Services Policy Reform and Economic Growth in Transition Economies

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Abstract: Major changes have occurred in the structure of former centrally planned economies, including a sharp rise in the share of services in GDP, employment, and international transactions. However, large differences exist across transition economies with respect to services intensity and services policy reforms. We find that reforms in policies toward financial and infrastructure services, including telecommunications, power, and transport, are highly correlated with inward FDI. Controlling for regressors commonly used in the growth literature, we find that measures of services policy reform are statistically significant explanatory variables for the post-1990 economic performance of transition economies. These findings suggest services policies should be considered more generally in empirical analyses of economic growth. JEL no. F14, F43, O14, O40
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1 Introduction

One of the stylized facts of economic development is that the share of services in GDP and employment rises as per capita incomes increase (Francois and Reinert 1996). This reflects increasing specialization and exchange of services through the market ("outsourcing")—with an associated increase in variety and quality that may raise productivity of firms and welfare of final consumers, in turn increasing demand for services. It also reflects the limited scope for (labor) productivity in provision of some services, implying that over time the (real) costs of these services will rise relative to

merchandize, as will their share of employment (Baumol 1967; Fuchs 1968). Services are increasingly becoming tradable as a result of the greater mobility of people and technological change. This further increases the scope for specialization in production and trade. The competitiveness of firms—both domestic enterprises operating on the local market and exporters on international markets—depends importantly on the availability, cost, and quality of producer services such as finance, transport, and telecommunications.

Services industries were generally neglected under central planning. Marxist thinking emphasized the importance of tangible (material) inputs as determinants of economic development, and classified employment in the services sector as unproductive. The lack of producer services was reflected in transport bottlenecks, queuing for and low quality of telecommunications, the absence of efficient financial intermediation, and much lower employment in services than was the case in OECD countries (e.g., less than 1 percent of the labor force was employed in finance and insurance) (Bićanić and Škreb 1991). Many of the services that are critical to the functioning of a market economy simply did not exist—not just a financial sector that could allocate investment funds efficiently, but also design, advertising, packaging, distribution, logistics, management, after sales services, etc.

In this paper we analyze the impact of service sector policy reforms on the growth performance of 24 transition economies. There are large differences in economic performance across these transition economies. Our primary objective is to explore to what extent services-related policies help explain these differences. We start with a brief discussion of shifts in the structure of these economies and developments in trade and inward FDI in services (Section 2). Section 3 turns to the role of the service sector as an engine of economic growth. We first present a snapshot of prevailing policies toward trade and investment in services and the changes that have occurred since the early 1990s, focusing in particular on so-called backbone service industries: finance, telecommunications, and infrastructure (including utilities). We then investigate the impacts of services policies and reforms on growth, controlling for standard explanatory variables commonly used in the literature. We find that services policies are an important determinant of growth performance. Section 4 concludes.

2 Shifts in the Structure of Services in Transition Economies

The share of services in GDP and employment has grown significantly since 1990 in almost all transition economies. Compared to the high income OECD average in 1990—when the share of services in employment and GDP was around 63 percent—transition countries in Europe and Central Asia (ECA) lagged far behind: services accounted for 30–40 percent of GDP and employment. As of 2003, services shares had increased substantially. The greatest growth is observed in the Baltic States, which have almost converged on the OECD average of 68 percent in terms of GDP shares, although employment shares remain lower (Figure 1). The Central and Eastern European (CEE) countries that acceded to the EU in 2004 have also converged to a large extent. Much less progress has been made by the Central Asian countries, where natural resource-based activities continue to constitute a major share of GDP.[1]

There is also a distinct pattern in labor productivity performance. The CEE, South-East European (SEE) and Baltic states register an increase in productivity, both overall and within services (broadly defined to include government).[2] Conversely, for those other countries where data is available, there has been a decline in the measured value of services output per employee. These countries also have not increased their overall labor productivity performance in the last decade. Noteworthy is the performance of the Baltic countries, where labor productivity in services outpaced the productivity increase in other sectors of the economy. Convergence with respect to high-income OECD countries in terms of productivity levels is still far from being achieved, however.

