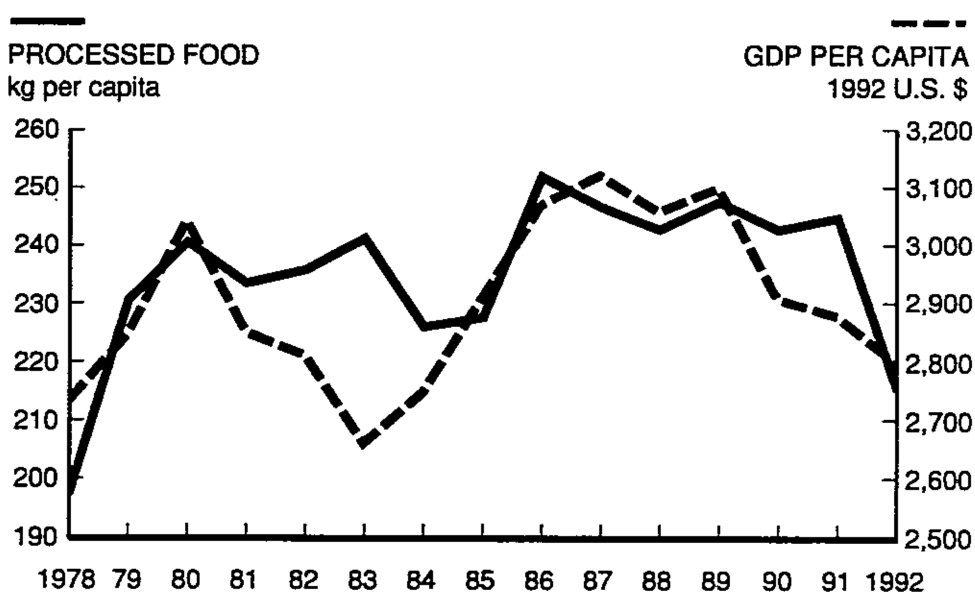
Tax rates:

	Income	Sales	Value-added
Argentina	30%	0	18
Brazil	45	12.4**	0
Colombia	30	0	0
Mexico	35	0	0
Venezuela	30	0	0
U.S.	44	0	0



* Excludes taxes on labor
** Due to an exemption to raw materials producers, the value-added ICMS tax becomes a tax on sales of 7%
Source: McKinsey analysis

Exhibit 25
EVOLUTION OF GDP AND FOOD CONSUMPTION PER CAPITA IN BRAZIL



Source: Datamark; Central Bank

Exhibit 26

INVESTMENT IN AUTOMATION

New plant built by a food producer in Latin America

DISGUISED EXAMPLE

Total investment	U.S. $70 million
Reduction in employment	900 employees
Annual savings	U.S. $12 million
Payback	6 years

The company exports 70% of its output to the U.S.

The U.S. sanitary authorities would cancel the export license if plant installations were not renewed

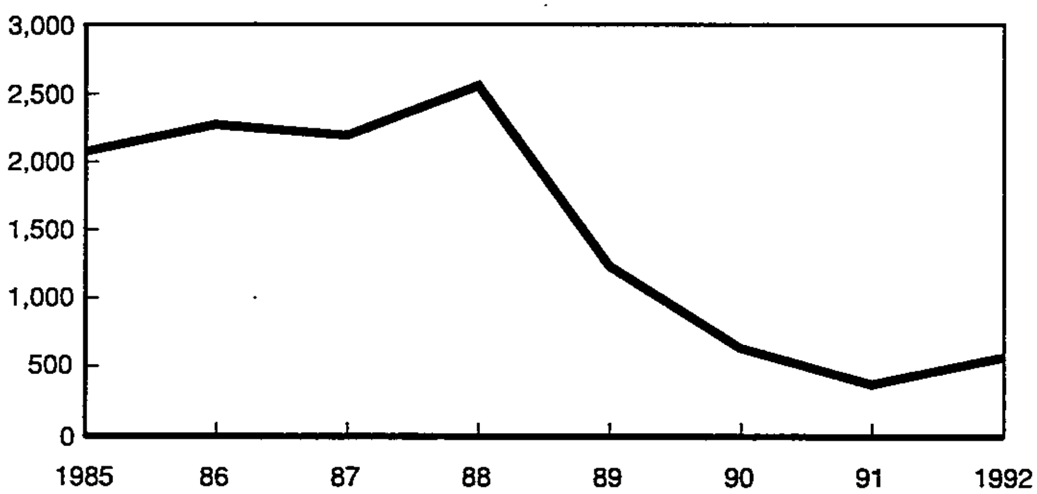
The investment was approved for marketing reasons, and not because of cost reduction

Source: Press; Interviews; McKinsey analysis

Exhibit 27

EVOLUTION OF INVESTMENTS IN BRAZIL

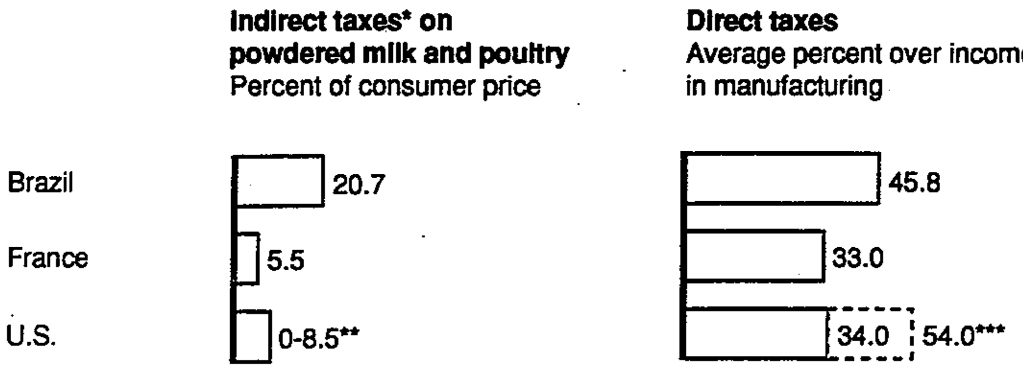
1993 U.S. $ Million



Source: Food Producers Association

Exhibit 28

TAX BURDEN COMPARISON



* Does not include taxes on labor

** Only 20 states tax sales, with rates that vary from 1.0% to 6.5%; local sales taxes (i.e., county, city, and other taxes) vary from 0% to 6%

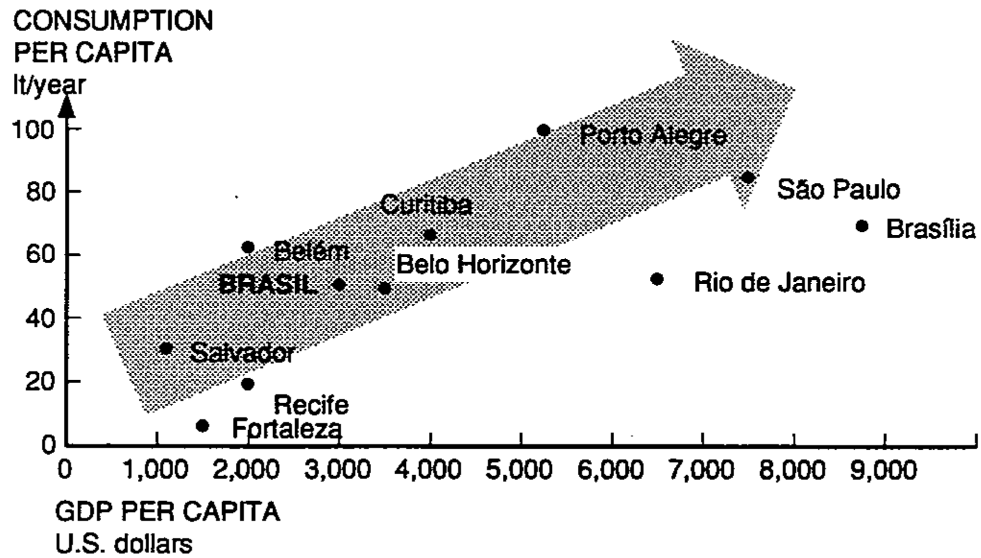
*** Federal tax is 34% and local/state tax varies from 0% to 20%

Source: Jornal do Brasil (Ernst & Young); Celulose & Papel (Arthur Andersen); U.S. Bureau of the Census

Exhibit 29

EXAMPLE

COMPARISON BETWEEN GDP PER CAPITA AND MILK CONSUMPTION IN BRAZIL

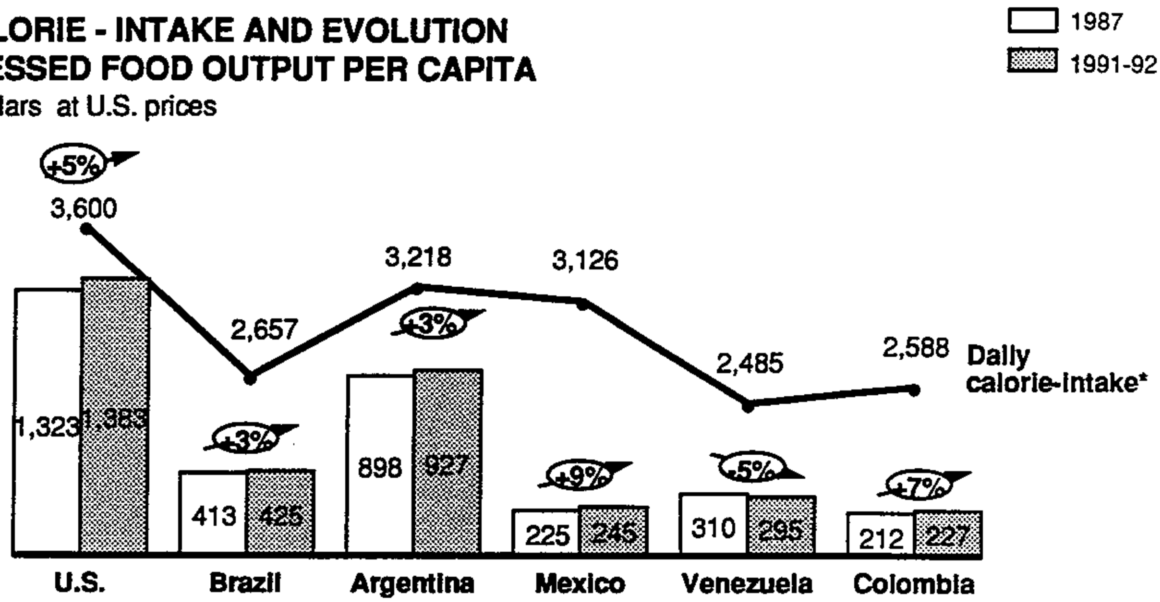


Source: IBGE; IPEA

Exhibit 30

DAILY CALORIE - INTAKE AND EVOLUTION OF PROCESSED FOOD OUTPUT PER CAPITA

1993 U.S. dollars at U.S. prices



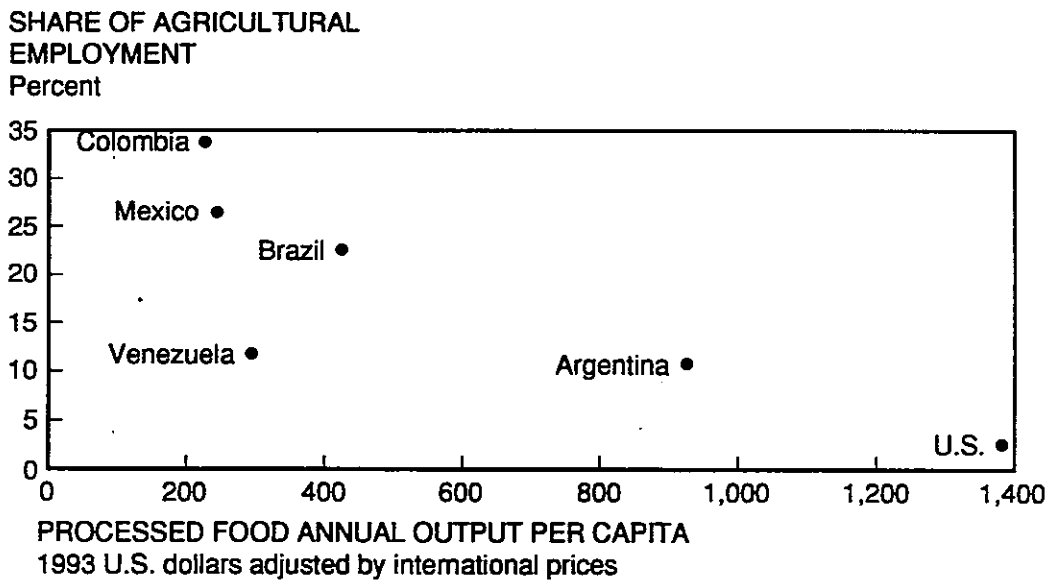
* Average for 1980-87 in Latin America and 1985-88 in the U.S.

** 1988

Source: Statistical Abstract of Latin America; Food and Nutrition (U.S.); McKinsey analysis

Exhibit 31

PROCESSED FOOD AND AGRICULTURAL EMPLOYMENT



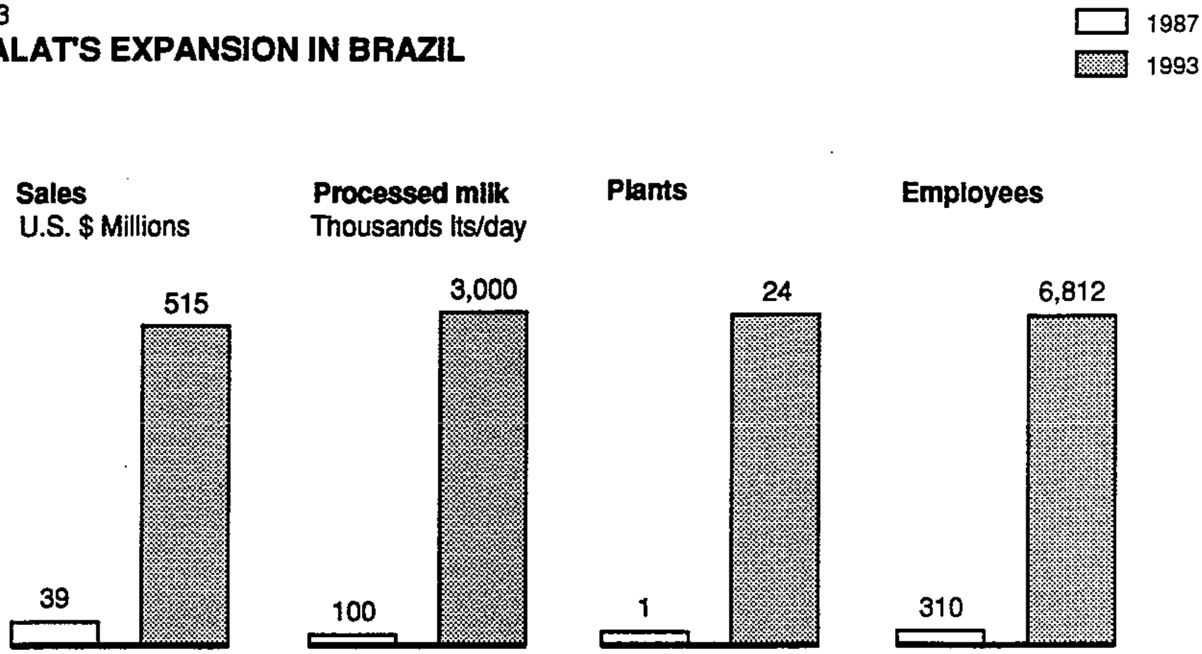
Source: McKinsey analysis

Exhibit 32

ACQUISITION BY MULTINATIONALS IN ARGENTINA, COLOMBIA, VENEZUELA, BRAZIL, AND MEXICO 1990-93

		1990	1991	1992	1993
Argentina	Nestle	Mendicrim	Laponia	Adler	
	Philip Morris		Suchard	Tang	La Montevideana
	Paramalat			La Vascongada	Rippoll
	Cadbury				Stani
Colombia	Unilever	Facegra Jainsa			
Venezuela	Plumrose		Venezolana		
	HJ Heinz		Empacadora		Kellogg (desert division)
	Cargill				Mavesa
Brazil	Parmalat	Teixeira Alimba Via Láctea	Alpha Santa Helena Suprergo	Gó-Gó Mococa de Goáis	Planalto Lacesa Petybon Discoitos
	Nestle	1 plant from CCPL			4 plants from SPHM Confianca
	Lever	Queijos Rex			Cica
	CPC (Refinacões de Milho Brasil)	Kitano	McKormick Arrozina	Indasa de São Brás	
	Bunge Group		Petybon		
	Polenghi		Skandia Campo Limpo Airouca		
Mexico	Unilever	Valores Industriales Industrias Conasupo			
	Pepsico	Empresas Gamesa			
	Hershey Foods		Nacional de Dulces		
	Aarhus Oliefabrik		Negociacion Industrial Santa Lucia		
	West Trust				Mexican Quality Foods
	Nabisco				Anderson Clayton (pasta division)

Exhibit 33
PARMALAT'S EXPANSION IN BRAZIL



Source: Exame

Exhibit 34
CAUSES OF LABOR PRODUCTIVITY DIFFERENCES
PROCESSED FOOD

● Important
○ Secondary
X Undifferentiating

External factors	• Market conditions	
	- Demand factors	X
	- Relative input prices/factor availability	●
	- Other industries	○
	• Policy and regulation	
	- Import barriers	●
	- Competition and concentration rules	○
	- Labor rules and unionism	X
	- State ownership	X
	- Other (fiscal policy, price controls)	●
	Nature of competition	○
Production process	• Output mix, variety, quality	X
	• Production factors	
	- Capital (intensity, vintage, technology)	●
	- Scale	●
	- Labor skills	X
	- Organization of functions and tasks	○
	LABOR PRODUCTIVITY	

Source: McKinsey estimate

APPENDIX

INTERNATIONAL PRICES FOR PROCESSED FOOD

PRODUCTIVITY MEASUREMENT IN THE FOOD INDUSTRY

Any attempt at comparing productivity levels among countries by using monetary output values must deal with the difficulty of choosing a suitable exchange rate for currency conversion. In the case of the processed food industry in Latin America, the use of monetary data is unavoidable due to the lack of homogeneity between the different products considered, which makes it impossible to aggregate physical output directly. Unlike other industries (such as steel) where products usually differ by grade or quality level, in the processed food industry there is no natural way of building an equivalence table for comparing, for example, chocolate and sausages. Besides, reliable information regarding physical output for the sector is hard to obtain, as volume of production statistics are rarely part of the census data.

One way to compare the output of different countries is simply to convert the national currencies at market exchange rates. However, market exchange rates do not reflect the differences in price levels between countries and are not, therefore, the appropriate currency conversion rates with which to make international comparisons of volume. Exchange rates and purchasing power differences will not usually coincide due to several reasons: exchange rates reflect capital flows between countries as well as flows of goods; value-added taxes differ from country to country; not all items produced by the economy are traded, and those that are will often suffer from price distortions due to import barriers.

An alternative approach is to use one set of prices for all the countries analyzed ("international prices" also called "purchasing power parity – PPP"), which provide us with a way of correcting the distortions caused by exchange rates and of computing physical productivity using monetary output data. International prices (IPs) equalize the purchasing power of different currencies. This means that a given sum of money will buy the same basket of goods and services in all countries. In other words, IPs are the rates of currency conversion which eliminate the differences in price levels between countries. We have used bilateral comparisons between each country and the U.S. Exhibit A1 illustrates the use of the IPs technique. Using a straight conversion based on exchange rates, the labor productivity of country A will be estimated at one-tenth of the U.S. level. On the other hand, if we adjust by IPs, this figure rises to 25 percent of U.S. productivity, which is consistent with the level of physical output per employee. This is the method we have adopted for measuring the labor productivity in the Latin American processed food industry.

IPs for the Food Sector

Although some country-specific IP estimates exist for the economy as a whole, few attempts have been made to calculate sector-specific IPs. In particular, there is not available figure for the relative prices of processed food in Latin America. IPs for the whole economy are not only difficult to compute and perhaps unreliable, they are also potentially misleading for our present purposes. Relative prices in Latin America tend to vary significantly from goods to goods and service to service. Items such as automobiles are typically more expensive (by whatever standard) than in the U.S. On the other hand, manual labor or public transportation tend to be a lot cheaper. It will, therefore, be crucial for us to establish an adequate IP before carrying out our comparison of food manufacturing. In the process we shall go even further and compute purchasing power parities for each of the major subsectors of the industry including meat, bakery, milling, dairy, fats and oils, and sugar, increasing the accuracy of our productivity measurement.

INTERNATIONAL PRICES METHODOLOGY

In order to come up with an adequate IP, our main task is to compare factory-gate prices of goods between each Latin American country and the U.S. Rather than hunting throughout the continent for wholesale prices at the factory level, it is much easier to obtain prices at large supermarkets and adjust them for these retailers' markups. Exhibit A2 shows the process followed to compute the IPs for each subsector.

Data Collection and Matching Process

In the process of defining a representative sample for price collection, we followed an OECD guideline which suggested that at least 200 items per country should be included. Trying to anticipate the difficulties we would encounter while attempting to match the products in Latin America to U.S. equivalents, we began by gathering a much larger sample. Price surveys were conducted in five of the largest stores in selected cities of each country, including Washington, D.C. for the U.S. The largest number of SKUs (stock keeping units) gathered was around 1,000 in the case of Brazil.

Average prices were computed for each item surveyed, and compared one-to-one against the U.S. standard. Every effort was made to restrict the matches not only to similar products, but also to items with the same type of presentation. Finer adjustments regarding additives, exact proportion of ingredients and "quality" were not made. As shown in Exhibit A3, a total of more than 1,300 matches was achieved. The resulting number of matches for Brazil was significantly higher than that for the other countries. This difference is due mostly to a greater variety of brands and types included for each product. A sensitivity analysis was performed by cropping this list down to a size equal to that of Venezuela, which resulted in very small variations in the IP values. This can be interpreted as empirical evidence for concluding that the other SKU lists are already large enough for good accuracy.

The above process allowed us to compute consumer level IPs for each product, each category or heading, each subsector, and finally for the entire food sector of each country. For each brand of a given product, the prices obtained at different stores were averaged. Then a second average was made using the prices for each brand, which led to a product IP. The IP for the whole processed food industry was calculated as a weighted average of the subsector IPs, using consumer price index weights for the different subsectors (Exhibit A4). In most cases, such weights were available for individual categories, which allowed greater precision in the computation of subsector IPs. Weights for individual products were usually not available, so in most cases straight averages had to be used to obtain category IPs.

To carry out the productivity analysis, producer level IPs are required, so information regarding markups for the U.S. and Latin American supermarkets was obtained through interviews, and the bilateral price comparison was performed using corrected figures of prices minus markups for each country. Producers sell their goods at very similar prices to wholesalers and large supermarkets, which is why supermarket prices minus their margins were used as a proxy for producer prices. The higher prices usually found in small retail establishments reflect not only higher markups but also the fact that small stores do not, in general, make purchases directly from producers.

Calculation of IP Evolution

Data regarding employment and production for Latin America is available only for 1987, 1991 and 1992, depending on the country. Therefore, before evaluating the productivity of the industry we need to calculate the food subsector IPs for these years. Consumer price index data was used to deflate 1993 prices to 1991 and 1987. For most countries, including the U.S., the price index data was available for each product category (Exhibit A5), which allowed the estimate to be made with greater precision.

IP RESULTS

Consumer Level Prices

Exhibit A6 shows that the consumer price level for food in Latin America is around 70 percent of the U.S. This means that what is available for U.S.$100 in the United States will cost U.S.$70 in Latin America (ranging from U.S.$60 in Venezuela to U.S.$85 in Argentina). This fact should be the result of cheaper inputs (raw materials and labor) that more than offset the lower productivity levels of the industry. Higher prices in the U.S. might also reflect some differences in service levels, such as the abundance of 24-hour stores, which are unheard of in most of Latin America.

Exceptions

Exhibit A6 shows consistently high IPs for bakery and preserved food as compared with other subsectors. Preserves in Latin America are produced in relatively low volumes compared with the U.S., and are considered somewhat more luxurious as well. It is, therefore, not surprising to find that they are priced a little higher than in the U.S. and are not produced as efficiently as other goods in the industry, as we show in the food case. The bakery IP reflects a cultural phenomenon which is pervasive throughout Latin America. The "paderías" or "panaderías," which account for a large fraction of bread sales, are usually small establishments (hybrids between a factory and a store) where dough is prepared and loaves are baked by traditional, old fashioned means, with low levels of automatization, no economies of scale whatsoever, and little interest doing things otherwise. In Mexico, there were over 12,000 panaderías in 1988, with an average of less than 8 workers per plant. Nearly 20 percent of the total food sector work force was employed at one of these bakeries. Exhibit A7 shows the number of workers per bakery in each country. From the difference in average plant size it is evident that the panaderías are very small producers indeed.

Producer Level Prices

Exhibit A8 shows the price levels compared with the U.S. after adjusting by the retailer margins shown in Exhibit A9. We can see that margins in the U.S. are generally higher than in Latin America, resulting in Latin American producer price levels that are relatively higher than consumer price levels. Latin American consumers might very well be more price sensitive than the U.S. public due to the fact that food purchases represent a much heavier burden for the average buyer, as will be shown below. Also, for certain basic goods such as milk, sugar and flour, price controls still exist in some of the countries studied. The IP for the subset of basic goods of these countries is generally lower than the subsector IPs corresponding to each of these goods (Exhibit A10). Besides the factors already mentioned, others such as lower costs of raw materials, higher production volumes, and tougher competition for basic food categories could also play a part in this phenomenon.

Exhibit A11 shows the evolution of the price levels over 6 years. The details are included in Exhibits A12 and A13. The rates of food inflation and currency devaluation do not usually coincide, even for industrialized nations. Therefore, the relative IPs among countries will tend to shift from year to year (Exhibit A14).

Workers' Income and Food Prices

It is interesting to observe that the IPs do very little to compensate for the differences in income that exist between the U.S. and Latin America. Exhibit A15 shows the number of days that a food industry employee must work in order to buy a given amount of processed food. Despite lower prices, the differences in salary are overwhelming. As a percentage of a worker's budget, food weighs a lot more in Latin America than in the United States.

SUMMARY

¶ The IPs computed above allow us to measure productivity with greater accuracy than monetary comparisons based on market exchange rates.

¶ Processed food in Latin America is cheaper than in the U.S. with the exception of bread and preserves.

¶ However, food prices are not as low as salaries, so purchasing processed food constitutes a heavier burden for Latin Americans.

Exhibit A1

MATCHING PHYSICAL AND MONETARY OUTPUT USING "INTERNATIONAL PRICES"

		U.S.	Country A
Physical productivity	Physical production	1,000 tons	100 tons
	Employment	10	4
	Labor productivity	100	25
Monetary productivity using market exchange rates	Monetary output in local currency	$1,000	80 pesos
	Exchange rate	–	2 pesos/U.S. $
	Monetary output in U.S. $	$1,000	$40
	Labor productivity (U.S. $/employee)	100	10
Monetary productivity adjusted by "International Prices"	Monetary output in U.S. $	$1,000	$40
	Price in local currency	$1	0.8 pesos
	Price in U.S. $	$1	0.4 $
	Monetary output at U.S. prices	1,000	100
	Labor productivity (U.S. $/employee)	100	25

Exhibit A2

METHODOLOGY FOR CALCULATING INTERNATIONAL PRICES

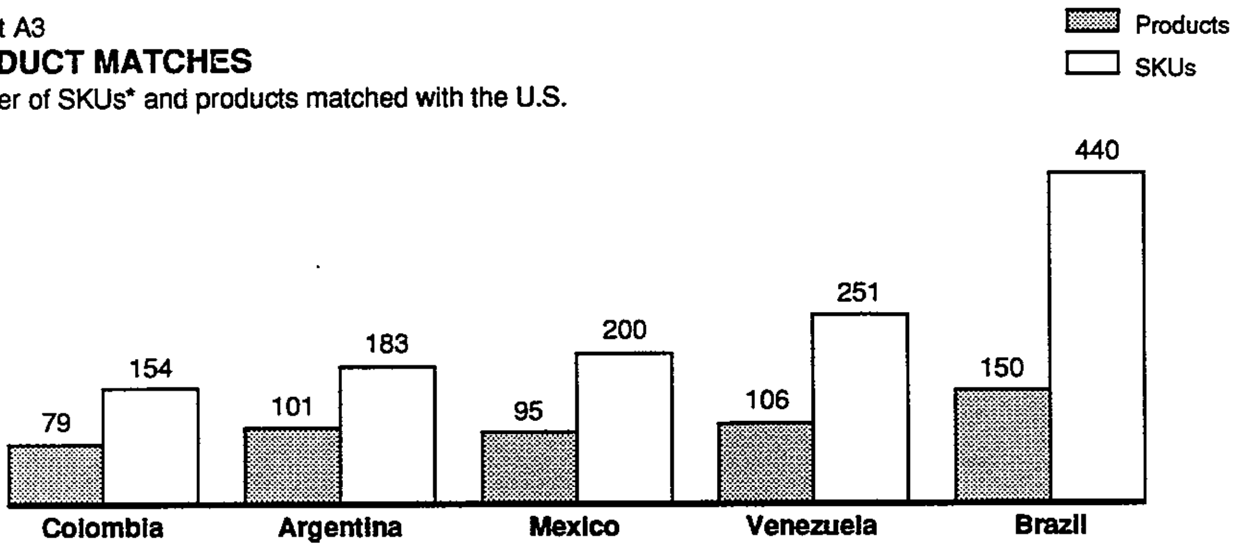
Define list of representative products	**Obtain consume r prices**	**Deduct retail markup to obtain factory-gate gross price**	**Match products in Latin America with the U.S.**	**Calculate relative prices for SKUs, product categories, and sub-sectors**	**Deflate 1993 prices to calculate price levels for years used in the analysis**	**End product: international prices by subsector for 87/88 and 91/92**
• Visit 2 supermarkets to create initial list • Interview supermarket purchasers to review/refine initial list	• Conduct price checks in 5 of the larger stores in 6 selected cities – Buenos Aires – São Paulo – Bogota – Mexico City – Caracas – Washington, D.C.	• Interview retailers to obtain estimated markup for large supermarkets	• Use bilateral comparison to match products in each L.A. country with the U.S. • Restrict matches to equal products (e.g., same packaging)	• Calculate product category price level using a simple average • Calculate subsector price level using a weighted average based on weights from local consumer price index • Present price level as a percentage of the U.S. price for 2 levels: consumer and producer with taxes	• Deflate 1993 prices based on inflation for most detailed items (i.e., either product or product category)	

Source: McKinsey

Exhibit A3

PRODUCT MATCHES

Number of SKUs* and products matched with the U.S.

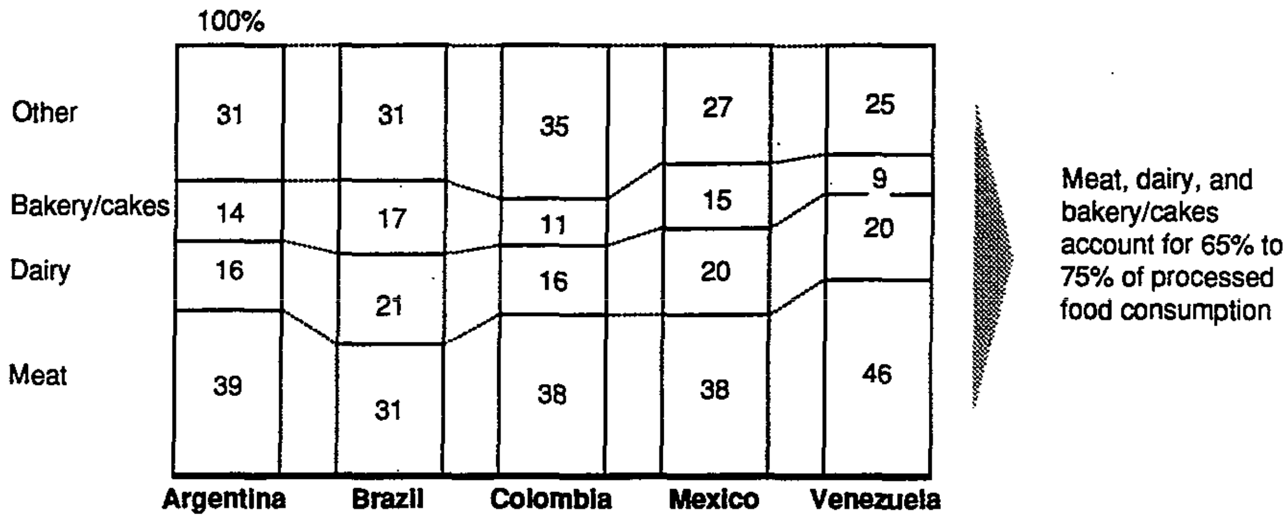


* Stock keeping unit

Note: A product will have more than one SKU if it has more than one brand or package; for example, if the product "egg noodles" appears in the list 5 times because of differences in brands or packages, its SKU count would be 5 even though its product count is 1

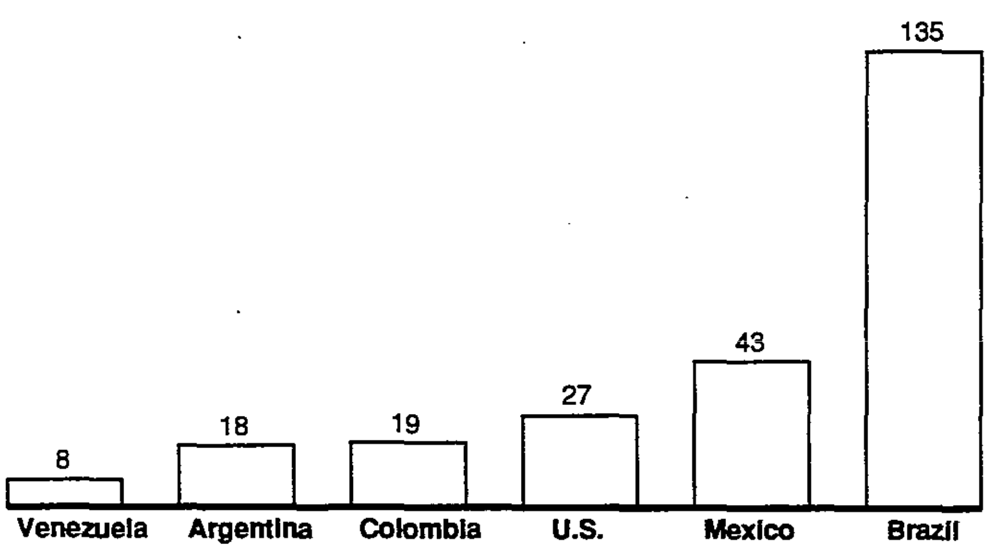
Source: McKinsey analysis

Exhibit A4
CONSUMER PRICE INDEX WEIGHTS FOR MAJOR SUBSECTORS



Source: Government agencies

Exhibit A5
NUMBER OF DEFLATION INDICES

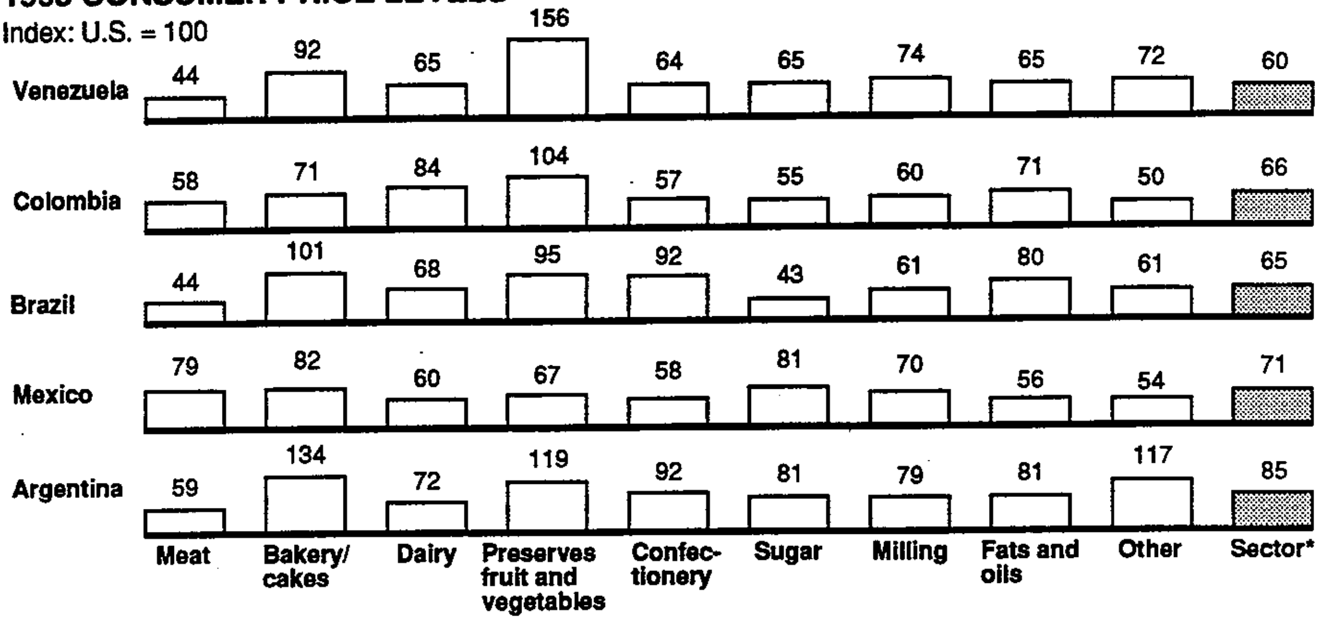


Source: McKinsey analysis

Exhibit A6

1993 CONSUMER PRICE LEVELS

Index: U.S. = 100



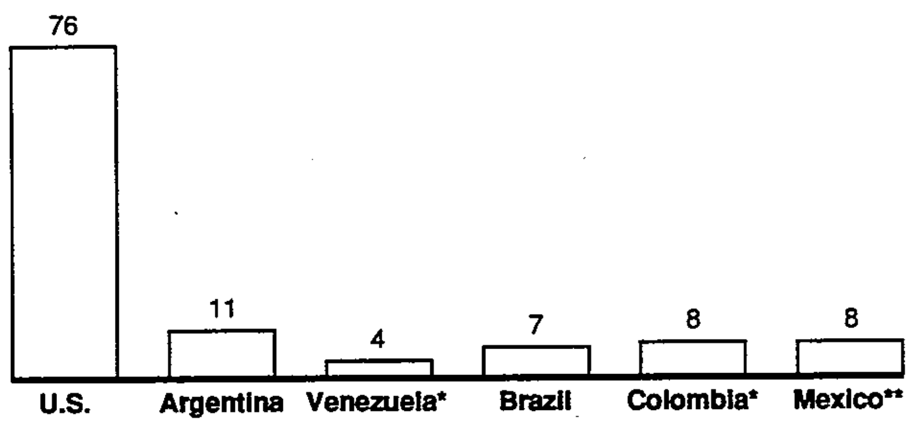
* Weighted by each country's consumer price index

Source: McKinsey analysis

Exhibit A7

PLANT SCALE FOR BAKERY/CAKES

Number of employees per plant



* The number of plants and employees for establishments with less than 5 employees in Venezuela and less than 10 employees in Colombia was estimated based on Mexico's figures

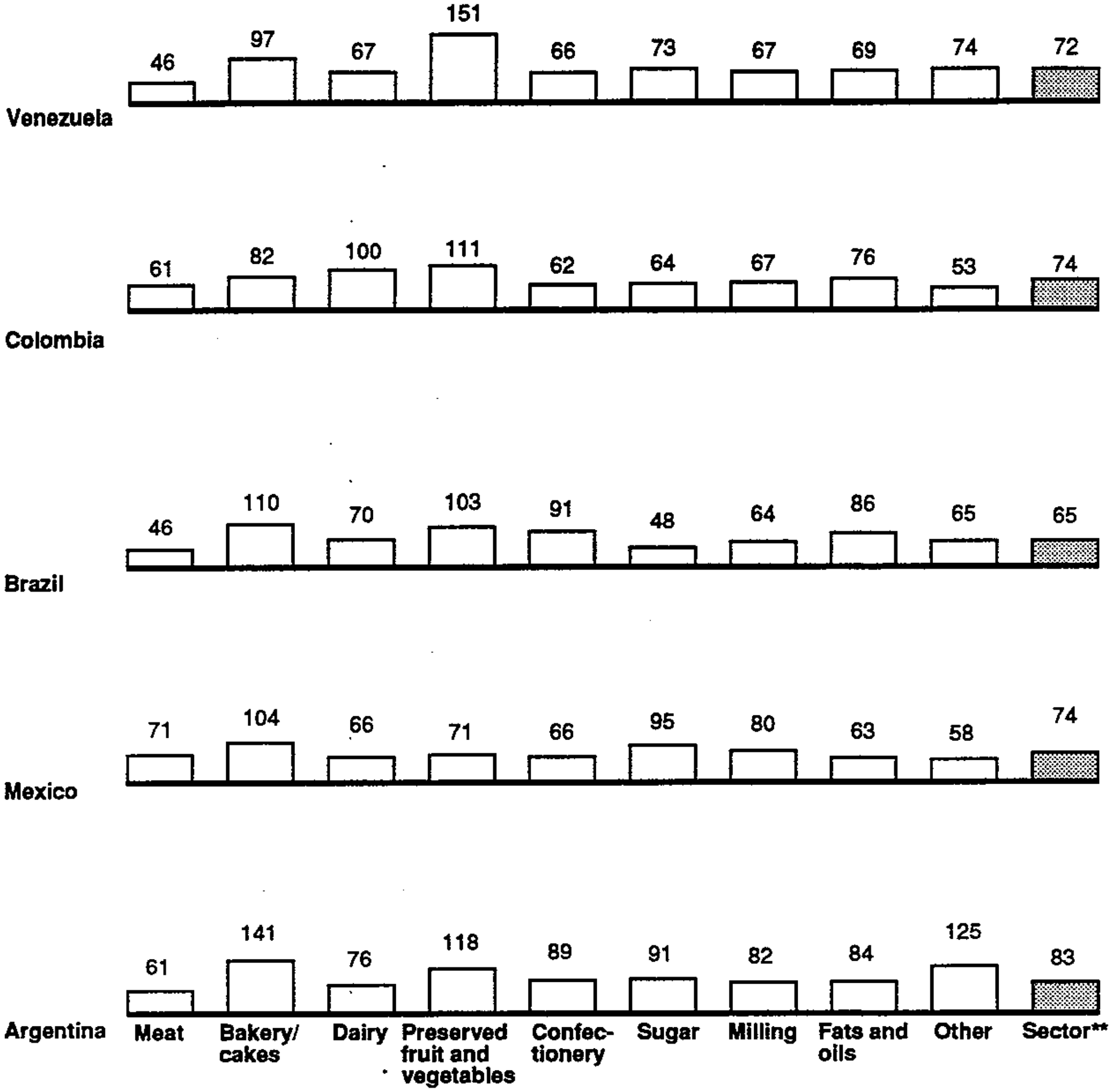
** Does not include "tortillerias;" the number including "tortillerias" would be 4

