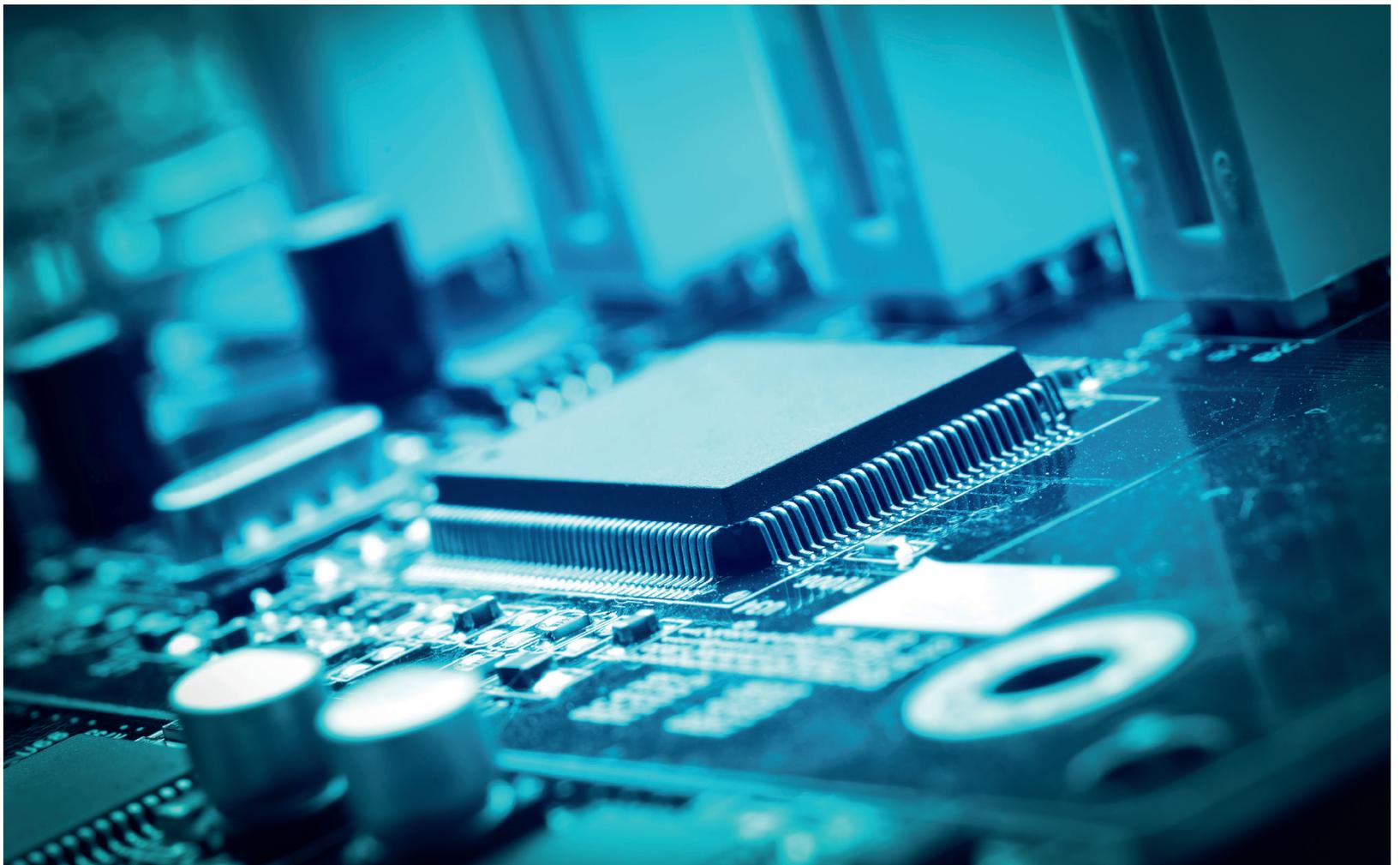


Economic Outlook & the Adoption of New Blockchain Technologies

With growth in Europe and Central Asia having peaked at 2.7 percent in 2017, policy makers face new challenges. How can they navigate the expected cyclical downturn?



By World Bank Group



Growth is strong in Europe and Central Asia (ECA), stronger than at any time since the last global financial crisis.

EXECUTIVE SUMMARY

How can they navigate the expected cyclical downturn? How can they boost underlying potential growth that has slowed, especially since the global financial crisis? How should they adjust regulations and reform policies to benefit from the digital revolution while mitigating the transition costs? This report summarizes the economic outlook for the region and examines the adoption of new blockchain technologies. In doing so, it touches on all three challenges.

The 2017 rates of growth of GDP (2.7 percent) and private consumption (2.5 percent) were faster than at any time since the global financial crisis of a decade ago. Growth was especially strong in Central Europe and in Turkey, but it was robust in other parts of the region as well. Unemployment rates are now close to their 2007 levels in most countries, and average inflation exceeds 2 percent, indicating that little spare capacity is left.

Deceleration of growth is expected to be modest, but a sharper correction remains possible. Cyclical forces can easily reinforce one another, and additional shocks—rising protectionism, geopolitical tensions, larger than expected disruptions caused by Brexit—could materialize. There is little room for further monetary stimulus if the expected slowdown is sharper than expected. The region has rebuilt some fiscal buffers, however. The average fiscal deficit in 2017 is estimated at just above 1 percent of GDP, down from 6 percent during the 2009 crisis and close to levels at the end of the boom that preceded that crisis. Fiscal stimulus is thus an option in several countries in case of a sharper than expected slowdown.

Under the baseline scenario of only a modest deceleration, however, a further buildup of fiscal buffers seems the best strategy. Many countries in the region have proven to be fertile ground for the development of cryptocurrencies and

blockchain technologies. The emergence of these technologies is part of a broader wave of technologies that facilitate peer-to-peer (P2P) commerce, the individualization of products, and the flexibilization of production methods.

For a variety of reasons, these trends gained traction after the global financial crisis a decade ago. Blockchain technologies aim to organize P2P transactions and P2P information flows without intermediaries and central banks have opportunities to use blockchain technologies to improve their services.

It is unclear how these technologies will develop in the long run; their ultimate impact may be very different from the current applications. In response, policy makers should strike a balance between curbing the hype surrounding these new technologies and unleashing potentially transformational new opportunities. While encouraging and facilitating these innovations, they should prepare to craft new regulations to create a level playing field for new and old industries, by adjusting financial oversight, consumer protection, and tax administration. They should also address the massive volume of electricity used to mine cryptocurrencies.

ECONOMIC DEVELOPMENTS AND PROSPECTS

Overview

Growth is strong in Europe and Central Asia (ECA), stronger than at any time since the global financial crisis of a decade ago. GDP rose 2.7 percent, and annual private consumption rose 2.5 percent. Growth was especially strong in Central Europe and Turkey, but it was robust in other parts of the region as well.

Growth has likely peaked, however. Increased capacity utilization, unemployment rates close to their 2007

levels, and average inflation now exceeding 2 percent are all signals that growth is likely to decelerate.

The peaking of growth raises several questions

■ How well is the region prepared for a sharper than expected cyclical downturn? As fiscal deficits have fallen to an average 1.5 percent of GDP, fiscal policy could be used. But in most countries, monetary tightening would probably be more appropriate.

■ Why is the underlying structural growth so low? Growth in 2017 was 0.4 percentage points below the average growth rate between 2000 and 2007. The decelerating growth trend is associated with the shift toward services, the decline in capital deepening, and a slower pace of measured total factor productivity (TFP).

