BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers

Productivity growth in Europe and Central Asia (ECA) has fallen from an above-EMDE-average pre-crisis rate of 5.5 percent to a below-EMDE-average post-crisis rate of 1.6 percent—the steepest decline of any EMDE region. There has been wide heterogeneity within the region, however, with productivity growth near zero since 2013 in the Western Balkans and above 2.5 percent in Central Europe. In the Western Balkans and the Russian Federation, investment weakness has weighed on productivity growth. The productivity slowdown in ECA has predominantly reflected weaker within-sector productivity growth, with a particularly sharp decline in the growth of services productivity, and weaker total factor productivity growth in Eastern Europe, the South Caucasus, and the Western Balkans. Sectoral reallocation has also slowed in the post-crisis period, reflecting headwinds that have limited the ability of firms with higher productivity to continue to absorb additional labor from less productive sectors. A comprehensive reform agenda is needed to boost investment in physical and human capital, address continuing demographic pressures, and raise innovation. Such reforms are also needed to improve business climates and governance, reduce the role of the state in the economy, and promote the diversification of commodity-dependent economies.

Introduction

Productivity growth in the Europe and Central Asia (ECA) region has fallen from an above-EMDE-average pre-crisis (2003-08) rate of 5.5 percent to a below-average post-crisis (2013-18) rate of 1.6 percent—the steepest decline of any EMDE region (Figure 2.2.1.1). Productivity levels in ECA in 2018 were one-half above the EMDE average, but only 30 percent of the advanced-economy average. The sharp post-crisis slowdown in productivity growth has significantly reduced the pace of ECA's convergence with advanced economies.

Within the ECA region, there is wide heterogeneity across economies. Productivity growth in Central Europe has been solid in the post-crisis period, at 2.6 percent, while it has been near zero in Russia and the Western Balkans. The region's agricultural commodity exporters, most of which are in Central Asia (excluding Kazakhstan) and Eastern Europe, have ECA's lowest productivity levels, at 3 and 10 percent of the advanced-economy average, respectively. In contrast, Poland and Turkey have productivity levels over 35 percent of the advanced-economy average, reflecting their integration into global value chains and roles as regional financial centers. Central Europe, whose economies are members of the European Union (EU), is deeply embedded in Western European supply chains and has the highest productivity of the ECA subregions, at 34 percent of the advanced-economy average.

Against this backdrop, this box addresses the following questions.

- How has productivity growth evolved in the ECA region?
- What have been the factors associated with productivity growth in the region?
- What policy options are available to boost regional productivity growth?

For the purposes of this box, productivity, unless otherwise indicated, refers to labor productivity, defined as real GDP (at 2010 prices and market exchange rates) per worker. The data refer to a sample of 21 ECA economies: Kosovo, Turkmenistan, and Uzbekistan are excluded in some analysis due to limited data availability.[1]

Evolution of regional productivity

Sharp post-crisis productivity growth slowdown. In the steepest post-crisis decline of any EMDE region, average productivity growth in ECA fell to 1.6 percent in 2013-18, below the EMDE average, from the above-average rate of 5.5 percent in 2003-08. This slowdown was broad-based across the region, affecting nearly all economies, with post-crisis productivity growth below longer-term (1992-2018) averages in roughly two-thirds of the region's economies (Figure 2.2.1.2).

Within-region heterogeneity. There has been wide heterogeneity within the region. The productivity growth slowdown was particularly steep in the South Caucasus and Russia, as well as in the Western Balkans, the latter of which was hit by the Euro Area crisis of 2010-12 amid already elevated unemployment rates. In contrast, the deceleration was milder in Central Europe, which is better

Note: This box was prepared by Collette M. Wheeler, building upon analysis in Chapter 3. Research assistance was provided by Vasiliki Papagianni and Shijie Shi.

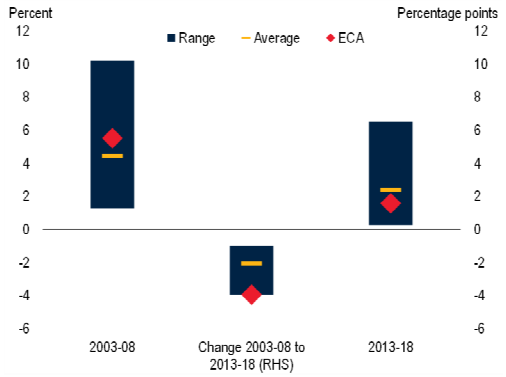
[1] Central Europe includes Bulgaria, Croatia, Hungary, Poland, and Romania. Western Balkans includes Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia. Eastern Europe includes Belarus, Moldova, and Ukraine. South Caucasus includes Armenia, Azerbaijan, and Georgia. Central Asia includes Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

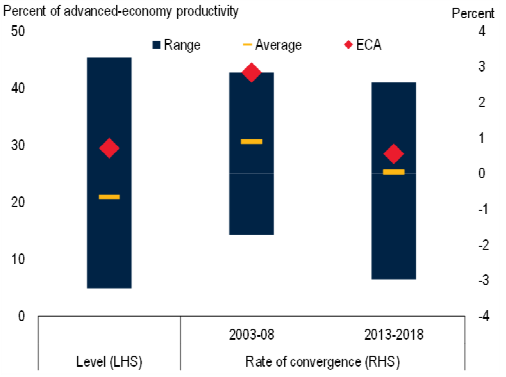
FIGURE 2.2.1.1 Productivity in ECA compared with other regions

Productivity growth in Europe and Central Asia (ECA) has fallen from an above-EMDE-average pre-crisis rate of 5.5 percent to a below-EMDE-average post-crisis rate of 1.6 percent—the steepest decline of any EMDE region. Convergence toward advanced economies slowed in the post-crisis period, after having been the fastest among EMDE regions in the pre-crisis period. Productivity levels in ECA, while above the EMDE average, are still one-third of those in advanced economies.

A. Average annual productivity growth in EMDE regions



B. Productivity levels and convergence in EMDE regions



Source: Penn World Table; The Conference Board; *World Development Indicators*, World Bank.