Source: Census of manufactures (Mexico: 1988; Argentina: 1992; Colombia: 1991; Venezuela: 1991; Brazil: 1992; US: 1987)

Exhibit A8

1993 GROSS PRODUCER PRICE LEVELS*

Index: U.S. = 100



* Includes taxes on sales and value-added

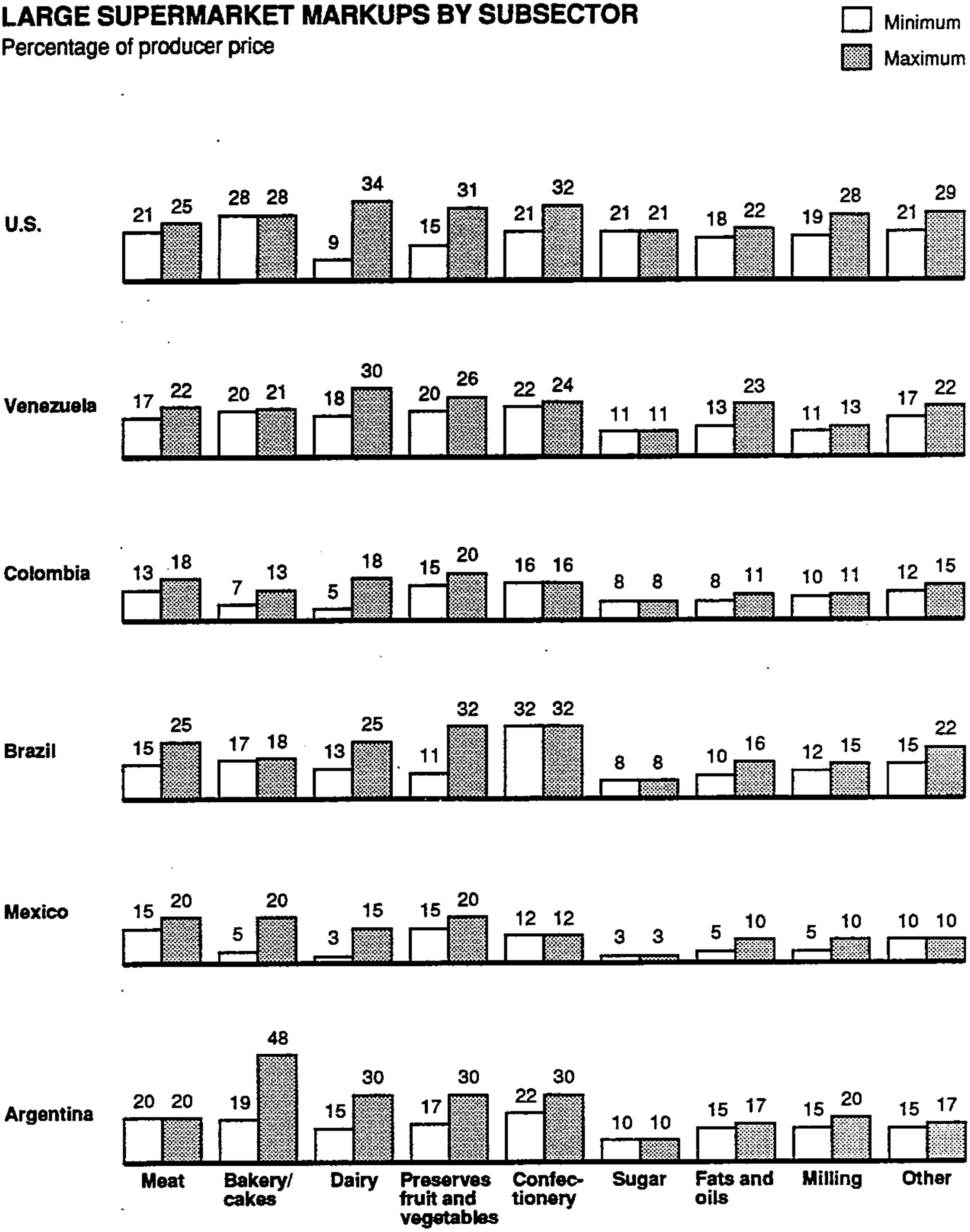
** Weighted by each country's output value

Source: McKinsey analysis

Exhibit A9

LARGE SUPERMARKET MARKUPS BY SUBSECTOR

Percentage of producer price

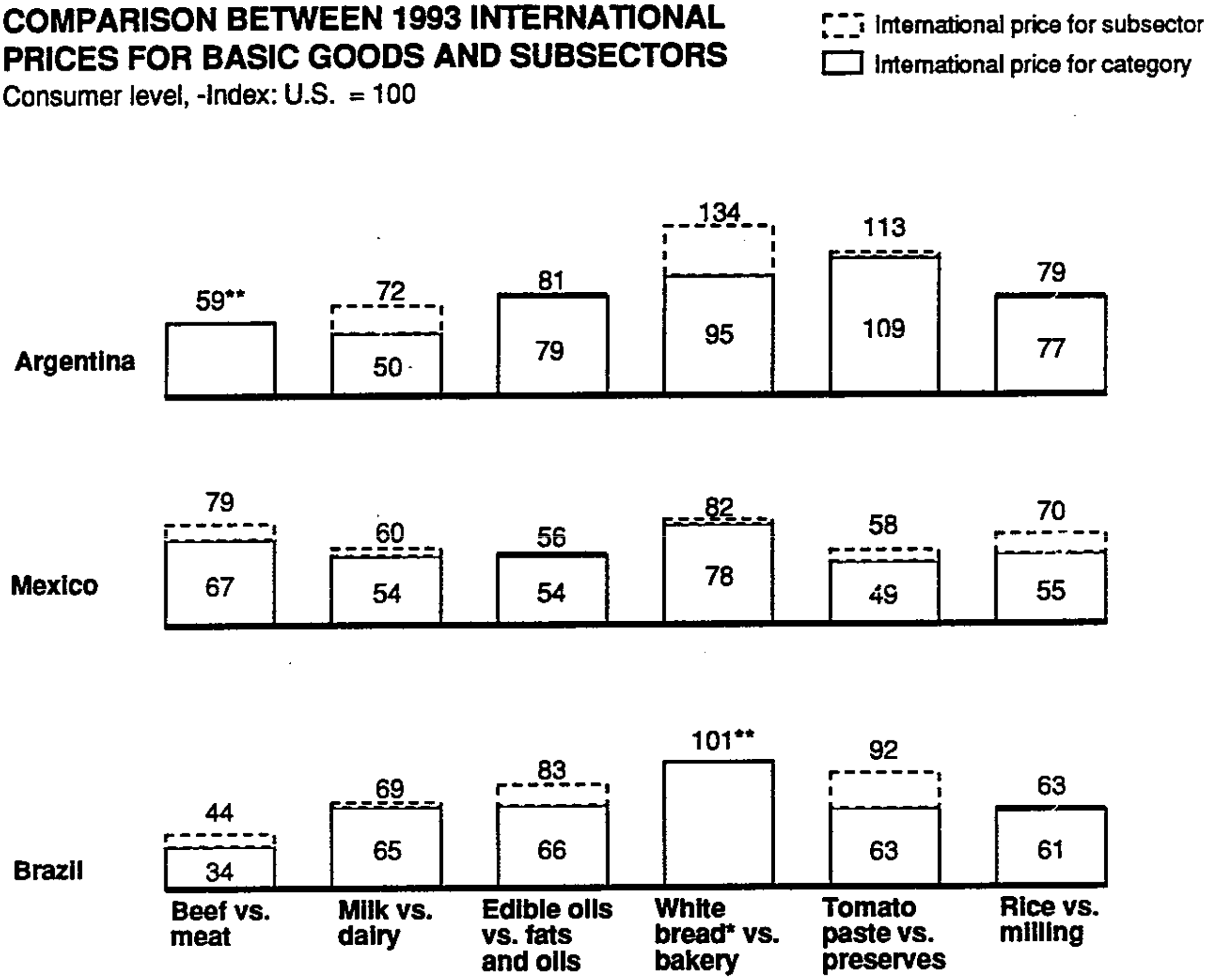


Source: Interviews; Food Producers Association (Brazil)

Exhibit A10

COMPARISON BETWEEN 1993 INTERNATIONAL PRICES FOR BASIC GOODS AND SUBSECTORS

Consumer level, -Index: U.S. = 100



* Baguete for Brazil, Bolillo for Mexico

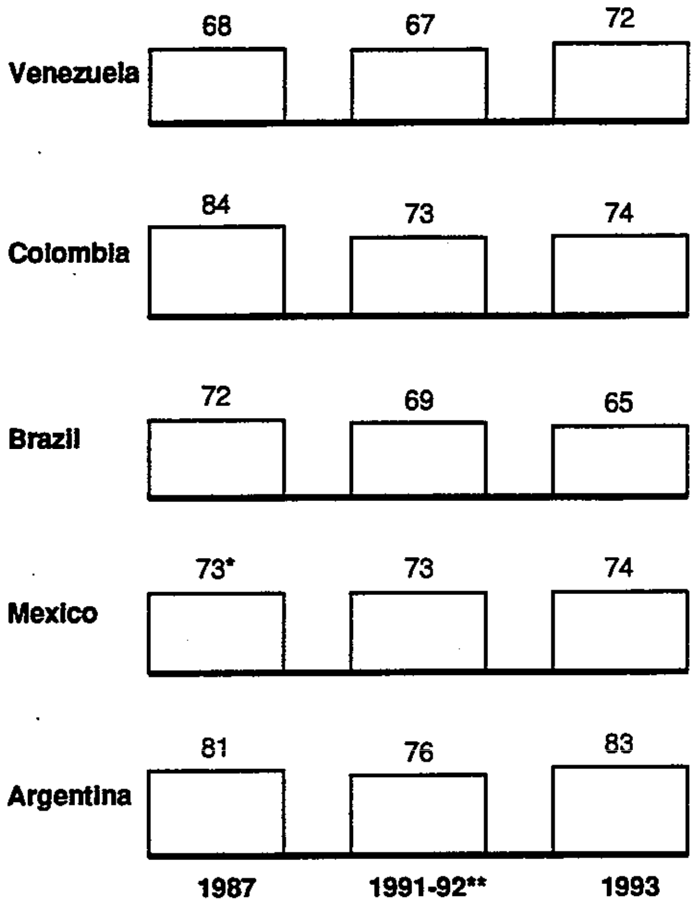
** Same IPP for category and subsector

Source: Brazil - DIEESE (cesta básica); México - Profeco (canasta básica)

Exhibit A11

PRICE LEVEL EVOLUTION (GROSS PRODUCER PRICES)

Index: U.S. = 100



* 1988

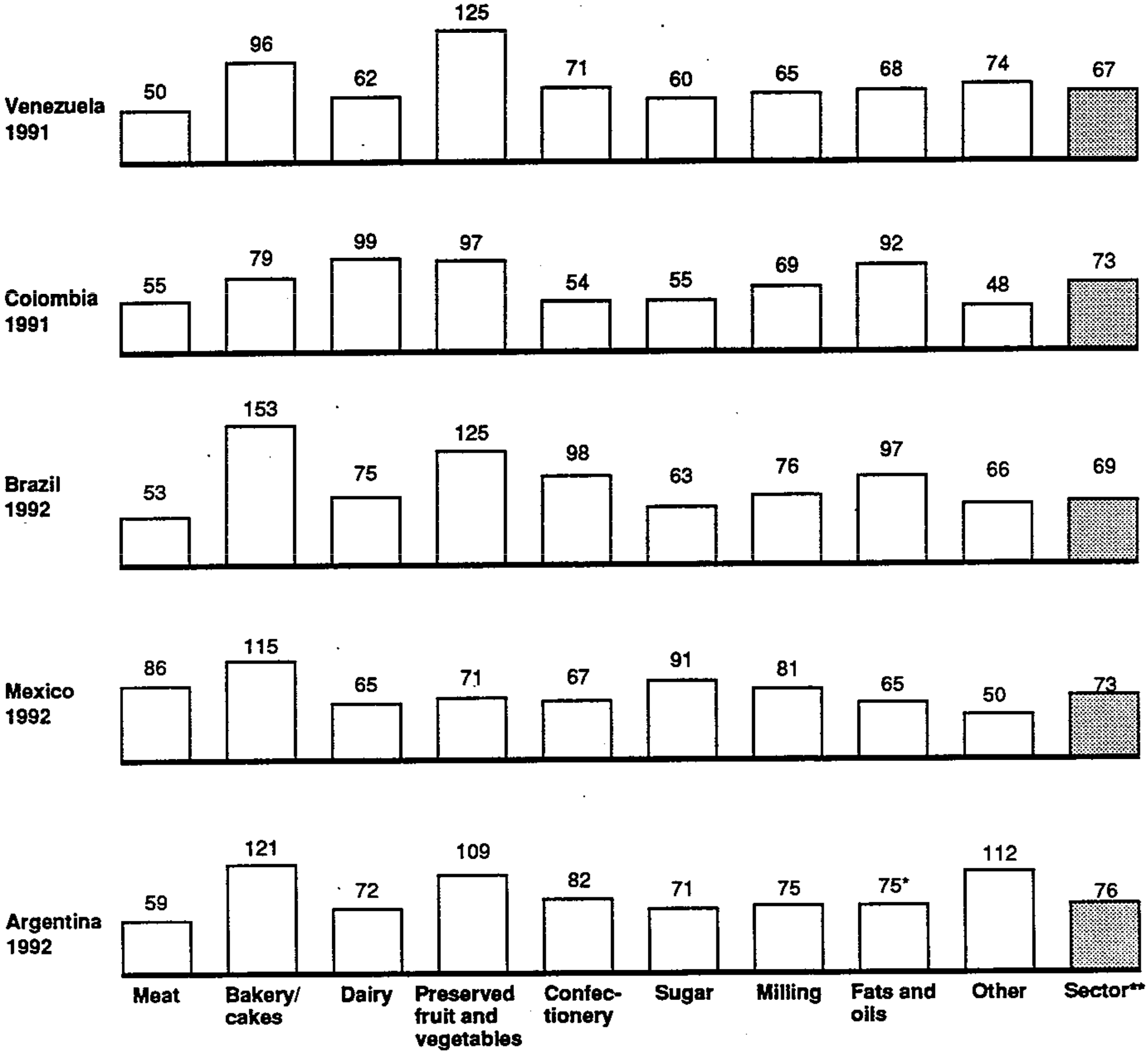
** Colombia and Venezuela: 1991; Brazil, Argentina, Mexico: 1992

Source: McKinsey analysis

Exhibit A12

1991-92 GROSS PRODUCER PRICE LEVELS

Index: U.S. =100



* The value used to adjust monetary output was increased to 98% due to the great share of exports (85% of production) in this subsector

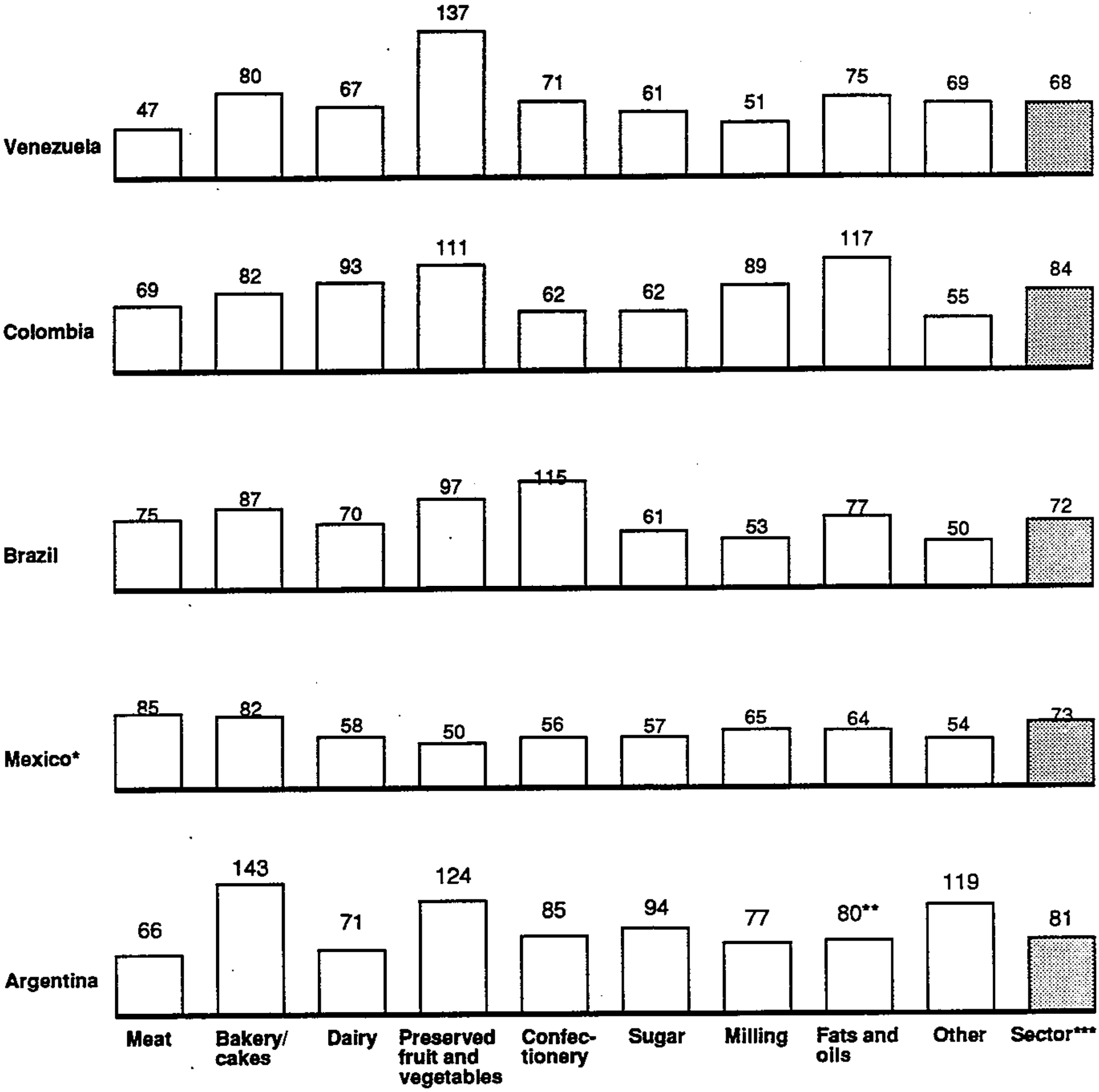
** Weighted by each country's output value

Source: McKinsey analysis

Exhibit A13

GROSS PRODUCER PRICE LEVELS 1987

Index: U.S. = 100



* 1988

** The actual PPP used to adjust monetary output was increased to 105% due to the great share of exports (85% of production) in this subsector

*** Weighted by each country's output value

Source: McKinsey analysis

Exhibit A14

CALCULATION OF INTERNATIONAL PRICES EVOLUTION

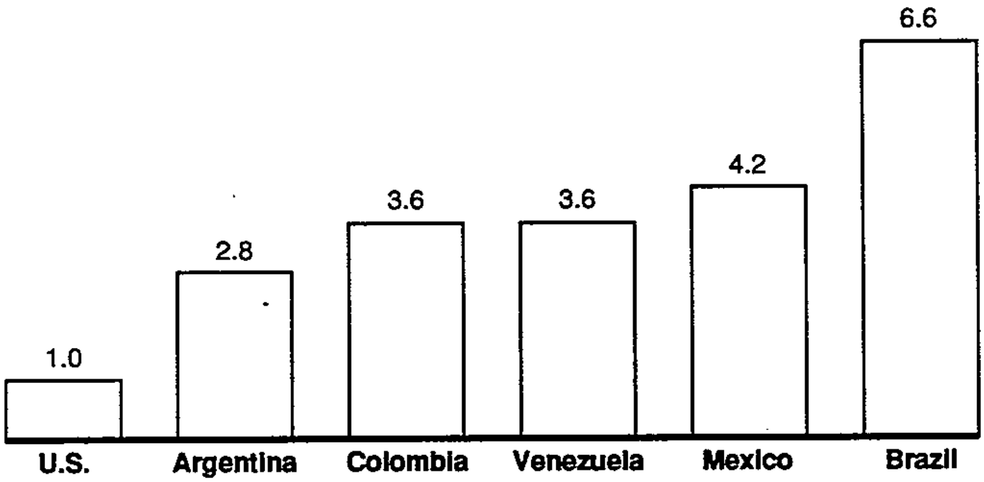
	June 1992		November 1993
Consumer price for a given product			
In a Latin American country	1.7 pesos	← Inflation = 18%	2 pesos
In the U.S.	2.88 dollars	← Inflation = 4%	3 dollars
Market exchange rate (peso/dollar)	1.05	Increase 43% →	1.50
Latin American price in dollars	1.61 dollars		1.33 dollars
International price (US = 100%)	56% (1.61 / 2.88)		44% (1.33 / 3)

Relative prices can change significantly over time, thus affecting monetary output

The measure of labor productivity evolution needs to take these variations into account

Exhibit A15

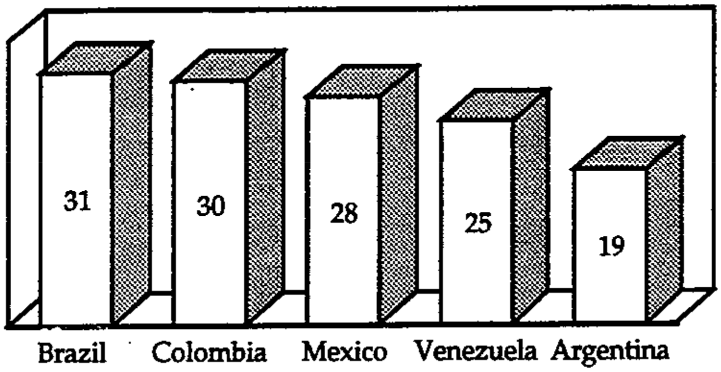
WORK DAYS NECESSARY TO BUY AN EQUIVALENT AMOUNT OF PROCESSED FOOD



Note: Calculated with the average compensation of an employee in the food processing industry
Source: UNIDA; McKinsey analysis

RETAIL BANKING CASE STUDY SUMMARY

Retail Banking Labor Productivity 1992
Physical output per employee; Index: U.S.=100



Deregulation and privatization is only starting to introduce more competition to this very concentrated and unproductive sector that serves only a minority of the population in Latin America.

The low level of productivity found in this industry is the result of limited competition, a product of regulatory controls and the strong presence of government-owned institutions. Legal restrictions have prevented or limited the entrance of new competitors in many countries, while less efficient state-owned banking establishments typically set an umbrella price for services that serve to protect private banks. The result has been expensive and scarce banking services, delivered by costly structures.

Latin American banks appear to have hierarchical, rigid and large organizations to deal with a complicated web of bureaucratic internal procedures. The use of part-time workers which increases flexibility, is practically non-existent. Automation and information technology have only started to become more widely used. Such costly structures entail high fees and margins for banking services.

Some countries have started to privatize banking institutions and liberalize activities in the industry. Mexico recently privatized all the banking sector, and beginning in 1994, authorities will allow foreign banks to set up operations. Colombia is in the midst of a strong privatization effort. Argentina has started to deregulate and open its banking sector to new entrants. However, inefficient state-owned banks still represent more than half of the market in Brazil and Argentina.

As competition intensifies and the economies consolidate their new found stability, banks in Latin America will increasingly explore the high level of potential demand for banking services not yet served through the region. The development of a virtuous circle in which increased competition will reduce spreads and fees, will lead to deeper penetration of banking activities. Private sector lending, especially consumer credits and home mortgages are the areas showing the greatest potential for growth. However, to serve this potential demand, banks would need to acquire new management skills and adjust their costs through productivity improvements. More flexible organizations, simpler processes and automation will be the drivers to achieve efficiency.

PRODUCTIVITY IN THE THE LATIN AMERICAN RETAIL BANKING INDUSTRY

The banking industry plays a vital economic role channeling savings into investments and serving as a nation's intermediary in effecting monetary transfers. How efficiently and productively the banking industry performs its mission affects all other sectors of the economy.

The case study that follows attempts to answer key questions concerning Latin America's banking sector. How productive is banking in the region? How does the level of productivity compare with that in more industrialized countries? What are the precise regulatory, managerial, structural and environmental causes for the levels of productivity found in Latin American versus more industrialized countries? Can Latin America's banking industry be considered world class? If it cannot, what can be done to achieve such a performance?

To answer these questions, we carefully examined productivity in retail banking, a subsector of banking activity that accounts for 80 percent of total employment in the sector. Our first step was to define which activities we considered to be in retail banking. Next, we measured productivity of labor in this subsector as compared to the same sector in the U.S. (a previous McKinsey study determined that the U.S. had the most productive retail banking sector in the world) and in Germany (another country found to have a highly productive banking system). We then made a careful evaluation of the causes for the observed productivity differences between Latin America and the more industrialized countries indicated. Finally, we examined the outlook for retail banking in each country. We will outline some recommendations that arise from the study.

THE RETAIL BANKING INDUSTRY

The banking industry in the broad sense encompasses all depository institutions in the economy and, thus, includes not only commercial banks, but also investment, savings and loans institutions, finance companies, and financial brokerages. The banking industry is an important employer. Worldwide it has around 2 percent of total employment, and in Latin America, about 1 percent (Exhibit 1).

Retail banking links depository institutions to private customers and small businesses. In most countries, commercial banks conduct retail banking activities (Exhibit 2). In Brazil, however, universal banks (multibanks) are the main retail banking provider, while in Germany, savings banks are.

Retail banking essentially means branch banking. It is at the branch where supply and demand for individual bank services meet. A breakdown of branches by type of banking institution provides a good indication of what kind of institutions conduct retail banking activities. Exhibit 3 points out the more important institutions conducting retail banking activities.

For Latin America, the main focus of our productivity study is the retail activity of commercial banks, which are the main providers of retail banking services. In the case of Brazil we also consider universal banks and savings and loan institutions (Caixas Economicas) and for Colombia we include savings and loan institutions (Corporaciones de Ahorro y Vivienda).

One of the first differences noticed between retail banks in Latin America and in the more industrialized countries concerns market share. Large and very large banks in Latin America have a much larger market share than in the U.S. or Germany (Exhibit 4). There are 71 banking institutions with more than 100 branches in the five countries analyzed, 105 in the U.S. and 33 in Germany. On the other hand, there are very few institutions with less than 10 branches in Latin America, while in the U.S. there are 26,000 and in Germany 4,300. If there exists any economy of scale in the industry, Latin America is in a much better position to capture them.

MEASURING LABOR PRODUCTIVITY

Retail banking is a very labor-intensive sector, with labor costs representing almost 50 percent of total non-interest expenses (Exhibit 5). For this reason, improvements in labor productivity can have a significant impact on the total cost of intermediation of the retail banking sector.

Conventional measures of productivity and profitability of banks (using financial variables) are neither conclusive nor very meaningful in measuring and comparing productivity in retail banking across countries. Differences in the economic environment between Latin America and more developed countries, as well as differences in the business mix (retail versus wholesale business) within the same banking institutions within the region seriously distort measurements of cost, revenue, asset, deposits and profits. These difficulties make traditional cost/income, cost/asset, asset, deposit or loan per employee virtually meaningless for international comparisons.

The drawbacks of the conventional measures point to the need for more sophisticated productivity analysis. We, consequently, adapted and improved a methodology used by the U.S. Bureau of Labor Statistics (BLS) for making international comparisons. Our methodology measures productivity according to each of the main types of retail banking outputs. In this regard, we avoided using any value-based output measure. Instead, we measured the number of physical output units, which provides a much better indication of the level of labor intensity of the banking activities examined. Next, we combined these functional productivities to arrive at an overall measure of labor productivity for the retail banking industry in each country.

The limited availability of information on physical output and input variables meant we had to gather information directly from banking institutions. To do so, we submitted questionnaires directly to select representative banks through bank associations in each country. By combining information obtained through the questionnaires, together with publicly available information, interviews with industry executives and the experience of McKinsey consultants in the region, we were able to arrive at a reliable measurement of productivity in these countries.

Functions of Retail Banking

The major functions common to the retail banking industry in all countries analyzed are first, transacting noncash payments, and carrying out transaction services provided by tellers, second, servicing deposits accounts and third, providing lending services. Most employees in retail banking are engaged in one of these functions. We measured output by number of physical output units for each of the three main functions of retail banking (Exhibit 6).

¶ Noncash payments and teller services. We found that the most labor-intensive function of retail banking is transacting noncash payment and carrying out teller transactions. In these functions we include all types of noncash payment transactions: checks, debit cards at POS, paper-based credit transfers (e.g., giro banks and drafts), credit cards, direct debits, paperless credit transactions (e.g., electronic transfers of funds, telephone, exchange of tapes), and ATM transactions (cash withdrawals, deposits and payments). We also include cash withdrawals and deposits and bill payments done at tellers. We measured the number of transactions a year in each country, regardless of the instrument used. In other words, a payment transaction done by a teller had as much value as a check, credit card or direct debit transaction. We recognize that the transaction intensity and thus, the labor intensity differs for each type of transaction and we consider this impact later on in our causality analysis. Wholesale transactions are also included in our output measure since they were impossible to accurately separate out.

(The main source of information for the U.S. and Germany was a Bank of International Settlements (BIS) report containing detailed data for noncash payments in these countries. Unfortunately, the only available information for Latin America was for checks cleared, credit card transactions and, for certain countries, ATM and debit card transactions. To overcome the lack of published data on banking transactions in the region, we used data obtained from direct bank surveys in addition to information furnished by banking industry associations. These data allowed us to estimate the total number of transactions and their distribution by type.)

¶ Deposit services. We measured the second major output of retail banking, deposit servicing, by the total number of deposit accounts (i.e., interest earning accounts). We included savings, time deposits, contractual savings accounts and specific types of accounts particular to the country involved.

These also include such accounts as investment fund accounts tied to money markets that are marketed by many banks throughout the region.

Since transaction intensity differs by type of account, we considered this impact by weighting with a proxy of labor intensity. We took into consideration both wholesale and middle market accounts, not just retail accounts. Breakdowns, detailing accounts by type of holder were not available and wholesale and middle market accounts, in any case, represent only a small percentage of the total number of accounts. Transaction accounts such as checking accounts were not included since their influence has already been accounted for in the noncash transactions analysis mentioned above.

(Our sources for data used were local central banks and/or regulatory institutions. For Brazil, information on funds and time deposit was provided by our own banking survey.)

¶ Credit services. For the third measured function in retail banking, credit servicing, we counted the stock of credits outstanding regardless of type. These included revolving credits, installment credits, credit card financing, mortgages and others. Data sources used included again local central banks, bank associations and our own survey of banking institutions.

Exhibit 7 shows the measured output for each of the three functions of retail banking by country. Not surprisingly, the U.S. retail banking industry produced more services in each of the functions than any of the other countries. Output per eligible person shows the underdevelopment of the industry in Latin America with the exception of Brazil (see box on "Bank-able" population and Exhibits 8 and 9).

Retail Banking Input

To measure productivity for each of the three retail banking functions in each country under study, we calculated direct retail banking employment, and estimated a breakdown of the labor input measures by the three main functions. The specific steps taken were the following:

¶ Direct retail banking employment. To calculate the number of those directly involved in retail banking, we subtracted those elements not assumed to be part of the retail banking industry from the available figure of total banking industry employment (Exhibit 10). We obtained figures for total banking industry employment from local central banks, government labor ministries or other regulatory institutions. From this total we subtracted the number of employees carrying out mainly wholesale banking, investment banking and security business activities (mainly important for Germany), as well as any other employees we deemed not to be involved in retail banking. Since most banks in Latin America normally undertake both retail and non-retail activities we used the results of our banking surveys to determine figures for retail employment in this region.

Numbers for part-time employees were adjusted to reflect their full-time equivalence. Part-time workers represent about 10 to 13 percent of the work force for the U.S. and Germany and an insignificant portion for Latin America. We counted each part-time worker as 50 percent of a full-time employee and used the total full-time equivalent (FTE) for the U.S. and Germany. Since there was no reliable information on the total number of annual hours worked for all the countries, we did not take this effect into account.

¶ Functional breakdown. To obtain a breakdown of retail banking employment by its three functions – transaction, credit and deposit services (Exhibit 11) – for Latin American countries we used the data obtained from our bank survey. For the U.S. and Germany, data was based partly on publicly available sources such as the Functional Cost Analysis in the U.S. and on McKinsey experience in the banking industry. In general we found that transaction services is the most labor intensive function in retail banking, employing around 50 percent of the retail bank employees. The deposit service function is the second largest with 30 percent of the total and credit services third with around 20 percent. The variations from one country to the next reflect differences in service demand, due to the particular macroeconomic environment of each country and to the varying costs of these banking services.

Productivity in Retail Banking

Having defined and measured the output and labor input in each of the three functions of retail banking, we can now calculate the functional productivities. To calculate the productivity for each function we divided the output (number of transactions, accounts and outstanding credits) by the input (number of employees) for each function (Exhibit 12). Taking U.S. productivity as our reference at 100 percent, we found Latin America's productivity to be far below the U.S. in all functions. The region showed a gap ranging from 55 to 84 percentage points below U.S. levels. Latin America's productivity levels also came out poorly when compared with Germany.

To compute an index of overall labor productivity levels in retail banking in the region, we combined the three functional productivity measures by calculating a weighted average of their functional productivities and set it as a percentage of U.S. productivity as shown in Exhibit 13. The weighting system was designed to reflect the relative importance of the different functions of retail banking and consequently parallels employment distribution (Exhibit 11).[1]

Overall productivity in Latin America's retail banking sector ranges from 19 to 31 percent of the U.S. productivity depending on the country. In other words, banks in the region need three to five times more employees than their counterparts in the U.S. to carry out their activities. Although the gap is wide, Brazil, Colombia and Mexico show a better level of performance than do Venezuela and Argentina.

A precise analysis of productivity in this sector in Latin America over time was unfortunately not possible given the lack of good historical data. Still, from the change in employment levels in the past several years we can get a sense of how productivity likely evolved (Exhibit 14). Argentina appears to be the country where productivity is increasing the most. Since the onset of its macroeconomic stabilization plan in 1990, banks in this nation have been adjusting their labor forces. At the same time, deposit and credit activity has been rising. How much productivity has increased in Brazil remains questionable. While this country has also reduced employment as it utilizes more automation and information technology, the output, except in the transaction function, remains constant. On the other hand, increasing payrolls and stable activity levels in Venezuela suggest there has not been any productivity gain in recent years.

PRODUCTIVITY DIFFERENCES

What accounts for the wide discrepancy between the productivity levels found in the U.S. and Germany, and the lower ones observed in the five Latin American countries we have studied? In the following sections we will look more closely at the differences in what we call the "production process" in retail banking. Later we will discuss the market forces in this sector as well as their influence on management priorities and decision making.

It is our contention that Latin America's unique operating environment is ultimately responsible for the lower levels of productivity found in the retail banking system. It is the operating environment that most strongly influences the nature of competition and management decision making in this industry. These two factors, in turn, determine the production processes that set the levels of productivity. Exhibit 15 summarizes our findings which are discussed in the sections that follow.

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1 Since the employment structure is slightly different from country to country, we computed the overall labor productivity indexes on a bilateral basis with the U.S. That means that we calculated the productivity index for each country twice, using in each case the U.S and the corresponding country labor weights. Then we took the geometric average from those two index numbers as the final overall productivity index.

Impact of the Production Process on Productivity

In this section we will examine three possible causes of the lower productivity found in Latin America's retail banking sector as well as the different level found from one country to the next. These are the causes: (1) product mix and service quality, (2) automation and (3) organization of labor.

¶ Product mix and service quality

Quantitative measurements tend to discount the richness and complexity of the industry output from country to country. A single service might have a different inherent labor productivity in one country versus another. These differing service mixes could consequently account for differences in the functional productivities. To test this hypothesis we weighted the output used to reflect productivity by the levels of labor intensity in Latin America to see how much of an impact product mix/service quality has on productivity.

- More retail banking **transactions** are carried out directly with tellers in Latin America than in the U.S. and Germany (Exhibit 16). Most people in Latin America still go to tellers to perform all types of transactions like cash withdrawals, bill payments and deposits (Exhibit 17). More efficient payment channels such as paying by mail, telephone and direct debit are largely under-developed.

- The mix of services provided is more similar for the **deposit** function (Exhibit 18). Deposits into savings accounts represent the largest portion of the deposits made in all the countries studied. While utilization intensity of this account type is apt to vary between countries, the impact on productivity is slight. As such, we considered savings accounts to have the same weight for all countries. But, money market accounts (relevant only for Brazil and Mexico), should have a higher weight in making productivity calculations than saving deposits since they involve more intensive labor input.

- As the **credit** reporting structures vary significantly among the different countries, we did not break them down in comparable terms to the U.S. and Germany. In any case, since the credit-oriented activity in the retail sector in Latin America is low and tends to be focused on less labor intensive short-term credits, weighting here if anything, would make the region appear less favorable compared to the U.S. or Germany.

The calculation of overall retail banking productivity based on these weighted output units reveals that the effect of the mix of retail banking activities explains only a small portion of the productivity gap. Only for Brazil does the product mix have some importance, causing an increase in total productivity from 31 percent to 41 percent. This jump is mainly due to the high level of utilization of money market accounts (FAF) and bank drafts, which are relatively more labor intensive. The impact for the other countries is not significant The weights used and the results obtained are contained in Exhibit 19.

The lower levels of productivity found in Latin America's retail banking sector are not offset by higher levels in the quality of service provided in the region, nor is the relatively higher employment explained by the delivery of better service. If anything, service is better in the U.S. and Germany. There are a number of factors that indicate this point:

- Access to the branch network, for example, is much easier in Germany and the U.S., where the branch density far exceeds the Latin American levels. This is true even if we consider only a statistically smaller "bank-able population; " i.e., those with sufficient income to habitually use banks (Exhibit 20). Residents in the U.S. also have more convenient banking hours. While branches are open for about the same amount of time (6 to 8 hours) in Latin America and the U.S. on weekdays, many banks in the U.S. are also open on Saturdays which is not true for Latin America (some exceptions in Mexico apply). Also because of an extensive network of automatic teller machines (ATMs) in the U.S. and Germany, 24 hour banking is much more accessible in these countries (Exhibit 21).

- Service quality within the branches is also higher in Germany and the U.S. compared to Latin American countries. This aspect is even more important in Latin America where branches are heavily used. One good measure of service quality at branches is customer waiting times before being served. Waiting times in the U.S. and Germany generally average below 4 minutes. But, they are typically much longer in Latin American countries, with long lines at bank branches being part of the life in Latin America.

- In one service area, check clearing, and in one country, Brazil, Latin America appears to surpass even the U.S. and Germany, however. Brazil has one of the most efficient payment instrument clearing systems in the world. Driven by high inflation and interest rates, funds transfer via checks often takes only a day in Brazil, compared to 2 to 3 days in other countries. In the U.S., interstate check clearing can often take more than a week. Here is an instance, though, when better service is achieved not with higher but with lower labor input thanks to automation and electronic clearing mechanisms.

In sum, the few points increase (1 to 10 percent) Latin American countries gain in productivity levels compared to the U.S. and Germany by factoring in product mix differences, are more than offset by the lower quality in banking services found throughout the region. Thus, the productivity gap cannot be explained by differences in product mix or service quality.

¶ Information Technology and Automation

The evidence shows that the effective use of automation and information technology is a major productivity driver in retail banking. While recognizing that lower labor costs in Latin America drive the more intensive use of labor over capital in this region, substantial gains in productivity and profitability are still possible through effective use of information technology.

To measure the impact of information technology on productivity in this sector we looked at two major types of technologies used in retail banking operations in the region: computerization of the transaction, credit and deposit functions and usage of automated teller machines (ATMs). Difficulties in obtaining consistent data on investments in automation equipment in Latin America's banking sector, precluded us from making comparisons based on actual investments made in information technology.

– Computer terminal usage greatly increases productivity. The use of computer terminals by tellers and "back office" employees increases transaction productivity by eliminating the need for additional processing at centralized locations since information is collected and transaction processing is fully completed at the entry point. In Latin America, the intensity of utilization of computer terminals by tellers, by back office and platform staff is much lower than in the U.S. (Exhibit 22). We evaluated the impact of computer usage on total productivity by running a regression on total productivity and the number of computer terminals per employee. It showed that, in fact, this application has an impact on productivity (Exhibit 23). (For Latin America, information was supplied by our bank survey.)

  Terminals installed in the platform can increase the productivity in both the deposit and credit functions. For example, in the deposit service function, the non-sufficient funds/overdraft reversal system (NSF/OD) usually is a manual process affecting both the branches and operations. An on-line NSF/OD reversal system eliminates unnecessary steps in the process and can save up to 60 percent of the full-time equivalent employees (FTE) required. In the credit function, mortgage loan processing represents another manual, paper-intensive process where automation can achieve substantial benefits. Automation of this process yields productivity gains of over 50 percent.

The other technology we have analyzed (ATMs) explained a smaller part of the productivity gap. The usage of ATMs in the U.S., for example, improves productivity only by 7 percent, and in all other countries studied the increase is equally small (2 percent to 10 percent) (Exhibit 24). This is because the percentage of transactions processed by ATMs versus other means is approximately the same in all countries analyzed. What is more, the high volume of checks processed in the U.S. to a large extent marginalizes the impact of ATMs on productivity. However, service quality is considerably affected by the availability of ATMs.

- The higher level of service quality and to a lesser extent, cost-savings achieved are driving the increased use of ATMs in Latin America. From 1990 to 1992, all but one of the Latin American countries analyzed, as well as Germany, showed an average annual growth rate (CAGR) in the number of ATMs installed of 30 to 39 percent. Argentina had a lower 10 percent CAGR, while the U.S. showed just 4 percent (Exhibit 25). In Brazil, for example, import liberalization and the elimination of its severe restrictions on the activities of foreign-owned computer firms has increased availability, improved quality and reduced the costs of ATMs – from \$45,000 to \$35,000 a unit in recent years. This change has led to increased investments in ATMs by local banks. In 1993, for instance, two private banks each bought 2,600 ATMs, and experts expect the number of ATMs in use in Brazil to double in 1994.

  The region's lower average labor costs is certainly one important reason why automation has not kept pace with industrialized countries (Exhibit 26). The ATM network in the U.S. and Germany is much denser than in Latin American countries (Exhibit 21). An idea of the trade-off in choosing between installation of an ATM and hiring tellers can be had by comparing labor and ATM costs as shown in Exhibit 27. Keep in mind that direct labor costs for tellers is really only a fraction of total actual costs which also include administrative and infrastructure costs. Actual cost savings by using an ATM is consequently much higher than indicated by the exhibit. Also, there are other clear benefits to the customer: 24 hour banking, more convenient location, shorter waiting times.

¶ Organization of Labor

In Latin America the inefficient organization of banks' work forces is one of the main reasons for lower productivity in retail banking compared to the U.S. and Germany. Although we cannot precisely quantify the impact of labor organization from one country to the next, it is easy to show how improvements in the utilization of labor would result in higher levels of productivity. Labor productivity gaps of up to 62 percent within a single bank have been observed within core banking functions (Exhibit 28). Few banks in Latin America measure and consequently control their productivity within core banking functions.