■ Has the economic upswing been used to adjust to the new normal of digital technologies, more flexible employment contracts, and increased tradability of goods and services? An unfinished agenda remains in terms of rethinking social protection and facilitating private sector development in new, internationally competitive sectors. It is important that adjustments toward this new reality continue, even if the expected slowdown materializes or deepens.

Growth is strong throughout the region

GDP growth of 2.7 percent in 2017 translated into a robust 2.5 percent increase in per capita GDP, as the population is growing at a mere 0.2 percent a year. This rate of growth was the fastest since 2007 and 0.9 percentage points faster than in 2016 (table 1.1). Growth exceeded 4 percent in 20 of the 47 countries in the region.

Ireland and Malta enjoyed growth of more than 5 percent. Romania and Slovenia in Central Europe; Armenia and Georgia in the South Caucasus; and Turkey, Tajikistan, and Uzbekistan in

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TABLE 1.1 Growth has reached an all-time high in most countries in Europe and Central Asia

Region/subregion	ANNUAL GDP GROWTH (PERCENT)					CHANGE IN FORECAST SINCE OCTOBER 2017 (PERCENTAGE POINTS)		
	2015	2016	2017 (estimate)	2018 (forecast)	2019 (forecast)	2016	2017 (estimate)	2018 (forecast)
Europe and Central Asia	1.9	1.8	2.7	2.3	2.1	0.0	0.5	0.4
European Union and Western Balkans	2.2	1.9	2.5	2.2	1.9	0.0	0.4	0.4
European Union	2.2	1.9	2.5	2.2	1.9	0.0	0.4	0.4
Western Europe	2.2	1.8	2.3	2.1	1.7	0.0	0.4	0.4
Northern Europe	2.6	2.5	2.5	2.3	2.1	0.2	0.2	0.2
Central Europe	3.9	3.1	4.6	4.1	3.6	0.2	0.9	0.7
Southern Europe	1.6	1.7	2.2	1.9	1.6	0.0	0.3	0.3
Western Balkans	2.2	3.0	2.4	3.1	3.4	0.1	-0.3	-0.1
Eastern Europe and Central Asia	0.3	1.1	3.7	3.0	3.0	0.0	1.1	0.4
South Caucasus	1.7	-1.6	2.0	2.6	4.0	0.5	1.7	0.8
Central Asia	2.8	2.8	4.4	3.5	3.6	0.0	0.1	0.0
Russian Federation	-2.5	-0.2	1.5	1.7	1.8	0.0	-0.2	0.0
Turkey	6.1	3.2	7.4	4.7	4.4	0.0	3.5	1.2
Other Eastern Europe	-7.6	0.8	2.5	3.3	3.6	0.1	0.5	0.2

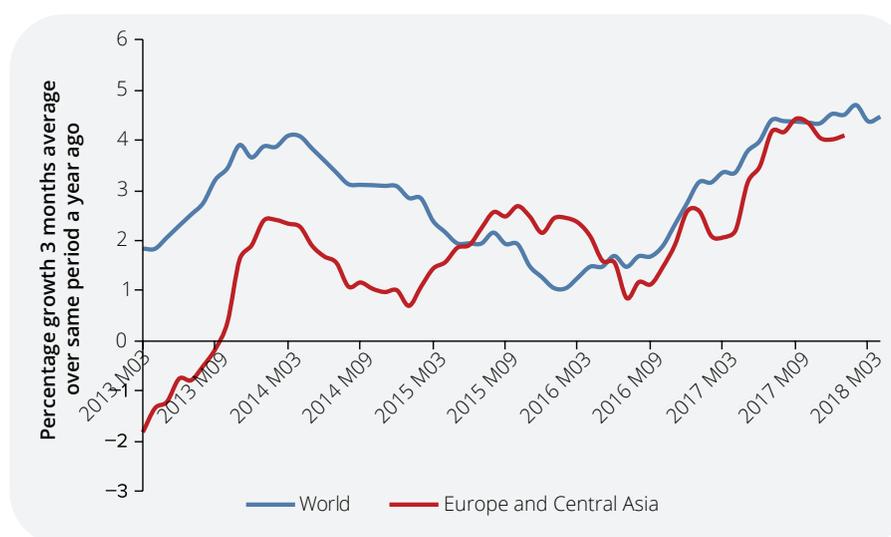
Source: World Bank.

Central Asia also reported strong growth. Azerbaijan, Belarus, and the Russian Federation emerged from recession (although their growth was only moderate). Not a single country in the region experienced a contraction in 2017.

Private sector demand drove this vigorous performance. Government consumption increased by less than 1 percent on average in the region. Private investment rose by more than 4 percent, and growth in investment outpaced GDP growth for the fourth year in a row. The volume of exports and imports expanded by more than 5 percent in 2017, roughly twice as fast as GDP growth⁽¹⁾.

The acceleration of growth has been a global phenomenon. Since the summer of 2016, growth of global industrial production has more than doubled, approaching 5 percent in recent months, very close to the 4.8 percent global growth during the 2003–07 boom.

Figure 1.1. Industrial production growth has soared since 2016, globally and in Europe and Central Asia



Source: World Bank.

The ECA region closely followed that acceleration (figure 1.1). The region as a whole outperformed the United States in 2017, and growth of industrial production

in Central Europe and Turkey was on par with growth in China and India.

This performance lies in sharp contrast to

There are no signs that oil markets will return to the record prices.

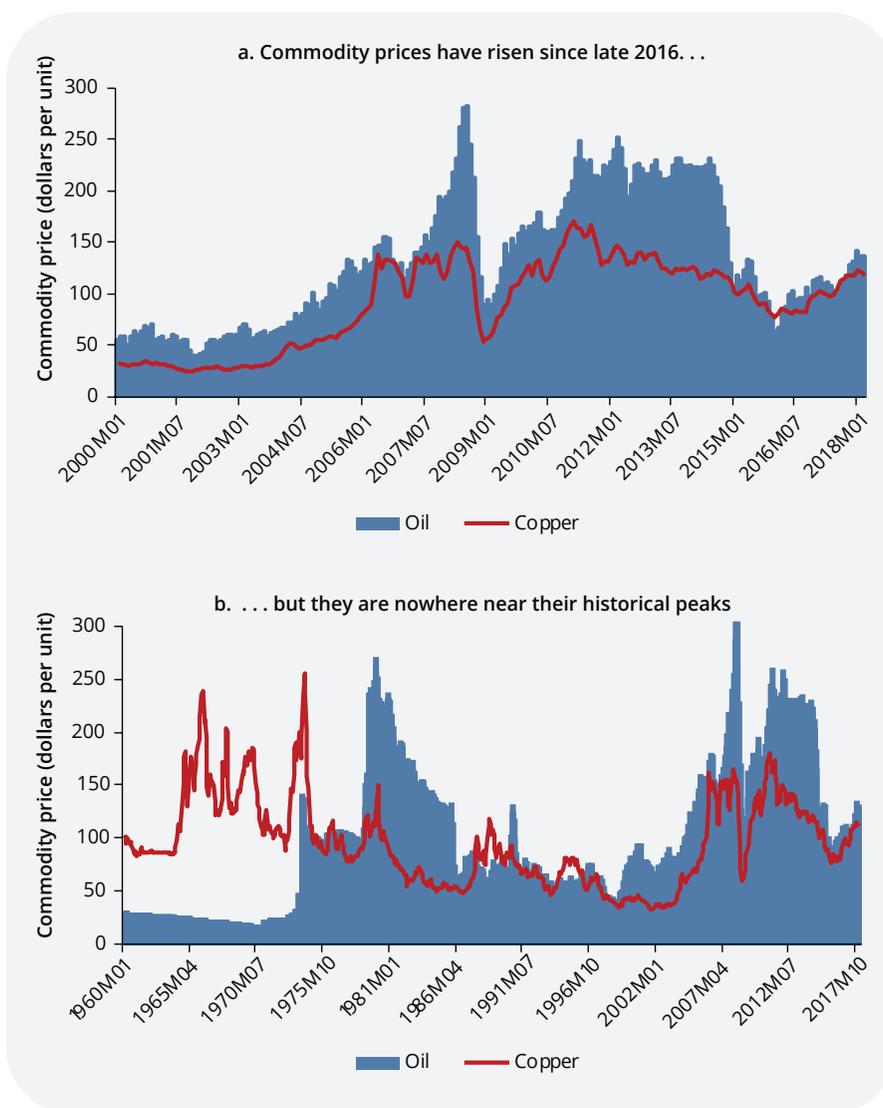
performance in the aftermath of the European banking and debt crisis, when the region's performance significantly lagged that of the world as a whole.

