Telecommunications Sector Reform—A Prerequisite for Networked Readiness

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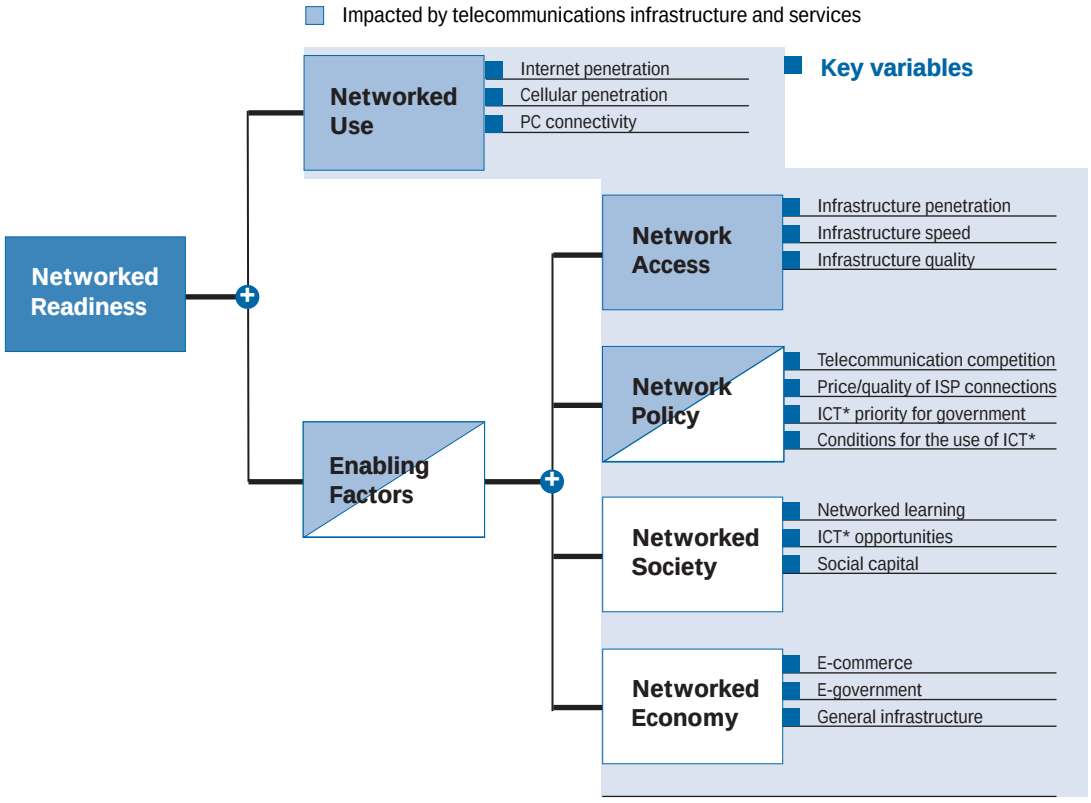
Executive Summary

Policymakers around the world have successfully used sector reform as a tool to improve the performance of telecommunications markets. Because of the direct link between Networked Readiness and the level and diversity of telecommunications services available to users, sector reform has played a key role not only in improving a country's readiness, but also in providing several important additional benefits.

- Regardless of the level of GDP, countries that have reformed their telecommunications sector have achieved a significantly higher Internet penetration than their economic peers.[1]
- Telecommunications sector reform has unlocked significant value for governments and shareholders in the period following privatization. Total market value of incumbents that was captured at the time of initial public offering (IPO)[2] was US$534 billion. This value increased to US$984 billion as of August 31, 2001.
- Reform has encouraged increases in teledensity and user intensity. Countries that reformed generally have had more rapid increases in teledensity and user intensity, regardless of their income level. Nevertheless, despite significant increases in Internet penetration around the world, there is tremendous potential for improvement—about 5.7 billion people are still not participating directly in the networked economy.[3]
- Differences in Internet penetration for equal GDP levels, as well as variance in user intensity for a given teledensity level (and vice versa) are partially explained by the details of sector reform. Customer behavior and other external factors such as PC penetration play a role as well.

In addition to direct benefits, experiences suggest that focus matters. Generally, countries that prioritized one or two medium-term objectives (e.g., benefits to customers, increasing incumbent valuations, or enhancing universal service) have, in general, made better progress towards their goals.

Figure 1: **Networked Readiness and the Impact of Telecommunications**



ICT* = Information and Communication Technologies
Source: World Economic Forum; Center for International Development at Harvard University; McKinsey

Networked Readiness and Sector Reform

Networked Readiness is directly impacted by telecommunications

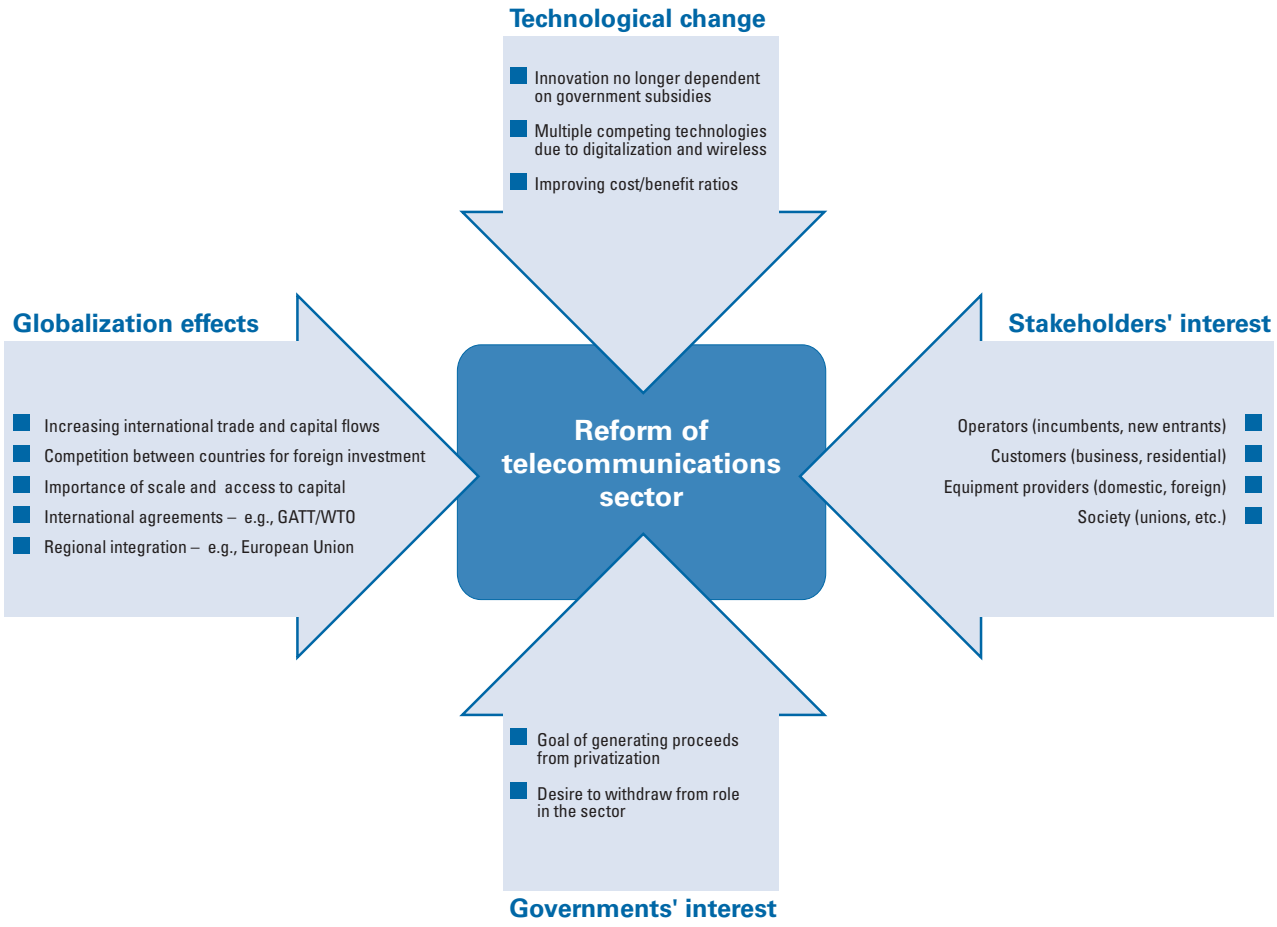
Networked Readiness, defined as "the degree to which a community is prepared to participate in the Networked World," is seen as critical for communities because it provides the following benefits (Sachs):

- Creation of opportunities. Networked Readiness increases consumer convenience and choice, extends market reach for businesses, and allows the emergence of new business models to support economic growth.
- Elimination of barriers. The open provision of information across the network allows individuals to overcome physical and virtual isolation and to better inform themselves of the policies and processes of government.
- Promotion of efficiency. A networked business world can streamline product and service delivery, increase transparency of operations, and reduce transaction costs.

When looking at the components of Networked Readiness as defined by Harvard University (and presented earlier in this book), one can observe that telecommunications directly impacts Networked Readiness. Telecommunications essentially defines Networked Use and one of its key enabling factors, Network Access; it also influences Network Policy, another key enabling factor. (See Figure 1.) Telecommunications sector reform is critical in that it is part of the Network Policy component; the success of reform largely determines the state of the Network Access component and, finally, Networked Use.

There are two levels of connection. The first is basic communication services (voice and fax communications) and the second is advanced services (access to data services and the Internet). It is, of course, critical for countries to take the first step of achieving sufficient penetration of basic communications services to permit communication, which often serves as a platform for the introduction of advanced services. However, going forward, stimulating advanced services will be critical for all countries, because prospects associated with the effective use of the Internet are much broader than those of voice communications only. This document takes the need for advanced

Figure 2: **Forces Driving Reform of the Telecommunications Sector**



Source: McKinsey

communication services into consideration by describing Networked Readiness using Internet penetration as indicator.

