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Economic Growth and Employment in Eastern Europe and Central Asia

Raimundo Soto

Documentos de Trabajo en Estudios Asiáticos No. 11
Octubre 2014

Documentos de Trabajo en Estudios Asiáticos

Pontificia Universidad Católica de Chile (UC)

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Octubre 2014

[1] The usual disclaimer applies

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1. Introduction

The economic development of Eastern Europa & Central Asia (ECA) countries in the last two decades is marked by the transition from a planned economy to a market economy and their progressive re-insertion in the world economic community. The path has not been easy for most countries as the physical and social cost of the massive restructuring of their economies have been dire. In the early 1990s all countries suffered from collapsing economic activity, industrial and financial disarray, and soaring unemployment. Some economies suffered also from high inflation. The 2000s, on the contrary, have been years of recovery in all economies and outright bonanza in a few of them. Countries benefited from the discipline brought upon firms by increasing market competition as a result of foreign trade opening, market de-regulation, and privatization while the retrenching of the government from productive activities gave way to individual initiative and creativity. Some countries also benefited from ample external funds in the form of foreign direct investment.

In this generally positive outlook ECA economies have transformed and benefited from rejuvenation in varying degrees depending on their initial backwardness, the wisdom of the policies implemented and, to a lesser degree, their good fortune in terms of natural resources, location, institutional fabric and other determinants of their insertion in global markets. Massive economic restructuring is a costly, lengthy and risky process: resources have to be relocated, non-profitable businesses have to be terminated, and emerging opportunities seized. Institutions have to be adjusted or created altogether to meet new, more challenging demands in efficient, non-corrupt manners. Political capacity is also needed to maneuver promptly and swiftly to ameliorate the social costs of restructuring for some groups in society and secure the benefits for the majority of the population.

The policy responses to the challenges of modernization in ECA has been mixed and their fate also heterogeneous. Some economies embraced economy wide, far reaching reforms and transformations, while others advanced rather timidly. Some ECA economies have been quite successful in this process while others have struggled for a long time to return to shape. Shocks and transformations elsewhere in the world have also affected this process. High commodity prices have played a significant role in fostering growth in the last decade, in particular the windfall received by resource-rich ECA countries exporting oil, gold or diamonds. The emergence of East Asia and China as leading trade partners of the developed economies increased external competition for ECA countries in semi-manufactured consumer and investment goods, although they also opened the door to substantially large markets. Finally, a buoyant international financial market provided ample access to resources to ECA for both investment and market development.

The recent global crisis put a transitory stop to the golden decade of the 2000s. Financial flows dried up, commodity prices collapsed and external demand plummeted. While globally the gross domestic product contraction was about two percent between 2008 and 2009, in ECA it was

more than four percent. In 2009, output in 20 of 29 Eastern European and Central Asian economies[2] contracted and only Central Asian countries appeared to have been spared from the downturn. However, such contraction in activity proved to be short-lived: by 2011 GDP had regained positive growth in all but one country (Slovenia) and (unweight) regional output growth had reached 4.5% year on year basis.

Although the setback in activity appears to be a transitory phenomenon, employment was disproportionally affected by the crisis. Between 2008 and 2009 employment declined in 18 of the 29 economies. Inasmuch as history repeats itself, the response of ECA economies to previous suggests that the excess sensitivity to economic downturns is a defining trait of ECA's labor markets and that recovery in employment take long time to materialize. By 2010, employment was around 5% below its pre-crisis level in 9 economies and unemployment rates were on the rise.

The recent global downturn proved the vulnerability of small open economies in Eastern Europe and Central Asia to foreign shocks. This, of course, is a well-learned lesson from previous crisis in other regions of the world. While the upswing of open economies is sweet, the downswing tends to quite painful. Much of the harshness of the downswings depends on the ability of countries to avoid the build-up of imbalances prior to the crisis and to adjust quickly to changing environments during the downturn. A poorly operating labor market can play a crucial role in deepening the crisis, while a well-oiled one can soften the costs by allowing changes in the intensive margin (intensity of use of workers) to cushion against the otherwise inevitable adjustment in the extensive margin (layoffs). In this regard, ECA economies portray precisely this tension: a number of countries entered the crisis with high and possibly chronic unemployment levels (e.g., the Balkans and the smaller CIS[3] economies) while others had already achieved single-digit unemployment rates by the mid-2000s. In almost all economies unemployment increased as a result of the crisis but in those where adjustments in the intensive margin were significant, unemployment rates are returning to pre-crisis levels faster.

This paper reviews the long-run growth and employment experience of ECA economies in the last two decades. The task is ambitious as there is a remarkable heterogeneity among these countries in initial conditions, the quality of the implemented policies and reforms, and their economic outcomes. Therefore the goals are three. First, to identify the stylized facts characterizing the evolution of the different economies from a macroeconomic viewpoint and in terms of comparative long-run growth (in section 2), the evolution of foreign trade (section 3), the performance of labor markets (section 4) and the sources of economic growth (section 5). Second, to study the determinants of employment in the period 2000-2011 and evaluate the role in creating employment of sustained economic growth, changes in real wages, the retrenchment in public employment and the concomitant decline in public employment, and the expansion in foreign trade. Econometric evidence on this is presented in section 6. Section 7 provides the conclusions and main stylized facts, while the most technical aspects are relegated to a set of appendices.

[2] Kosovo is excluded from the analysis due to lack of data.
[3] Commonwealth of Independent States

2. Comparative growth analysis

When analyzing the economic performance of ECA countries it is important to benchmark them against the rest of the economies in the world. This allows controlling for cross-country international phenomena and transient shocks. I consider first real GDP per capita at PPP prices as an encompassing indicator of economic development as well as a proxy of the welfare levels of the population.[4] Naturally, equalizing welfare with GDP per capita ignores issues derived from the very diverse income distributions that characterize countries in different regions and suffer from the limitations of national accounts, but it allows for easier comparison across countries and in time. In Table 1 I present data for around 187 economies of the world, grouped by geographic area. I use simple averages (non-weighted) for regional comparisons because in ECA, as well as other regions, large economies tend to dominate regional averages and trends. In ECA, Russia and Turkey would dominate weighted averages while in LAC it would be Brazil, in South Asia it would be India, and in East Asia, China. I acknowledge that there is a significant heterogeneity among ECA countries and, consequently, undertake a more detailed country-by-country analysis below.

It can be seen that as of 2010, ECA countries had on average higher per-capita income than any other region in the world, excepting of course the developed economies. Average income levels, however, were still below OECD and EU standards by a significant margin. In fact, the highest income economy in ECA –the Czech Republic—would barely make it to the lowest income segment of the developed economies group, while the poorest country –Tajikistan—has income levels comparable to low-income countries in Middle East & North Africa (MENA) or South Asia. The evidence indicates furthermore that the heterogeneity (variance) in terms of income, and thereby development levels, in ECA is not significantly different than that in MENA, LAC, or East Asia & Pacific (EAP) –when excluding Hong Kong and Singapore from the latter.

Table 1
GDP per capita in ECA and other regions of the world in 2010
Constant US$ of 2005

Regions[5]	Average	Lowest	Highest
Europe & Central Asia	10,976	1,886	24,833
Middle East & North Africa	7,836	2,023	26,183
Latin America & Caribbean	9,227	999	23,041
South Asia	3,256	1,079	5,168
East Asia & Pacific	9,354	832	51,326
Sub-Saharan Africa	3,637	303	31,471
Developed economies	34,385	21,660	71,048
World	11,360	303	71,048

Source: Own elaboration based on World Development Indicators 2012, World Bank.

[4] GDP per capita based on purchasing power parity (PPP) is GDP converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. Data are in constant 2005 international dollars.
[5] The list of countries is in the appendix.

While the development levels of ECA economies may be similar to those in other emerging regions of the world, their evolution in the last two decades is markedly different. As shown in Table 2, economic growth has gone through two very dissimilar phases. First, a significant contraction in economic activity in the early 1990s as a result of the collapse of the Soviet Union, political unrest and civil wars, and the replacement of the socialist command economy –with varying degrees of intensity and success- by a private sector, market-driven economic system. For most economies in the region the 1990s amounted to *a decade lost* in terms of economic growth. Between 1990 and 1994 GDP in ECA declined on average by around 35%. The second half of the decade saw a few ECA countries recover swiftly while most other struggle to improve. On average economic growth was a modest 2.9% per year, allowing for a mild recovery of ECA's average GDP to around 80% of its level of 1990. The poor performance of ECA countries in the 1990s contrasts with the buoyancy of most other regions and the world economy, particularly in the second half of the 1990s. Even lagging regions –such as Sub-Sahara Africa—display a better performance.

The second phase is one of sustained economic growth for most ECA economies, although the initial rapid growth of the early 2000s seems to be yielding in recent years to more moderate expansions in economic activity. The majority of ECA countries have already recovered the pre-crisis income levels indicating that the first stage of the transition towards modern market economies has been completed. In fact, during the early 2000s ECA was the fastest growing region in the world and there was a significant catch-up with the mature economies of the European Union. In general terms the 2000s can be characterized as *a decade gained*.

Catching up in ECA was further fueled by differences in population growth: while in the developed economies population grows slowly but systematically, in ECA average growth rates are close to zero or even slightly negative. This is a phenomenon unique to ECA as in other regions per-capita GDP growth is significantly lower than GDP growth (by around one and a half percentage point at the world level, as shown in Table 2). Of course, this raises issues of manpower availability, on one hand, and population ageing and obsolescence, on the other, which I discuss below.

As explored below, ECA economies are notoriously heterogeneous in terms of population and economy size, as well as their endowment of natural resources. A few countries (including Azerbaijan, Kazakhstan, Turkmenistan and Russia) enjoy significant deposits of hydrocarbons and valuable minerals (gold) and, therefore, benefited from the commodity price boom prior to the recent global crisis. As shown in Table 2, this windfall is sizable as, on average, natural resource rents[6] in ECA are quite high for world standards, second only to oil-rich Arab nations in MENA. Furthermore, it can also be noted that between the 1990s and 2000s resource rents in ECA as share of GDP expanded by around four percentage points, indicating the ample magnitude of the windfall.

In the last two decades ECA countries underwent a massive restructuring of their economies from state-driven socialism to private sector-led market economies. Naturally, countries have engaged in reforms with varying levels of enthusiasm and wisdom, and while some economies have enjoyed substantial success others continue to struggle. One key indicator of the degree of

[6] Rents are defined as the volume of production times the difference between the international price and the cost of production.

success of reforms is labor productivity: if reforms are successful, labor productivity should increase on a sustainable basis and eventually converge to the standards of highly developed economies. I use real GDP per worker as a crude measure of labor productivity. It can be seen that as of the early 1990s labor productivity in ECA was well below international standards (one third of the OECD level and 15% below LAC averages), indicating a significant backwardness in the region even if we take into account that these were years of political and economic turmoil. In the subsequent recovery years, labor productivity has grown systematically –particularly in the 2000s—to achieve around 70% of the EU and leveling off with LAC and EAP.

Table 2
Main Performance Indicators in ECA and other regions of the world (simple averages)

	Europe & Central Asia	Middle East & North Africa	Latin America & Caribbean	South Asia	East Asia & Pacific	Sub-Saharan Africa	Developed Countries	World
			Real GDP growth (annual average, percent)					
1990-1994	-9.6	5.6	3.2	4.8	4.9	0.1	2.1	1.0
1995-1999	2.9	4.6	3.4	5.3	4.1	4.8	3.5	3.9
2000-2004	6.1	3.6	2.6	5.6	4.0	4.2	2.6	4.0
2005-2011	4.4	5.5	3.3	6.3	4.5	4.7	1.4	4.1
			Growth in real GDP per capita (annual average, percent)					
1990-1994	-9.9	2.2	1.7	3.3	3.0	-2.3	1.3	-0.7
1995-1999	3.0	2.0	2.0	3.6	2.4	2.1	2.9	2.4
2000-2004	6.1	1.2	1.3	3.7	2.6	1.7	1.9	2.5
2005-2011	4.1	3.0	2.1	4.6	3.1	2.4	0.6	2.7
			Total natural resources rents (percent of GDP)					
1990-1994	8.7	18.7	5.2	5.9	6.9	9.3	1.7	7.7
1995-1999	7.1	18.2	3.5	4.7	5.5	9.3	1.3	6.8
2000-2004	12.3	25.7	4.7	3.9	6.5	10.2	1.3	9.0
2005-2011	12.6	32.5	7.5	4.6	6.8	12.6	1.6	11.2
			GDP per person employed (thousands of US$ at PPP of 1990)					
1990-1994	12.0	15.2	15.3	5.4	12.9	2.4	37.1	16.2
1995-1999	12,0	14.7	16.6	6.2	15.3	2.4	40.6	17.3
2000-2004	15.4	15.3	171	6.8	17.2	2.5	43.8	18.9
2005-2011	20.0	16.7	19.2	8.1	20.3	2.9	46.3	21.3
Countries	*29*	*10*	*30*	*7*	*22*	*44*	*45*	*187*

Source: Own elaboration based on World Development Indicators 2012, World Bank.

This portrait of ECA economies vis-à-vis other regions of the world is informative of general trends but hides the very dissimilar nature of ECA countries as well as their complex interactions. The following sub-sections provide an in-depth analysis of the experiences of countries belonging to the CIS, the Balkan region, and those in the European Union to which I add Croatia and Turkey (EU+). Arguably, the latter constitutes a very different case from the rest of ECA but serves as benchmark for contrasting their experiences.