During this global acceleration, commodity prices rebounded. Copper prices, which are closely linked to the industrial cycle, increased 43 percent between October 2016 and March 2018, more than any other commodity. Oil prices increased 30 percent over the same period (figure 1.2, panel a), providing somerelief for energy exporters and recipients of remittances in the eastern part of the region. Consistent with their strong relationship with energy prices, grain prices increased 18 percent between October 2016 and March 2018. Other agricultural prices declined, leaving the index of agricultural prices flat.

The total nonoil commodity price index increased 10 percent over the last year and a half, largely reflecting the weakening of the U.S. dollar over that period, as all commodity prices are measured in dollars. The dollar depreciated 11 percent against the euro and 6 percent against the Chinese renminbi over this period.

Average commodity prices expressed in these two currencies were thus relatively stable. The dollar also depreciated against other currencies in the region. Between October 2016 and March 2018, it fell 16 percent against the Czech koruna, 14 percent against the Albanian lek and the Polish zloty, 9 percent against the Russian ruble and the Hungarian forint, 7 percent against the Romanian leu, and 3 percent against the Kazakh tenge. Only a few regional currencies depreciated during this period against the dollar. The Turkish lira depreciated 27 percent, and the Azeri manat depreciated 5 percent. Metal and oil prices increased in all currencies, and many other commodity prices declined in euros or other currencies in the region. Despite their cyclical upturn, oil prices are nowhere near their historical highs.

Figure 1.2. Commodity prices have followed the economic upswing



Source: World Bank. Note: Panel a: Index of nominal prices in U.S. dollars; January 2015 = 100. Panel b: Index of real prices (deflated with U.S. Consumer Price Index), January 2015 = 100.

Indeed, adjusted for inflation, global oil prices are 57 percent below their peak of July 2008 and 43 percent below the average level between early 2011 and late 2014 (figure 1.2, panel b)⁽²⁾. There are no signs that oil markets will return to those record prices. Consequently, adjustments in countries that directly or indirectly depend on oil exports should continue.

Several of these countries have become more competitive in international

markets and begun diversifying their economies, partly as a result of the depreciation of real exchange rates since the fall in oil prices late 2014. Unexploited opportunities remain to shift farther away from nontradable production. Domestic reforms that correct price distortions, eliminate privileges for state-sponsored companies, and unleash more competition and innovation remain essential. The recent wave of reforms in Uzbekistan sets a good example⁽³⁾. They

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will likely lead to further diversification and may trigger reforms in surrounding countries.

Growth appears to have peaked

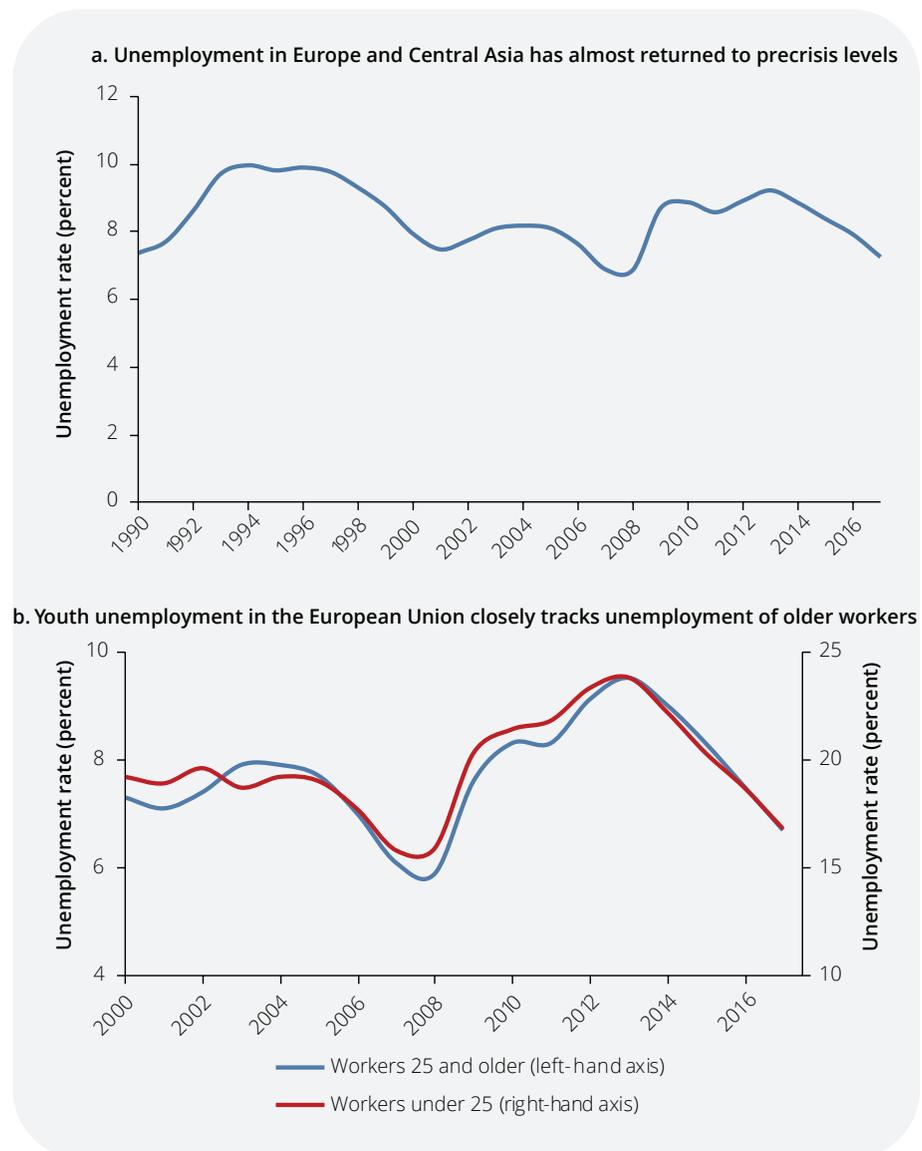
Signals are mounting that global growth has peaked. With less spare capacity, lower unemployment, rising inflation, and tightening monetary policy, the potential for continued rapid growth has diminished, especially in the ECA region.

Unemployment is now close to where it was at the height of the boom a decade ago (figure 1.3, panel a). The labor market has become tight, especially in Northern Europe. The rapid decline in unemployment is remarkable, given the history of hysteresis in the region's labor markets. After every major crisis, the typical pattern in Europe was for unemployment rates to settle at higher levels.

It is especially encouraging that youth unemployment in the European Union has fallen sharply. It is now back to 2005 levels (figure 1.3, panel b), having fallen from 24.0 in 2013 percent to 16.8 percent in 2017 (the overall unemployment rate fell from 9.5 percent to 6.7 percent over this period) ⁽⁴⁾.