- Probably one of the most important areas that management can improve is in the designing of core banking processes. For example, we estimated from analysis in several banks that about 55 percent of the calls answered by platform employees are simple telephone inquires that could be off-loaded to customer service centers with considerable gains in productivity due to scale effects (Exhibit 29). Also, additional management time would be freed up for more value-added activities.

- Another example is in mortgage application processing. In most banks in Latin America, it takes about 30 days from the time a customer applies for a loan until he actually receives a mortgage. Improvement in the mortgage loan approval procedures could shorten the total response time to 2 to 7 days. One way would be to separate the real estate approval process from the customer's creditworthiness evaluation process, and do each in parallel. Banks could establish permanent relationships with notary offices to shorten legal processes. They could also maintain a pool of pre-approved houses available for mortgage customers. They could also provide all information necessary to potential clients by telephone, eliminating unnecessary trips to the banks.

- A third example involves teller staffing. Banks in the region could make more efficient use of their staff by hiring part-time employees for peak service hours, such as lunch hours or at the end and beginning of the month when salaries are paid. For the most part, banks in the region do not make use of part-time employees. We calculate that improved utilization of staff resources, through the timely use of part-time tellers, can result in significant gains in the transaction productivity (25 percent more transactions per teller) as the example shows (Exhibit 30).

Summarizing, automation and organization of labor explain most of the observed productivity gap. Leaner organizations could perform the present activity level through the reorganization of tasks and process made possible by the investment in information technology. It is a management choice to enhance labor performance.

The Operating and Competitive Environment Influence on Productivity

Bank managers are not operating in a vacuum. The systems they choose to put in place and the mix of services they offer the public are largely determined by the environment in which they operate. The level of competition they face, the degree of interventionist government policies and regulations they must deal with and the workings of the economy in which their industry is embedded, all influence the decisions they make.

Latin America's retail banking industry does not operate in an environment that is conducive to high productivity, although that is changing in many countries. The sector is generally heavily regulated, has a high degree of government ownership, and has operated for years in an unstable economic environment. These factors make for a low competitive intensity and a concentrated industry with little incentives to improve performance.

By contrast, U.S. banks operate in a highly competitive environment that fosters productivity. The efficiency consciousness found among U.S. bank managers, of course, is no accident. Deregulation of the U.S. banking industry in the late 1970s and early 1980s was largely responsible. As a result, today, the industry competes not only within itself but with other sectors, such as the securities industry. German banks are not as productive as U.S. counterparts, partly because deregulation in Germany has only started recently.

To see how various outside factors affect management behavior and consequently the level of competition and productivity in retail banking in Latin America, we examined three key areas that define Latin America's competitive conditions: excessive regulations, unstable economic environment with low financial penetration, and large-scale government ownership. After discussing how these three factors have shielded Latin American banks from a more intense competition, we will look at their financial results.

¶ Regulatory environment. The regulatory system acts to reduce enormously the level of competition, since all players end up offering products and services basically equal both in their design/specifications and price. Latin American regulatory authorities usually have taken the approach of prohibiting any kind of operation that is not contained in the regulation, as opposed to punishing the ones that violate the established laws. This approach makes it very difficult to bring innovations to the market, as the very few exceptions observed prove. Usually, regulations specify in great level of detail the services and products that are permissible and their characteristics, instead of protecting bank customers by making sure that the banking institutions are in good financial situation.

Regulations found in Latin America that particularly harm competition are the following:

- Controls on interest rates for loans and deposits
- High cash reserve requirements. Non existent in Germany and only 3 to 12 percent in the U.S., but close to 50 percent in most of Latin America for checking accounts
- Barriers to entry of foreign institutions
- Restrictions on the opening of new branches
- Restrictions on the activities of universal banks.

Recently, Latin American countries have realized the negative effects of the heavy regulation on their banking system and have been taking steps to promote a freer environment. Some of the most important initiatives are discussed below:

- Mexico is the furthest along in the deregulation process. Starting in 1988, Mexico has completely liberalized interest rates, lifted controls on credit ceilings and forced lending for all instruments, lowered compulsory reserve requirements, and granted new banking licenses to increase competition. Starting in 1994, Mexico will finally be opened for foreign competition. In order to improve the financial health of the banking system, capital requirements have been raised to 8 percent of equity and stricter guidelines for classification of the loan portfolio have been established.

- Colombia has been, since 1989, moving step by step away from a very specialized banking system and towards the universal bank concept. Still the system inhibits cross-selling and open competition between the different types of banking institutions, and reserve requirements are still high (e.g., 40 percent on checking accounts). On the other hand, Colombia has opened the banking industry to the entry of foreign institutions, eliminated most forced investments and credits, authorized the creation of foreign investment funds, freed interest rates on all types of deposits, reduced control on interest rates on loans and permitted the creation of private pension and "cesantia" funds. Minimal capital requirements are risk weighted and also follow the Basle recommendations.

- Argentina has only very recently made substantial changes in the banking regulation. Important first changes were the enhancement of legal assurances for foreign exchange loans: the reduction of restrictions on permitted investments with the introduction of a mutual funds law, and the reduction on compulsory reserve requirements on checking accounts from an astonishing 73 percent to a still high 43 percent. Starting in 1993, two very important changes took place: liberalization of the opening of new branches, and the complete opening of the banking sector to foreign banks, which are now treated the same as local banks. Minimum capital requirements for financial institutions are similar to, but stricter than, recommendations by the Basle Committee.

- Venezuela, starting in 1993, has approved the creation of universal banks and allowed the entry of foreign banks. Minimum capital requirements have been raised and now follows the Basle recommendations.

- Brazil has one of the most heavily regulated banking systems in the region, and has yet to begin liberalization. Some of the most stringent regulations include limits on savings accounts interest rates, prohibition against interest bearing checking accounts, high reserve requirements on demand accounts, restrictions on bank product fees, and limitations against opening new branches by foreign banks.

  The negative impact of regulations and interference of the government sometimes had drastic effects on the Brazilian banking system. One example of this is the home mortgage system (SFH) that is heavily government regulated. The system collapsed owing to indiscriminate granting of subsidies to mortgage-holders by the government. As such, mortgage-holders were able to reduce installment payments by up to 15 percent of the value of the installment. This policy served to create a huge $21 billion deficit in the government accounts and a drastic reduction of the number of new mortgages granted (Exhibits 31 and 32).

¶ Government ownership. State-owned banks in Brazil, Argentina and Colombia control virtually half of the market share (Exhibit 33) and until quite recently the government owned all but one bank in Mexico. Government-owned banks have serious inefficiencies and generally higher cost structure than their private counterparts. We estimated the productivity levels of public and private banks for Brazil and Argentina. The gap, in both cases, is more than 50 percent. Brazilian public banks use almost four times the personnel as a U.S. bank (productivity = 28 percent), and, Argentinean public ones use almost seven times (productivity = 15 percent). Surprisingly, Brazilian public-owned bank employees are paid more than twice what their private colleagues get, despite being half as productive (Exhibit 34).

¶ Economic environment. Economic instability, characterized by runaway inflation, recurrent fiscal crises, and balance of payments disequilibria in most Latin American countries in recent years has prevented banking executives from focusing on their core businesses and planning. Instability has also hindered increased financial penetration, the development of financial markets, and in many countries has led to serious capital flight.

Latin America's scarce monetary resources make productivity look worse when measured in financial terms (Exhibit 35). Brazil and Argentina, two countries that have faced more severe economic instability in past years are the ones with lower financial penetration.

The extreme volatile fluctuations in the key Argentinean indicators led to the emigration of the bulk of Argentinean savings, which affected the very basis of the banking business; that of intermediating between savings and investments. Banks in Argentina became mere managers of payment services in an economy which called for less and less local currency for conducting its transactions.

Brazil's banking system has been able to successfully weather economic instability and high inflation. Although the government opted to temporarily confiscate savings to prop up its sagging finances, Brazilians never lost confidence in their banks and consequently the degree of capital flight experienced in neighboring countries never took place in Brazil. A good reason for this was the country's virtually unique indexation system and the high real interest rates it is able to charge. Also, the central bank's ability – because of huge foreign reserve holdings – to manipulate the exchange rate prevented capital migration from the banking system to hard currency. The country's ability to effect rapid payments and collections thanks to both electronic intra and interbank clearing mechanisms also contributed to prevent value loss despite extremely high inflation rates. The acceptance and use of checks for retail payment is one of the highest in the world, only possible because of the very fast clearing system in place.

The higher financial penetration of Mexico, Colombia and Venezuela is the result of the lower inflation rate and more controlled macroeconomic environment (Exhibit 36).

Stabilization of the Mexican (since December 1988) and Argentinean economy (initiated in April 1991) had an immediate, strong and positive impact on the banking sector, as the great boom in bank deposits and loans shows (Exhibits 37 and 38). Both countries carried out sweeping fiscal reforms, initiated far reaching programs to privatize state-owned assets, carried on monetary reforms and moved to deregulate economic activity. Fiscal reform focused on expenditure reduction and strengthening tax collections. Both governments took important steps to liberalize their financial systems, such as freeing capital flows and interest rates, diminishing cash requirements, and making their central banks autonomous entities and, thereby, separating the government treasury from the central bank functions. They are also adopting measures to strengthen domestic savings through the introduction of a private pension system.

After discussing how these three factors (regulation, instability, and government ownership) have shielded Latin American banks from more competition, leading to a very concentrated industry (Exhibit 39), let us look closely at their financial statements, where we believe this comfortable environment should be reflected.

Despite low productivity, private banks in Latin America are very profitable, even though public banks are not (Exhibit 40). In general, high return on equity (ROE) of private banks is caused by high operating income (Exhibit 41). This offsets the high salaries and administrative expenses. These costs are high even though salary expenses per employee are low, because banks in Latin America tend to be overstaffed and/or have low labor productivity (Exhibit 42). For example, in Argentina, an average 20 percent ROE is the result of extremely high spread and fees charged. The income so provided allows Argentinean banks to pay salaries to their employees more than two times higher than the country's average while remaining highly profitable. This clearly indicates the low level of competition prevailing in the industry in 1992, where most of the surplus from banking services are being transferred to the banking industry and almost nothing to customers.

The very comfortable environment created by the regulators and the inefficiency of state-owned banks have allowed the private banking industry to earn good returns at the same time they have an expensive cost structure. Exhibit 43 shows a clear and peculiar correlation between income and cost structure. Since banks in Argentina and introduction of some state-of-the-art products and services will continue to benefit the customers. These include pre-approved financing, accessible through credit cards, retirement fund plans, and new design of branches with distinctive service areas for high net worth individuals, less affluent individuals and the middle market.

¶ Argentina. Reduced employment and expansion of financial services is leading to an increase in productivity in the banking industry. Improvement will continue in the years ahead especially in the development of mass market retail products which today remain prohibitively expensive. Long- and short-term interest rates, already coming down, should decrease further. The introduction of new retail banking products will intensify as Argentinean banks face increased competition in the years ahead. Expect to see such innovations as banking by phone, and sophisticated marketing techniques such as telemarketing of securities as banks try to catch up with international standards.

Banks with a heavy cost structure, small market share and difficult access to international or domestic capital markets would merge or exit as competition grows. Increases in loan portfolios will continue, especially in the consumer credit and home mortgage areas – funded by capturing foreign savings through bond issues. Also, the implementation of the private pension fund system starting August 1994 will be another important source of long-term funds. The use of peso-denominated means of payments will increase with the reduction of the compulsory reserve requirement to 43 percent and the end of the inflation tax, presenting an opportunity to modernize the payment system in order to increase transaction productivity levels.

¶ Colombia. Privatization, continued deregulation and the opening of the country to foreign-owned institutions will foster competition substantially. Many new players will be attracted by both the current high margins and future growth prospects.

Newly privatized banks will fight aggressively to gain market share in order to recover the high purchasing prices they paid.

As competition intensifies and spreads and fees are driven down, pressure to reduce costs by enhancing productivity will also increase. Investments in information technology and reorganization of functions will be the main levers to improve efficiency. In their struggle for market share and expansion of the total customer base, managers will also focus on better service to current and potential customers through the launching of new products and services.

Loan portfolios will continue to grow, fueled by lower interest rates and the reduction of compulsory reserve requirements. The increasing participation of foreign investors in Colombia and the private pension fund system launched in April 1994 will also be additional large sources of capital.

¶ Brazil. The main challenge faced by Brazilian banks will be to survive in a stable economic scenario after many years of benefiting from windfall inflationary profits. Float income, which today represents approximately 40 percent of banks' operational income will fall sharply if inflation rates decline and this will have a significant adverse impact on profits. Collection services, for example, which are currently among the most important sources of float and fee income profits, will be reduced as companies diminish the volume of collections processed by banks. Today, companies are willing to use banks for all their collection, because each day of delay has an important impact with an inflation rate of 40 percent per month. These collection services generate not only fees but a huge amount of float to the banks. If inflation decreases substantially, companies will either accumulate bills or collect them directly, as they do in the countries with lower inflation. We expect to see banks cutting effective prices substantially to increase volume in order to fully utilize the huge installed systems capacity.

To cope with the new scenario, banks will have to review their cost structures and generate new sources of revenue. Significant impact in cost reduction will come from increased automation of payment transactions, development of new payment channels like direct debit and payment by mail, all of which will take customers away from the branches when performing simple transactions. Credit card volumes and consumer credits should grow exponentially and will be among the main new sources of revenue. However, the expansion of credit activities will require improvements in retail credit processing to speed up the credit approval process and properly screen for good credit risks. The sharp growth in mortgage lending that occurred in Argentina and Mexico will probably not occur in Brazil until regulations change and the government refrains from erratic intervention in the home financing system.

State-owned banks are the ones that will suffer the most because of their high cost structure and low flexibility to reduce personnel expenses. Furthermore, small- and middle-tier banks with retail orientation will no longer be viable with the decline of float income. We expect to see intense merger and acquisition activity. The outcome of the transformation in the banking industry resulting from stabilization of the economy will be a move to higher levels of overall productivity.

¶ Venezuela. Recent events in a few key institutions coupled with structural problems in the sector have triggered the present turbulence of the financial system in Venezuela. High interest rates limit demand for credit, while banks hold vast portions of their assets in nonliquid investments (i.e., real estate).

Rumors about a possible political crisis fostered extensive withdrawals from many banks during 1993, while the value of the assets plummeted as a result of the recession. The second largest institution in the country experienced such extensive withdrawals that intervention was necessary. This event fueled even more general mistrust of the financial system.

There will be major restructuring in the sector, particularly in small and medium size institutions. Reduction of unproductive assets and improved efficiency will be the key drivers to compete. The required expansion of the productive loan base and government goal to reduce interest rates will increase competition and drive down spreads.

Productivity improvements through rationalization of functions and tasks performed will be needed to cope with the lower margins. Foreign participation in the sector will increase through privatization of the nationalized banks, and through joint ventures or alliances with other institutions in the "Andean region." Stricter supervision from the regulatory agencies will be needed to guarantee a smooth transition.

Despite the potential that could result from the restructuring, at the close of this report, rumors about possible new interventions and nationalizations have not ceased.

RECOMMENDATIONS AND POLICIES IMPLICATIONS

On the individual company level, our analysis revealed several potential areas of improvement for management in Latin America. The key ones are as follows:

¶ Modernization of the payment system. Develop an Automated Clearing House (ACH) to perform transactions electronically. The gain in efficiency and speed with the reduction of paper flow both for the banks and their clients will substantially reduce operating costs for both. In all of the Latin American countries studied there was no true ACH in place, and we think that the timeframe to develop it is appropriate, as the number of individuals, companies and banks using computers have passed a critical level and the communication network is improving quickly. The check clearing system in Brazil is already automated. The bank recipient of the check exchange tapes with the check information entered with the bank issuer of the check, avoiding the repetition of the labor-intensive sorting and coding of the check more than once. Argentina, Colombia and Venezuela still utilize the more inefficient and paper-intensive system.

Development of financial Electronic Data Interchange (EDI) system, already in embryonic form in Argentina and Brazil, but visibly absent in Venezuela, Colombia and Mexico, will greatly improve payment and collections in these countries, as well as improve order processing and logistic management.

¶ Improve the organization of labor. Here management can make substantial improvements. Target areas include better utilization of capacity with the employment of part-time employees, off-loading of simple tasks done at the branch to central processing centers, and redesign of certain core banking processes such as credit and payment functions.

¶ Improve management of the credit function. Those banks able to improve retail credit processing and credit risk evaluation procedures will be the winners in the increasing competitive and more affluent markets of the future. Banks that do not improve their credit approval process and focus on credit quality will either lose market share or face serious problems with bad loans.

¶ Get capital markets know-how. Issuance of bonds in the domestic and international capital markets will be key to close two gaps: local currency deposits (linked to income and savings propensity) will increase less than the loan portfolio (high latent potential), and maturity mismatch because of high demand for long-term loans combined with short-term investments. To satisfy the borrowing appetites, appropriate access to capital markets will be critical.

Government policies directly impact productivity. Most damaging to the productivity performance of the banking sector has been the constant interference of the government in financial markets. Having the economy balanced with reasonable inflation rates is the precondition to having a well working banking industry. Besides that, we think that policy agendas should focus on the idea of a competitive, open banking industry in which the major roles of government are making markets work better and supporting the transition to an industry with high competitive intensity. Below we outline a policy agenda for policy makers in months and years ahead.

¶ Privatization. The governments of Brazil and Argentina should sell their banks to the private sector. The Mexican government has privatized all of its 18 banks in less than 2 years generating U.S.$12.2 billion in proceeds, and Colombia's authorities plan to privatize virtually all state-owned banks. Privatization will increase competition and hence efficiency, with the benefits passed on to the public in the form of better service, cheaper financial costs and greater availability of credits. We have seen that state-owned banks are half as productive as their private counterparts, and in the case of Brazil, they pay their employees three times what the private ones do.

¶ Deregulation. Banking regulation has been excessive in Latin America and should be reduced as soon as possible. In Latin America, regulations of banking has done serious harm to its societies. It has distorted the allocation of resources, increased intermediation costs, hindered innovation of services and products, obstructed the free flow of financial capital across borders, and restricted or barred more efficient financial institutions from the market place. Consequently, the industry lags far behind the banking systems of more industrialized countries where regulation is moderate. Luckily, several countries have taken important steps to liberalize their banking industries and these countries will reap the benefits in the years to come. Brazil, however, still has a high degree of government interference. The incoming government should take steps early on to promote an open and more competitive banking system.

As deregulation moves forward, governments in the region must be careful to protect their economies and the public from the failure of non-competitive financial institutions, always bearing in mind that the ultimate goal should be to protect depositors, not the institutions. Maintaining high capital and accounting standards, and forcing failing institutions to raise capital or to merge with strong institutions are examples of measures that could minimize the impact of the restructuring process.

BANK-ABLE POPULATION

When comparing banking penetration in different countries, we face the problem that the "eligible" target population varies from country to country according to many "hard" factors (income level and age structure) and some "soft" ones (such as cultural preferences). It is very clear that children are not bank clients, and it is also clear that people below certain income level cannot afford to pay for banking services. Setting the minimum income levels is difficult, however, because the cost of banking services determines affordability. Cultural preferences are not only difficult to measure, but their very existence is debatable.

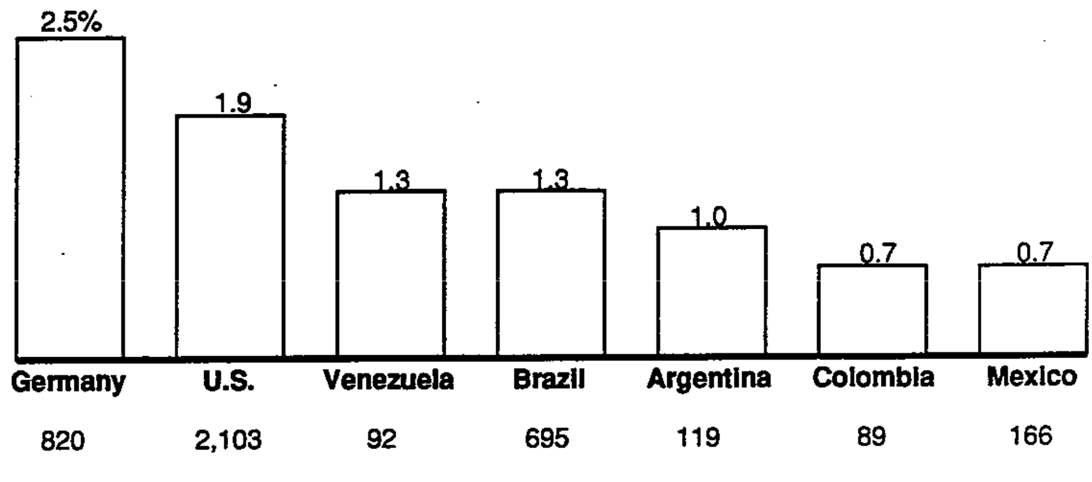
We believe that pricing influences the target population for any product or service. In the U.S., where prices are more determined by the market, there are almost 600 million bank accounts (deposit and checking), and 130 million telephone lines. As a result, consumers are demanding more than 4 bank accounts per telephone. In Argentina, there are 7 million bank accounts and 4.3 million phones, or 1.6 accounts per phone (with telephones growing at 15 percent per year since privatization). Similarly, there are 230 million credit cards in the U.S., almost 2 credit cards per telephone. In Colombia, that figure is 0.5 (with telephones growing at 11 percent per year). These ratios suggest that the banking industry in Latin America is not serving all of its potential clients, even when compared with an industry with acknowledged supply constraints.

However, certain groups should not be included in the eligible population for banking services. We excluded from our "bank-able" population all individuals under 18 years of age and with an income lower than U.S.$ 5,000 per year, adjusted by Purchase Power Parity. Because of the relatively younger and poorer population, the "Bank-able" population in Latin America is a small fraction of the total population (from 20 to 30 percent) compared to over 70 percent in the U.S. and Germany (Exhibit 8).

If we divided the total physical output of the retail banking industry in each country (Exhibit 7) by the "bank-able" population, we arrive at the output per eligible person, or a proxy for banking services penetration. All Spanish speaking countries have a very low level of **transactions** per bank-able person, ranging from 73 to 109 transactions per year, versus 472 performed in the U.S. Brazil has a very high number of transactions per person as a result of a sophisticated system to combat inflation. Every bank-able citizen in the U.S. has more than 2 **deposit accounts**, as do bank-able persons in Brazil and Venezuela. Mexicans and Argentineans have only 0.6 accounts per person. The low number of outstanding **loans** in every Latin American country reflects the chronic lack of credit in the region (Exhibit 9).

Exhibit 1

EMPLOYMENT IN THE BANKING INDUSTRY* AS A PERCENTAGE OF TOTAL EMPLOYMENT 1992



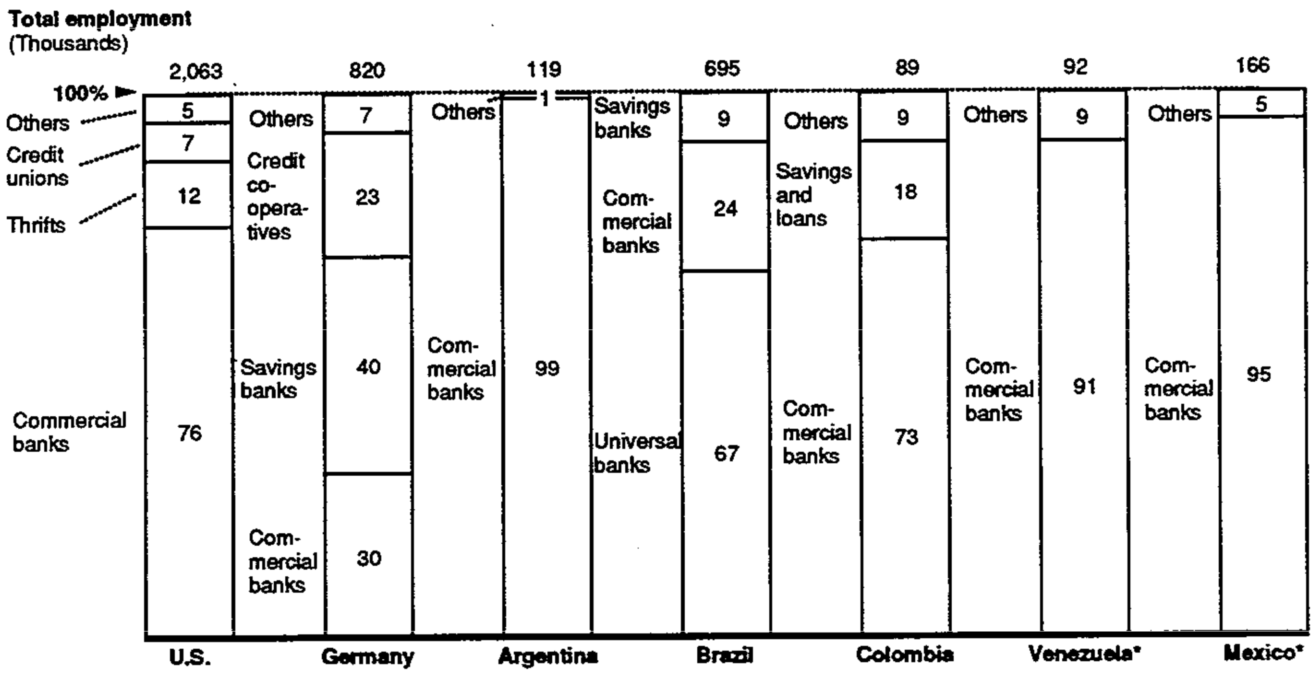
* Commercial and multiple banks, saving & loans, investment banks, financing companies and credit cooperatives

Source: Brazil: Ministério do Trabalho, FEBRABAN; Banco Central de la Republica Argentina; Venezuela: OCEI; Colombia: Superintendencia Bancaria; U.S. Department of Labor; McKinsey analysis

Exhibit 2

BANKING INDUSTRY EMPLOYMENT BY RELEVANT TYPE OF INSTITUTIONS 1992

Percent



* Estimation

Source: Colombia: Superintendência Bancária; Venezuela: OCEI, Superintendência de Bancos; Brazil: BACEN/DEASF/COGER, public banks includes caixas econômicas and private banks includes multiple and commercial banks; Banco Central de la Republica Argentina; McKinsey analysis

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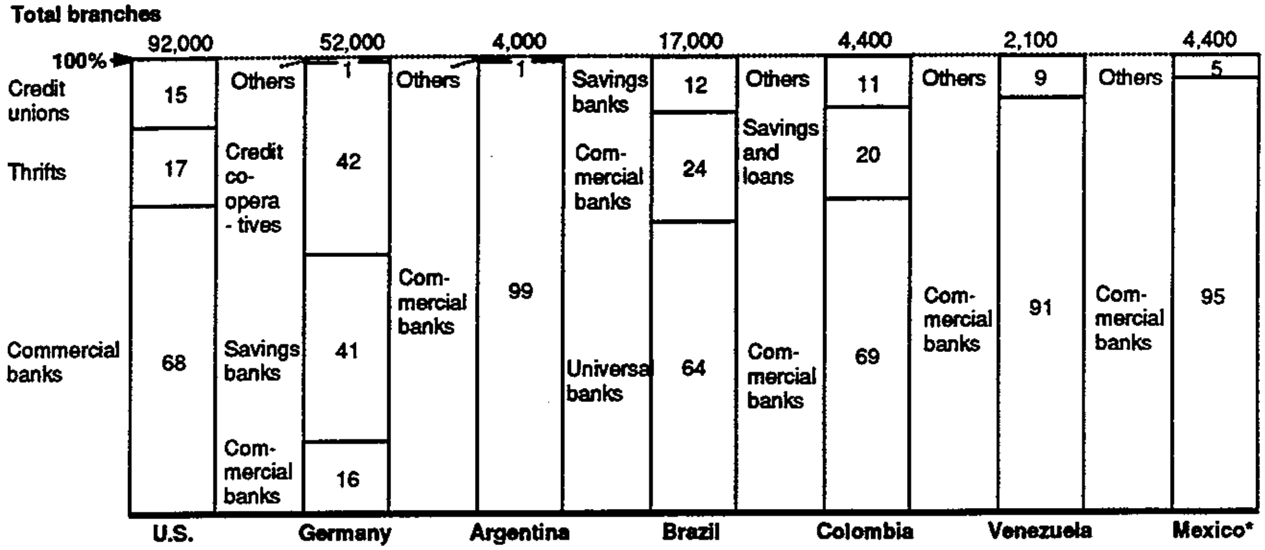
Exhibit 3

BRANCHES BY RELEVANT TYPES OF INSTITUTIONS 1992

Percent



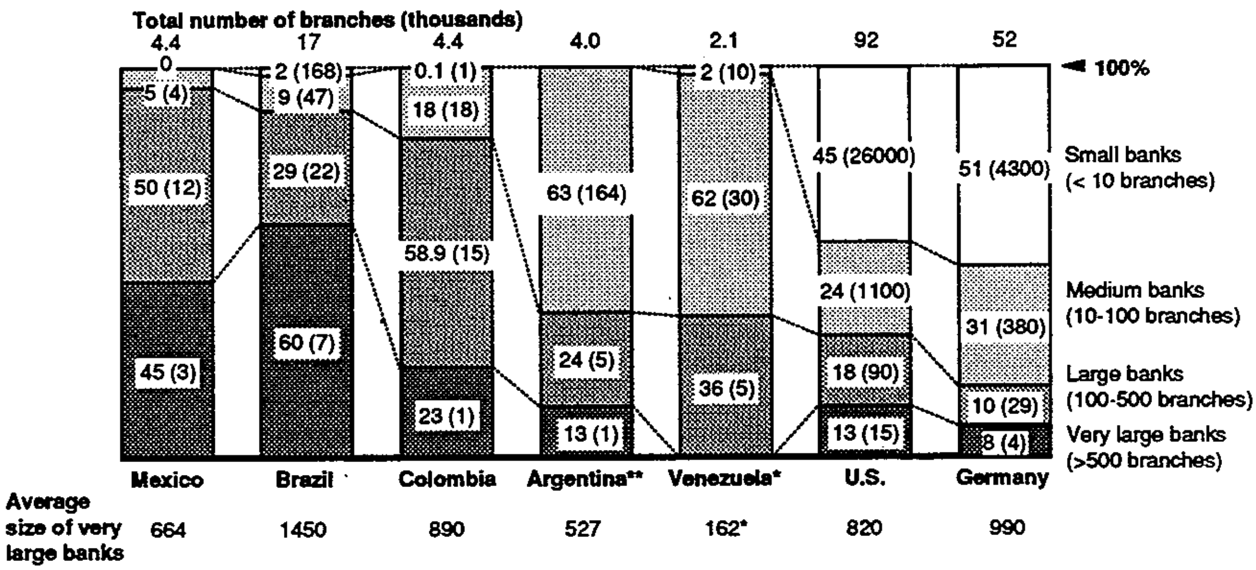
* Estimation

Source: Banco Central do Brasil, IBGE; Venezuela: Superintendência de Bancos; Colombia: Superintendência Bancária; Banco Central de la Republica Argentina; McKinsey analysis

Exhibit 4

DISTRIBUTION OF BRANCH NETWORK BY BANK SIZE

Percent of branches, (number of banks)



* Largest bank in Venezuela

** The figure for medium and small banks is not available

Source: Febraban; Banco Central do Brasil; Superintendencia Bancaria; Superintendencia de Bancos; Comision Nacional Bancania; McKinsey analysis

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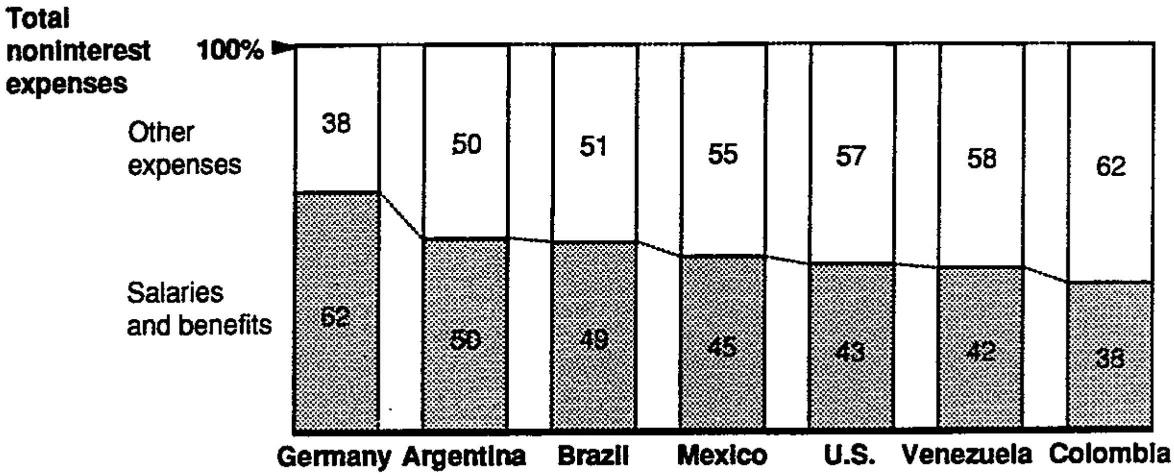
Exhibit 5

CONSOLIDATED NONINTEREST EXPENSES BY COUNTRY

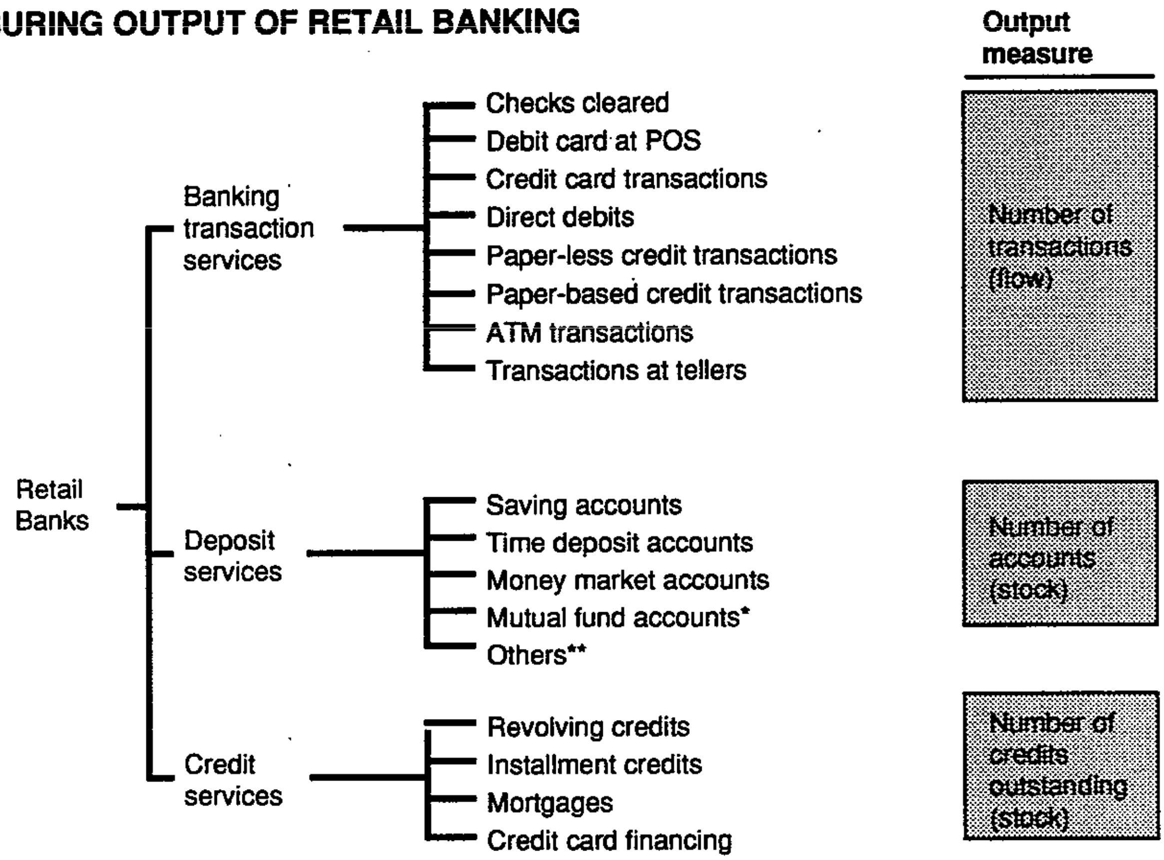
Percent



Source: McKinsey analysis

Exhibit 6

MEASURING OUTPUT OF RETAIL BANKING



* Commodities and fixed income funds for Brazil, FAF is considered as a money market account; Fondos de activos liquidos for Venezuela; Fondos comunes ordinarios for Colombia; Fondos comunes de inversión for Argentina

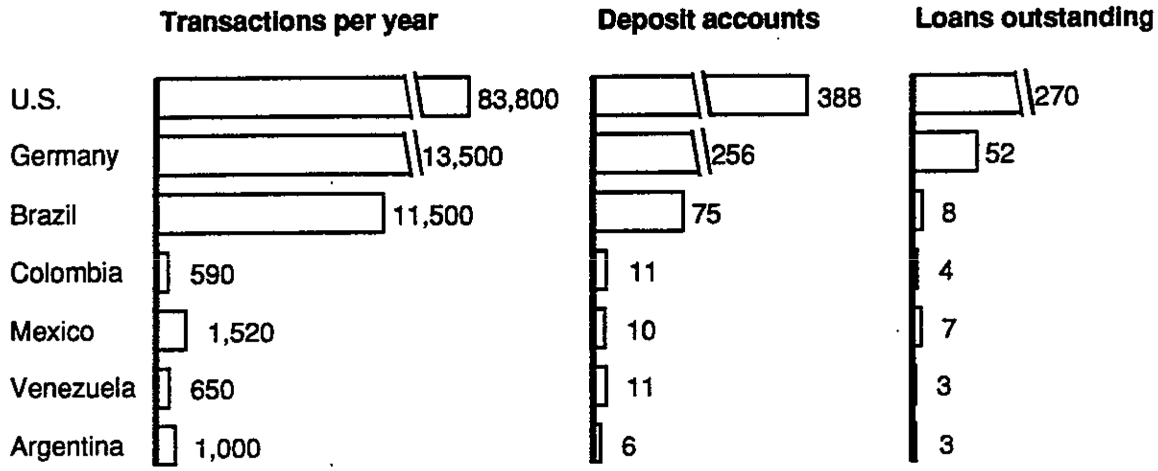
** Cuentas maestras for Mexico; Building society contracts for Germany

Source: McKinsey analysis

Exhibit 7

OUTPUT OF RETAIL BANKING - 1992

Millions

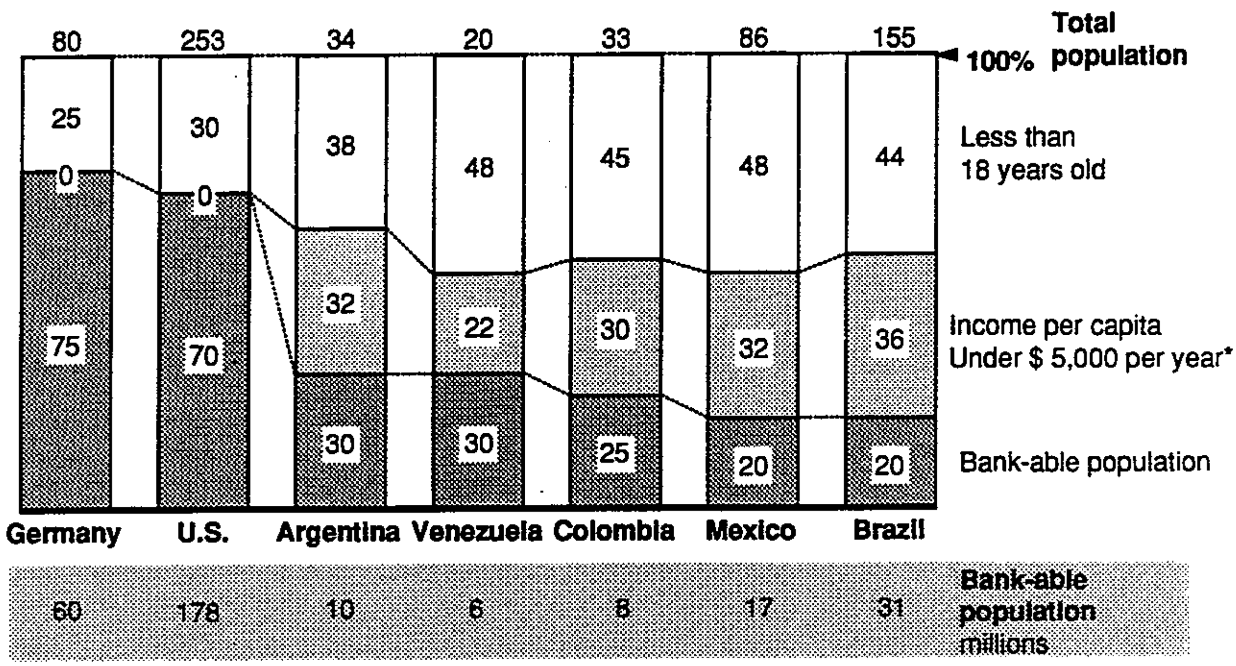


Source: BIS; local central banks; local banking associations; questionnaires; McKinsey analysis

Exhibit 8

ESTIMATION OF BANK-ABLE POPULATION

Millions, Percent



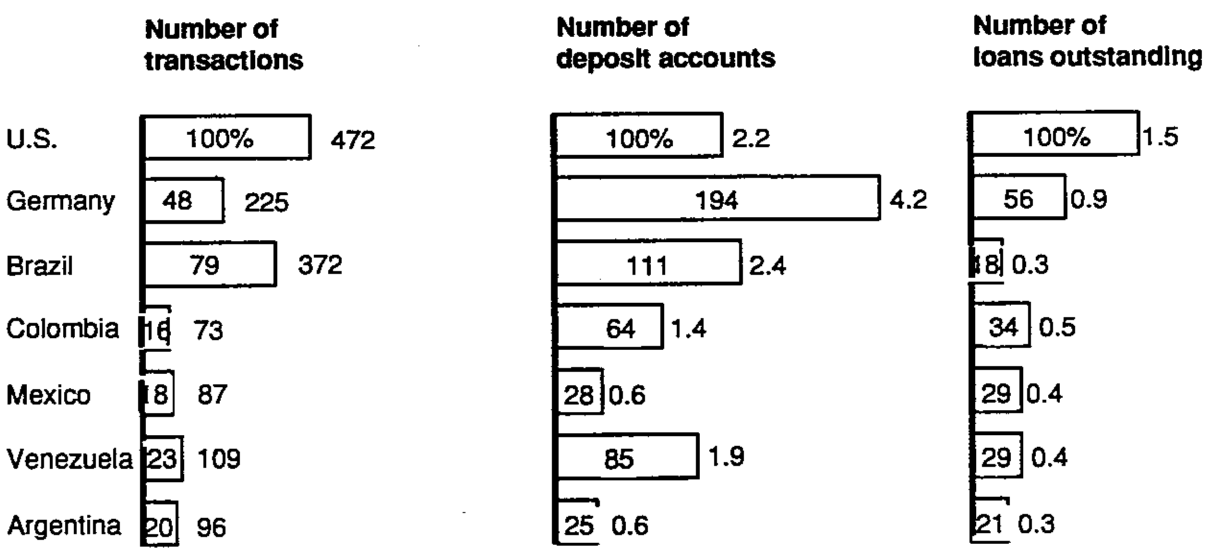
* Adjusted for purchasing power parity (PPP)