2.1.1. A decade lost

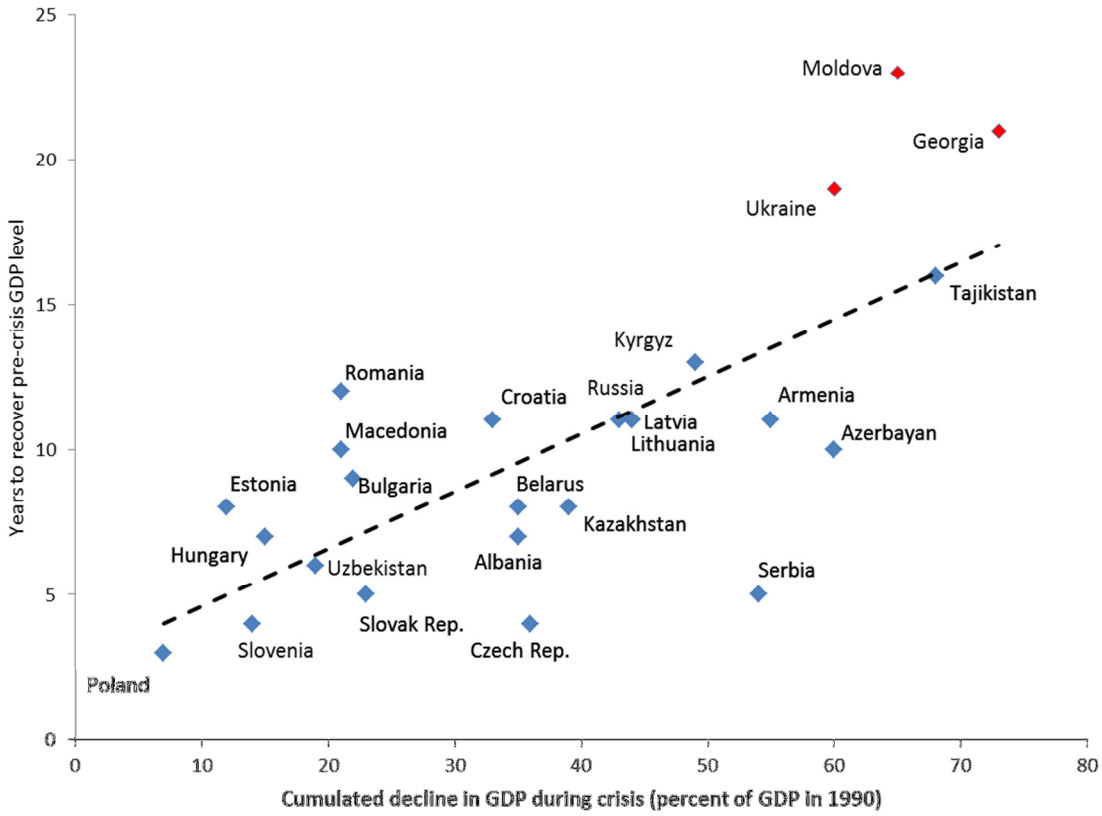
The 1990s constitute a decade lost for economic growth in ECA.[7] All economies, with the only exception of Poland and Slovenia, either contracted or stagnated in real terms. While growth in Poland was above 3% per year and helped reduce the income gap vis-à-vis developed economies, in Slovenia it was only a modest 1.5% per annum, insufficient for any catch up with European countries. Bosnia and Herzegovina grew very fast after the end of the 1992-1995 war, but it is estimated that by 1999, income was still well below the 1990 levels, thereby also falling in the lost-decade group.[8]

In this generalized negative scenario there are remarkable differences in economic performance among ECA economies in the 1990s. While for most countries the decade initiated with massive recessions, the depth and length of such downturns and the strength of their recoveries are remarkable different, as shown in Figure 1. The economies in EU+ group and the Balkans experienced deep but short-lived recessions with GDP contracting typically by around 20% to 30% in a period of three to four years, after which economic growth resumed. On the contrary, the downturns in the CIS economies lasted much longer (from five to seven years), were more profound (with cumulated declines above 50%) and were not necessarily followed by vigorous growth.

The cumulative decline in GDP in the EU+ countries was moderate when compared to the CIS economies (although quite large for the standards of international business cycles[9]). On average it was around 25% and some economies it did not reach 15%, as in Estonia, Hungary, Poland, and Slovenia. Only in Latvia and Lithuania, GDP contractions of 45% approached the levels of the CIS economies. Despite the mildness of the negative shock, recovery patterns have been quite heterogeneous. Some countries recovered quite fast –in less than five years—even if they had suffered massive contractions (e.g., the Czech Republic with an initial drop of 35% of GDP). Others endured slow recoveries for around a decade before reaching the pre-crisis GDP levels (e.g., Bulgaria, Romania) even if the initial negative shock was not significantly high (e.g., Estonia). As discussed below, the differences in recovery patterns are linked to significant differences in total factor productivity gains and the working of the labor market.

[7] Turkey is an exception to ECA's performance in that in 1990 it was already a relatively developed market economy, it did not undertake massive restructuring, and did not experience a severe depression. I therefore use it mainly as a benchmark.
[8] IMF (1998) also casts doubts on the quality of the national accounts of Bosnia and Herzegovina in the 1990s.
[9] These episodes qualify as "great depressions" according to Kehoe and Prescott's (2007) definition: "*To be a great depression, a negative deviation from trend must satisfy two conditions. First, it must be a sufficiently large deviation. Our working definition is that a great depression is a deviation of at least 20 percent below trend. Second, the deviation must occur rapidly. Our working definition is that de-trended output per working-age person must fall at least 15 percent within the first decade of the depression.*"

Figure 1
Crisis and recovery in Eastern Europe and Central Asia



Note: The "cumulated decline in GDP" measures the percent drop in GDP between 1990 and its lowest level achieved afterwards. The "years to recover" measures the number of years that passed between the lowest GDP level and its return to the 1990 level. Countries in red have not yet regained the 1990 GDP level: plotted values are the expected date of recovery based on current growth levels.
Source: Own elaboration based on World Development Indicators 2012, World Bank.

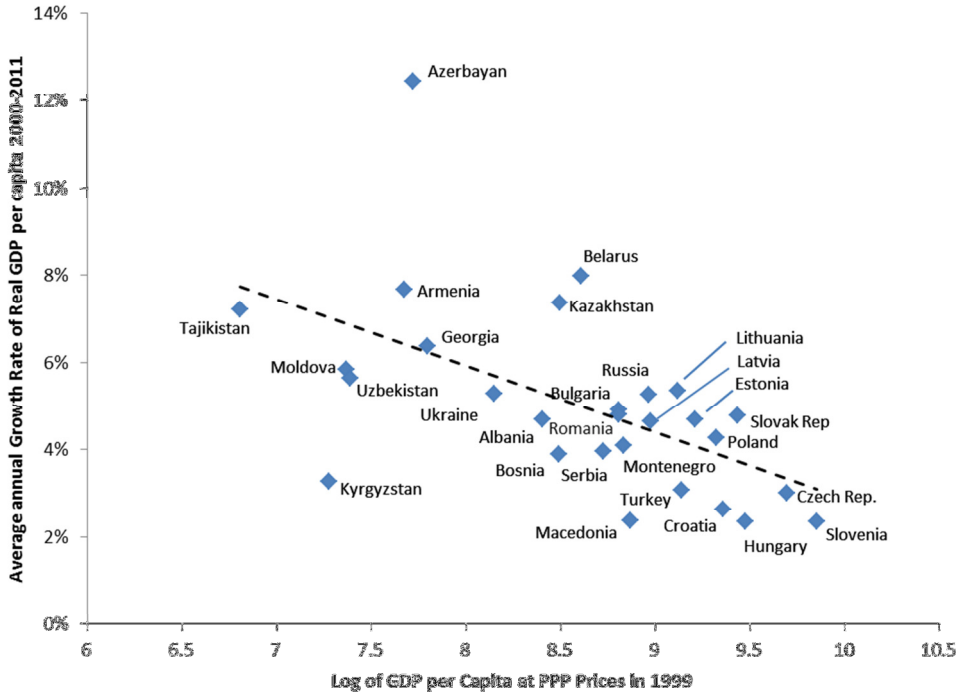
The CIS economies, on the other hand, suffered very deep, long lasting downturns. In all economies –except Uzbekistan—GDP contracted by more than 35%. In several countries economic growth after the crisis was not vigorous and, given the magnitude of the initial downturn, recoveries took much longer than in the EU+ group (around 11 years on average). Even as of today in some economies GDP has not yet regained pre-crisis levels (e.g., Ukraine, Moldova, and Georgia). Again, the hesitant recovery of the 1990s in the CIS economies is linked to productivity issues as discussed below.

2.1.2. A decade gained

While the 1990s were the years of collapse, the 2000s have been years of bonanza for most countries in ECA. As shown in Figure 2, in general lines economic growth has followed the classical convergence pattern whereby countries with initial lower levels of income per-capita tended to grow faster and to some extent catch-up with more advanced economies. As evidenced by the location of countries along the negatively-sloped regression line, the CIS economies were on average far behind the EU+ group in terms of income level by the end of the 1990s and have subsequently grown much faster. Other reasons, such as natural resource rents, have also been instrumental as discussed below.

The EU+ economies have grown in the 2000s at an average annual rate of 3.3% and in a very homogenous fashion: the fastest growth economy being Lithuania (at 4%) and the slowest being Hungary (at 1.8%). In the CIS and the Balkans, on the contrary, heterogeneity is the norm. The fastest economic growth is observed in Azerbaijan where gas-exports have fueled double-digit growth rates (at an annual rate of 13.5% on average). Lower but still quite sizable growth rates have been achieved by Armenia, Belarus and Kazakhstan. Underperformers in this group are clearly Macedonia and Kyrgyzstan. Albania, Montenegro and Serbia locate midway between CIS and EU+ economies.

Figure 2
Economic Prosperity in Eastern Europe and Central Asia



Source: Own elaboration based on World Development Indicators 2012, World Bank.

3. The Evolution of Foreign Trade

One of the most important aspects of the transition from socialist rule to market economy is the opening to foreign trade and the intensification of market competition. Several countries literally abandoned trade autarky whilst others that had previously traded with the global economy saw themselves competing without the support of the government in terms of subsidized exchange rates, forced trading with members of the political coalition, and soft-budget constraints that would allow surviving despite systematic losses.[10]

Among other things, foreign competition has increasingly brought discipline to ECA economies, it has demanded improvements in the quality of the goods sold and in the delivery conditions, it forced firms to become more efficient and required exporters to meet environmental standards. Some countries have been more successful than others and some industries within countries have been less apt to adapt than others.

Foreign trade has undoubtedly become a key aspect of economic development for most ECA economies. As shown in Table 3, foreign trade has increased markedly during the past two decades in most economies. First, note that on average for all countries, imports are significantly larger than exports, i.e., ECA has a systematic trade deficit. Such deficits are financed in the long run by surpluses in the services accounts; in the short-run capital flows can be used to finance but considering the size of such deficits the latter option would amount to accumulating unsustainable debt levels. Historically such trade deficits would have been a source of concern but nowadays trading in services has become a major industry: for example, several Eastern European economies have well developed tourism facilities that provide significant returns to the economy.

Second, note that larger economies tend to trade less than smaller economies. Trade in Russia, Turkey and Poland is significantly less than in smaller economies with similar levels of development such as Slovenia or the Czech Republic. This is a worldwide empirical regularity as documented in the literature on "gravity models of trade" which I discuss below: large-size economies can rely on domestic markets for a stable demand on which to base the development of industries and, more often than not, they count on the natural resources contained in extensive geographical areas. Economies, particularly in the western regions of ECA, are small in both size and population.

Third, the countries in the EU+ group tend to trade significantly more than those in the CIS or the Balkans. Exports by EU+ economies in the period 2000-2011 are ten percentage points of GDP higher than those of the CIS (which include energy exporters) and twenty percentage points higher than the Balkan countries. Naturally, accessing the EU provides ample opportunities to sell products in a very large and rich trade area and can explain the leadership of EU+ economies in trade. However, in order to use such opportunities producers ought to be as efficient as the "domestic" producers; therefore, the higher share of exports in EU+ countries also indicates the higher competitiveness levels.

[10] For a detailed analysis see the companion paper in Soto (2014).

Fourth and related to the previous issue, it can be seen that exports as share of GDP have increased quite significantly in the EU+ group and the Balkans but have stagnated in the CIS. The same is observed in terms of imports. As discussed below, the very different structures in terms of trade partners in ECA could provide an explanation for this regularity.

Fifth, as is the case with most markets in ECA, there is substantial heterogeneity among countries vis-à-vis trade volumes. In the last decade, a large number of economies exported around 30% to 40% of GDP, whilst very few surpassed the 50% mark typically EU+ countries.

Table 3
Foreign Trade: Export and Import Values

	Exports (as % of GDP)		Imports (as % of GDP)	
	1990-2000	2001-2011	1990-2000	2001-2011
Balkans				
Albania	13.0	25.2	41.0	48.9
Bosnia	24.4	34.4	83.2	70.8
Macedonia	38.0	44.4	47.5	63.7
Montenegro	36.8	38.2	51.1	67.4
Serbia	20.4	27.8	30.9	48.4
Average	26.5	34.0	50.7	59.8
CIS				
Armenia	30.2	23.9	57.4	44.2
Azerbaijan	39.5	55.1	47.9	39.6
Belarus	56.8	61.6	60.9	67.7
Georgia	29.2	31.3	50.5	50.4
Kazakhstan	43.1	48.5	45.6	39.5
Kyrgyzstan	35.1	46.2	47.5	67.3
Moldova	44.4	46.6	56.6	84.8
Russia	32.6	32.5	25.3	22.2
Tajikistan	53.2	35.1	59.0	65.8
Turkmenistan	66.1	65.1	67.5	52.7
Ukraine	39.1	51.7	39.2	52.5
Uzbekistan	26.3	35.8	30.6	32.0
Average	41.3	44.4	49.0	51.6
EU members, Croatia and Turkey				
Bulgaria	49.3	53.2	50.5	64.5
Croatia	45.4	41.0	50.3	46.5
Czech Republic	49.3	64.4	49.8	62.7
Estonia	71.9	74.4	79.9	77.8
Hungary	45.7	74.8	47.3	74.2
Latvia	49.8	45.8	51.0	57.0
Lithuania	47.3	57.9	53.5	64.3
Poland	23.5	36.6	24.5	38.9
Romania	25.3	31.2	31.5	39.7
Slovak Republic	56.1	78.8	60.7	81.7
Slovenia	59.8	62.1	58.1	62.5
Turkey	18.5	23.2	21.5	26.0
Average	45.2	53.6	48.2	58.0

Source: own elaboration based on World Bank database.

These stylized facts ought to be linked with the trade structure of the countries in terms of goods exported and imported as well as the trade partners of each country for several reasons. On one hand, elements such as geographical proximity, historical and cultural ties, and trade agreements usually have influence on the type of goods traded and the origin and destination of such trade. On the other hand, the endowment of natural resources and the relative availability of production factors (manpower, land and capital) also shape the nature of trade among countries. In the case of ECA the potentially overwhelming influence of Russia and the EU can also affect trade patterns as smaller economies tend to gravitate around large-size countries. In Table 4 I provide a summary of trade structures –in partners and goods—to identify stylized facts.

The results are quite clear. It can be seen that the EU is the major trading partner of all economies except a few countries in the CIS group for which Russia is the main source of imports and an important destination for exports. The importance of EU is, not surprisingly, the largest in those countries that have joined the trade union: around 60% of exports are directed to the EU from where it comes 55% of imports. However, note that Balkan countries, which are not part of the EU, trade only slightly less with around 50% of total export and imports linked to the EU. Indeed, and more strikingly, while in the CIS trade with the EU is not as important as elsewhere, the main trade partner of Russia is the EU: around 50% of all Russian imports come from the EU and, even when excluding energy, almost 40% of Russian exports go to the EU.

Russia, on the other hand, is not a major trade partner of the Balkans or the EU+ countries both in terms of a destination for exports and as a source of imports. On average less than 5% of export volumes and 10% of import volumes correspond to trading with Russia. Some EU+ economies are more dependent on Russia's exports: the Baltic countries import up to 20% of total imports from their giant neighbor.

