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Stock Markets in Transition Economies

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Summary

Stock markets are underdeveloped in transition economies

Given the transformation in ownership that needed to take place—from the state to the private sector—many observers considered well-functioning stock markets essential to the process of transition. Indeed, 20 of 26 transition economies have established formal stock markets in the past 10 years. Yet many of these markets are undeveloped or dormant. Even the most developed markets in Central Europe are small—market capitalization does not exceed \$15 billion in the Czech Republic, Hungary, or Poland. Among the members of the Commonwealth of Independent States (CIS), with the exception of Russia, market capitalization is less than \$1 billion. As a share of GDP, market capitalization matches levels in other emerging markets only in Estonia and Hungary. And there is little trading activity in most transition economy stock markets, with value traded as a share of market capitalization averaging less than 30 percent.

A domestic stock market will be difficult to develop for most—if not all—transition economies

Thanks to advanced legal and institutional reform and good private sector development, markets in Central Europe and the Baltics should continue to grow. Yet except for Poland, none of these markets will exceed \$20 billion in capitalization in the near future. In the CIS and some Eastern European countries, weak laws and regulations, slow progress on private sector development, a limited supply of institutional investors, and macroeconomic uncertainty pose serious obstacles to stock market development. Although many of these constraints can be overcome, stock markets in all transition economies will remain small by international standards, and most will not achieve minimum economies of scale. Even if macroeconomic and legal reform progresses and institutional investors in these countries grow as expected, by 2005 the market capitalization of all transition economies is projected to be about \$150 billion—just 4 percent of today's global market capitalization. Thus most individual markets would pale in comparison to the megamarkets emerging in developed countries.

The services of stock markets will be available regardless

The limited scope for domestic stock markets does not mean that transition economies will lack access to the services and functions offered by stock markets. Globalization, increased cross-border trade in financial services, harmonization in the rules for global capital raising and trading, and stronger technological links have made it much easier for any large corporation to list its stock and raise capital in the market that offers the most available financing, lowest price, and best liquidity. Similarly, globalization in trading systems and new, Internet-based systems enable customers everywhere to access stock market services. Thus corporations can easily raise capital abroad, and local institutional and retail investors will have increased access to the desired mix—in terms of risk and returns—of financial instruments, reducing the need for local stock markets. As marketplaces transform into virtual electronic platforms, most transition economies may choose to import stock market services.

Developing the basic infrastructure will still be essential

Although transition economies can import stock market services, they still need to improve the basic infrastructure for the financial sector, including stronger legal rights for creditors and shareholders, better information, greater disclosure, well-governed institutional investors, and supporting public and private institutions. The strength of legal systems and the quality of information determine the development of the financial sector—as well as the benefits of financial sector development for economic growth. Rather than trying to develop costly stock markets, countries can focus on overall institutional development, particularly legal reforms. This will also facilitate corporations' access to global markets.

EU integration will drive the process in Central Europe and the Baltics

Although they are well-developed by the standards of transition economies, the stock markets of Central European and Baltic countries are unlikely to remain independent markets. Driven by the process and prospects of EU integration, they will

see their domestic markets merge with bigger European exchanges. Most of these countries have already harmonized most of their financial laws with those of the European Union. To the extent that issues of enforcement remain, these will be bypassed as corporations increasingly use foreign jurisdictions to help define property rights. These countries have also largely completed the ownership transformation process—that is, the privatization and post-privatization reordering of ownership claims. They need stock markets to raise new financing and enhance corporate governance, but both goals can be achieved through global markets.

Some Eastern European countries are further off

Countries like Bulgaria and Romania have yet to achieve macroeconomic stability, proceed sufficiently with privatization, or develop some of the basic financial sector infrastructure. Thus well-developed stock markets should not be expected in the near future. At the same time, the corporate sector in Romania, and to some degree Bulgaria and FYR Macedonia, still has to undergo significant ownership transformation. Experiences in Central European countries suggest that for this process of reordering claims, which lasts only a short time, a formal stock exchange is not necessary. Simpler systems can be used to transfer ownership claims. Several countries (Moldova, Ukraine) have systems today similar to the system that was used effectively in the Czech Republic in the early 1990s. After an

initial ownership transformation, trading will most likely happen in the form of block trades and among investors (institutional investors, direct investors), for which exchanges are not necessarily needed. And because many of these countries are candidates for EU accession, integration with EU markets is the most likely course once these countries have completed privatization and other reforms.

Many transition economies will have to put in place the basics for a financial system

Many transition economies have to focus on developing the basic infrastructure for a financial system. In many CIS countries, high inflation, large-scale expropriation and defaults, and limited trust in contracts and institutions discourage people from investing in any financial assets, let alone equity contracts. Furthermore, given their small size, it will be very costly for most countries (except perhaps Russia) to develop stock markets. These countries should aim to develop their overall financial sector, starting with their banking systems. This will also be the most effective way to foster the development of small and medium-size enterprises, a key source of economic growth. While developing the basics for a sound financial sector, transition economies can facilitate the access of domestic firms to international markets by removing barriers (including through liberalization of the capital account) and by importing financial market services (including through easier entry by foreign financial institutions).

The Emergence of Stock Markets in Transition Economies

Well-developed stock markets provide many benefits (see Levine 1997 for a survey). They enhance economic performance by providing a way for growing companies to raise capital at lower costs. Because these companies do not have to rely as much on internal financing, they are able to grow faster. Stock markets also have advantages over other financing sources. Companies in countries with developed equity markets are less dependent on bank financing, which can reduce the risk of a credit crunch. Equity markets also allow companies to rely more on equity and less on debt, creating a less risky financial structure in the event of an economic downturn. Finally, stock markets can increase the efficiency of corporations' investment and management by enhancing their governance. Overall, a mix of bank-intermediated funds and stock markets can enhance growth (Demirgüç-Kunt and Maksimovic, 1998).

Stock markets are not new in transition economies—the Warsaw Stock Exchange was opened in 1817, and the Prague Stock Exchange was established in 1871. Under socialism, however, all stock markets were closed. But during the transition from plan to market, stock exchanges have reemerged or were created in 20 of 26 transition economies. These exchanges have mainly been used for the mandatory listing of shares of mass-privatized companies and for voluntary initial public offerings (IPOs).

The first stock market in transition economies emerged in Czech and Slovak Republics in 1992; Bulgaria, Lithuania, FYR Macedonia, Moldova, and Romania followed soon after (Table 1). The basic feature of this first group of markets was the transfer among investors of ownership rights to mass-privatized companies. At first these markets listed a large number of stocks, many of which were illiquid. But once the markets became more established, through transactions at stock exchanges, the number of stockholders fell and ownership became more concentrated.¹ A second type of market—developed in Croatia, Estonia, Hungary, Latvia, Poland, and Slovenia—started with a small number of stocks, all of which were offered in traditional ways using IPOs. Many stocks had fairly liquid trading.

A third group of stock markets set up in seven transition economies—Armenia, Azerbaijan, Kazakhstan, the Kyrgyz Republic, Russia, Ukraine, and Uzbekistan—straddled these two types. All these countries had mass privatization programs, but the initial exchange of voucher shares took place off the stock exchanges. While some of the companies in the privatization programs were publicly listed, such listings were not mandatory for all companies. In several countries (Kazakhstan, Kyrgyz Republic) the plan was to develop the privatization program and the stock market in parallel. To that end, during privatization the stock market was built around public offerings of companies whose majority ownership was sold to strategic investors. The government then floated a small percentage of the listed shares on the market, creating broader ownership. Finally, six transition economies—Albania, Belarus, Bosnia-Herzegovina, Georgia, Tajikistan, and Turkmenistan—have not established stock markets.

Table 1

Origins of Stock Markets in Transition Economies

Mandatory listing after mass privatization	Voluntary initial public offerings	Mandatory listing of minority packages during privatization
Bulgaria	Croatia	Armenia
Czech Republic	Estonia	Azerbaijan
Lithuania	Latvia	Kyrgyz Republic
Macedonia, FYR	Hungary	Kazakhstan
Moldova	Poland	Poland
Romania	Slovenia	Russia
Slovak Republic		Uzbekistan
		Ukraine

Note: Poland also had mandatory listings of mass-privatized companies and National Investment Funds after 1996. See Hashi 2000 for a detailed description of the program.

Source: Compiled by the authors.

1. Claessens and Djankov (1999) find that this was the case in the Czech Republic, and similar patterns occurred in most countries that adopted mass privatization. However, Earle and Telegdy (1998) find little evidence of ownership concentration on the Rasdaq in Romania. Recent studies have argued that mass privatization markets were misunderstood by foreign investors, who poured in money only to find out that disclosure requirements were weak and that they did not have much legal recourse because the regulatory framework was not developed (Black, Kraakman, and Tarassova 2000). In some countries these foreign portfolio flows seem to have slowed the process of ownership concentration.