An increasing number of countries have chosen market-based sector reform to improve their telecommunications infrastructure

Increasingly, internal and external forces are pushing governments away from direct control of the telecommunications industry towards market-based mechanisms

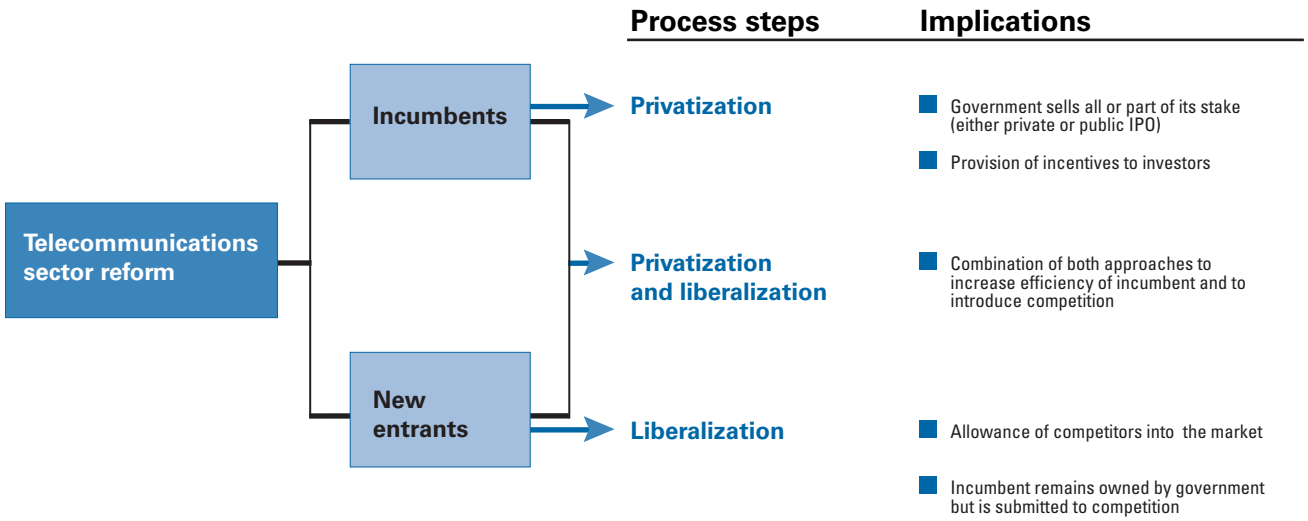
Historically, most countries had direct public control of the telecommunications sector. In this model, a state-owned monopoly provider had to meet targets, such as teledensity or affordability, which had been set by its government. This model worked well in developed countries in that it delivered significant penetration and network quality.

To distinguish countries, this document applies a typology based on economic wealth, thereby using the countries' real GDP per capita as of 2000. Categories used are (GDP per capita): developed countries (above US$10,000), emerging countries (US$3,001 to US$10,000), and developing countries (below US$3,000). Developed countries are separated into upper high income countries (above US$20,000) and lower high income countries (US$10,001 to US$20,000) to extract some more details when analyzing their Networked Readiness.

However, increasing pressure from both internal and external forces has altered the status quo. (See Figure 2.) The most important forces involved are:

- Ever accelerating technological change. State-owned companies often react too slowly to keep up. They also struggle to master the uncertainty created by change.
- Growing political consensus around the world on the benefits of open markets and reduced government control. This has been promoted mainly by international organizations such as the World Trade Organization (WTO) and the European Union (EU).
- Stakeholders pushing for change. These include retail consumers looking for better service, businesses that require data connections to compete both locally and globally, and domestic and foreign investors who want to participate in a growing market.

Figure 3: **Process Steps of Sector Reform**



Source: McKinsey

- Increasing fiscal pressure on government and budgets, which means that resources have to be reallocated. It often results in privatization and liberalization, including the sale of telecommunications to new operators, both to generate budget financing and to decrease state investment in the sector.

An added impetus for change in emerging and developing countries is the lack of capital. In these countries, sector reform is the only way to bring in the funding needed to expand their telecommunications infrastructure, and ensure the provision of communication services to their citizens. For this reason, many of those countries have been moving towards reform in recent years.

Despite these forces, state control of the telecommunications sector is still a viable option for some countries. Countries that follow this path are basically reproducing the route taken by developed countries prior to sector reform. China, for example, decided to assign priority to building out its telecommunications infrastructure, as the government undoubtedly recognized that this was key to making the country economically powerful. The country has been adding more fixed lines than the rest of the world in recent years, and creating incentives for equipment providers to manufacture in the country. State control has increasingly been coupled with sector reform and partial privatization. This option can work if a government has resources to divert towards infrastructure build-out and if it is willing to subsidize the provision of access with profits earned in other segments, such as long-distance. In addition, a government must be able to manage possible pressure to deliver open access and/or competitive entry.

A market-based reform generally allows market forces to set prices, quantities, and quality, as well as to determine the services to be provided. Governments can start reform in three ways: through privatization, liberalization,[4] or by a combination of both (full sector reform). A more detailed description of each option is included in Figure 3. Full sector reform is rarely done in one leap. Countries usually start with either privatization or liberalization before combining both approaches. This document breaks down the development process into three categories in order to explain variations among countries. These categories are: liberalization (combining full sector reform and liberalization alone), privatization, and no reform.[5]

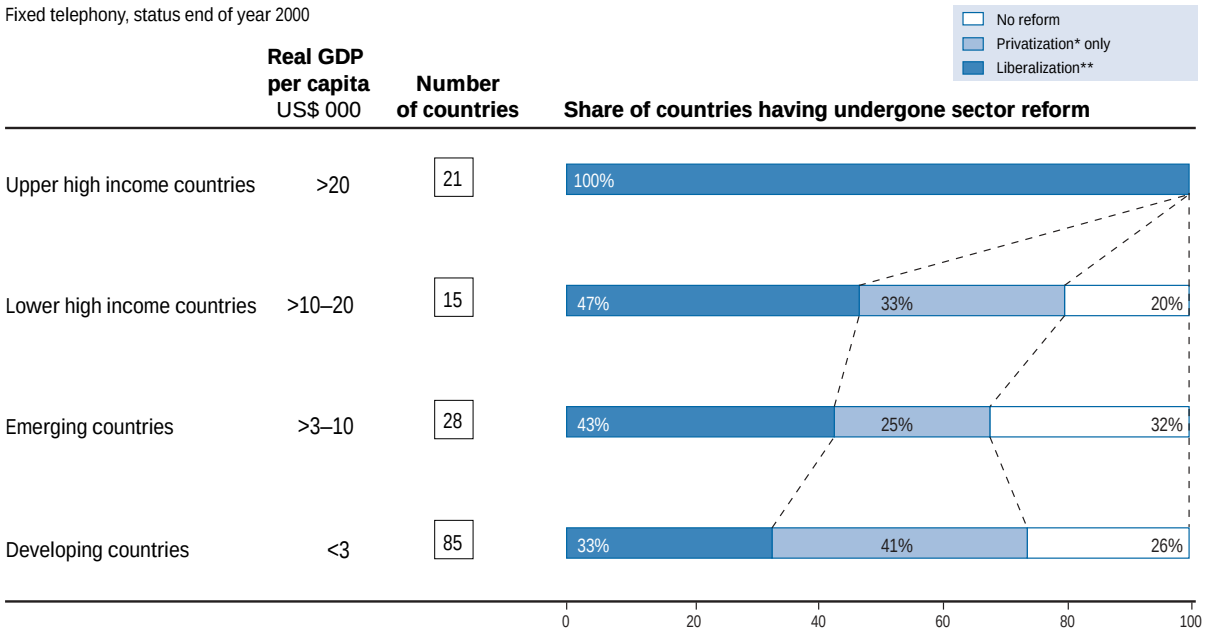
Networked Readiness is primarily led by the reform of fixed telecommunications

For several reasons, fixed telecommunications appear to be more important than mobile services in driving Networked Readiness. Mass-market Internet access has traditionally been facilitated by fixed networks, where service pricing seems to influence usage. Businesses and governments usually have high-speed access through fixed data networks.[6]

Despite more extensive competition among mobile networks than among fixed, two factors reduce the impact of mobile networks on Networked Readiness:

- Technological constraints. So far, technological constraints seem to have limited the ability of mobile networks to be a significant enabler of Internet access (with the exception of I-mode in Japan). This could change in the future with the advent of advanced wireless data networks. However, recent announcements from newly licensed 3G operators suggest that for the years to come, even 3G networks will operate at relatively low data transmission rates of only 64 kbps, discouraging the rapid adoption of mobile Internet services.
- Lack of immediate effect on penetration. Although most

Figure 4: **Status of Telecommunications Sector Reform**



*Includes partial privatization and privatization in progress
**Includes countries with liberalization only and full reform (privatization and liberalization)
Source: ITU; McKinsey

mobile markets have seen the introduction of multiple, alternative operators, it appears that this has not had an immediate effect on penetration per se. Even when competitive entry became common in the early 1990s, mobile services remained expensive and provided limited bandwidth and quality. It was only with the introduction of prepaid services (which was a product innovation) and price reductions due to technological progress, from about 1996, that mobile penetration rose significantly.[7]

In the future, developing countries may be able to exploit what is now a relatively cheap technology. Experiences in Egypt, Botswana, and Morocco (which all had significant increases in penetration following the licensing of a second operator between 1998 and 2000) suggest a high potential for mobile services in developing countries due to pent-up demand. Mobile networks can be deployed more rapidly and at relatively lower cost than fixed networks, which allows them to meet demand more efficiently, even if end user costs are higher. The introduction of prepaid services has permitted a segment of the population to pay for a service without the need for banking intermediaries, and has reduced bad debt. Both of these factors have encouraged operators to push penetration. As a result, mobile networks may be the primary form of communication and access to global information in developing countries, and it is in this sense that those networks have a positive impact on the first level of Networked Readiness.

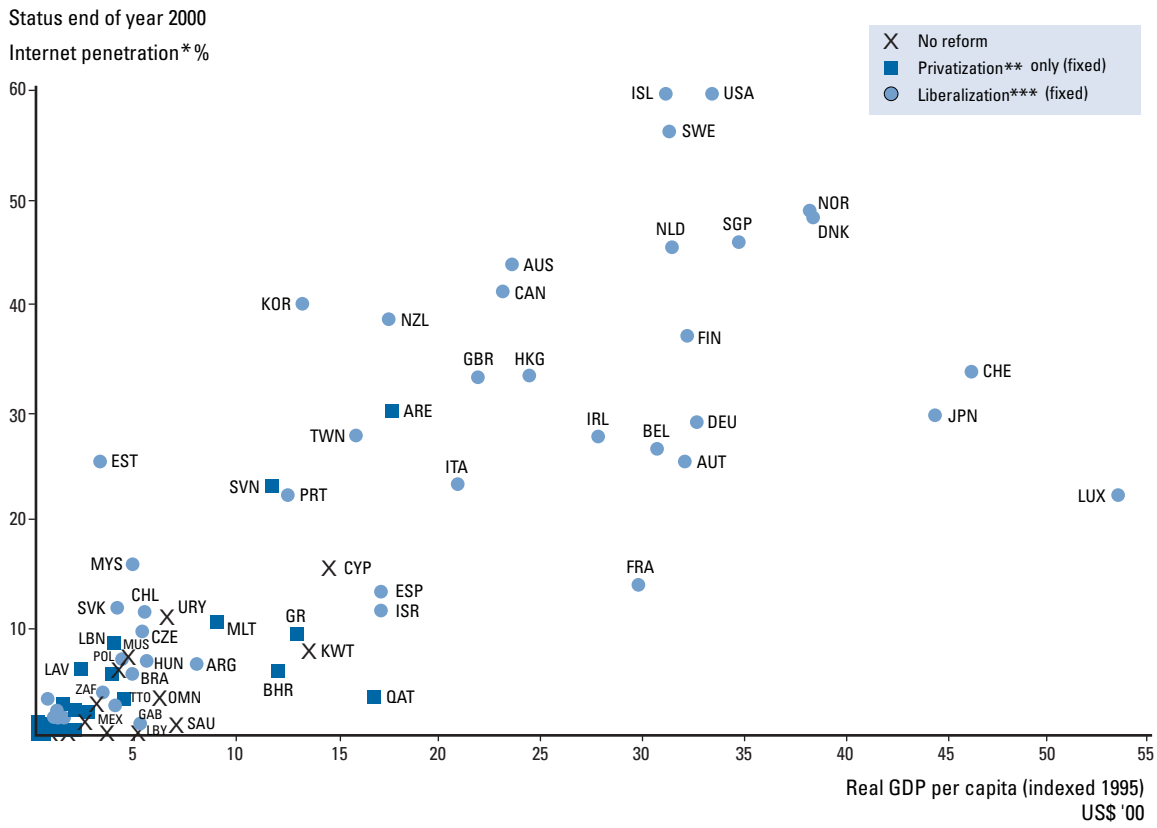
In addition, in many emerging and developing countries, liberalization of mobile services took place before reform of the fixed service. The direct competition existing between mobile and fixed service makes it increasingly difficult to build fixed networks, as margins from fixed services are under pressure from mobile competition.