Note: ECA = Europe and Central Asia, EMDE = emerging market and developing economies. Aggregate regional growth rates calculated using GDP weights at 2010 prices and market exchange rates. Unless otherwise specified, productivity refers to labor productivity, defined as output per worker. Sample includes 127 EMDEs, of which 21 are ECA economies.

A. Blue bars denote the range across six (GDP-weighted) averages for EMDE regions. Yellow bars denote the simple average of the six EMDE regional averages.

B. Rate of convergence calculated as the difference in productivity growth rates with the average advanced economy divided by the log difference in productivity levels with the average advanced economy. Regional rate of convergence is the GDP-weighted average of EMDE economies of each region. "Level" of productivity refers to the GDP-weighted average of regional productivity as a share of the average advanced economy during 2013-18. Advanced-economy sample includes 35 advanced economies.

Click here to download data and charts.

integrated into global supply chains, and Central Asia, which has growing economic ties with China.

- *South Caucasus.* The post-crisis decline in productivity growth was most pronounced, at 14 percentage points, in the South Caucasus. After reaching double-digit annual productivity growth pre-crisis, the subregion suffered several post-crisis shocks, including conflict (Georgia), bouts of violence (Armenia), and a plunge in commodity prices (Armenia, Azerbaijan, Georgia).

- *Western Balkans.* Productivity growth also markedly declined in the Western Balkans (by 5.4 percentage points), where the Euro Area crisis disrupted financial intermediation, including foreign bank retrenchment, and progress on structural reforms stalled. Since 2013, productivity growth in this subregion has been near zero.

- *Russia.* Amid international sanctions and the 2014-16 oil price collapse, Russia's productivity growth was, on average, near zero in 2013-18—a sharp decline from 6.0 percent in 2003-08.

- *Turkey.* Productivity growth more than halved relative to its pre-crisis average, slowing to 2.1 percent in 2013-18, as the economy faced political and economic shocks.

- *Central Europe.* Annual productivity growth slowed by just over 1 percentage point, from 3.7 percent to 2.6 percent, in Central Europe in the post-crisis period, in tandem with the modest slowdown in the Euro Area. This partly reflects the close integration of this subregion with Western European supply chains. Notwithstanding anemic Euro Area growth since the global financial crisis, Central Europe achieved the second highest productivity growth of any ECA subregion in 2013-18, after only Central Asia. This, in part, reflected buoyed investment, which was supported by the absorption of EU structural funds.

- *Eastern Europe.* Annual productivity growth in Eastern Europe slowed by about 4.5 percentage points from pre-crisis rates, to 2.2 percent during 2013-18. Productivity growth averaged only 1.4 percent in 2013-16, which reflected the dual shocks of conflict in Ukraine and a commodity price plunge, but picked up in the next two years.

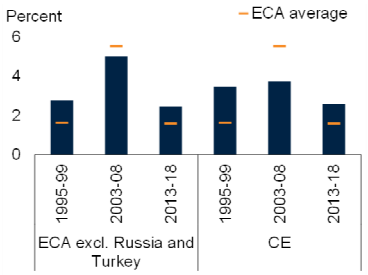
- *Central Asia.* Central Asia insulated itself somewhat from the impact of the oil price slump of 2014-16

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

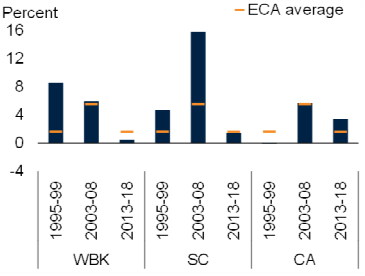
FIGURE 2.2.1.2 Evolution of productivity in ECA

The post-crisis slowdown in productivity growth has affected nearly all the economies in ECA. There is wide heterogeneity within the region, however, with productivity growth near-zero since 2013 in Russia and the Western Balkans but above 2.5 percent in Central Asia and Central Europe. The post-crisis productivity growth slowdown has reflected a sharp deceleration in total factor productivity growth in Eastern Europe, the South Caucasus, and the Western Balkans but investment weakness in Russia and Central Europe.

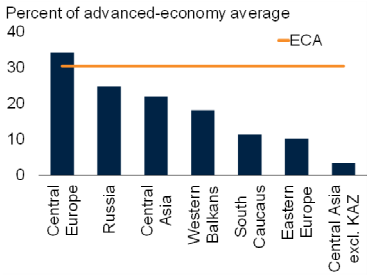
A. Productivity growth in ECA



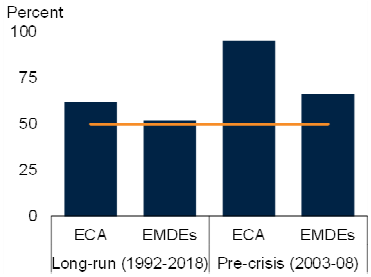
B. Productivity growth in Central Asia, South Caucasus, and Western Balkans



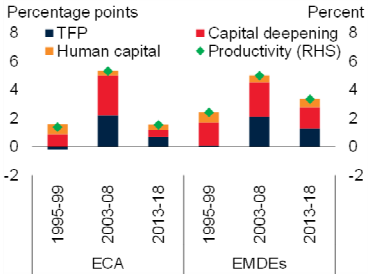
C. Productivity levels relative to advanced-economy average, 2018



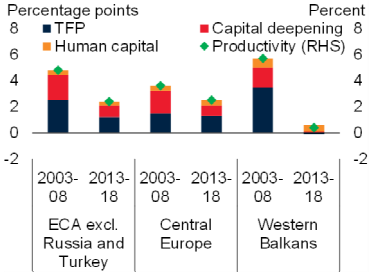
D. Share of economies with productivity growth below long-run and pre-crisis averages, 2013-18



E. Contribution to productivity growth



F. Contribution to productivity growth, by ECA subregion



Source: Barro and Lee (2015); Haver Analytics; International Monetary Fund; Penn World Table; United Nations; Wittgenstein Centre for Demography and Global Human Capital; *World Development Indicators*, World Bank.

Note: CA=Central Asia, CE=Central Europe, KAZ=Kazakhstan, SC=South Caucasus, WBK=Western Balkans. Unless otherwise specified, productivity refers to labor productivity, defined as output per worker.