Features of Stock Markets in Transition Economies

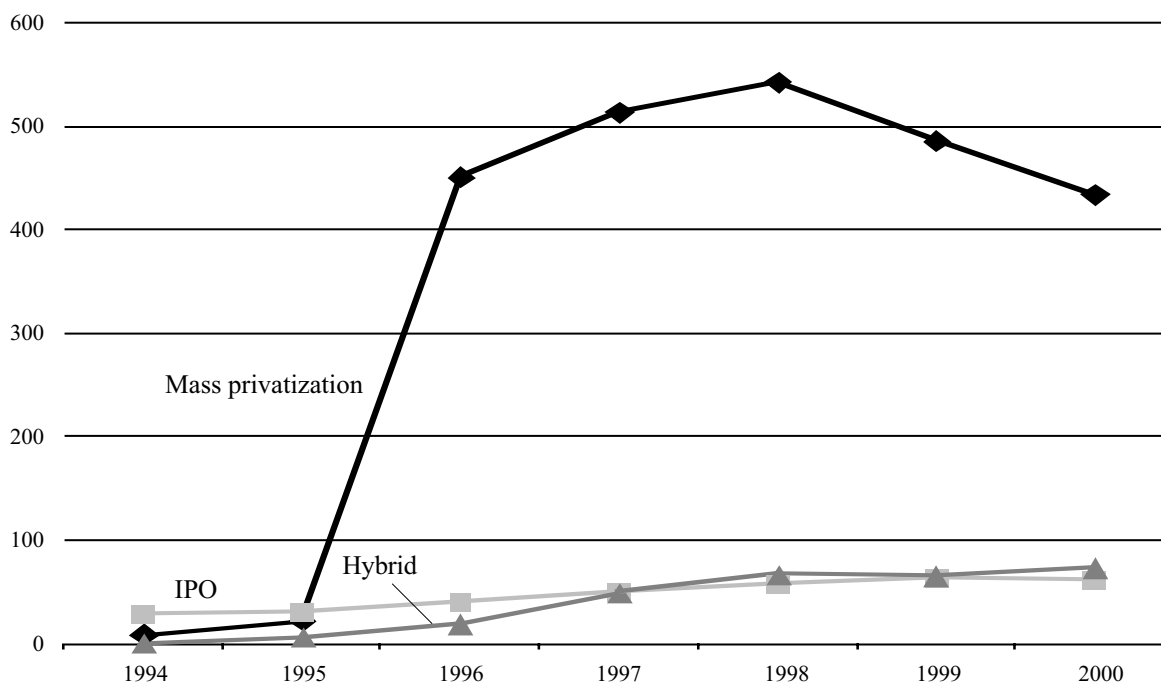
Because markets in the first group were designed to facilitate a rapid ownership transformation, the regulatory framework was intentionally left light. And because regulators in mass-privatized markets had to oversee many companies, enforcement was limited. Sometimes a formal regulator or supervisory body was not even established, as in the Czech Republic. Most companies in these markets were not natural candidates for raising capital through stock markets and did not see much purpose in being listed. For example, in 1999 the median company on the Sofia (Bulgaria) Stock Exchange in terms of market capitalization, a textile company, had annual revenues of \$4 million, and the largest owner controlled 64 percent of the shares. Given its small size and concentrated ownership structure, it seems unlikely that the company would have been willing to list in the first place, float more equity, or raise new capital from equity offerings.

As a result, starting with the Czech Republic in 1996, Bulgaria, Lithuania and the Slovak Republic in 1999, and Bulgaria in 1998, the number of listed companies fell in the first group as illiquid stocks were de-listed (Figure 1; Table A1). Several other factors also explain corporations' decision not to trade publicly and to de-list. First, by listing on stock markets, corporations were less likely to be able to avoid paying taxes. Second, the cost of external capital was quite high relative to the cost of bank credit. This was especially the case in countries where large firms could lobby politicians for directed credit. Finally, the extensive disclosure requirements of listed companies made it harder for corporations to conduct non-market-based transactions.

In contrast, the IPO-type markets in the second group of countries (such as Hungary and Poland) saw increases in the number of listed companies, though starting from a low base (see Figure 1). In

Figure 1

Number of Listed Firms in Transition Economies by Market Origin, 1994–2000



Note: The mass privatization line represents the median number of publicly traded firms in Bulgaria, the Czech Republic, Lithuania, FYR Macedonia, Moldova, Romania, and the Slovak Republic. The IPO line tracks the median number of publicly traded firms in Croatia, Estonia, Hungary, Latvia, Poland, and Slovenia. The hybrid group includes Armenia, Azerbaijan, Kazakhstan, the Kyrgyz Republic, Poland, Russia, Ukraine, and Uzbekistan.

Source: Stock exchange websites and information departments.

the third group of countries—as in the IPO-type markets—the number of companies listed was significantly below that of mass privatization markets but rose in the second half of the 1990s. Here some corporations were sold directly to international investors with the residual free float offered domestically. Of the 45 percent free float offered to investors of the Polish oil refinery Polski Koncern Naftowi, for example, 30 percent were sold to international mutual funds and foreign-managed domestic investment funds, while 15 percent were available on the market in tradable employee shares.

Market capitalization

Countries with better fundamentals (a more stable macroeconomy, better laws and accounting rules, stronger disclosure requirements) generally have larger stock markets as measured in market capitalization as a share of GDP. Of the 20 stock markets in transition economies, only 3—the Czech Republic, Estonia, and Hungary—have capitalization-to-GDP ratios comparable to those of other emerging markets (Figure 2). Market capitalization is very low in CIS countries, with the exception of Russia (see Table A2). At an average of 11 percent of GDP, market capitalization in transition economies is significantly lower than in comparable emerging market economies.

Market turnover

Market turnover, defined as the value of trading over market capitalization, is an important indicator for measuring the effect of stock markets on growth (Levine and Zervos 1998). Among transition economies, market turnover is highest in Hungary (93 percent), the Czech Republic (81 percent), and Poland (69 percent; see Figure 3 and Table A3). Most other transition markets are illiquid, particularly in Central Asia—market turnover is less than 5 percent in Kazakhstan, the Kyrgyz Republic, and Uzbekistan.

Overall, markets in transition economies are less liquid than their comparators in both developed and other emerging markets. Only the most liquid markets in Central Europe compare favorably to Latin American markets, where market turnover is about 50 percent. But these markets trail developed countries' markets significantly. Market turnover is 167 percent in Germany, for example, and 127 percent in Portugal. On average, stock markets in

transition economies have a turnover of 30 percent, compared with 121 percent in 10 comparator countries. This lower market turnover can mostly be attributed to ownership concentration, a relatively limited free float, and the international migration of trading among large firms.

Stock markets in transition economies are dominated by a small number of firms. As a result, the high concentration of market turnover—defined as turnover of the top 5 percent of listed firms as a percentage of total turnover—is high in most transition economies. Yet at an average of 75 percent, it is similar to that of other stock markets. At about 40 percent, Poland is the least concentrated market in terms of turnover (Figure 4). Armenia, Azerbaijan, Bulgaria, Kazakhstan, Latvia, Macedonia FYR, Moldova, Romania, Ukraine, and Uzbekistan all have turnover concentrations above 80 percent.

While similar concentration levels are found in Germany and the United Kingdom, a larger number of firms account for the concentration. For example, on the London Stock Exchange 112 listed equities (5 percent of 2,274) account for 85 percent of market turnover. In contrast, 5 or fewer companies account for all of the market turnover in Azerbaijan, FYR Macedonia, and Uzbekistan—and for more than 95 percent of the market turnover in Armenia, Bulgaria, Kazakhstan, the Kyrgyz Republic, Lithuania, Moldova, Romania, Slovenia, and Ukraine.

Foreign financing

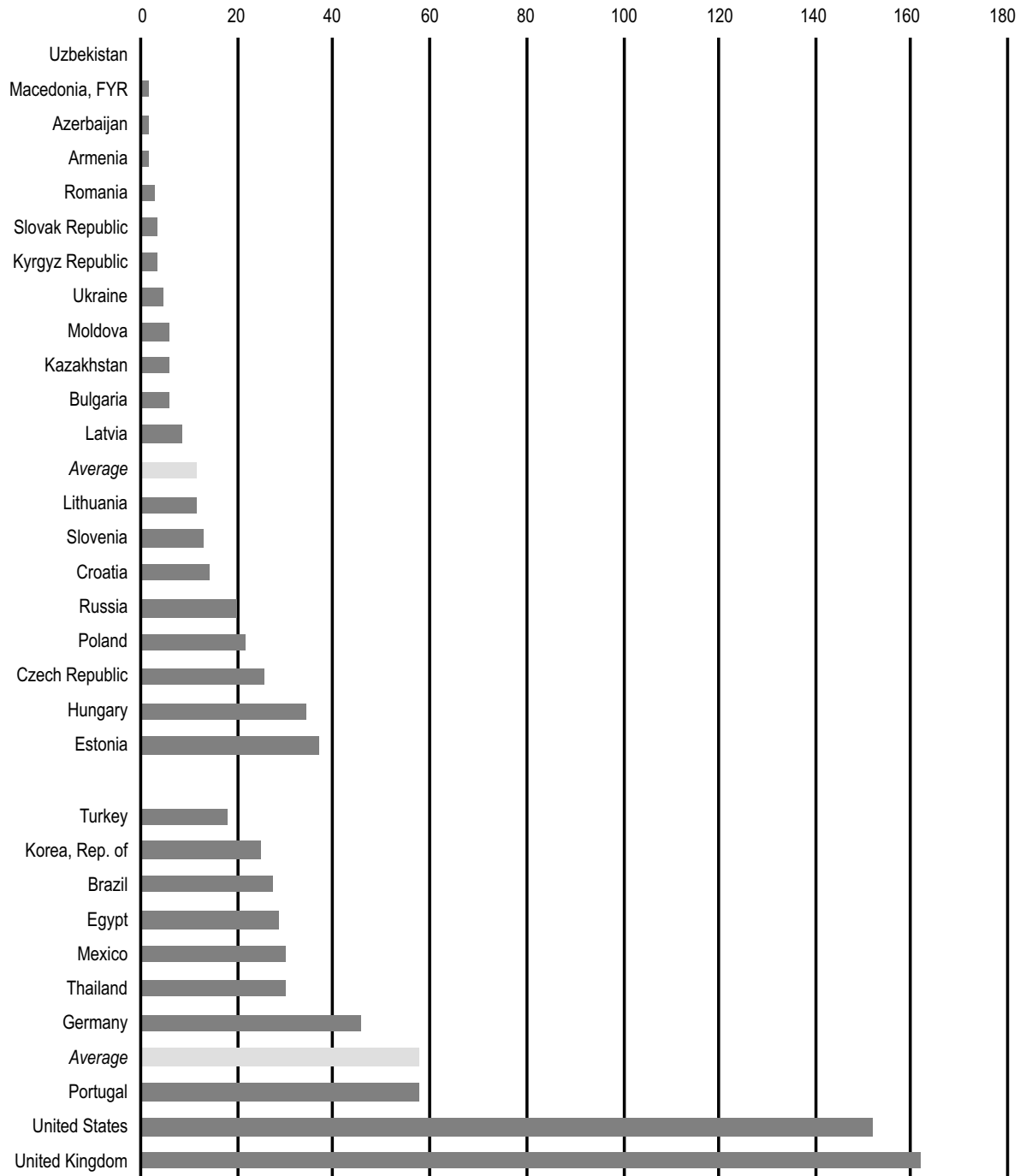
Many large, publicly listed companies in transition economies have sought equity financing abroad. At the end of 1999, 72 corporations from transition economies had American depository receipts (ADRs) listed on the New York Stock Exchange or the Nasdaq, and 61 corporations from transition economies were listed in London. Corporations listed abroad (in New York, London, and Frankfurt) account for an average of 18 percent of domestic stock market capitalization in transition economies—and in Kazakhstan for almost two-thirds (Figure 5). In Estonia, Hungary, Latvia, and the Slovak Republic companies listed abroad account for about one-third of domestic market capitalization.