Russia, nevertheless, is the major trade partner for the smaller economies of the CIS with only a few significant exceptions. As a destination for exports, some economies are quite integrated with Russia: Belarus, Kyrgyzstan, Moldova, Ukraine and Uzbekistan sell over 20% of total exports to the Russian markets, a figure that increases significantly if energy transactions are excluded. These economies, particularly Belarus, also import a sizable proportion of their foreign purchases from Russia. For other economies such as Armenia, Azerbaijan, Kazakhstan, Moldova and Tajikistan the Russian market is important but not dominant. Finally, for Georgia and Turkmenistan Russia represents a small share of their trade volumes.

Beyond identifying stylized facts, the importance of scrutinizing the structure of trade in terms of partners and goods lies in determining the diversification of ECA economies: trade diversification is an important mechanism to reduce the risk inherent to participating in international markets. The risk can be split in two components. First, the lack of diversification in terms of exported goods, whereby countries that concentrate on a few goods (in the limit, mono-exporters) tend to pass-on to the economy the wide fluctuations that characterize commodity prices. Second, the lack of diversification in terms of partners, whereby economies tend to become dependent on the business cycles of another country (e.g., Russia or the EU).

Table 4
Foreign Trade: Goods and Partner Structures, 2010

	Exports to (as % of total exports)		Non-Energy Exports to (as % of total non-energy exports)		Imports from (as % of total imports)	
	Russia	European Union	Russia	European Union	Russia	European Union
Balkans						
Albania	0.5	58.1	0.6	56.9	3.4	62.0
Bosnia	0.3	43.8	0.3	43.9	1.9	36.4
Macedonia	1.3	57.1	1.3	58.5	7.2	43.4
Serbia	5.4	44.4	5.4	45.1	9.3	43.8
Average	***1.9***	***50.9***	***1.9***	***51.1***	***5.5***	***46.4***
CIS						
Armenia	14.3	52.1	14.3	51.8	18.7	33.3
Azerbaijan	2.7	67.4	30.2	12.3	18.2	34.9
Belarus	37.2	27.7	54.4	10.4	62.7	18.1
Georgia	5.5	32.5	7.1	26.4	10.7	29.1
Kazakhstan	10.3	53.5	24.6	26.9	34.7	28.4
Kyrgyzstan	33.6	7.1	34.3	6.9	20.0	8.3
Moldova	26.3	27.0	26.4	27.1	12.0	27.6
Russia	-	49.4	-	37.0	-	52.1
Tajikistan	17.6	40.7	17.6	40.8	25.3	6.8
Turkmenistan	1.4	10.8	8.9	12.3	17.4	27.4
Ukraine	23.7	20.4	24.3	19.4	26.5	30.8
Uzbekistan	23.6	12.7	30.0	15.6	24.9	16.7
Average	***17.8***	***33.4***	***24.7***	***23.9***	***24.6***	***21.1***
EU members, Croatia and Turkey						
Bulgaria	2.4	55.8	2.7	60.3	9.9	50.0
Croatia	1.5	52.1	1.6	55.7	7.2	56.2
Czech Rep.	2.3	70.3	2.3	70.5	4.3	65.8
Estonia	8.8	61.8	9.8	60.5	12.0	55.4
Hungary	3.2	67.0	3.2	67.3	6.2	63.0
Lithuania	10.3	49.8	13.3	49.2	22.4	44.5
Latvia	7.2	52.1	8.4	49.9	15.1	41.2
Poland	4.4	69.8	4.4	69.8	8.6	65.8
Romania	1.7	62.8	1.8	66.6	5.3	58.1
Slovak Rep.	3.1	62.8	3.2	63.7	8.5	47.6
Slovenia	3.6	61.7	3.6	61.9	1.1	72.5
Turkey	4.1	58.5	4.2	59.6	11.9	50.5
Average	***4.4***	***60.4***	***4.9***	***61.3***	***9.4***	***55.9***

Source: own elaboration based on UN TRADECOM database.

4. The Performance of Labor Markets

While vigorous economic growth and recovery seems to be a general characteristic of the region in the 2000s, the performance of the labor markets is distinct and very heterogeneous. Heterogeneity comes from both sides of the labor market. On one hand, there are important differences in the behavior of the labor supply in terms of population growth and participation rates. I review these issues first. On the other hand, there are also noticeable differences in labor demand in terms of the sectorial distribution of workers and the role of the public employment. I review these issues in the second part of this subsection.

Naturally, this heterogeneity produces quite different outcomes in the labor markets of the economies of ECA. Unfortunately the data on labor market outcomes are quite restricted and frequently of weak quality. In the third part I therefore focus on three market outcomes for which there is some systematic information: average labor productivity, real wages, hours worked, and unemployment. Information for other market outcomes–such as underemployment—is largely missing (particularly for CIS countries). Data are occasionally distorted for political reasons (e.g., official unemployment rates systematically below 1% in some Central Asia countries).

4.1. Labor supply

The supply side of the labor market depends largely on the size and growth of the population and the participation rate of the economically active population. The latter is customarily defined as the ratio of the population that participates in the labor force and the overall size of their cohort (national population of the same age range), usually those between 15 and 65 years of age. These variables do not respond to short-term fluctuations in the economy, moving slowly in time and largely in response to structural changes in society. I therefore treat them as exogenous forces in the analysis of the labor market performance in ECA; considering our interest in analyzing the last decade this does not seem to be very restrictive.

Population in many ECA countries is stationary; in the period 1990-2011 total population has remained virtually unchanged in Albania, the Czech Republic, Hungary, Kazakhstan, Moldova, Montenegro, Poland, the Russian Federation, Serbia, the Slovak Republic, and Slovenia. On the other hand, it has declined by more than five percent in another eleven countries (Armenia, Bulgaria, Bosnia and Herzegovina, Belarus, Croatia, Estonia, Georgia, Latvia, Lithuania, Romania, and Ukraine). In only seven countries population increased more than five percent between 1990 and 2010: Azerbaijan, Kyrgyzstan, Macedonia, Tajikistan, Turkey, Turkmenistan and Uzbekistan. When compared to other regions in the world, it can be seen that population growth in ECA economies is extremely slow for any standard. In fact, it is even slower than in the demographically mature economies of the Eurozone. Only in Turkish countries population grows at the world level.

This phenomenon determines, to some extent, the development path of ECA countries as they cannot count on an expanding population to provide additional manpower in the labor market.

A stationary or declining population indicates that countries have achieved some demographic maturity and suggests also that adjustment in the labor market would most likely take place in the intensive margin (higher use of existing resources) and not in the extensive margin (increase in resources). I return to this issue below.

In addition to very stationary population, ECA countries are characterized by the evolution of participation rates that do not contribute to the extensive margin. The data in Table 5 indicate that in ten countries participation rates have either remained practically stagnant or declined slightly (Azerbaijan, Bosnia and Herzegovina, Hungary, Kyrgyzstan, Kazakhstan, Latvia, Macedonia, Russia, Turkmenistan, and Uzbekistan). Furthermore, participation rates declined in 16 economies, ranging from Tajikistan (where the decline has been around one percentage point) and Moldova (with a drop of 14 percentage points). In only in Slovenia participation rates have expanded in the last 20 years by around two percentage points.

The general trend towards lower participation rates may be the result of several forces at work usually dubbed "push" and "pull" factors (see Becker, 1965). In most market economies, evidence suggests that participation changes with phenomena such as the entry/exit of women from the labor force, changes in retirement periods and pension levels, expansions and contractions in the informal sector, and the abolishment of discriminatory practices against women. It should be noted, however, that a large number of countries in ECA have higher participation rates than the European standard and, therefore, there may be a tendency in these countries to converge the Eurozone as a result of the homogenization in working conditions, particularly in those countries that are already member of the EU (e.g., Czech Republic, Estonia, Lithuania, Latvia, Romania, Slovak Republic).

The combination of stationary population and stable or declining participation rates indicate that the supply of national workers tends to be quite stable and that labor-market conditions may be primarily determined by labor demand. In fact, the labor force has remained stagnant or declined in the last 20 years in 17 ECA countries. Considering the size of the downturns in the early 1990s and the reputedly high education levels of the labor force, it comes as no surprise that ECA countries tend to show very significant levels of out-migration. The lowering of migratory barriers by Western European economies in the 1990s facilitated migration. In the last two columns of Table 5 I collected data on the stock of nationals living abroad and its share in national population. It can be seen that in only three economies (Czech Republic, Poland and Russia) there is net immigration (i.e., the number of nationals living abroad is smaller than the number of foreigners living in the country) while in another two economies migration is not an issue (Estonia and Slovenia). In all other ECA countries outmigration is significant, being extremely high in Balkan countries (Albania, Bosnia and Herzegovina, and Macedonia), quite high in some CIS countries (Armenia, Azerbaijan, Georgia and Moldova) and comparatively moderate in the economies of EU+ group. The gross out-migration in some countries is compensated by a significant inflow of migrants –e.g., Belarus, Russia—indicating an important labor mismatch.

Table 5
Main Demographic Indicators

	Population Growth Rate (annual average, %)		Participation Rates (average, %)		Population outside country in 2010	
	1990-2000	2001-2011	1990-2000	2001-2011	Millions	Share of Population (%)
Balkans						
Albania	-0.7	0.3	63.4	60.7	1.35	42.1
Bosnia	-1.5	0.2	45.1	44.8	1.45	38.6
Macedonia	0.5	0.2	54.3	53.9	0.33	16.1
Serbia	-0.1	-0.3	-	62.4	0.20	2.7
Average	***-0.5***	***0.1***	***54.3***	***55.5***	***0.83***	***24.9***
CIS						
Armenia	-1.4	0.0	66.2	60.1	0.55	17.9
Azerbaijan	1.2	0.9	63.3	63.8	1.33	14.6
Belarus	-0.2	-0.3	62.5	56.4	0.68	7.2
Georgia	-0.8	0.1	65.7	64.1	0.90	20.1
Kazakhstan	-0.9	0.8	69.7	70.1	0.65	4.0
Kyrgyzstan	1.1	0.8	65.6	65.1	0.41	7.5
Moldova	-0.2	-0.2	63.7	49.0	0.39	10.9
Russia	-0.1	-0.3	62.1	61.2	-0.76	-0.5
Tajikistan	1.5	1.2	66.9	65.6	0.58	8.4
Turkmenistan	2.1	1.3	60.2	60.6	0.07	1.4
Ukraine	-0.5	-0.7	60.2	57.8	1.59	3.5
Uzbekistan	1.9	1.2	59.3	60.0	1.12	4.0
Average	***0.3***	***0.4***	***63.8***	***61.2***	***0.63***	***8.3***
EU members, Croatia and Turkey						
Bulgaria	-0.8	-0.6	55.5	52.6	1.10	14.6
Croatia	-0.8	0.0	55.5	53.0	0.17	3.7
Czech Rep.	-0.1	0.2	61.1	59.2	-0.06	-0.6
Estonia	-1.4	-0.2	63.0	59.8	0.00	0.0
Hungary	-0.2	-0.2	50.8	49.9	0.18	1.8
Lithuania	-0.6	-0.5	63.1	57.7	0.30	9.1
Latvia	-1.2	-0.5	61.9	59.1	-0.06	-2.5
Poland	0.1	-0.1	59.1	54.9	2.35	6.2
Romania	-0.3	-0.4	62.7	56.9	2.66	12.4
Slovak Rep.	0.2	0.1	61.7	59.7	0.39	7.2
Slovenia	0.0	0.3	56.4	58.7	0.00	0.0
Turkey	1.7	1.2	54.2	48.1	2.99	4.1
Average	***-0.3***	***-0.1***	***58.8***	***55.8***	***0.84***	***4.7***
Euro Area	***0.3***	***0.5***	***54.5***	***56.2***	***22.2***	***6.7***
Latin America	***1.6***	***1.2***	***63.0***	***65.3***	***30.5***	***5.1***
World	***1.5***	***1.2***	***65.9***	***64.9***	***193.6***	***2.8***

Source: Own elaboration based on World Bank (2011) and Migration and Remittances Factbook 2011.

There are three main explanations for these strong migration currents. First, prior to 1990, migration was severely limited by national authorities. As shown in Table 5, migration is a significant in the world and in the Eurozone or other emerging economies. Therefore, part of the increase in the stock of national population living abroad may reflect a simple convergence to world standards. In addition, some migratory flows observed after 1990 may be the result of relocations of ethnic groups that have been repressed in their desired of returning to their fatherlands (e.g.,

Germans in Poland). If average figures for the Eurozone or LAC are valid reference points (5% to 7%), then one can consider that out-migration has been "normal" in 13 ECA countries. However, double-digit out-migration levels require additional explanations. Political unrest –and outright civil violence—provides an additional explanation for some economies.

While these explanations are valid, it seems that economic reasons also play a significant role (Kaczmarczyk and Okólski, 2005). In the early 1990s, the transition from communist rule to market economy led to massive restructuring and significant layoffs of public employees. Such transition revealed in several countries, particularly in Eastern Europe, a significant excess supply of labor with a concomitant increase in unemployment (a phenomenon largely absent prior to 1990). The rather low level of social protection led unemployed persons (often very young, particularly school leavers and relatively low-skilled) to seek jobs in western countries and in other countries of the region. A vigorous demand for such workers in Western Europe provided additional impetus to migration.

Structural changes in trade patterns can also provide explanations for migration flows. Trade patterns were significantly affected during the transition; changes in relative prices and market size led trade within ECA to become less significant and trade with the EU more prominent. Such changes in trade structure led to changes in the structure of the demand for labor because they made certain abilities more demanded and others redundant. Workers with less demanded abilities had incentives to migrate.

4.2. Labor demand

The demand for labor in ECA, as elsewhere in the world, is largely pro-cyclical: in periods of expansion of economic activity employment also expands while in periods of recession it tends to contract. In the case of ECA economies the cyclical adjustment of the labor market has been superseded by the significant restructuring of the demand for labor as a result of the abandonment of socialist planning and, in particular the retrenchment of the public sector.

In Table 6 I present annual growth rates of employment for the 1990s and 2000s. It can be seen that employment declined in the 1990s in almost all ECA countries in the EU+ group, being the only exceptions Romania, Slovenia, and Turkey. In the majority of cases these figures represent a systematic decline in employment while in only a few they are the product of a steep initial declines and posterior recovery in employment. The U-shaped trajectory is characteristic of Bulgaria, Hungary, Romania, Slovenia and the Slovak Republic. In the 2000s, there was some expansion in employment in all economies (except Romania) although it was significant only in the Slovak Republic and Turkey. On average, employment in this group of economies in 2011 was six percent lower than in 1990/91. The case of Slovenia is notable in that it has achieved significant growth in employment despite having a largely stationary population. The case of Romania is also noticeable but for the opposite reasons: despite coping better with the downturn in the early 1990s and achieving a recovery in employment in the early 2000s, this proved to be short-lived. By 2011, employment in Romania was 14% below its level of 2000.

The case of the Balkan economies is clear cut. In Albania and Bosnia and Herzegovina there is a steep initial decline in labor demand and a posterior recovery that is insufficient to return employment levels to pre-crisis levels. In the other economies, initial employment losses were not very significant and there was a continued expansion in demand afterwards.