Source: World Bank, McKinsey analysis

Exhibit 9

MEASURED OUTPUT OF RETAIL BANKING PER BANK-ABLE INHABITANTS - 1992

Per Bank-able Inhabitant



Source: Questionnaires; McKinsey analysis

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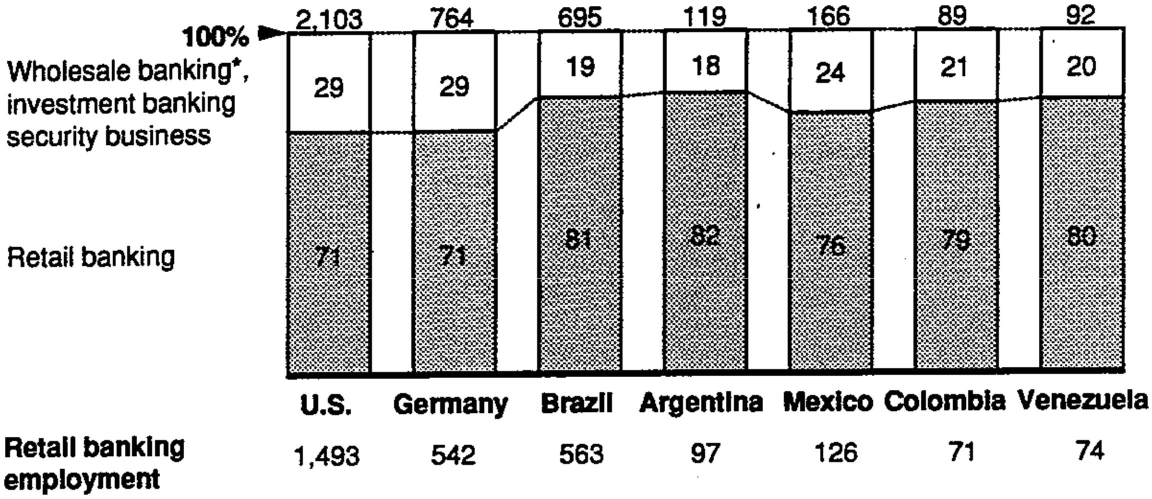
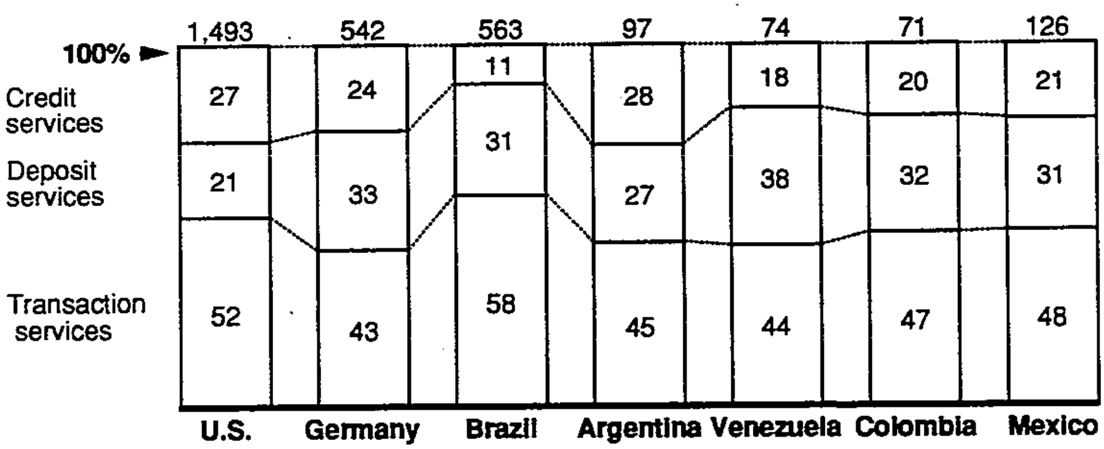
Exhibit 10
EMPLOYMENT IN THE RETAIL BANKING INDUSTRY 1992
Thousands



* Employment staff for wholesale payment systems was included as retail banking
Source: McKinsey analysis

Exhibit 11
EMPLOYMENT STRUCTURE IN RETAIL BANKING (FTEs)* BY MAJOR FUNCTION 1992
Thousands



* Part-time employees converted as half of a full-time employee
Source: Questionnaires, McKinsey analysis

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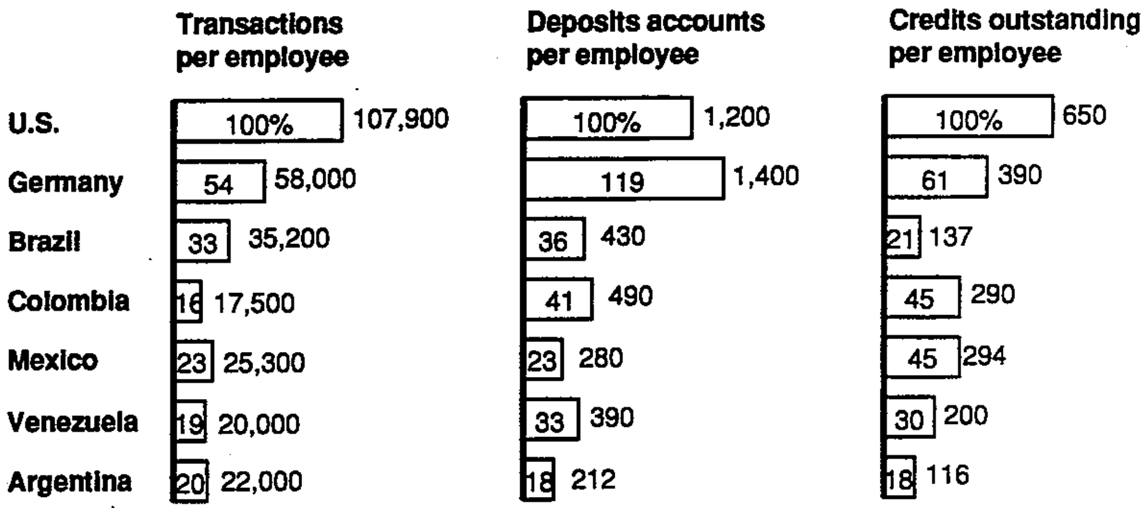
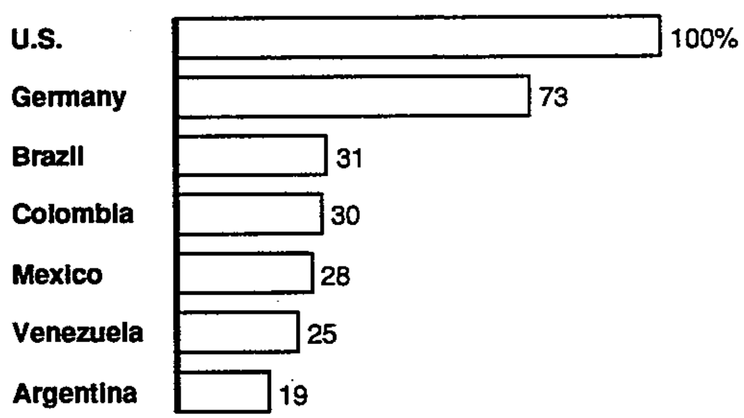
Exhibit 12
FUNCTIONAL PRODUCTIVITY MEASURES OF RETAIL BANKING* 1992



Source: Questionnaires; McKinsey analysis

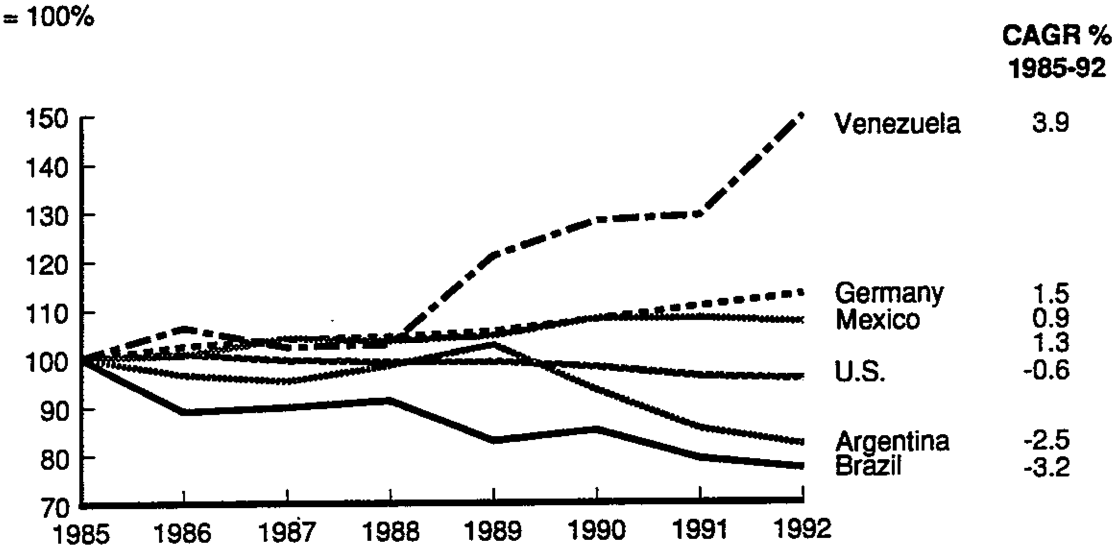
Exhibit 13
OVERALL PRODUCTIVITY OF THE RETAIL BANKING INDUSTRY* 1992



* Composite index of productivities for payment, deposit and credit services, weighted by labor input

Source: McKinsey analysis

Exhibit 14
INDEX OF EMPLOYMENT EVOLUTION
1985 = 100%



Source: Ministerio do Trabalho; Banco de la Republica Argentina; Superintendência Bancaria; OCEI; McKinsey analysis

Exhibit 15
CAUSES FOR THE PRODUCTIVITY GAP OF LATIN AMERICA RETAIL BANKING INDUSTRY

External factors

- Low cost pressure due to high profitability
- Low financial penetration and macroeconomics instability affecting demand for banking services
- Heavy regulatory environment inhibiting competition
- Inefficient state owned banks have large market share

Nature of competition

- Low competitive pressure
  - Lack of price/interest competition
  - Competition more intense for service levels which creates inefficient allocation of resources
- Very concentrated industry

Production process

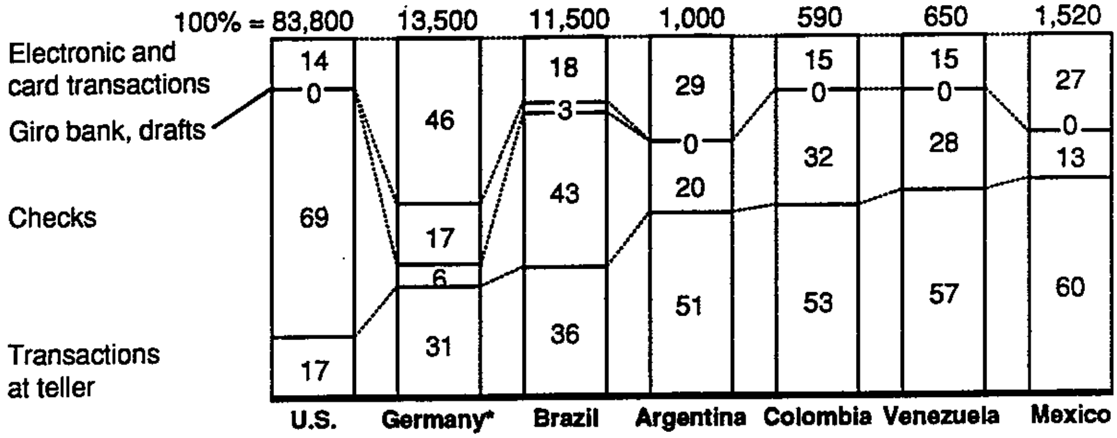
- Inefficient organization of labor
  - No utilization of part-time workers
  - Use of branch as virtually the only channel for transactions, instead of other more efficient channels
  - High complexity of core process
- Low level of automation and usage of information technology
- Different mix of services provided explain only very small part of gap

Exhibit 16

FORMS OF RETAIL PAYMENT 1992

Millions

Total annual transactions



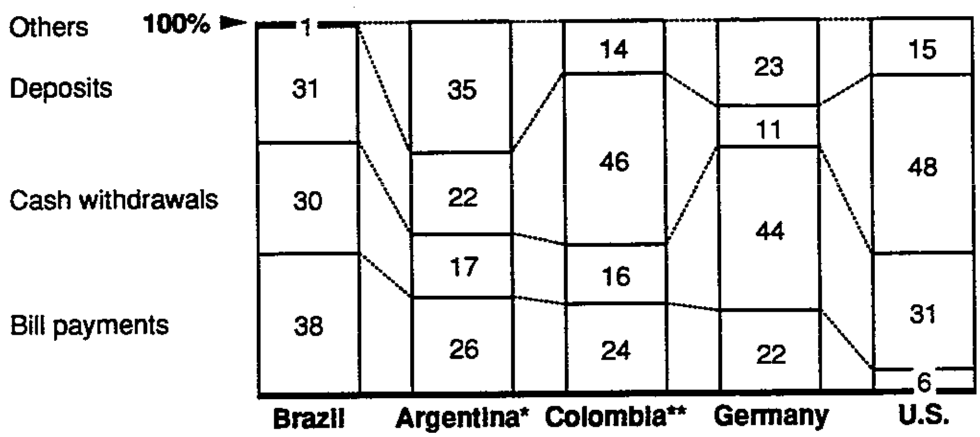
* Paper-based credit transfers at tellers are included in transactions at tellers

Source: Questionnaires; BIS; McKinsey analysis

Exhibit 17

MIX OF TRANSACTIONS DONE AT THE TELLER

Millions



* Others: payment to retirees 5%, exchange of currencies 9%

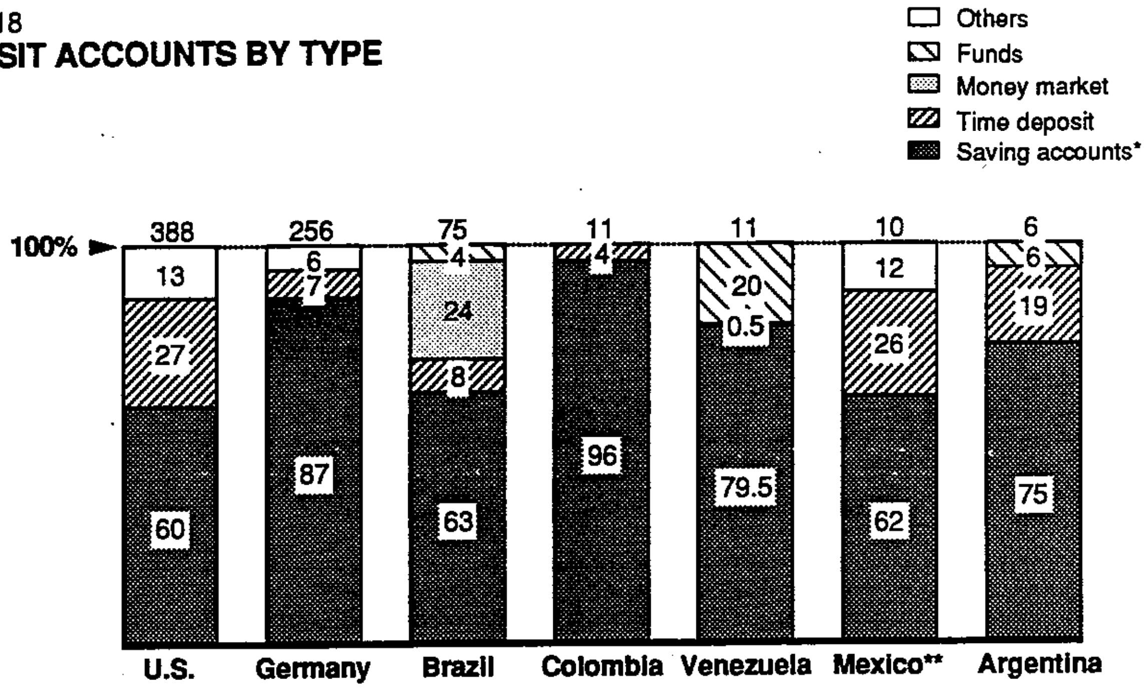
** Based on major retailer banks

Source: Febraban; savings banks; questionnaries; Bank Administration Institute; McKinsey analysis

Exhibit 18

DEPOSIT ACCOUNTS BY TYPE

Millions



Number of checking accounts (millions)	170	77	44	1.8	2.2	3	1.7

* All types of savings accounts, including contractual accounts

** For Mexico cuentas maestras are included as others.

Source: McKinsey analysis

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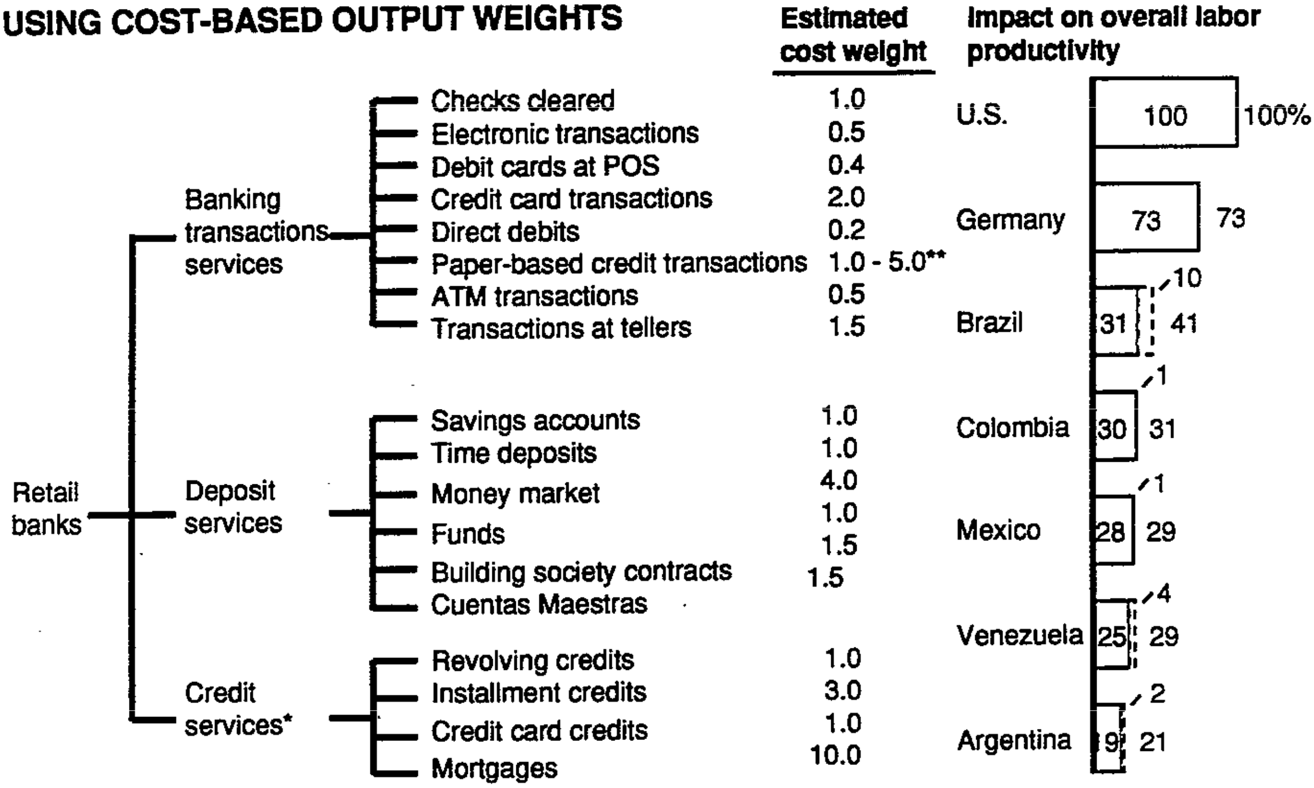
Exhibit 19

MEASURING IMPACT ON PRODUCTIVITY USING COST-BASED OUTPUT WEIGHTS



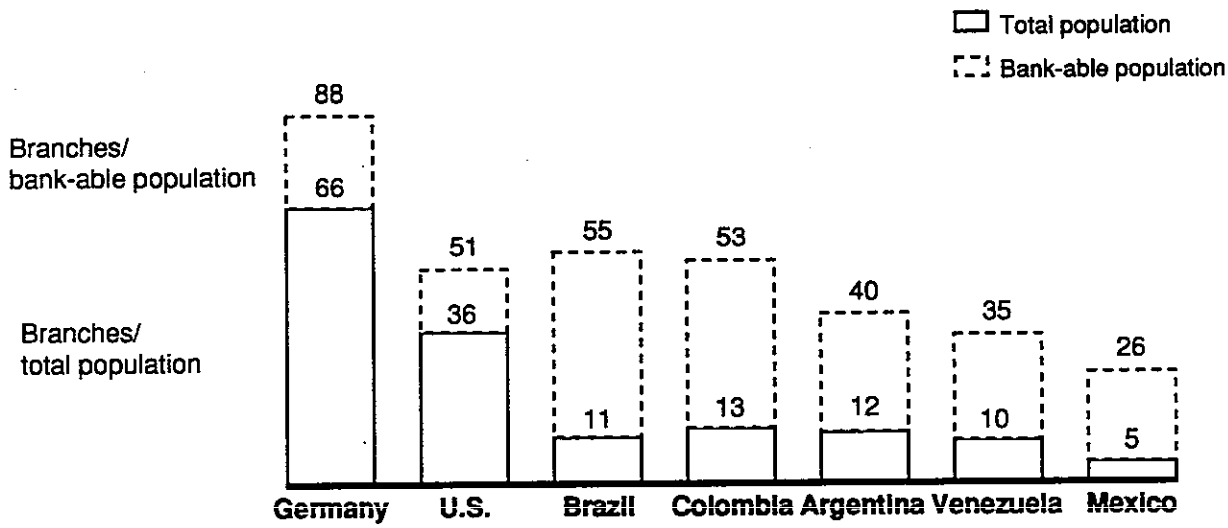
* Credit output measures were not weighted because it is not available for all countries divided by types as above

** Weights used for Brazil and Germany were respectively 5.0 and 1.0

Source: Questionnaires; Febraban, McKinsey analysis

Exhibit 20

BRANCHES IN THE BANKING INDUSTRY PER 100,000 INHABITANTS



Source: World Bank; McKinsey analysis

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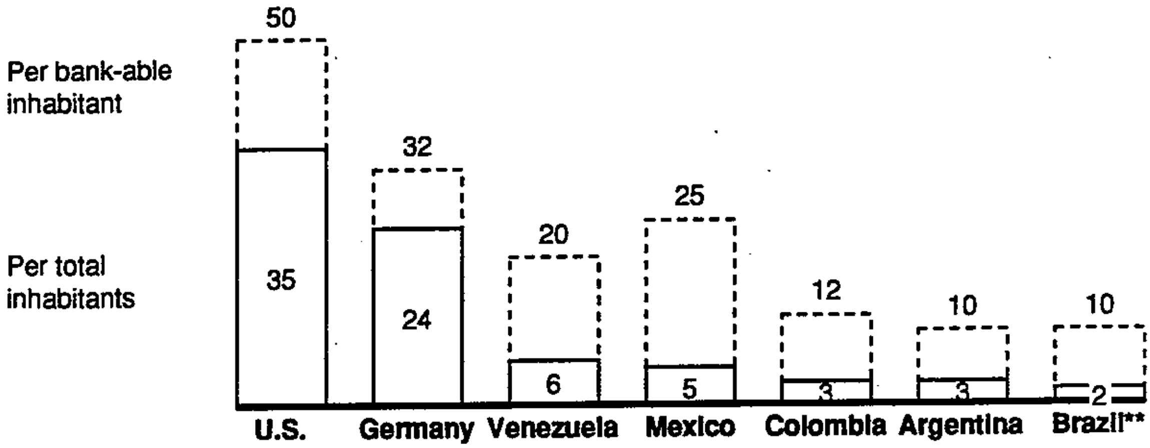
Exhibit 21

ATMs/100,000 BANK-ABLE INHABITANTS - 1992

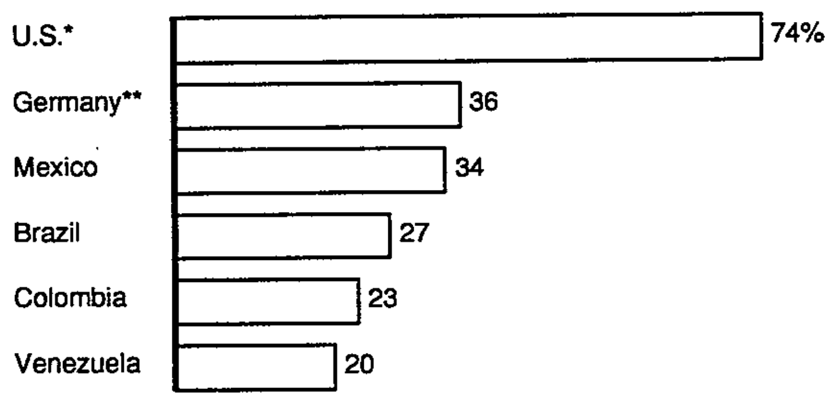


* Average for Banco Mercantil (30% market share)
** Average for Itaú, Bradesco and Tecnologia Bancária
Source: McKinsey analysis

Exhibit 22

ON-LINE TERMINALS PER 100 EMPLOYEES 1992

Percent

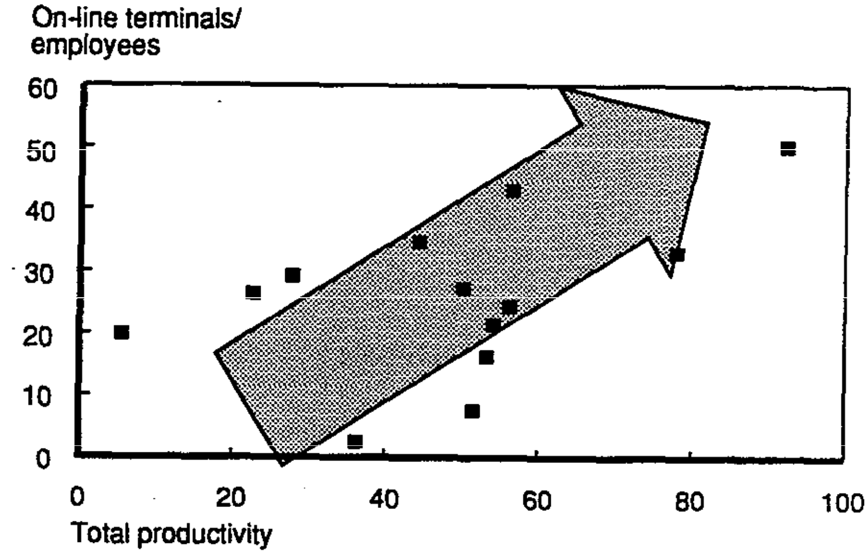


* U.S. figure for 1989
** Figure for savings banks - 1991
Source: ABA National Operations/Automation Survey; annual report Sparkassen; MACE; questionnaires; McKinsey analysis

Exhibit 23

ON-LINE TERMINALS/EMPLOYEES X TOTAL PRODUCTIVITY - SAMPLE OF BRAZILIAN BANKS

Percent

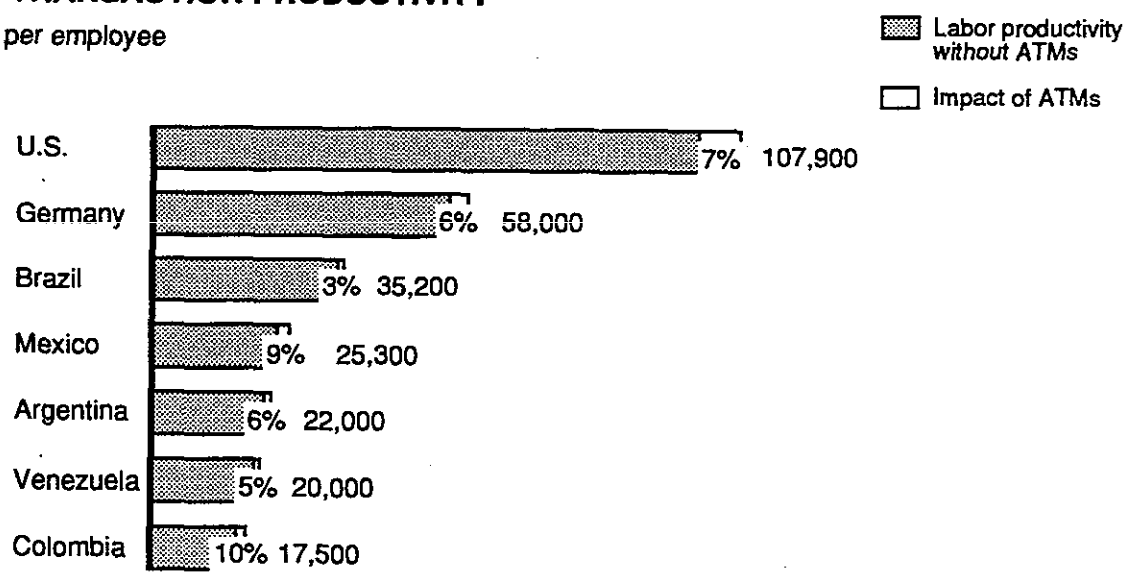


Source: Febraban; questionnaires; McKinsey analysis

Exhibit 24

IMPACT OF ATM USAGE ON THE PAYMENT TRANSACTION PRODUCTIVITY

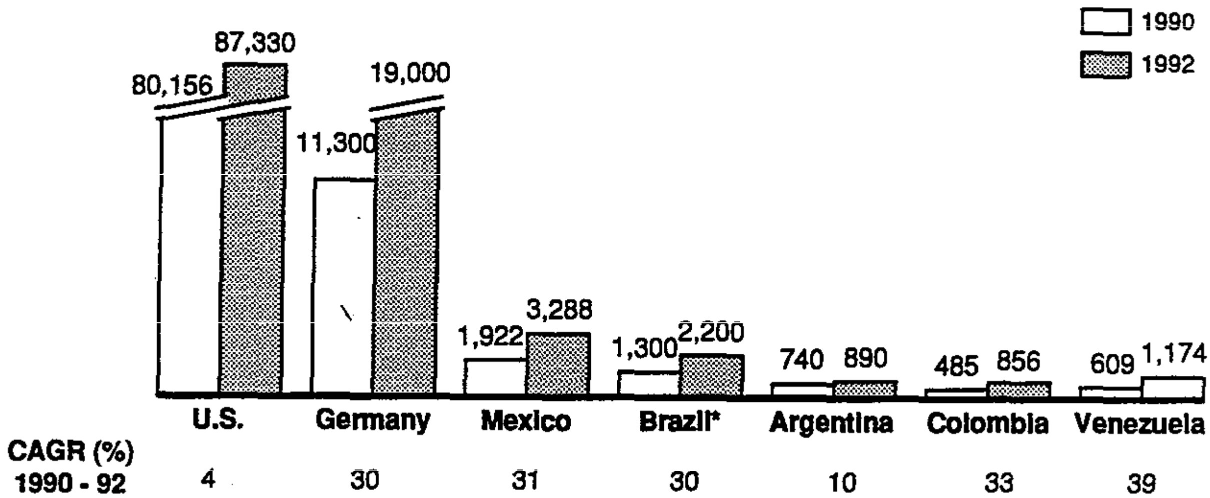
Transactions per employee



Source: McKinsey analysis

Exhibit 25

TOTAL NUMBER OF ATMs 1990/92



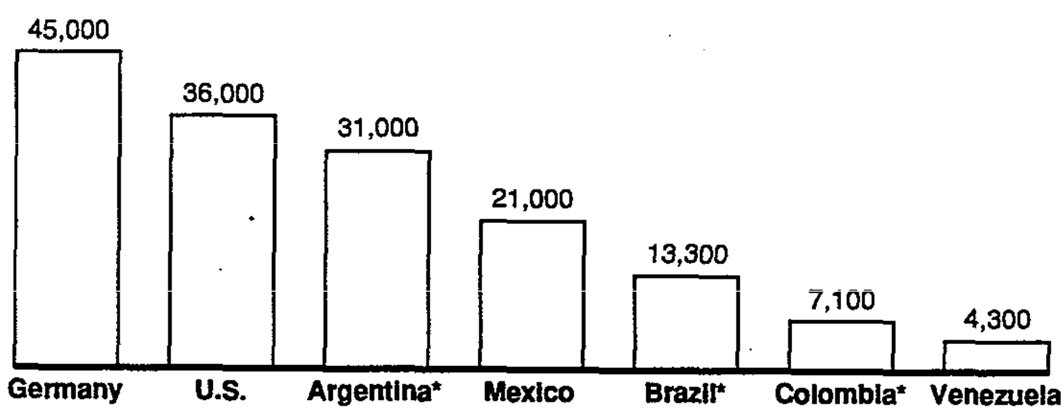
* The number of cash dispensers increased from 4.300 to 7.000 from 1991 to 1992. Cash dispenser can only be utilized inside branches and costs much less than an ATM

Source: McKinsey analysis

Exhibit 26

ANNUAL LABOR COST PER EMPLOYEE IN THE BANKING INDUSTRY 1992

U.S. $



* Average for private banks employees only

Source: McKisney analysis

Exhibit 27
ATM PRICES AND TELLER SALARIES

Average salary of a teller (U.S. $ Thousands)		Ratio (Capital/labor)	ATM prices - 1992 (U.S. $ Thousands)
23.0	U.S.	0.9	20
35.0	Germany	0.8	29
12.5	Argentina	2.0	35
5.0	Mexico**	5.5	28
4.1	Colombia	8.5	35
3.0	Venezuela	11.5	35
3.2	Brazil	14.0	45

* Salary without social security benefits
** 1993 figures
Source: NCR; Datapro reports; interviews; McKinsey analysis

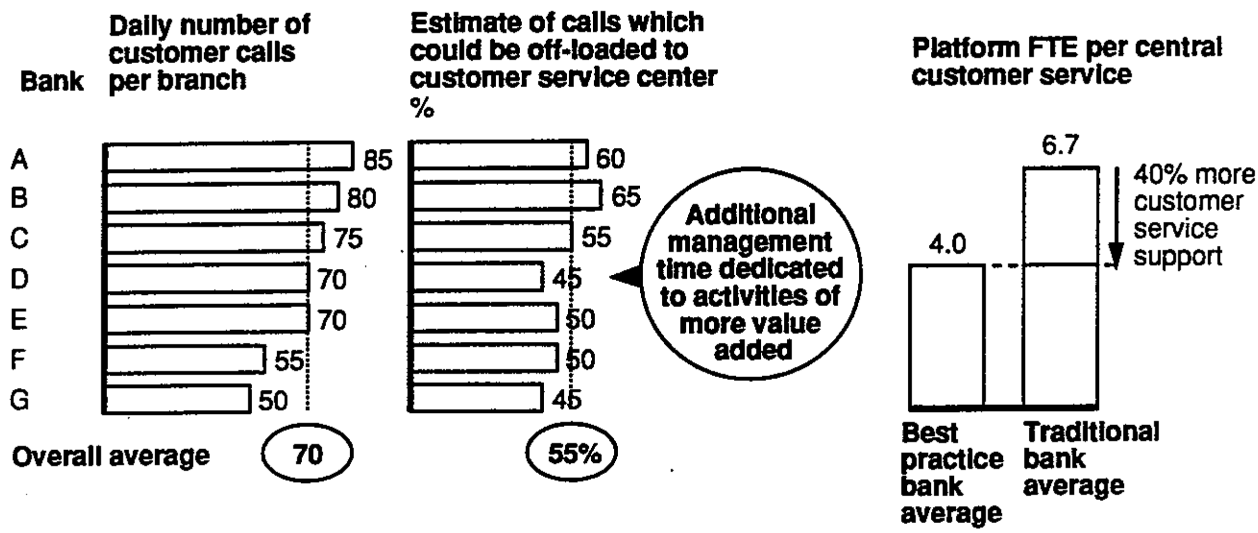
Exhibit 28
OBSERVED INTERNAL LABOR PRODUCTIVITY GAPS

Line of business	Function/ position	Example productivity measure	Observed gap within a bank Percent
Operations	Proof	Statements/FTE	62
Mortgage Banking	Processor/closer	Caseload per FTE	55
Retail payment	Teller	Teller utilization: transaction volume X standard time per available FTE	38
Telephone Banking	Customer service representative	CSR working time + total available time	33

Source: McKinsey Financial Institutions Practice

Exhibit 29

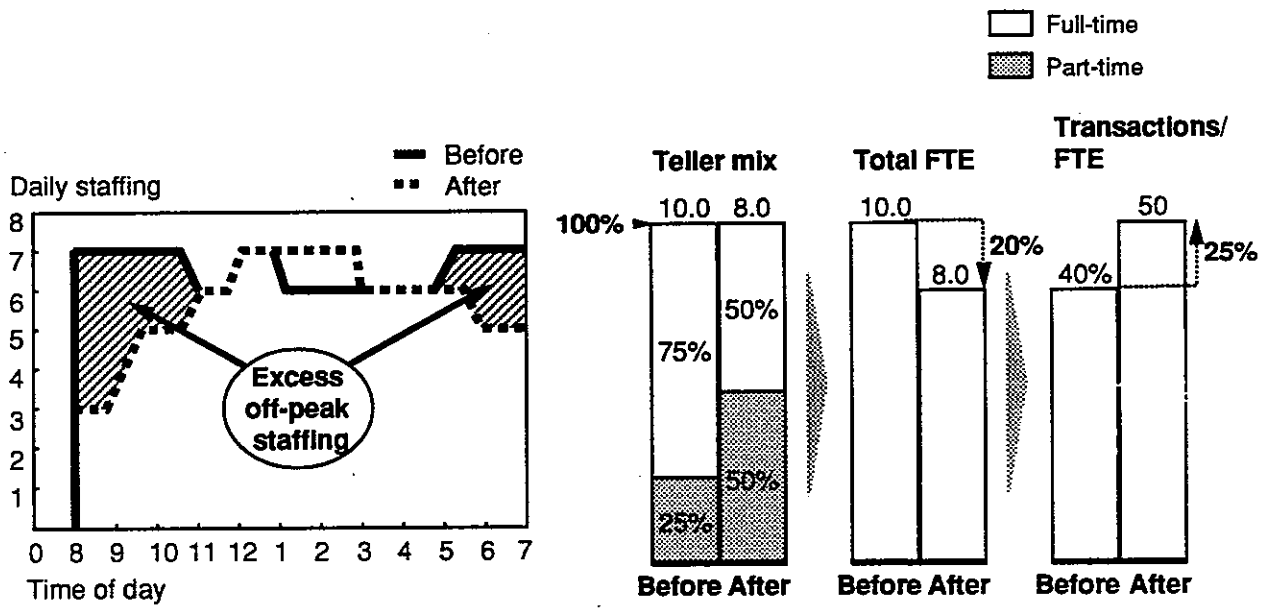
BRANCH CUSTOMER TELEPHONE INQUIRY "OFF-LOADING" OPPORTUNITIES



Source: Retail Delivery System Management Practices Survey; McKinsey experience

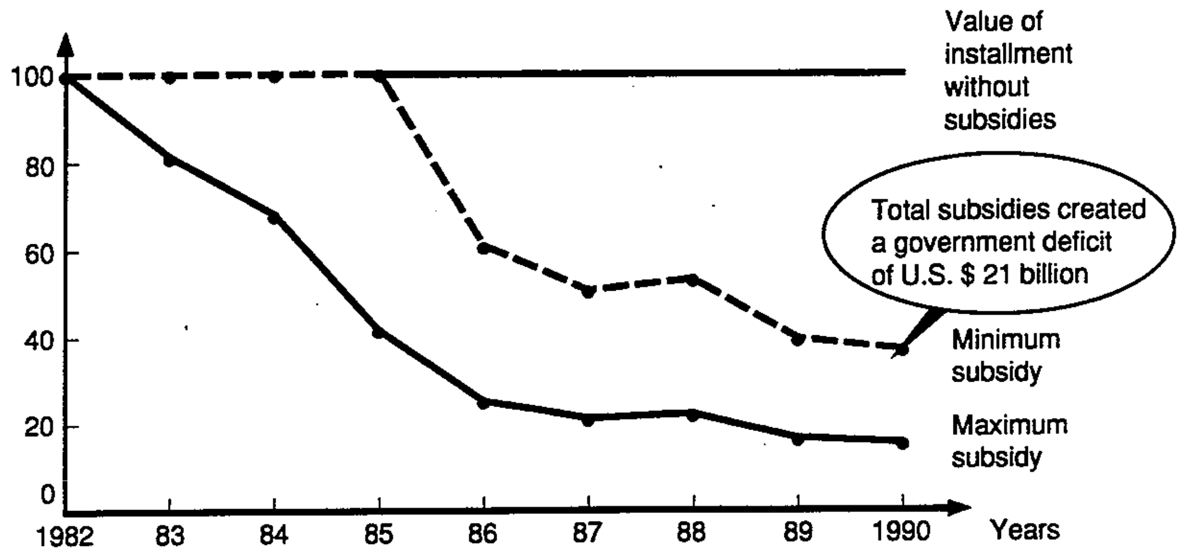
Exhibit 30

CASE EXAMPLE OF TELLER STAFFING OPPORTUNITY



Source: McKinsey Financial Institutions Practice

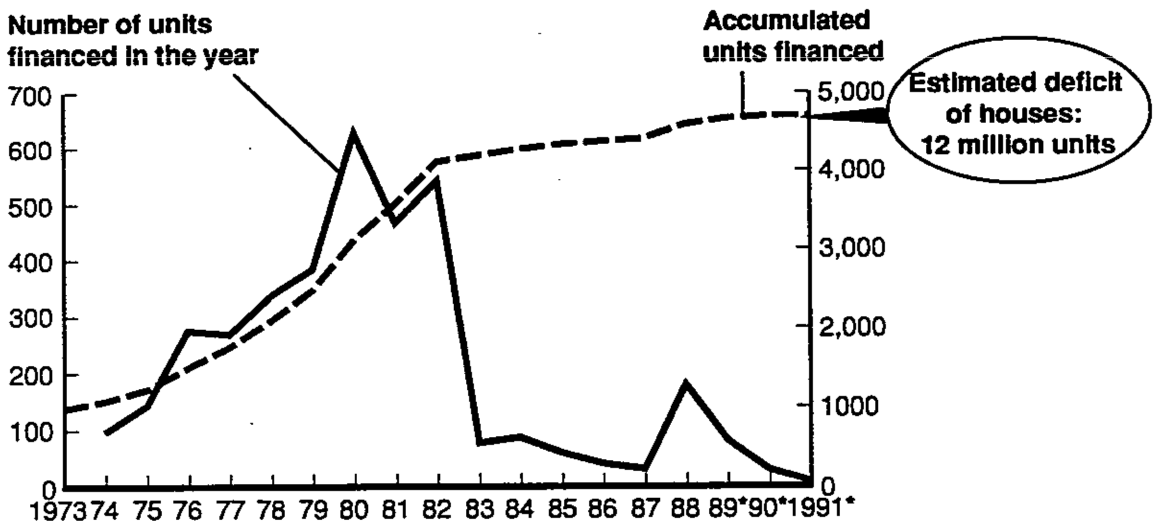
Exhibit 31
EFFECT OF SUBSIDIES IN THE INSTALLMENTS