Input-output tables for the year 2001, the latest available year for many ECA countries, provide information on differences in economic structure and the extent to which ECA countries have converged to comparators in the rest of world as regards both intermediate services use and final demand, as well as on the service intensity of exports. Table 1 reports information on the sectoral intensity of exports: the direct contribution of agriculture, mining, manufactures, and services to total exports, expressed as a share of total exports of goods and services.[3] Albania, Croatia, and the Baltic States are the most services-intensive in exports. The first column in Table 2

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[1] See Figure 1 for the definition of country groups used in this paper.
[2] Output data are measured in constant 1995 US dollars, as reported in the World Development Indicators.
[3] We are grateful to Joe Francois for sharing these data.

Figure 1: *Changes in the Share of Services in GDP and Employment and Labor Productivity*

Share of Services Sector in GDP by
Country Group, 1991 vs. 2003

Employment Share of Service Sector by
Country Group, 1991 vs. 2001

Labor Productivity of Service Sector by
Country Group, 1991 vs. 2001

Labor Productivity of All Sectors by
Country Group, 1991 vs. 2003
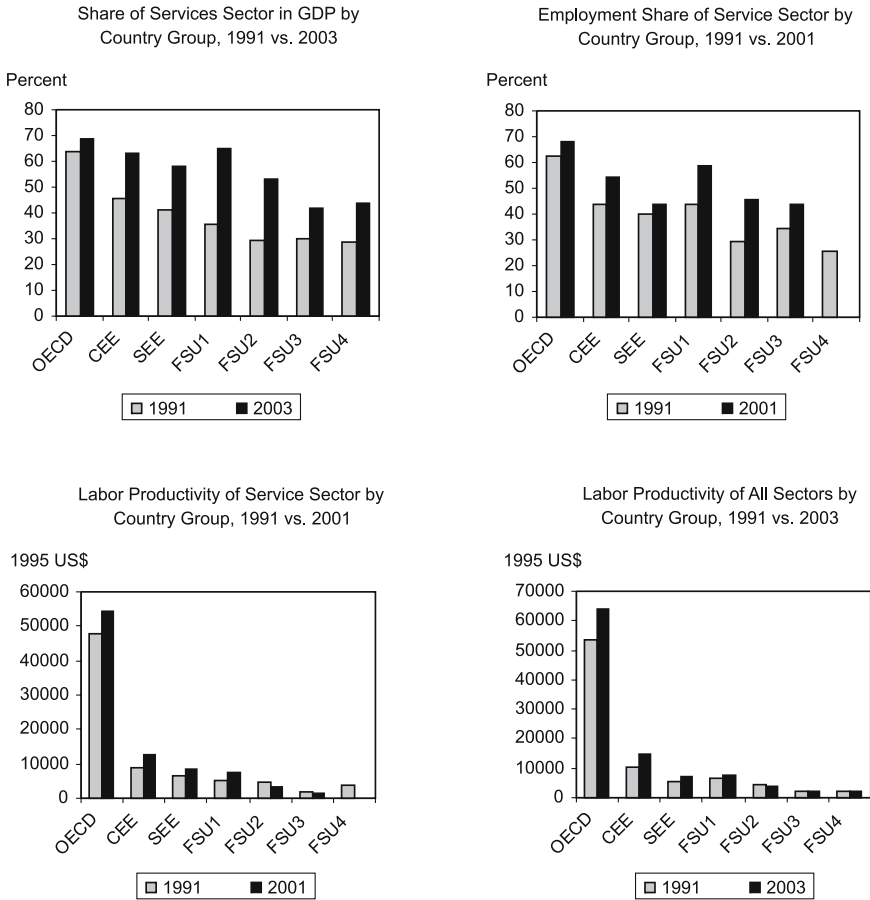
Note: CEE = Central and Eastern European countries (Poland, Hungary, Czech and Slovak Republics, Slovenia); SEE = Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Romania, and Serbia and Montenegro; FSU1 = Estonia, Latvia, and Lithuania; FSU2 = Russia, Ukraine, Belarus, Moldova; FSU3 = Armenia, Azerbaijan, Georgia; FSU4 = Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.
Source: World Bank, *World Development Indicators.*

reports the sum of the direct and indirect linkage effects generated by a unit of export revenue—the total activity generated by (going into) one unit of foreign exchange (exports). The average "multiplier" is 3.6, i.e., every US dollar of exports generates $3.6 in economic activity. On average a little

Table 1: *Sectoral Share of Total Export Revenue (Selected Transition Economies)*

	Agriculture/food/mining	Manufactures	Services
Albania	19	35	46
Croatia	9	49	42
Czech Rep.	5	80	15
Hungary	7	76	17
Poland	10	73	17
Romania	4	85	10
Slovakia	4	86	10
Slovenia	4	81	15
Estonia	11	66	22
Latvia	13	64	24
Lithuania	13	63	24
Russia	40	52	8

Source: GTAP Input-Output data derived from Social Accounting Matrices for 2001.