Average inflation in the western part of the region has been almost 2 percent since early 2017 (figure 1.4). That is a critical change from the deflationary threats in the aftermath of the European banking crises. Between 2012 and 2016, the consumer price index declined in at last one year in Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Estonia, Finland, Georgia, Greece, Ireland, Italy, Lithuania, Macedonia, Montenegro, Poland, Romania, the Slovak Republic, Spain, Sweden, and Switzerland. In several of these countries, the GDP deflator still rose, and the drop in consumer prices reflected terms-of-trade gains. Nevertheless, the deflationary threat was a serious concern and the manifestation of underutilized resources.

Figure 1.3. Acceleration of growth has resulted in lower unemployment



Sources: World Economic Outlook, April 2018 (panel a); Eurostat (panel b).

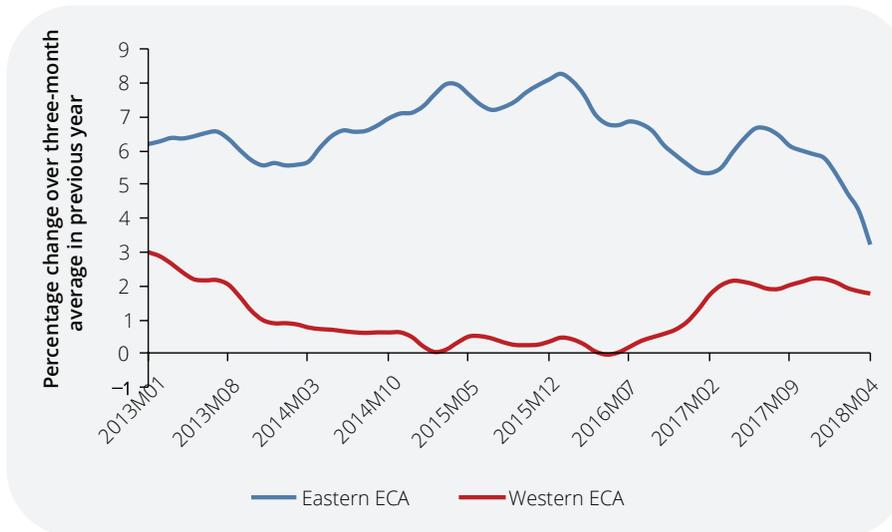
None of these countries experienced deflation in 2017. The average inflation rate of 2 percent is close to the target of monetary authorities. As a result, the European Central Bank will likely discontinue quantitative easing in 2018; central banks outside the euro area are also expected to tighten their policies. Tightening has already started in Turkey, where inflation has reached double-digit levels.

Asset prices have risen even faster than consumer prices (figure 1.5). The increase in real estate prices is not nearly as extreme as it was during the boom a decade ago, but in Northern Europe double-digit annual increases were not uncommon in 2017. This boom is an additional reason for monetary policy makers to raise interest rates.

In the eastern part of the region, monetary

Signals are mounting that global growth has peaked. With less spare capacity, lower unemployment, rising inflation, and tightening monetary policy, the potential for continued rapid growth has diminished, especially in the ECA region.

Figure 1.4. Normalization of inflation in Europe and Central Asia continues



Source: World Bank. Note: Western ECA is the unweighted average of 29 countries: Albania, Austria, Belgium, Bulgaria, Bosnia and Herzegovina, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Latvia, Macedonia, the Netherlands, Portugal, Romania, Serbia, the Slovak Republic, Slovenia, Spain, Sweden, the United Kingdom, and Turkey. Eastern ECA is the unweighted average of nine countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, the Russian Federation, and Tajikistan.

FIGURE 1.5 Housing prices in the European Union have risen since 2013



Sources: Data from Eurostat and the Federal Reserve Bank of St. Louis.

policies are likely to tighten in coming years, even as inflation has recently fallen (figure 1.4). High inflation in 2015 and 2016 was part of a one-time price adjustment after the fall in oil prices and the subsequent unavoidable depreciations of exchange rates. That adjustment has been completed. Further inflation should

now be controlled by central banks, which have to build their credibility with floating exchange rates. Now that oil prices are recovering, tighter monetary policies make sense, as they can allow higher prices to be absorbed by appreciating currencies.

Tighter monetary policy and rising

interest rates will restrain domestic growth and reduce capital flows to emerging economies. The capital flows that were searching for yields in emerging economies when interest rates in high-income countries were close to zero will likely decline, moderating growth in countries with large external funding needs. In such an environment, a cyclical downturn is more likely than further acceleration or even stabilization of growth at current levels.

That slowdown may already be happening. The Purchasing Managers' Index, which combines various indicators in the manufacturing sector (new orders, inventory levels, production, deliveries, employment), has fallen in the region since the beginning of 2018 (figure 1.6, panel a). The drop from the peak reached in the last six months was particularly large in France, Germany, Italy, Turkey, and the United Kingdom, even if the index was still above 50, indicating growth (figure 1.6, panel b).

The coming cyclical downturn is expected to be modest, mainly because, with few exceptions, there are no signs of overheating that require sharp corrections.

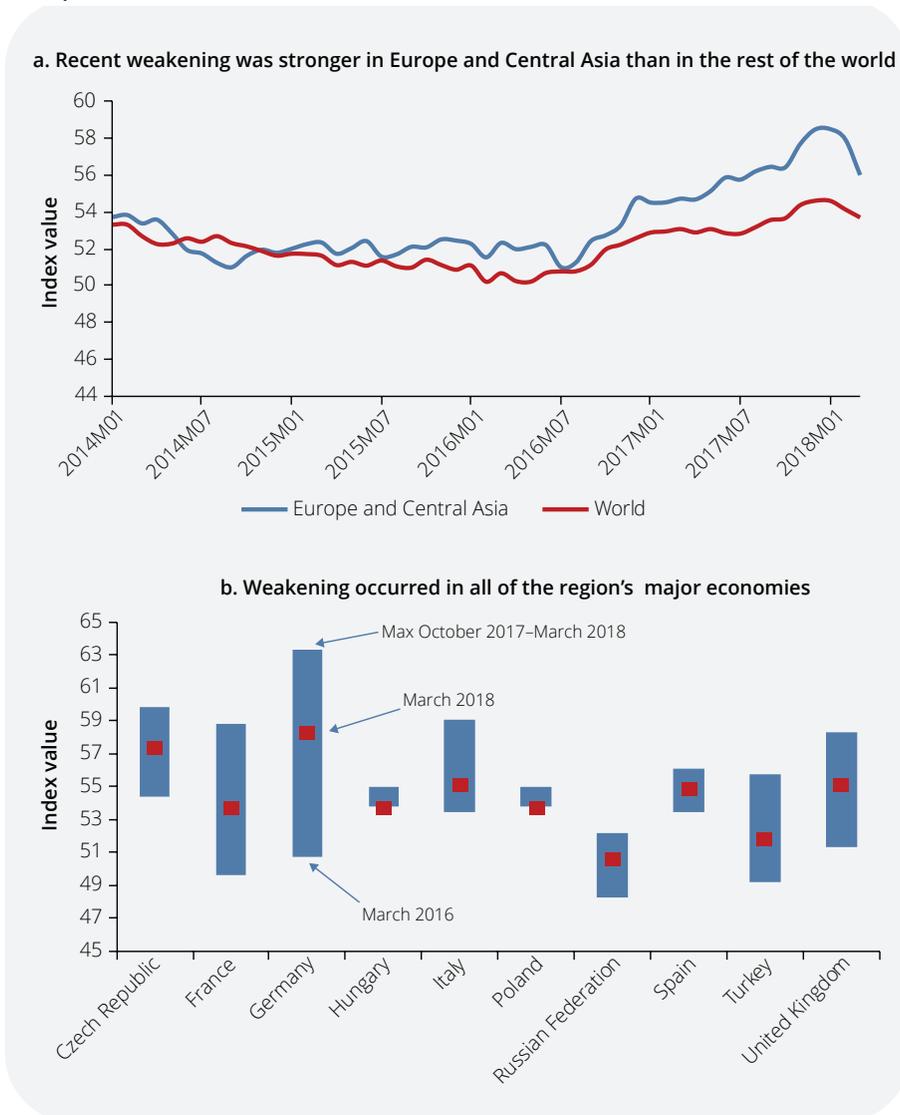
Investment ratios are still at balanced levels, and no steep declines in those ratios are expected. Inflation is at normal levels, and monetary tightening can be very gradual. GDP growth for the region is expected to fall from 2.7 percent in 2017 to 2.3 percent in 2018 and 2.1 percent in 2019.