A.-F. Aggregate growth rates calculated using GDP weights at 2010 prices and market exchange rates.

C. Figure shows 2018 subregional productivity levels as a share of 2018 advanced-economy weighted average. Sample includes 35 advanced economies and 21 ECA economies.

D. Figure shows the share of economies for which average productivity growth in 2013-18 was lower than a long-run (1992-2018) and the pre-crisis (2003-08) average. Sample includes 127 EMDEs, of which 21 are ECA economies.

E.F. Productivity defined as output per worker in 2010 U.S. dollars. Samples are unbalanced due to data availability, and include up to 21 ECA economies and 92 EMDEs.

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and recession in Russia during 2015-16 by pivoting its exports toward China. By 2018, China had become the second largest export market for Central Asia after the Euro Area, accounting for 20 percent of exports. As a result, the subregion's productivity growth slowed mildly in comparison to the rest of the region, by 2.3 percentage points to 3.4 percent in 2013-18—the fastest productivity growth in ECA in the period.

High productivity levels relative to EMDEs, but with wide range. Partly as a result of rapid productivity growth in 2003-08, the average productivity level in ECA in 2013-18 was 30 percent of the advanced-economy average—roughly one-half above the EMDE average. The ECA average, however, masks wide divergences across ECA subregions, from 3 and 10 percent of the advanced-economy average in predominantly agricultural commodity-exporting Central Asia (excluding Kazakhstan)

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

and Eastern Europe, respectively, to 34 percent of the advanced-economy average in Central Europe, which is deeply embedded into Euro Area supply chains and which has benefited from the absorption of EU structural funds. Poland and Turkey had productivity levels above 35 percent of the advanced-economy average, partly reflecting their openness to trade and positions as regional financial centers (World Bank 2014; World Bank 2019i). Since the global financial crisis, the pace of convergence to advanced -economy productivity levels in the ECA region as a whole has slowed sharply, to average less than 1 percent per year over 2013-18—one-fifth of its rate in 2003-08.

Sources of productivity growth. Labor productivity growth can be decomposed into its sources: Factor accumulation (human or physical capital) and advances in the efficiency of factor use (total factor productivity, or TFP). Two-thirds of the post-crisis slowdown in productivity growth in ECA is estimated to have been due to slowing capital accumulation—partly reflecting weak investment amid lower foreign direct investment (FDI) inflows and declining commodity prices—and one-third to slowing TFP growth, compared with about equal contributions of these sources in the average EMDE.

In Russia and Central Europe, particularly Bulgaria and Romania, weakening capital services deepening accounted for most (three-quarters) of the slowdown in productivity growth in the post-crisis period. In Russia, international sanctions, combined with the 2014-16 oil price plunge, deterred investment, which was further dampened by the weak business environment (Russell 2018). Although EU structural funds have buoyed overall investment in Central Europe, they have not fully offset weakness in machinery and equipment investment, which has been due partly to reduced commercial credit supply (Gradzewicz et al. 2018; Levenko, Oja, and Staehr 2019).

In contrast, reduced TFP growth has been the main source (accounting for three-quarters) of the productivity growth slowdown in Eastern Europe, the Western Balkans, and the South Caucasus. This has partly reflected pockets of conflict and violence (Armenia, Georgia, Ukraine). However, private and public investment has also been weak in the post-crisis period, contributing to reduced TFP growth. As a result of weak investment, these subregions face large infrastructure gaps, particularly in transport and telecommunications networks, which limits the capacity to promote regional integration and, for energy exporters, diversification (IMF 2014). Obstacles to private sector development also constrain TFP in these subregions, with certain economies in the Western Balkans facing notable challenges with corporate over-indebtedness and market concentration (EBRD 2018a). In both Turkey and Central Asia, the sources of the productivity deceleration were broad-based, reflecting a slowdown in physical capital deepening and human capital improvements, as well as in TFP growth, particularly in Kazakhstan. In Central Asia, Eastern Europe, and the Western Balkans, reform momentum has also slowed, with many of these economies falling short of completing the transition to competitive and inclusive markets.

Sources of regional productivity growth

Post-crisis slowdown across all sectors. Pre-crisis productivity growth in ECA was mostly driven by shifts of resources from agriculture and industry to higher-productivity services sectors, partly as a result of continued reforms to address resource misallocation inherited from central planning (World Bank 2008). The post-crisis period, however, was marked by weakness of growth across all sectors as a slowdown in manufacturing, exacerbated by dwindling global trade growth and a collapse in commodity prices, spilled over to services (Figure 2.2.1.3; Orlic, Hashi, and Hisarciklilar 2018). In contrast to the EMDE average, the contribution of services to productivity growth in 2013-15 was negative in ECA, likely reflecting, in part, spillovers from the Euro Area debt crisis and the continued migration of skilled labor to Western Europe.

Sectoral reallocation as a source of productivity growth in ECA. Resource reallocation toward more productive sectors accounted for almost half of ECA's productivity growth in the 1990s, as output of the region's services sectors increased by nearly 15 percentage points of GDP (World Bank 2008; Arnold, Javorcik, and Mattoo 2011; World Bank 2015b). In contrast, the surge in productivity growth of 2003-08 mostly reflected within-sector growth, as firms in Central Europe became integrated into Euro Area supply chains, technology transfer accelerated, and the services sectors became more liberalized.[2] After the global financial crisis, however, within-sector productivity

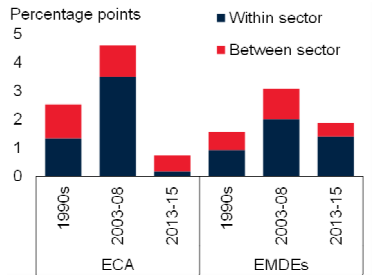
[2] As economies in Central Europe initiated the process to join the European Union, structural policies that boosted competition and facilitated integration with global value chains helped spur within-sector growth, particularly within services. Thus, liberalization of services sectors is likely to have increased the average productivity of incumbent firms and facilitated the entry of new and more innovative firms. Please refer to Bartelsman and Scarpetta (2007); Brown and Earle (2007); Georgiev, Nagy-Mohacsi, and Plekhanov (2017); Shepotylo and Vakhitov (2015); and World Bank (2008) for further detail.