Source: ABECIP - "Departamento técnico"; "Uma nova luz sobre o SFH"

Exhibit 32
NUMBER OF HOMES FINANCED BY THE BRAZILIAN HOME FINANCING SYSTEM (SFH)

Thousand

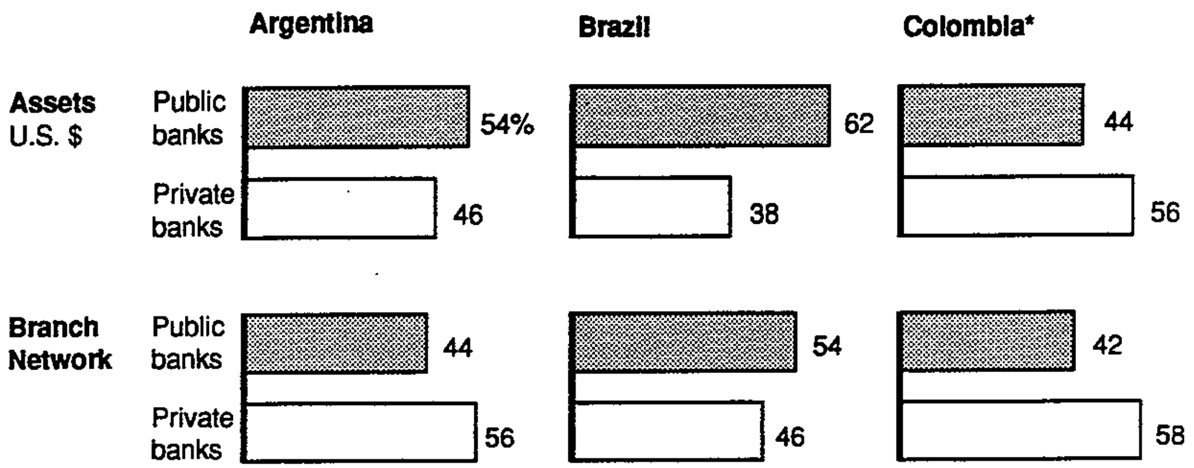


* Includes only houses financed by SBPE: more than 50% of total
Source: ABECIP - "Departamento técnico"

Exhibit 33

MARKET SHARE OF PRIVATE VS. PUBLIC BANKING INSTITUTIONS

Percent

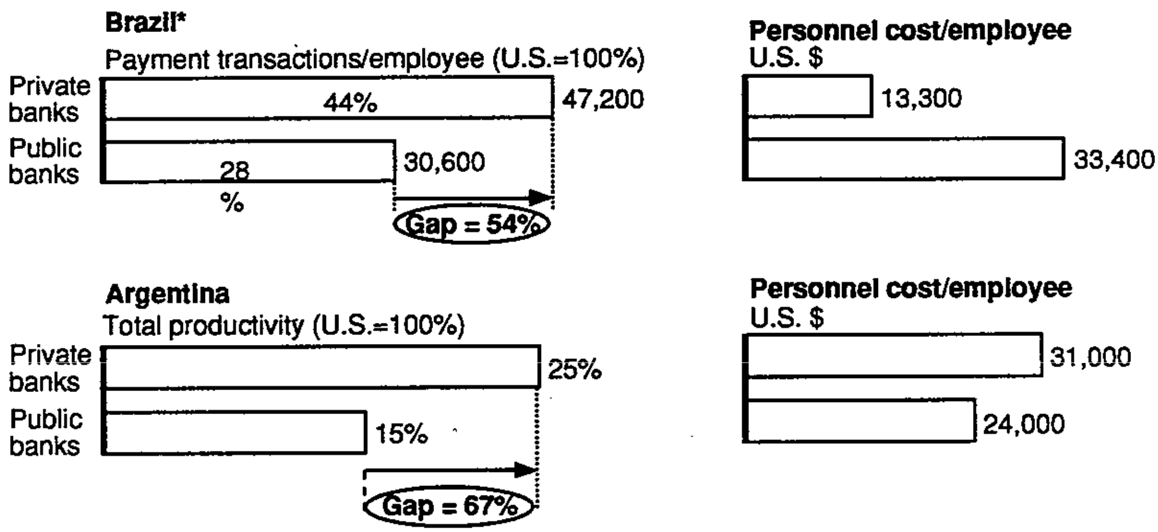


* Public banks as of 1992: Cafetero, Ganadero, Colombia, Estado, Popular, Caja Agraria and some "Corporaciones Financeiras"

Source: McKinsey analysis

Exhibit 34

COMPARISON OF SOME INDICATORS BETWEEN PUBLIC AND PRIVATE BANKS

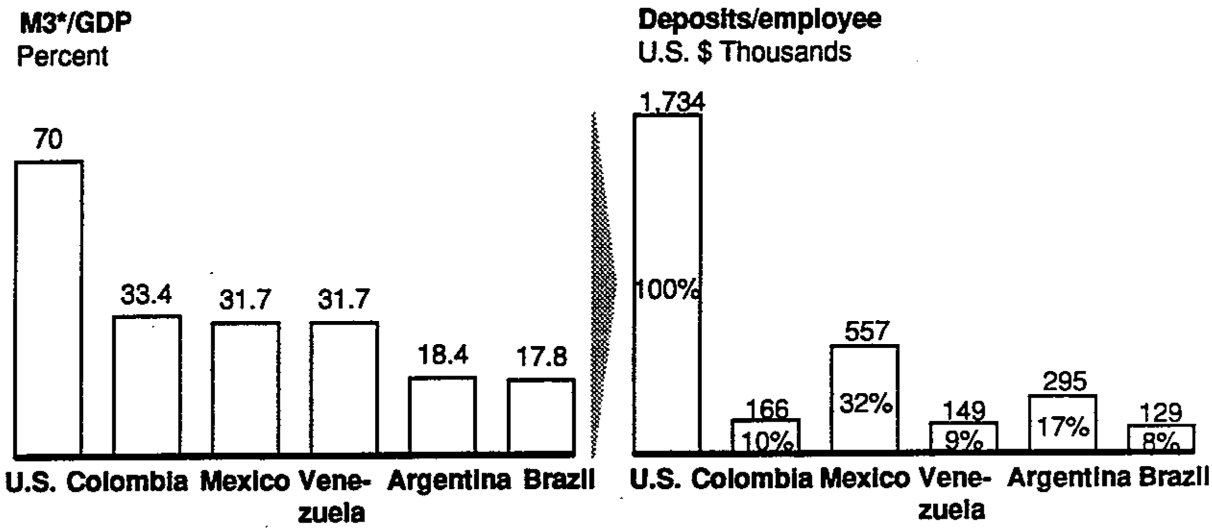


* Sample of 19 banks including the major public and private banks

Source: Questionnaires; Febraban; Financial Statements; Banco Central de la Republica Argentina

Exhibit 35

FINANCIAL PENETRATION AND FINANCIAL PRODUCTIVITY 1992



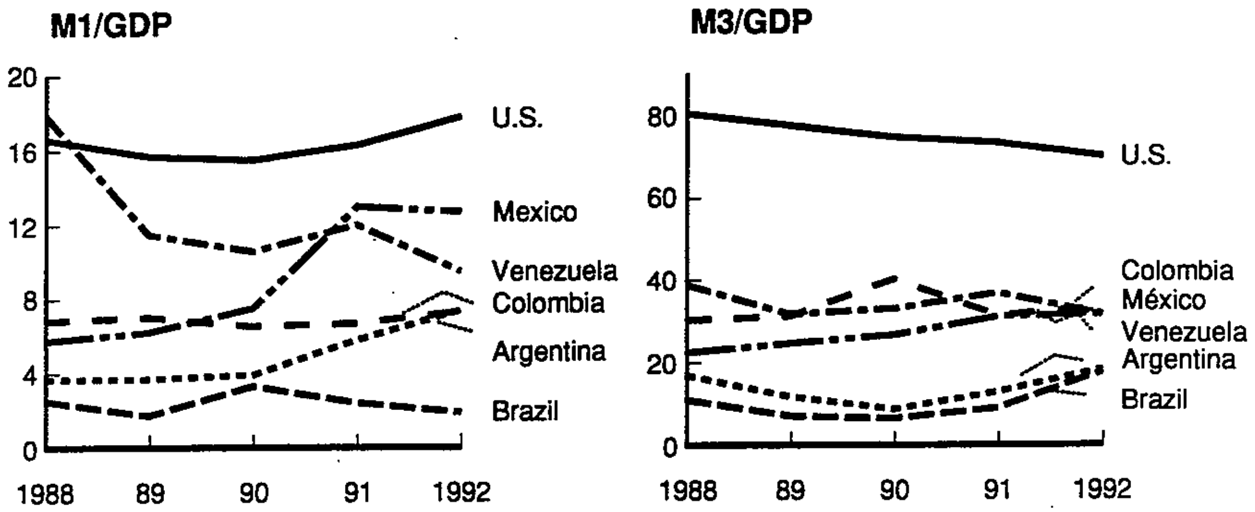
* M3 = Monetary base + demand deposits + savings deposits + time deposits

Source: McKinsey analysis

Exhibit 36

EVOLUTION OF FINANCIAL PENETRATION - M1*/GDP AND M3**/GDP

Percent



* M1 = Monetary base + demand deposits

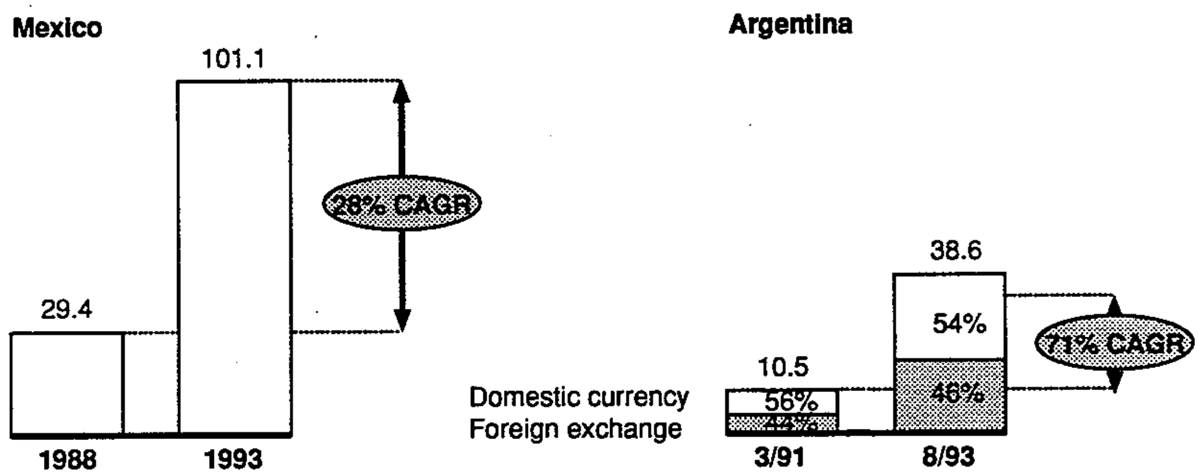
** M3 = M1 + saving deposits + time deposits

Source: McKinsey analysis

Exhibit 37

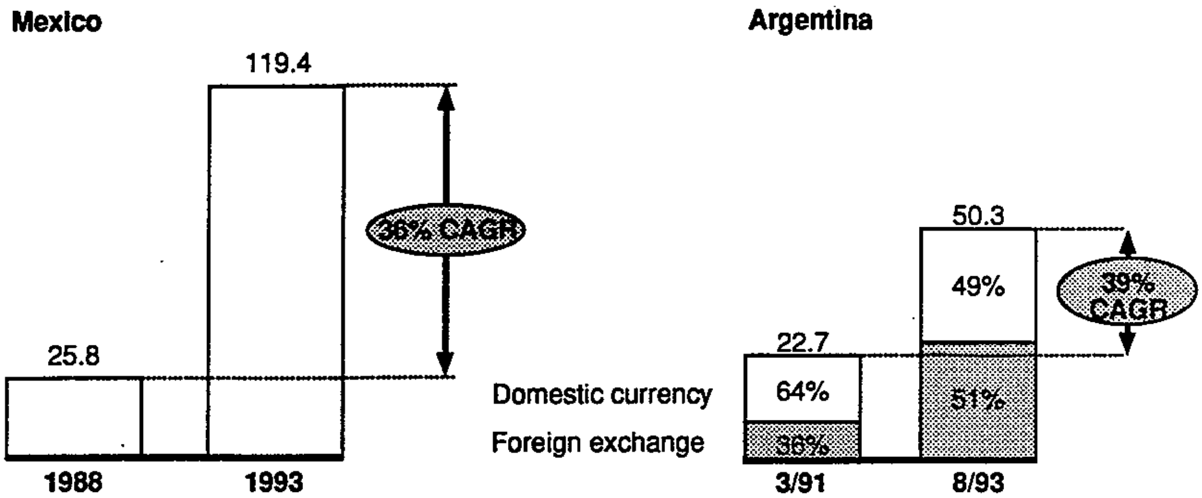
GROWTH IN TOTAL DEPOSITS

U.S. $ Billions



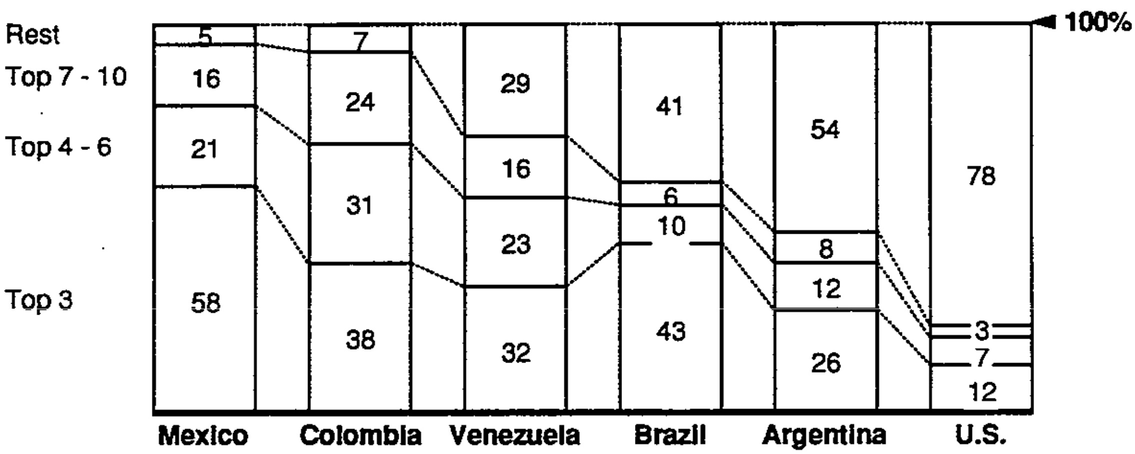
Source: Banco Central de la Republica Argentina; Comision Nacional Bancaria

Exhibit 38
GROWTH IN LOAN PORTFOLIO
U.S. $ Billions



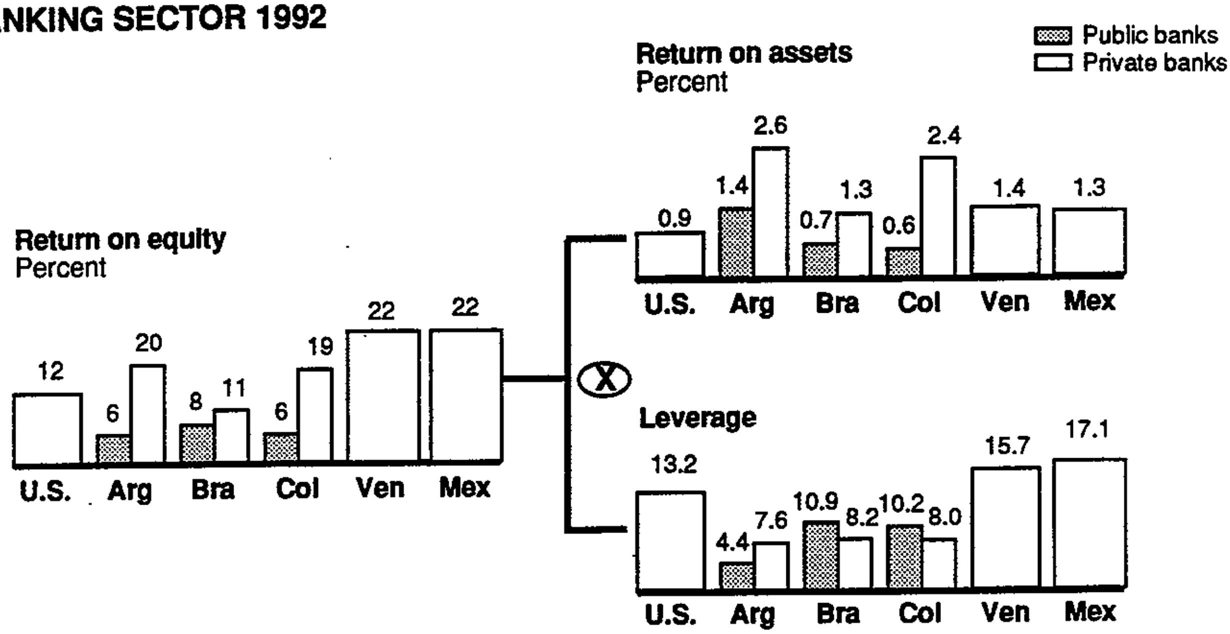
Source: Comision Nacional Bancaria, ADEBA, McKinsey analysis

Exhibit 39
CONCENTRATION OF BANKING IN LATIN AMERICA 1992
Percent of total assets



Source: McKinsey analysis

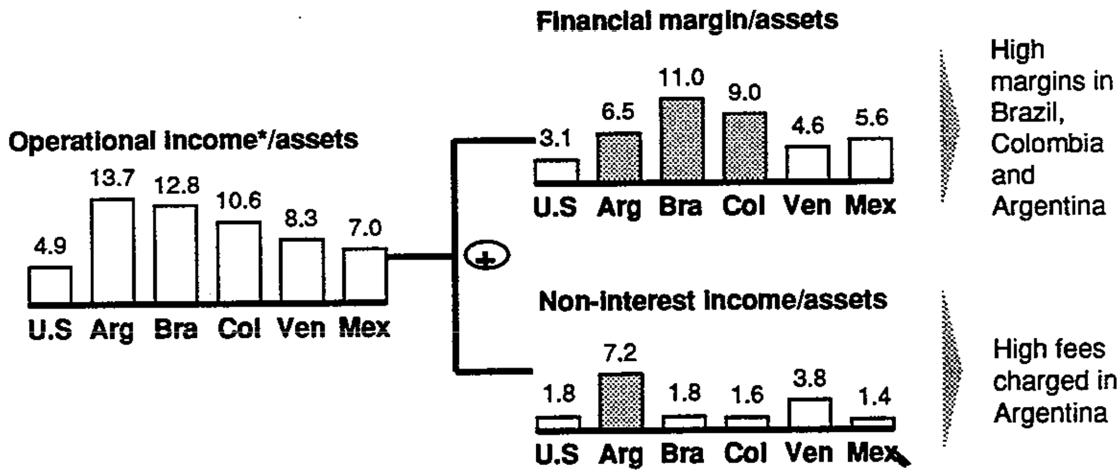
Exhibit 40
RETURN ON EQUITY OF THE BANKING SECTOR 1992



Source: McKinsey analysis

Exhibit 41
OPERATIONAL INCOME STRUCTURE OF PRIVATE BANKS 1992

Percent of assets



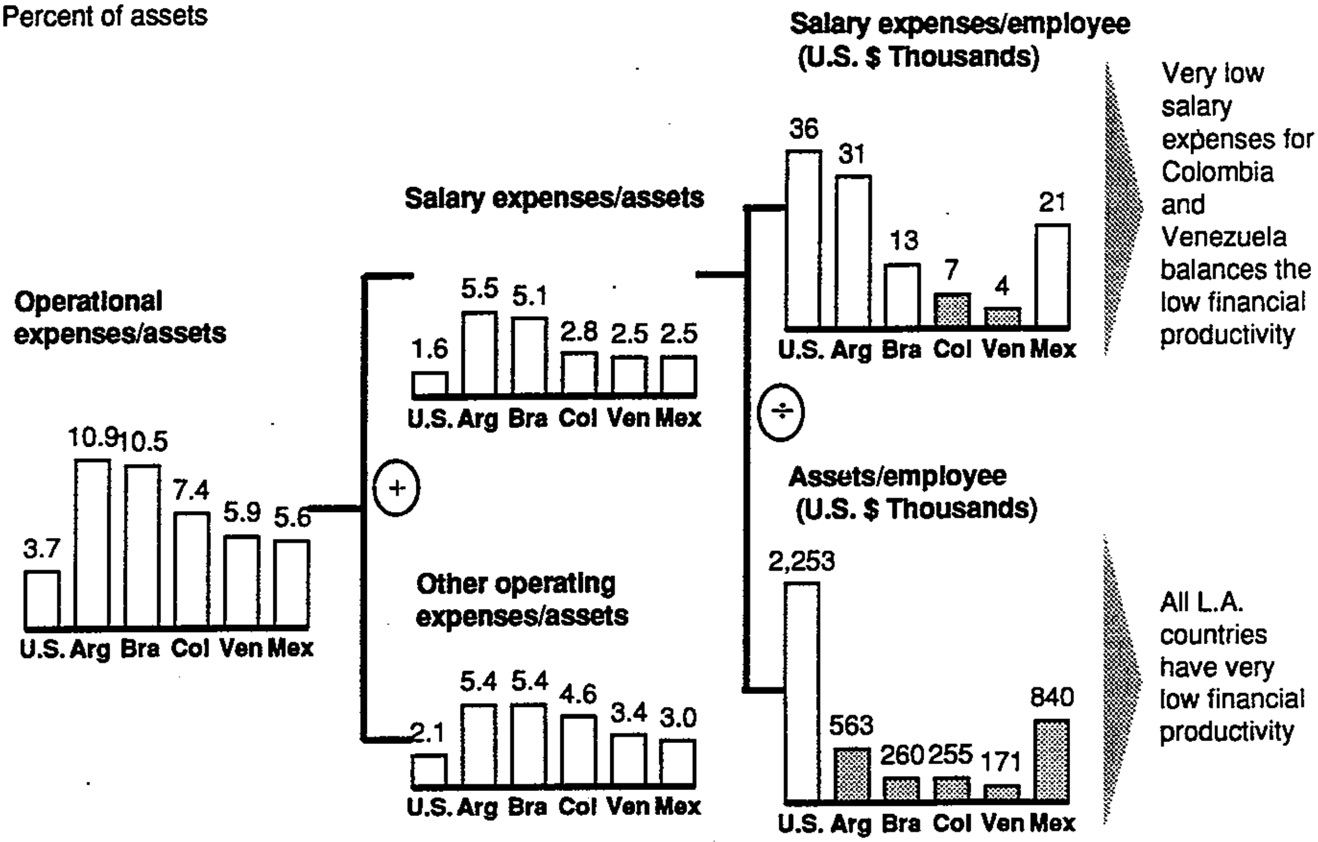
* Defined as the sum of net interest income (financial margin) plus non-interest income minus provisions for bad loans

Source: McKinsey analysis

Exhibit 42

OPERATIONAL EXPENSE STRUCTURE OF PRIVATE BANKS 1992

Percent of assets

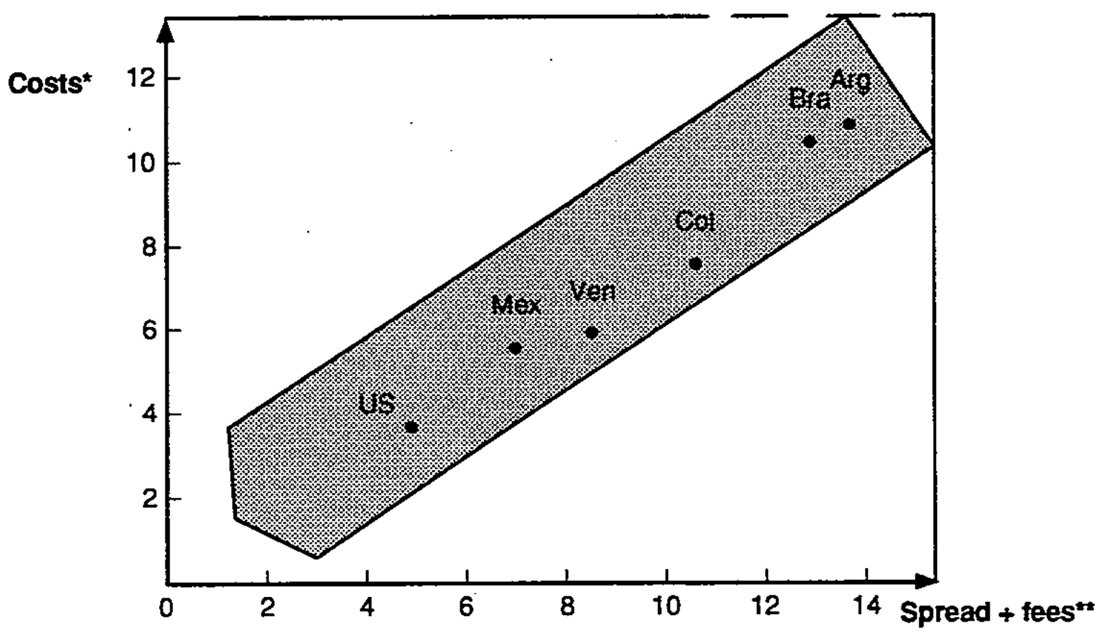


Source: McKinsey analysis

Exhibit 43

SPREAD + FEES VS. COSTS OF FINANCIAL INTERMEDIATION

Percent of assets



* Costs = operations expenses

** Spread + fees = net interest income + non-interest income

Source: McKinsey analysis

DC 062494 ZXO-550.6

Exhibit 44

KEY TRENDS DURING TRANSITION TO STABLE ENVIRONMENT

Privatization/ deregulation	Increase importance of market forces
Remonetization	Increase in funds intermediated by banks as a result of: • Repatriation of flight money • Capital inflows • Increase in domestic savings through reform of pension system
Lending boom	Boom in lending in the retail and middle market segments as a result of increase in deposits, lower reserve requirements and less government lending
Disintermed-lation of banks in corporate lending	Use of international and later domestic capital markets for corporate debt and equity financing
Innovation	Introduction of new products for corporate, middle market and retail segments
Structural changes	Change in industry structure • Importance of fee income • Loss of market share by public banks

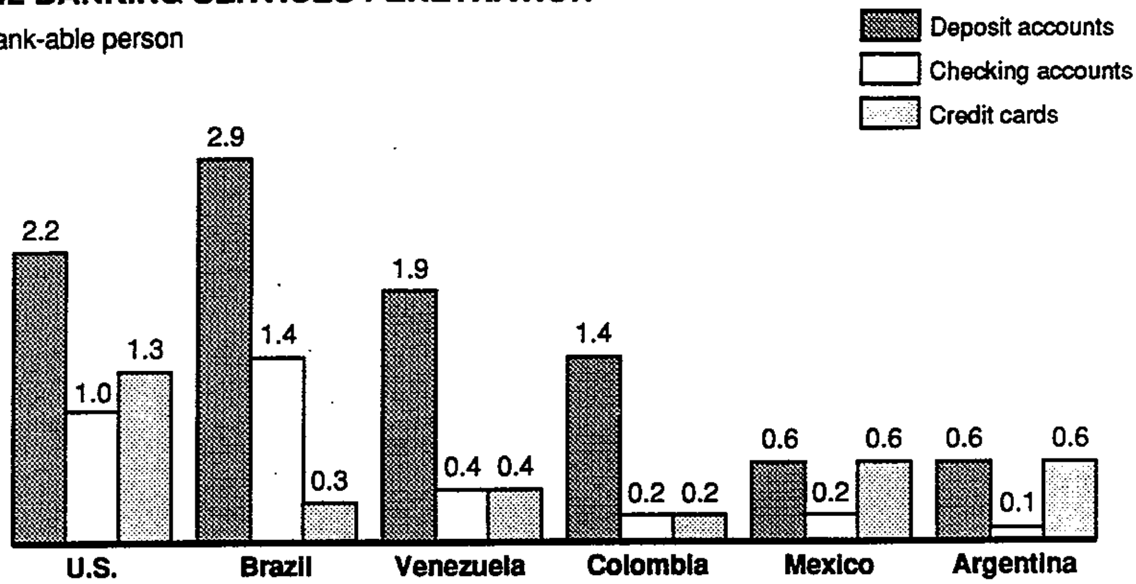
SPEED and INTENSITY of changes depend on the role of government/ central bank, financial industry structure, financial penetration and customer characteristics at the beginning of the stabilization program

Source: Interviews; McKinsey analysis

Exhibit 45

RETAIL BANKING SERVICES PENETRATION

Units/bank-able person

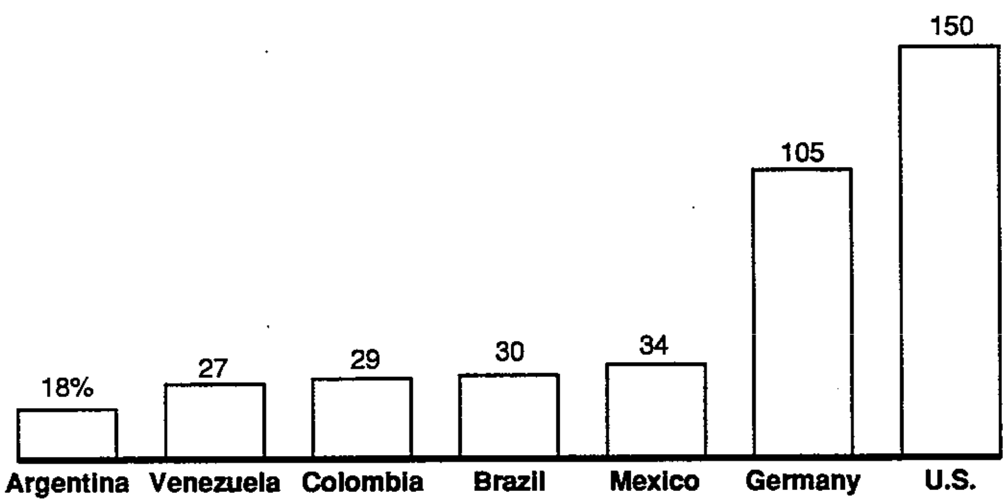


Source: McKinsey analysis

Exhibit 46

TOTAL CREDITS OUTSTANDING WITH FINANCIAL INSTITUTIONS 1992

Percent of GDP



Source: McKinsey analysis

Exhibit 47

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES

RETAIL BANKING

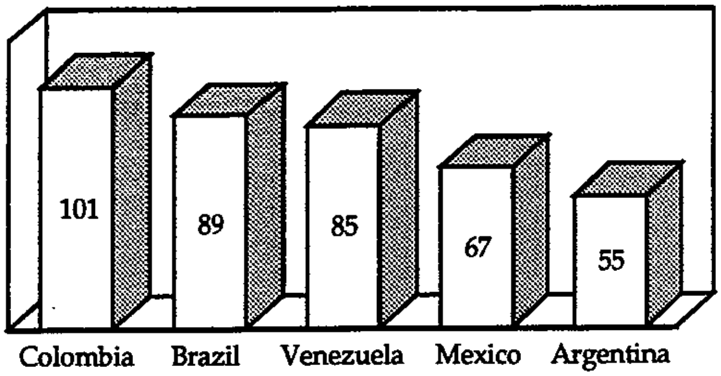
● Important
o Secondary
X Undifferentiating

External factors	
• Market conditions	
- Demand factors	X
- Relative input prices/factor availability	●
- Other industries	X
• Policy and regulation	
- Import barriers	○
- Competition and concentration rules	●
- Labor rules and unionism	○
- State ownership	●
- Other (fiscal policy, price controls)	X
Nature of competition	●
Production process	
• Output mix, variety, quality	○
• Production factors	
- Capital (intensity, vintage, technology)	●
- Scale	○
- Labor skills	X
- Organization of functions and tasks	●
LABOR PRODUCTIVITY	

Source: McKinsey estimate

TELECOMMUNICATIONS CASE STUDY SUMMARY

Telecommunications Total Factor Productivity 1992
Index: U.S. = 100



Privatization and deregulation are transforming once inefficient firms into fast-growing and profitable carriers while productivity is rising and customers are being much better served. Brazil's slower growth and stagnant labor productivity is the exception to this virtuous cycle.

The relatively narrow productivity gap between Latin America and the U.S. is due, in part, to the still low competitive intensity found among the latter. Performance varies substantially from country to country; Colombia, for instance, shows a very high level of productivity brought about by a combination of excellent capital utilization and continuous improvements in labor productivity. Brazil's network utilization and Venezuela's efficient investment help their otherwise poor labor performance. Mexico and Argentina's lower productivity ratios are the result of long-term inefficiency in both labor and capital utilization that have still not been offset despite their good performance in recent years.

The existence of state-owned telecommunications monopolies has resulted in overstaffed organizations that invested inefficiently in building their networks while never matching potential demand. The prevalence of powerful trade unions in this sector has contributed to the preservation of the status-quo at the expense of potential telephone users. The advances that have taken place since privatization as well as the few historically privately-owned carriers in the region, are a living proof of the impact a new approach to management can have on this industry.

Deregulation and privatization has dramatically changed the environment in most of the countries studied. The 1990s have seen faster growing networks in the newly privatized carriers and in the efficiently state-owned Colombian company, together with substantial productivity increases in Argentina, Colombia and Mexico. Venezuela's productivity is not growing at the same speed that its network is doing, not even matching the U.S. improvement, thus deteriorating its relative productivity level. Brazil's network presents much slower growth than the other countries studied and its relative productivity gains have been smaller. Network expansion is a critical issue due to the present low telephone penetration.

Deregulation so far has shown that, if correctly priced, ownership of a telephone does not have to be a luxury enjoyed by only a minority of Latin America's population. To enhance broader access, regulatory bodies should begin to fix rate schemes in accordance with local cost structure as well as continue liberalizing competition.

PRODUCTIVITY IN THE LATIN AMERICAN TELECOMMUNICATIONS INDUSTRY

INTRODUCTION

As recently as the early 1980s, the world's telecommunications industry remained heavily regulated and controlled by state-owned monopolies. By the late 1980s, deregulation and privatization in Japan, the UK, and the U.S. introduced competition into this industry, once thought by economists to be a perfect "natural" monopoly. Latin America has not escaped this trend. In many countries in the region, the telecommunications sector has also become the centerpiece of far-reaching privatization programs.

Telecommunications is not only important as a provider of income, employment and services, it also forms a vital component of national infrastructure. The existence of widespread transmission networks and the inexpensive, reliable service telecommunications provides are indispensable to the development of an economy. Telecommunications allows for the efficient exchange of ideas, offers ease in conducting the complexities of business and commerce, and generally serves to keep societies cohesive. In developing countries, where telecommunications networks are not complete, the telecommunications industry must, aside from continuously improving the services it provides, continually expand its reach. Decision makers in these countries are consequently faced with the challenge of balancing the interests of key participants (current and potential customers, employees, and shareholders) to guarantee the delivery of a service that is no longer a luxury, but a necessity.

Many Latin American countries have recognized the need to rapidly improve their telecommunications system. Several countries have chosen privatization programs to rapidly improve their systems. The report that follows carefully examines the telecommunications industry in five countries in the region. Three – Argentina, Mexico, and Venezuela – privatized their state-owned companies and two – Brazil and Colombia – did not. By examining the relative performance of the industry in these countries, this case should shed light on the effects of previous privatization and deregulation, and thus contribute to the discussion of what future national policies should be.

INDUSTRY PROFILE

This study examines the major telecommunications providers in each country. In most countries, telecommunications is still provided by a small number of firms. Even where it is most fragmented, in the U.S., the activities of a vast majority in the industry can be examined by studying major long distance carriers and seven regional local holding companies. In other countries, the industry still consists only of the original national company and a few new private companies that have formed recently (Exhibit 1).

Latin America's telecommunications industries are generally similar from country to country. They all employ an average 0.25 percent of the national labor force which is less than half of what developed country industries employ. Since they either enjoy a common past or are still national telephone monopolies, the basic services they provide are also similar. Industries in each country install, maintain and operate a variety of networks that transmit voice, data, paging and telex by wire or wireless means.

To understand productivity, an awareness of certain key characteristics of today's telecommunications industries is needed.

¶ Regulation. Telecommunications is among the most heavily regulated industries in all countries. Exhibit 2 shows the regulatory and competitive environment in the U.S. and the Latin American countries. In the U.S., it is the most deregulated and also the most competitive. Regulatory differences between the Latin American countries are not yet significant.

¶ Capital Intensity. Telecommunications is an extremely capital intensive business. In this industry, capital costs are almost equal to labor costs. About 75 percent of capital expenditures are geared to the local network; i.e., they go toward the installation of access lines (the connection from the customer to the first switch) and for local switching (Exhibit 3). Consequently, the major factor determining cost of capital in telecommunications is the number of access lines in the network and a high utilization of the access lines are key to an economical utilization of invested capital.

¶ Fixed Costs. High capital intensity means high fixed costs. Labor costs are also mostly fixed. We estimate that, over the long term, only about 15 percent of labor costs within the U.S. industry varies with the traffic volume (Exhibit 4). The remaining 85 percent are fixed costs related to expansion and maintenance of the network and customer base. The main determinant of labor cost is the number of access lines installed or maintained, rather than the volume of traffic in the network.

¶ Entry Barriers. Without regulatory barriers, capital intensity and high fixed costs create high entry barriers to potential new competitors. In fact, until recently, both local and long distance service have long been considered the best example of a "natural monopoly." Here, fixed costs are so high that operations are most efficiently run by one company under the close supervision or even ownership of a government.

The advent of new, cheaper technologies is rapidly breaking down this phenomenon. Fiber optics and digital switching technology have already removed natural barriers in long distance service in the U.S. The improving performance and economic viability of digital radio and cable TV technologies once again suggest that U.S. consumers may soon be able to choose between two local service providers. Latin America, however, is still a long way from generating the wealth and traffic volume which the economical use of these technologies require. As such, high entry barriers will remain over the medium term.

MEASURING LABOR PRODUCTIVITY IN THE TELECOMMUNICATIONS INDUSTRY

This study follows the methodology defined by the McKinsey Global Institute when it studied the telecommunications industries in the developed world. It uses a calculation of total factor productivity to reconcile inherent conflicts in determining an overall ratio for the industry.

The Concept of Productivity in the Telecommunications Industry

Measuring productivity in telecommunications is more difficult than in other industries. The first step in analyzing an industry's productivity is to decide which specific outputs and inputs to measure to provide a useful productivity ratio. Normally, the inputs most directly involved in generating a specific output should be used. But what are the outputs and inputs in a telecommunications system?

From the system users' standpoint, the primary measure of output should be total call volume. What they are mostly getting from the telecommunications companies is calls, be it telephone-to-telephone, computer-to-computer, etc. Residential users chiefly buy voice calls, some accessory services, telephone directories, communications facilities, etc., as well as connection to the telecommunications network. In addition, business users buy more sophisticated services for data transmission, paging, etc.

The capital installed and maintained by the employees is used by the customer when he or she makes a call. With the exception of call completion services, which we excluded from the productivity comparison, the usage of the network and the service delivery to the customer do not require any further labor input. From the user's point of view, the primary service of the telephone company is provided solely by the network. Measuring capital productivity by using a traffic measure as output (e.g., calls) and a capital measure as input (e.g., network capital stock) reflects the productivity of the telecommunications industry from the customer's point of view.

For the telecommunications service provider the view is different. It sees, as its primary task, not to connect callers with one another, but to build and maintain the network that connects callers with one another. The majority of a telecommunication firm's employees are involved in activities directly related to creating and maintaining the telecommunications network (Exhibit 4). Consequently, their primary output is the number of access lines they install and maintain. Of course, telecommunications workers perform other tasks too, such as serving customers, primarily in providing information and answering questions or service complaints.

Exhibit 5 summarizes these user and provider views of the production process within the telecommunications industry and its implications for measuring productivity. The telecommunications firm's labor force is creating the network and providing direct service to its users. From the provider's standpoint, labor productivity has to be measured using a measure of its direct output. For it, the number of access lines of the telephone network appears to be a good proxy for approximately 85 percent of the employees who are engaged in the access network of the system and in maintaining the customer relationship (Exhibit 4). For the remaining 15 percent of labor deployed in the traffic related parts of the system (e.g., maintaining and operating switches or providing directory service), the number of annual calls is perhaps the best proxy output measure available.

Both measures of productivity are valid. The production process of a telephone company is a two-step function: labor creates capital and capital provides services. But the telecommunications industry, as a whole, can only be productive if the two production processes are effective and efficient. In other words, telecommunications employees "should" build an effective network which provides services that customers want, and the telephone company "should" do this efficiently so that the customers are also willing to pay the price to buy these services.

Both aspects can be captured when labor and capital productivity are combined to determine a total factor productivity measure of the telecommunications industry. Total factor productivity takes both outputs (the network and the network services) and both inputs (labor and capital) of the telecommunications industry into account. We computed total factor productivity as the factor cost-weighted average of labor and capital productivity.

Why did we not apply the concept of pure labor productivity and why did we not explicitly take the capital input into account in the telecommunications industry as we did for the others? It is not only that the telecommunications industry is very capital intensive; capital is also relevant in the steel the steel industry. It is that in the telecommunications industry, pure labor productivity does not reflect the service output as it is perceived by the customer. This has always been the case in the other industries we looked at in which labor, at least in some functions, is always involved in the delivery of the final service to the customer. We think that measuring productivity in a market economy should take this customer perspective into account, since the customer is the final judge of the ultimate economic value of the output delivered by the industry.

Exhibits 6a and 6b show the output and input measures used for the productivity comparison in this case study and based on the rationale discussed above and summarized in Exhibit 5. The two output measures used are the number of access lines and the number of calls. We have weighted the number of calls by their type (local, long distance and international) and by their duration to obtain a homogeneous measure. The two input measures we used are full-time equivalent employees for labor and the capital stock invested in the telecommunications network for capital. Capital stock was calculated by accumulating the capital expenditures for plant and equipment between 1983 and 1992 (without depreciation) and converting it into 1992 U.S. dollars. This "capital stock" was also adjusted for differences in the price of equipment and service quality providing a fairer comparison (See box entitled "Adjustments to the Capital Stock" and Exhibits 7, 8 and 9). A combination of these four output and input measures results in the labor, capital, and total factor productivities for the six countries which we will compare (see box entitled "Adjustments to the Cost Structure" and Exhibits 10 and 11).

Differences in Productivity Among the Telecommunications Industries

Our productivity analysis reveals that the gap between the Latin American carriers and the U.S. is narrower than in the other industries analyzed in this report. Moreover, Colombia presents equal total productivity than the U.S. The monopolistic behavior still present in a vast part of the industry in the U.S. could be the explanation of this relatively not much better performance of the U.S. carriers. However, the gap widens in labor productivity, in spite of the impressive improvements of recent years achieved by the Latin American companies.