Table 2: *Total Export Related Activity (Direct Plus Indirect Linkages), 2001*

	Total "multiplier"	Shares			
		Agriculture/food	Mining	Manufactures	Services
Albania	4.8	20	4	24	52
Croatia	2.9	18	1	36	45
Czech Rep.	3.0	10	2	61	27
Hungary	2.8	10	2	51	37
Poland	4.2	17	3	43	38
Romania	6.6	27	3	39	30
Slovakia	2.9	12	3	57	28
Slovenia	2.9	10	1	58	31
Estonia	2.5	15	2	49	35
Latvia	3.0	17	1	36	47
Lithuania	3.5	17	4	36	42
Russia	3.6	14	17	30	39
Memo:					
Cyprus	2.5	10	7	30	52
Turkey	3.7	17	2	40	41
China	3.7	18	3	62	17
Malaysia	2.1	8	3	64	25
Germany	3.3	7	1	49	43

Source: GTAP Input-Output data derived from Social Accounting Matrices for 2001.

over one third of this total activity is services-related, ranging from a high of 52 percent (Albania) to a low of 27 percent (Czech Republic). Many transition countries are more services oriented than developing countries such as China or Malaysia.

Although technology is making it easier to trade services, often a commercial presence remains required to sell services, i.e., FDI. Given the lack of a service sector under central planning, FDI can be expected to play a particularly important role, more so than in countries where incumbent competition confronts foreign providers. FDI is an important channel for foreign providers to contest infrastructure service markets. FDI sometimes takes the form of greenfield investment, but has mostly occurred through privatization. The extent of privatization varies substantially by country and sector, with Central European and Baltic countries the leaders in attracting FDI in infrastructure. The SEE countries have attracted the least. On average, services account for some 62 percent of the stock of FDI in the reporting countries (Table 3).[4] Finance, transport, communications and distribution services account for the largest share of this FDI. The service intensity of FDI is highest in the Baltic states, presumably reflecting their relatively small size and limited manufacturing base, and lowest in Romania and the Ukraine. Services FDI is also very high as a ratio of GDP in the Baltic States. It is lowest in Romania, Russia and the Ukraine.

3 Services Reforms and Growth Performance

The forgoing snapshot of trends in the share of services in GDP, employment, output per worker, trade, and FDI reveal both substantial convergence toward European countries, but also a distinct difference between Central European/Baltic states and Central Asian and CIS (Commonwealth of Independent States) economies. Given that trade and FDI in services can be expected to be associated with the acquisition of new technologies, higher service standards and more effective delivery, these differences should help explain the observed higher labor productivity performance in services in the former. The question explored in the rest of this paper is whether these services developments are determinants of the aggregate growth perform-

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[4] Aggregate data on FDI inflows are available for a wider set of countries, but these are not broken down across services sectors.

Table 3: *Inward FDI Stock by Sector (End 2003 Unless Indicated Otherwise; Shares in Total (percent))*