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

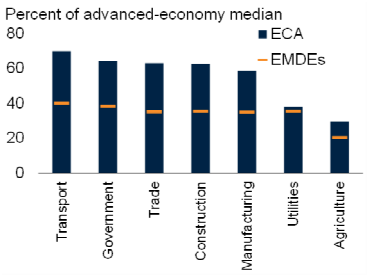
FIGURE 2.2.1.3 Factors supporting productivity growth in ECA

Within-sector productivity growth—the main driver of pre-crisis productivity growth in ECA—fell sharply in the post-crisis period, and productivity gains from sectoral reallocation halved as economies moved to services sectors with relatively low productivity levels. The deceleration of productivity reflected slower improvements in a broad range of its fundamental drivers.

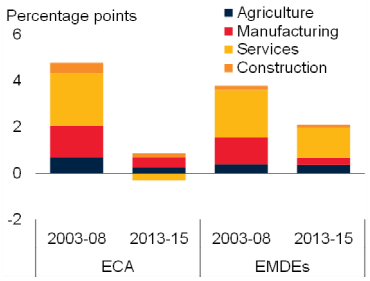
A. Contribution to productivity growth



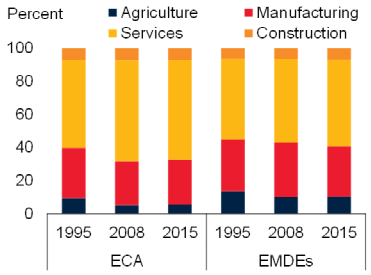
B. Sectoral productivity levels



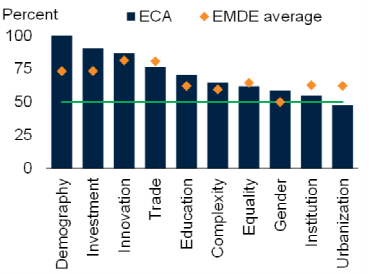
C. Sectoral contribution to productivity growth



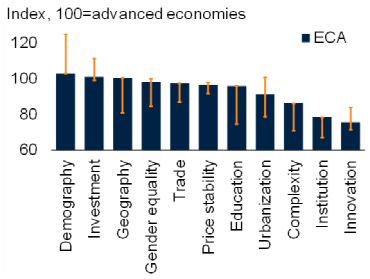
D. Sectoral composition of GDP



E. Share of EMDEs with a post-crisis slowdown in growth of underlying drivers of productivity



F. Drivers of productivity, 2017



Source: APO productivity database; Expanded African Sector Database; Groningen Growth Development Center Database; Haver Analytics; International Country Risk Guide; ILOSTAT; Observatory of Economic Complexity; Organisation of Economic Co-operation and Development STAN; Penn World Table; United Nations; World Bank; World KLEMS.

Note: Unless otherwise specified, productivity refers to labor productivity, defined as output per worker.

A.-D. The sample includes 6 ECA economies and 46 EMDEs.

A.D. Aggregates calculated using GDP weights at 2010 prices and market exchange rates.

A. Growth "within sector" shows the contribution to aggregate productivity growth of each sector holding employment shares fixed. The "between sector" effect shows the contribution arising from changes in sectoral employment shares.

B. Figure shows the median of country groups.

C. Figure shows median values. "Manufacturing" includes manufacturing, mining and utilities; "Services" includes financial and business services, government and personal services, trade services, and transport services.

D. Figure shows the share of total value added within each sector. "Manufacturing" includes mining and utilities; "Finance" includes business services.

E. Post-crisis slowdown defined as a decline in the growth of each variable during 2008-17 compared to growth in the pre-crisis period, defined as 1998-2007. The blue bars represent share of 21 economies in Europe and Central Asia economies where improvements in each driver of productivity were lower during 2008-17 than in the pre-crisis period 1998-2007 or changes in 2008-17 were below zero. Orange diamond is the corresponding values for EMDE countries. Variables corresponding to each concept and their sample sizes are: Institutions=government effectiveness (20 ECAs; 126 EMDEs), Innovation=patents per capita (15 ECAs; 43 EMDEs), Investment=investment to GDP ratio (21 ECAs; 109 EMDEs), Income equality=(-1)*Gini (21 ECAs; 121 EMDEs), Urbanization=urban population percentage (21 ECAs; 127 EMDEs), Complexity = Hidalgo and Hausmann (2009)'s Economic Complexity Index (17 ECAs; 79 EMDEs), Education=years of schooling (17 ECAs; 103 EMDEs), Demography=share of working-age population (21 ECAs; 127 EMDEs), Gender equality= female average years of education divided by male average years (17 ECAs; 102 EMDEs). Green horizontal line indicates 50 percent.

F. Figure shows the unweighted average levels of drivers normalized as an average of AEs as 100 and standard deviation of 10. Blue bars represent average within Europe and Central Asia economies in 2017. Orange whiskers represent the range of the average drivers for six regions in 2017. Variables corresponding to the concepts are as follows: Education = years of education, Urbanization = share of population living in urban area, Investment = share of investment to GDP, Institution= rules of law, Complexity=Economic complexity index, Geography=share of land area which are not in tropical region, Gender equality= Share of the year of schooling for female to male, Demography=share of population under 14, Innovation=Log patent per capita, Trade=Export+Import/GDP, Price stability=(-1)*log inflation rate. Sample includes 21 ECA economies.

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BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

growth collapsed, falling to near zero in 2013-15. This may have reflected falling investment in physical capital, particularly in commodity exporters amid the collapse of commodity prices, as well as stalling structural reforms to improve business environments (EBRD 2018b; Georgiev, Nagy-Mohacsi, and Plekhanov 2017).

Between-sector shifts in resources to productivity growth also declined in ECA after the crisis: In 2013-15 it was half its pre-crisis average. The fall may partly have reflected a shift out of agriculture into lower-productivity sectors post -crisis (trade services) than pre-crisis (manufacturing), such as was the case in Kazakhstan (World Bank 2019j). In Romania, reallocation towards more efficient firms was more important within the manufacturing sector, as other sectors, including services, were less exposed to foreign competition (Iootty, Pena, and De Rosa 2019). More broadly, spillovers from the Euro Area debt crisis, slowing global trade growth, and the oil price plunge dampened growth in sectors with higher levels of productivity—including in finance, manufacturing, and mining—limiting their ability to continue to absorb additional labor from other sectors with lower productivity (ILO 2017). Indeed, unemployment grew and labor participation fell in the region, particularly in the Western Balkans and South Caucasus.