¶ Labor productivity. The labor productivity index is based on two labor productivity measures: calls per full-time equivalent employee (FTE) and access lines per FTE (Exhibit 12). As discussed earlier, more employees work in access line or customer-related functions. Based on the U.S. cost structure, we weighted the access line measure as 85 percent and the call measure as 15 percent when we computed the labor productivity index. Mexico and Colombia are the most productive in Latin America, showing a steady increase year after year. The other three countries had lower results in the 1980s, but some have improved in recent years. Productivity in Brazil is constant compared to the U.S.; Venezuela's performance has been the worst (it was the only country where employment has grown), and Argentina has jumped from an almost chaotic situation in 1989 to better than average productivity in 1992 (Exhibit 13). Given that the U.S. carriers have been continually restructuring, the relative gains achieved by Latin American companies are quite impressive (Exhibit 14).

¶ Capital productivity. The measure of output for capital productivity (number of calls) is easy to obtain. Measuring input, however, could be more problematic since it requires calculating the amount of capital invested in the network to provide the calls. The number of access lines works especially well as a measure of input, especially for international comparisons. The resulting measure, "calls per access lines," (which can also be interpreted as utilization of the network) assumes that network capital increases with the number of access lines. While this is certainly directionally correct, the measure fails to take into account those aspects of network structure and/or of modernization. This caveat is particularly relevant for Latin American companies since they display markedly different levels of investment per line. This phenomenon occurs even after making adjustments for equipment prices. The cause is a likely result of differences in the efficiency of the investing process (see box entitled, "Adjustments to the Capital Stock" and the capital productivity causality analysis). Therefore, a U.S. dollar measure of invested stock of network capital was used as input for the capital productivity measure, as discussed earlier in Exhibit 6b.

The resulting capital productivity, measured in calls per U.S. dollars of invested network capital, shows very different results which are not always consistent with our labor productivity findings (Exhibit 15). Colombia and Venezuela have better capital productivity than the U.S. owing to extremely low investment per line (less than $1,000 even after price adjustment). Since our price adjustment should have eliminated price distortions, these low investments per line can be the result of a very efficient buying process. Brazil offsets its relatively expensive network with a utilization rate almost equal to that of the U.S. and three times that of Germany; its productivity is also higher than that of the U.S. Mexico's network has not been very expensive, but its utilization rate is extremely low; as a result, its productivity is only 61 percent of the U.S. level. Since the input measurement is based on investments in the last 10 years, the large, inefficient investments made by the state-owned Entel have left Argentina with an expensive network which is barely used; its productivity is just 51 percent of the U.S. level.

¶ Total factor productivity. Labor and capital productivity were combined into a single index of total factor productivity derived by calculating a weighted average of the labor and capital productivity indices (Exhibit 16). The weights are based on the cost relationship between capital and labor (see Exhibits 10 and 11 and the box entitled "Adjustments to the Cost Structure" for the relative weight of labor and capital cost in the different countries).[1] The position of Colombia is good with respect to both productivity measures, showing the same total productivity as the U.S. Venezuela improves its poor labor performance with its very high capital productivity ratio, as Brazil does to a lesser extent. On the other hand, Mexico spoils its goods and improves labor productivity with its very low capital yield. Argentina's impressive improvement in labor productivity in recent years began from a chaotic situation, reflected in its still poor performance in both labor and capital productivity indicators.

CAUSES OF THE OBSERVED PRODUCTIVITY DIFFERENCES

The section that follows analyzes the causes for the differences in productivity found among countries in Latin America. It first examines the differences found in the **productivity of labor** at the production process level and then looks into observed differences in the **productivity of capital.**

While the exact causes for the different levels of labor and capital productivity found are far from uniform, they do have a common origin. They are largely determined by the specific regulatory and competitive environments in which telecommunications firms must operate. These conditions, different in every country, determine how management of telecommunications companies behave, and ultimately, how the industry will or will not develop. Exhibit 17 points out the major causes for the differences in productivity found in the regions' telecommunications industries.

Labor Productivity

One structural factor, high network growth rates, penalizes certain Latin American telecommunications industries when comparing their productivity against that found in more developed countries. Fast growing Latin American carriers must allocate more employees to the expansion of their network. We estimate that labor productivity suffers by 10 percent in Argentina and Mexico and 6 percent in Colombia, Venezuela and Brazil compared to the U.S. industry because of this factor alone. Until market penetration of the industry is higher in Latin America, this structural gap will be unavoidable (Exhibit 18).

¶ Network technology. The physical age of the telecommunications network and the lack of digital technology accounts for part of the remaining gap in productivity between Latin America and the U.S. The

1 Since the relationship of labor and capital costs differs from country to country we calculated first two indices of total factor productivity: the first using the U.S. labor/capital ratio and the second using the labor/capital ratio of the other country (bilateral comparison). The final total factor productivity figure in Exhibit 17 is the average of the two results.

case of Mexico best illustrates the effects of this technological disadvantage. Telmex, Mexico's leading telecommunications company, has more than 10,000 operators (almost 20 percent of its payroll) which would be unnecessary given a more digitized network (Exhibit 19). Factors such as network scale, population density, or topography did not significantly affect labor in the developed world (see "Service Sector Productivity", McKinsey Global Institute, October 1992), and little evidence was found to suggest that they should be any more important in Latin America.

¶ Organization of Labor. Many regional carriers in Latin America have been able to achieve higher than national average labor productivity through better organization of their labor force. Examples include Telnor in Mexico (a pilot project of Telmex to test better management practices) and Teleasociadas in Colombia (with a level equal to 96 percent of the U.S. in access lines per employee against the average figure for Colombia of 74 percent).

An even more striking example is CTBC in Brazil (Exhibit 20). CTBC is one of the few private regional carriers in Brazil. It functions under the same regulation and tariffs, in the same economic environment, and with the same type of labor force as all the regional carriers of Telebras (the state-owned holding company), but it is almost twice as productive as the average Brazilian company. Moreover, CTBC has a much deeper penetration, less repair requirements and more rural phone lines than average.

In Argentina, regional company information was unavailable, but the dramatic improvement in the performance of its two leading telecommunications firms, Telecom and Telefónica, have led to a tripling in the number of access lines per employee (from 50 to 147). The improvement is the result of an aggressive expansion plan and tough reductions in redundant employees implemented by management (Exhibit 21). The high performance of Telnor, Teleasociadas, and CTBC was also the result of better management practices.

¶ Output Mix. U.S. carriers offer a much wider span of services than their Latin American counterparts. This could affect the productivity differences observed since the output measure does not take all aspects of variety and quality into account. These shortcomings in our productivity measures should lead to an underestimation of U.S. productivity, if anything. If properly adjusted, the gap observed could be wider.

Capital Productivity

Capital productivity measures how much service the telecommunications network provides to the economy and how effectively the invested capital stock is utilized. The differences in capital productivity displayed in Exhibit 16 can be explained by factors which cause either a high or low capital input or a high or low network utilization. Since in this industry service quality depends mainly on the quality of the network installed, we should also take into consideration the obvious differences observed in service level to ensure that we are making a fair comparison.

¶ Service quality. By any indicator used, service quality of the telecommunications companies in Latin America is far behind that of the U.S. (Exhibit 22). Potential users must wait several long months (or even years) to have their lines installed while the lucky ones who already have a phone have to try twice to get each successful call. Pay phones are also a rarity in these countries' streets. The variety of the services delivered by the U.S. carriers is also overwhelmingly superior (i.e., call waiting, 3-way calling, call forward, priority call, call block, third party billing, credit card call). Our productivity comparisons would be unfair, if we do not consider these big differences in the quality of the "output". Instead of adjusting the "output" (how can we calculate the equivalence between the "Latin" and "U.S." calls?), we asked ourselves what the Latin American carriers should do to upgrade their services to something closer to the U.S. level. The answer was clear: modernize the network, since quality in this industry depends on the technology used. The huge investment in software made by the U.S. carriers allows them to perform like a totally digitized network. Therefore, we concluded, that the best proxy to correct the service differences and penalize the Latin American carriers was to calculate how much should they invest in "modernization" to emulate the digital performance of the U.S. We estimated these investments considering that all the existing electromechanical lines in each country should be renovated.

Exhibit 23 summarizes the results of this adjustment. Since Latin American carriers have focused their investments towards expansion rather than modernization, all of them would need to invest extra money if they want to update their networks. Our estimation shows Argentina and Brazil should invest heavily (almost US$800 per existing line), Colombia and Mexico moderately (less than US$600), while Venezuela's lower share of electromechanical lines produced a smaller need of modernization expenditure. (The percentage of electromechanical lines in 1992 was 65 percent for Brazil, 64 percent for Argentina, 48 percent for Mexico, 45 percent for Colombia and 21 percent for Venezuela).

If we use these "adjusted by quality" figures to recalculate capital and total factor productivity, obviously, our original results decrease (Exhibits 24 and 25). However, the relative position of the Latin American countries between eachother does not vary significantly. Colombia, Brazil and

Venezuela still show better capital productivity results, ahead of Mexico and Argentina.

It would be arguable that this kind of adjustment is unfair, since we are contemplating the extra investment needed to upgrade the network, while not allowing for an output increase, when in some countries the actual low utilization rates are caused by the poor network. It would be true that once the networks are improved, their utilization will increase. However, we believe that other factors (such as prices) also influence network utilization. Very different utilization rates between the Latin American countries which have a similar network quality, support our argument. Summarizing, even when we recognize our adjustment would not be perfect, capital productivity should be lower than originally calculated when the quality of the output is taken into account.

¶ Capital expenditure per line. The capital productivity of a network reflects both the investment cost of a given network and the extent to which that network is utilized. If a network was relatively more expensive to build, capital productivity would likely be lower. Investment policies, which over invest in network expansion and under invest in switching and trunk transmission capacity, could create bottlenecks and inefficiency. Our investment figures reflect adjustments made because of differences in local equipment prices (caused mainly by country-specific import tariffs) as well as to reflect the lower service quality found in Latin America (see previous paragraph).

Two of the countries studied, Venezuela and Colombia, have spent much less per line to build their network than the U.S. These nations have invested less than $1,400 a line, even after adjusting for prices and quality (actual investment was less than $700 a line). Argentina and Brazil, however, have spent almost $2,200 to install each line. Mexico shows an average investment of less than $1,600.

Land mass could explain part of the expense difference in comparing Colombia and Venezuela with the U.S. The area covered by the telecommunications network in these countries is relatively smaller than the U.S. But this factor does not help to explain why investment per line is higher in Brazil and Argentina where (despite the comparable larger size of these two countries) the area served by the telecommunications network in these two countries is also smaller than in the U.S.

Some Latin American carriers are obliged to serve very small and remote towns, which need a relatively higher investment per line than the ones in more populated areas. However, we have found that lines are actually more concentrated in Latin America than in the U.S., where almost 100 percent of the households are connected, including all in the very small and distant cities, also present in the U.S.

The price and quality adjustments might not have accounted for the differences in levels of technology found in the U.S. and Latin America's telecommunications industries. Technology, or the lack thereof, could explain the low investments of Colombia, Venezuela and Mexico, but would make the investments in Argentina and Brazil look even more inefficient. Consequently, the high investment per line in Argentina and Brazil most likely reflects inefficient investment policies. This explanation seems quite plausible, given the lack of control that prevailed within the state-owned companies of these two countries at the time the investments were made.

¶ Network utilization. About two-thirds of the network investments are spent on the access line portion of the network. Access lines, however, have a low average utilization and are not the main bottleneck. To leverage the capital invested in the access network, management must ensure a sufficient switch and transmission trunk capacity and stimulate high levels of consumer demand. The low amount of extra equipment needed to allow for higher traffic volume on the same number of access lines should enable countries with higher traffic to have higher capital productivity.

As the comparison of calls per access line showed, the U.S. has the highest demand per access line. This is an important factor contributing to high U.S. capital productivity. It raises the question of why demand is higher in the U.S. than in other countries. There are four possible reasons:

- Culture. People in the U.S. might use their telephone more often than people in other countries for simple cultural reasons. For instance, the fact that U.S. households are more geographically mobile indicates a greater need for long distance communications. Calls per access line and overall network utilization may also be lower in Latin America because users do not demand more output from the network. This reasoning was argued in the earlier study of developed countries to explain lower utilization rates in Europe. However, Brazil, Venezuela, and Colombia have much higher telephone usage than their other Latin American counterparts. It is therefore difficult to argue that Mexican and Argentinean culture is the primary cause of low telephone utilization.

- Price Elasticity. Within limits, managers can increase demand by lowering prices. Several studies have looked at price elasticity of demand for telephone services in the U.S. Exhibit 26 summarizes the results and shows the range of price elasticities found in different studies using different methodologies. Although the findings vary, we conclude the following from the pattern exhibited about the U.S. demand for telephone services:

- It is more elastic in the long run than in the short run
- It is only elastic for long distance calls and not for local services
- It reacts to lower prices with longer calls rather than with more calls (which might explain why the number of calls per telephone stayed almost flat in the U.S.).

These findings have important implications for pricing policy, profitability, and capital productivity in the telecommunications industry. If management aims to maximize profitability and is not impeded by regulatory restrictions, then it makes sense to cut prices for long distance services (assuming a price elasticity of -2.5, a price cut of 10 percent would in the long run increase revenues by 15 percent) and to increase prices for local service (assuming a price elasticity of -0.7, a price increase of 10 percent would, in the long run, result only in a decrease in demand of only 7 percent). Such a pricing policy would increase both profitability and capital productivity, since revenues and traffic would increase. After deregulation in the 1980s, U.S. carriers followed such a pricing strategy and abandoned cross-subsidization of local calls by long distance calls (Exhibit 27).

The existence of demand elasticity for certain telecommunications services means that this demand can be partly influenced and managed. Figures on real revenues per long distance calls in Exhibit 28, suggest that the U.S. telecommunications firms appear to have recognized this possibility. As such, they used pricing policies during the 1970s and after deregulation in the 1980s to increase demand. Indeed, the U.S. industry seemed to have pursued an outwardly aggressive pricing strategy to leverage capital stock and increase capital productivity.

Customer behavior in Latin America seems hardly different than in the U.S. Telecommunications carriers in Brazil, Colombia and Venezuela charge very low rates, and not surprisingly, subscribers use their telephones more. On the other hand, Argentina and Mexico have very expensive rates, and their customers react by using their phones sparingly (Exhibit 29). However, some studies suggest that price elasticity in Mexico is lower than in the U.S., mainly for local calls.

– Demand Miscalculation. "Technical reserves," a euphemism used when companies overestimate future demand by region, are much bigger in Latin America than in the U.S. Surprisingly, the countries in Latin America with the longest waiting lists have approximately 15 percent of their installed lines not connected to any customer. These unused lines obviously decrease network utilization (Exhibit 30).

- Network Bottlenecks. In our capital expenditure adjustments we recognized that Latin American carriers would have to make certain extra investments necessary to upgrade their networks to meet U.S. standards. But until these investments are made, many bottlenecks will continue to reduce the effectiveness of the network. In some cases subscribers do not make more calls, not because of cost, but simply because of long and agonizing busy signals.

We have seen that differences in scale of demand not only reflect differences in consumption patterns and preferences, but are also partly the result of management decisions. To a certain extent, capital productivity is, therefore, controllable by management. Furthermore, capital productivity is not independent from labor productivity, but is linked by the cost/price mechanism. Low labor productivity eventually leads to higher labor costs per unit output. Since prices in the long term must cover costs, low labor productivity will lead to higher prices which tend to depress demand and capital productivity. Consequently, management should not treat capital and labor productivity as being completely independent.

In summary, the gap in labor productivity between Latin America and the U.S. is mostly attributable to the way in which Latin American telecommunications firms have organized their labor force. To a lesser extent, the lower technological state of the network in Latin America contributes to the lower productivity levels found there. Specifically, the low values of capital productivity found in Argentina and Mexico are a result of very low network utilization, which is partly a function of high telecommunication rates charged in those countries.

External Factors and Management Behavior

In Latin America, telecommunications is a highly regulated industry, dominated by regional monopolies, that are often state-owned. Such a phenomenon prevents competition from fulfilling its role as an incentive and control system geared toward fostering productivity and innovation. We have witnessed the importance of competition in this industry after the deregulation and break up of ATT that took place in the U.S. Since 1984 productivity has jumped, the service delivered to the customers has improved significantly while real prices have been falling. In Latin America, market competition in this industry is replaced by government regulations, state-controls and internal corporate controls.

Such regulation has a particularly strong impact on the way labor is organized within the industry. As previously pointed out, labor organization is the key reason for the lower level of labor productivity found in the region's telecommunications sectors.

To better understand the impact of such a highly regulated environment on management decision making within the industry, we will take a close look at the companies' financial statements, their ownership structure, other regulations that affect the industry, and labor rules and unionism.

Low Productivity But High Profitability

From 1991 to 1992, Latin America's telecommunications companies (with the exception of Brazil) showed a high level of profitability (Exhibit 31). These profits were derived from charging high rates to their subscribers (e.g., in Argentina and Mexico) or by paying relatively lower salaries to their employees (e.g., in Venezuela, Colombia and Brazil) (Exhibits 32 and 33). Given favorable labor costs and pricing schemes, the companies in Latin America enjoy a more favorable position than U.S. carriers. Here is the first evidence of how regulations affect productivity. Telecommunications experts complain that low tariffs are the reason for the lack of investment and ultimately for the supply shortages in the region. The huge tariff increases before privatization in Mexico and Argentina seems to support their argument. However, at least 70 percent of the total cost of these companies are linked to the cost of local labor, so it is the relation between prices and local labor costs that matter. This relation is favorable to all the Latin American countries, especially the three recently privatized ones. To justify employing one person, a U.S. carrier needs to "sell" 223,000 calls per year. In Venezuela, Argentina and Mexico, the companies need to sell less than one third that amount, in Colombia and Brazil, one half. Therefore, U.S. carriers experience greater pressure to reduce employment and sell more calls, in other words, to be more productive (Exhibit 34).

Telecommunications companies in Mexico and Argentina have pioneered the route to the massive privatizations programs that followed them. High tariffs and good profitability were critical to attract, at that time, the reluctant first world operators. This scheme has proved to be correct, looking at the network expansion and upgrade taking place in both countries since 1990. It also opened the road to successfully achieve other privatizations, enhancing the countries' images to foreign investors. It would be short-sighted to look only at their present high tariffs level without considering all these previous issues. However, we do believe that after the initial "comfortable" period granted in both countries to the operators (until 1997), the regulatory bodies should begin to open competition and lower tariffs, given the companies actual and potential cost structure.

State Ownership

Performance of state-owned telecommunications firms in Latin America appears to show little correlation with type of ownership. Colombian companies, for example, which are government-owned, have consistently shown themselves to be the best managed ones in the sector. They have increased labor productivity year after year, made efficient investments, charged relatively lower rates, and have even allowed themselves to face competition from international carriers. Argentina's once government-owned monopoly, Entel, on the other hand, had for years posted disastrous results wasting valuable labor and capital. Brazil's average labor productivity performance is overshadowed by its huge expenditure level per line, a sign of an investment process out of control. Mexico and Venezuela's performances under state control were only middling.

Employment and Unionism

In recent years trade unions have played an important role in shaping the structure and costs of this industry in the region. They have both won additional benefits and in many cases have effectively prevented significant restructuring of firms through obtaining protection against post-privatization layoffs for their members (in Mexico and Venezuela). In some cases they may have slowed or prevented the sale of enterprises to the private sector. Telecommunications companies in Latin America have only slowly taken steps to restructure. Since networks are growing faster, they have not experienced the same pressures to reduce labor cost to increase productivity, but growing employment such as in Venezuela is unlikely to be sustainable for long.

As a result of such pressures, employment evolution has been different across countries (Exhibit 35). Mexico and Venezuela showed the highest increase in employment over the 1984 to 1993 period. Employment in these countries grew 25 percent and 40 percent, respectively. Argentina's telecommunications industry reduced employment the most. The level of workers at its facilities fell 30 percent from 1984 to 1993, the direct result of massive restructuring undertaken after the sale and break-up of Entel in 1991.

U.S. carriers, on the other hand, decreased employment by 20 percent in 1984 to 1993 (mainly in the long distance calls segment where competition was allowed). As recently as January 1994, U.S. carriers announced an additional employment cut of 50,000 people (7 percent of total employment in the industry and equal to the number of reductions during all of 1993), and further reductions are anticipated.

Another sign of unions' power is the relatively higher labor cost this industry must pay. The Mexican union has not only achieved no employment cuts at all, but an average labor cost of $28,400 per year, which is outrageously high for this country. Argentina's carriers are also paying $28,000 per year per employee, 50 percent higher than what they paid in 1991, resulting in a stable labor cost per line, since all the productivity gains have been offset by this labor cost increase.

* * *

Closing our causality section, we can conclude that the observed productivity gap can be explained by the different management attitude towards organization of labor and capital expenditure, motivated by the lack of incentives to perform better. State-owned monopolies did not rank improvement and efficiency as a priority, relative prices of labor and tariffs cushion any possible cost pressure and finally, unions delayed or prevented any attempt to restructure.

OUTLOOK

Latin America's telecommunications industries will likely change along the following two dimensions in the next 10 years:

- ¶ Deregulation and privatization are likely to proceed; even the U.S. will continue to loosen its telecommunications regulations and bring more competition into the industry.
- ¶ Technology advances will allow new players into the industry. Entry barriers will come down as digital radio technology becomes increasingly economical.

Private Versus State Owned

While we found no hard evidence in the course of this study that shows that privately owned firms make a better contribution to society than government-owned ones do, there is one important indicator that points precisely in this direction. Countries that have privatized their phone systems are experiencing higher rates of expansion than in countries where the system is still government operated. Expansion of telecommunications networks is critical, especially in developing countries where the majority of the population lacks a telephone, but in fact, could afford one if it were reasonably priced. Each of the three national systems that has been privatized has had a faster network growth rate than their historical performance as state-controlled companies.

Moreover, newly privatized companies are trying to expand their profitable business (growing at 13 to 15 percent per year), surpassing even the goals set by the regulatory body (Exhibit 36). Their main motivation is to earn even higher profits by expanding an already profitable business. State-owned firms in Colombia are growing slower at 11 percent and in Brazil at only 6 percent a year. These differences are not trivial for countries with less than 15 lines per 100 inhabitants. If Colombia can sustain its continuous improvement, its case for privatization (based on relative performance) is not very compelling, but Brazil's privatization appears to offer significant potential for improvement.

Regional Versus National Monopolies

Privatization and deregulation have taken various forms in recent years. Mexico and Venezuela have privatized their networks while preserving their national monopolies. Argentina has split its system into two regional monopolies. The 1984 deregulation in the U.S. split the monopolistic carrier, AT&T, into seven regional carriers.

The break up of national telecommunications monopolies appears to bring clear benefits because of the competition, albeit indirect, which it fosters. It can be argued that competitive pressures are the same under a national monopoly or several regional monopolies, since the market has only one choice of carrier. However, the experience of Argentina and the U.S. suggests that a certain amount of competition is generated by creating regional monopolies within a country. For instance, in Argentina subscribers can compare (and complain) if they see noticeably different service levels between the two carriers, Telefónica and Telecom. The two firms constantly advertise their achievements, and as such, they must care about the other's activities. They also compete head-to-head for capital in the Buenos Aires stock market, so their financial performance (admittedly different from productivity) is under daily scrutiny. The earlier partition of AT&T and Colombian regional carriers are other examples of better performance brought about by indirect competition.

CONCLUSIONS

The telecommunications industry is key to a nation's development. Latin American governments could make a valuable and lasting contribution to progress in their countries by adopting policies that stimulate growth and competition in this pivotal industry. By adopting policies that take advantage of the latest digital technologies, the currently perceived need to maintain so-called natural monopolies would vanish.

Still, Latin American deregulation of its telecommunications sector has yet to begin in earnest (Exhibit 37). The privatization programs now in place in the region will guarantee the continuation of monopolistic systems for years to come. The experiences of such countries as Japan and the U.S. point to the benefits to be derived by society as a whole in making the change. Open competition in the long distance service should be the first step in this direction. As worldwide competition increases in the years ahead, increasing labor and capital productivity will be paramount, and telecommunications will play a vital role in this process but only to the extent that governments in the region allow it to do so. Organization of labor and an efficient investment process are the two main drivers necessary to achieve higher productivity. The external factors affecting the nature of competition have only begun to change in these countries, with the exception of Brazil that neither privatized nor deregulated its industry. In the years ahead, we expect continued productivity improvement, in the other countries analyzed (Exhibit 38).

ADJUSTMENTS TO THE COST STRUCTURE

To derive the appropriate weight for our labor and capital productivity we need to calculate the cost structure of each country. Following the methodology used by the McKinsey Global Institute in its former study about the telecommunications industries in the developed world, we divided the total costs in three categories: labor, capital and other (defining capital costs as depreciation and interest expenses). This definition of capital costs was applicable in the developed countries where depreciation rates and capital structures are similar. However, Latin American companies neither depreciate homogeneously, nor finance themselves with the same leverage. Brazil, Mexico and Venezuela depreciate their assets at a lower rate. As debt was not generally available since the Latin American debt crisis, carriers in Latin America have financed their investments with equity (Exhibit 10).

Depreciation

Depreciation should reflect the erosion or obsolescence of the asset base. There are no reasons why the same kind of assets (produced by the same manufacturers) should have different lifetimes from country to country. These differences have to do with accountant and/or fiscal policies. Since we are trying to find the relative weights of labor and capital within the cost structure, we found a more fair weight was made by applying the U.S. depreciation rate to all the countries (12 percent on fixed assets).

Capital Structure

Since the Latin American carriers are financed mainly with equity, we should also consider the dividends paid, or some cost of capital, to make a just weighting of labor and capital. This process could be a subjective one because many carriers do not pay dividends at all and many different rates can be argued for the cost of capital. We concluded that to simulate the U.S. capital structure in the Latin American carriers, it would be a simpler and better proxy of how relatively important labor and capital are.

Results

Our "adjusted" cost structure is shown in Exhibit 11. When capital costs are more homogeneously reflected, cost structures look very similar. The "strange" magnitudes include Venezuela's much bigger "other costs" due to its relatively cheaper labor and network, and Brazil's larger share of "capital costs" caused by its more expensive network and relatively lower salaries.

ADJUSTMENT TO THE CAPITAL STOCK

Our input measure for capital productivity was defined as the capital stock invested in the network. We calculated this measure by accumulating the capital expenditures for plant and equipment between 1983 and 1992 (without depreciation) and converting it into 1992 U.S. dollars, using the average market exchange rates of each year.

However, we believe that to make a fair comparison of the amount of money poured into each network, we must recognize the very different equipment prices these companies are paying, mainly due to protectionist policies in some countries.

In other words, it would be unfair not to correct their investments by the unit price they are obliged to pay because of policies out of their control.

Equipment Prices Adjustment

The two major inputs needed to build a network – telephone equipment prices and labor costs – are very different between the countries analyzed. Brazil, Argentina and Mexico have shielded their local producers from international competition (normally they are the same companies, but located outside these countries' frontiers) while Colombia and Venezuela allow their carriers to auction their investments in the international markets. The last two countries have paid significantly less for their lines than the three protectionist ones. Since the late 1990s, all the countries have begun to apply more free trade policies, and prices have converged. Switching equipment prices have decreased substantially since the opening of the economies in all the countries analyzed with the exception of Venezuela where they were already very low (Exhibit 7). However, as we are considering the last 10 years' investment we have to calculate the average price (equipment and labor) each country has paid for their lines since 1983. In other words, we have calculated the amount of lines they would have bought at U.S. prices, since we are trying to measure the performance of the telecom carriers, without the influence of the trade policies of each country.

Results

Exhibit 8 illustrates the reasoning applied and Exhibit 9 summarizes our results. Equipment prices have been higher (from 13 to 36 percent more expensive than in the U.S.) in Argentina, Brazil and Mexico than in the U.S., so the total investment "adjusted by price" decreases in these three countries. On the other hand, since Venezuela and Colombia's prices have been very low (from 18 to 39 percent cheaper than in the U.S.), their total investment increases when adjusted to U.S. prices.

What are the reasons for the remaining difference in the investment levels after we have adjusted them by price ? There are only three possible explanations: technological differences, topography and efficiency of the buying process (see the "Capital Productivity Causality Analysis").

Exhibit 1

DEFINITION OF THE TELECOMMUNICATIONS INDUSTRIES 1992

Country	Lines per 100 inhabitants	Employees Thousands	Percent telecom employees/total employment	Scope of the industry
Argentina	13	36	0.4%	2 independent carries: Telefónica de Argentina, Telecom (Local and long distance) 1 carrier for international (owned by Telecom and Telefónica) 1 carrier for data and text (owned by Telecom and Telefónica) 2 carriers in mobile communication
Brazil	7	98	0.2	Telebras: national company and regional companies (local, long distance, international, data, text, mobile and private network) 4 private companies
Colombia	10	25	0.3	National company (Telecom) and 26 regional companies (local, long distance, international, data and text)
Mexico	9	49	0.1	Telmex: private company (local, long distance, international, mobil data and text)
Venezuela	11	22	0.3	CANTV: private company (local, long distance, international, data text, private network, and mobile)
U.S.	52	725	0.7	Long distance carriers; independent local exchange carriers; 7 regional Bell Holding Companies
Germany	50	190	0.8	DBP Telecom
Japan	45	257	0.5	KDD and other telecom companies NTT and telecom related subsidiaries

Exhibit 2

REGULATORY AND COMPETITIVE ENVIRONMENT IN TELECOMMUNICATIONS

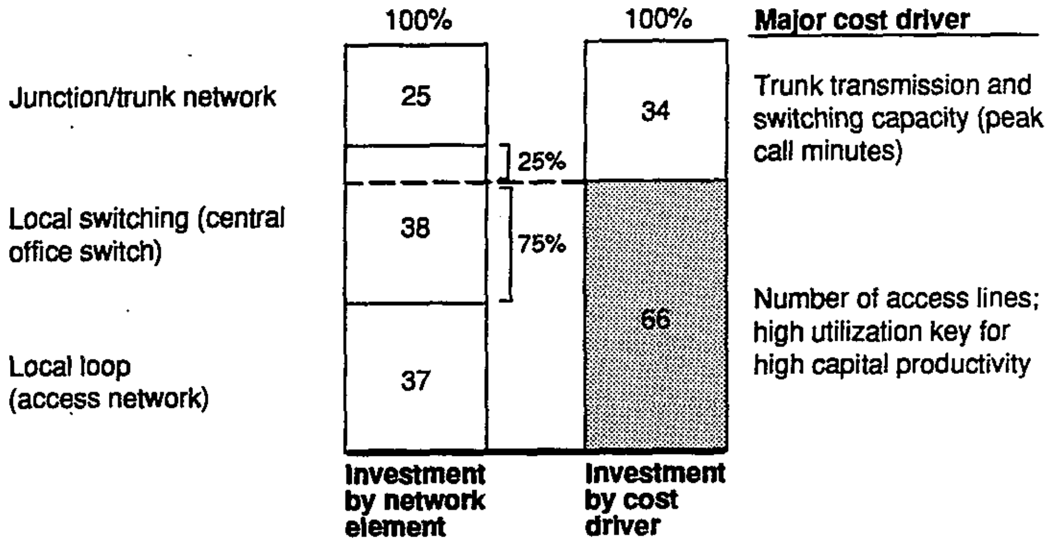
	U.S.	Argentina	Brazil	Colombia	Mexico	Venezuela
Regulation	Independent, government-regulated monopoly prior to 1984 Open competition for long distance services since 1984 Regional monopolies for local service	Privatized in 1990 Government regulation entity: CNT Monopoly for 7(+3) years	Government-owned monopoly since 1972 28 state-run companies (8 regional companies in future) 4 private companies	Government-owned international carrier 26 regional local companies Since 1992 operates under private law, now open competition for international	Privatized in 1990 Government regulation entity: SCT Monopoly until 1996	Privatized in 1992 Government regulation entity: CONATEL Monopoly until 2000
Competition						
- Local	1 local monopoly in all locations Some competition in urban areas in data services	Monopoly: 2 carriers Telefonica de Argentina (Spain) Telecom Argentina (France-Italy; 30% traded in stock exchange since 1992)	Monopoly Telebras: Embratel +28 regional companies	Telecom + 26 regional companies	Monopoly Telmex (Southwestern Bell, France Telecom, AT&T, others)	Monopoly CANTV (GTE, Telefonica de Espana, and local groups)
- Long distance - International	3 major carriers and several hundred minor carriers and resellers					
- Data	Many competitors	Open competition but only one operator (owned by Telefonica and Telecom)		Telecom Open competition	Telecom Telmex	
- Mobile	2 carriers in each metropolitan area	2 carriers in Buenos Aires (1 independent and 1 owned by Telefonica and Telecom)		Open competition (project)		2 carriers
Private network	Open to competition	Open competition		No		Open competition

Exhibit 3

NETWORK INVESTMENTS OF TELCO'S

BY ELEMENT AND COST DRIVER 1989

Percent



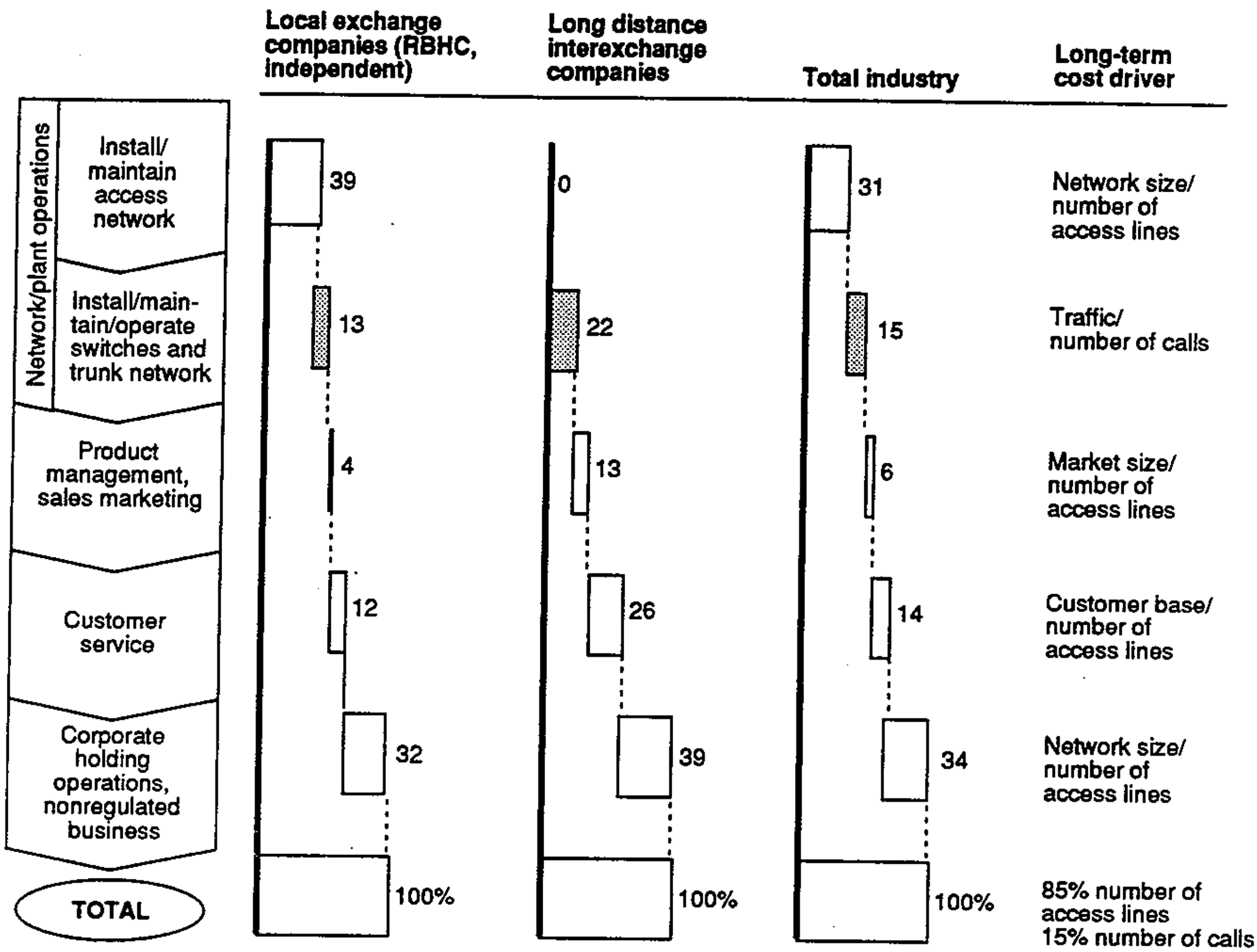
Source: Rand Corporation; McKinsey analysis

Exhibit 4

LABOR COST STRUCTURE U.S. TELECOMMUNICATIONS INDUSTRY

BY ELEMENT OF BUSINESS SYSTEM 1989

Percent of labor costs



* Including number service (3.3% of total); call completion services excluded (additional 5% on total)

Source: FCC; McKinsey analysis

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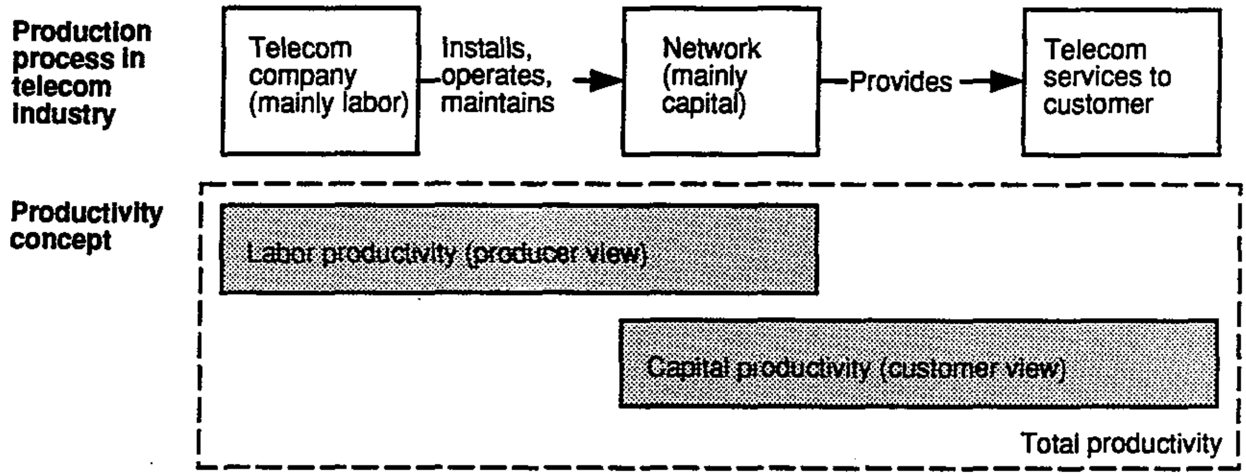
Exhibit 5

PRODUCTIVITY IN THE TELECOMMUNICATIONS INDUSTRY



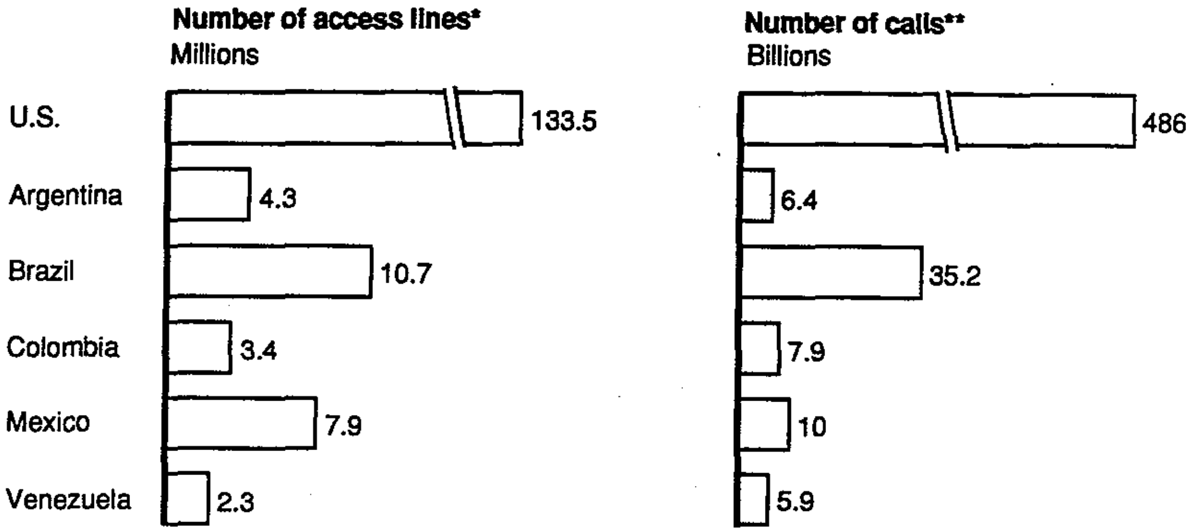
Output	Number of access lines Number of calls	Number of calls	Provide network and network services
Input	Labor (own and contracted)	Capital stock in network	Labor and capital
Our productivity measure	Weighted indices of access lines per employee (85%) and calls* per employee (15%)	Number of calls* per $ capital stock in network	Weighted average labor and capital productivity

* Calls are weighted by their type (local, long distance, international) and their duration

Source: McKinsey analysis

Exhibit 6a

OUTPUT OF THE TELECOMMUNICATIONS INDUSTRIES 1992



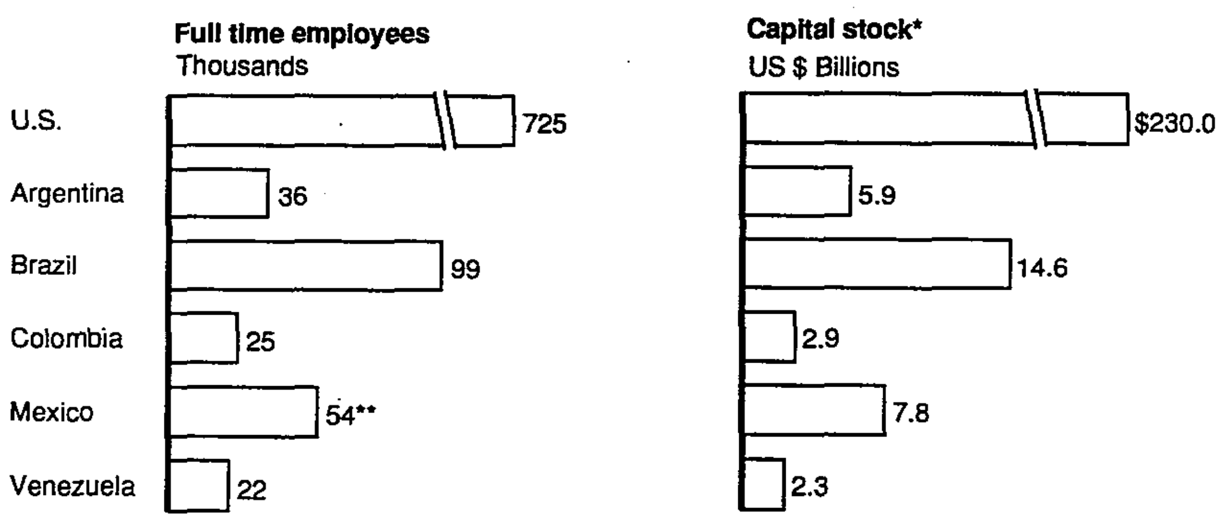
* Installed lines

** Calls are weighted by their type (local, long distance, international) and their duration

Source: UIT, annual report, sectorial studies; The World's telephones; McKinsey analysis