The expected slowdown is very similar for the eastern and western parts of the region. However, there are marked differences between smaller subregions.

In the eastern part of the region, almost all the slowdown in growth is forecast to come from Turkey, with a modest strengthening of growth in oil-exporting countries.

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Figure 1.6. The Purchasing Managers' Index reached an all-time high in Europe and Central Asia in 2018



Source: World Bank. Note: A value of more than 50 indicates expansion.

In the western part of the region, the slowdown is expected to be rather evenly distributed among members of the European Union, and some acceleration of growth is expected in the Western Balkans.

Although there are good reasons to expect only a modest deceleration of growth, a sharper correction is possible. Cyclical forces can easily reinforce one another, and additional shocks—including rising

protectionism, geopolitical tensions, and larger than expected disruptions from Brexit—could slow growth.

Does the region have the capacity for countercyclical policies? There is no room for further monetary stimulus; at most, the expected monetary tightening could be delayed slightly. The region has rebuilt some fiscal buffers. The average fiscal deficit is estimated to have been just above 1 percent of GDP in 2017,

down from 6 percent of GDP during the 2009 crisis; it is close to levels at the end of the boom that preceded that crisis (figure 1.7). Fiscal stimulus is thus an option in several countries in the event of a sharper than expected slowdown. Under the baseline scenario of only a modest deceleration, further buildup of fiscal buffers seems the best strategy.

Two additional questions are worth investigating. Did countries in the region use the recovery to adjust the structure of their economies, to better equip them for future challenges? Why has potential growth been slower since the crisis than it was during the boom that preceded it? The rest of this chapter addresses these questions.

The region has shifted toward more exports. . .

The biggest and most important adjustment during the recovery has been the shift of production capacity toward exports. Despite the slowdown in global trade, the share of exports in GDP is now 10 percentage points higher than it was during the 2000s (figure 1.8). This shift is important, because the economic structure during the 2003–07 boom, when growth in many countries in the region was driven largely by expansion of nontradable sectors, was no longer sustainable.

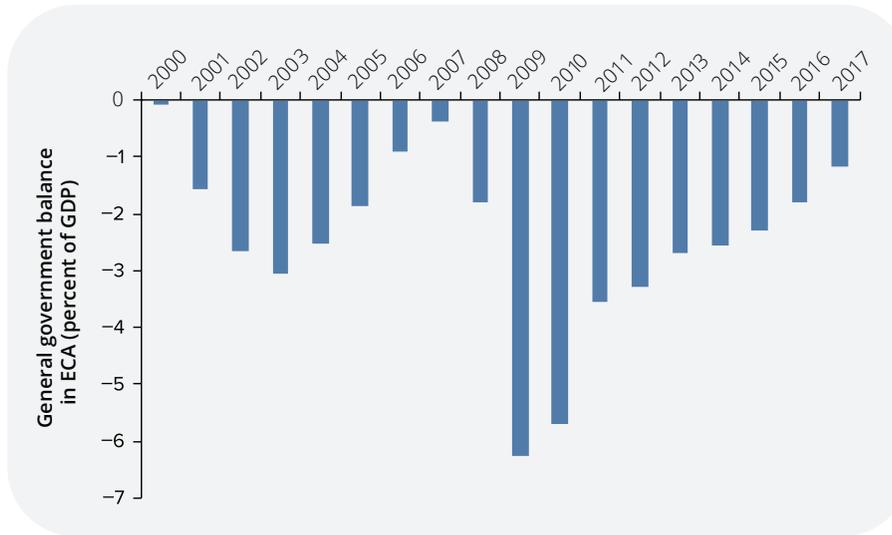
During that boom, capital inflows, oil revenues, and inflows of remittances resulted in increased domestic spending and a related loss in international competitiveness.

In the new normal after the crisis, all three forms of foreign inflows are more moderate. The change has created the opportunity to become more competitive in international markets while reducing investments in real estate and other nontradable sectors.

Imports have also increased as a share of

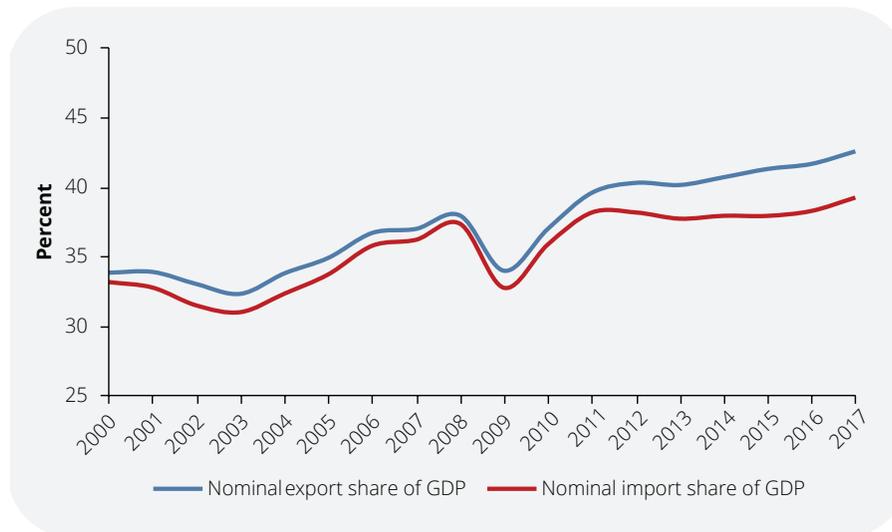
*In the new normal after the crisis,
all three forms of foreign inflows are more
moderate.*

Figure 1.7. Government deficits in the region have fallen sharply since 2009



Source: World Economic Outlook, April 2018.

FIGURE 1.8 Since the crisis, production in Europe and Central Asia has shifted toward exports



Source: World Bank

GDP, albeit by less than exports. The overall current account surplus of the region has thus increased, largely because the deficits that Central European countries financed with massive capital inflows during the boom have disappeared. These inflows came with a sharp decline in investment ratios in those countries.

This adjustment is similar to the correction in East Asia after the 1998 financial crisis (box 1.1). During the 1990s, emerging East Asian economies received large capital inflows after they opened up to global markets, just as Central Europe did later, during the 2000s. The reversal of capital flows in 1998 had similar effects on East Asia as

the 2008 crisis did on Central Europe.

. . . and adapted to technological change

Apart from this macroeconomic adjustment, countries are adapting to the rapid change in technologies caused by the digital revolution, which has far-reaching consequences for the way production, labor, and commerce are organized. The analysis of how countries are adapting is beyond the scope of this chapter. Chapter 2 examines ECA's involvement in some of these new technologies.