Widely varying sectoral productivity levels across ECA. Although most sectors in ECA have productivity levels above EMDE averages, aggregate regional numbers mask significant variations. For example, although productivity has improved in most sectors, agricultural productivity has declined in the economies of Central Asia since their transition to market economies in the 1990s amid disruptions to markets and trade (Gharleghi and Popov 2018). While there are a few exceptions in Central Asia where productivity in the production of specific commodities has improved—mainly grains in Uzbekistan and oil seeds in Kazakhstan—reallocating labor and capital from less competitive agricultural subsectors to more productive sectors continues to have the potential to boost economy-wide productivity.

More broadly in ECA, cross-sectoral productivity differentials continue to imply scope for further overall productivity gains from resource reallocation. In sectors such as agriculture, mining and utilities, ECA's productivity lags about 50-70 percent behind advanced-economy averages, and in mining and utilities it lags behind even EMDE averages. On average in ECA, productivity in agriculture (which accounts for 18 percent of GDP) is about one-third of productivity in other low-skilled sectors such as construction or trade and less than one-sixth of productivity in high-skilled services such as finance, which accounts for 9 percent of GDP.

Reform momentum

Two waves of reform spurred pre-crisis productivity growth in ECA. In the first wave, in the 1990s, the region transitioned toward market from centrally planned economies. In the early 2000s, the second wave of reforms in ECA was associated with the initiation by countries in Central Europe and the Western Balkans of their EU accession process.

First wave. In the wake of the collapse of the Soviet Union in the early 1990s, productivity plunged as transition economies fell into deep recessions caused by the rupture of trade and financial links with the Soviet Union, the emigration of skilled labor, and armed conflict in parts of the region. Central planning was dismantled and replaced by more market-based approaches (Falcetti, Lysenko, and Sanfey 2006). ECA economies were opened up to international trade and capital markets, prices and interest rates were liberalized, and state-owned enterprises were privatized to a degree (Georgiev, Nagy-Mohacsi, and Plekhanov 2017). These reforms helped boost productivity growth in the mid-1990s, particularly in Central Asia and the South Caucasus (World Bank 2018f).

Second wave. In the early 2000s, accession to the EU by the countries of Central Europe accelerated their international economic integration, and drove institutional improvements, further privatization, and deepening of their capital markets (Bruszt and Campos 2016). FDI and private investment surged as reforms were anchored externally, with many ECA economies rapidly becoming integrated into global value chains with Western Europe, accelerating the adoption of new technologies and practices (Aiyar et al. 2013, EBRD 2014). The growing international integration of financial and banking systems helped deepen capital markets, particularly in Central Europe. It was subsequently accompanied by a credit boom (de Haas and van Lelyveld 2006).[3]

Post-crisis reform momentum. Post-crisis, ECA has faced multiple headwinds, including the legacy of the global

[3] The rise in foreign currency borrowing by households and firms, however, left sectors exposed to external vulnerabilities, such as capital flow reversals, and deepened the recession following the global financial crisis as economies faced a credit crunch and a period of deleveraging (Zettelmeyer et al. 2010; de Haas et al. 2015).

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

financial crisis, the collapse of oil prices in 2014-16, heightened geopolitical tensions, and international sanctions on Russia. Meanwhile, reform momentum has slowed, with parts of the region witnessing reform reversals, leaving a need for substantial reform progress, especially in Central Asia and Eastern Europe—which are not anchored to an EU accession process—and the Western Balkans.[4] Many of the commodity exporters in the region also suffer from structural constraints, including a lack of export diversification, large state presence in firms, unfavorable business environments, and weak international competitiveness (Azerbaijan, Kazakhstan, Russia, Ukraine; EBRD 2017; Funke, Isakova, and Ivanyna 2017).

Post-crisis slowdown in drivers of productivity. There has been a broad-based slowdown in the growth of most key drivers of labor productivity in ECA in the post-crisis period. Demographic pressures have been intensifying, particularly in the past decade, in nearly all ECA economies. Growth in working-age populations in the region has long lagged the average for EMDEs as a result of significant migration to western European countries in the EU and to Russia and sharp declines in fertility rates. Additionally, more than three quarters of the economies in ECA have experienced post-crisis slowdowns in investment rates, reflecting adverse shifts in investor sentiment amid conflicts and financial pressures in the region, as well as weak external economic growth, including in the Euro Area, and adverse shocks to Russia. Low innovation rates—which partly stem from weak competitiveness, inadequate control of corruption, and a high presence of state-owned enterprises—also continue to dampen the business environment and hinder investment in the region, particularly in the absence of progress with other reforms (EBRD 2018a; EBRD 2019b).

Other factors affecting productivity in the region

Natural resource extraction. Standard productivity growth decompositions fold the extraction of natural capital into total factor productivity growth and, to a lesser extent, physical capital growth (Brandt, Schreyer, and Zipperer 2017; Calderón and Cantu 2019). An economy's natural capital consists of its natural resources such as oil, metals, and agricultural land, and is particularly relevant to ECA given the presence of large commodity exporters. During the pre-crisis commodity price boom and the accompanying boom in resource exploration and development, the increased extraction of natural capital lifted productivity growth in ECA (Khan et al. 2016). The rate of natural capital extraction declined in some economies following the boom and as commodity prices fell, dampening TFP growth.

Urbanization. Urbanization tends to be associated with productivity gains because it encourages more rapid dissemination of knowledge and technologies and facilitates the reallocation of resources from lower to higher-productivity sectors: such reallocation can be constrained by limited urban development, as has been the case in the Kyrgyz Republic (World Bank 2018g). The fact that ECA's population density is lower than in other EMDE regions with similar GDP per capita levels (such as Latin America and Caribbean) indicates scope for further productivity gains from urbanization. Yet, relative to the rest of the world, economies in ECA—particularly those in Central Europe, the Western Balkans, and Eastern Europe—have recently experienced declines in urban, as well as total, populations amid decades of below-replacement fertility and net emigration (World Bank 2017a).