Clear trend towards full sector reform, with developed countries leading

Following the lead of the U.S. and the U.K. in 1984, sector reform has now spread around the globe. As of the end of 2000, more than 55 percent of 236 countries and territories around the world had undergone some sort of reform.[8] Among these are all upper high income countries, most lower high income countries, and a large number of emerging and developing nations.

In terms of the extent of reform, there is a clear trend towards full sector reform, with upper high income countries leading in this respect. (See Figure 4.)[9] This preponderance of relatively wealthy countries means, however, that the primary focus of liberalization has been on increased economic efficiency (which, among other things, implies working towards the elimination of cross-subsidies and overstaffing at incumbents), promoting customer choice, and lowering prices. This efficiency drive coincided with a broader trend towards reduced state intervention in economic activity and also with governments' attempts (particularly in Eastern Europe and Latin America) to increase their budget resources through license fees and returns from privatization.

Figure 5: **Internet Penetration and Economic Wealth**



*Based on unique Internet users who access the Internet at least once a month
**Includes partial privatization and privatization in progress
***Includes countries with liberalization only and full sector reform (privatization and liberalization)
Source: ITU; EMC; NielsenNetRatings; WEFA; World Economic Forum; McKinsey

Sector reform has worked

Strong correlation between network access and GDP

This document uses Internet penetration, defined as the percentage of Internet users in a population, as the main indicator of the level of network access.[10] It is a more appropriate indicator than, for example, teledensity alone, because it reflects both the availability of infrastructure and the performance and intensity of competition in the telecommunications industry. This means that it offers a measurable target by which to gauge the success of efforts to improve Networked Readiness. Furthermore, it provides a measure of the quality of a country's network. High teledensity does not necessarily result in high Internet penetration, particularly if a large number of the phone lines cannot be used to establish reliable connections.

Figure 5 shows a high correlation between Internet penetration and a country's GDP.[11] Internet penetration increases in proportion to a country's economic wealth. Both developments are mutually reinforcing. As a country's national income increases, its inhabitants demand additional telecommunications services, buy more PCs, and work increasingly in information-intensive sectors (such as design and financial services). Growth in information-intensive sectors drives up GDP, and so on.

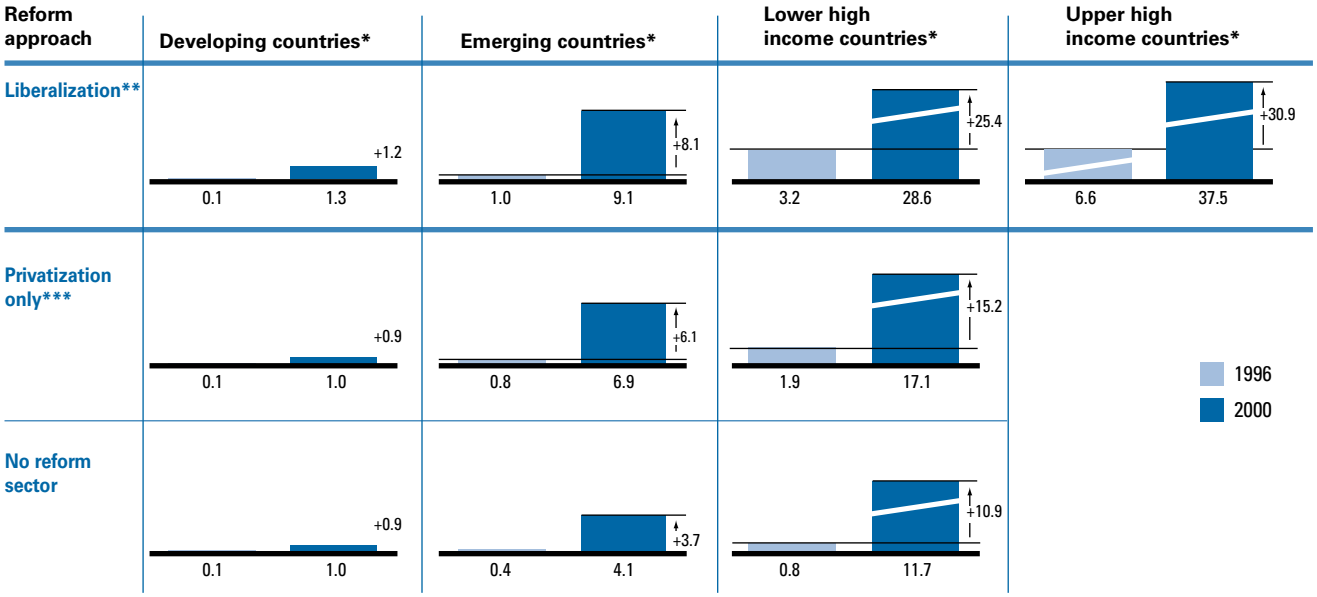
Countries with liberalization have reached higher Internet penetration even after adjusting for GDP

The snapshot of Internet penetration at the end of 2000 shows that countries that have undergone full sector reform have reached a higher level of Internet penetration than countries with privatization or no reform. (See Figure 5.) This observation holds across all economic bands, but is particularly true for emerging and developing countries. Here, the majority of countries that had started to reform their telecommunications sector were positioned above peer countries that had yet to initiate reform.

In addition, whatever the level of economic wealth, countries with liberalized telecommunications markets experienced much stronger Internet penetration growth between 1996 and 2000 than other countries. (See Figure 6.)[12] One can also observe the correlation between this penetration and economic wealth. Developing countries appear to have had the slowest advance-

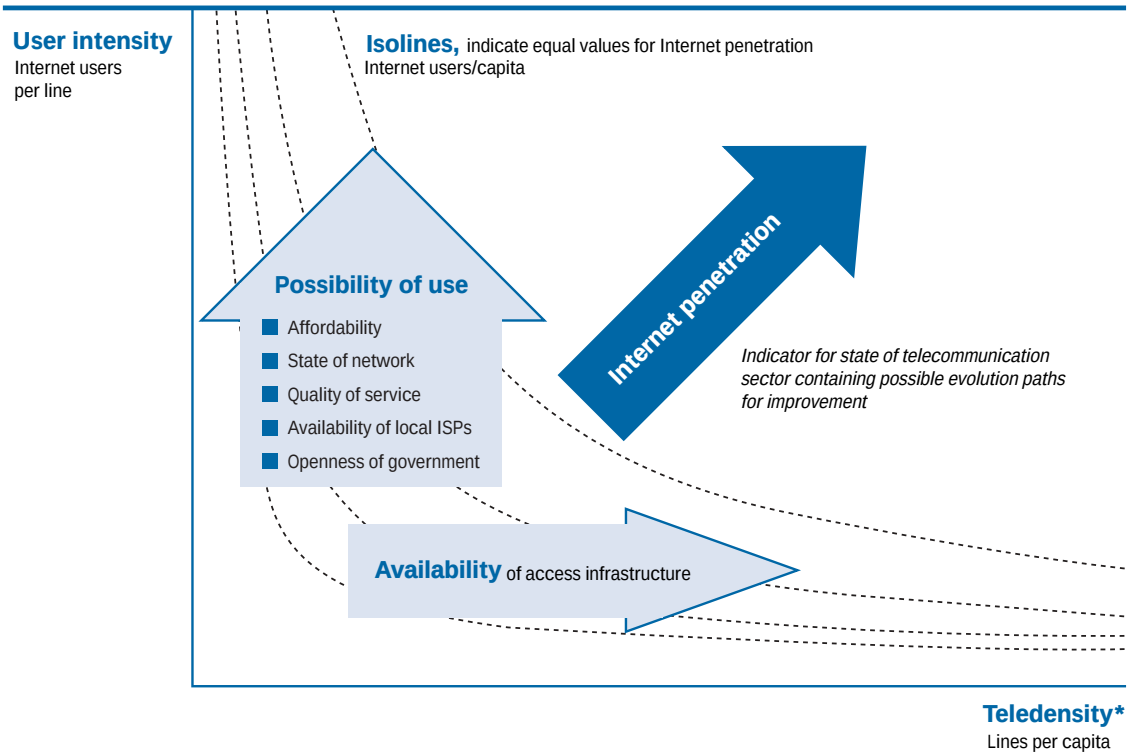
Figure 6: **Comparison of Internet Penetration 1996 vs. 2000**

Average Internet penetration at end of respective year, %



*Each sample contains all countries with data available
**Includes countries with liberalization only and full sector reform (privatization and liberalization)
***Includes partial privatization and privatization in progress
Source: ITU; EMC; NielsenNetRatings; WEFA; McKinsey

Figure 7: **Control Map of Internet Penetration**



* Combined fixed and mobile teledensity
Source: McKinsey

ment, and also did not show a significant variation in Internet penetration as a function of the reform approach they applied. As of 2000, liberalization clearly facilitated higher growth rates and higher Internet penetration in emerging and developed countries.

Details of reform matter: regulatory execution drives differences among countries

Teledensity and user intensity define network access. Sector reform affects both dimensions

To make clear differences in Internet penetration, this document breaks the indicator down into two dimensions, teledensity and user intensity. The resulting Control Map of Internet Penetration, combines these two dimensions, with Internet penetration, defined as the percentage of Internet users in a population, as their product shown on the isolines. (See Figure 7.) Choices of sector reform and the resulting regulatory policies have a direct impact on both dimensions.

Teledensity describes the availability and reach of the telecommunications infrastructure, and is defined as lines per 100 inhabitants.[13] Increasing teledensity is a political objective achieved through specific government targets. As such, it requires a more interventionist reform approach. Most developed countries have achieved high levels of teledensity, driven mainly by the political pressure to provide access to all citizens, and secured by investment over several decades. For emerging and developing countries that lack sufficient financial resources to catch up quickly, however, high teledensity will be much more difficult to achieve.[14] Those countries therefore need to develop innovative universal access schemes and funding mechanisms. For example, Chile has used universal service funds to finance community Telecenters which provide Internet access.