In both regions, large current account deficits during the boom were financed with capital inflows that were reversed during the crisis. Emerging economies in East Asia received large capital inflows during the 1990s, after they opened their economies to global markets. Central European economies received large flows of foreign direct investment and other capital before and during their accession to the European Union. Their aggregate current account deficit widened to more than 8 percent of GDP in 2007. Heavy borrowing in foreign markets increased the vulnerability of both corporate and financial sectors to capital flow reversals (Truman 2013). In both cases, the reversal of capital inflows led to a steep and immediate decline in investment rates. In East Asia the loss in income was larger, so the immediate fall in investment rates was greater. Investments rates bounced back subsequently, but they remained below the preceding boom levels.

A combination of factors caused the decline in labor productivity after the crisis

Growth in ECA returned to precrisis levels in 2017. It has not been strong enough to compensate for the production losses that have occurred since the crisis, however (figure 1.9). Moreover, as little spare capacity is left, it is unlikely that these losses can be recouped in the

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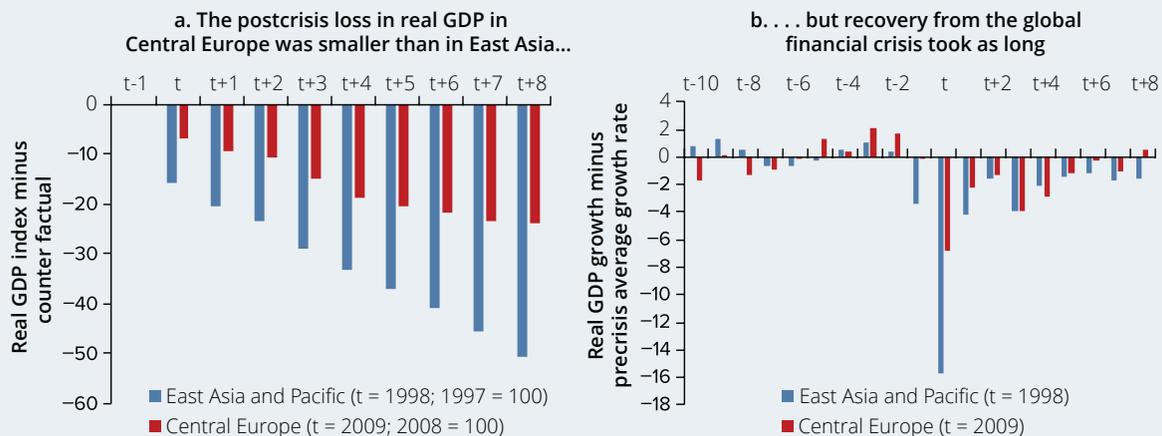


Box 1: Similarities between recoveries in Central Europe after 2009 and East Asia in the late 1990s

The recovery of economies in Central Europe from the 2008–09 global financial crisis was comparable to the recovery of East Asia following the 1998 financial crisis. Both recoveries took about eight years. In East Asia, however, the impact of the crisis was much greater. Five years after the crisis began, GDP in East Asia was 37 percent below its precrisis level. In Central Europe, the corresponding loss was 20 percent. In both regions, large current account deficits during the boom were financed with capital inflows that were reversed during the crisis. Emerging economies in East Asia received large capital inflows during the 1990s, after they opened their economies to global markets. Central European economies

received large flows of foreign direct investment and other capital before and during their accession to the European Union. Their aggregate current account deficit widened to more than 8 percent of GDP in 2007. Heavy borrowing in foreign markets increased the vulnerability of both corporate and financial sectors to capital flow reversals (Truman 2013). In both cases, the reversal of capital inflows led to a steep and immediate decline in investment rates. In East Asia the loss in income was larger, so the immediate fall in investment rates was greater. Investment rates bounced back subsequently, but they remained below the preceding boom levels.

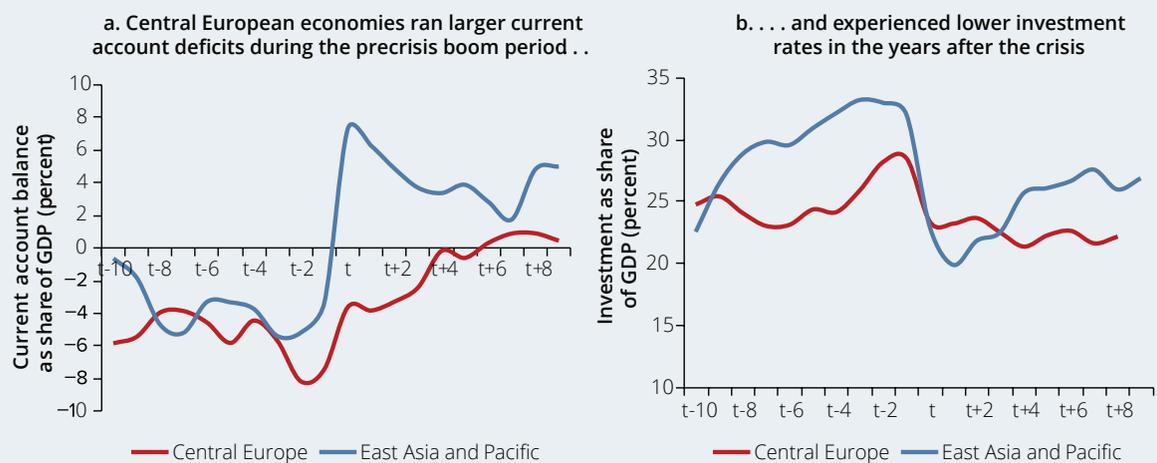
FIGURE B1.1.1 Recovery in Central Europe was similar to recovery after Asian financial crisis



Source: Data from World Development Indicators and Eurostat.

Note: The postcrisis counterfactual real GDP series were constructed assuming that annual GDP growth remained at the precrisis average growth rates. East Asia and Pacific includes Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Vietnam.

FIGURE B1.1.2 Investment rates adjusted immediately to reversal in capital flows



Source: Data from World Development Indicators and Eurostat.

Note: East Asia and Pacific includes Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Vietnam.

Only 0.35 percentage points of the slowdown in potential growth can be attributed to slowing labor supply growth.

coming years. Thus not only actual growth but also potential growth has declined since the crisis.