Policy options

Across nearly all ECA economies, productivity growth has slowed since the financial crisis. To reinvigorate productivity growth, a four-pronged, comprehensive policy approach is needed to improve the provision and quality of factors of production, boost firm productivity, promote productivity-enhancing sectoral reallocation, and establish a more growth-friendly business environment. Some of these policies offer the prospect of relatively short-term productivity gains, such as changes in state-owned enterprise ownership and improvements in the investment climate, while others are more likely to lay the foundation for longer-term productivity gains, such as efforts to improve human capital or adjust migration policies. Within these broad categories, specific policy priorities need to be tailored to country-specific circumstances, especially given the region's wide heterogeneity.

Improving factors of production

In ECA, roughly two-thirds of the post-crisis slowdown in productivity growth has reflected slower physical capital

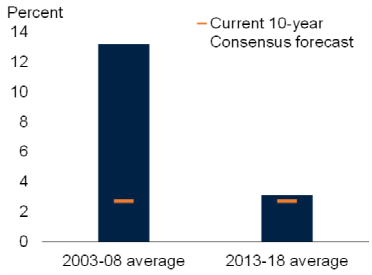
[4] A reversal of structural reforms remains a key risk in these regions, and the pace of growth will depend partly on the successful implementation of structural reforms to enhance the business environment, achieve debt sustainability, and restructure state-owned enterprises to improve competition. Please refer to EBRD (2013); Lehne, Mo, and Plekhanov (2014); Georgiev, Nagy-Mohacsi, and Plekhanov (2017); Rovo (2019); and World Bank (2019g) for further detail.

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

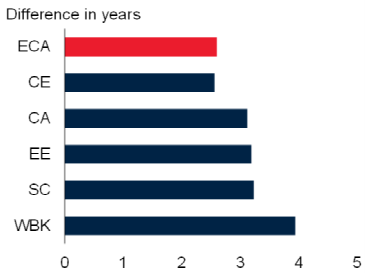
FIGURE 2.2.1.4 Drivers of productivity growth in ECA

Investment growth across the region has fallen in the post-crisis period, reflecting external headwinds—including a commodity price plunge—and idiosyncratic factors—including conflict in pockets of the region and financial pressures in large economies. The workforce is continuing to age, and the working-age population share is declining. Learning gaps are sizable in parts of the region, the control of corruption indicator and business climates remain weak, and the role of the state has remained large.

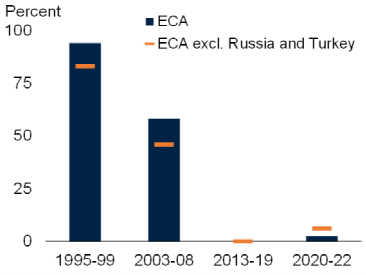
A. Actual and *Consensus* forecasts for investment growth



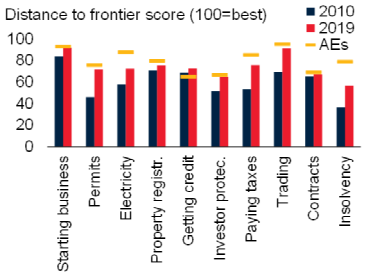
B. Learning gaps, 2017



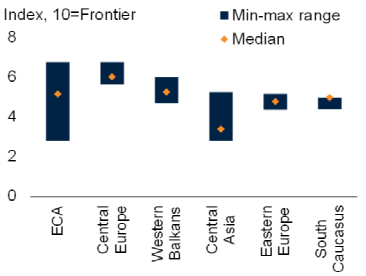
C. Share of regional GDP accounted for by economies with growing working-age populations



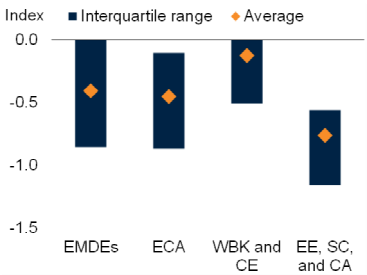
D. Doing Business indicators



E. Assessment of transition to a competitive market economy, 2019



F. Control of corruption, 2017



Source: Consensus Economics; European Bank for Reconstruction and Development; Kraay (2018); United Nations; World Bank.

Note: Unless otherwise specified, productivity refers to labor productivity, defined as output per worker.

A. Blue bars denote actual investment growth, where investment is measured as gross fixed capital formation. Actual growth aggregate calculated using GDP weights at 2010 prices and market exchange rates. *Consensus* forecasts aggregate calculated as a simple average of surveys for periods indicated based on data availability. Unbalanced sample includes 8 ECA economies, due to data availability.

B. CE = Central Europe, CA = Central Asia, EE = Eastern Europe, SC = South Caucasus, and WBK = Western Balkans. The learning gap is the difference between expected years of schooling and learning-adjusted years of schooling, as in Kraay (2018). The sample includes 21 ECA EMDEs.

C. The working-age population is defined as people aged 15-64. Unbalanced sample including 23 ECA economies.

D. AEs=advanced economies. Figure shows the median ECA value for 2010 and 2019, and the median advanced economy for 2019. The full names of the *Doing Business* reform areas given on the x-axis are: Making it easier to start a business, making it easier to deal with construction permits, making it easier to get electricity, making it easier to register property, making it easier to get credit, making it easier to protect minority investors, making it easier to pay taxes, making it easier to trade across borders, making it easier to enforce contracts, and making it easier to resolve insolvency. Sample includes 33 advanced economies and 22 ECA economies.

E. Figure shows the distance to the frontier for achieving a full transition to a competitive market economy, as measured by EBRD (2019b). Economies with higher index levels are closer to the frontier, where scores range from 1 to 10, with 10 denoting the synthetic frontier. The sample includes 24 ECA economies.

F. CE = Central Europe, CA = Central Asia, EE = Eastern Europe, SC = South Caucasus, and WBK = Western Balkans. The indicator reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests, as measured by the *World Governance Indicators*. Sample includes 23 ECA economies and 150 EMDEs.