|	CZ	HU	PL	SK	SI	EE	LV	LT	BG	CR	RO	RU flow	UK
	2002	2002	2002		2002							00-02	2002
Agriculture, forestry, fishing	0.1	1.3	0.4	0.2	0.0	0.4	1.5	0.8	0.3	0.3	0.7	0.4	2.1
Mining and quarrying	1.4	0.3	0.3	0.8	0.0	0.4	0.6	0.8	1.1	3.1			2.4
Manufacturing	35.5	45.8	35.8	37.5	43.3	18.2	15.5	31.1	33.4	30.6	54.3	45[a]	46.4
Electricity, gas, water supply	6.9	4.6	2.6	11.7	1.0	2.4	3.4	4.4	1.0	1.1			1.6
Construction	1.9	1.1	2.6	0.7	0.1	2.5	1.0	1.2	2.7	0.9	2.4	2.2	2.9
Distribution and repair services	11.9	11.1	17.1	11.2	14.5	15.9	18.0	17.9	18.0	6.9	16.4	22[b]	18.5
Hotels and restaurants	1.2	1.1	0.6	0.5	0.4	1.7	1.3	1.6	1.7	4.0	2.4		2.3
Transport, storage & comm.	13.6	10.1	10.4	10.0	4.4	17.7	11.9	17.1	15.7	25.0	7.8	9.5	7.2
Financial intermediation	15.9	10.3	21.3	23.5	18.8	28.1	15.0	15.7	17.7	24.6		1.8	8.1
Real estate, rental & business act.	9.3	11.7	7.5	3.2	15.2	11.4	24.5	7.3	3.9	3.1		8.2	4.7
Education, health, social work	0.2	.	.	0.4	0.1	0.1	0.1	0.2	0.3	0.0			2.3
Other community & personal ser.	2.4	.	.	0.3	0.5	0.8	1.1	1.5	0.8	0.5		0.2	1.5
Other not classified activities	0.0	1.0	1.4	.	1.7	0.4	6.0	0.3	3.2	..	16[c]	11.0	
Real estate purchases by foreigners	.	1.5	.	.	.	.	.	.	.	..			
Total services share [d]	56.2	47.9	60.9	49.8	55.7	78.6	78.9	62.8	65.2	64.9	45	54.6	47.5
Value of services FDI stock ($ bn)	26.7	22.9	36.8	5.6	2.8	5.1	2.6	3.1	3.3	7.4	5.7	35.5	3.6
Services FDI stock as % of GDP	31.6	27.7	17.6	17.6	7.7	60.7	26.8	37.8	16.6	26.1	9.4	8.2	7.3

[a] Covers all industry, including mining/energy. – [b] Includes hotels and restaurants. – [c] Includes finance and business services. – [d] Not including utilities.

Source: WIIW-Wifo Database on FDI, July 2004 edition.

ance of countries. The services outcome variables are of course endogenous, influenced by the policy stances of governments, so that the focus is on the impact of services policy reforms.

Service sector reform involves a mix of deregulation (the dismantlement of barriers to entry and promotion of competition) and improved regulation (putting in place an appropriate legal environment, strengthening regulatory agencies, increasing their independence, etc.). The policy challenge is to achieve a balance between effective regulation and increasing the contestability of markets. Much has been done by transition countries to reform and adapt policies and regulatory regimes for service industries. Figure 2 plots three indicators of the extent of policy reform in banking, non-bank financial services, and infrastructure. These indices, constructed by the European Bank for Reconstruction and Development (EBRD), range from 0 to 4.3, and span the period 1990–2004.[5] The value of the indices is set at zero for 1989, so that the 2004 value provides a measure of the progress that has been made by countries in converging to "best practice" standards—measured by a maximum value of 4.3. Data are available annually for the 1990–2004 period.

Figure 2: *Services Reform Index, 2004*
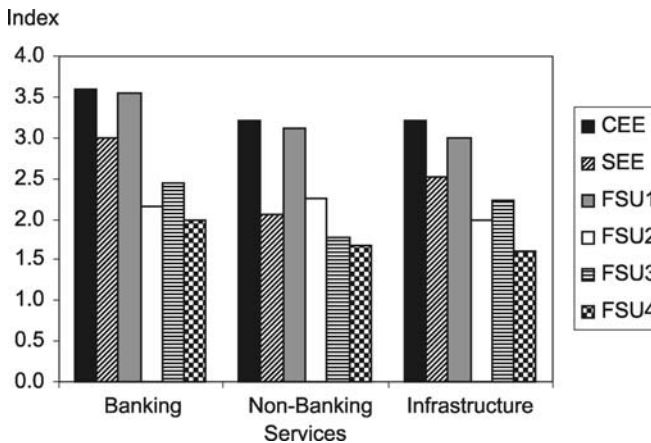
Source: EBRD (2004).

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[5] See Appendix for more detailed information on the construction of the EBRD reform indices.

Central and East European (CEE) and Baltic states (FSU1) have made the most progress in all three services policy areas. For the other transition countries there is significant variation across indices. SEE have advanced the most on reforms in banking and infrastructure, followed by the Caucasus (FSU3), while European CIS countries (FSU2) have done the most in the non-bank financial area, followed by SEE. The Central Asian republics have made the least progress in all three areas, with one country—Turkmenistan—not advancing at all in any area.[6]

While significant progress has been made by many transition economies in services reforms, there is also substantial cross-country heterogeneity in terms of liberalization and the quality of the regulatory framework for key "backbone" services. Differences in policy reforms are reflected by differences in FDI in services. This is confirmed by the correlation coefficients in the Appendix Table A1 relating investment climate and the combined service sector reform variables to the stock of FDI as a share of GDP.[7] The higher coefficient for the services reform variable relative to the investment climate indicator is suggestive of the important role service-related policies may play in attracting FDI.