On average, the value of the shares traded abroad is almost half of the value traded on local markets, and the number of shares traded abroad

Figure 2

Market Capitalization in Transition and Comparator Economies

Percentage of GDP



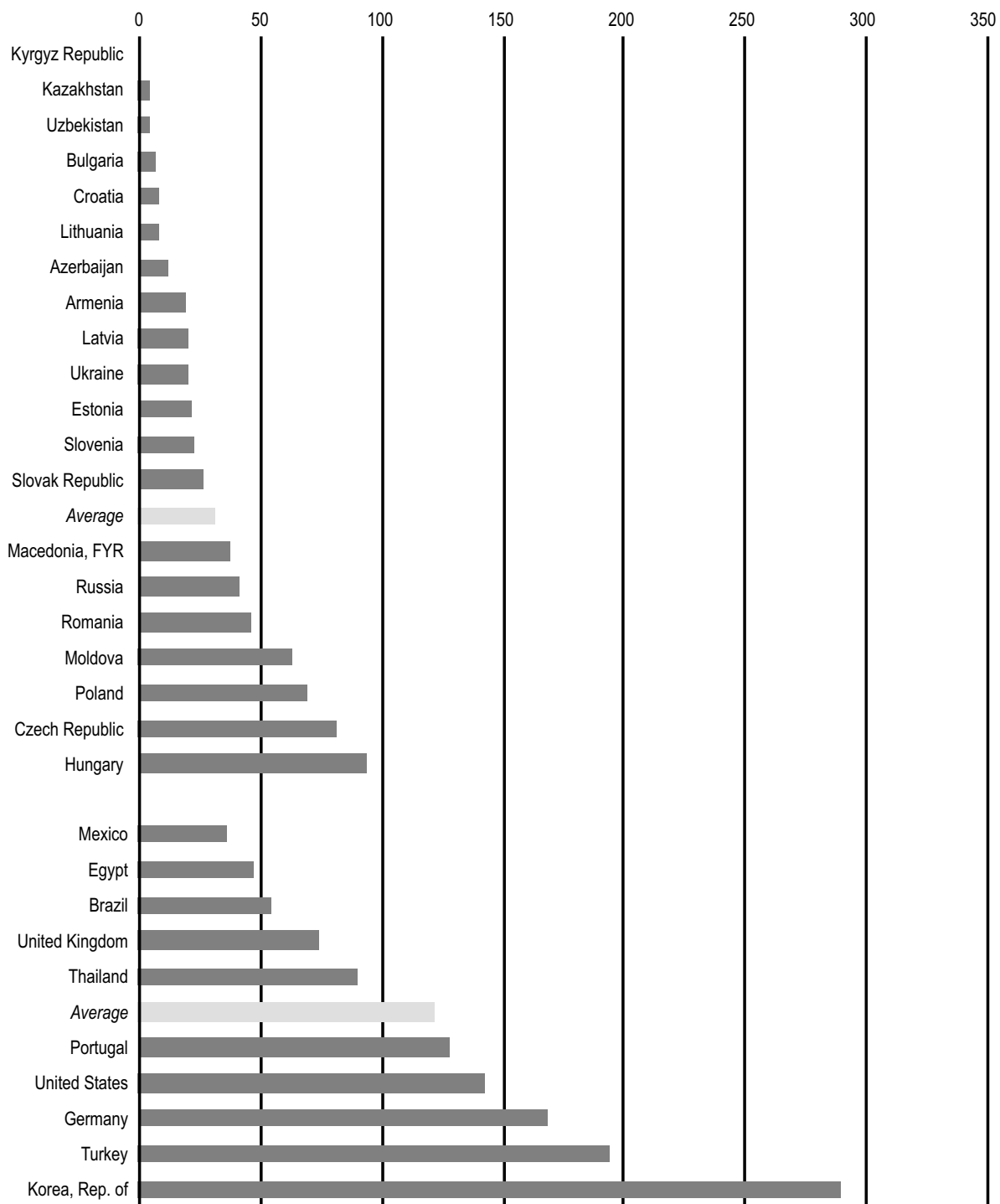
Note: Data are for March 2000 for transition economies and December 1998 for comparator countries.

Source: Stock exchange websites and information departments and authors' calculations.

Figure 3

Market Turnover in Transition and Comparator Economies, March 2000

Percentage of market capitalization

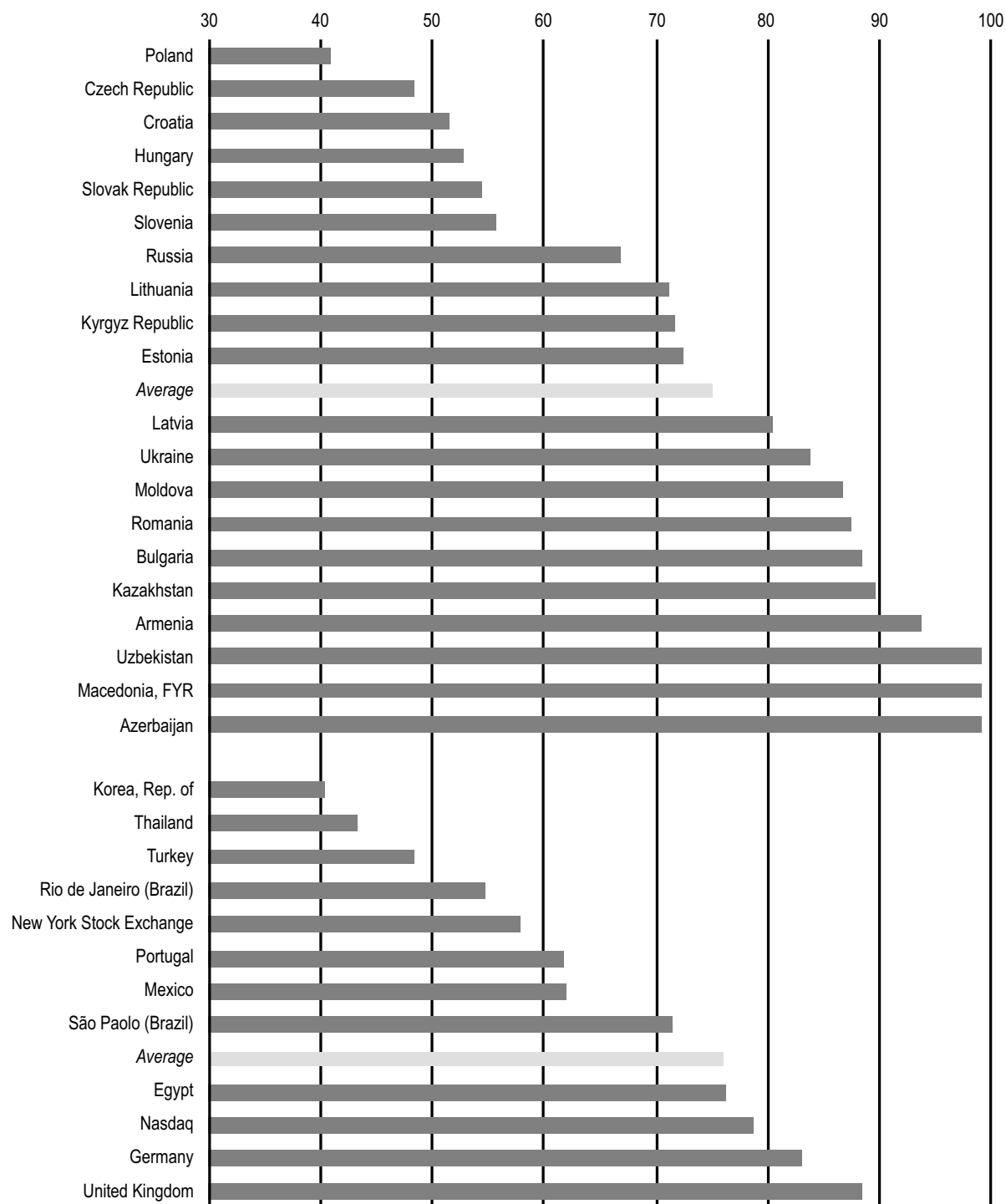


Source: Stock exchange websites and information departments and authors' calculations.

Figure 4

Concentration of Market Turnover in Transition and Comparator Economies, March 2000

Percentage of market turnover accounted for by the top 5 percent of listed companies



Source: Stock exchange websites and information departments and authors' calculations.

is twice as high as the number of shares traded locally. The turnover of Russian depository receipts in Frankfurt, for example, was more than twice as high in the first three quarters of 1999 than the turnover of the same instrument in Moscow (Creditanstalt 1999). Incentives to list abroad are particularly strong in transition economies that have had trouble establishing credible frameworks for corporate governance (Black and Gilson 1999). But the tendency to list and trade abroad has not been limited to markets with weak minority rights: of the 14 countries with good investor protection, 9 have more than 20 percent of their stocks traded abroad.