Click here to download data and charts.

accumulation, with investment weakness particularly notable in Central Europe, Russia, and, more recently, Turkey, which together account for over 85 percent of ECA's GDP. In some parts of the region, infrastructure investment gaps are sizable. There is thus need for a renewed push to close infrastructure gaps as well as to boost private investment. Meanwhile, human capital accumulation has contributed less to productivity growth in ECA than in other EMDEs, suggesting there is also a need to improve this source of productivity growth.

Addressing investment and infrastructure gaps. Investment growth has fallen sharply in ECA in the post-crisis period, reflecting a commodity price plunge as well

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

as weakening external economic growth and investor sentiment, amid conflict, international sanctions, and financial pressures (Figure 2.2.1.4). Across the region, reforms to boost private sector development, transition to competitive and inclusive markets, and regional integration are needed to attract private investment and capital flows, particularly to economies outside the EU that lack access to financing sources, such as EU structural funds (EBRD 2018a; World Bank 2019g).

In certain subregions, particularly Central Asia, removing key bottlenecks to private sector development, such as inadequate infrastructure, is especially important to support productivity growth. In some pockets of the region, improved connectivity could accelerate the absorption of technology and speed convergence with advanced economies (Gould 2018). Infrastructure needs remain large in ECA, particularly in transport and electricity. Unreliable electricity supply hinders activity in parts of the region: while the percentage of firms experiencing electrical outages is lower in ECA than in any other EMDE region, related losses for affected firms in Central Asia can exceed 9 percent of annual sales (Blimpo and Cosgrove-Davies 2019; IMF 2019a). In surveyed manufacturing firms in Uzbekistan, for instance, smaller firms report more interruptions of electricity, gas, and water supply, than larger firms, as well as a lack of territory or high lease rates on land as impediments to expanding output production (Trushin, E. 2018). Appropriate land use planning and urbanization policies can substantially reduce the cost of meeting transport needs while minimizing carbon footprints (ITF 2018; Rozenberg and Fay 2019).

Raising human capital. In a few economies in ECA, particularly in Central Asia, inadequate investment in human capital has left parts of the workforce poorly equipped with the skills required for the future, and unprepared for rapid technological change (Flabbi and Gatti 2018). Boosting human capital investment—including through education and health—could help remove bottlenecks to productivity growth. How education systems adapt to evolving skill needs will be a key determinant of the productivity and distributional effects of technological change (Barro and Lee 2015).

In several economies in ECA, educational attainment and the acquisition of needed skills have been lower than expected given the level of school enrollment and the average years of schooling (Altinok, Angrist, and Patrinos 2018). The learning gap (the difference between years spent in schools and educational assessment outcomes) is wider than the global average in most Western Balkan economies—particularly in Kosovo and North Macedonia—as well as in a few economies in Eastern Europe (Moldova), Central Asia (the Kyrgyz Republic), and the South Caucasus (Georgia). While most economies in Central Europe have smaller gaps than ECA as a whole, Romania is an exception. Turkey also has a larger gap than ECA, in addition to low education attainment in the work force, large gender gaps in education, and an inadequacy of skills, which is often cited as a constraint for doing business and a bottleneck to innovation in the country (World Bank 2019d). Some economies in ECA with large learning gaps, including Georgia, have taken measures to reform the education sector and its funding (Kraay 2018).

Although ECA has the lowest rate of extreme poverty of all EMDE regions, the share of school-age children not enrolled in school is higher than in both East Asia and Pacific and Latin America and Caribbean (World Bank 2018h). Economies in the Western Balkans (Albania, Montenegro, Serbia), Eastern Europe (Moldova), Central Asia (the Kyrgyz Republic, Uzbekistan), and Turkey have elevated out-of-school rates relative to the ECA average for secondary education (UNICEF 2019). The diversity of situations in ECA—with human capital investment quite high in some economies but lagging in others (such as in Central Asia)—indicates a need for policies to be tailored to countries' specific needs (Kraay 2018). Education policy and training programs can also be redesigned to adapt the skills of aging populations to changing needs and new technologies (Hallward-Driemeier and Nayyar 2018; World Bank 2018a).

Counteracting unfavorable demographic trends. In ECA, the workforce is continuing to age, and the working-age population share is declining, with many young and skilled workers having emigrated. These developments are likely to weaken productivity growth and highlight the need for education to help workers adapt to new job requirements and technologies (Aiyar, Ebeke, and Shao 2016). Generating stronger productivity growth will require measures to mitigate the decline in skilled workforces. Implementing more flexible immigration policies could help relieve skilled labor shortages by attracting skilled foreign workers in an orderly way (Delogu, Docquier, and Machado 2014; World Bank 2019g).

Boosting firm productivity

Within-sector productivity gains stalled in ECA in 2013-15, consistent with slowing reallocation of resources between firms and slowing productivity growth within

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

firms. This highlights the need to boost firm productivity in the region, including by completing the transition to competitive and inclusive markets, which could strengthen the environment for private investment and innovation (World Bank 2019a). Policy options include measures to level the playing field for private and state-owned firms and expanding access to finance to a wider range of firms.

Leveling the playing field. State-owned enterprises tend to be less efficient than those in the private sector (World Bank 1995). In Eastern Europe and Central Asia, and to some extent Russia, the state's presence in the economy remains large, with state ownership accounting for more than 10 percent of firms surveyed in some cases, and with ECA ranking second overall among EMDE regions, after Sub-Saharan Africa (World Bank 2019k). In Ukraine, firms with at least partial state presence account for roughly 20 percent of total turnover by firms and over 25 percent of firms' assets (Balabushko et al. 2018). State-owned enterprises also have a large presence in Moldova, accounting for one-third of GDP (World Bank 2019l). Restructuring or privatizing state-owned enterprises therefore still presents an opportunity to raise economy-wide productivity in several countries across the region, if it is accompanied by effective regulation and improvements in management, corporate governance, and the business environment (Brown, Earle, and Telegdy 2006; EBRD 2019b; Funke, Isakova, and Ivanyna 2017). Additionally, there are a number of economies, including in Eastern Europe, where price controls remain in place for particular goods, tending to constrain competition and lower productivity.