The goal of this paper is to investigate whether reforms have had a positive effect on output growth for the countries under consideration. Standard economic growth theory postulates that growth is a function of capital and labor inputs. It accords no special role to services. Services play a more prominent role in the literature on financial sector development (see Levine 1997 for a survey), which recognizes that financial intermediaries do not simply passively convert savings into physical investment. Instead, temporary or permanent growth effects of capital accumulation and productivity improvement are supported by financial intermediaries (banks, capital markets) that actively mobilize savings and channel these toward profit-maximizing investment opportunities. Another strand of the growth literature that (implicitly) emphasizes a services dimension stresses the importance of human capital and R&D in generating growth (e.g., Lucas 1988; Romer 1990).

The role of producer services of the type captured by the infrastructure services reform index in the growth process has not attracted much

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[6] For a more detailed discussion of the evolution of services policies in transition economies, see Eschenbach (2006) and World Bank (2005).

[7] As discussed in the Appendix, the investment climate reform variable measures progress in terms of privatization, price liberalization (including the foreign exchange regime), and corporate governance.

attention in the theoretical or empirical growth literature. Francois (1990) develops a model that points to the importance of such producer services for economic growth, although his model is not dynamic. He argues that the increasing importance of producer services in modern economies reflects economies of scale and specialization. As firm size increases and labor specializes, more activity needs to be devoted to coordinating and organizing the core businesses of a company. This additional activity is partly outsourced to external service providers. The associated organizational innovations and expansion of "logistics" (network) services yields productivity gains that in turn should affect the economy-wide growth performance by enhancing the efficiency of production in all sectors. The associated cost reductions can have the effect of upgrading overall productivity, and are likely to be enhanced by, if not conditional on, increased FDI in services (Konan and Maskus 2006; Markusen et al. 2005).[8]

In what follows we explore the impact of financial and infrastructure services policy reforms on growth using time-series data for a panel of 24 transition economies covering the 1990–2004 period.[9] Tables A1 and A2 describe the data sources and provide pair-wise correlation coefficients, respectively. We exclude three countries for which the coverage of macroeconomic data over time is poor (Turkmenistan, Serbia/Montenegro, Bosnia/Herzegovina). We start with simple OLS country fixed effects regressions[10] (Table 4). The dependent variable is the growth rate of per capita GDP. In most of the literature, the main factor driving growth is assumed to be investment (e.g., Levine and Renelt 1992). Transition economies experienced large swings in investment in the first half of the 1990s, with the collapse of central planning and the initial lack of market institutions leading to sharp reductions in investment (Roland 2000; Falcetti et al. 2002). Subsequently, a gradual buildup of a domestically and externally financed private capital stock occurred. This well-known U-shaped pattern of output and investment collapse and recovery suggests that the *change* in the investment ratio may be used as an alternative to the investment-GDP ratio as a measure of investment.[11]

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[8] Most of the quantitative analyses of the impact of services policy reforms has used static applied general equilibrium models. These find that services policies are important for welfare—e.g., Konan and Maskus (2006).

[9] See Mattoo et al. (2006) for a complementary, cross-sectional analysis of the effects of service sector policies on growth.

[10] The fixed effects model allows to some extent for heterogeneity across countries.

[11] In the empirical analysis we do not use several variables that are often used in growth regressions. These include measures of human capital, trade openness and initial per capita

Table 4: *Per Capita GDP Growth and Service Sector Policies in a Panel of 24 Transition Economies*