User intensity describes the extent to which the available infrastructure is used to access the Internet and is defined as Internet users per line; that is, voice-only usage of a line is excluded. User intensity reflects the possibility of use, and summarizes a number of potential factors that ultimately drive demand for Internet use, such as affordability, the state of network and quality of service, the availability of access devices, and the presence of service providers.[15] In addition, it is influenced by the general openness of a country's political regime. If political policy hinders access to the Internet, no amount of suitable infrastructure will get users online.

Regulatory policy can influence user intensity in a number of ways. A government can improve affordability by introducing competition that leads to price decreases, or it can impose price caps on a monopoly provider. For example, the policy of free local calls in the U.S. has clearly stimulated dial-up Internet traffic. A government can also directly influence the affordability of Internet service provision through the interconnection regime defined, even if this is not always the intended outcome. For example, free Internet service providers (ISPs) in Europe were made possible by termination payments from the incumbent local operators to the ISPs. This, in turn, grew out of the failure of regulators to adapt the voice interconnection regime to Internet access. A regulator can specify network performance and service targets for service providers or, in the ideal case, open the market to competition, making such targets superfluous. Brazil constantly monitors improvements in metrics such as the number of peak-time calls completed, or the speed with which operators respond to customer complaints. The operators are subject to fines if they do not meet certain targets. In general, the factors that determine the possibility of use can be influenced by liberalization and privatization approaches.

Higher penetration levels can be reached by influencing either dimension

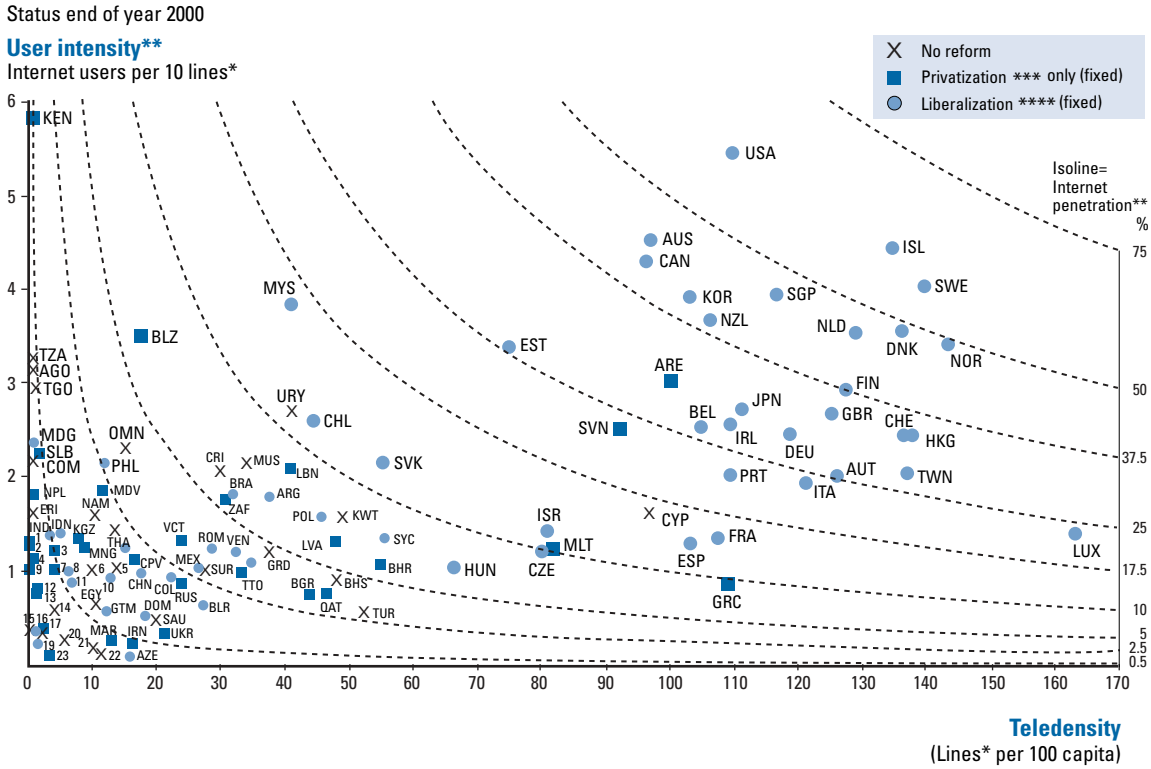
As was shown earlier, there are some differences in penetration rates even among countries at similar stages of economic development or with the same extent of sector reform. Mapping all the countries studied onto the control map sheds more light on these differences, and on the challenges for emerging and developing countries associated with improving Networked Readiness. Figure 8 shows that higher teledensity correlates with higher user intensity and thus the number of Internet users per capita.

A number of other observations emerge from analyzing the control map:

- Countries with highest Internet penetration also have high GDPs. With the exception of Estonia, countries with more than 17.5 percent Internet penetration have a GDP per capita of more than US$10,000.[16]
- Apart from a few islands or small states (such as Cyprus, Macao, and Uruguay), all countries with more than 10 percent Internet penetration have undergone one type of sector reform.
- Countries that have chosen not to undergo sector reform have shown no improvement in either teledensity or user intensity.
- There are significant differences in how developed countries achieve Internet penetration. Some countries have moved along the teledensity dimension, but have relatively low user intensity (e.g., Germany), and some have reached a similar penetration level through more intense use of a limited number of lines (e.g., New Zealand).

When developing countries are compared to developed countries and emerging countries, significant differences emerge.

Figure 8: **Control Map of Internet Penetration**



*Fixed and mobile subscriptions
**Based on unique users who access the Internet at least once a month
***Includes partial privatization and privatization in progress
****Includes countries with liberalization only and full sector reform (privatization and liberalization)
Source: ITU; EMC; NielsenNetRatings; World Economic Forum; McKinsey

The user intensity of developing nations tends to be higher, which can be explained by a certain degree of latent demand, that is, people want and can afford Internet access, but do not own an access line. This higher user intensity, however, does not result in high Internet penetration.[17] Countries may, therefore, need to reach a minimum level of teledensity in order to unleash this latent demand. If this is so, increasing teledensity ought to be a priority for developing countries.

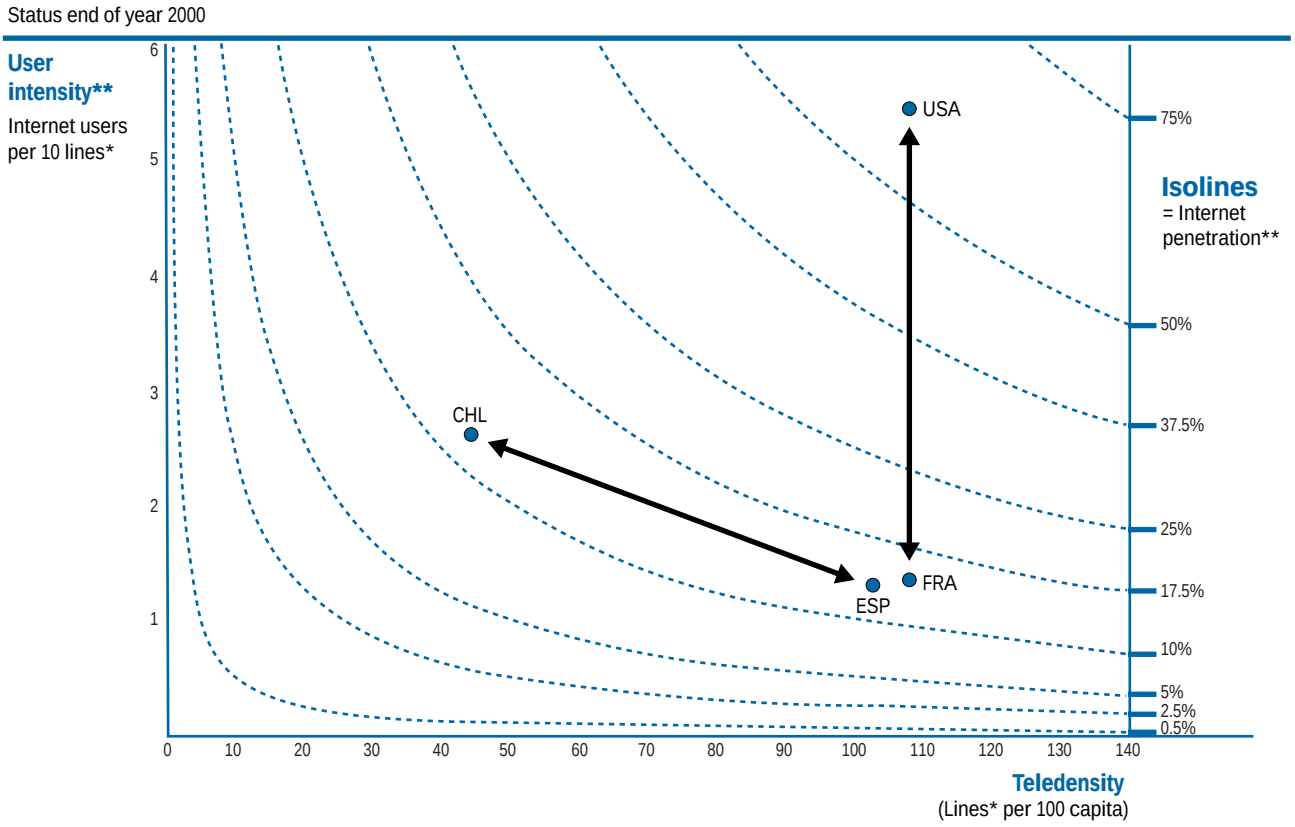
Policy variations can explain some of the differences between discrete country pairs

A closer look at certain pairs of countries highlights and explains differences along both dimensions. (See Figure 9.)[18]

Differences between countries with the same combined teledensity, but different user intensity, are colored by regulatory decisions. If France and the U.S. are compared, for example, it can be seen that their respective local access charges are polar opposites. Local calls are not metered in the U.S., but they are metered by the minute in France. Moreover, the prices of leased lines used by businesses are far lower in the U.S., in this instance due both to more aggressive rate regulation and to more competition in the leased line market. Other differences are the higher mobile penetration in France (it should be noted that mobile devices do not yet offer a sufficiently positive user experience to make them a large-scale means of Internet access), and the greater competition between ISPs in the U.S.[19] U.S. regulators spurred competition by putting in strong structural and nonstructural safeguards to prevent local incumbent operators from suffocating ISPs (Oxman 1999). In addition, prior to the advent of Internet services, France Telecom had rolled out an alternative online information service, Minitel, which met with early success and may have limited the uptake of Internet services similar to that of the competitive U.S. market. A country with lower intensity needs to determine to what extent increasing affordability, network quality, or changing behavior will stimulate more user intensity.[20]

The most interesting cases are those where countries have the same Internet penetration despite differences in both user intensity and penetration, such as, Chile and Spain. Language differences do not explain the differences in penetration; Spain has a higher GDP per capita than Chile (US$17,000 versus US$5,400), which may explain its higher teledensity. Sector reform may have helped Chile to overcome its wealth disadvantage. Chile started reform in 1989, and adopted a particu-

Figure 9: **Snapshot Analysis of Control Map**



*Fixed and mobile subscriptions
**Based on unique users who access the Internet at least once a month
Source: ITU; EMC; NielsenNetRatings; World Economic Forum; McKinsey

larly aggressive approach towards liberalization after 1994, together with a strong emphasis on modernizing its network. Whereas Chilean main lines have been 100 percent digitalized since 1997, the Spanish network was only 87 percent digitalized in 1999. Sector reform in Spain started later, and while its liberalization process has followed EU guidelines, it has not been as aggressive as the Chilean model.