In the CIS, on the other hand, employment levels have evolved in markedly different ways. Employment grew in the 1990s only in countries where population was also growing (Azerbaijan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan). In fact, in these economies employment grew faster than population (compare Tables 3 and 4). Excepting Kazakhstan, in all other economies employment declined more or less at the same rate of the decline in population. In the 2000s, employment continued to grow above population growth in Azerbaijan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. In the rest of the CIS economies, employment recovered steadily albeit very slowly at less than one percent per year. As a result, employment levels in 2011 were on average ten percent below the levels of 1990-91.

When comparing the evolution of employment and GDP it is clear that there are significant lags in the long-term adjustment of the labor market; employment declined steadily in the 1990s even in economies where economic activity was recovering swiftly and did not necessarily expanded rapidly during the booming decade of the 2000s. Chronically high unemployment, as discussed below, in most economies reinforces this conclusion. Although part of the chronic unemployment could be the result of labor market mismatches (e.g., workers offering abilities no longer demanded by the private sector as a result of the transition to market economy), the persistence in unemployment indicates other deep-rooted problems including the inability to re-train the labor force (using active labor market policies), the aging of population (that makes re-training less cost-effective), and the lack of opportunities for rural workers.

Contrary to countries in other regions, in ECA public employment is a significant component of the labor demand. Furthermore, it largely shaped the evolution of employment in the past two decades. Historically, employment in most ECA countries was mainly in state agencies and state-owned enterprises while the labor demand of the private sector was minimal; unemployment was also very low as the public sector operated as the employer of the last resort. In 1991-92, the share of public employment in ECA countries was on average slightly above 80%, as shown in Table 6. Only in Turkey the private sector commanded a significant share of the labor market with around 70%, but well below the levels of developed economies (85% to 90%) or emerging countries such as Chile (over 90%). The massive restructuring of the ECA economies –including privatization, divestiture, and downsizing—led to the emergence of a vigorous private sector labor demand and the retrenchment of the public sector to around 35% in 2010 on average. The retrenchment in public employment has been remarkably similar in the three country groups (EU+, CIS and Balkans), to the tune of twenty percentage points decade on decade, but the levels remain quite different. Countries in the CIS started with extremely high levels of public employment and, while it has declined, their economies remain dominated by public employment. Countries in the EU+ group started from lower levels of public employment and some are converging to Eurozone standards.

Therefore, the observed evolution of employment reflects both market forces and administrative decisions on public-sector restructuring. However, there is no clear connection

between the size of the retrenchment in public employment and the response of the private sector, indicating that changes in total employment responded to more complex determinants than the mere substitution of one type of employer for another (as would have been by simply privatizing public firms). In some economies, public sector employment declined significantly and total employment expanded, as is the case in the Balkans (Albania and Macedonia), most of the CIS economies (except Belarus and Moldova) and the EU members (except Hungary, Lithuania and Romania).

Table 6
Total Employment, Public sector Employment, and Sectorial Employment

	Total Employment Annual Growth Rate (%)		Public Sector Employment (as share of total employment, %)		Sectorial Employment in 2008-2010		
	1990-2000	2001-2011	1990-2000	2001-2011	Agricul.	Industry	Services
Balkans							
Albania	-0.6	1.3	72.7	47.5	44.2	18.9	36.9
Bosnia	-0.9[a]	-0.6	74.3	47.9	16.1	25.0	58.9
Macedonia	0.6	1.4	70.5	44.5	19.7	31.3	49.1
Montenegro	0.7[a]	-0.6	75.1	57.0	6.8	20.9	72.3
Serbia	0.7[a]	-1.5	77.0	55.6	24.6	25.7	49.8
CIS							
Armenia	-1.5	0.3	73.5	57.8	44.2	16.8	39.0
Azerbaijan	2.1	2.6	80.2	66.5	38.5	12.8	48.7
Belarus	-1.0	-0.3	92.5	81.7	12.0	40.0	48.0
Georgia	-0.3	0.2	82.4	60.3	47.1	9.1	43.7
Kazakhstan	0.9	2.1	74.6	44.1	29.8	18.9	51.3
Kyrgyzstan	1.5	1.7	80.6	58.1	34.0	20.6	45.3
Moldova	-0.4	-2.5	74.4	51.4	31.1	19.7	49.3
Russia	-0.5	0.7	71.5	48.0	9.2	28.4	62.4
Tajikistan	2.0	1.9	77.6	60.4	44.4	9.3	46.2
Turkmenistan	3.1	2.2	-	-	48.2[j]	14.0[j]	37.8[j]
Ukraine	-1.4	0.2	76.1	52.7	15.8	23.4	60.7
Uzbekistan	2.8	2.5	88.7	69.6	34.0[k]	21.0[k]	45.0[k]
EU members, Croatia and Turkey							
Bulgaria	-2.2	0.2	71.0	38.5	7.1	35.0	57.9
Croatia	-1.5	0.3	68.0	48.5	14.1	29.1	56.8
Czech Rep.	-0.7	0.4	46.9	32.6	3.1	39.0	57.8
Estonia	-3.6	0.7	55.8	36.9	4.2	32.4	63.4
Hungary	-1.0	-0.2	55.6	33.3	4.5	31.4	64.1
Lithuania	-1.0	-0.1	69.4	44.6	8.8	27.3	63.8
Latvia	-2.8	0.5	61.5	37.2	8.5	26.0	65.4
Poland	-1.3	0.1	63.3	40.4	13.4	31.1	55.5
Romania	0.9	-1.3	63.1	39.1	29.3	30.1	40.6
Slovak Rep.	-1.8	1.2	62.7	42.7	3.6	38.4	58.0
Slovenia	0.6	0.5	60.5	45.0	8.9	33.7	57.4
Turkey	1.3	1.6	29.1	22.5	23.4	26.1	50.4

Source: Own elaboration based on World Bank data, Life in Transitions and national statistics offices.
Notes: (a) 1991-2000; (b) 1993-2000; (c) 1996-2000; (d) 1994-2000; (e) 2001-2010; (j) 2004; (k) 2006.

Finally, Table 6 contains information on the distribution of employment by sectors of economic activity. It can be seen the remarkable differences among countries: employment in the economies of the EU countries is primarily allocated to services –around 60 percent on average—

and to industry (30%) while those in the agricultural sector are usually less than 10%. On the contrary, in the CIS only Belarus, Russia and Ukraine resemble the EU economies, while in the rest countries agricultural employment is predominant (over 30% of total employment). In the Balkans, most countries are midway between EU and CIS members, except for Albania which is highly dependent on agriculture. By the same token, employment in the industrial sector is far more significant in the EU group (30%) than in the CIS (20%) or the Balkans (25%).

The size of agricultural employment is of economic significance for understanding the evolution of labor markets in ECA. In most cases, agriculture and the rural world are viewed as lagging considerably in terms of income and employment opportunities and as the main source of migration of workers (the simple correlation between the size of the agricultural sector and the share of out-migrants in population in 2010 is a staggering 49%). Often stated reasons for this backwardness are the lack of agglomeration advantages, the low endowment of infrastructure and human capital, as well as the effects of structural changes in the economy towards a growing importance of services and globalization. In ECA these problems are compounded by the nature of reforms during the early stages of the transition to market economies: according to Petrick and Weingarten (2004) "in those countries which preserved the large-scale farming structures of the collectivist era, agriculture turned out to be more tailored to global competition than in countries where substantial restructuring into small (subsistence) farms took place" (page 9). Therefore, lack of dynamism in employment creation and a source for chronic unemployment and out-migration in the non-industrial ECA countries could be the results of inadequate agricultural reforms.

4.3. Labor market outcomes

As mentioned, data on market outcomes in ECA beyond employment and average labor productivity levels are quite difficult to obtain, particularly for the 1990s. With regards to nominal wages data collection is not systematic and suffers from methodological changes, it sometimes tends to reflect mostly public-sector wages (in some CIS countries) and price deflators needed to compute real wages are unavailable for economies that suffered from high or hyper-inflation. Furthermore, data on wages tend to represent public sector wages rather than a weighted average of the latter and wages in the private sector. Data on hours are absent for most CIS and Balkan economies and when available it usually refers only to the period 2000-2010. Table 7 collects the available information.

Data on average labor productivity correspond to total GDP divided by the number of employed workers. It can be seen that productivity levels declined quite significantly in the CIS in the 1990s: the moderate decline in Belarus, Kazakhstan and Armenia contrasts with the massive collapse in Azerbaijan, Georgia, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, and Ukraine. No other country in ECA experienced as such collapse with the only exceptions of Lithuania and Serbia. The EU members suffered from less significant drops in the early 1990s and productivity recovered in the second part of the decade to return to the 1990 levels. The recovery period is characterized by productivity gains of around 3% to 5% per year in countries that are members of the EU and the

Balkans. This is a relatively high growth rate for international standards. In the CIS, however, average productivity growth is much higher on average and quite heterogeneous among countries reflecting both the lasting effects of the lost decade of 1990 and their ability to implement pro-growth policies.

Table 7
Average Labor Productivity, Real Wages, and Hours Worked

	Average Labor Productivity Annual Growth (%)		Real Wages Annual Growth Rate (%)		Average Hours Worked per Week	
	1991-1995	2001-2011	1991-2000	2001-2011	2000	2010
Balkans						
Albania	-2.4	3.6	2.7	6.5	34.8	-
Bosnia	-7.3	4.4	11.3[c]	5.7	-	42.2
Macedonia	-4.9	1.1	3.0	2.0	-	41.4
Montenegro	-	4.1	-	-	-	42.4
Serbia	-15.8	5.1	-	8.5	-	-
CIS						
Armenia	-13.3	7.3	10.6[b]	10.5	43.5	38.5
Azerbaijan	-21.3	10.7	1.0[b]	11.8	-	37.9
Belarus	-8.7	7.6	-	23.6	39.3	39.5
Georgia	-23.9	6.1	15.0	15.6	-	-
Kazakhstan	-7.8	6.0	-0.6[b]	8.9	35.0	36.0
Kyrgyzstan	-14.3	2.4	-	11.1	34.8	-
Moldova	-19.0	7.9	-	11.3	28.1	31.4
Russia	-9.4	4.0	-	11.4	38.1	38.0
Tajikistan	-25.4	6.1	-	20.7	-	-
Turkmenistan	-17.8	11.2	-	-	-	-
Ukraine	-16.3	4.2	-2.5[b]	12.8	32.5	35.3
Uzbekistan	-7.6	4.4	-	-	-	-
EU members, Croatia and Turkey						
Bulgaria	-3.5	3.6	-4.6	4.2	40.6	40.5
Croatia	-5.8	2.1	22.5[b]	1.7	40.6	39.0
Czech Rep.	-0.1	2.6	4.1[b]	2.9	43.0	40.4
Estonia	-4.4	3.6	6.1[b]	4.5	40.5	38.4
Hungary	-1.2	2.1	-0.7	2.0	40.9	39.6
Lithuania	-10.8	4.6	-4.4	3.0	39.3	38.4
Latvia	-8.9	3.3	12.3	5.3	42.4	38.4
Poland	0.0	3.9	4.6	1.2	40.6	39.6
Romania	-4.0	5.5	6.6	9.5	39.4	39.2
Slovak Rep.	-1.4	3.5	4.2[d]	2.3	41.6	39.5
Slovenia	-1.4	1.9	-1.4	0.8	41.0	38.6
Turkey	0.0	2.6	-1.8	-2.8[e]	49.8	47.4

Source: Own elaboration based on World Bank data, Life in Transitions and national statistics offices.
Notes: (a) 1991-2000; (b) 1993-2000; (c) 1996-2000; (d) 1994-2000; (e) 2001-2010; (j) 2004; (k) 2006.

The changes in real wages during and after the transition do not conform to classical market responses to changes in economic activity. The massive change in relative prices brought upon by market liberalization, privatization and, in particular, the drop in GDP and the massive public sector retrenchment would have called for a significant decline in real wages. Although the data are scarce

for the early 1990s, the evidence indicates that real wages dropped significantly in some countries with the unveiling of the economic crisis. However, real wages actually *increased* in economies that were experiencing severe contractions in both output and employment, such as Albania, the Czech Republic, Romania or Estonia. A similar behavior was observed in the late 1990s in other economies when real wages grew quite fast even though employment was declining at the same time: in Armenia, Belarus, Georgia, and Poland real wages grew at double-digit levels in the period 1995-2000 while employment was declining at significant rates.

It has been argued that nominal wages are computed largely on the basis of public sector wages and that the latter had been adjusted upwards during the crisis for political reasons and with disregard of labor market conditions. Still, as noted, the public sector was –and in some countries continues to be—the main employer so to that extent wage indices are representative of the market conditions, distorted as they may be.

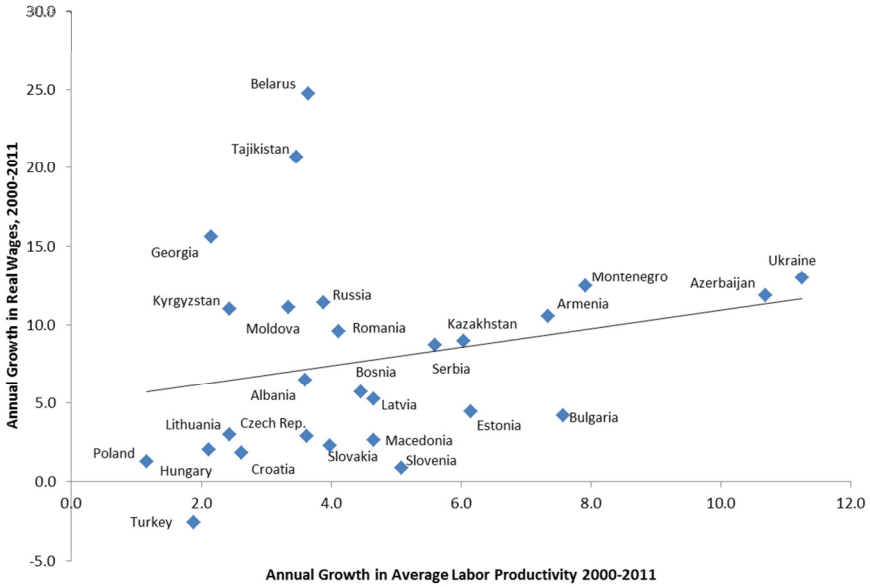
Growth in real wages in the recovery period seems to be more closely related to sustained growth in productivity levels in the majority of countries. As shown in Figure 3, there is a clear positive relationship between the average growth in labor productivity in the 2000s and the increases in real wages. Two conclusions can be highlighted from these data. First, real wage growth seems to be more contained and in line with productivity increases in the EU+ economies than in the CIS, with the only exception of Romania. In the latter real wages have increased at around 10% per year in the period 2000-2011 yet economic growth has been only around 5% per year.