	OLS fixed effects							Two-stage least squares fixed effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Independent variables											
(a) Investment/GDP	0.67 (0.74)										
(b) Δ Investment/GDP		0.56 (5.97)***	0.39 (4.73)***	0.28 (3.80)***	0.32 (4.21)***	0.28 (3.93)***	0.21 (3.06)***	0.61 (4.26)***	0.69 (4.73)***	0.69 (4.53)***	0.82 (5.31)***
(c) Inflation			−0.002 (−4.50)***	−0.0011 (−2.68)***	−0.0012 (−3.06)***	−0.001 (−2.66)***	−0.0006 (−1.49)	−0.001 (−2.69)***	−0.001 (−3.00)***	−0.0004 (−0.75)	−0.0007 (−1.54)
(d) Crisis			−16.36 (−8.29)***	−12.1 (−6.90)***	−13.23 (−7.36)***	−12.23 (−7.00)***	−9.13 (−5.44)***	−10.9 (−5.85)***	−11.73 (−6.06)***	−8.74 (−3.98)***	−10.09 (−4.75)***
(f) Finance				8.29 (10.26)***				7.71 (8.93)***		13.32 (7.11)***	
(g) Infrastructure					6.8 (8.81)***				6.3 (7.75)***		10.35 (6.54)***
(f) Service						8.47 (10.28)***					
(g) Invclim							8.87 (13.01)***				
Instruments								exogenous variables= (c), (d), (f) plus: first lag of (a)	exogenous variables= (c), (d), (g) plus: first lag of (a)	exogenous variables= (c), (d) plus: first lag of (a), first lag of growth, Gastil	exogenous variables= (c), (d) plus: first lag of (a), first lag of growth, Gastil
R-squared	0.01	0.09	0.29	0.37	0.37	0.38	0.44	0.38	0.37	0.34	0.34
No. of obs.	348	332	329	329	329	329	329	329	329	322	322

t-values in parentheses. *** denote significance at the 1 percent level.

The reduced form models (1) and (2) test the alternative hypotheses of a linear vs. non-linear relationship between investment and growth. Investment/GDP is statistically insignificant (model 1), while the change in the ratio is significant. Thus, the initial collapse and the subsequent recovery in GDP growth was associated with changes in the rate of change in investment at a fast pace: first falling and subsequently rapidly growing investment ratios. We therefore use the change in investment in the regressions. In model (3) we account for inflation and crisis. Inflation, a measure of macroeconomic stability, is expected to have a negative impact on growth. Crisis is a dummy variable that equals one in years when countries experienced armed conflict or a major financial crisis. It captures conflicts affecting Georgia, Armenia, Azerbaijan, and Tajikistan and the financial crises in Russia and Albania. These events will be captured in part by other variables, but not completely, and we want to control for them explicitly in any event. Both variables have the predicted sign and are statistically significant at the 1 percent level.

In models (4) and (5) we add the annual EBRD reform indices that were discussed previously, the premise being that service sector policy reform affects growth indirectly by supporting FDI inflows as well as the efficiency of domestic investment. The indices are constructed to reflect finance and infrastructure policy frameworks in a relatively broad sense (see Appendix 1 for details). Both indicators are significant at the one percent level. The coefficients suggest, ceteris paribus, that a one point increase in the reform index (scaled from no reform=1 to 4.3) is associated with an increase in the per capita growth rate of 6.8 (Infrastructure) and 8.5 (Finance) percentage points. Given the huge differentials in growth rates during the observed period this is not as large as it appears, but still amounts to a sizeable impact. The analysis of the model fit suggests that the reform indices add substantial explanatory power (the R^2 increases from 0.29 in model (3) to 0.37 in models (4) and (5)). The banking sector reform measure has a slightly larger effect in explaining observed growth than does the infrastructure policy reform variable. In those transition economies where financial intermediation existed during the 1990s, the output col-

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income. The reason is that our country sample is quite specific in the sense that all experienced a sharp fall in output in the first half of the 1990s, notwithstanding relatively high levels of human capital. Also, trade volumes during the early transition do not reflect integration with world markets but rather traditional COMECON barter trade relations. As a result of these factors, conditional convergence is not observed in the data, and including these variables, yields rather counterproductive results.

lapse was much less pronounced and the subsequent recovery occurred at a faster pace.[12] Strengthening the financial sector and bolstering confidence in the private commercial banking sector by improving the policy framework therefore is of great importance.[13] Indeed in many of the countries in question, potential depositors still shy away from banks and credit remains influenced by or subject to direct or indirect government control. As discussed above, the policy reform agenda in infrastructure spans many dimensions, including pro-competitive regulation of public providers—tariffs that reflect costs and provide incentives for providers to pursue efficiency improvements, ensuring access to networks and interconnection on reasonable terms, and the development of effective, independent regulatory bodies.

In models (6) and (7) we alternatively use the service sector reform and the investment climate indices (introducing these variables jointly gives rise multicollinearity, see Table A1). They both cover a broader spectrum of economic activities and therefore turn out to have slightly more explanatory power than Finance and Infrastructure alone. The investment climate in particular relates to industrial and other sectors as well, and not just to services.