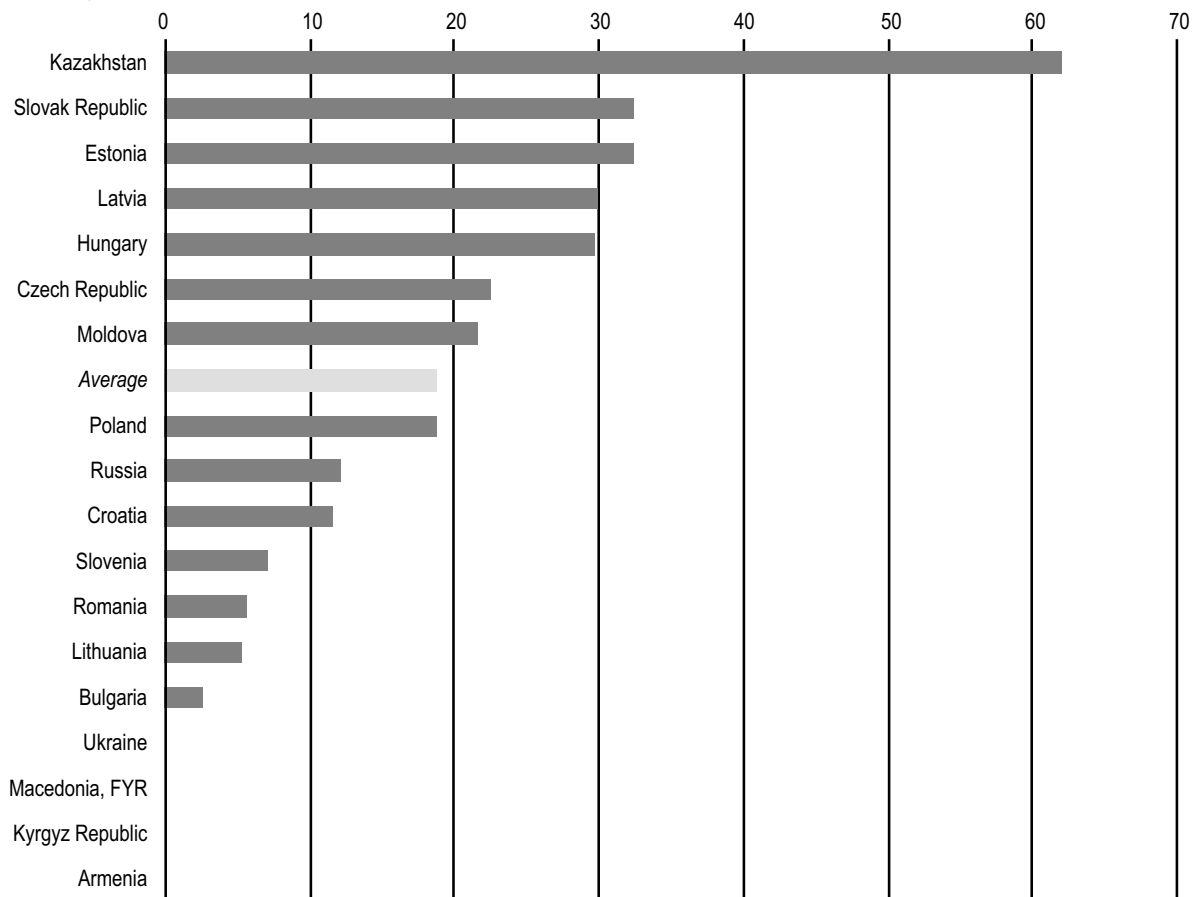
This offshore migration has been especially strong among big companies—for example, 7 of Russia’s 10 largest listed stocks have depository

receipt programs. Many of the firms listed abroad are involved in resource extraction or telecommunications. But new, Internet-related firms are also listing and raising capital abroad, especially firms from the Czech Republic and Hungary. The disappearance of big companies that trade only domestically—the average size of companies that are cross-listed or that have depository receipts is 12 times that of companies listed only domestically—deprives local exchanges of liquidity, discouraging foreign investors from considering remaining stocks. Even large stock markets in transition economies will be hurt by this development, because foreign portfolio managers may avoid them in the belief that trading in these markets is not worth their research time and money.

Figure 5

Market Capitalization of Transition Economy Companies Listed Abroad

Percentage of domestic market capitalization



Note: Azerbaijan and Uzbekistan do not allow firms to list abroad.

Source: Stock exchange website and information departments and authors’ calculations.

Determinants of Stock Market Development in Transition Economies

There is some empirical literature on what determines successful stock market development (see Levine and Zervos 1998). The basics are clear: for any market to exist, there needs to be a demand and a supply for the product. In the context of stock markets, the product is the external equity financing of firms. Companies that do not have a sufficient flow of retained earnings want to tap stock markets. The supply of funds typically comes from institutional investors like pension funds, investment funds, life insurance companies, and mutual funds.

But the professed demand and supply is not enough. Countries that experience high inflation are unlikely to see equity markets develop, because investors will not invest or will keep their money in foreign assets (Boyd, Levine, and Smith 2000). Or, if the return on government securities for bank deposits is higher than that on corporate stocks and bonds, a stock market will not develop because the supply goes elsewhere. In addition to favorable macroeconomic conditions, there need to be adequate regulations for listed corporations and proper governance of institutional investors to ensure proper intermediation (Levine and others 2000). These rules include protection of minority rights, disclosure of the activities of corporations, and proper accounting rules and practices.

The size of a market will also play a large role in determining its long-term viability. A small country will have a hard time supporting a stock market because there will be a small number of firms suited for public listing, the costs of running a stock market will be relatively high, and firms may find it cheaper to raise money abroad. The desire of market participants for larger, more liquid markets and lower transaction costs—including trading, clearing, and settlement systems—is illustrated by the recent cross-border mergers of large stock exchanges (as with the integration of the London Stock Exchange, the Deutsche Boerse, and the Nasdaq). This trend toward market consolidation is aided by Internet technology, which makes it easier to link stock markets. In that respect, the minimum size of a stock market has increased substantially.

To assess the potential for stock markets in transition economies, it is important to understand what determines their current development. Their recent establishment plays a large role. But the development of stock markets in transition

economies also depends on the degree of macroeconomic stability, the evolution of securities and corporate laws, and the assets accumulated by institutional investors in each country.

Macroeconomic stability

Only 4 of 26 transition economies—Croatia, the Czech Republic, the Slovak Republic, and Slovenia—averaged single-digit inflation during 1994–99, in contrast to most comparator emerging markets (except Brazil, Mexico, and Turkey). Several transition economies—Armenia, Azerbaijan, Bulgaria, Ukraine, Uzbekistan—had triple-digit inflation over the period (see Table A4). Stock market development is difficult in a high-inflation environment.

High inflation meant that during 1994–99 the real return on stock market investments in transition economies was often negative before adjusting for risk, and largely negative on a risk-adjusted basis. Stock market returns also compare unfavorably with those on bank deposits: before adjusting for risk, only stock markets in Hungary, Russia, and Slovenia offered investors higher returns than those from bank deposits during 1994–99. On a risk-adjusted basis, only 2 of 20 markets—Hungary (16 percent returns) and Russia (42 percent)—likely outperformed bank deposits (this calculation does not take into account losses on bank deposits due to bank failures). In Bulgaria, Croatia, the Czech Republic, Latvia, Lithuania, Romania, and the Slovak Republic bank deposits yielded a positive but low annual return of about 2 percent in real terms. In contrast, stock market investments in these countries yielded a negative average annual return on a risk-unadjusted basis in 1994–99. Especially in CIS countries, holding foreign currency would have yielded the highest returns. For example, in Kazakhstan and Ukraine holders of U.S. dollars saw the worth of their holdings appreciate by 5 percent and 10 percent in real terms over 1994–99.

Legal framework

Another key determinant of stock market development is the level of shareholder protection in publicly traded companies, as stipulated in securities or company laws (Shleifer and Vishny 1997). Stock market development is more likely in countries with strong shareholder protection because investors do not fear expropriation as much. Moreover, ownership in such markets can be

Table 2
**Shareholder Protection in Transition and
 Comparator Economies, 1998**

Country	Shareholder protection rating	Effectiveness of shareholder protection (United States=100)
Armenia	5	21
Azerbaijan	2	25
Bulgaria	4	62
Croatia	2	45
Czech Republic	3	51
Estonia	3	62
Hungary	3	71
Kazakhstan	4	56
Kyrgyz Republic	2	29
Latvia	3	50
Lithuania	3	53
Macedonia, FYR	2	24
Moldova	3	46
Poland	3	69
Romania	3	44
Russia	5	49
Slovak Republic	2	57
Slovenia	3	40
Ukraine	2	54
Uzbekistan	3	28
Brazil	3	
Egypt	2	
Germany	2	
Korea, Rep. of	4	
Mexico	1	
Portugal	3	
Thailand	3	
Turkey	2	
United Kingdom	5	
United States	5	

Note: The shareholder protection rating is a sum of the following indexes: proxy by mail allowed (true = 1; false = 0); shares not blocked before a shareholder meeting (true = 0.5; false = 0); no registration cut-off date before the meeting (true = 0.5; false = 0); cumulative voting for election of supervisory board allowed (true = 0.5; false = 0); other rules to ensure proportional representation in place (true = 0.5; false = 0); shareholders can take judicial recourse against decisions by executives (true = 0.5; false = 0); shareholders can take judicial recourse against decisions made at shareholder meetings (true = 0.5; false = 0); pre-emptive rights in the issuance of new shares (true = 1; false = 0); and shareholders representing 10 percent or less of the vote can demand the convocation of an extraordinary shareholder meeting (true = 1; false = 0). The shareholder protection rating can have a maximum value of 6. Effectiveness of shareholder protection is estimated based on structured interviews with securities and exchange commission officials in transition economies. The interviews were conducted by EBRD consultants in June 1998.

Source: La Porta and others 1998; Pistor 2000; Slavova 2000.

relatively dispersed, which provides liquidity to the market.

La Porta and others (1999) provide formal support for the importance of minority rights protection by using indicators of the quality of shareholder protection as written in laws. They show that the quality of shareholder protection is correlated with the capitalization and liquidity of stock markets in 49 countries around the world. Pistor (2000) extends the analysis by constructing identical indexes for transition economies. The results of both studies are presented in Table 2.