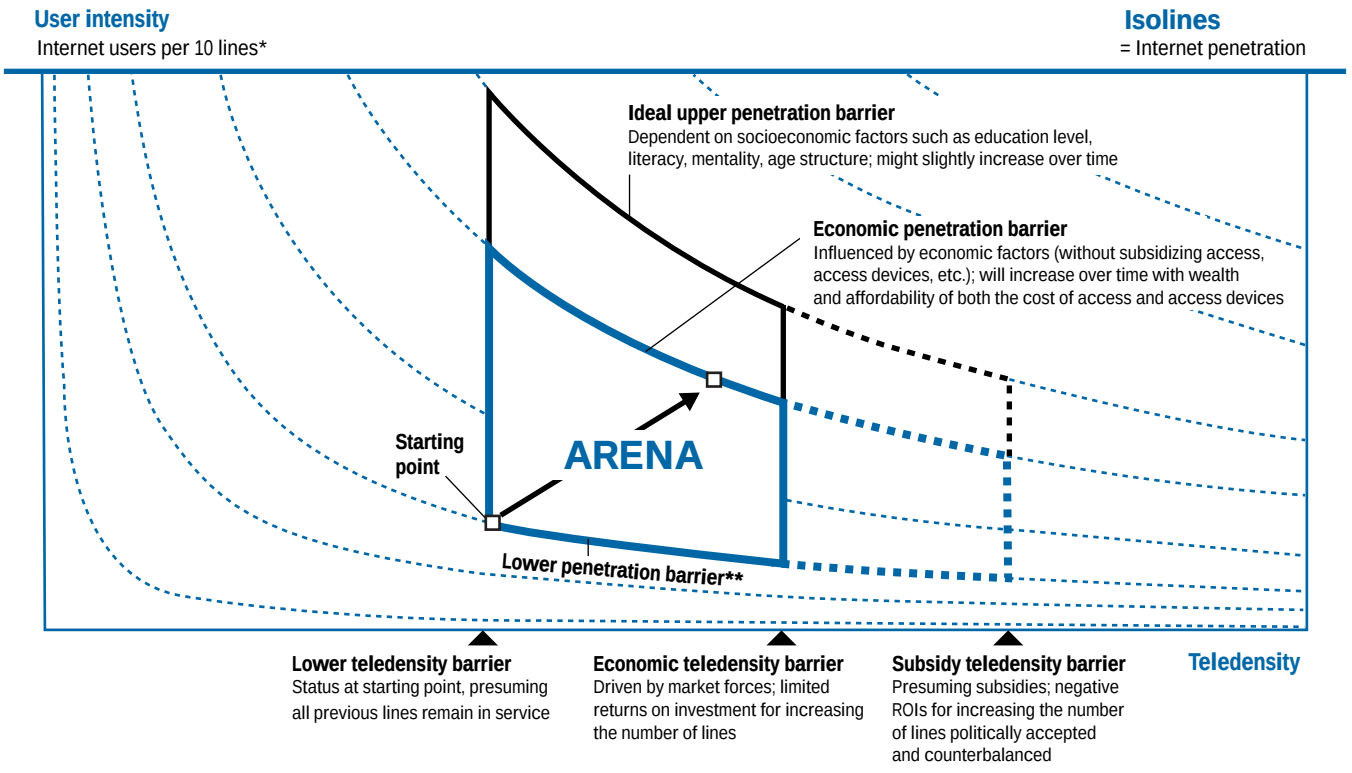
Aspirations for advanced Networked Readiness: the need to consider economic and behavioral constraints

Countries should use the control map to identify whether they need to put more emphasis on teledensity (and determine which network to be used—fixed or mobile) or on user intensity (determine how to enable the network to provide connectedness). As illustrated in Figure 10, countries may face limitations when trying to move in either direction. Increasing teledensity is constrained by two barriers: an economic barrier, where operators' investments in additional lines no longer pay off, and a subsidy barrier, where there are no sufficient funding mechanisms to finance further expansion of the network. When increasing user intensity, there are also two barriers: an economic penetration barrier, where limits may be imposed by affordability, and prices cannot be reduced enough to facilitate widespread use, and an ideal penetration barrier, which is mostly affected by habits and other socioeconomic factors that could potentially limit more people from using the access lines.

Within these limits, governments need to decide whether to move along both dimensions, or to focus on one in preference of the other. This decision depends on an understanding of where the limits are for their own country. This understanding also helps to avoid unrealistic expectations. Clearly, both economic barriers and subsidy or upper penetration barriers are reached earlier by developing countries. Therefore, they should not expect large increases in Internet penetration, but rather a gradual movement within the arena.

However, countries need to recognize that achieving advanced Networked Readiness must be accomplished within the context of overall sector reform, that is, within an understanding and consideration of the possible impacts of regulatory policies on the telecommunications sector as a whole. For developing and emerging countries in particular, improving teledensity is a prerequisite for achieving readiness. This needs to be reflected in the objectives of telecommunications reform.

Figure 10: **Control Map and Arena of Improving Readiness**



*Fixed and mobile subscriptions
**Assumes that no Internet users would be lost
Source: World Economic Forum; McKinsey

Value from Telecommunications Sector Reform

Significant impact and benefits through sector reform

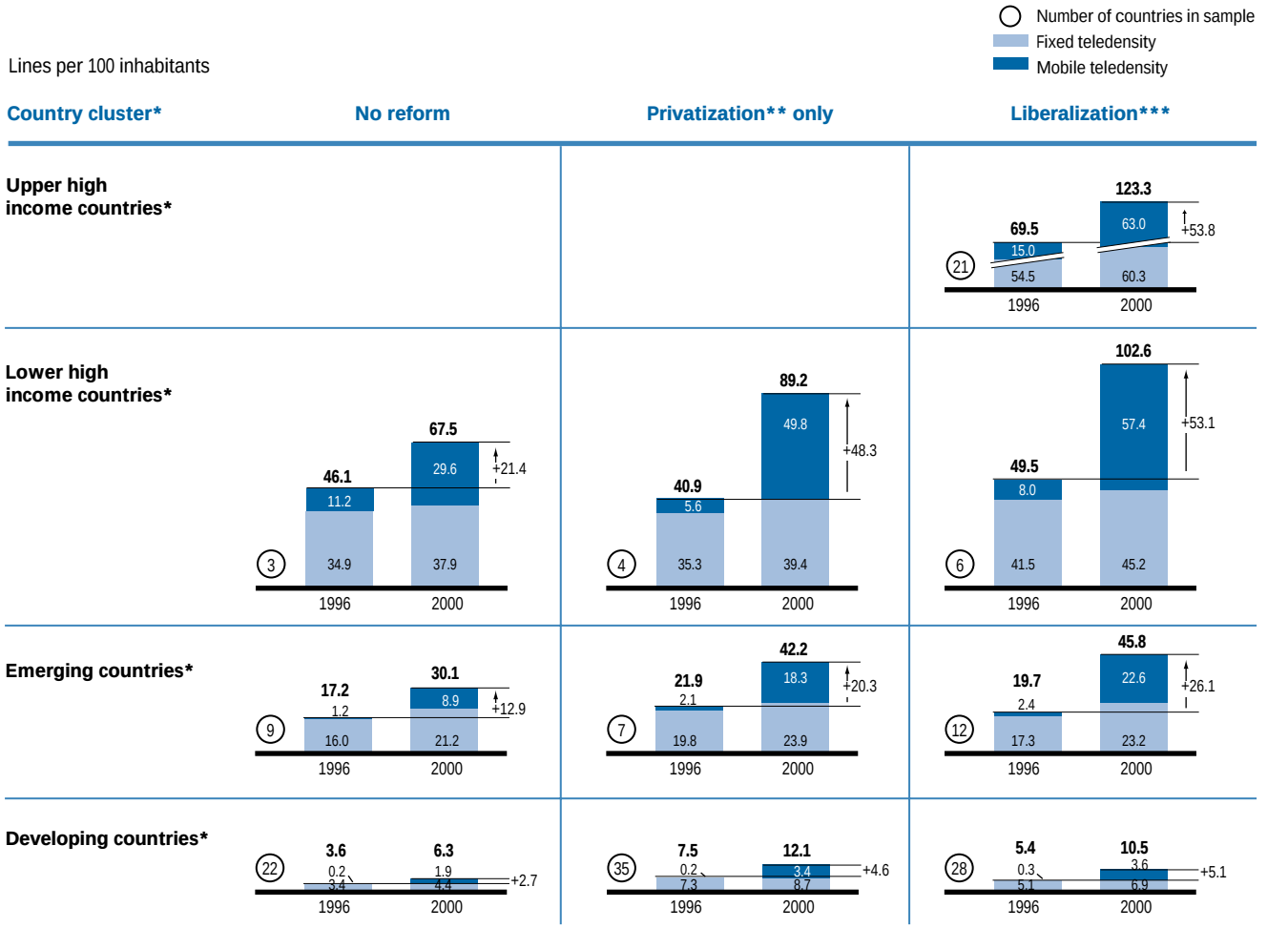
While Networked Readiness has been positively influenced by telecommunications sector reform, most countries have so far not made it a primary objective of their reform process. This is because sector reform has historically been important for the huge value potential; this potential has been felt in many ways, providing benefits for society, governments, and customers. Whether or not Networked Readiness is an explicit objective of reform, it is important that governments and regulators understand the value and impact of reform if they are to draw up an appropriate scheme for it.[21]

For example, teledensity in countries that have reformed their telecommunications sector grew at a much higher rate between 1996 and 2000 than in countries where reform had not taken place. (See Figure 11.) As was seen with the Internet penetration figures, this holds for all levels of economic wealth, with emerging and developed countries being more effective at growing their teledensity than developing countries. The method of reform appears to have less impact on effectiveness in the developing countries.

Privatization made the value of the incumbent operators transparent and attracted huge amounts of capital to the industry. As illustrated in Figure 12, total value generated through public IPOs was US$534 billion worldwide, a value that grew by 16 percent annually to US$829 billion over three years. Even with recent capital market developments, the market value of incumbents in developed countries is generally still higher today than at the time of initial flotation. Operators in developing countries have seen their values decline following IPO. Market value in emerging countries did increase initially, but today is also lower than at flotation. Apparently, operators in these countries did not deliver on their promises.