In models (8) through (11) we repeat the exercise of models (4) and (5) using two-stage least squares regression analysis so as to take into account the potential simultaneity bias in the relationship between growth and investment (models (8) and (9)), and, in addition, between growth and the reform stance (models (10) and (11)). The lag of the investment/GDP ratio is highly correlated with the current change in the investment/GDP ratio, but exogenous to current GDP growth, making it a useful instrument. The results are similar, with the coefficient estimate of the investment variable being somewhat higher on average than in the OLS regressions. The reform indices, however, lose very little, if any, explanatory power.

In models (10) and (11) we take account of the fact that reform and economic performance are to some extent simultaneously determined. We hypothesize that the sectoral regulatory policy reforms will be more effective if the economy is already on a stable growth path and if the political framework has been changed so as to have generated (allow for) greater

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[12] Campos and Coricelli (2002: 29ff) and Roland (2000) discuss the importance of missing and underdeveloped credit markets in the early transition period.
[13] This spans adoption of and compliance with good practice standards defined by organizations such as the IMF, BIS, and IOSCO, including credible and effective implementation-cum-enforcement by regulatory authorities.

accountability for outcomes. We therefore use the lag of per capita GDP growth and the Gastil index as instruments for our two reform indices.[14] The coefficients of our reform indices are much higher now, and remain statistically significant. The result suggests there may be a "virtuous circle" in which recent economic performance and progress toward political freedom make current reform measures more effective in stimulating growth.[15]

4 Conclusions

Controlling for a number of standard explanatory variables used in the growth literature (investment, crises, inflation), we find a statistically significant positive association between per capita GDP growth and measures of service sector policy reforms. Two-stage estimates hint at a "virtuous circle" in which growth and political reform foster the efficiency of reform, which in turn stimulates growth. Although the sample of countries was limited to transition economies—annual policy reform indicators of the type compiled by the EBRD do not exist for developing countries—the findings indicate that services policies should be considered more generally in empirical analyses of economic growth. Services such as finance, telecommunications, and transport are major inputs into the production of goods and services—including agriculture as well as manufacturing. The costs of these inputs can account for a major share of the total cost of production, and are thus important factors affecting the competitiveness of firms. Services are also important determinants of the productivity of workers in all sectors—education, training, and health services are key "inputs" into the formation and maintenance of human capital. Thus, service sector reforms potentially can do much to enhance economic growth and efficiency.

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[14] The Gastil index is a measure of the extent of democratic accountability and political freedoms in a country. It is reported by Freedom House. It is based on responses to an annual survey involving 10 political rights questions (grouped into three subcategories) and 15 civil liberties questions (grouped into four subcategories). The index ranges from 1 (most free) to 7 (least free). See http://www.freedomhouse.org/template.cfm?page=35&year=2005. See also Table A1.

[15] The first stage regressions, not reported here, clearly show a positive association between the degree of political freedom/civil liberties as reflected in the Gastil index and lagged per capita GDP growth on the one, and the reform measures on the other hand.

Appendix

The EBRD Services Reform Indices

The index ranges from 1 (little progress) to 4.3 (most advanced implementation of reform agenda) and has been compiled on an annual basis for the 1990–2004 period.

1. *Finance* = average of the following two banking and non-banking reform indicators:

- *Banking and interest rate liberalization:* A 4.3 means full convergence of banking laws and regulations with BIS standards, provision of full set of competitive banking services.
- *Securities markets and non-bank financial institutions:* 4.3 means full convergence of securities laws and regulations with IOSCO standards, fully developed non-bank intermediation.

2. *Infrastructure* = average of the following five infrastructure reform indicators:

- *Electric power:* 4.3 means tariffs cost-reflective and provide adequate incentive for efficiency improvements. Large-scale private sector involvement in the unbundled and well-regulated sector. Fully liberalized sector with well-functioning arrangements for network access and full competition in generation.
- *Railways:* 4.3 means separation of infrastructure from operations and freight from passenger operations. Full divestment and transfer of asset ownership implemented or planned, including infrastructure and rolling stock. Rail regulator established and access pricing implemented.
- *Roads:* 4.3 means fully decentralized road administration. Commercialized road maintenance operations competitively awarded to private companies. Road user charges reflect the full costs of road use and associated factors, such as congestion, accidents, and pollution. Widespread private sector participation in all aspects of road provision. Full public consultation on new road projects.
- *Telecommunications:* 4.3 means effective regulation through and independent entity. Coherent regulatory and institutional framework to deal with tariffs, interconnection rules, licensing, concession fees, and spectrum allocation. Consumer ombudsman function.
- *Water and waste water:* 4.3 means water utilities fully decentralized and commercialized. Fully autonomous regulator exists with complete authority to review and enforce tariff levels and quality standards. Widespread private sector participation via service/management/lease contracts. High-powered incentives, full concessions and/or divestiture of water and waste-water services in major urban areas.