Financial market development and financial inclusion. Small and medium-sized enterprises (SMEs) have the largest potential for productivity catch-up with advanced economies. Their growth continues to be hindered by many factors, including insufficient access to finance and regulatory barriers (Ayyagari, Demirgüç-Kunt, and Maksimovic 2017; Cusolito, Safadi, and Taglioni 2017; Wang 2016). The largest gaps in financial inclusion for SMEs in ECA are in Central Asia and the South Caucasus (excluding Georgia), where access to financial services is nearly as limited as in the Middle East and North Africa, South Asia, and Sub-Saharan Africa (IMF 2019b).

Policies that promote more widespread adoption of digital technologies, including in the delivery of financial and public sector services, could bolster financial inclusion and boost productivity by helping spread innovation and improving private sector and government efficiency (Baldwin 2019). In economies with large informal sectors, more widespread adoption of these technologies could also help expand tax bases through the fiscalization of informal sector transactions (World Bank 2019a). Increasing SMEs' access to finance could help these firms increase their average size and reduce their reliance on retained earnings to fund investment, which in turn would support job creation (Ayyagari, Demirgüç-Kunt, and Maksimovic 2017; Ayyagari et al. 2016).

Encouraging sectoral reallocation

Between-sector productivity gains from sectoral reallocation have slowed in ECA since the global financial crisis. Also, some ECA economies remain undiversified: renewed efforts to diversify commodity-based economies could generate new opportunities for labor to move toward more productive employment.

Diversifying economies. Energy-exporting economies, including those in ECA, are characterized by generally low levels of economic diversification, in terms of both exports and fiscal revenue (Grigoli, Herman, and Swiston 2017).[5] Energy sector production tends to be capital-intensive, with relatively high labor productivity (Aslam et al. 2016; Danforth, Medas, and Salins 2016; Stocker et al. 2018). Productivity growth, however, has been more tepid in ECA's energy-exporting countries than in the region overall, with post-crisis (2013-18) growth at 1.2 percent versus 1.6 percent, reflecting weaker TFP growth. Diversification therefore presents an opportunity to boost TFP and productivity growth, as well as macroeconomic stability (Brenton, Newfarmer, and Walkenhorst 2009; Papageorgiou and Spatafora 2012). Diversification of resource-based economies can be promoted by reforms that increase capital and skill accumulation, innovation, and reduce transaction costs.[6]

Enhancing a growth-friendly environment

Several ECA economies have severe institutional weaknesses that continue to erode incentives for innovation and investment. Addressing these weaknesses requires reforms to improve governance and business climates.

[5] On the budget front, Russia has made strides in anchoring fiscal policy by implementing a fiscal rule that targets a primary balance of zero at the benchmark oil price of $40 per barrel. Any excess fiscal reserves that are generated from higher oil prices are saved in the National Welfare Fund.

[6] Please refer to Beck (2018); Gylfason (2018); Lederman and Maloney (2007); Hesse (2008); and IMF (2016a) for further detail.

BOX 2.2.1 Labor productivity in Europe and Central Asia: Trends and drivers (*continued*)

Growth-friendly governance. Over the long term, institutional quality is one of the most important determinants of productivity growth (Chapter 3). In ECA, productivity catch-up to advanced economies was particularly pronounced in Central Europe during the pre-crisis period, reflecting the anchoring of structural and institutional reforms to the EU accession process (Rodríguez-Pose and Ketterer 2019). Overall, however, the region continues to face governance challenges with nearly 75 percent of ECA EMDEs falling below the global average for the control of corruption, including almost all of the economies of Central Europe, Eastern Europe, and the South Caucasus (Kaufmann, Kraay, and Mastruzzi 2010). Because progress in confronting perceived and actual corruption has been slow, continuing efforts have reinforced the perception that the control of corruption is higher than in other EMDEs (Transparency International 2019).

Structural reforms to improve governance can lead to sizable productivity gains, particularly in countries that are farthest from best practices (Chapter 3; Acemoglu, Johnson, and Robinson 2005; Cusolito and Maloney 2018). Major governance and business reforms in EMDEs have in the past been associated with higher growth rates in output, total factor productivity, and investment (Hodge et al. 2011; Divanbeigi and Ramalho 2015; World Bank 2018a). The detrimental effects of corruption on firm productivity can be exacerbated by excess or complex regulation (Amin and Ulku 2019). Anticorruption campaigns, as well as reductions in the number of regulations and tax complexity, have helped some economies tackle corruption (IMF 2019c).

Growth-friendly business climates. Lack of exposure to international competition—including from non-tariff barriers and complex trade rules—as well as restrictive product market and services regulation, remain structural bottlenecks in the region, hindering the ability to attract foreign direct investment and private investment in some economies (Kazakhstan, Russia, Ukraine; World Bank 2016b; Shepotylo and Vakhitov 2015). Over the past decade, several ECA economies made significant strides in improving their business environments. As a result, in several countries in Central Europe, the Western Balkans, and the South Caucasus, business environment indexes have recently approached the levels in advanced EU economies (World Bank 2018a).

Notwithstanding these improvements, business climates in Eastern Europe and Central Asia lag the ECA average, with the latter trailing the EMDE average in access to electricity and the ease of trading across borders (World Bank 2019j). For example, in Ukraine, the largest economy in Eastern Europe, the average worker takes one year to produce the same amount that the average worker in Germany produces in 17 days (World Bank 2019m). At current growth trends, Ukraine is unlikely to converge to Poland's per capita income, despite having had similar income levels in 1990; this partly reflects Ukraine's relatively low ratio of capital stock to GDP. Removing market distortions and improving resource allocation could triple manufacturing productivity and help improve prospects in Ukraine (Ryzhenkov 2016). The Western Balkans also struggle to attract FDI notwithstanding reforms to improve business climates and further integration into regional and global markets (Jirasavetakul and Rahman 2018; World Bank 2019h; World Bank 2019n). Although Turkey has high productivity levels, it lags well behind the ECA average for resolving insolvency, which could dampen overall productivity as less productive firms are more likely to remain in the market (World Bank 2019d). To address this, Turkey has recently introduced a more streamlined procedure that focuses on business continuation instead of liquidation.