In the CIS, there is a group of economies where real wages have grown quite fast in the 2000s but where average productivity levels have also expanded in a vigorous manner. This group includes oil and gas producers and exporters (Azerbaijan, Russia, and Kazakhstan) as well as two Balkan economies, Serbia and Bosnia and Herzegovina. The other group exhibits extremely high growth rates in real wages that are in excess of labor productivity increases and general growth: in Belarus, Georgia, Moldova and Tajikistan real wages increases exceed 15% per year yet productivity gains do not exceed 5%.

Perhaps one of the most intriguing outcomes of labor markets in ECA –in particular when confronted with the evolution of real wages—is the persistence of unemployment in some economies as shown in Table 8. Unemployment statistics are controversial in ECA countries as in some cases they refer to administrative data (e.g., those registered in unemployment agencies) while in others the data come from labor force surveys. Notwithstanding the limitations of the data, it can be seen that unemployment levels remained stubbornly stagnant in the period 2000-2008 in several countries despite de fact that these economies were growing at very high rates; these include all the Balkan states and most CIS economies. Only in the EU group unemployment rates declined from relatively high levels in 2000 and converged by 2008 to what can be termed as frictional unemployment. In the CIS, four economies (Kazakhstan, Moldova, Russia, and Turkmenistan) reduced unemployment significantly and leveled with the EU group. Four other CIS economies continued to display double-digit unemployment rates, despite the very fast pace of economic growth (over 6% per year in the period 2000-2011).

Figure 3

Average Labor Productivity and Real Wages



Own elaboration based on data from the World Bank.

It is, to some extent, difficult to reconcile high, chronic unemployment levels as those observed in some CIS economies or the Balkans with evidence of very high real wage growth of the period 2000-2011 (e.g., Armenia, Georgia, Tajikistan). Naturally, it may reflect a statistical artifact in that wage data may cover only a small fraction of the labor force –typically, public sector workers—and this group may not represent adequately the market stance. However, such explanation requires a rationale to justify why governments would like to raise wages far above national productivity gains.

Most likely the chronically high rate of unemployment reflects the existence of low-employability workers that tend to remain unemployed for long periods of time while real wage indices represent the evolution of employment opportunities for those who are highly employable. Long unemployment duration impairs the human capital of the unemployed and discourages job search which, in turn, reinforces the stigmatization of those unemployed for a long time as low quality workers. In this framework, labor rigidities are bad not only because they restrain labor demand from increasing but also because low and delayed hiring rates imply an increase in the duration of unemployment.

Table 8
Unemployment Rates, selected years (%)

	2000	2004	2008	2009	2010
Balkans					
Albania	14.6	14.3	13.0	13.8	13.7
Bosnia	25.2	29.1	23.9	24.1	27.2
Macedonia	32.3	37.2	33.7	32.2	32.0
Montenegro	15.6	22.5	16.8	19.1	19.7
Serbia	12.6	18.5	13.6	16.1	19.2
CIS					
Armenia	33.7	33.9	28.6	30.5	29.3
Azerbaijan	7.2	9.0	6.0	6.0	6.3
Belarus	10.1	9.8	9.7	10.1	9.7
Georgia	10.8	12.6	16.5	16.8	16.4
Kazakhstan	12.8	8.4	6.6	6.6	5.8
Kyrgyzstan	7.5	8.6	8.2	8.4	8.8
Moldova	8.5	8.2	4.0	6.4	7.5
Russia	10.6	7.7	6.3	8.4	7.5
Tajikistan	11.2	11.3	11.5	11.7	11.6
Turkmenistan	-	-	-	-	-
Ukraine	11.6	8.6	6.4	8.8	8.5
Uzbekistan	-	-	-	-	-
EU members, Croatia and Turkey					
Bulgaria	16.2	12.0	5.6	6.8	10.2
Czech Rep.	8.8	8.3	4.4	6.7	7.3
Estonia	13.1	9.9	5.5	13.7	16.9
Croatia	16.1	13.7	8.3	9.0	11.8
Hungary	6.4	6.1	7.8	10.0	11.2
Lithuania	14.2	9.9	7.4	17.2	18.7
Latvia	16.0	11.3	5.9	13.7	17.8
Poland	16.1	19.0	7.1	8.2	9.6
Romania	7.0	7.7	5.8	6.9	7.3
Slovak Rep.	18.8	18.1	9.6	12.0	14.4
Slovenia	7.2	6.2	4.4	5.8	7.3
Turkey	6.5	10.8	11.0	14.0	11.9

Source: The ILO's KILM database 7th edition (2012) and World Bank (2012).

4.4. Adjustment in the extensive/intensive margins

Adjustments in the labor market occur in two dimensions or margins. First, the number of workers can be adjusted as needed for production purposes. This is usually called the *extensive margin*. Second, firms can adjust the intensity of the effort (number of hours worked) by each worker. This is usually called the *intensive margin*. Modern market economies usually employ both margins as the optimal economic response to changes in demand and the business cycle. The reason for using both margins is that the hiring and firing workers in response to production needs tends to be a costly process. In addition to the entry and exit costs (recruiting costs, severance payments and the like), there is uncertainty about the true productivity of new workers and about the future availability of equally qualified personnel once a downturn is over.

In principle, there is a wealth of information arising from the study of both margins. For example, when hiring/firing costs are too high or when firm-specific human capital is an important component of costs, then adjustments would tend to occur in hours more than in workers as employers would find it in their advantage to avoid laying-off workers. On the contrary, in economies where job schedules are rigid or part-time employment is penalized and where human capital is not important, then adjustments would tend to rely more on the number of workers.

Adjustments in the extensive margin are also limited by the availability of manpower in some ECA countries. As mentioned above, population growth is in general extremely low and in some countries it is negative, while participation rates tend to be relatively high and stable. In principle, this limits the capacities of an economy to use its extensive margin during an economic boom (increase employment) and forces the adjust more on the intensive margin (increase hours per worker). Likewise, the scarcity of workers gives incentive to employers to retain manpower during downswings and rely on adjusting hours. In ECA, economies can also recourse to migration to adjust for lack of national workers –as has been the case in the past—but this is of course slow and quite costly. I therefore expect the use of the extensive margin to be more pronounced in the seven economies identified above, while in the rest adjustments in the intensity should be the norm.

The availability of data on hours worked for ECA countries –which is needed to compute the changes in the intensive margin—is unfortunately very limited and to some extent unreliable (for example, underemployment is usually not measured). The underlying surveys used to construct these series, whether sampling establishments or the labor force, are not uniform across countries and, in some cases, for the same country at two different dates. In general, there are no data available before 2000, thus limiting our comparative analysis to the last decade, and only for a handful of countries. Information on the Balkan economies and the CIS is much weaker and scarcer.

In Table 9 I present the available data on the growth of total hours worked and its decomposition into the growth in employment (extensive margin) and the growth in the average number of hours worked by workers (the intensive margins). It can be seen that the information on total hours is available for the EU economies but quite scarce for the countries in the CIS and the Balkans. Six economies do not provide any information on hours worked (Georgia, Azerbaijan, Tajikistan, Turkmenistan and Uzbekistan). In the latter four of these economies, relatively high population growth would indicate that there is space for adjusting the extensive margin.

Prior to the recent global economic crisis –in the period 2000-2004—the changes in total hours worked largely reflect the evolution along the extensive margin in eight economies: Albania, Belarus, Bulgaria, Estonia, Hungary, Poland, Russia, and Turkey. I consider any change in the number of hours worked by a worker below 0.5% to be negligible (in a workweek of 35 hours it would amount to less than two hours). In two economies –Kyrgyzstan and Ukraine—there was an increase in both employment and hours worked per worker. In Moldova and Romania, somewhat paradoxically, hours per worker increased at the same time that employment was declining further fueling unemployment issues. Finally, in several EU+ countries worked hours per worker declined by around 1% per year but while in Lithuania, Latvia, Slovenia and the Slovak Republic the

reduction in effort per worker was partially compensated by higher employment levels, in the Czech Republic it was purely an intensive margin adjustment.

Table 9
Adjustments in the Extensive and Intensive Margins of the Labor market

	Annual growth in total hours worked (%)			Annual growth in employment (%)			Annual growth in hours worked per worker (%)		
	2000-04	2004-08	2008-10	2000-04	2004-08	2008-10	2000-04	2004-08	2008-10
Balkans									
Albania	1.2			1.1	1.7	0.5	-0.1		
Bosnia			-2.5	0.9	-1.6	-1.5			-1.0
Macedonia			1.2	-1.8	3.9	2.6			-1.4
Montenegro			-2.5	-2.0	1.7	-2.9			0.3
Serbia				-2.0	1.7	-7.8			
CIS									
Armenia		-2.6		-0.5	1.0	0.9		-3.6	
Azerbaijan				2.1	3.5	2.6			
Belarus	0.2	-1.1		-0.2	-0.8	-0.6	0.5	-0.3	
Georgia				-0.1	-0.2	1.4			
Kazakhstan		2.3		2.1	2.3	2.7		0.0	
Kyrgyzstan	2.5			1.4	2.6	1.4	1.1		
Moldova	-0.1	-1.7		-2.4	-2.1	-5.1	2.3		
Russia	0.8	1.4	-0.9	0.6	1.4	-0.4	0.2	0.0	-0.5
Tajikistan				1.2	2.0	2.5			
Turkmenistan				2.1	2.2	2.1			
Ukraine	2.1	1.2		0.4	0.9	-1.1	1.7	0.4	
Uzbekistan				2.6	2.9	3.0			
EU members, Croatia and Turkey									
Bulgaria	-0.1	3.8	-5.1	-0.1	3.5	-4.6	0.0	0.3	-0.6
Czech Rep.	-1.1	1.3	-1.3	-0.1	1.6	-1.2	-1.0	-0.4	-0.1
Estonia	1.5	2.2	-8.8	1.4	2.6	-6.7	0.1	-0.3	-2.2
Croatia		1.0	-3.1	1.1	1.4	-2.5		-0.4	-0.6
Hungary	-0.1	-0.2	-1.9	0.4	-0.2	-1.3	-0.5	-0.1	-0.6
Lithuania	-0.3	2.0	-7.0	0.6	1.1	-6.0	-0.9	0.9	-1.0
Latvia	1.4	1.5	-10.0	2.2	2.6	-8.8	-0.8	-1.1	-1.2
Poland	-1.0	3.7	-0.5	-1.0	3.9	0.2	-0.1	-0.2	-0.8
Romania	-2.8	-0.4	-1.3	-3.6	0.2	-0.8	0.8	-0.7	-0.5
Slovak Rep.	-0.1	3.7	-2.1	0.9	2.9	-2.5	-1.0	0.7	0.4
Slovenia	0.6	1.3	-0.9	1.5	1.0	-1.1	-0.9	0.3	0.2
Turkey	-0.8	1.9	2.6	-0.5	2.2	3.3	-0.2	-0.2	-0.6

Source: Own elaboration based on data from World Bank (2012), ILO (2012) and Eurostat (2012).

Adjustments in the labor market in the booming years of 2004 to 2008 were comparable to those in the previous period. Twelve economies adjusted primarily along the extensive margin either expanding or contracting employment but refraining from changing working hours (Belarus, Kazakhstan, Russia, Ukraine, Bulgaria, the Czech Republic, Estonia, Croatia, Hungary, Poland, Slovenia, and Turkey). In Lithuania both margins contributed equally to the increase in total hours worked demanded by firms while in the Slovak Republic there was more reliance in the extensive margin. In Armenia, Romania and Latvia worker's efforts declined while employment increased.

In summary, during the years of sustained and vigorous growth that characterize the "decade gained" most ECA economies tended to adjust primarily using the extensive margin. It is difficult to explain the rationale of this strategy because in most of these economies there are significant limitations on the supply side of the market as mentioned as the result of stagnant population and declining participation rates. Naturally, institutional restrictions –e.g., labor market regulations—could explain the rigidity in labor markets to adjust along the intensive margin.

On the contrary, during the recent crisis adjustments in the intensive margin have been more significant. Around one third of the significant drop in total hours worked in Bosnia and Herzegovina, Estonia, Hungary, Russia and Romania was the result of lowering the average hours worked per worker, the rest corresponding to lower employment. A minor yet still significant adjustment in the intensive margin was observed in Bulgaria, Estonia, Croatia and Lithuania. Adjustment in Poland also relied primarily on the intensive margin. The rest of the economies adjusted primarily using the extensive margin.

5. Sources of Economic Growth

The above analysis of growth rates and the identification of trends in employment and real wages allow us to identify several stylized facts but do not provide an explanation for such phenomena. Such stylized facts indicate very dissimilar patterns of growth after the 1990's crisis and demand an explanation of why some countries quickly recovered and maintained a fast economic pace while other stagnated or struggle to achieve a slow recovery. They also demand some understanding of why growth rates vary so much in the CIS and Balkan economies and tend to be quite homogeneous in the EU+ group of countries.

Economic growth is the result of the accumulation of factors (physical and human capital, hours of work and employment effort) as well as increases in the efficiency of use of such factors. Decomposing the contribution of each type of factor is useful to understand a significant part of the dynamics of economic growth. I therefore use growth accounting to answer the following questions: What portion of the performance of the economy can be accounted for by differences in inputs of factors like capital and labor? What portion can be accounted for by differences in the efficiency with which these factors are used? Were the differences in recoveries due mostly to differences in paths for factor inputs, like capital and labor, or were they due to differences in productivity?[11]

[11] Growth accounting is based on national accounts and other official statistics. Therefore, it is limited by the quality and veracity of official statistics.

5.1. Methodology

When computing the sources of growth I follow Solow (1956) and use a simple, aggregate Cobb-Douglas production function of the form[12]:

$$GDP_t = A_t \mu_t KS_t^{\alpha} \left(L_t^{\beta} HK_t^{1-\beta}\right)^{1-\alpha} \quad (1)$$

where KS_t is the stock of capital, L_t is the use of the labor force, and HK_t is the stock of knowledge or human capital. Variable A_t is an indicator of the efficiency in the use of factors and μ_t is an indicator of the occupation rate of resources. The combination of the latter two elements is popularly known as total factor productivity or TFP. Parameters α and β are constants. The validity of the Cobb-Douglass specification in economies dominated by energy exports is doubtful as hydrocarbon exports are generally characterized by economics rents. Its use here is to maintain comparability among the 26 countries in our sample.

I compute TFP as:

$$TFP_t = A_t \mu_t = \frac{GDP_t}{KS_t^{\alpha}\left(L_t^{\beta} HK_t^{1-\beta}\right)^{1-\alpha}} \quad (2)$$

Our definition of TFP, therefore, encompasses not only technological capacity but also the efficiency in the use of labor, human capital, and physical capital. In this view, several elements could affect factor productivity beyond the technical ability to mix inputs and generate goods and services. For example, poor government regulation leading to lower use of capital and, thus, lower production is interpreted as declining TFP. On the other hand, an improvement in the education and training of the labor force is interpreted as increasing TFP. This interpretation of TFP links naturally with the analysis of long run economic growth.