Exhibit 6b

INPUT OF THE TELECOMMUNICATIONS INDUSTRIES 1992



* 1983-92 investments in network without depreciation, at 1992 U.S. $ converted at Telecommunications Investment International Price Level

** Mexico: added 5000 employees for network building

Source: UIT, annual report, sectorial studies; McKinsey analysis

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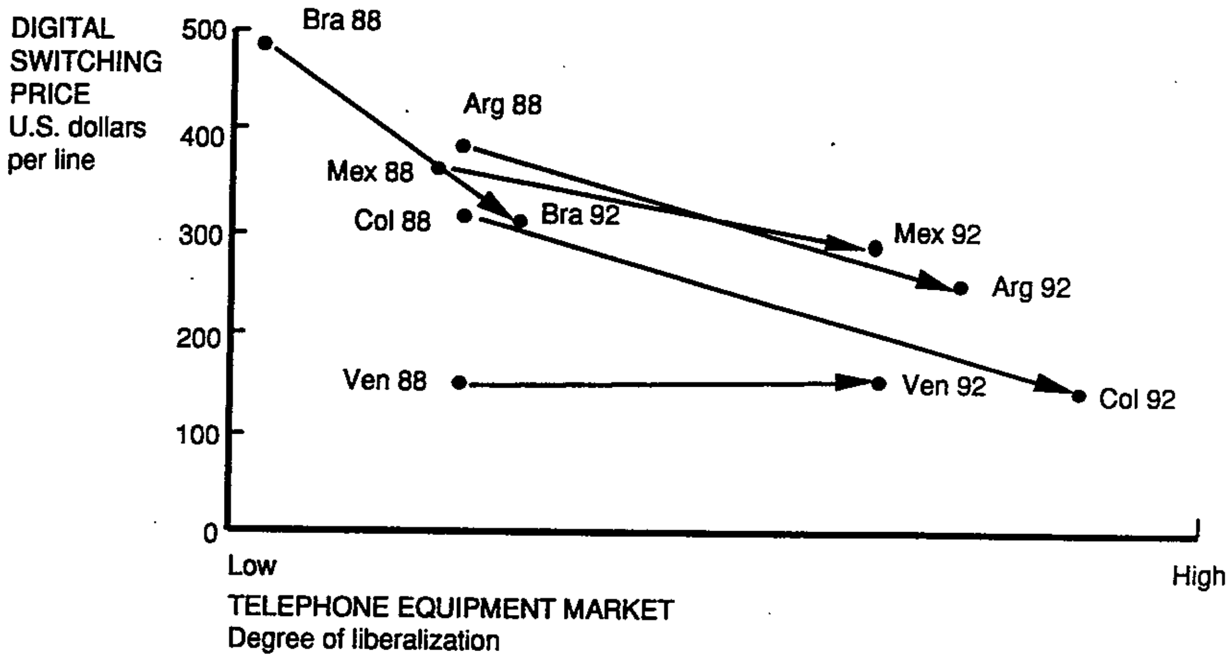
Exhibit 7
EQUIPMENT PRICING TREND
Based on switching equipment prices



Source: Interviews; McKinsey analysis

Exhibit 8
CALCULATION OF THE CAPITAL STOCK INVESTED IN THE NETWORK

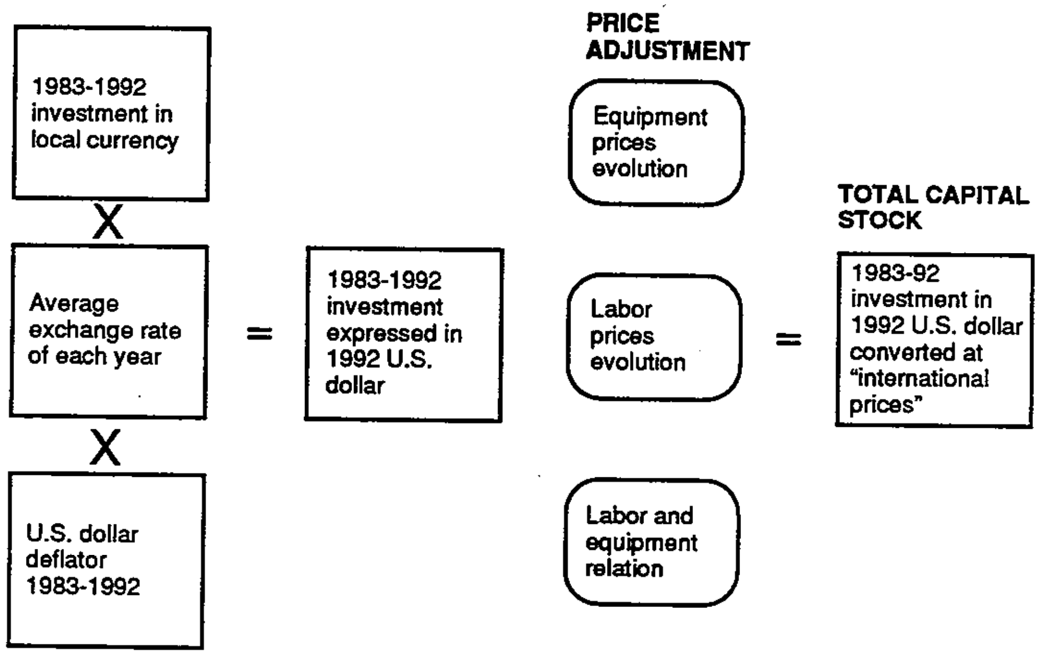
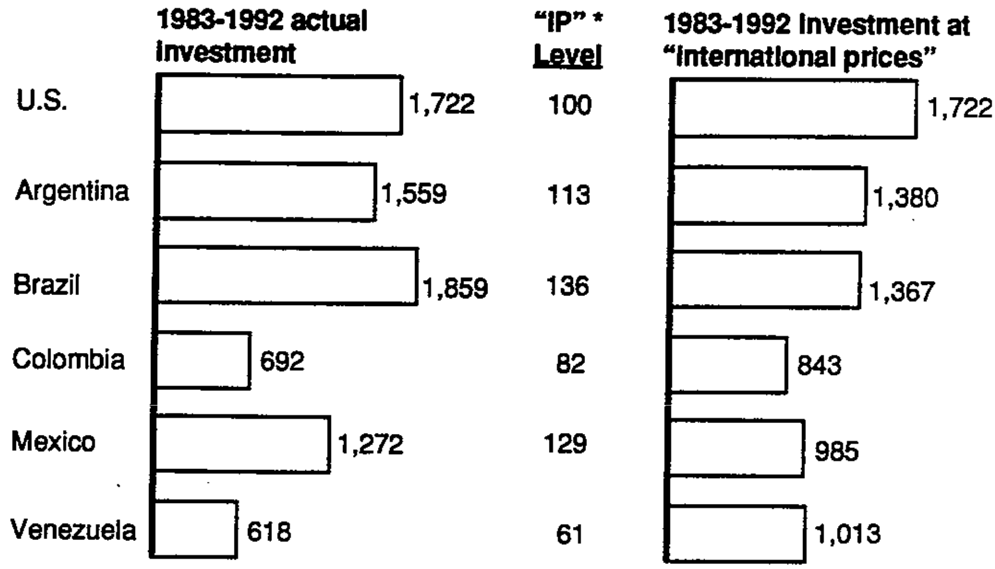


Exhibit 9

CAPITAL STOCK PER LINE

1992 U.S. dollars per existing lines



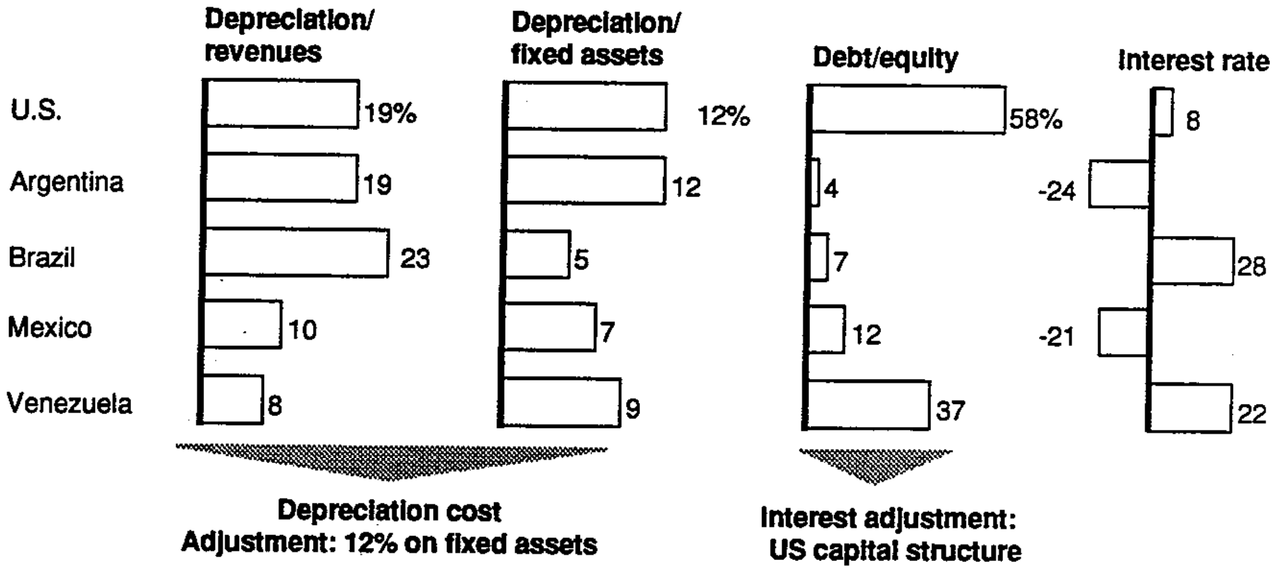
* "International Price level": Weighted average of labor and equipment prices from 1983 to 1992

Source: FCC; Annual reports; ITU; McKinsey analysis

Exhibit 10

DIFFERENT COST AND CAPITAL STRUCTURE BETWEEN COUNTRIES

Percent



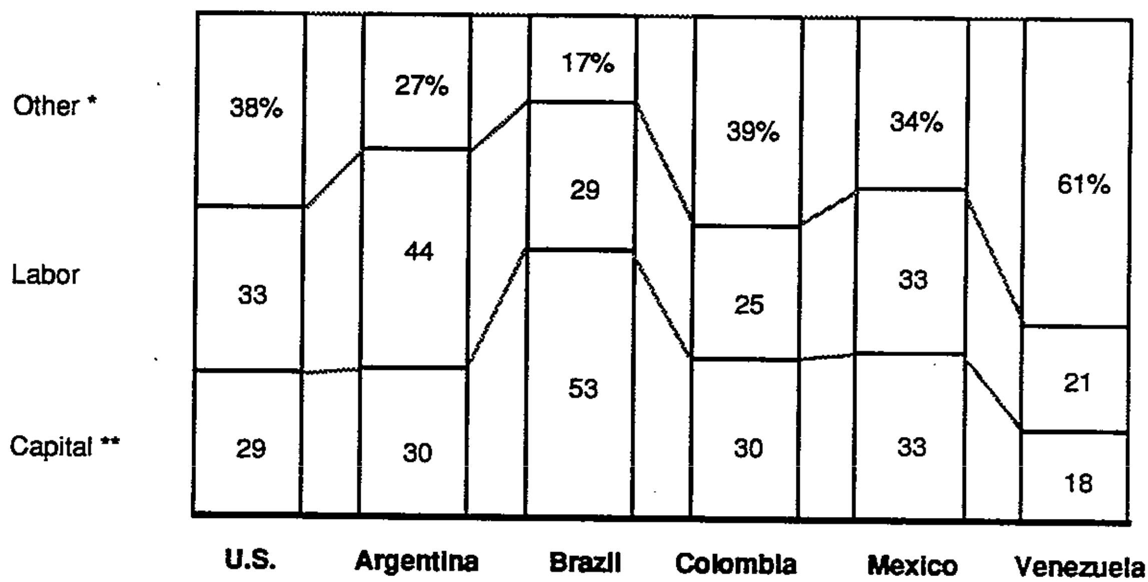
* U.S. 7 Bells 1992; Argentina, Mexico and Venezuela 1992, Brazil 1991

Source: Annual Reports, McKinsey analysis

Exhibit 11

COST STRUCTURE OF TELECOMMUNICATIONS COMPANIES

Adjusted



* Other cost includes: commercial, administrative, insurance, allowance for doubtful accounts, bank commissions, transportation, material consumption, rentals, taxes, etc.

** Capital cost: includes depreciation and interests

Source: Annual reports, McKinsey analysis

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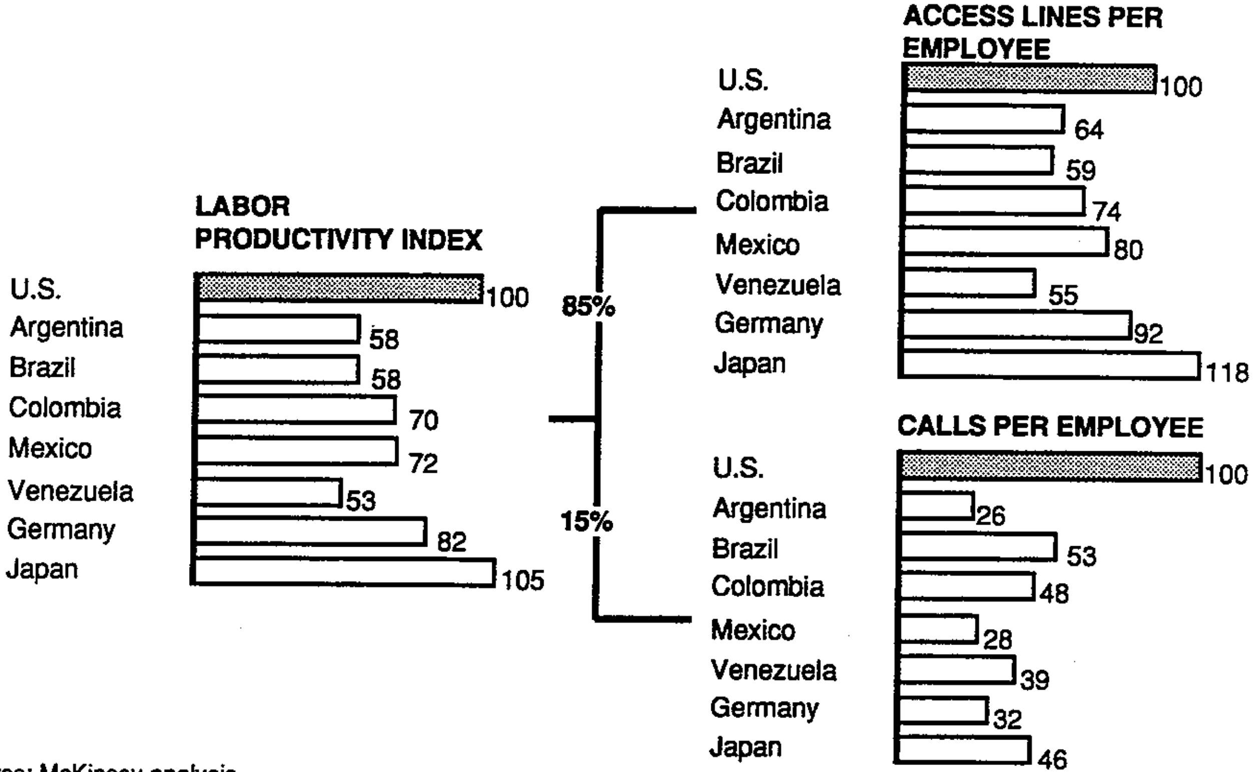
Exhibit 12

LABOR PRODUCTIVITY IN TELECOMMUNICATIONS INDUSTRIES 1992

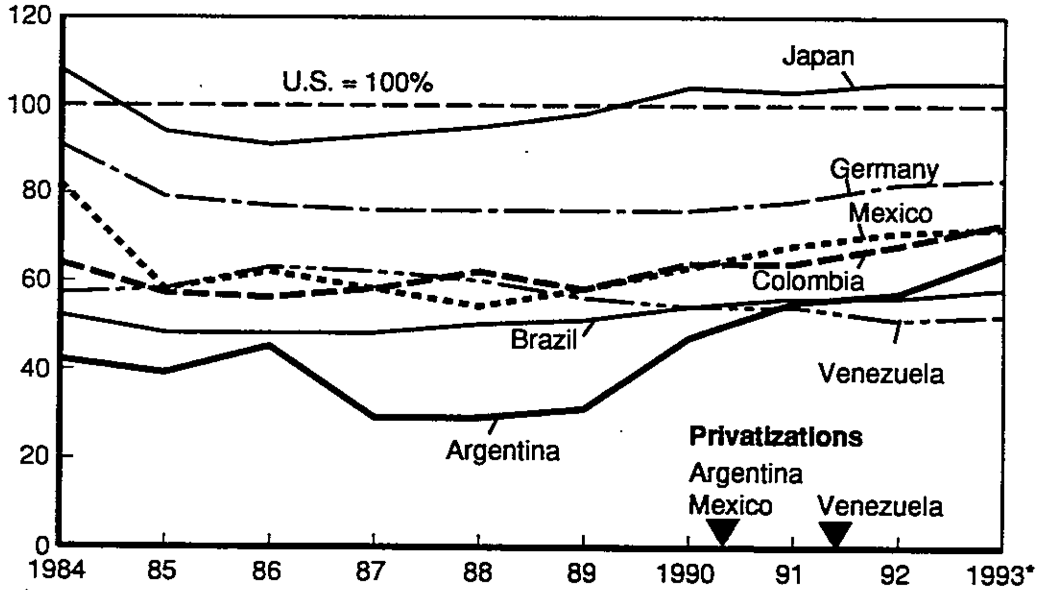


Source: McKinsey analysis

Exhibit 13

LABOR PRODUCTIVITY IN TELECOMMUNICATIONS INDUSTRIES

Index access lines (85%) and calls (15%) per full time equivalent employee



* Estimated

Source: ITU; Annual reports; McKinsey analysis

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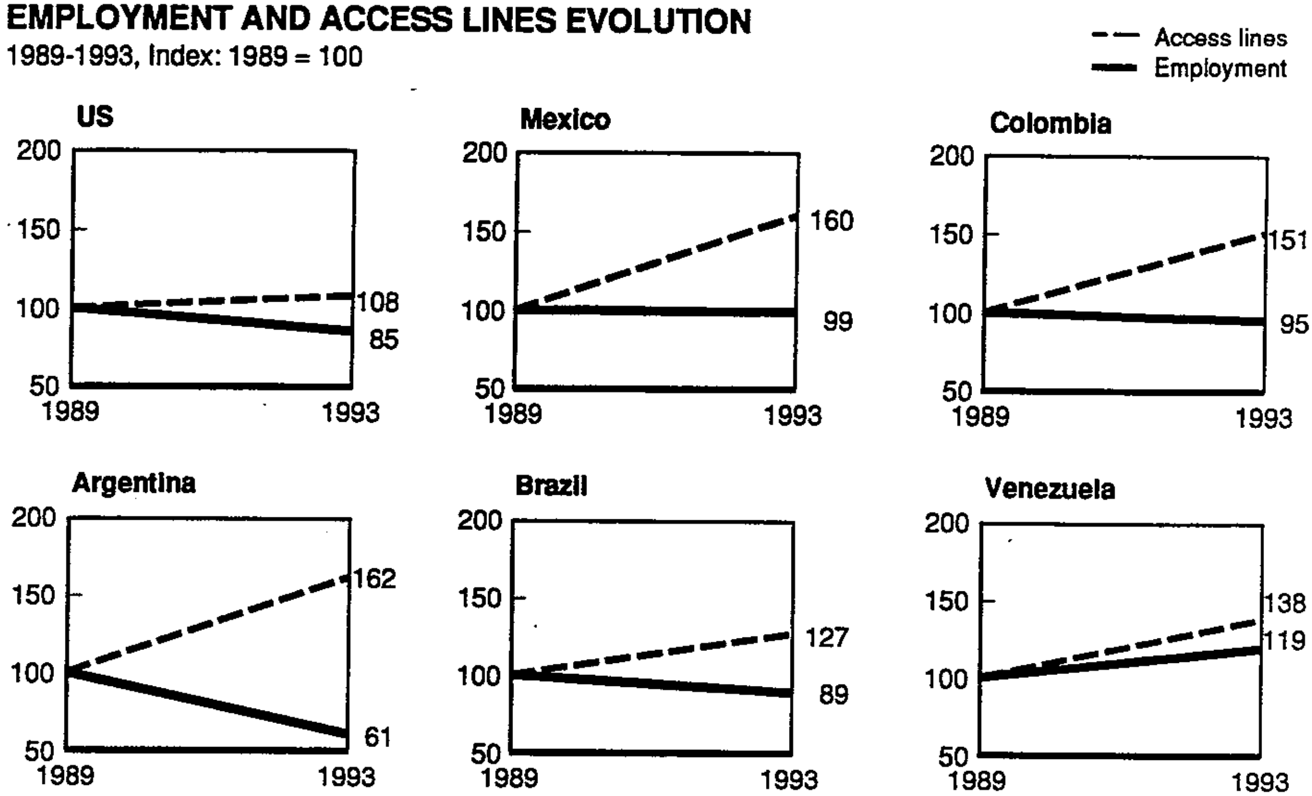
Exhibit 14

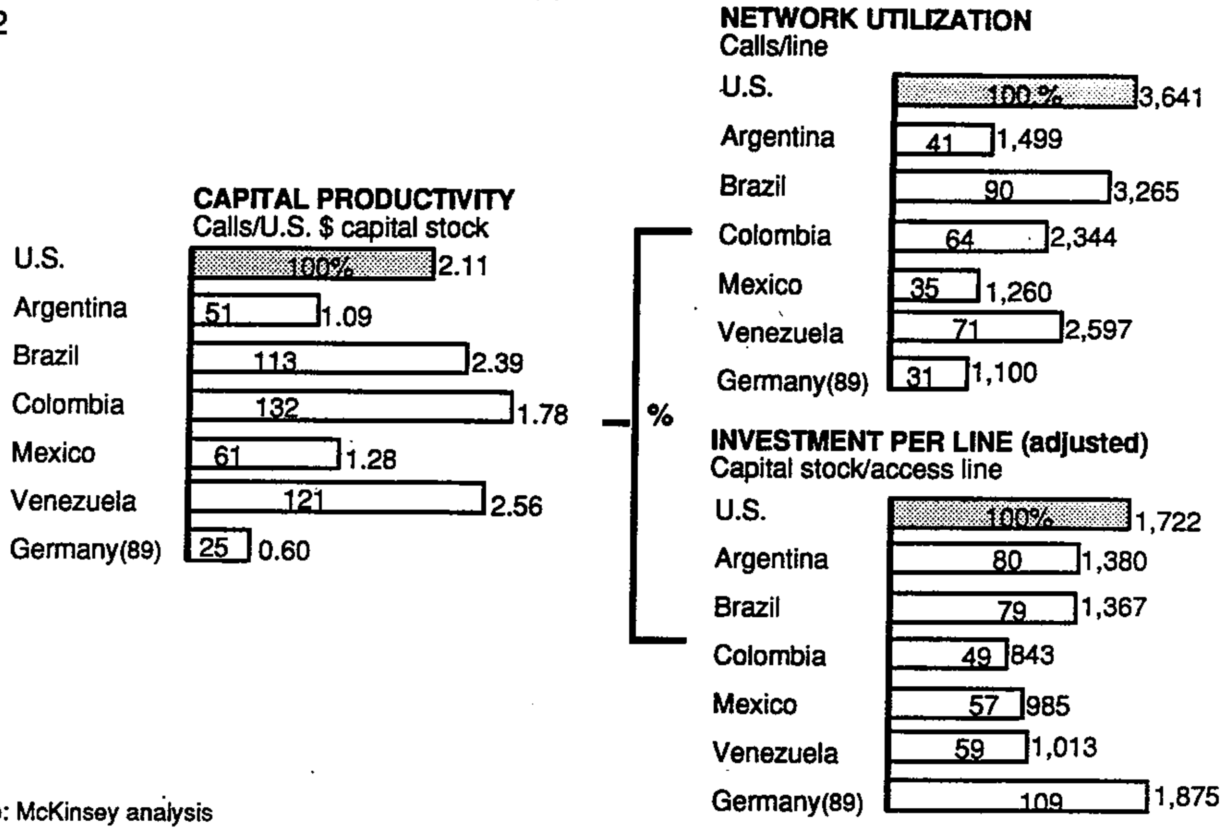
EMPLOYMENT AND ACCESS LINES EVOLUTION

1989-1993, Index: 1989 = 100



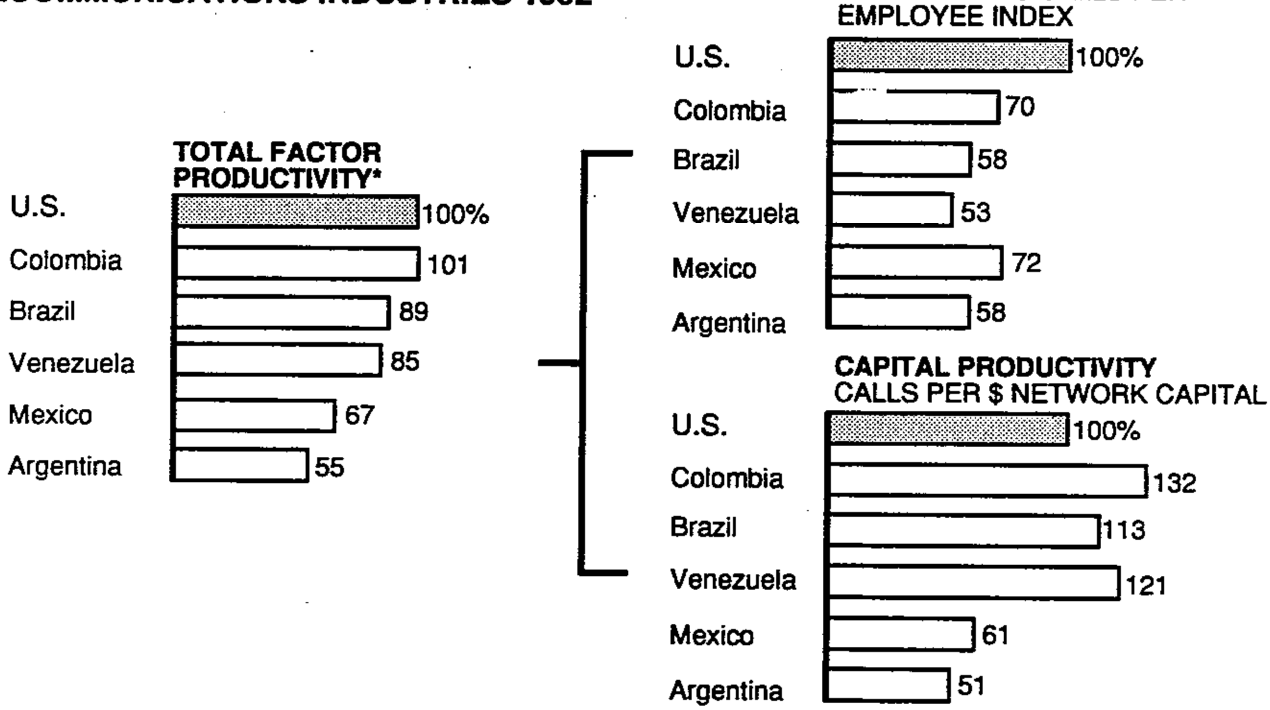
Source: ITU, Annual reports

Exhibit 15
MEASURES OF CAPITAL PRODUCTIVITY
1992



Source: McKinsey analysis

Exhibit 16
TOTAL FACTOR PRODUCTIVITY IN TELECOMMUNICATIONS INDUSTRIES 1992



* Average of labor and capital productivity weighted by cost relations of labor and capital

Source: McKinsey analysis

Exhibit 17

CAUSES OF PRODUCTIVITY DIFFERENCES IN THE TELECOMMUNICATIONS INDUSTRIES

External factors

- Heavily regulated industry partly government owned
  - Market entries prohibited
  - Regulation of prices
  - State/private monopolies
- Very high prices for Mexico and Argentina
- Relatively very low compensation of labor in Venezuela, Colombia, and Brazil
- Brazilian state willing to accept very low financial return

Production process

- Labor productivity
  - Structural: faster growing carriers need to allocate relatively more workers to the expansion of the network
  - Difference in organization of labor major explanatory factor
  - Secondary importance of network technology
- Capital productivity
  - Relatively high investment per line in Brazil and Argentina
  - Big "technical reserve" due to wrong demand estimations
  - Very low network utilization in Argentina and Mexico caused by higher tariffs and obsolescence of the networks

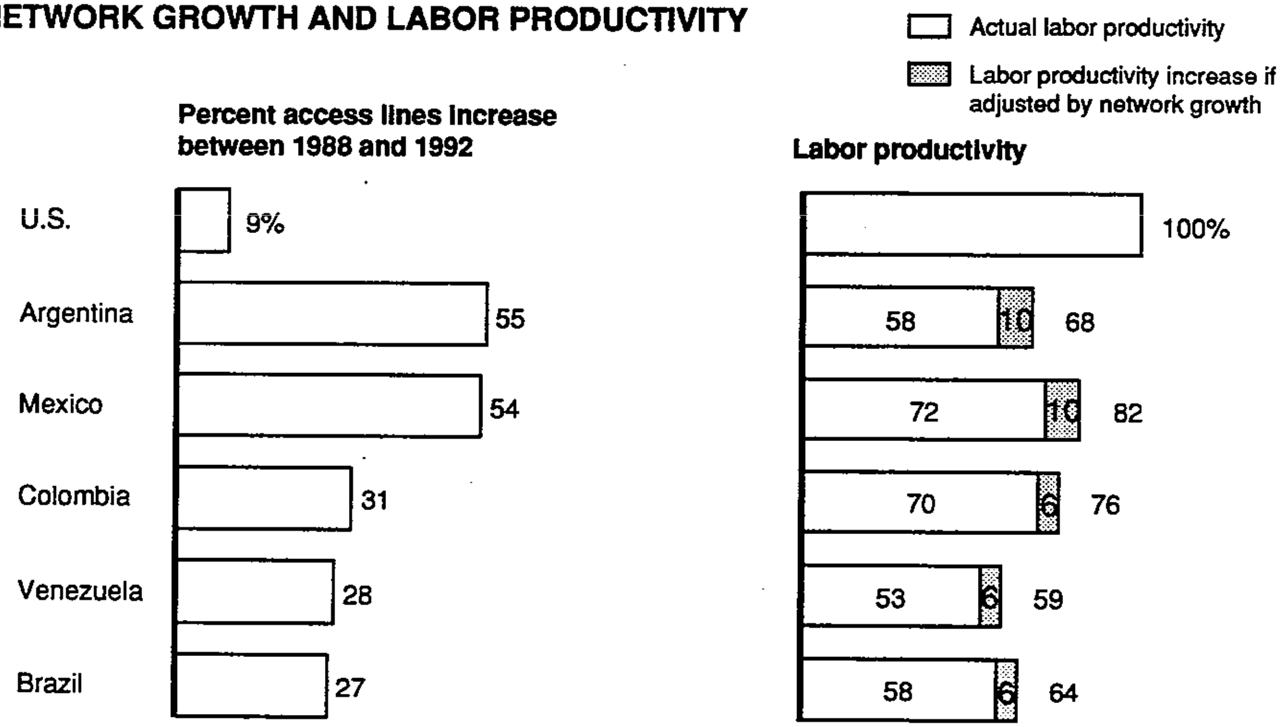
Productivity

- Colombia's 101% reflects good performance in both labor and capital productivity
- Brazil's 89% and Venezuela's 85% take advantage of a better capital productivity
- Mexico's 67% is punished by a low capital productivity
- Argentina's 55% shows a great improvement from a chaotic situation, but still suffers from a very low capital and labor productivity

Source: McKinsey

Exhibit 18

NETWORK GROWTH AND LABOR PRODUCTIVITY



Source: ITU; Annual reports; interviews; McKinsey analysis

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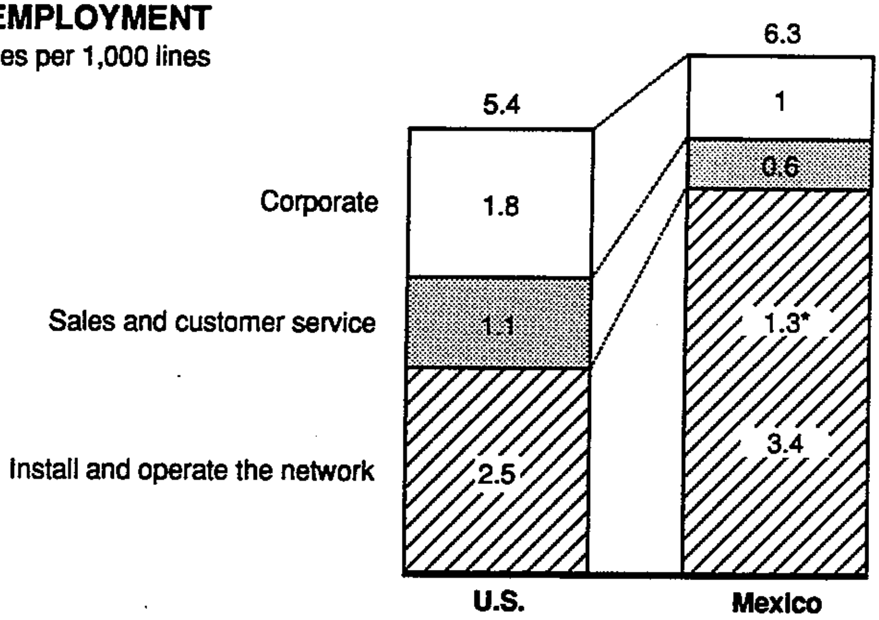
Exhibit 19

FUNCTIONAL EMPLOYMENT

Number of employees per 1,000 lines



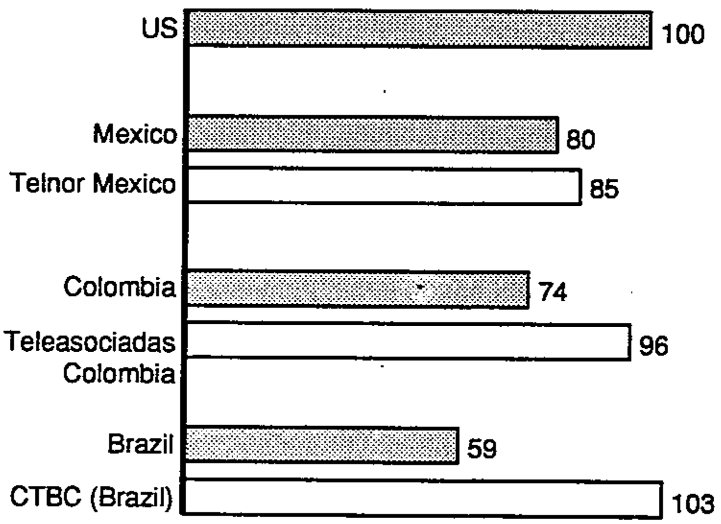
* Operators that could diminish substantially with digitalization

Source: FCC; Annual reports; interviews; McKinsey analysis

Exhibit 20

MORE PRODUCTIVE TELECOM COMPANIES WITHIN LATIN AMERICA

Access lines per employee, Index U.S. = 100



	CTBC	TELEBRAS
Lines (000)	280	10,500
Lines per inhabitant	13	8
Repair requirements/100 lines	2.5	4.5
Rural phones (index)	100	25

Source: Exame, Nov 93; annual reports, sectorial studies' McKinsey analysis

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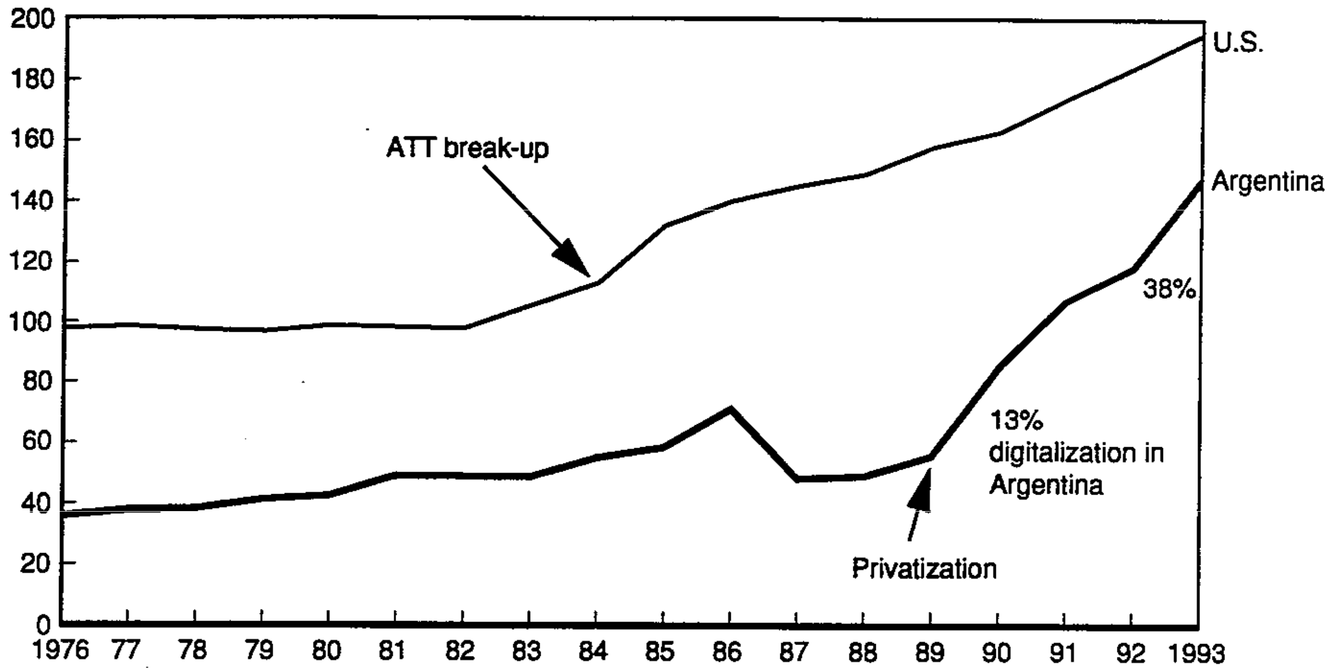
Exhibit 21

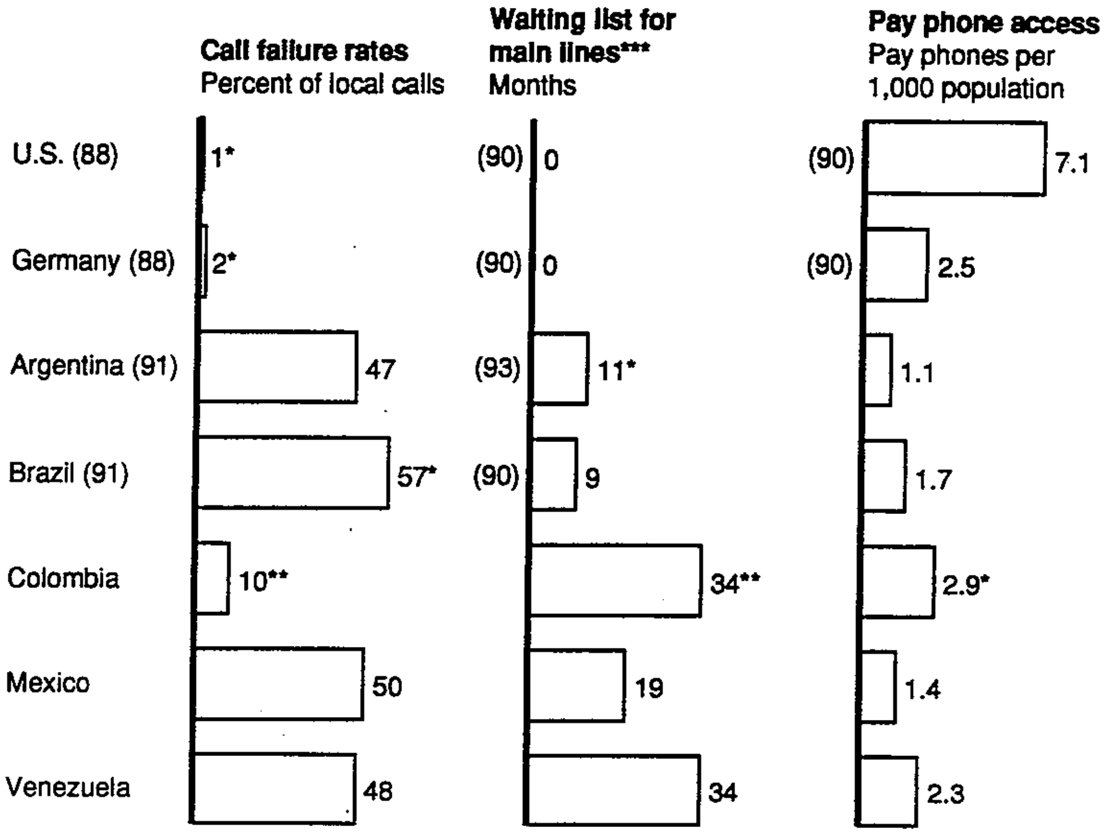
ACCESS LINES PER EMPLOYEE



Source: FCC, Entel, Telecom, Telefonica

Exhibit 22

SERVICE AND NETWORK QUALITY INDICATORS 1992



* Based on local calls
** Only Empresa de Teléfonos de Bogotá

* Only Telefónica de Argentina
** Only Empresa de Teléfonos de Bogotá
*** Lines in waiting list/lines installed in one month

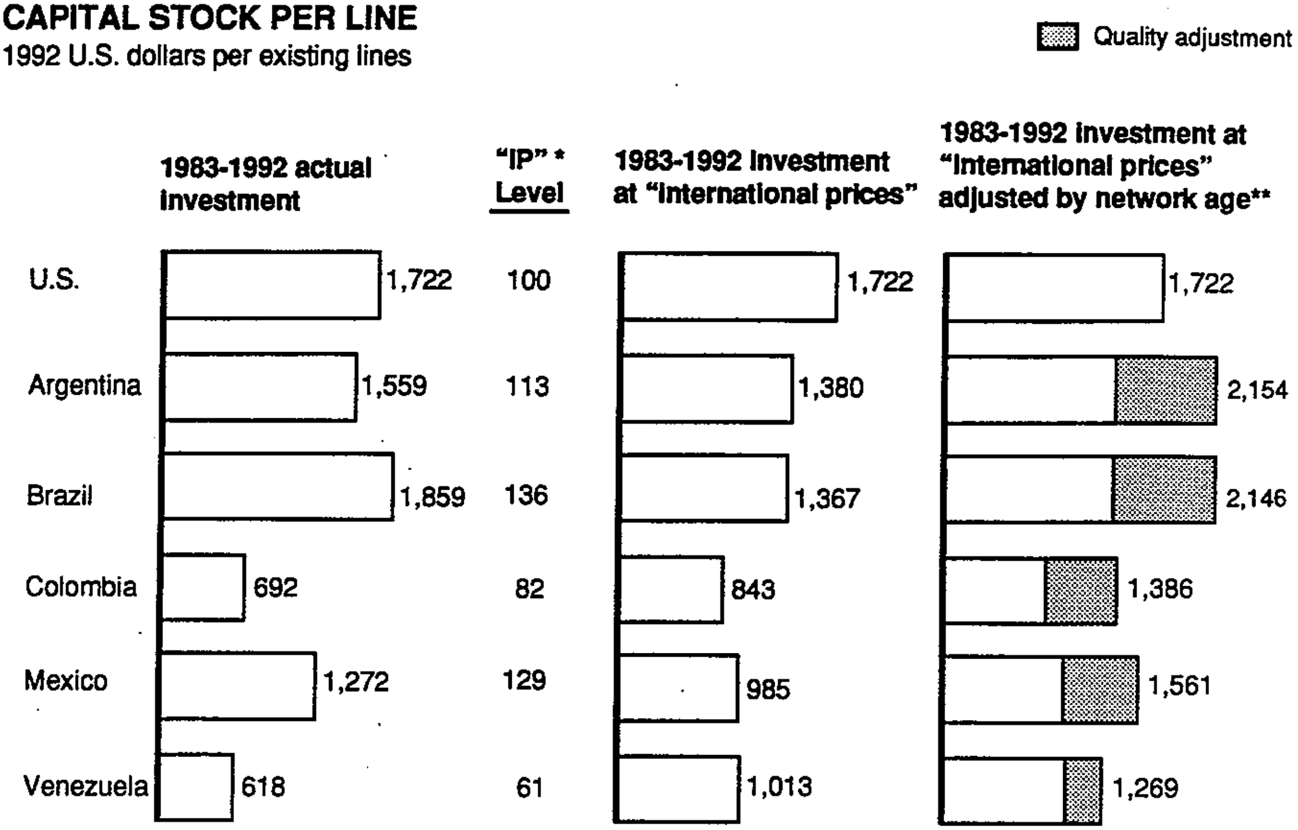
* Only Telecom & Empresa de Teléfonos de Bogotá

Source: Annual Reports, UIT, interviews, McKinsey analysis

Exhibit 23

CAPITAL STOCK PER LINE

1992 U.S. dollars per existing lines



* "International Price level": Weighted average of labor and equipment prices from 1983 to 1992

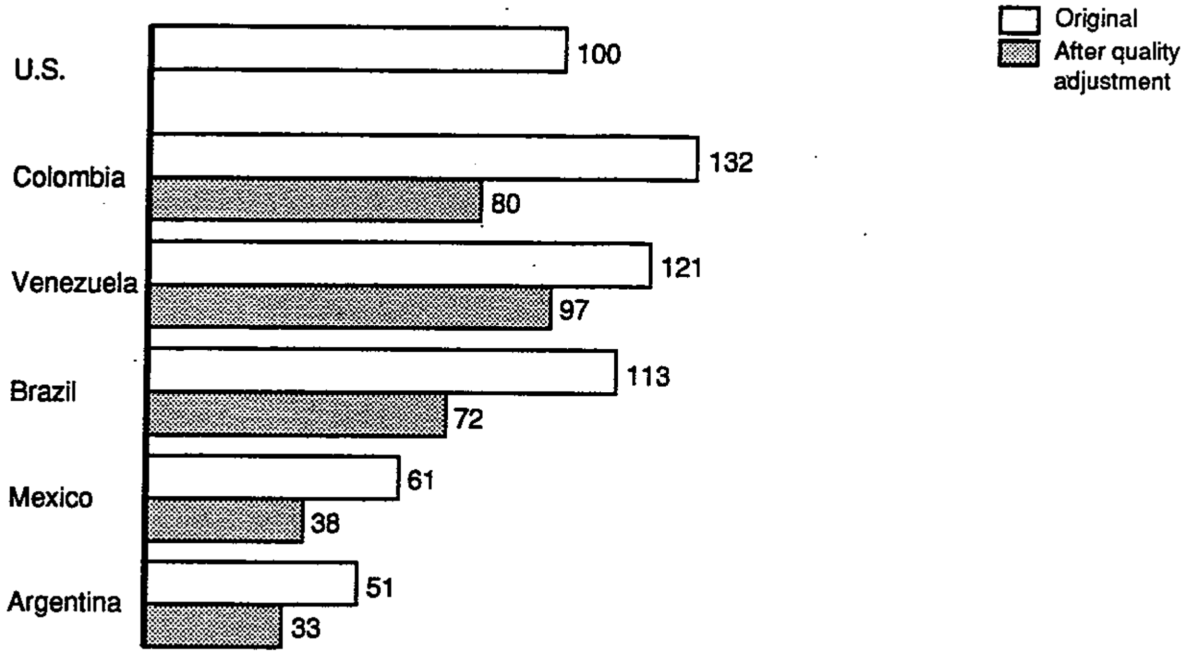
** Estimated by adding the entire investment needed to replace the electromechanical lines, aiming to emulate the digital performance of the U.S.