3. *Service* = average of Infrastructure and Finance

4. *Invclim* = investment climate measure, the average six EBRD reform indicators:

- *Large-scale privatization:* 4.3 means standards and performance typical of advanced industrial economies; more than 75 percent of enterprise assets in private ownership and significant progress on corporate governance of these enterprises
- *Small-scale privatization:* 4.3 means standards and performance typical of advanced industrial economies; no state ownership of small enterprises; effective tradability of land.
- *Governance and enterprise restructuring:* 4.3 means standards and performance typical of advanced industrial economies; effective corporate control exercised through domestic financial institutions and markets, fostering market-driven restructuring.
- *Price liberalization:* 4.3 means standards and performance typical of advanced industrial economies; complete price liberalization with no price control outside housing, transport and natural monopolies.
- *Trade and foreign exchange system:* 4.3 means standards and performance typical of advanced industrial economies; removal of most tariff barriers; membership in WTO.
- *Competition policy:* 4.3 means standards and performance typical of advanced industrial economies; effective enforcement of competition; unrestricted entry to most markets.

Source: EBRD (2004).

Table A1: *Pair-Wise Correlation Coefficients of Variables Used in Panel Analysis*

	No.	1	2	3	4	5
Growth	1	1				
Investment/GDP	2	0.10	1			
Δ investment/GDP	3	0.30	0.35	1		
Inflation	4	−0.30	−0.13	−0.05	1	
Crisis	5	−0.42	−0.03	−0.17	0.20	1
FDI/GDP	6	0.35	0.31	−0.01	−0.24	−0.12
Finance	7	0.51	0.16	0.17	−0.27	−0.32
Infrastructure	8	0.48	0.14	0.15	−0.23	−0.26
Service	9	0.51	0.16	0.16	−0.26	−0.30
Invclim	10	0.59	0.03	0.23	−0.28	−0.31
Gastil	11	−0.17	−0.15	−0.07	0.15	0.28

Table A1: *continued*

	No.	6	7	8	9	10	11
Growth	1						
Investment/GDP	2						
Δ investment/GDP	3						
Inflation	4						
Crisis	5						
FDI/GDP	6	1					
Finance	7	0.72	1				
Infrastructure	8	0.78	0.88	1			
Service	9	0.78	0.97	0.97	1		
Invclim	10	0.68	0.89	0.82	0.88	1	
Gastil	11	−0.44	−0.65	−0.63	−0.67	−0.56	1

Table A2: *Documentation of Data Used in Panel Analysis*

Variable	Definition	Source
Growth	Per capita GDP growth	World Bank, WDI
Investment/GDP	Gross fixed capital formation in percent of GDP	IMF WEO
Δ Investment/GDP	Change in investment/GDP ratio	IMF WEO
Inflation	Consumer price inflation	IMF WEO
Crisis	Dummy for financial crisis/armed conflict	n.a.
FDI/GDP	Stock of FDI as percent of GDP	WIIW[a]
Finance	Average of EBRD reform indices on banking and non-banking financial sector, see Appendix for details	EBRD Transition Report
Infrastructure	Average of EBRD reform indices on infra-structure (telecom, rail, road, water, power), see Appendix for details	EBRD Transition Report
Invclim	Average of EBRD reform indices on privat-isation and liberalization, see Appendix for details	EBRD Transition Report
Service	Average of Invclim and Infrastructure, see Appendix for details	EBRD Transition Report
Gastil	Average of Civil Liberties and Political Rights indices	Freedom House

Sample countries

Albania	Czech Republic	Latvia	Russia
Armenia	Estonia	Lithuania	Slovak Republic
Azerbaijan	Georgia	Macedonia	Slovenia
Belarus	Hungary	Moldova	Tajikistan
Bulgaria	Kazakhstan	Poland	Ukraine
Croatia	Kyrgyz Republic	Romania	Uzbekistan

[a] Wiener Institut für Internationale Wirtschaftsvergleiche.

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