Given this scenario, governments need to include a capital market perspective in their decisions. Venture capitalists, institutional and private investors have become very selective about where to allocate their investments. Capital markets now are very reluctant to fund new entrants. Recent developments in the telecommunications industry, such as the high cost of 3G mobile licenses, have created difficulties for a number of large internationally active incumbents from developed countries; this means that they are now less likely to act as strategic investors. As a consequence, governments of emerging and developing markets need to carefully assess how

Figure 11: **Average Increase in Teledensity, 1996–2000**



*Each cross sample contains all countries with data available
**Includes partial privatization and privatization in progress
***Includes countries with liberalization only and full sector reform (privatization and liberalization)
Source: ITU; EMC; WEFA; McKinsey

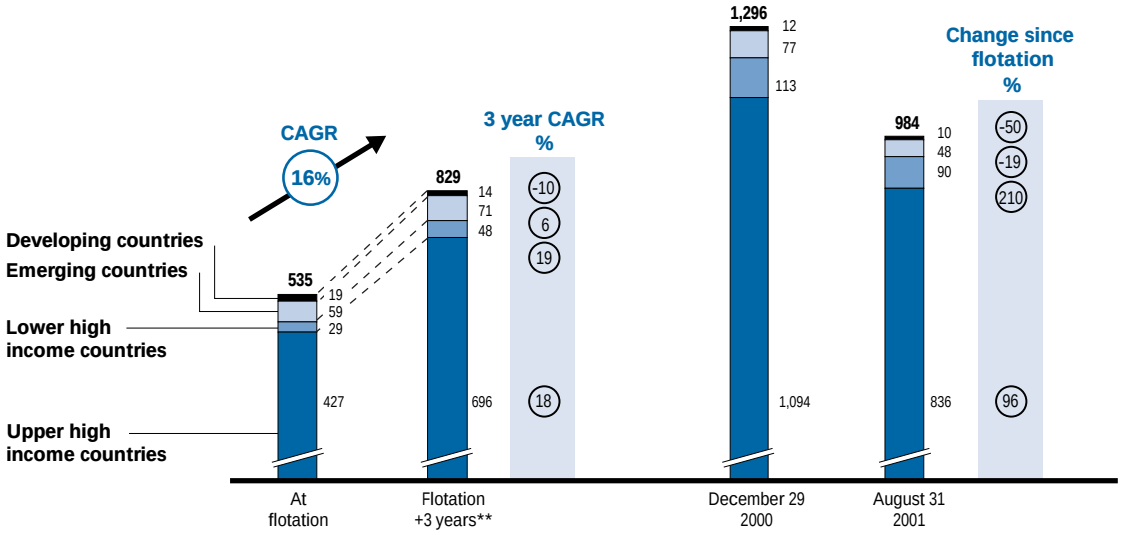
to design sector reform and to strike the best deal with the few, strong international players remaining (these are mainly incumbents) so that they can still access their operating skills and financial resources.

A detailed cross-country analysis of how telecommunications revenues evolved between 1996 and 1999 suggests that the additional value for emerging and developing countries created through sector reform was US$29 billion, or 10 percent more than if these countries had not undergone reform. (See Figure 13.)

Especially in developing countries, privatization appears to have had a more positive impact on performance than liberalization. In developing markets, the growth rate of sector revenues in countries that privatized was twice as high as that of countries that liberalized. The main reason for this is the low penetration of telecommunications infrastructure in developing countries, resulting in a high level of unsatisfied demand. It would seem that adding more lines can absorb this demand without the necessity of price cuts to attract more users. Developing countries should, therefore, take a stepwise approach towards sector reform, consequently not introducing competition until they have reached a basic infrastructure penetration that allows for the take-up of additional demand. If they do not, the margin squeeze caused by competition could prevent operators, and the incumbent in particular, from making the investments necessary to enhance penetration.

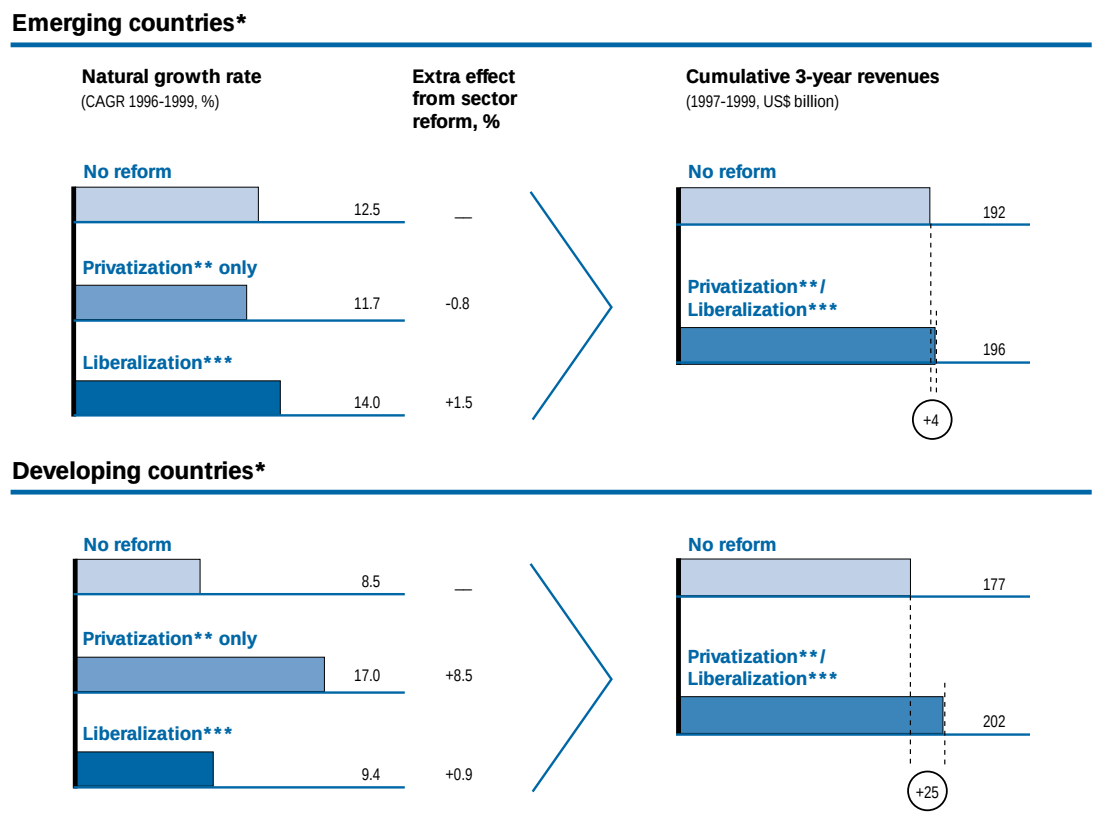
Emerging countries apparently had a basic teledensity level at which decreasing prices did benefit a portion of the population with higher price elasticity. This resulted in an overall revenue increase that was slightly stronger than that of countries with only privatization efforts. However, most of these countries did

Figure 12: **Market Capitalization of Incumbent Operators***



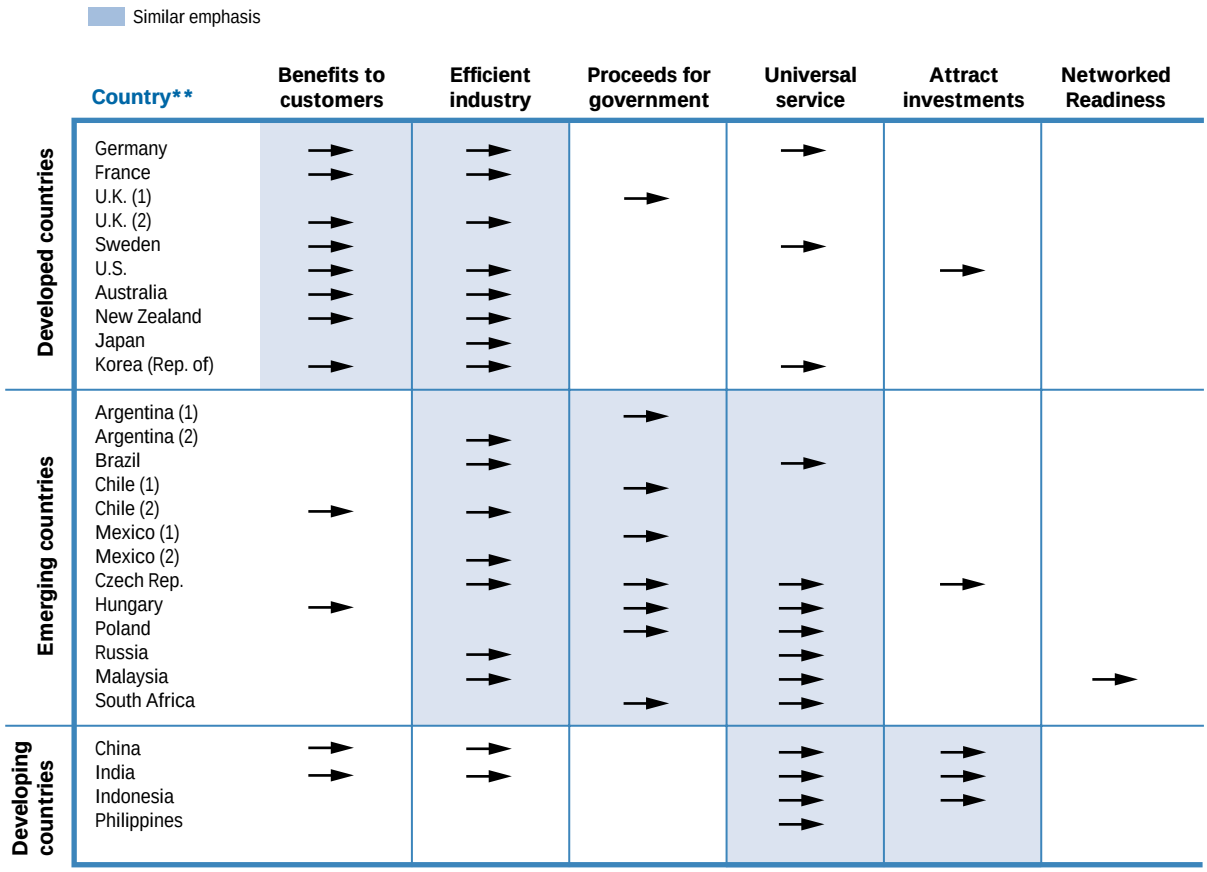
*Based on 42 countries where information on market capitalization was available
**In cases where flotation dates less than 3 years, market capitalization of August 31, 2001 was used
Source: Bloomberg; Datastream; McKinsey

Figure 13: **Telecommunications Revenues and Influence of Sector Reform**



*Based on a sample of 56 countries, extrapolated to total sample of 113 countries
**Includes partial privatization and privatization in progress
***Includes countries with liberalization and with full sector reform (privatization and liberalization)
Source: ITU; McKinsey

Figure 14: **Prioritization of Sector Reform Objectives***



*Relative prioritization of objectives implied from execution and regulatory details
**Due to significant change of objectives over time, some countries' reform process was split into two phases
Source: Espicom; ITU; national policy statements and legislation; press clippings; World Economic Forum; McKinsey

use a paced process, in which incumbents were granted an initial period of "monopoly grace" to become more efficient and prepare for competition.