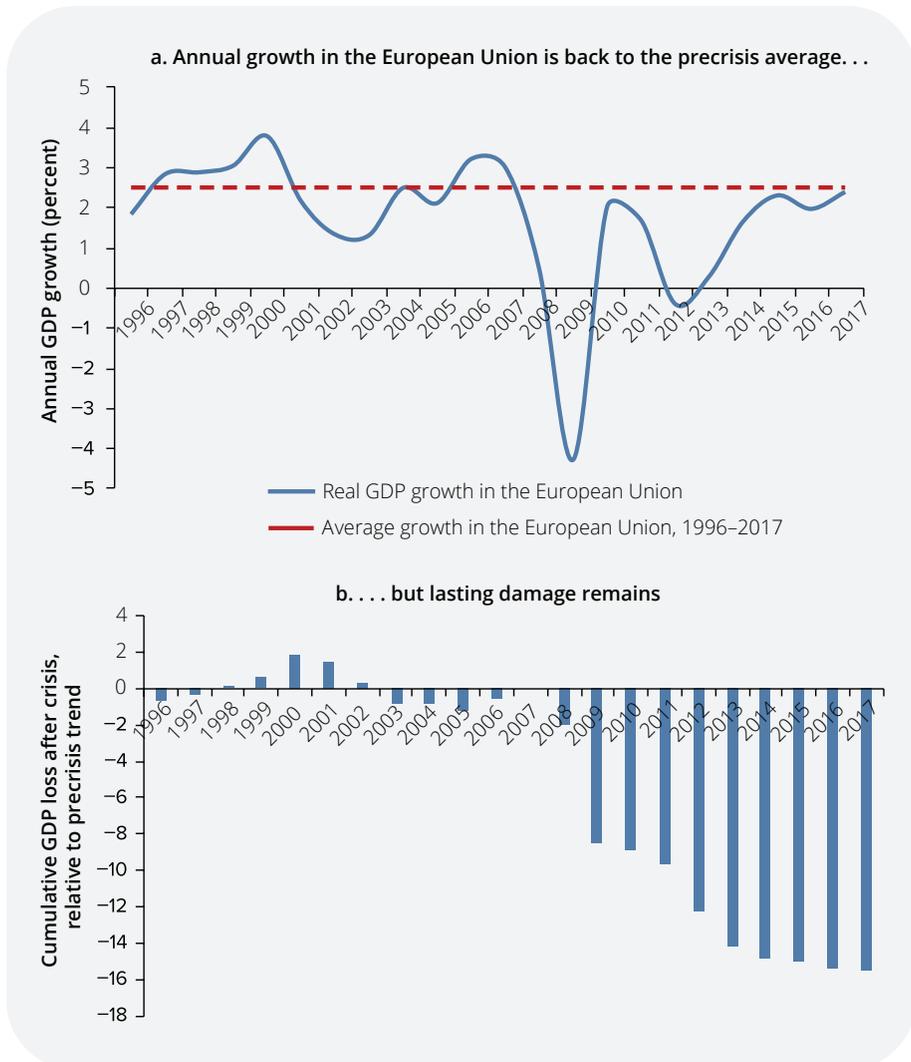
In the region's middle-income countries, slower labor productivity growth caused most of the deceleration in potential growth; only 0.35 percentage points of the slowdown in potential growth can be attributed to slowing labor supply growth (World Bank 2018). The changing pace of capital deepening cannot explain this slowdown in labor productivity, most of which is reflected in total factor productivity (TFP), the unexplained factor in production functions (figure 1.10).

Differences across countries were considerable, and many idiosyncratic events occurred. But after the crisis, every country in the region except Ireland experienced a decline in the contribution of TFP to labor productivity growth (figure 1.11). In most countries, TFP actually fell.

Labor productivity growth can be decomposed into three components:

- changes in labor productivity within each economic sector (the within-sector component)
 - changes in labor productivity resulting from the reallocation of labor across sectors (the shift component)
 - a cross component that represents the interaction between the change in labor productivity within a given sector and the change in labor input share of that sector
- As the third component is numerically insignificant, analysis of labor productivity growth can be based on the within-sector and shift components. This decomposition reveals three important trends in the drivers of labor productivity in Germany and some countries in ECA (figure 1.12).
- The deceleration in labor productivity growth in Germany started during the 1980s and continued in subsequent decades. Most of it was caused by weaker

Figure 1.9. Even after full recovery, the effects of the global financial crisis remain



Source: Eurostat

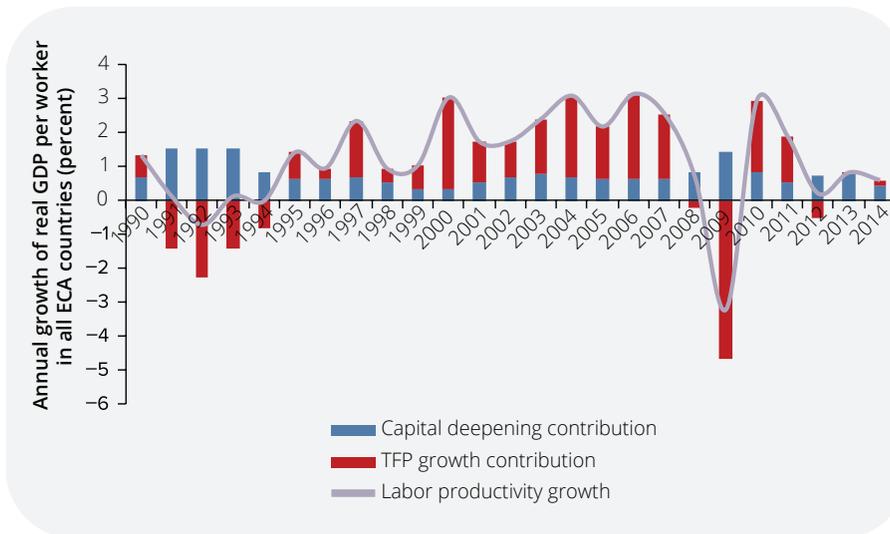
productivity growth within sectors. This pattern is also evident in other major European countries.

- The contribution of sectoral shifts to overall labor productivity growth in Germany changed markedly over time. Between the 1970s and the start of the 2000s, the shift of employment toward more productive sectors increased labor productivity growth by about half a percentage point. The contribution of sectoral shifts to labor productivity growth fell to zero after 2000 and turned

negative around the time of the 2008 global financial crisis. The long-term trend of labor shifting toward sectors with higher labor productivity, and likely higher capital intensity, came to an end when the digital economy started in earnest (see below). The contribution to labor productivity growth of the shift of labor to more productive sectors was greater in Central European countries than in Germany before the crisis, but as in Germany, it diminished after the crisis. This change is in line with the boom and

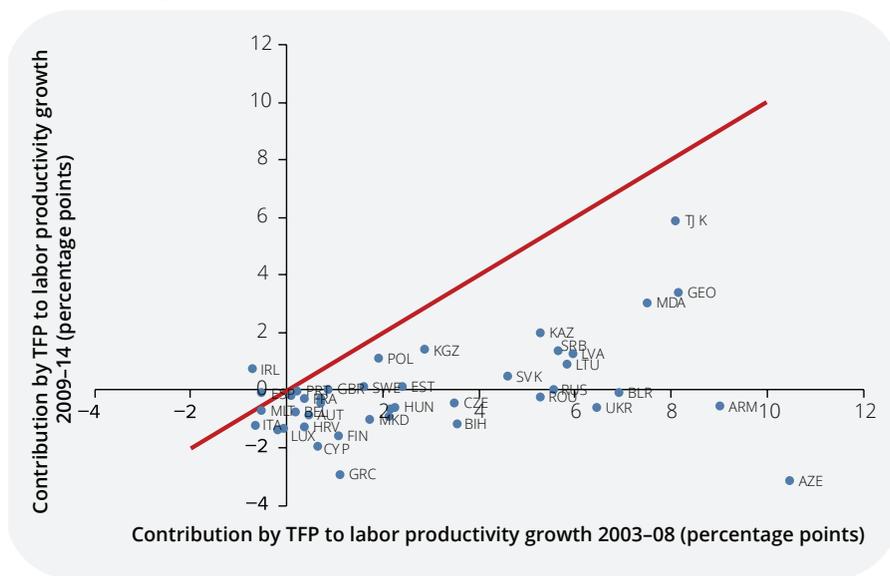
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Figure 1.10. After the crisis, labor productivity increased at a slower rate



Source: Penn World Table 9.0 dataset.

Figure 1.11. The contribution of total factor productivity (TFP) to labor productivity growth declined after the crisis



Source: Penn World Table 9.0 dataset.

bust in the growth in FDI flows to these countries (EBRD 2015; World Bank 2018).

During the boom period, FDI inflows created high-productivity jobs. These flows plummeted after the crisis. The contribution of the sectoral shift to productivity declined also in Armenia after the crisis (box 1.2).

Major crises—the second oil crisis of the late 1970s and the global financial crisis—led to a permanent loss in productivity. Even where productivity growth returned to the original (downward) trend, the damage of the crisis was not recouped. Productivity remains below the levels that would have been achieved had the crisis not occurred.

The lasting impact of deep crises on productivity growth may have been caused by the loss of capital and skills that become obsolete or by a loss in confidence by workers who suffered extended bouts of unemployment.