As mentioned, this measure of TFP –which stems from Prescott (1998) pioneering research– is richer than what standard economic theory assumed: in addition to the impact of technological advances, productivity depends on the framework in which economic agents make decisions to work, invest, and consume. Consequently, TFP can be affected by the quality of macro and microeconomic policies and transient phenomena, such as commodity booms or unemployment cycles.

To some extent, the measurement of GDP and consequently that of TFP are sensitive to transient phenomena. In the case of energy exporting economies oil-price shocks can be very significant. As noted by Kehoe and Ruhl (2008), however, terms of trade shocks do not directly taint the computation of TFP using the sources of growth method because national accounts do not register price changes (they are based on Laspeyres quantity indices). However, caution ought to be exercised as indirectly they can filter through demand booms (imports and consumption via income effects).

[12] A detailed description of the methodology is in the appendix.

5.2. Main results

The following stylized effects can be collected from Table 10. First and foremost, in almost all ECA countries economic growth in the period 2000-2011 is mainly the result of TFP gains. I find that, while important, physical and human capital accumulations are not the main driving force of economic growth. Around 70% of the average growth rate of all ECA economies is due to increases in total factor productivity.

Second, I find that most of the differences in economic growth in the decade resulted from the different paths of productivity. Countries with relatively slow growth, such as Hungary, Slovenia, and Macedonia, are also countries where TFP gains are also the smallest. Even in the fast-growing group of CIS countries, Kyrgyzstan displays both the lowest GDP and TFP growth.

Third, employment levels have played a very minor role. In the EU+ group employment levels have not contributed at all to growth, with the only exception of Turkey. This, of course, is linked to the stagnated or declining population in these economies coupled with a very high and quite stable participation rate in the labor force. As mentioned, these elements limit expansions in the use of manpower. The situation is more heterogeneous in the Balkans and in the CIS where, as discussed, some economies have suffered from massive outmigration and thus a negative contribution of employment to growth (Serbia, Belarus, Moldova, and Montenegro). Other economies have had very moderate expansions in employment with the notable exception of energy-rich economies –such as Azerbaijan and Uzbekistan— where the growth rate of labor is above 0.7% (still below world average).

Fourth, human capital, which is major explanation for observed differences in economic growth and income levels in other regions of the world, plays a minor role in ECA. There are two reasons for this. First, human capital levels –measured by school achievement—tend to be very similar among countries and relatively high compared to other regions of the world. Second, the data covers only the years 2000 to 2010, a period that is too short to observe significant changes in schooling levels. Notwithstanding this, human capital accumulation has contributed more in Latvia, Lithuania and Turkey among EU+ economies and in Azerbaijan and Belarus in the CIS.

Fifth, physical capital accumulation is an important source of economic growth in most economies. In the some high income countries of EU+ it has played a relatively minor role (see Czech Republic, Hungary and Slovenia) but in others economies physical capital accumulation contributes to around on third of the GDP growth rate. Note that in the latter case, the range of contribution is notably narrow –between 1.3% and 1.5%. Heterogeneity is much higher in the CIS. On one hand, resource rich economies tend to invest significantly more than the rest of countries, thereby assigning to capital accumulation a significant role in GDP growth (Azerbaijan, Kazakhstan, and Uzbekistan). In other economies, physical capital accumulation has been significantly small (Georgia, Kyrgyzstan, and Russia) or even negative (Moldova, Tajikistan and Ukraine).

Table 10
Sources of economic growth, 2000-2011

	GDP growth	Contribution to growth of			TFP Gains
		Physical Capital	Human Capital	Employment	
Balkans					
Albania	5.1	1.9	0.1	0.4	2.7
Bosnia	4.0	2.9	na	-0.1	1.2
Macedonia	2.7	0.2	1.0	0.4	1.1
Montenegro	3.5	0.8	0.1	-0.1	2.7
Serbia	3.6	1.0	0.1	-0.4	3.0
CIS					
Armenia	7.5	2.5	0.0	0.0	4.9
Azerbaijan	13.3	2.1	0.8	0.7	9.3
Belarus	7.1	2.2	1.2	-0.1	3.7
Georgia	5.9	0.4	0.0	0.0	5.5
Kazakhstan	8.3	1.5	0.2	0.6	5.9
Kyrgyzstan	4.3	0.7	0.0	0.5	3.0
Moldova	5.0	-0.3	0.1	-0.6	5.9
Russia	5.2	0.2	0.1	0.3	4.5
Tajikistan	8.3	-0.6	-0.1	0.6	8.4
Turkmenistan	14.1	4.8	na	0.8	8.5
Ukraine	4.5	-0.4	0.1	0.0	4.8
Uzbekistan	6.8	1.2	-0.4	0.8	5.2
EU members, Croatia and Turkey					
Bulgaria	4.0	1.5	0.1	0.0	2.4
Croatia	3.1	0.6	0.1	0.1	2.3
Czech Rep.	2.5	1.0	0.2	-0.1	1.4
Estonia	4.7	1.4	0.1	0.1	3.0
Hungary	2.1	0.6	0.1	0.0	1.4
Lithuania	4.1	1.5	0.3	0.1	2.2
Latvia	4.4	0.7	0.3	-0.1	3.5
Poland	4.0	1.3	0.1	-0.1	2.6
Romania	4.0	1.2	0.1	-0.4	3.0
Slovak Rep.	4.4	0.8	0.0	0.3	3.3
Slovenia	2.6	1.3	0.1	0.1	1.0
Turkey	4.5	1.5	0.3	0.4	2.3

Source: own elaboration based on data from World Bank (2012), KILM (2012) and Barro and Lee (2012).
Note: Human capital data for Bosnia and Herzegovina and Turkmenistan are not available. Its contribution to economic growth is assign to TFP.

While TFP has been the main force behind economic growth in ECA and an explanation for the differences in performance among countries, the reasons for the differences in TFP growth among countries are not themselves explained. There is a substantial empirical literature linking TFP gains with economic reforms, such as trade opening, privatization, market deregulation, etc. Such literature suggests also that reforms tend to yield sizable initial TFP gains but are in need of further, more specialized reforms to sustain such gains. The evidence collected in this paper indicates that TFP growth in most ECA countries was very rapid in the late 1990s and beginning of the 2000s, but has slowed down noticeably in the 2005-2011 period. That is the case of all EU+ economies except the Czech Republic, Poland and the Slovak Republic, where TFP growth is exactly the same in both periods of time. Likewise, in all economies in the CIS TFP growth slowed down

noticeably in the period 2005-2010, except Azerbaijan and Uzbekistan where productivity growth has remained high and stable. The most worrisome cases are in the Balkans where TFP growth declined to around 1% in all economies, thus curtailing GDP growth significantly.

From our growth accounting exercise, I therefore conclude that the only reforms that are promising as explanations for the differences in success in the ECA region are those that economic theory dictates would show up primarily as differences in productivity, not those that would show up as differences in factor inputs.

6. The Determinants of Employment

The previous section has provided a set of stylized facts regarding the evolution of the economies of ECA countries, including several related to the demand for labor and total employment. Among others, the pro-cyclicality of labor demand and the dependency of employment of economic cycles, the importance of public employment and its retrenchment from around 80% of total employment in 1990 to 35% in 2010, the difficulty in reconciling real wage adjustments and changes in employment and economic activity, and the persistence in unemployment levels.

As a result of these elements, casual inspection of the data found no clear connection between the retrenchment in public employment and the response of the private sector and that changes in total employment responded to more complex determinants than the mere substitution of one type of employer for another (as would have been by simply privatizing public firms).

In this section I extend a very simple and standard model of labor demand to accommodate these stylized facts, in particular the role of public employment and foreign trade. The analytical model is the estimated using panel data for the period 1992-2011, the longest data available. Finally, the estimated model is use to predict employment levels and measure the contributions to employment creation of economic activity, real wages, public employment and foreign trade.

6.1. A simple model of the labor market

The labor market is modeled in a very simple fashion in view of the restrictions on the availability and quality of the data in ECA countries. I specify a demand for labor stemming from the production function of a stand-in firm and the supply of labor of the representative consumer, in a context where possibly there is unemployment. An appendix provides the details of the model.

Almost all labor demand models are specified so as to include a scale variable (typically GDP), factor prices (real wages and cost of capital) and an indicator of the cost of intermediate

inputs.[13] Assume that there are only three inputs in the economy: capital (*K*), labor (*L*), and an intermediate imported good, *M*. The aggregate cost function for production level, *Y*, is then:

$$C_t = w_t L_t^* + q_t K_t^* + x_t M_t^* = C(Y_t, w_t, q_t, x_t) \tag{1}$$

where *w* is the real wage, *q* is the cost of capital, and *x* is the cost of the imported intermediate factor. Superscript * denotes levels of employment, capital, and intermediate goods that are consistent with output level *Y*. The derived demand for each factor can be obtained by direct minimization of the cost function for each output level. In the case of the labor:

$$L_t^d = \frac{\partial C(Y_t, w_t, q_t, x_t)}{\partial w_t} = L(Y_t, w_t, q_t, x_t) \tag{2}$$

Log-linearizing equation (2) allows us to have an estimable model:

$$Log\, L_t^d = \alpha_0 + \alpha_1 Log\, Y_t - \alpha_2 Log\, q_t - \alpha_3 Log\, w_t - \alpha_4 Log\, x_t \tag{3}$$

with homogeneity condition $\alpha_2 + \alpha_3 + \alpha_4 = 0$. The model in equation (3) is an equilibrium condition for the labor market. In that sense it represents a long-run condition; it may not verify period by period, but it must be fulfilled in the long run. For that reason, right hand side variables are called "fundamentals" hereafter.

For the empirical estimation there are two methodological options. I could estimate equation (3) for each economy but this would be subject to the problems of missing data in some economies and the short period of estimation available for most economies (1992-2011 at best). I prefer, therefore, to use a panel data econometric estimation which allows pooling of the data for a group of economies –so that estimated parameters are common to all countries included in a group—while retaining individual characteristics (or *country specific effects)* that determine the level of employment in each economy. Therefore, the estimated model is re-written as:

$$Log\, L_{it}^d = \alpha_i + \alpha_1 Log\, Y_{it} - \alpha_2 Log\, q_{it} - \alpha_3 Log\, w_{it} - \alpha_4 Log\, x_{it} + \varepsilon_{it} \tag{4}$$

where sub-indices *it* refer to country and year, respectively; α_i is the country specific effect and ε_{it} is the country specific perturbation term.

The supply of labor follows the classic specification of a representative agent that maximizes a utility function that depends on consumption and leisure (the time complement of work) and subject to a wealth restriction and the expected wage, i.e., the wage times the probability of finding a job which is set at $(1 - \mu_t)$ and where μ_t is the unemployment rate. The derived supply function is:

$$\log L_t^s = \beta_0 + \beta_1 \log Y_t + \beta_2 \log w_t + \beta_3 \log(1 - \mu_t) \tag{5}$$

[13] See Hammermesh (1986) for a detailed analysis.

Higher levels of non-labor income, wages and lower unemployment increase the supply of labor. The demand and supply for labor interact to determine employment levels in a context of unemployment. The following reduced-form model (see Appendix 3 for details on the derivation):

$$\log L_t = \theta_0 + \theta_1 \log Y_t + \theta_2 \log w_t - \theta_3 \log q_t - \theta_4 \log x_t - \theta_5 \mu_t \qquad (6)$$

All parameters are positive except for the wage-elasticity which depends on two underlying forces: on one hand, higher wages reduces the demand for labor; on the other hand higher wages increase the supply of labor. Which effect predominates is a matter of empirical analysis.

As derived, equation (6) mostly describes the labor market in the private sector. The demand for labor in the public sector in ECA, as amply discussed in section 2, does not follow this type of economic rationale and, in particular in the period of analysis, it has been largely determined by political and administrative considerations rather than by the strict economic calculus. Therefore I modify equation (6) in two ways: first, I restrict the dependent variable to be *private employment* and, second, I include public employment (L^g) as a regressor. There are two reasons for the latter adjustment. First, to acknowledge the fact that some workers had been transferred to the private sector during the reforms. Second, in most ECA economies the supply of manpower is quite limited and, whenever unemployment levels are low, the public sector competes with the private sector for workers: therefore, the retrenchment in public employment equates to an increase in the supply of labor for the firms.

I also extend the analytical model to acknowledge the importance of foreign trade. As discussed above, trade volumes have changed quite noticeably since the transition to market economies started in the early 1990s. The opening of markets and the deregulation of foreign transactions have had a profound impact in the different industries, with some being sectors able to expand whilst other being less fortunate. I use exports and imports as share of GDP to capture the economic transformation of ECA countries. I expect exports to have a positive impact on private employment, although the ability of ECA exporters could be precisely in modernizing and laying off low-productive workers. The a-priori impact of imports on employment is ambiguous: on one hand, higher import levels could indicate a contraction in import-substituting exports and a subsequent decline in the demand for labor. On the other hand, higher import levels could also reflect an expansion in the purchase of imported intermediate goods to be used in producing exportable and non-traded goods, thereby an expected expansion in employment.

The complete specification of the model for private-sector employment $\left(L_{it}^p\right)$ is:

$$\log L_{it}^p = \alpha_i + \alpha_1 \log Y_{it} + \alpha_2 \log q_{it} + \alpha_3 \log w_{it} + \alpha_4 \log x_{it} + \alpha_5 \log L_{it}^g + \alpha_6 \log T_{it} + \alpha_7 \mu_t + \epsilon_{it} \qquad (5)$$

$$\log L_{it}^p = \alpha_i + \alpha_1 \log Y_{it} + \alpha_2 \log q_{it} + \alpha_3 \log w_{it} + \alpha_4 \log x_{it} + \alpha_5 \log L_{it}^g + \alpha_6 \log X_{it} + \alpha_7 \log M_{it} + \alpha_8 \mu_t + \epsilon_{it}$$

In the empirical estimation I use *total GDP in real terms (US$ of 2005)* as the scale variable, the *real wage index* whenever available (or the nominal wage index adjusted by CPI inflation), the *real, ex-post interest rate on loans of 1 year maturity* (supplemented by the deposit rate, when needed), and the *real exchange rate* (2005=100) as a measure of imported intermediate goods. To

this I add, as mentioned, public employment and foreign trade. The estimation period is 1992 to 2011 and I eliminated two countries –Turkmenistan and Uzbekistan— for lack of data on real wages, private employment, and interest rates. I use lagged right-hand side variables as instruments to avoid simultaneity biases and use Hausman tests for the choice of fixed vs. random effects.

The results of the estimation are presented in Table 11. I first present the results for a model including all 27 economies (pooled model). It can be seen that the estimated model is not satisfactory: although some of the estimated parameters match the standard prior of having a positive scale-elasticity and negative elasticity for the cost of imported intermediate goods and capital cost, the estimated parameters are imprecisely estimated. Tests on the residuals also confirm the pooled model as inappropriate. Therefore, I turn to country-group models. The choice of groups follows the discussion in Section 2, i.e. CIS, Balkans and EU+, but I acknowledge that, from an econometric viewpoint, this is arbitrary. Empirical determination of groups or clustering would require better and more extensive data than available.