The indicators of minority rights protection show that, starting from no legal basis whatsoever, many transition economies have made significant strides in improving—at least on the books—the legal environment for investors. All but six transition economies (Azerbaijan, Croatia, Kyrgyz Republic, FYR Macedonia, Slovak Republic, and Ukraine) have better investor protection laws than Egypt, Germany, Mexico, and Turkey (see Table 2). The relatively high scores for Eastern European countries are perhaps not surprising because these countries have started harmonizing their stock market laws with those of the European Union. But the scores are surprising for the countries of the former Soviet Union.²

These indicators of formal shareholder rights do not indicate how well these laws and regulations are enforced in transition economies. Slavova (2000) expands on the formal laws by creating an index of effective shareholder protection. Among transition economies, Hungary has the highest score of effective protection, 71 percent of that in the United States, followed by Poland, Estonia, and Bulgaria (see Table 2). The other transition economies fall far short in their enforcement. Armenia, Azerbaijan, and FYR Macedonia have effective enforcement that is just over 20 percent of that in the United States. Ineffective enforcement of shareholder protection can largely be attributed to corruption, a weak judicial system, and limited

2. Pistor (2000) points out that 10 transition economies—including Armenia, Kazakhstan, the Kyrgyz Republic, Latvia, Moldova, Russia, Ukraine, and Uzbekistan—have received technical assistance from the U.S. Agency for International Development in drafting capital market legislation. This assistance has resulted in well-designed shareholder protection laws that have borrowed extensively from U.S. laws.

information disclosure (Pistor, Raiser, and Gelfer 2000). For example, Armenia has formal levels of shareholder protection similar to those in the United States. Yet its ability to enforce compliance with these rules is only a fifth of that in the United

States—even though there are only four actively traded companies in Armenia.

Even these indexes of effective enforcement may paint an overly rosy picture of investor protection in transition economies. While Russia scores as high as the United States on legal protection of shareholders, and is only twice as bad as the United States in securities law enforcement, basic property rights stemming from company laws are often neglected. Troika Dialog (1999) and Fox and Heller (1999), in reports on corporate governance in Russia, document many cases of minority as well as majority shareholder expropriation by incumbent managers or by local governments. While the disregard of investor rights is beyond the narrow scope of stock market enforcement, it is of primary importance in the provision of public and private funds to equity issuers.

Table 3

Assets Held by Institutional Investors in Transition and Comparator Economies

Percentage of GDP

Country	Investment and mutual funds	Pension funds	Insurance	Total
Armenia	4	0	0	4
Azerbaijan	0	0	0	0
Bulgaria	5	0	1	6
Croatia	2	0	2	4
Czech Republic	8	2	9	19
Estonia	5	0	3	8
Hungary	12	4	3	19
Kazakhstan	2	3	1	6
Kyrgyz Republic	2	0	0	2
Latvia	5	0	1	6
Lithuania	6	0	0	6
Macedonia, FYR	4	0	0	4
Moldova	4	0	2	6
Poland	8	2	5	15
Romania	8	0	0	8
Russia	2	1	1	4
Slovak Republic	6	0	4	10
Slovenia	5	0	4	9
Ukraine	0	1	0	1
Uzbekistan	0	0	0	0
Brazil	16	10	1	27
Chile	5	40	13	58
Germany	28	13	32	73
Korea, Rep. of	20	2	16	38
Mexico	4	3	2	9
Portugal	21	11	10	42
Turkey	3	1	1	5
United Kingdom	60	101	89	250
United States	129	90	43	262

Note: Data are for June 2000 or most recent available period.

Source: Authors' calculations based on OECD 1999; Mercer 2000; and World Bank data.

Institutional investors

The development and particularly the liquidity of a stock market depend on the development of a class of well-governed institutional investors.

Institutional investors are small in transition economies, with assets accounting for an average of just 7 percent of GDP—much less than in other emerging market economies. In only 3 of 20 countries (the Czech Republic, Hungary, Poland) do institutional investors have assets averaging 18 percent of GDP, and even that is lower than in other countries with similar per capita incomes (Table 3).

There are three types of institutional investors. Investment and mutual funds form the largest group in transition economies. Investment funds largely emerged out of the mass privatization funds used to transfer ownership during privatization. The funds collected vouchers from citizens and invested them in corporate securities. The mutual fund industry is still in its infancy in transition economies. Hungary is the region's leader: by early 2000 mutual fund holdings accounted for 8.5 percent of GDP.

Pension funds are another class of institutional investors. Because funded pension schemes have yet to be established or were only recently set up in transition economies, pension funds are insignificant in terms of the size of assets under management. In only 4 of 20 countries do these funds amount to a few percentage points of GDP (see Table 3). In most transition economies assets in pension funds do not even amount to 1 percent of

GDP. Hungary was the first transition economy to introduce a funded occupational pension scheme (in 1993) and a defined contribution scheme (in 1998). By March 2000 the assets of the defined contribution scheme amounted to 3 percent of GDP and the assets of the occupational pension scheme accounted for 1 percent of GDP. A number of countries followed Hungary in establishing defined contribution plans and funded occupational pension schemes. By June 2000 Croatia, the Czech Republic, Kazakhstan, Poland, Russia, Slovenia, and Ukraine had created defined contribution schemes, and Bulgaria, Estonia, Latvia, and FYR Macedonia will have established such a pillar by the end of 2001.

The insurance industry in transition economies started developing only after 1996. Thus the assets of the third type of institutional investors, insurance companies, are no more than a few percentage points of GDP in most transition economies (see Table 3).³ One exception is the Czech Republic, where the insurance market is relatively well-developed and is dominated by foreign players. Foreign players also dominate the insurance sector in Hungary, where they account for more than 90 percent of assets.

The importance of each factor

To show the relative importance of different factors in stock market development, we analyzed the determinants of stock market development and turnover in transition economies. We constructed time series for 1994–99 for market capitalization, market turnover, inflation, institutional assets, and minority shareholder protection. The simple correlation coefficients among these variables suggest that market capitalization is positively correlated with single-digit inflation, the size of institutional investor assets, and high shareholder protection—and is negatively correlated with triple-digit inflation and low shareholder protection. Market turnover is positively related to the size of institutional investor assets and is negatively related to triple-digit inflation and low shareholder protection. These correlation coefficients are all statistically significant at the 5 percent level.

3. It is not always possible to distinguish between life and non-life insurance, so these numbers overestimate the potential liquidity that insurance assets can inject into capital markets.

These simple correlations do not control for other explanatory variables, such as initial income and integration with more developed countries, proxied by geographic location. To establish more formally the importance of various factors in stock market development, we used regression analysis while controlling for income (proxied by the log of GDP per capita) and distance from Europe (proxied by the log distance from Vienna). The ordinary least-squares regressions are shown in Table 4.⁴

The analysis shows that low inflation, good shareholder protection, and the size of institutional investor assets are important in explaining market capitalization, even after controlling for income or distance. The pattern is less clear for market turnover. The size of institutional investor assets is positively associated with high turnover, and this association is statistically significant. But the association between market turnover and inflation or shareholder protection is non-monotonic. As long as inflation is not above 50 percent and shareholder rights are average or high, market turnover increases. This is consistent with the findings in Boyd, Levine, and Smith (2000) for other equity markets. These regressions highlight the importance of mild inflation and institutional investor assets in enhancing the development of stock markets in transition economies.

The results in Table 4 suggest that the underdevelopment of stock markets in transition economies can be traced to these countries' unstable macroeconomic environment, weak minority

4. Between regressions (ordinary least-squares regressions on means) and random regressions show that the results for market capitalization are robust to alternative specifications, while the association between market turnover and high shareholder protection turns insignificant. As a robustness check, we repeated the regression analysis described in Table 4, this time using data for the 26 transition economies as well as the 10 comparator countries. The six transition economies that do not have functioning stock markets get a score of 0 for market capitalization and market turnover. Table A5 shows that the importance of low inflation in explaining market capitalization doubles in comparison to the sample of transition economies only, shareholder protection is no longer statistically significant, and the role of institutional investor assets declines slightly. In contrast, the importance of shareholder protection increases in the market turnover regressions, and the role of institutional investor assets decreases significantly (Table A5, column 4). In both cases a country's per capita income is the most robust explanatory variable for both market capitalization and market turnover.

shareholder rights, and limited asset base of institutional investors. Many of these factors should improve over time. Today few countries have double-digit inflation, and legal frameworks have improved considerably—though much remains to be done in improving enforcement in most transition economies. Experiences in other emerging markets show that it takes considerable time and effort to protect minority rights. Relatively well-developed stock markets in East Asia, for example, still experienced large expropriation of minority shareholders in the late 1990s (Claessens and others 1999b).

Market capitalization is positively correlated with ratios of private credit to GDP in transition economies (Figure 6). Low ratios of private credit to GDP indicate that basic financial sector infrastructure is lacking in transition economies. Many transition economies have very shallow banking systems, with credit amounting to less than

10 percent of GDP. Because banking systems typically develop before stock markets, countries should focus on developing the basic infrastructure—investor protection, contract enforcement, sound accounting standards—for both credit and equity markets.

The benefits of focussing on the institutional framework are confirmed by a growing literature that stresses the importance of creditor rights in developing banking systems (La Porta and others 1999; Levine, Loayza, and Beck 2000). In addition to macroeconomic instability and low per capita income, weak creditor rights are an important reason for underdeveloped banking systems in transition economies. The better is the quality of creditor rights, the more developed is the banking system (Figure 7). Thus, before considering equity markets, transition economies should focus on improving and enforcing creditor rights to foster their banking system development. This will also be

Table 4

Determinants of Market Capitalization and Market Turnover in Transition Economies, 1994–99

Dependent variable	Market capitalization	Market capitalization	Market capitalization	Market turnover	Market turnover	Market turnover
Inflation <10 percent a year	3.54* (3.09)	3.15* (2.58)	2.84* (2.61)	9.24* (2.07)	4.56 (1.02)	5.65 (1.20)
Inflation 10–50 percent a year	0.33 (0.42)	0.29 (0.35)	0.05 (0.12)	10.47* (2.93)	9.90* (2.67)	8.92* (2.38)
Inflation 50–100 percent a year	-0.41 (0.52)	-0.34 (0.42)	-0.63 (0.76)	5.53 (0.91)	6.28 (1.04)	4.35 (0.73)
Medium shareholder protection	0.61 (0.92)	0.44 (0.64)	0.75 (1.17)	10.94* (3.58)	12.84* (3.94)	10.15* (3.32)
High shareholder protection	6.28* (3.69)	6.73* (3.85)	5.93* (3.49)	10.37* (2.51)	15.85* (2.21)	8.61 (1.22)
Institutional investor assets	0.64* (6.80)	0.57* (5.31)	0.56* (4.88)	3.07* (5.07)	2.19* (3.18)	2.68* (4.01)
Log distance from Vienna		-0.62 (1.38)			-7.48* (2.72)	
Log GDP per capita			0.82 (1.61)			4.21 (1.61)
Number of observations	156	156	156	156	156	156
Adjusted R ²	0.61	0.61	0.61	0.41	0.44	0.42

* Indicates statistical significance at the 5 percent level.