The reasons for the long-term decline in within-sector labor productivity growth, in many ECA countries and globally, have been debated in the economic literature. The change in within-sector labor productivity can be decomposed into changes generated by capital deepening and changes that cannot be explained (TFP). The contribution of capital deepening shrank significantly in several, but not all, countries during the years around the 2008 crisis. And almost all countries experienced a decline in within-sector TFP growth.

The literature has suggested several possible causes for the slowdown in TFP.

First, deep reforms led to a temporary rise in productivity growth in several ECA countries. Productivity growth subsequently fell when major aspects of the reform agenda were completed. In Central Europe, reforms connected to EU accession initially boosted the growth of GDP and productivity. Reform momentum, and productivity growth, slowed after EU accession, in the mid-2000s (World Bank 2018). In Central Asia and the South Caucasus, TFP growth accelerated in the 1990s with institutional reforms in the early transition period. It plunged by the beginning of 2000s, perhaps because such benefits diminished as the room for further reforms narrowed.

Second, across the world, technological changes in advanced and emerging economies affected the measurement and growth of productivity. The digital revolution that began in the 1990s led to a massive shift of resources to information and communications technology (ICT) industries. The output of these industries

Major crises—the second oil crisis of the late 1970s and the global financial crisis—led to a permanent loss in productivity.



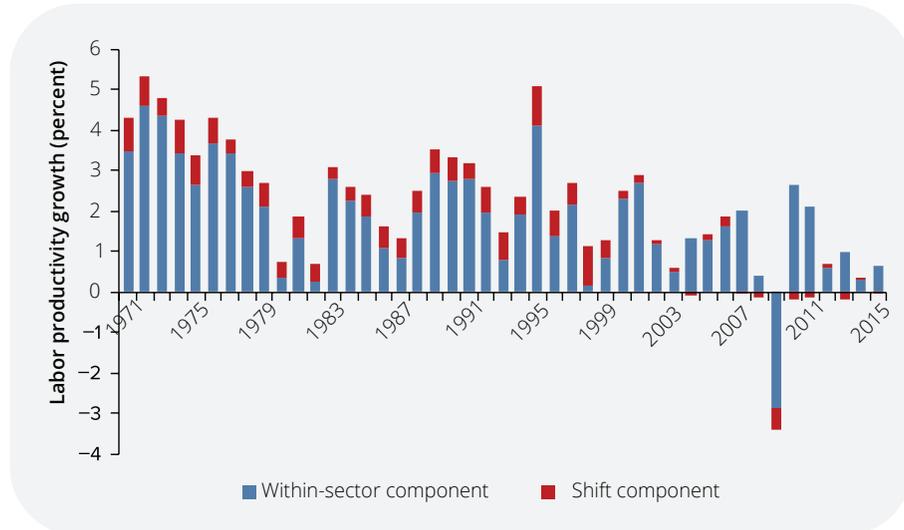
Box 2:

A new normal in Armenia

Armenia's economy changed markedly following the global crisis. Per capita GDP growth fell from 8.4 percent a year in 2003–09 to 3.2 percent a year in 2010–16. Labor productivity growth was similar in the two periods (6.7 percent a year before the crisis and 6.2 percent after), but migration flows, employment levels, and the composition of labor productivity growth changed dramatically. During the boom, many people found jobs abroad, especially toward the end of the period, when oil revenues skyrocketed in Russia. As a result, Armenia's population declined by almost 5 percent between 2003 and 2009. At the same time, many jobs were created in construction and other nontradable sectors, to satisfy domestic demand fueled by remittances. The combination of emigration and job creation boosted the share of the population that was employed from 36 percent in 2003 to 40 percent in 2009. During those six years, the shift toward capital-intensive construction led to an increase in labor productivity of 4 percentage points a year. Within-sector productivity growth contributed only 2.7 percentage points to overall labor productivity growth, perhaps because elevated domestic demand reduced competitive pressures on the supply side. These patterns reversed in the aftermath of the crisis. Emigration slowed, the population increased by 1.7 percent between 2010 and 2016, and the construction sector and other nontradable sectors laid off workers. As a result, the share of the population that was employed fell to 34 percent. The impact of sectoral shifts on productivity growth turned negative, and the within-sector contribution to annual labor productivity growth increased to 7.4 percentage points. The increase may have reflected increased competition, as domestic demand declined and production shifted toward goods and services that are tradable in international markets.

is notoriously difficult to measure (for example, how does one value free Internet services financed by advertisements?). If the value of these new services is understated, then aggregate measurements of productivity may also be understated, particularly if growth slows in more traditional industries that are losing labor and capital to the ICT sector. Given the magnitude of the slowdown, however, not all of it can be attributed to measurement issues (Syverson 2016).

Figure 1.12. Labor productivity growth in Germany is on a long-term downward trend



Source: Data from KLEMS dataset (available at <http://www.euklems.net/>). Data for years before 1995 are KLEMS estimates. Note: Labor productivity is calculated as real value added per hour worked.

The shift to ICT industries may also be connected to lower productivity. It is costly and time consuming to overcome the special difficulties involved in commercializing novel technologies (David 1990). Because it may take time to realize the return on the labor and capital moving to these new industries, shifts of labor and capital to (initially) low-return industries may depress aggregate productivity growth. In the United States, for example, the slowdown before the 2008 crisis occurred mainly in industries that produce information technology (IT) services or use such services intensively (Fernald 2015; Gordon 2016).

Third, declining flexibility in some advanced countries may be reducing productivity growth. Business dynamism has declined in the United States, as reflected in the drop in reallocation rates for jobs (after 1990) and workers (after 2000) (Davis and Haltiwanger 2014), and the pace of startup creation in the

United States declined over the 2000s (Haltiwanger 2011). Across OECD countries, productivity growth in the

most advanced firms remained robust over the 2000s, but the difference in productivity levels between leading and lagging firms widened (Andrews, Criscuolo, and Gal 2015; Haltiwanger 2011). This phenomenon may have deepened the productivity slowdown if barriers to the reallocation of labor and capital intensified.

Fourth, long-term trends in the global economy may be contributing to the slowdown in productivity growth. Aging and other demographic factors may account for part of the decline (Maestas, Mullen, and Powell 2016). The slowdown in global trade integration following the crisis may also be contributing to slower TFP growth (Adler and others 2017).

No single factor is responsible for the observed deceleration of productivity growth: long-term trends, sectoral shifts, reform momentums, and global crises all play roles. No silver bullet can reignite productivity growth. Policy makers need a diverse set of instruments to encourage innovation, build up skills and infrastructure, and facilitate competition.

MACROECONOMIC OUTLOOK

- 1) That used to be the rule globally, but after the global financial crisis a decade ago, that ratio came down closer to one. As illustrated in earlier ECA Economic Updates, the global decline in the income elasticity of trade has not materialized in Europe and Central Asia.
- 2) Current real copper prices are also 57 percent below their historical peak, which was reached in April 1974.
- 3) A key reform in Uzbekistan was the elimination of the dual exchange rate, which reduced domestic price distortions and opened up new export opportunities. The government also reduced import duties and is harmonizing the duty code with Eurasian Economic Union norms.
- 4) The much higher rate for youth unemployment is normal, for a variety of reasons. Search unemployment is much higher for people entering the labor market than for workers who already have jobs. Cyclical changes in unemployment also tend to be more pronounced for young people. During crisis periods, the lack of job vacancies disproportionately hurts people entering the labor market for the first time. During economic recoveries the opposite happens, as the opening up of new vacancies disproportionately benefits newcomers to the labor market.
- 5) This decomposition is based on sector-level data on real value added and the number of hours worked. We follow the methodology of Molnar and Chalaux (2015).

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