Prioritization of objectives has led to better results

Multiple objectives with varying prioritization

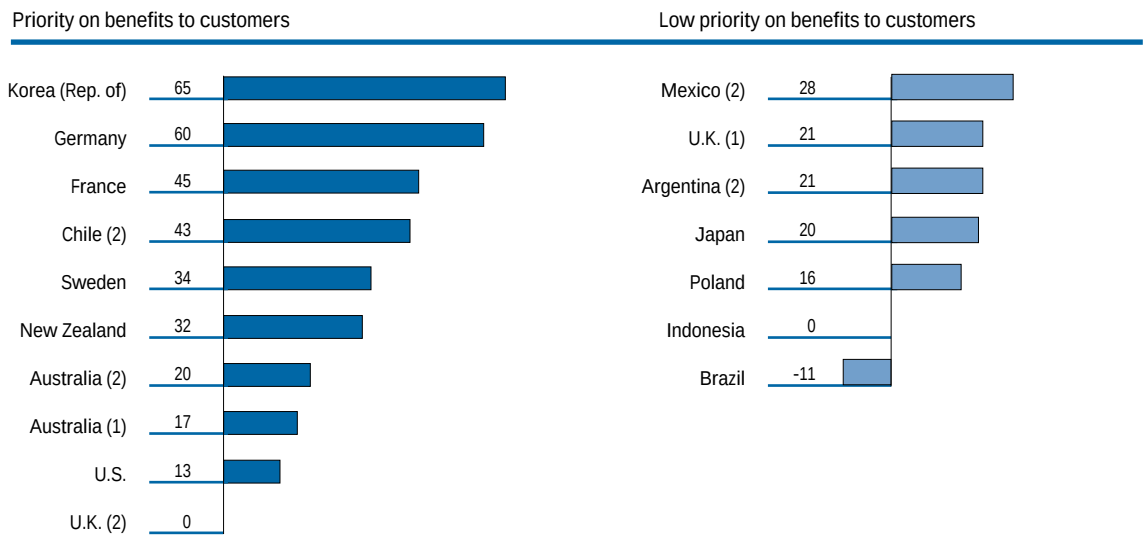
Telecommunications sector reform can and should be directed toward a number of objectives. Government objectives have primarily included increasing benefits to customers, increasing industry efficiency, maximizing proceeds for government, enhancing universal service, and attracting investments.[22] Stimulating Networked Readiness has not been a specific objective historically, although going forward, it may play a more prominent role.

Starting conditions often determine the priority that individual countries place on specific objectives. (See Figure 14.) Developed countries have typically focused more on increasing benefits to customers and on improving the efficiency of their telecommunications sector. On the other hand, emerging countries generally have had three main priorities: generating proceeds for government, increasing industry efficiency, and enhancing universal service. Developing countries have focused on universal service and attracting investments.[23]

To give an example of the differing priorities, a major, initial reform driver for both Argentina and the U.K. was raising proceeds for the government or eventual shareholders of the incumbent operators, and as such, to make privatization a success. This translated into policies that, at first, supported the incumbent's efforts to improve efficiency and generate large profits. This, however, came initially at the cost of

Figure 15: **Benefits to Consumers: Price Reductions***

Percent, cumulative long-distance price reduction measured in local currency, 3 years postreform**



*Based on tariffs of incumbent operators
**With the year before effectiveness of reform being used as the base year
Source: ITU; World Economic Forum; McKinsey

potential entrants and customers. Other countries emphasized competition and benefits to customers from the beginning (e.g., Chile in its second phase of reform and Germany).

Emerging and developing countries, in particular, are under significant pressure to increase teledensity and/or continue the provision of subsidized access (via various universal service requirement mechanisms). In addition, they are pressured to increase the quality and range of telecommunications services. Forcing operators to fulfill both of these demands for unprofitable customer segments can have huge costs, and may damage the reform process by discouraging potential entry into the sector, thus lowering the privatization price and the potential future performance of the incumbent.

Prioritization generally results in better progress toward objectives

To assess the progress that countries have made toward their objectives, this document looks at one characteristic indicator for each of the five main objectives.

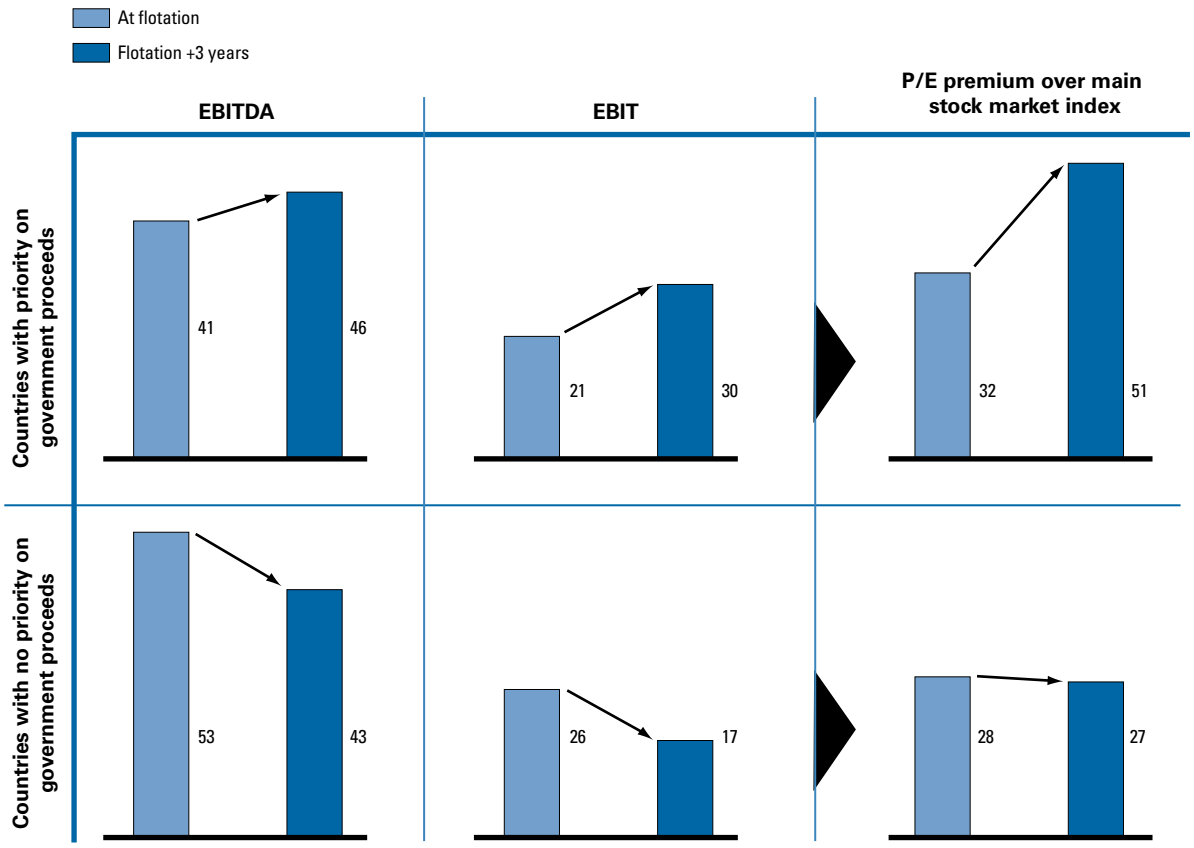
As shown in Figure 15, countries that prioritize increasing benefits to customers have experienced significantly higher reductions in long-distance call prices. These countries tended to allow in competition rapidly, and implemented interconnection and access policies that favored new entrants. This approach has transferred value from the operators to the customers.

An analysis of price declines also highlights the importance of carefully assessing the impact of applying regulatory policies. Germany introduced an interconnection regime favorable to new entrants. In addition, no contributions to universal service funds or minimum infrastructure requirements were imposed. As a result, resellers entered the market and were able to quickly engage in very aggressive pricing. Almost all of the 60 percent decrease shown in Figure 15 was realized in the first year of competition. The regulator had not expected such a rapid decline.

Improving efficiency has been another objective in many countries. Interestingly, the majority of countries have been able to increase productivity of their incumbents by between thirty and fifty lines per FTE over a three-year period, with different effects on the percentage, depending on the base used. Productivity gains were made regardless of whether this objective was given priority. There is, however, a wide spread in the relative gain: developing countries usually realize a productivity increase of between 70 and 150 percent over three years, versus between 40 and 100 percent in emerging countries. This is not surprising, as the need for efficiency is a direct consequence of the pressure on margins resulting from a focus on increasing benefits to customers.

Figure 16 shows that in countries that placed priority on proceeds for the government, and therefore a more protective regime for the incumbent or delayed entry of competition,

Figure 16: **Priority on Proceeds for Government and Key Indexes***



*Analysis referring to flotation dates of incumbents from 19 countries
Source: ITU; Datastream; Bloomberg; McKinsey

incumbent operators had a significantly higher median P/E-ratio than the main stock market index of that country three years after the start of reform. Initial premiums were relatively similar, possibly reflecting a widespread uncertainty about future outcomes and a lack of trust in government promises. In addition, operating results, reflected by EBITDA[24] margins, and overall results, reflected by EBIT[25] margins, were higher for operators under regimes putting emphasis on government proceeds. This also translated into a higher increase in share prices. During the three years after the first flotation, the median share price increase of incumbents in a protective regime was 70 percent, compared to 57 percent for operators where proceeds where not a priority.