Note: Standard errors are heteroskedastic-consistent. A constant term is included in every regression. Medium investor protection is defined as a Pistor (2000) score of 2 or 3. High investor protection is defined as a Pistor (2000) score of 4 or 5. t-statistics in parentheses.

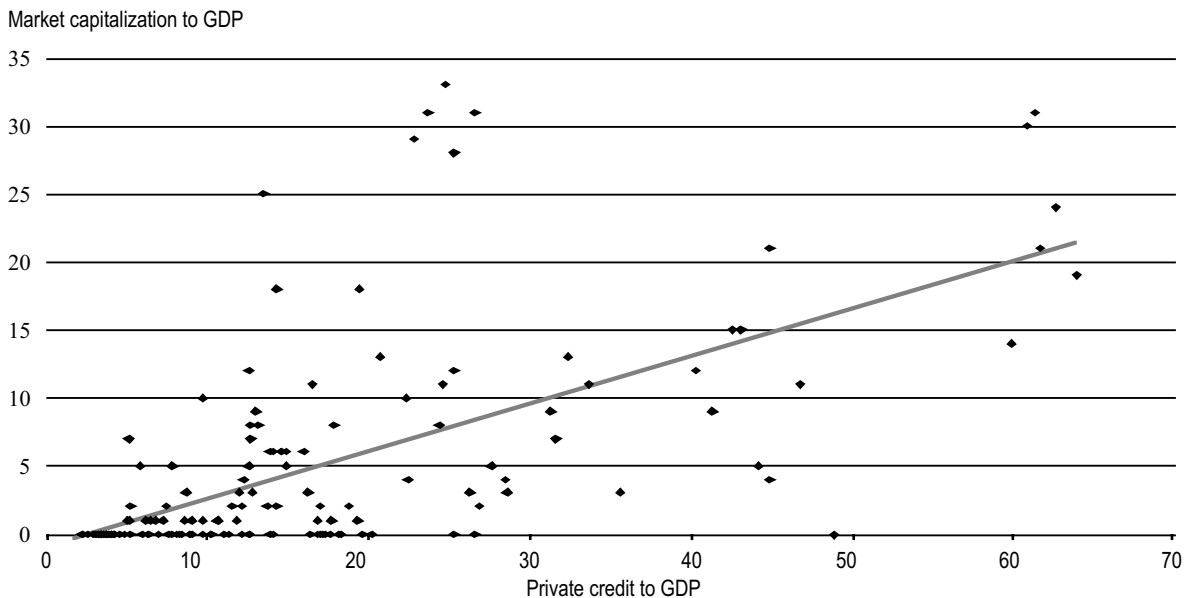
Source: Authors' calculations.

the most effective way to foster the development of small and medium-size enterprises, a key source of economic growth.

Several transition economies could foster funded pension schemes to boost the demand for shares of listed securities. Yet under current policies, the projected assets of funded occupational pension funds will remain fairly small in most transition economies. By 2005 assets are expected

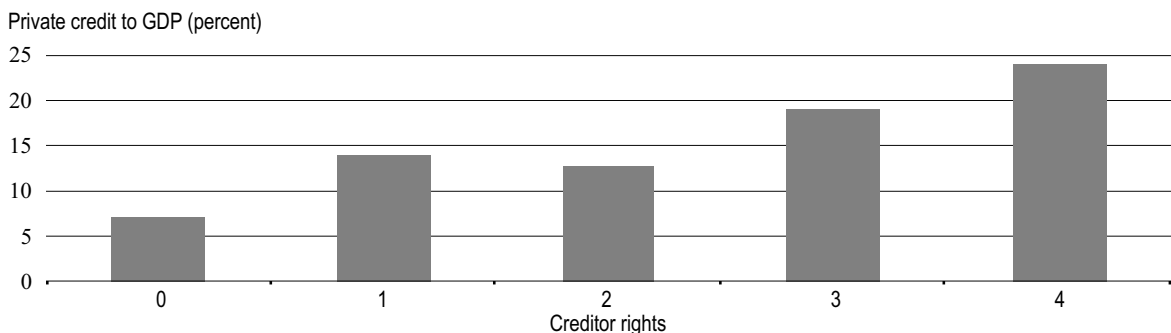
to be 10 percent of GDP in Kazakhstan, 8 percent in Hungary and Poland, 7 percent in the Czech Republic, 6 percent in Croatia, and 4 percent in Estonia, Latvia, and the Slovak Republic. But not all of the increase in funds will flow to stock markets, because regulations often limit the share of assets that can be invested in stock markets. In Kazakhstan, for example, this share is just 10 percent.

Figure 6
Private Credit and Market Capitalization in Transition Economies, 1994–1999
 Percent



Note: The sample is based on a panel set, 1994–99, for 26 transition economies.
 Source: Authors' calculations.

Figure 7
Creditor Rights and Ratios of Private Credit to GDP in Transition Economies, 1999



Note: The higher is the index of creditor rights, the better creditors are protected. For details, see Pistor (2000).
 Source: Authors' calculations.

Over time these restrictions will be phased out in countries vying for EU membership, and equity investment could rise. Fewer restrictions will also allow institutional investors to diversify their portfolios by investing abroad. But this beneficial development will reduce the resources available for

domestic investment. Phasing out restrictions on foreign investment will be important; otherwise countries will create a captive investor base that may impede institutional development, and result in inefficient resource allocation.

Prospects for Stock Markets in Transition Economies

To investigate the potential for and economic viability of stock markets in transition economies, we used the regression analysis to simulate the future development of stock markets under different policy assumptions (For similar policy experiments, see Beck [2000] for Brazil and Levine [2000] for capital markets in Latin America.). In particular, we simulated the market capitalization and market turnover that could materialize if policymakers achieve macroeconomic

stability (as indicated by single-digit inflation), the highest score on shareholder rights, and the projected accumulation of new pension fund assets (Table 5). These represent best-case scenarios in which countries achieve and maintain the highest scores on all three variables.

Such scenarios may not be realistic, however, and projecting that all three best-case policies will materialize may be overly optimistic for some transition economies. Indeed, a number of countries

Table 5

Best-Case Scenarios for Market Capitalization and Market Turnover in 2005

Percentage of GDP

Country	Market capitalization in 2000	Change in market capitalization from			Increase from 2000	Market capitalization in 2005	Market turnover in 2000	Increase from 2000	Market turnover in 2005
		Macro stability	Investor rights	Institutional assets					
Albania	0	0	5	0	5	5	0	16	16
Armenia	1	0	5	5	10	11	18	25	43
Azerbaijan	1	0	5	0	5	6	10	16	26
Belarus	0	3	5	0	8	8	0	16	16
Bosnia-Herzegovina	0	3	5	0	8	8	0	16	16
Bulgaria	5	0	0	3	3	8	6	20	26
Croatia	13	0	5	7	12	25	7	40	47
Czech Republic	25	0	0	14	14	39	81	15	96
Estonia	36	0	0	5	5	41	21	28	49
Georgia	0	0	5	0	5	5	0	16	16
Hungary	34	0	0	12	12	46	93	9	102
Kazakhstan	5	3	5	3	11	16	45	28	73
Kyrgyz Republic	3	3	5	2	10	13	2	20	22
Latvia	8	0	0	4	4	12	19	22	41
Lithuania	11	0	0	2	2	13	7	13	20
Macedonia, FYR	1	3	5	5	13	14	36	31	67
Moldova	5	3	6	2	11	16	62	29	91
Poland	21	0	0	17	17	38	69	10	79
Romania	2	3	6	4	13	15	45	33	78
Russia	19	3	0	5	8	27	40	7	47
Slovak Republic	3	0	6	8	14	17	25	46	71
Slovenia	12	0	6	6	12	24	22	42	64
Tajikistan	0	3	5	0	8	8	0	16	16
Turkmenistan	0	3	5	0	8	8	0	16	16
Ukraine	4	3	5	1	9	13	19	18	37
Uzbekistan	0	3	5	0	8	8	4	18	22
Average	8	2	4	4	9	17	24	22	46

Source: Authors' calculations.

have backtracked rather than progressed. In Bulgaria inflation increased in 1996 after an initial stabilization. The Slovak Republic saw a deterioration in shareholder rights after 1996. And Croatia's Parliament recently retracted a draft pension fund law after more than a year of deliberations. The simulation results also assume that shareholder rights will remain well-protected, at least on the books.

In the results presented in Table 5, a country sees an increase in market capitalization only if it has not already achieved the highest scores for each variable. For example, Bulgaria already has single-digit inflation and a shareholder protection score of 4. Thus it would not see an increase in market capitalization due to either factor, but only due to further accumulation of pension fund assets.

At the other end of the spectrum, 11 of 26 transition economies—Belarus, Bosnia-Herzegovina, Kazakhstan, the Kyrgyz Republic, FYR Macedonia, Moldova, Romania, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan—stand to gain from macroeconomic stability and improvements in shareholder rights. Under the best possible policy outcomes, six stock markets (in Croatia, the Czech Republic, Estonia, Hungary, Poland, and Russia) could see market capitalization of 25 percent of GDP or more by 2005, which would put them at about the average of middle-income emerging markets.⁵

5. The increase in market capitalization reported in Table 5 will be enhanced in countries that have not achieved low inflation if the estimated coefficients in Table A5 are used instead of the coefficients from Table 4. But this will be counterbalanced by a reduction in the positive effects from increases in the value of institutional investor assets and

The elasticity from policy changes is higher for market turnover, so even countries that do not have stock markets with any liquidity (such as Turkmenistan) could reach 16 percent market turnover by 2005 (see Table 5). Under the best-case scenario, market turnover of more than 50 percent may be reached in nine countries, namely the Czech Republic, Hungary, Kazakhstan, FYR Macedonia, Moldova, Poland, Romania, the Slovak Republic, and Slovenia. But even under the best scenario, turnover remains far below that of other markets in Europe (such as London or Frankfurt) and in many other emerging markets. Low liquidity not only implies that these markets will not be providing corporations with the opportunity to raise new capital at relatively low cost, but also that investors will be more reluctant to trade given the high implicit costs of price movements. Perhaps most important, low liquidity means that it will be harder to support a local market with its own trading system, market analysis, brokers, and the like, because the business volume would simply be too low.

improvements in investor protection. On net, this leads to a reduction in the projected market capitalization across all transition economies, especially in countries that have poor shareholder protection—such as Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Croatia, Georgia, and the like. Projected market turnover also decreases across transition economies, but not uniformly. Countries that have made significant strides in accumulating institutional investor assets stand to gain less. But countries that can still improve investor protection record a higher increase in market turnover. These robustness checks show that the results reported in Table 5 should broadly be seen as the most optimistic scenario, the upper bound of growth potential of stock markets in Central and Eastern Europe and the former Soviet Union.