Table 11
Econometric estimation of labor demand models
Fixed effects panel-data, 1990-2011

	All countries	EU+	Balkans	CIS
GDP	0.290***	0.210***	1.399***	0.256***
	(0.058)	(0.058)	(0.319)	(0.098)
Real wages	0.074***	-0.078**	-0.416**	0.117***
	(0.017)	(0.030)	(0.125)	(0.025)
Cost of Capital	-0.022	-0.0030	0.023*	-0.001
	(0.044)	(0.064)	(0.014)	(0.001)
Real Exchange Rate	0.018	0.073***	0.032	-0.191***
	(0.025)	(0.023)	(0.075)	(0.056)
Public Employment	-0.534***	-0.576***	-0.741***	-0.799***
	(0.046)	(0.058)	(0.116)	(0.097)
Exports	0.217***	0.112**	-0.081	0.281***
	(0.029)	(0.043)	(0.080)	(0.044)
Imports	-0.171***	-0.032	-0.153	-0.275***
	(0.046)	(0.054)	(0.134)	(0.086)
Unemployment	0.041	-0.505***	-1.497*	0.725***
	(0.184)	(0.208)	(0.550)	(0.288)
Observations	387	202	56	129
Countries	27	12	5	10
Within R^2	0.79	0.86	0.91	0.78
F-test	171.47	254.02	41.51	195.66
Hausman test	177.40	107.68	37.33	87.24

Note: ***, **, * significant at 99%, 95% and 90%, respectively.

The country group models are more satisfactory. First, Hausman tests validate the choice of the fixed effects estimator over the random effect model; therefore, the simulations below are based on consistent –yet potentially inefficient—estimators. Second, the models display reasonable fit to the data considering the high heterogeneity of the countries and the low quality of the data for some economies. Third, in general terms the estimated parameters match theoretical predictions but the differences in estimated elasticities highlight the convenience of estimating separate models for each country group as they have very different sensitivities to fundamentals.

The estimated parameters for the scale variable are similar in the EU+ and CIS groups but much smaller than that of the Balkans. It should be noted that the number of countries in this latter group is very small and that estimates can be imprecise (the fixed-effects estimator convergence in the number of countries and not in the tome periods). The estimated wage elasticity is negative in the EU+ and Balkans groups suggesting that, given a relatively fixed labor supply, wages respond mainly to changes in the demand for labor. On the contrary, in the CIS the estimated parameters is positive indicating the important role of a growing labor force on real wages. The cost of capital has the expected negative sign in the case of the EU+ and CIS but it are not significant. In the Balkans it is positive. The estimated parameter for the real exchange rate –the proxy for the cost of imported goods—is negative in the CIS group and positive in the EU+. The most interesting results are in the strong and significant negative parameters associated to public employment which are remarkably similar in the three groups. The elasticities are smaller than one indicating that it is not a one-to-one relationship: for example, a 10% decline in public employment would only expand private employment between 6% and 8%. Likewise, the estimated coefficient for export is positive and quite significant in the EU+ and CIS groups, while it is not-significant in the Balkans. Arguably, the size of the estimated coefficient is large only in the CIS. On the other hand, the estimated coefficients for imports are negative but only significant in the CIS case. While estimated parameters may appear to be large or small, our interest is in the contribution of each factor to observed changes in employment in each country as discussed in the next section.

6.2. Decomposing employment growth

The estimated parameters indicate that private employment increases with higher foreign trade, higher economic activity and lower public employment. Likewise, in the EU+ group and the Balkans private employment declines with higher wages and capital costs. However, to understand fully the role of these fundamentals it is necessary to measure their contribution to observed changes in private employment in the recent years. I focus on the period 2000-2010 and use the estimated parameters to decompose the observed changes in employment as follows:

$$\Delta\%\, L_{it}^{p} = \hat{\beta}_1\, \Delta\%\, Y_{it} + \hat{\beta}_2\, \Delta\%\, q_{it} + \hat{\beta}_3 \Delta\%\, w_{it} + \hat{\beta}_4 \Delta\%\, x_{it} + \hat{\beta}_5\, \Delta\%\, L_{it}^{g} + \hat{\beta}_6\, \Delta\%\, X_{it} + \hat{\beta}_6\, \Delta\%\, M_{it} + \hat{\beta}_6\, \Delta\%\, \mu_{it} + \hat{\sigma}_{it}$$

Where $\Delta\%$ indicates the percent rate of change and the $\hat{\beta}_i$ are the estimated parameters. The last term $\hat{\sigma}_{it}$ corresponds to the unexplained residual. The results are collected in Table 12.

First note that the models predict employment growth levels which are remarkably close to those observed in the data, with a few exceptions which I discussed below. This is a noteworthy achievement and can be seen as a reflection of the ability of these very simple models to replicate the data; note that in the case of the CIS the same model is capable of predicting very closely both the significant expansion in private employment in Georgia or Kyrgyzstan and the relatively small growth in Armenia or Ukraine.

Second, note that the most consistent and significant contributor to employment creation is the expansion in economic activity. This is the result of the sustained growth in the period 2000-2010 and the sensitivity of the labor market to economic growth. In the case of the EU+ and the CIS most of the action comes from the actual growth in GDP, as the estimated elasticity is only in the range of 0.2-0.3. In the Balkans the result comes from the higher sensitivity to GDP changes.

Third, note the very heterogeneous role of changes in real wages. In the EU+ group, changes in real wages have reduced employment but only very slightly. This is congruent with the abovementioned comment that changes in real wages in the EU group have been in line with gains in labor productivity, i.e., in line with fundamentals. On the contrary, in the Balkans increases in real wages beyond what productivity gains would suggest have significantly hampered employment.

Fourth, the cost of capital has played a very minor role in creating employment in the economies of ECA being only detrimental in Albania and Bulgaria, one of the few economies with *negative* real cost of capital through the period. Slightly larger effects on private employment are observed as a result of changes in the real exchange rate in the CIS and the Balkans, but not in the EU+ group.

The most novel and interesting results are those for public employment and foreign trade. It can be seen that the retrenchment in public employment has been a major contributor to the private sector demand for labor. As mentioned, this reflects the cumulative effects of privatization, market deregulation, and business creation, as well as the freeing of public workers to be employed by the private sector. The size of the effects is substantial in almost all economies except Azerbaijan, the Slovak Republic and Turkey. In most EU+ economies the retrenchment in public employment would have induced an expansion in private sector employment in the range of 20% to 30%, while in the Balkans the effect is much larger, reaching 60% in Montenegro. On the contrary, in the CIS the effects are much smaller largely because of the slower decline in public employment.

Changes in foreign trade, as discussed in section 3, have been significant in most ECA countries which have expanded imports and exports by as much as ten percentage points of GDP. As shown in Table 12, the combined effects of changes in exports and imports on employment have been only significant –and with mixed directions—in some Balkan economies (Albania) and in the CIS countries (Azerbaijan, Kazakhstan, Kyrgyzstan, Russia and Tajikistan). The lack of response of private sector employment to the notable expansion in foreign trade in the last decade in the EU+ economies is not really surprising: as mentioned, the supply of labor in these economies is quite inelastic and once unemployment receded in the early 2000s there was little space to increase employment levels, so that the expansion in trade volumes had to be accommodated via changes in

hours worked (which I showed to be minimal) and increases in labor productivity (which I showed were more significant).

Finally, the decline in unemployment levels in several economies has reduced the availability of manpower to be used by the private sector, in particular in those economies that between 2000 and 2010 approached to their natural rates of unemployment. Relative to changes in total employment the effect is larger in the EU+ group.

Table 12
Contribution of fundamentals to the cumulative employment creation in the period 2000-2011

	Actual Change	Predicted Change	Contributions to growth in private employment							
			GDP	Real Wages	Cost of Capital	Cost of Interm. Inputs	Public Employ.	Exports	Imports	Unemp. Rate
Balkans										
Albania	40.6	41.6	75.4	-27.4	-1.8	-1.3	12.2	-7.7	-12.6	4.8
Bosnia	50.5	41.5	28.5	-24.5	1.2	-0.4	46.4	-5.0	-1.7	-3.0
Macedonia	65.5	61.9	38.7	-10.1	-0.1	1.1	38.3	-1.8	-4.4	0.3
Montenegro	68.2	95.7	63.5	-24.5	0.7	-0.5	61.8	-1.0	-6.0	1.6
Serbia	2.9	23.1	50.1	-37.5	11.0	-3.9	21.9	-6.0	-1.9	-10.6
CIS										
Armenia	31.2	39.3	18.9	13.3	0.3	-3.8	11.3	17.9	-17.4	-1.2
Azerbaijan	68.3	60.3	25.1	14.2	0.0	11.2	-4.3	48.2	-20.0	-14.2
Belarus	74.2	69.7	17.4	28.7	0.0	7.1	18.3	23.8	-21.1	-4.4
Georgia	113.5	125.0	14.8	17.5	0.0	-2.7	100.0	14.7	-12.5	-6.7
Kazakhstan	53.8	52.0	18.2	10.1	0.0	10.5	10.5	15.2	-7.5	-5.1
Kyrgyzstan	123.8	127.6	15.4	12.3	0.0	9.8	96.9	19.0	-26.7	0.8
Moldova	-4.4	65.7	15.7	12.6	0.0	-0.3	41.2	13.1	-19.5	3.0
Russia	37.5	25.4	15.4	12.6	-0.1	-12.2	19.4	2.2	-9.8	-2.2
Tajikistan	90.0	55.6	29.6	22.0	-0.1	5.3	37.3	-30.0	-8.1	-0.4
Turkmenistan	-	-	-	-	-	-	-	-	-	-
Ukraine	24.3	31.2	12.8	14.3	0.2	-0.9	10.9	6.0	-9.5	-2.5
Uzbekistan	-	-	-	-	-	-	-	-	-	-
EU members, Croatia and Turkey										
Bulgaria	38.6	36.0	10.4	-3.3	-0.1	1.1	26.6	1.7	-1.1	0.7
Croatia	20.7	23.3	4.4	-2.5	0.0	1.1	19.4	2.8	-0.4	-1.6
Czech Rep.	24.1	25.3	8.3	-4.0	0.0	-3.9	21.1	9.0	-2.1	-3.0
Estonia	39.3	27.6	4.4	-1.5	0.0	2.7	18.0	4.2	-0.9	0.7
Hungary	14.1	22.0	2.0	-1.7	0.0	2.5	18.5	3.8	-0.7	-2.4
Lithuania	18.3	22.7	7.9	-2.5	0.0	-3.6	18.1	7.7	-1.8	-3.1
Latvia	15.3	18.0	6.5	-4.4	0.0	-3.1	13.0	8.8	-2.1	-0.7
Poland	39.0	32.2	7.0	-1.0	0.0	0.8	14.8	9.2	-2.1	3.3
Romania	3.8	29.7	9.1	-7.9	0.0	1.6	24.6	1.0	-0.6	1.8
Slovak Rep.	21.2	14.3	5.4	-0.6	0.0	-0.7	4.6	4.6	-1.2	2.2
Slovenia	35.2	27.8	9.0	-2.1	0.0	4.2	11.4	7.5	-1.9	-0.3
Turkey	16.9	6.6	11.9	2.3	0.0	-4.0	1.8	-2.6	0.0	-2.8

7. Conclusions and Stylized facts

The previous analysis contains a number of results which I resume in the following set of stylized facts:

1. By 2011 and on average, ECA countries have achieved higher per-capita income than any other region in the world, except of course the developed economies. This is a remarkable achievement for a region that in 1990 lagged significantly. Average income levels, however, are still below OECD and EU standards by a wide margin.

2. There is substantial heterogeneity in development levels, ranging from industrialized high-income countries (such as the Czech Republic and Poland) to agricultural-based, middle-to-low income economies (e.g., Tajiskistan). ECA countries that are members of the EU tend to be more homogeneous in development levels and policies than those of the Balkans and the CIS.

3. The development of ECA economies has been very different to other emerging regions. For most economies the 1990s amounted to a decade lost in terms of economic growth at a period where other emerging economies were growing fast. On the contrary, for all economies in the region, the 2000s had been a decade of sustained growth and a significant catch-up with the mature economies of the European Union.

4. In the early 1990s labor productivity in ECA was well below international standards (one third of the OECD), indicating a significant backwardness in the region. Subsequently labor productivity has grown to achieve around 70% of the EU and leveling off with LAC and EAP.

5. Although there is substantial heterogeneity among ECA economies, there are four common features that characterize labor supply:

    a. Population in most ECA countries is stationary or slowly declining.
    b. Participation rates have either remained stagnant or declined in all economies.
    c. Consequently, labor force has remained stagnant or slowly declined.
    d. Out-migration has been significant in all but five economies, particularly in the 1990s, indicating both a severe malfunctioning of labor markets as well as the lifting to mobility restrictions.

6. Likewise, there are common features that characterize the demand for labor:
    a. As in the rest of the world, labor demand is pro-cyclical. Therefore, employment declined sharply in all ECA economies during the "lost decade" of the 1990s and recovered somewhat in the 2000s. Employment growth, however, has not been vigorous.
    b. There appear to be significant lags in the adjustment of labor markets to the economic cycle, with employment trailing by several years to economic growth.

Chronic unemployment in some economies also indicates lack of adjustment in labor markets.

c. Public employment is a significant component of the labor demand and has shaped the evolution of employment in the past two decades. In 1991-92, the share of public employment was on average around 80% but by 2010 it had dropped to 35%.
d. The retrenchment in public employment has been around twenty percentage points in the three country groups (EU+, CIS and Balkans) but the CIS countries remain dominated by public employment. In the EU+ group countries are converging to Eurozone standards.
e. There is no clear connection between the retrenchment in public employment and the response of the private sector, indicating that changes in total employment responded to more complex determinants than the mere substitution of one type of employer for another (as would have been by simply privatizing public firms).
f. Employment in the EU+ countries is primarily allocated to services (60%) and industry (30%) while those in the agricultural sector are usually less than 10%. In the CIS agricultural employment is predominant (over 30%). Reforms in the agricultural sector could be linked to lack of dynamism in employment creation, chronic unemployment and out-migration in the non-industrial ECA countries.