Source: FCC; Annual reports; ITU; McKinsey analysis

Exhibit 24

MEASURE OF CAPITAL PRODUCTIVITY AFTER "QUALITY ADJUSTMENT" 1992

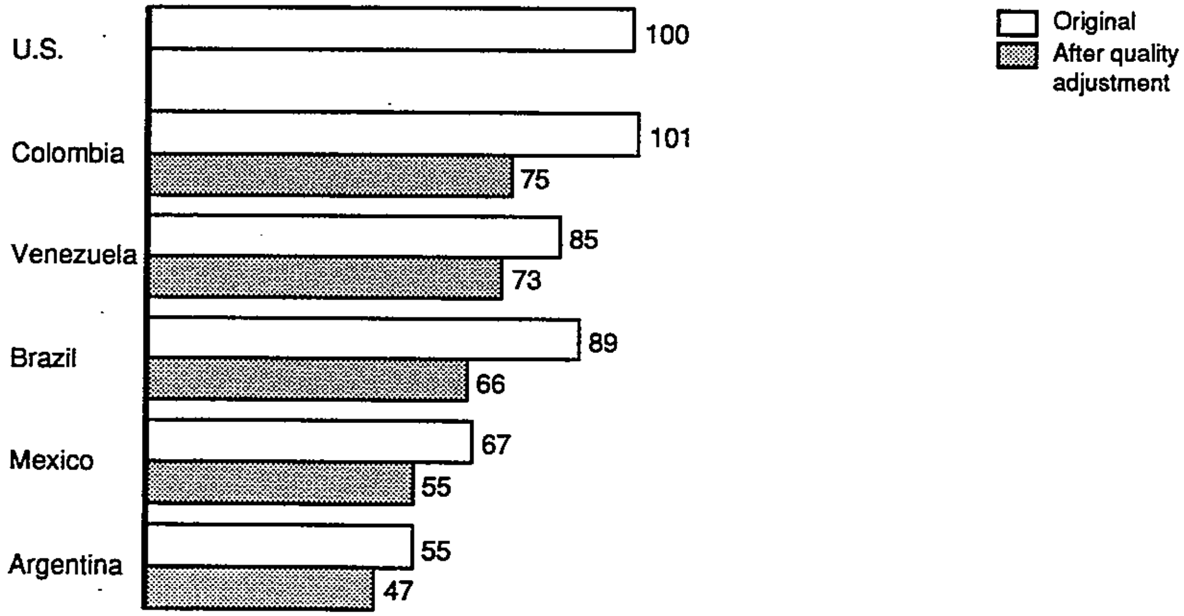
Calls/U.S. $ capital stock U.S. = 100



Source: McKinsey analysis

Exhibit 25

TOTAL FACTOR PRODUCTIVITY* IN TELCOMMUNICATIONS INDUSTRIES AFTER QUALITY ADJUSTMENT 1992



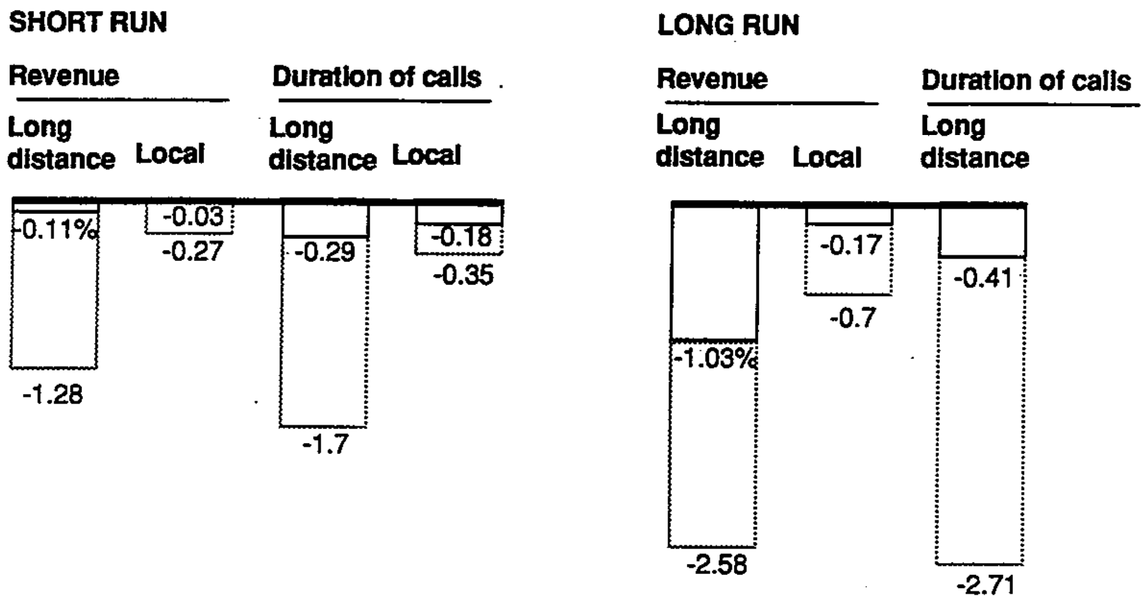
* Average of labor and capital productivity weighted by cost relations of labor and capital

Source: McKinsey analysis

Exhibit 26

PRICE ELASTICITY OF DEMAND FOR TELEPHONE SERVICE

Range of results from different studies in percent



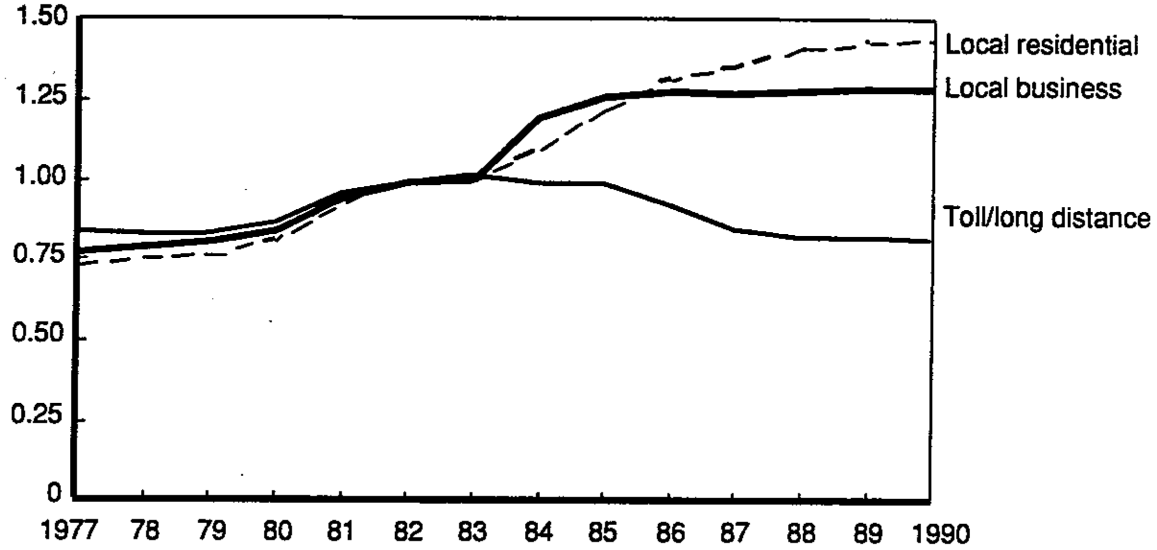
"When price **increases** by 1%, demand **decreases** by . . .%"

Source: Telecommunications Demand Survey; L. D. Taylor, University of Arizona

Exhibit 27

PRODUCER PRICE INDEX U.S. TELEPHONE SERVICES

1984 =100%

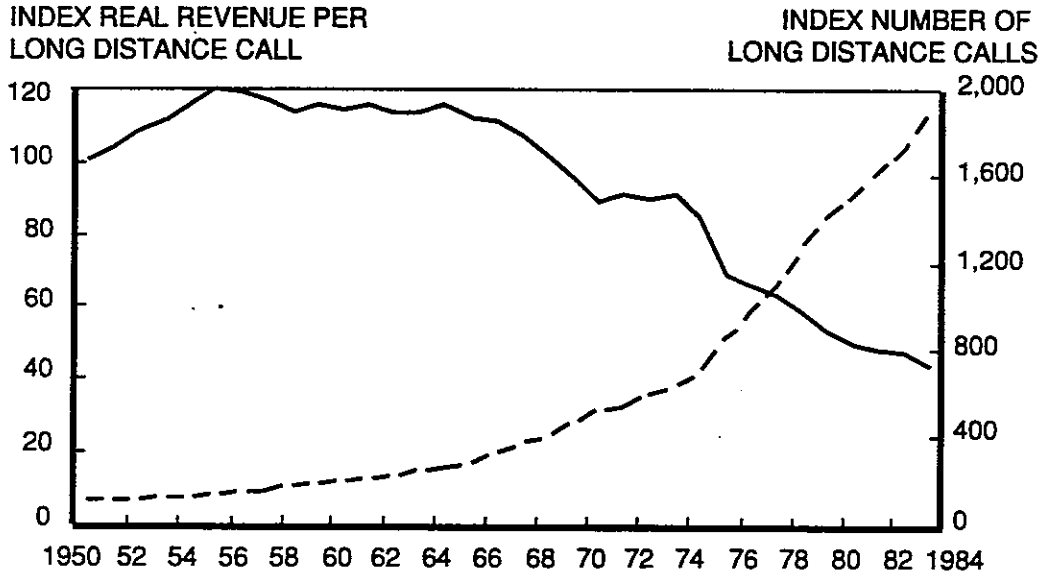


1989 local service revenues: $35.3 billion
1989 toll service revenues: $66.1 billion
Source: FCC

Exhibit 28

REAL REVENUE PER LONG DISTANCE CALL AND NUMBER OF LONG DISTANCE CALLS

Deflated with CPI, Index 1950 = 100%

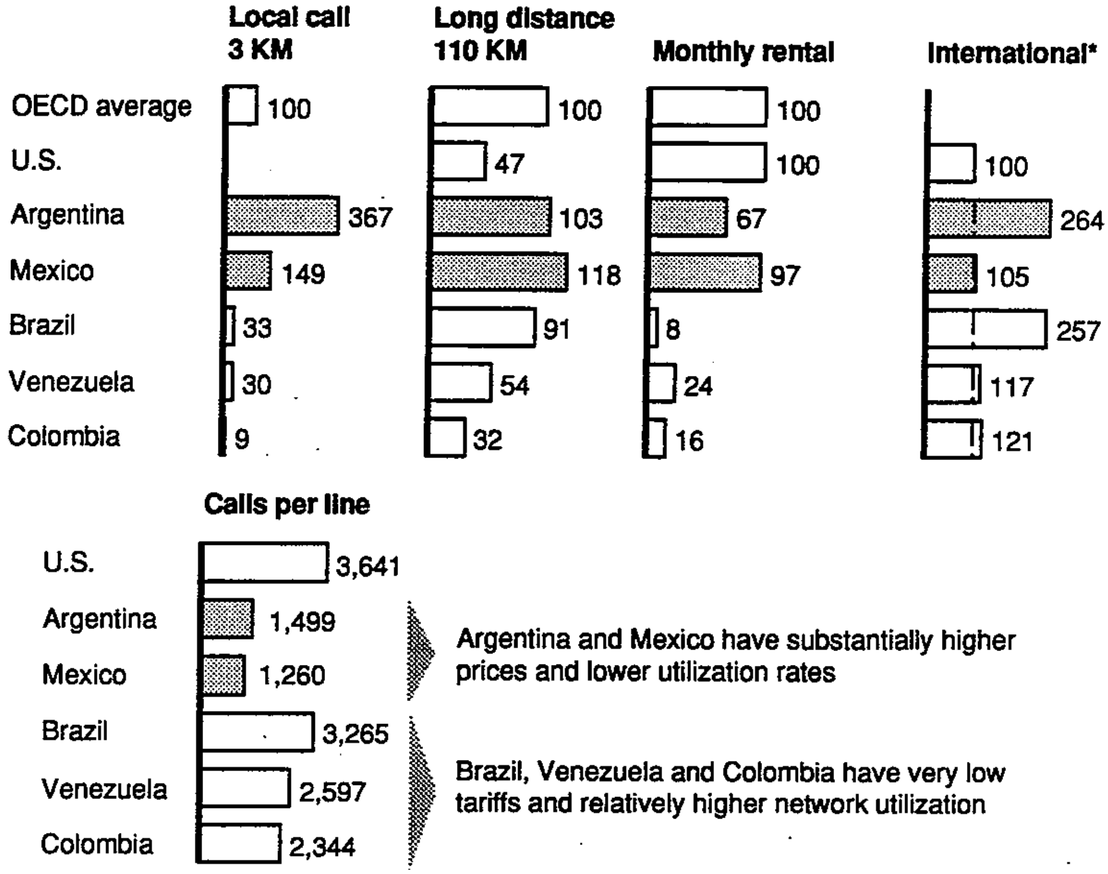


Source: FCC

Exhibit 29

COMPARATIVE CALL CHARGES AND NETWORK UTILIZATION

Index: OCDE average = 100



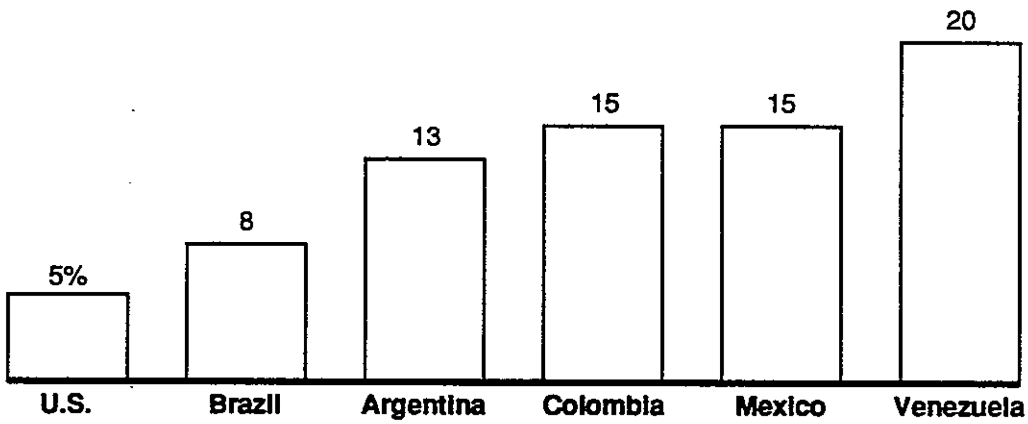
* Ratio: (call to the U.S./call from the U.S.) x 100

Source: Companies, FCC, OCDE; McKinsey analysis

Exhibit 30

TECHNICAL RESERVE

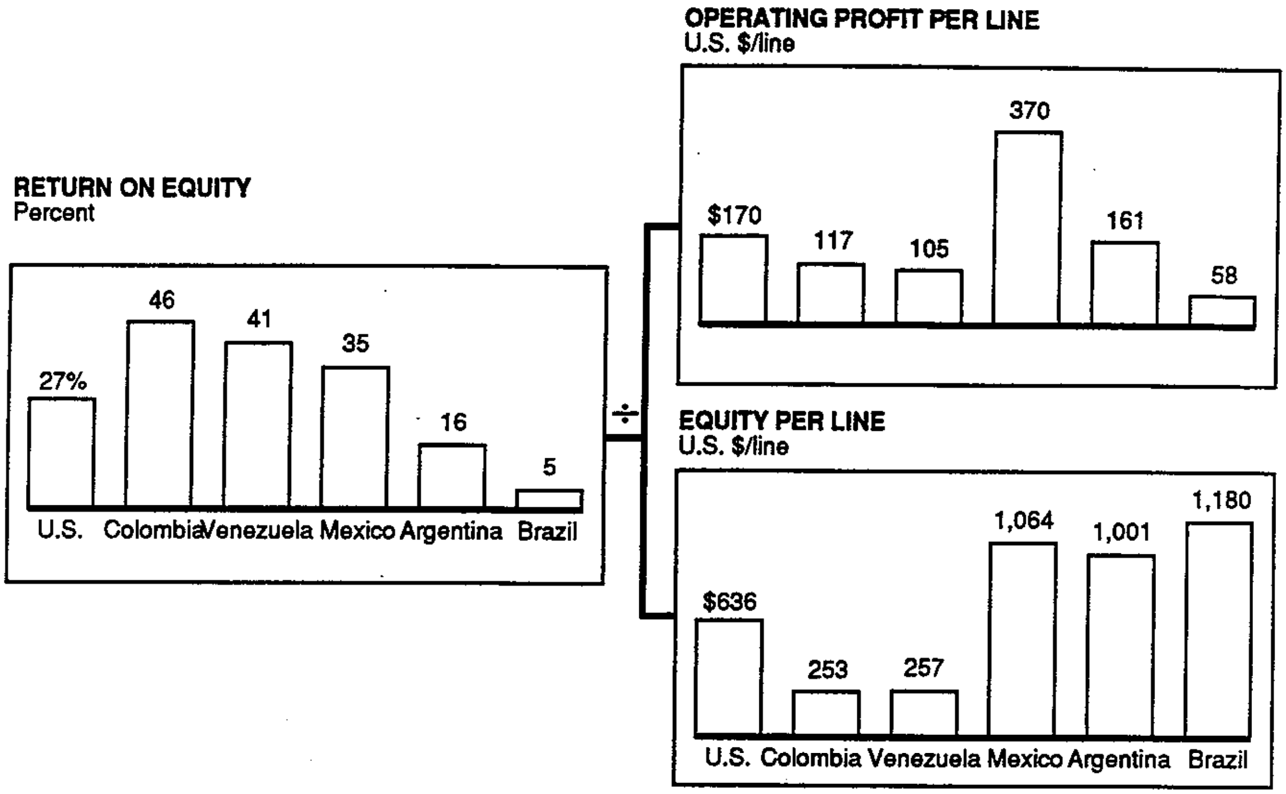
Percentage of installed lines not in service



Source: Annual reports, McKinsey analysis

Exhibit 31

RETURN ON EQUITY FOR TELECOMMUNICATIONS INDUSTRIES*

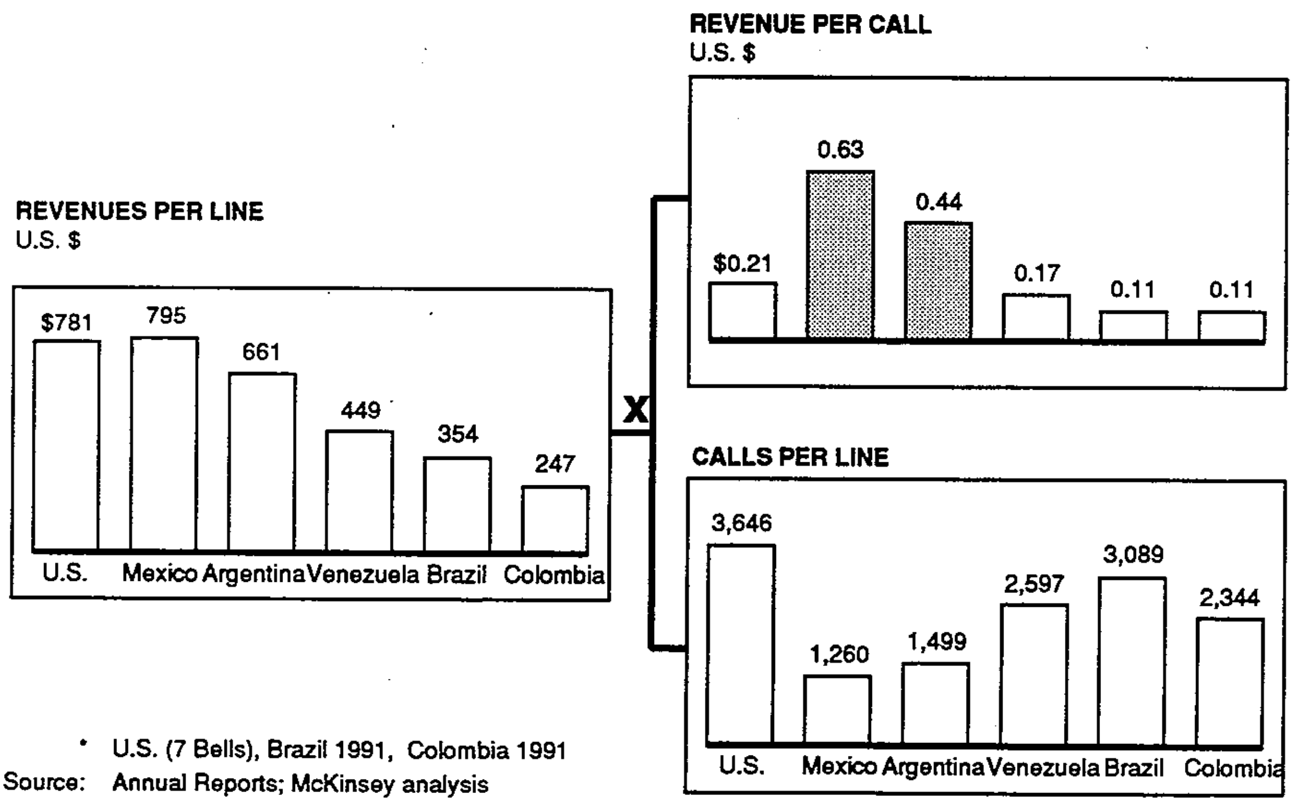


* U.S. (7 Bells) 1992, Argentina 1992, Brazil 1991, Venezuela 1992, Colombia 1991 only Telecom + Teleasociadas, Mexico 1992

Source: Annual Reports; McKinsey analysis

Exhibit 32

REVENUES PER LINE FOR TELECOMMUNICATIONS INDUSTRIES 1992



* U.S. (7 Bells), Brazil 1991, Colombia 1991

Source: Annual Reports; McKinsey analysis

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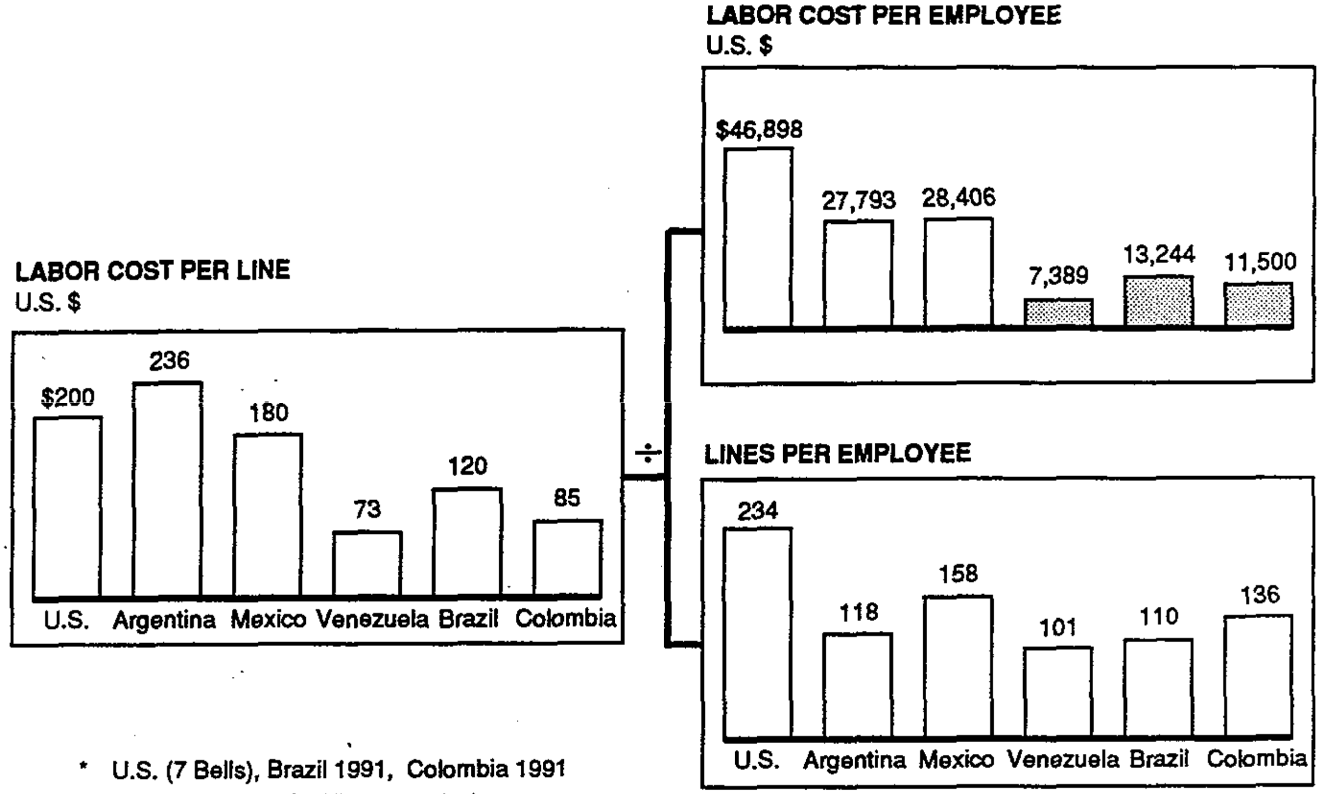
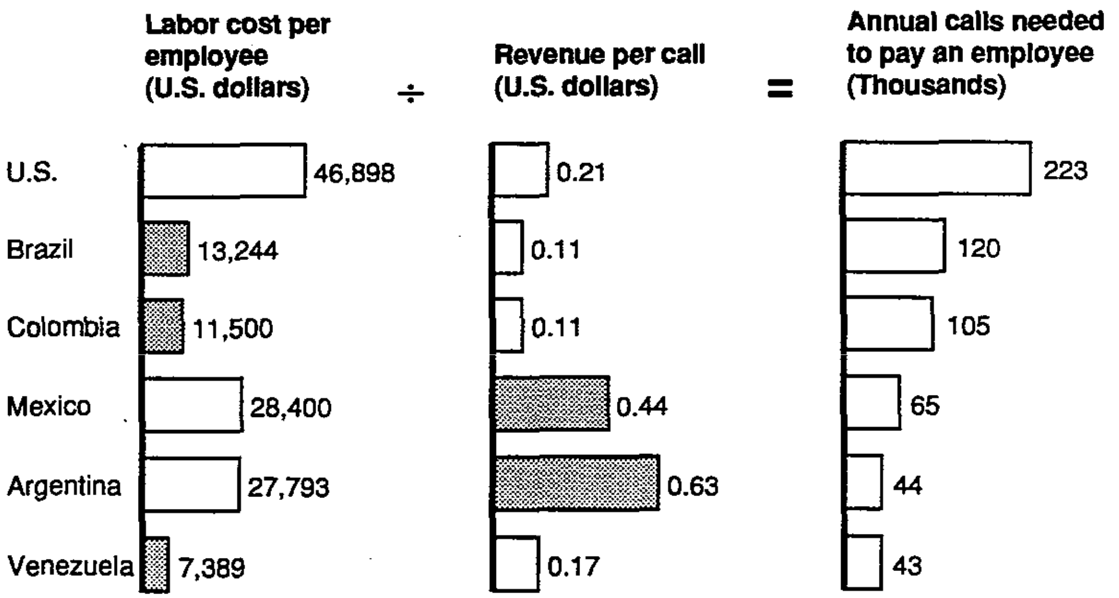
Exhibit 33
LABOR COST PER LINE IN TELECOMMUNICATIONS INDUSTRIES 1992



* U.S. (7 Bells), Brazil 1991, Colombia 1991

Source: Annual Reports; McKinsey analysis

Exhibit 34
REVENUES AND LABOR COST IN THE TELECOMMUNICATIONS INDUSTRY 1992

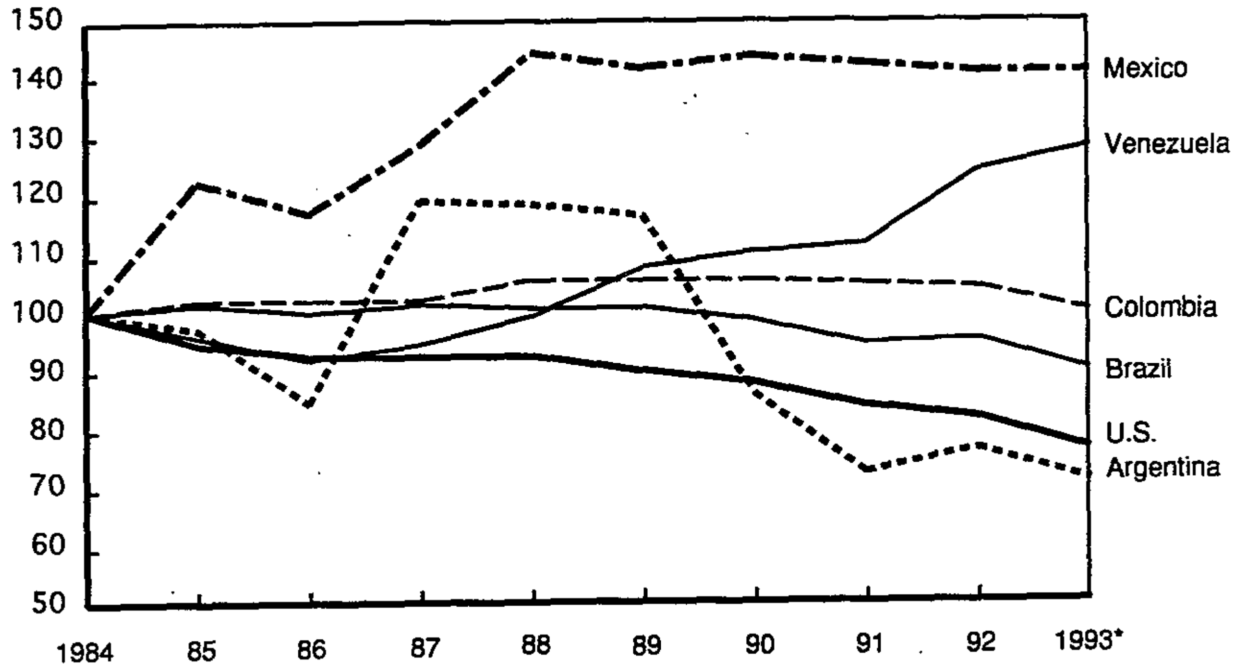


Source: Annual reports; McKinsey analysis

Exhibit 35

TELECOMMUNICATIONS LABOR EMPLOYMENT EVOLUTION

INDEX: 1984 = 100%



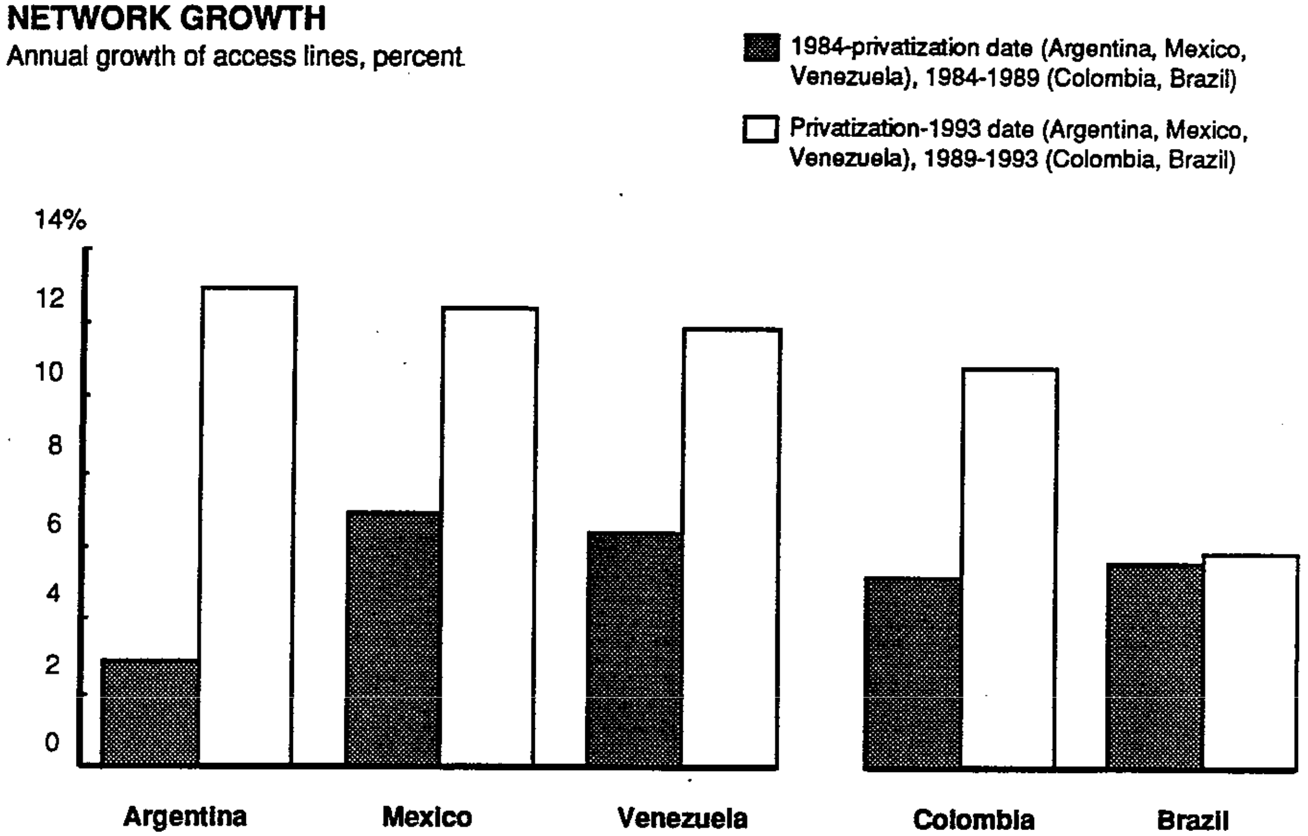
* Estimated

Source: UIT; annual reports; McKinsey analysis

Exhibit 36

NETWORK GROWTH

Annual growth of access lines, percent

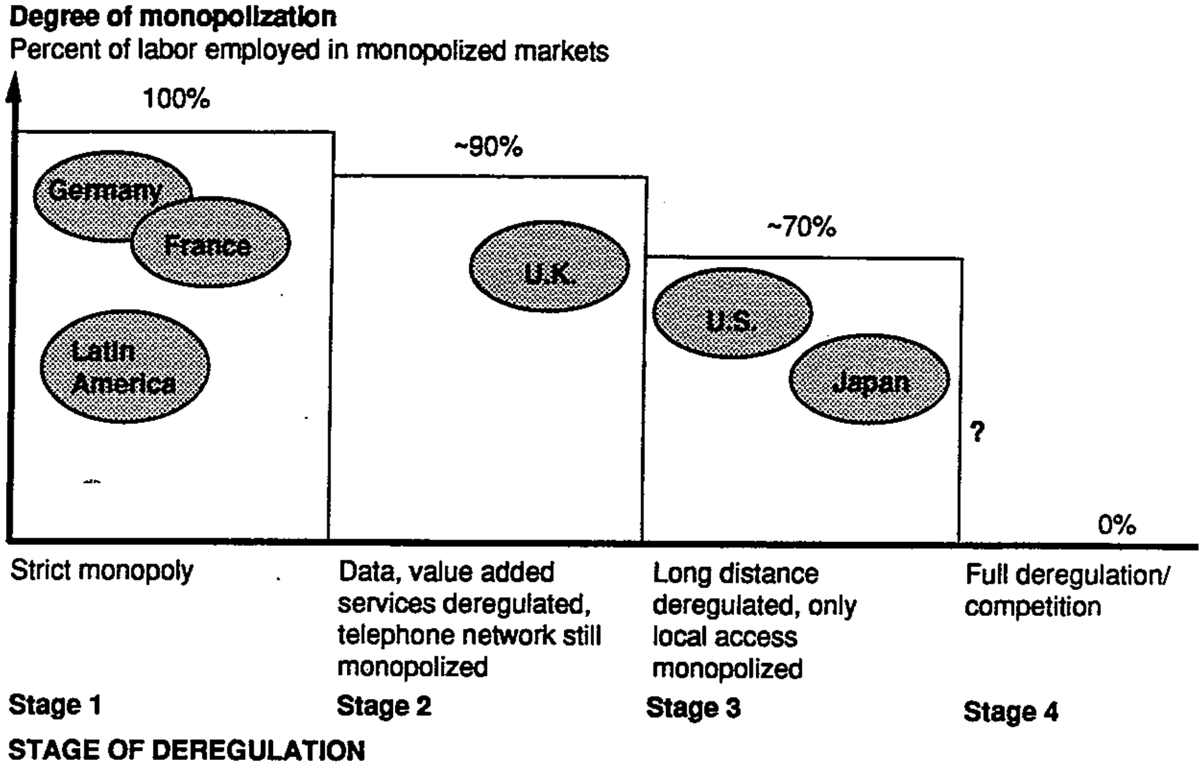


Note: Privatization took place in 1990 in Argentina and Mexico, and in 1992 in Venezuela

Source: Annual reports; McKinsey analysis

Exhibit 37

4 STAGES OF DEREGULATION IN TELECOMMUNICATIONS



Source: McKinsey estimate

Exhibit 38

CAUSES OF LABOR PRODUCTIVITY DIFFERENCES

TELECOM

● Important
o Secondary
x Undifferentiating

Factor	
External factors	
• Market conditions	
- Demand factors	○
- Relative input prices/factor availability	●
- Other industries	○
• Policy and regulation	
- Import barriers	○
- Competition and concentration rules	●
- Labor rules and unionism	○
- State ownership	●
- Other (fiscal policy, price controls price schemes)	●
Nature of competition	●
Production process	
• Output mix, variety, quality	○
• Production factors	
- Capital (intensity, vintage, technology)	○
- Scale	X
- Labor skills	X
- Organization of functions and tasks	●
LABOR PRODUCTIVITY	

Source: McKinsey estimate

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