The Influence of International Developments

Stock market developments in transition economies cannot be analyzed without reference to global developments. While some transition economies may be able to develop reasonably liquid stock markets in the next few years, such progress could be stalled by global events. Around the world, stock markets are undergoing rapid changes. They have become increasingly global, with large increases in cross-border capital flows. Listing, trading, and new issuance are concentrating in fewer markets. And alternative electronic trading networks are gaining market share. These trends are starting to affect stock markets in transition economies.

Globalization is proceeding in all forms of financial services, through capital flows, cross-border provision, and entry of foreign financial institutions. International equity issues have increased substantially, from \$120 billion in 1997 to \$214 billion in 1999 (BIS 2000). Within these international equity flows, depository receipts—global depository receipts (GDRs), American depository receipts (ADRs), and the like—have been the most popular instrument for raising capital. In 1999 a record \$22 billion in new capital was raised in U.S. markets through depository receipts, bringing the total equity capital raised through ADRs to \$133 billion since 1990. Other financial centers have seen similar trends.

Depository receipts are used not just to raise capital, but also to effectively cross-list a stock in more markets. In 1999, 1,800 depository receipt programs from 78 countries were in existence in the United States, compared with 352 from 24 countries in 1990. The combined market capitalization of these companies exceeded \$6 trillion at the end of 1999 (Bank of New York 2000). In London the use of depository receipts is more limited and cross-listing is mostly direct. At the end of 1999, 512 of 2,274 companies listed on the London Stock Exchange were foreign.

Trading is also moving offshore. During the 1990s the trading value of ADRs grew by 22 percent a year—reaching \$758 billion in 1999 (Bank of New York 2000). As a result of these trends, listing and trading are concentrating, with the combined capitalization of the top five markets (New York Stock Exchange, Nasdaq, Tokyo Stock Exchange, London Stock Exchange, Deutsche Boerse) accounting for about three-quarters of global capitalization and trading. Thus activity

outside these centers is only one-quarter of global capitalization and trading (Table 6; see also Clayton, Jorgensen, and Kavajecz 1999).

Increased cross-listing and use of depository receipts and other forms of international capital raising reflect the recognition among large corporations worldwide that larger stock markets offer more financing, lower capital costs, greater liquidity, and better name recognition. Empirical evidence provides strong support for this assessment. When firms from emerging markets use ADRs or GDRs or list on U.S. equity markets, their financing constraints are relaxed—that is, their new investment becomes less sensitive to internal cash flow (Lins, Strickland, and Zenner 1999). In addition, domestic firms that enter international markets obtain better financing opportunities and extend their debt maturities (Chaplinsky and Ramchand 1999). Trading in foreign markets is typically much more liquid than in local markets. For example, Mexican stocks with ADRs see more trading in New York than in the domestic market, with mixed benefits for investors (Domowitz, Glen, and Madhavan 1998).

Because corporate governance rules are more stringent for international listings, corporations have used them to signal that they are willing to protect the rights of minority shareholders. Corporations from countries with weak corporate governance laws are more likely to (cross-) list abroad if they are allowed to do so (Reese and Weisbach 2000). And by raising bonds abroad (in the United States), corporations certify to act in the interest of investors and so lower their borrowing costs and increase shareholder wealth (Miller and Puthenpurackal 2000).

New Internet-related startups in Latin America and Israel, for example, are establishing their legal domicile in the United States to facilitate the raising of new capital. Cross-listing will be further facilitated by the recent announcement that IOSCO, the club of stock market regulators, will develop more complete international accounting standards. These standards could be used by incoming multinational corporations in cross-border offerings and listings.

Trading systems are consolidating and going global

These trends are being influenced by advances in information technology that make it easier for

market participants to trade from remote locations. Trading is moving toward electronic forms that are not tied to any particular location. Nasdaq's computers are based in Turnbull, Connecticut, for example, but traders are located around the globe.

A number of electronic communication networks have emerged in recent years. These networks started as pools of liquidity feeding into existing markets but increasingly serve as alternative trading outlets. Electronic communication networks now account for a large share of trading in some developed stock markets—for example, they account for one-quarter of the dollar volume of Nasdaq trading.

Alternative trading systems are also being set up around the world, often with links to existing trading systems. For example, Instinet started out as a brokerage service but now has automatic routings to a number of stock exchanges.⁶ There is speculation that a few trading systems will emerge globally that allow investors to trade 24 hours a day. Existing exchanges are recognizing that their services—trading systems—are becoming a commoditized product offered through other means.⁷ Many observers predict that traditional stock markets (such as the New York Stock Exchange) will cease to exist in their current form, reflecting changes in corporate structure, physical trading location, and institutional organization (such as the distinction between specialists and retail brokers).

Reflecting these competitive pressures, and the general desire for increased liquidity through larger markets, many stock exchanges in developed countries have established links or even merged. Recent examples include the proposed mergers of the Amsterdam, Brussels, and Paris exchanges and of the London and Frankfurt exchanges; the joint ventures and alliances between Nasdaq and stock

exchanges in Australia, Canada, Japan, and Hong Kong (China); and a joint venture between Nasdaq and the proposed London-Frankfurt exchange focusing on growth stocks (see Table 6). The Singapore and Australian stock exchanges recently agreed to cross-list all traded shares. The New York Stock Exchange has formed alliances with the Tokyo Stock Exchange, Australian Stock Exchange, Toronto Stock Exchange, Mexican Bolsa, São Paulo Bovespa, and Euronext to trade through linked exchanges 24 hours a day. The consolidation of these markets—which account for more than 60 percent of global market turnover—is leading to a small number of very large markets.

Most transition economies have missed out on these developments

With few exceptions, transition economies have not participated in these consolidation trends. The only merger has been among the three Baltic exchanges (Estonia, Latvia, Lithuania), which have also established links with Helsinki (Finland). Other countries are still pursuing a “made at home” strategy. Global trends suggest that many of these “import substitution” approaches are doomed to fail. Even under a best-case scenario, most transition markets will remain small even relative to most emerging markets—let alone compared to developed markets. This raises the question of whether transition economy stock markets will achieve the economies of scale needed to compete internationally alone, or whether they need to join global alliances.

To reach the point where increasing market activity is associated with decreasing costs in the processing of trades, a market needs to have capitalization of more than \$15 billion (Malkamaki 1999). Using the best-case scenario for market turnover from Table 5, only 4 of 26 transition economies will reach this point by 2005—the Czech Republic (with an estimated \$19 billion in market capitalization in 2005), Hungary (\$16 billion), Poland (\$46 billion), and Russia (\$53 billion). The next largest markets, Romania and the Slovak Republic, will each have market capitalization of less than \$5 billion. This suggests that, given their scale, most stock markets in transition economies will not be able to compete with other markets in providing trading services. Moreover, these estimates are based on existing economies of scale. The globalization of stock markets is continuously

6. For purposes of executing cross-border transactions involving foreign securities, retail investors are, in effect, connected to foreign markets through such electronic “pass through.” A U.S.-based investor may, for example, be linked electronically to a U.S. broker-dealer, who in turn is linked electronically to foreign markets, either directly or through a local broker-dealer.

7. To the extent they have not done so already, many exchanges are considering demutualizing—that is, becoming for-profit organizations—to survive in an increasingly competitive environment.

increasing the scale needed for trading systems to operate competitively and provide the desired liquidity—making an independent stock market an increasingly difficult proposition even for those transition economies that today appear to have sufficient size.

Low economies of scale are corroborated by the cost structure of stock markets in transition economies. Domowitz, Glen, and Madhavan (2000) use data from 42 developed and emerging markets to calculate the explicit and implicit costs of equity trading, where explicit costs include commissions

and fees and implicit costs represent indirect trading costs (the main one being the price impact of trades). Even though most transition economies do not have explicit taxes that raise trading costs and lower liquidity, total costs in the leading transition markets (Budapest and Prague) are twice the sample average, about three times the costs in Germany and the United States, and about 60 percent higher than in leading Latin American and East Asian markets. This analysis suggests that even the largest transition economy stock markets will have a hard time competing internationally.

Table 6

Features of the World's Largest Stock Exchanges

Market or exchange	Average daily trading volume (billions of shares)	Market capitalization (billions of US dollars)	Links with other exchanges or electronic communication networks
New York Stock Exchange	35.0	12,000	Preliminary talks with Toronto Stock Exchange, Euronext, and Mexico Bolsa; cooperative links with Tokyo Stock Exchange
Nasdaq	41.5	5,020	All electronic communication networks trade Nasdaq stocks; deals with Osaka Stock Exchange, Deutsche Boerse, London Stock Exchange, Quebec government, Hong Kong Stock Exchange, and Australian Stock Exchange
Tokyo Stock Exchange	6.8	4,100	Cooperative links with exchanges in the Republic of Korea, the Philippines, Singapore, and Thailand, as well as with the New York Stock Exchange
London Stock Exchange	13.5	2,800	Deutsche Boerse merger, Nasdaq joint venture
Toronto Stock Exchange	2.85	1,700	New York Stock Exchange, Euronext, Hong Kong Stock Exchange, Mexican Bolsa, São Paulo Bovespa
Deutsche Boerse	4.53	1,500	Merger with London Stock Exchange (iX), Nasdaq joint venture, MarketXT joint venture
Paris Bourse	4.18	1,500	Euronext alliance
Hong Kong Stock Exchange	1.5	568	Co-listing agreement with Nasdaq, New York Stock Exchange
Australian Stock Exchange	0.8	370	Nasdaq, Singapore Stock Exchange
São Paulo Bovespa	0.4	208	London Stock Exchange, Lisboa Stock Exchange, Argentina Caja de Valores
Global Total	148.8	35,005.4	

Source: *The Wall Street Journal*; Federation Internationale de Bourses de Valeurs.