7. The performance of the labor market can be summarized as follows.
    a. Employment levels have reduced in all economies with stagnant or declining population in the period 1990-2011. Only in the five economies with positive population growth rates, employment has grown, albeit slowly.
    b. Real wage adjustments do not conform to classical market responses to changes in economic activity. Real wages dropped significantly with the unveiling of the economic crisis of the 1990s only in some countries but they actually increased in several economies in both the EU+ and CIS groups. In the 2000s, real wage growth seems to be more in line with productivity increases in the EU+ economies but in the CIS real wages have grown extremely fast, often in excess of labor productivity and GDP growth.
    c. Unemployment levels remained stubbornly stagnant in the period 2000-2008 in the Balkan states and most CIS economies despite de fact that these economies were growing at very high rates; these include all. Only in the EU group unemployment rates declined from relatively high levels in 2000 and converged by 2008 to what can be termed as frictional unemployment.
    d. Most likely the chronically high rate of unemployment in some economies reflects the existence of low-employability workers that tend to remain unemployed for long periods of time while real wage indices represent the evolution of employment opportunities for those who are highly employable.
    e. During the years of sustained growth that characterize the “decade gained” most ECA economies tended to adjust primarily using the extensive margin. On the

contrary, during the recent crisis adjustments in the intensive margin have been more significant.

f. It is difficult to explain the reliance on the extensive margin because in most of these economies there are significant limitations on the supply of labor as a result of stagnant population and declining participation rates. Naturally, institutional restrictions –e.g., labor market regulations—could explain the rigidity in labor markets to adjust along the intensive margin.

8. The sources of growth analysis indicates:
    a. In almost all ECA countries economic growth in the period 2000-2011 is mainly the result of TFP gains. While important, physical and human capital accumulations are not the main driving force of economic growth. Around 70% of the average growth rate of all ECA economies is due to increases in total factor productivity.
    b. Most of the differences in economic growth in the decade resulted from the different paths of productivity: countries with relatively slow growth are also countries where TFP gains are also the smallest.
    c. Employment levels have played a very minor role in fostering GDP growth.
    d. Human capital, which is major explanation for observed differences in economic growth in other regions of the world, seems to play a minor role in ECA.
    e. Physical capital accumulation is an important source of economic growth in most economies.

9. While TFP has been the main force behind economic growth in ECA and an explanation for the differences in performance among countries, the reasons for the differences in TFP growth among countries are not themselves explained. Microeconomic studies on the different industries are needed to unveil the mechanics of TFP gains in ECA countries.

10. From our growth accounting exercise, I therefore conclude that the only reforms that are promising as explanations for the differences in success in the ECA region are those that economic theory dictates would show up primarily as differences in productivity, not those that would show up as differences in factor inputs.

11. In ECA employment responds to market forces, in the case of employees in the private sector, and administrative/political decisions when it refers to public sector employment. Therefore, the empirical analysis focuses on the evolution in labor demand in the private sector. Employment is largely related to three main factors.

    a. The most consistent and significant contributor to employment creation is the expansion in economic activity. This is mainly the result of sustained economic growth in the period 2000-2010 and a relatively low income elasticity of the demand for labor.
    b. In addition, the retrenchment in the public sector from production, the emergence of private businesses, the privatization of public firms and the freeing of public

servants to seek better opportunities in newly formed private companies have been instrumental in increasing private employment.

c. Real wage increases that bear no relation to labor productivity gains have been the main deterrent to employment creation in countries afflicted by chronic unemployment (e.g., the Balkans and some CIS countries). In the EU+ group, where economies tend to operate at the natural rate of unemployment, real wages have grown more in line with productivity and therefore employment has been largely unaffected.
d. The cost of capital and the cost of intermediate production factors is of minor importance.
e. The retrenchment in public employment, itself the result of privatization and freeing of public workers, has been a major contributor to the private sector demand for labor. In most EU+ economies the retrenchment in public employment would have induced an expansion in private sector employment in the range of 20% to 30%. In the CIS the effects are much smaller largely because of the slower decline in public employment.
f. Trade-induced changes in private employment are only significant in some Balkan economies (Albania and Serbia) and in four CIS countries (Kazakhstan, Kyrgyzstan, Russia and Tajikistan). The lack of response of private sector employment to the notable expansion in foreign trade in the last decade in the EU+ economies is not really surprising: as mentioned, the supply of labor in these economies is quite inelastic and once unemployment receded in the early 2000s there was little space to increase employment levels, so that the expansion in trade volumes had to be accommodated via changes in hours worked (which I showed to be minimal) and increases in labor productivity (which I showed were more significant).

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Appendix 1: List of countries used in International Comparisons.

ECA	MENA	LAC	SA	EAP	SSA	Developed
Albania	Algeria	Antigua-Barbuda	Afghanistan	Brunei	Angola	Andorra
Armenia	Bahrain	Argentina	Bangladesh	Cambodia	Benin	Australia
Azerbaijan	Egypt	Bahamas	Bhutan	China	Botswana	Austria
Bulgaria	Iran	Barbados	India	Hong Kong	Burkina Faso	Belgium
Bosnia-Herzegovina	Iraq	Belize	Sri Lanka	Macao	Burundi	Canada
Belarus	Israel	Bolivia	Maldives	D.P.R. Korea	Cameroon	Cyprus
Czech Republic	Jordan	Brazil	Nepal	Indonesia	Cape Verde	Denmark
Estonia	Kuwait	Chile	Pakistan	Lao	C.A.R.	Finland
Georgia	Lebanon	Colombia		Malaysia	Chad	France
Croatia	Libya	Costa Rica		Mongolia	Comoros	Germany
Hungary	Morocco	Cuba		Myanmar	Congo	Greece
Kazakhstan	Oman	Dominica		Philippines	Cote d'Ivoire	Iceland
Kyrgyz Republic	Qatar	Dominican Rep.		Korea	D.R. Congo	Ireland
Kosovo	Saudi Arabia	Ecuador		Singapore	Djibouti	Italy
Lithuania	South Sudan	El Salvador		Thailand	Eq. Guinea	Japan
Latvia	Sudan	Grenada		Timor-Leste	Eritrea	Liechtenstein
Moldova		Guatemala		Viet Nam	Ethiopia	Luxembourg
Macedonia		Guyana		Fiji	Gabon	Malta
Montenegro		Haiti		Kiribati	Gambia	Monaco
Poland		Honduras		Micronesia	Ghana	Netherlands
Romania		Jamaica		Nauru	Guinea	New Zealand
Russia		Mexico		Palau	Guinea-Bissau	Norway
Serbia		Nicaragua		P. Guinea	Kenya	Portugal
Slovakia		Panama		Samoa	Lesotho	San Marino
Slovenia		Paraguay		Solomon Is.	Liberia	Spain
Tajikistan		Peru		Tonga	Madagascar	Sweden
Turkmenistan		S. Kitts & Nevis		Tuvalu	Malawi	Switzerland
Turkey		Saint Lucia		Vanuatu	Mali	UK
Ukraine		S. Vincent			Mauritania	USA
Uzbekistan		Suriname			Mauritius	
		Trinidad & Tobago			Mozambique	
		Uruguay			Namibia	
		Venezuela			Niger	
					Nigeria	
					Rwanda	
					Saint Helena	
					Sao Tome	
					Senegal	
					Seychelles	
					Sierra Leone	
					Somalia	
					South Africa	
					Swaziland	

Appendix 2: Computing Sources of Growth

I follow Solow (1956) and use a simple, aggregate Cobb-Douglas production function:

$$GDP_t = A_t \mu_t KS_t^{\alpha} \left(L_t^{\beta} HK_t^{1-\beta}\right)^{1-\alpha} \quad \text{(A1)}$$

where KS_t is the stock of capital, L_t is the use of the labor force, and HK_t is the stock of knowledge or human capital. Variable A_t is an indicator of the efficiency in the use of factors and μ_t is an indicator of the occupation rate of resources. The combination of the latter two elements is known as total factor productivity or TFP. Parameters α and β are constants. I compute TFP as:

$$TFP_t = A_t \mu_t = \frac{GDP_t}{KS_t^{\alpha}\left(L_t^{\beta} HK_t^{1-\beta}\right)^{1-\alpha}} \quad \text{(A2)}$$

Our definition of TFP, therefore, encompasses not only technological capacity but also the efficiency in the use of labor, human capital, and physical capital. In this view, several elements could affect factor productivity beyond the technical ability to mix inputs and generate goods and services (e.g., poor government regulation or policies leading to lower use of capital and, thus, lower production is interpreted as declining TFP)

To calculate TFP, given series for GDP and employment, I need to choose a value for α and β and generate series for KS and HK. I chose a value of the capital share for growth accounting of α=0.45 for two reasons. First, there is a growing consensus among researchers that a share in the 0.3-0.45 range is adequate (see Gollin, 2002 for an empirical analysis); I have chosen the top of the range to acknowledge the fact that oil is a capital-intensive industry that dominates GDP. Second, a high capital share implies an implausibly high long-run rate of return on capital. As for parameter β, I choose a value of 0.25, following Bernanke and Gürkaynak (2001).

To calculate a capital stock series, I cumulate gross fixed capital formation or investment, I_t:

$$KS_t = (1-\delta)KS_{t-1} + I_t \quad \text{(A3)}$$

for some chosen depreciation rate δ and an initial condition on capital. Based on information by Bu (2006) I use a depreciation rate of 7%, and, for the initial condition on capital, I assume the capital-output ratio to be 2.5 in 1975. These assumptions are inconsequential for our long-run analysis.

I use the educational attainment of the labor force as a proxy of human capital. Methodologically, this corresponds to estimating human capital with reference to a stream of past investments, instead of future earnings or individual characteristics (see Stroombergen et al., 2002). The main benefit is that data are more readily available; its main limitation is that school attainment does not consider the quality of education. I use the data from Barro and Lee (2011) which is collected in 5-year intervals from 1950 to 2010; linear interpolation was used to obtain a continuous annual series. For Azerbaijan, Belarus, Georgia, Macedonia, and Uzbekistan I use "enrolment in tertiary education as percentage of age-group population" (Unesco, 2012).

Appendix 3: A model of the labor market

Almost all labor demand models are specified so as to include a scale variable (typically GDP), factor prices (real wages and cost of capital) and an indicator of the cost of intermediate inputs.[14] Assume that there are only three inputs in the economy: capital (K), labor (L), and an intermediate imported good, M. The aggregate cost function for production level, Y, is then:

$$C_t = w_t L_t^* + q_t K_t^* + x_t M_t^* = C(Y_t, w_t, q_t, x_t) \tag{A.1}$$

where w is the real wage, q is the cost of capital, and x is the cost of the imported intermediate factor. Superscript * denotes levels of employment, capital, and intermediate goods that are consistent with output level Y. The derived demand for each factor can be obtained by direct minimization of the cost function for each output level. In the case of the labor:

$$L_t^d = \frac{\partial C(Y_t, w_t, q_t, x_t)}{\partial w_t} = L(Y_t, w_t, q_t, x_t) \tag{A.2}$$

$$\log L_t^d = \alpha_0 + \alpha_1 \log Y_t - \alpha_2 \log q_t - \alpha_3 \log w_t - \alpha_4 \log x_t + \alpha_5 \log T_t \tag{A.3}$$

with homogeneity condition $\alpha_2 + \alpha_3 + \alpha_4 = 0$. The model in equation (3) is an equilibrium condition for the labor market. In that sense it represents a long-run condition; it may not verify period by period, but it must be fulfilled in the long run. For that reason, right hand side variables are called "fundamentals" hereafter.

The supply of labor is also derived from the utility maximization of the consumer. Assume a utility function depending on consumption c and leisure l –the time complement of work. The consumer $\max U(c_t, l_t)$ subject to an income restriction of the form $(1 - l_t)w_t + g(y_t)$, where $g(y)$ is a function of non-labor income arising from the stock of physical capital.[15] Because there is unemployment the consumer does not receive work every period and, therefore, has an expected salary equal to the probability of being employed $(1 - \mu_t)$ times the current wage. The first order condition allows to derive the following labor supply function:

$$\log L_t^s = \beta_0 + \beta_1 \log Y_t + \beta_2 \log w_t + \beta_3 \log(1 - \mu_t) \tag{A.2}$$

where

Note that $\log(1 - \mu_t) = \log L_t^d - \log L_t^s$. Replacing this into A.2 and ordering, obtain:

$$\log L_t^s = \frac{\beta_0}{(1-\beta_3)} + \frac{\beta_1}{(1-\beta_3)} \log Y_t + \frac{\beta_2}{(1-\beta_3)} \log w_t + \frac{\beta_3}{(1-\beta_3)} \log L_t^d \tag{A.3}$$

Replacing A.1 into A.3

[14] See Hammermesh (1986) for a detailed analysis.
[15] See McCurdy (1981) for details and the congruency of this specification in an intertemporal set up.

$$\log L_t^s = \frac{\beta_0}{(1-\beta_3)} + \frac{\beta_1}{(1-\beta_3)}\log Y_t + \frac{\beta_2}{(1-\beta_3)}\log w_t + \frac{\beta_3}{(1-\beta_3)}[\alpha_0 + \alpha_1 \log Y_t - \alpha_2 \log q_t - \alpha_3 \log w_t - \alpha_4 \log x_t + \alpha_5 \log T_t]$$

Reordering and simplifying

$$\log L_t^s = \frac{\beta_0+\alpha_0\beta_3}{(1-\beta_3)} + \frac{\beta_1+\alpha_1\beta_3}{(1-\beta_3)}\log Y_t + \frac{\beta_2-\alpha_3\beta_3}{(1-\beta_3)}\log w_t - \frac{\beta_3\alpha_2}{(1-\beta_3)}\log q_t - \frac{\beta_3\alpha_4}{(1-\beta_3)}\log x_t + \frac{\beta_3\alpha_5}{(1-\beta_3)}\log T_t \quad (A.4)$$

Using the unemployment condition, obtain:

$$\log L_t^d = \theta_0 + \theta_1 \log Y_t + \theta_2 \log w_t - \theta_3 \log q_t - \theta_4 \log x_t + \theta_5 \log T_t + \log(1-\mu_t) \quad (A.6)$$

where $\theta_0 = \frac{\beta_0+\alpha_0}{(1-\beta_3)}$; $\theta_1 = \frac{\beta_1+\alpha_1}{(1-\beta_3)}$; $\theta_2 = \frac{\beta_2-\alpha_3}{(1-\beta_3)}$; $\theta_3 = \frac{\beta_3\alpha_2}{(1-\beta_3)}$; $\theta_4 = \frac{\beta_3\alpha_4}{(1-\beta_3)}$; $\theta_5 = \frac{\beta_3\alpha_5}{(1-\beta_3)}$.

Appendix Table 1: Data Sources and Coverage

Variable	Source	Definition	Sample
Gross Domestic Product	World Bank (2012a), IMF 2012	National Accounts	1990-2011 for all countries except Montenegro (1997-2011)
Gross Domestic Fixed Capital Formation	World Bank (2012a), IMF 2012	National Accounts	1990-2011 for all countries except Bosnia and Herzegovina (1994-2011), Kazakhstan (1991-2011), Montenegro (1997-2011) and Serbia (1996-2011).
Employment	World Bank (2012b), ILO (2012)	Employees 15 years and older.	1990-2011 for all countries except Bosnia and Herzegovina, Montenegro and Serbia (1991-2011).
Human Capital	Barro and Lee (2011) UNESCO (2012)	Labor force education achievement	1990-2011 for all countries except Azerbaijan, Belarus, Georgia, Macedonia, and Uzbekistan for which I use tertiary education enrolment.