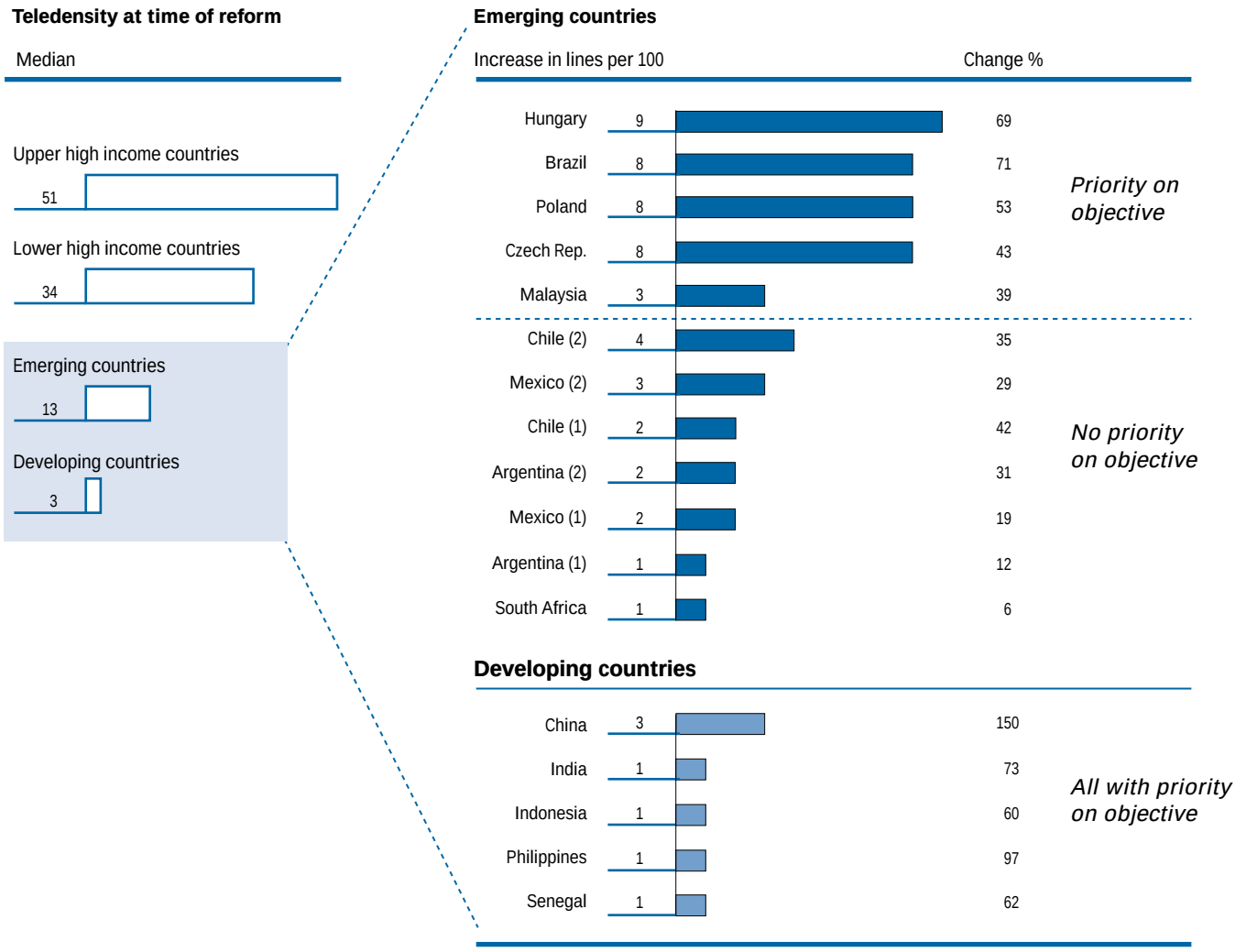
Underlying policy choices in the countries influenced these results. Countries that were not focused on proceeds allowed for more and faster competition. As a result, the median price decrease three years after privatization for national long-distance calls was 11 percent and for international calls, 27 percent. In countries with a focus on proceeds, national long-distance prices went up by 1 percent, and international call prices decreased only by 2 percent. In addition, the incumbents' performance was influenced through the prevailing rebalancing regimes.[26] Countries that had a priority on proceeds rebalanced more aggressively, leading to a median increase for local call prices of 97 percent after three years, compared to unchanged prices in countries where proceeds were not a priority.

Thus, governments retaining a large stake in their incumbent operator, and aiming at two or more tranche flotations, should be concerned about managing the reform process carefully if they are to be successful in maximizing proceeds as a key objective.

Whereas the impact on proceeds for government, benefits to customers, and industry efficiency is, to a large extent, independent of differences in the starting conditions, the impact on universal service objectives and investments is determined by these very conditions. This document will show the impact on these objectives in only emerging and developing countries.

Figure 17: **Impact of Telecom Sector Reform* on Teledensity Growth**

Cumulative growth of fixed-line teledensity, 3 years postreform*



*Privatization and liberalization efforts
Source: ITU; Espicom; McKinsey

Prioritization of universal service results in a higher absolute and, in most cases, relative increase in lines per hundred inhabitants versus countries with no particular universal service priority (See Figure 17.), with a strong difference in the absolute increase. However, it would appear that because of their low level of wealth, developing countries find significant improvements difficult to achieve. Such countries should therefore pursue a focused approach to reform that addresses latent demand bottlenecks by, for example, first enhancing business communications. Not surprisingly, increasing the telecommunications share of a country's total investment is closely related to universal service targets. Those countries that had the highest increases in telecommunications investments (relative to total gross fixed capital formation) also emphasized universal service. Countries ahead of the field, such as Chile, Brazil, Hungary, and South Africa, have achieved an increase in this metric of between 3 and 4 percentage points within three years.

Prioritization of objectives is, therefore, critical for reform success. However, countries should be careful about focusing on a single, politically sensitive objective to the exclusion of all others. While potentially attractive in the short term, long-term goals may be compromised. Furthermore, it is often difficult to switch tactics after courses of action lead to unintended outcomes. The focus on monetary gain from the auctions of

UMTS (Universal mobile telecommunications system) spectrum by German and U.K. governments is a possible case in point. Overall, a government's choice of reform objectives needs to be based on a thorough understanding of that country's starting conditions, factoring in the interests of stakeholders so that broad-based support can be assured.

Conclusion

The analysis clearly demonstrates that sector reform has contributed significantly to the promotion of Networked Readiness. Countries that have pursued sector reform clearly improved their Networked Readiness (as measured through the network access indicator teledensity and the Networked Use indicator user intensity) significantly more than countries that have not pursued reform. In addition, sector reform is the single most important lever determining the value of a country's telecommunications industry.

Although Networked Readiness has come a long way over the past decade, there is still a huge distance to travel. There are more an estimated 500 million Internet users in the world—that still leaves approximately 5.7 billion people without Internet access.[3] Many countries still lack basic infrastructure, and many developed countries still have low Internet penetration. Creating conditions that attract the substantial infrastructure investment required to develop network access via strategic investors or capital markets investment can only be achieved through a regulatory process that has clear objectives, is thoroughly adapted to a country's specific conditions, and makes infrastructure investment economically viable. Given the large amount of investment required to both improve basic Networked Readiness and take Networked Readiness into the broadband age, regulators and policymakers alike still face substantial challenges in even the most developed markets, and cannot take digital readiness for granted. Lessons learned in the successful design of this process are described in Chapter 12 of this book, entitled "The Elements of Successful Telecommunications Sector Reform."

References

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Endnotes

1 This document uses Internet penetration as an approximate indicator to describe Networked Readiness.

2 That is, the first listing of a corporation at a stock exchange.

3 As of August 2001, the total number of Internet users was approximately 500 million people worldwide (Source: NUA Internet online - www.nua.com). The total world population as of December 2001 is 6.2 billion (Source: U.S. Bureau of the Census)

4 Based on ITU (International Telecommunications Union) classification: countries with at least partial competition for either long distance, international calls, local loop, or xDSL services were considered being liberalized.

5 This is to reflect the importance of market forces in achieving sustainable positive change. Among countries with a liberalized market there are differences in the aggressiveness towards and the scope of liberalization.

6 In most of Western Europe and the Western Hemisphere, there was liberalization of data services prior to liberalization of fixed services.

7 Other factors are the introduction of longer-lived batteries for handsets, and digital services providing higher privacy. The existence of a second provider may have helped to increase adoption of new technologies and to quicken the uptake of prepaid services. But no immediate effect on penetration has been observed.

8 Source: ITU statistics as of August 2001 (http://www.itu.gov). The assessment uses the criteria presented in endnote 4, and includes dependent territories (American Samoa, Greenland), the Holy See, and a large number of islands (Channel Islands, South Sea islands).

9 The analysis shown in Figure 4 comprises 147 countries for which complete and reliable information on both the extent of sector reform and economic wealth is available.

10 This document counts Internet users, and not subscribers, since this metric allows the consideration of multiple usages, for example in schools, or in public Internet centers (prevalent in developing countries).

11 This document uses GDP to reflect the overall stage of development of a country, since it best summarizes all other indicators, such as transparency (corruption perception), literacy, school enrollment, and the participation of nonagricultural sectors in a country's GDP. All these metrics are also positively correlated with Internet penetration.

12 Analysis made using the average of countries falling into one of the categories.

13 This document uses the combined fixed (defined as installed main lines) and mobile teledensity (defined as number of subscribers) to reflect the rapid growth in mobile networks and the increasing availability of mobile access to the Internet, whether by using mobile phones as modems or for direct access.

14 Teledensity correlates with economic wealth. However, even in developed countries, not all access lines are economically viable (due to an unfavorable ratio of returns and investment required). For developing countries, given the lower purchasing power of their citizens, the limits of economically viable teledensity are reached earlier, thus requiring alternative funding mechanisms to support the expansion of their infrastructure.

15 Of the drivers mentioned above, the availability of access devices (e.g., PCs, handhelds) is the most important. However, it usually is not subject to measures directly related to the telecommunications sector. A government that wants to stimulate readiness needs, of course, to act on this driver as well.

16 The high penetration of Estonia is caused by two factors. The Estonian government has pursued a dedicated policy to increase Internet penetration, even making Internet access a constitutional right for its citizens. In addition, the country is small, which makes achieving high penetration rates relatively easy.

17 Given their low teledensity, improving user intensity (which is easier and results in more immediate effects than increasing teledensity) makes developing countries move vertically along the steep slope of the isoline, thus barely improving penetration.

18 Large differences in teledensity, but not user intensity, are mainly influenced by economic wealth. As such, there is no large regulatory influence to be explained.

19 In addition, behavioral differences, the availability of content in the local language, as well as a higher PC penetration in the U.S. play a role. These factors are not directly influenced by telecommunications sector reform.

20 Countries with strong use of English as a second language often have a higher Internet penetration (e.g., the Scandinavian countries). Therefore countries either should encourage the use of English and/or aggressively develop local content.

21 For example, a very customer-friendly regime that does not allow players to achieve a reasonable return on capital could damage the industry and prevent further investments, thus negatively affecting readiness goals. Similarly, allowing a large number of competitors into a country where the market potential is sufficient for at most two players also would lead to a period of shakeout during which readiness goals probably would not be pursued.

22 Assessment made by doing a qualitative analysis of the reform processes of a set of countries within each level of economic wealth with an ongoing reform process, based on stated and implied objectives.

23 Describing those objectives seen as being the priority of a country. This does not mean that other objectives have not been pursued.

24 Earnings before interest, taxes, depreciation, and amortization.

25 Earnings before interest and taxes.

26 Rebalancing is a regulatory policy lever that usually means lowering long-distance prices and raising local call prices (either the subscription or the per-minute fee) in order to reflect the real costs of these services. In most countries, profits from long-distance business were historically used to cross-subsidize local access provision to large parts of the population, largely following political and societal objectives.