Appendix

Table A1

Number of Listed Equities in Transition and Comparator Economies, 1994–2000

Country	1994	1995	1996	1997	1998	1999	March 2000
Armenia	1	1	10	59	82	86	95
Azerbaijan	0	0	0	1	2	2	2
Bulgaria	16	26	15	15	998	828	842
Croatia	29	61	66	77	50	59	59
Czech Republic	1,024	1,635	1,588	276	261	164	154
Estonia	0	0	0	22	26	25	23
Hungary	40	42	45	49	52	66	65
Kazakhstan	0	0	0	13	36	24	20
Kyrgyz Republic	0	10	27	40	51	63	66
Latvia	0	17	34	51	69	70	64
Lithuania	13	351	460	607	60	54	54
Macedonia, FYR	0	0	2	2	2	2	2
Moldova	0	11	16	48	61	58	28
Poland	44	65	83	143	198	221	221
Romania	4	7	17	76	5,753	5,825	5,578
Russia	72	170	73	208	237	207	218
Slovak Republic	18	18	816	872	837	845	843
Slovenia	25	17	21	26	28	28	34
Ukraine	0	96	99	102	113	117	120
Uzbekistan	0	0	0	4	4	4	3
Brazil ^a							472
Egypt							1,051
Germany							851
Korea, Rep. of							723
Mexico							185
Portugal							125
Thailand							390
Turkey							298
United Kingdom							2,274
United States ^b							3,025

Note: Excludes over-the-counter (OTC) traded issues. For example, in March 2000, 51 companies were registered with the Almaty (Kazakhstan) Stock Exchange and traded OTC, but only 20 companies were traded on the exchange. More than 100 companies are pre-listed on the Macedonian Stock Exchange, more than 500 are pre-listed in Moldova, and more than 2,000 are pre-listed in Ukraine.

a. São Paulo Bovespa only

b. New York Stock Exchange only

Source: Stock exchange websites and information departments; Beck, Demirgüç-Kunt, and Levine 1999.

Table A2

Market Capitalization in Transition and Comparator Economies, 1994–2000

Percentage of GDP, mid-period

Country	1994	1995	1996	1997	1998	1999	March 2000
Armenia	0	1	1	1	1	1	1
Azerbaijan	0	0	0	0	0	1	1
Bulgaria	0	1	0	1	8	6	5
Croatia	3	3	15	21	15	11	13
Czech Republic	14	30	31	24	21	19	25
Estonia	0	2	10	11	28	31	36
Hungary	3	5	12	33	29	31	34
Kazakhstan	0	0	0	1	1	2	5
Kyrgyz Republic	0	0	1	5	7	3	3
Latvia	0	1	3	6	6	6	8
Lithuania	1	2	11	18	10	12	11
Macedonia, FYR	0	0	0	0	0	1	1
Moldova	0	0	0	2	6	22	19
Poland	3	4	6	8	13	18	21
Romania	0	0	0	2	3	2	2
Russia	2	5	9	8	7	25	19
Slovak Republic	8	7	12	9	5	4	3
Slovenia	4	2	4	9	13	11	12
Ukraine	0	0	0	0	2	3	4
Uzbekistan	0	0	0	0	1	6	6
Brazil	27	24	24	30	27		
Egypt	8	10	16	23	28		
Germany	23	22	27	36	45		
Korea, Rep. of	44	42	34	22	24		
Mexico	45	39	31	33	29		
Portugal	15	17	24	34	57		
Thailand	92	82	66	44	29		
Turkey	19	14	15	25	17		
United Kingdom	116	119	137	146	161		
United States	74	82	101	122	151		

Note: Excludes over-the-counter (OTC) traded issues.

Source: Stock exchange websites and information departments; Beck, Demirgüç-Kunt, and Levine 1999.

Table A3

Market Turnover in Transition and Comparator Economies, 1994–2000

Percentage of market capitalization, mid-period)

Country	1994	1995	1996	1997	1998	1999	March 2000
Armenia	0	2	2	7	5	15	18
Azerbaijan	0	0	4	12	12	13	10
Bulgaria	0	8	1	1	2	4	6
Croatia	8	8	13	10	5	5	7
Czech Republic	26	33	50	47	37	61	81
Estonia	0	0	59	78	108	44	21
Hungary	22	17	42	76	112	103	93
Kazakhstan	0	0	0	2	2	2	3
Kyrgyz Republic	0	2	8	2	6	2	2
Latvia	8	12	15	35	24	21	19
Lithuania	0	37.3	9	18	16	13	7
Macedonia, FYR	0	0	3	24	41	45	36
Moldova	0	0	12	81	173	81	62
Poland	177	72	85	78	54	62	69
Romania	2	7	72	73	66	58	45
Russia	367	7	11	20	11	27	40
Slovak Republic	96	69	134	109	74	48	25
Slovenia	68	71	82	31	35	28	22
Ukraine	0	5	11	6	4	12	19
Uzbekistan	0	3	19	12	3	2	4
Brazil	76	47	61	85	70	64	54
Egypt	19	11	22	33	22	38	47
Germany	98	109	123	137	145	152	167
Korea, Rep. of	172	97	109	171	183	223	288
Mexico	44	31	42	40	28	32	35
Portugal	36	48	59	67	96	114	127
Thailand	60	41	36	39	70	86	89
Turkey	87	221	139	128	141	167	193
United Kingdom	78	78	37	44	53	62	73
United States	70	85	92	104	106	117	141

Note: The share for March 2000 is annualized under the assumption that the turnover for the last three quarters of the year will be the same as for the first quarter.

Source: Stock exchange websites and information departments; Beck, Demirgüç-Kunt, and Levine 1999.

Table A4

Inflation in Transition Economies, 1992–2000

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000 (proj)	Average 1994–99
Armenia	1,341.0	10,896	1,885.3	31.9	5.8	21.8	-1.3	8.2	n.a.	325.2
Azerbaijan	1,395.0	1,294.2	1,788.4	84.5	6.5	0.3	-7.6	1.7	n.a.	312.2
Bulgaria	79.0	63.8	121.9	32.9	310.8	578.6	1.3	1.8	7.2	174.5
Croatia	938.2	1149	-3.1	3.8	3.4	3.8	5.4	4.0	5.5	2.9
Czech Republic	12.7	18.2	9.7	7.9	8.6	9.8	6.8	3.5	4.3	7.7
Estonia	953.5	35.6	42.1	28.9	15.1	12.4	4.4	3.1	4.7	17.7
Hungary	21.6	21.1	21.2	28.3	19.8	18.4	10.3	8.1	9.2	17.7
Kazakhstan	2,984.1	2,169.3	116.1	60.4	28.6	11.3	1.9	19.6	14.2	39.7
Kyrgyz Republic	1,259.0	1,363.2	95.7	31.9	35.4	14.7	18.3	40.1	n.a.	39.3
Latvia	959.0	35.3	26.2	23.1	13.1	7.1	2.8	2.1	2.9	12.4
Lithuania	1,161.1	188.8	45.2	35.5	13.1	8.5	2.4	2.5	3.5	17.9
Macedonia, FYR	1,935.0	241.8	55.1	9.0	-0.6	2.6	-3.1	2.2	n.a.	10.8
Moldova	2,198.0	837.2	115.8	23.8	15.1	11.2	18.2	29.7	n.a.	35.6
Poland	44.3	37.6	29.4	21.4	18.5	13.2	8.6	6.5	n.a.	16.3
Romania	199.2	295.5	61.7	27.8	56.9	151.4	40.6	38.9	40.5	62.9
Russia	2,506.1	840.1	204.4	128.6	21.8	10.9	84.5	45.3	18.2	82.5
Slovak Republic	9.1	25.1	11.7	7.2	5.4	6.4	5.6	14.5	14.3	8.5
Slovenia	92.9	22.8	19.5	9.1	9.2	8.8	6.5	6.4	n.a.	9.9
Ukraine	2,730.0	10,155	401.2	181.3	39.7	10.1	20.1	17.2	25.2	111.5
Uzbekistan	910.1	885.2	1,281.2	117.4	64.1	49.8	26.2	42.3	n.a.	263.4

n.a. Not available.

Source: IMF, *International Financial Statistics*, May 2000.

Table A5

Determinants of Market Capitalization and Market Turnover in Transition and Comparator Economies, 1994–99

Dependent variable	Market capitalization	Market capitalization	Market turnover	Market turnover
Inflation <10 percent a year	9.13* (3.79)	5.04* (2.28)	21.09* (2.34)	11.38 (1.31)
Inflation 10–50 percent a year	2.76 (1.47)	0.76 (0.49)	9.29 (1.17)	6.58 (0.86)
Inflation 50–100 percent a year	2.08 (1.02)	0.46 (0.25)	7.41 (1.70)	15.42 (1.11)
Medium shareholder protection (index of 2 or 3)	-1.24 (0.59)	-2.75 (1.38)	31.21* (5.29)	19.10* (3.83)
High shareholder protection (index of 4 or 5)	2.13 (0.83)	0.35 (0.13)	40.59* (4.71)	20.87* (2.77)
Institutional assets	0.46* (11.66)	0.43* (10.06)	1.60* (3.18)	0.90* (1.97)
Log GDP per capita		3.19* (3.42)		25.34* (9.11)
Number of observations	216	216	216	216
Adjusted R ²	0.81	0.82	0.23	0.46

* Indicates statistical significance at the 5 percent level.

Note: The table reports findings for a panel of 26 transition economies and 10 comparator countries (Brazil, Egypt, Germany, Republic of Korea, Mexico, Portugal, Thailand, Turkey, United Kingdom, United States). Transition economies that do not have stock markets have a score of 0 on market capitalization and market turnover. The shareholder protection indexes are constructed from La Porta and others (1998) and Pistor (2000). Data on institutional investor assets are reported in Table 3. Standard errors are heteroskedastic-consistent. A constant term is included in every regression. t-statistics in parentheses.

Source: Authors' calculations.

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