



BACKGROUND NOTE

Innovation in Emerging Europe

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¹ Helena Schweiger: Office of the Chief Economist, EBRD. E-mail: schweigh@ebrd.com; Alexander Stepanov: Office of the Chief Economist, EBRD. E-mail: stepana@ebrd.com. These notes are largely based on European Bank for Reconstruction and Development (EBRD) (2014 and 2017). The views expressed in this paper are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors, EBRD or its Board of Directors or the governments they represent. ADB does not guarantee the accuracy of the data included in this paper, and accepts no responsibility for any consequence of their use.

INNOVATION IN EMERGING EUROPE

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Governments everywhere acknowledge the importance of innovation for long-term growth. This is most noticeable in countries where the easy options have been exhausted and future growth depends on more efficient ways of combining inputs or producing new or improved outputs. Most of emerging Europe as well as Central Asia³ fit this category.

The actual innovation happens in research institutions and firms. The former tend to be engaged primarily in basic or applied research and development, and the latter in transforming ideas from basic or applied research into products and processes. This box provides a closer look at three indicators of innovation: research and development (R&D) and acquisition of external knowledge as innovation inputs, and patents and firm-level product and process innovation as innovation outputs. Firm-level product and process innovation is particularly important in countries further from the technological frontier.

The introduction of new products and processes often requires specific inputs, such as spending on R&D, but it can also be facilitated by acquiring external knowledge. This can be done through the purchase or licensing of patented technologies, non-patented inventions and know-how derived from other businesses or organizations.

Less than a tenth of all firms in both emerging Europe (8.8%) and Central Asia (7.9%) reported spending on R&D activities in the last fiscal year. Moreover, the median firm spent the equivalent of about 1.3% of its sales for such activities, indicating that these were likely not hard-core R&D activities. Slightly higher percentage of firms reported spending on the acquisition of external knowledge: 13.4% of firms in emerging Europe and 19.1% of firms in Central Asia. This pattern is not surprising—firms in lower-income countries which are, on average, further removed from the technological frontier naturally focus more on the adoption of existing technologies. This may also reflect insufficient human capital and other limitations in terms of their capacity to conduct their own R&D.

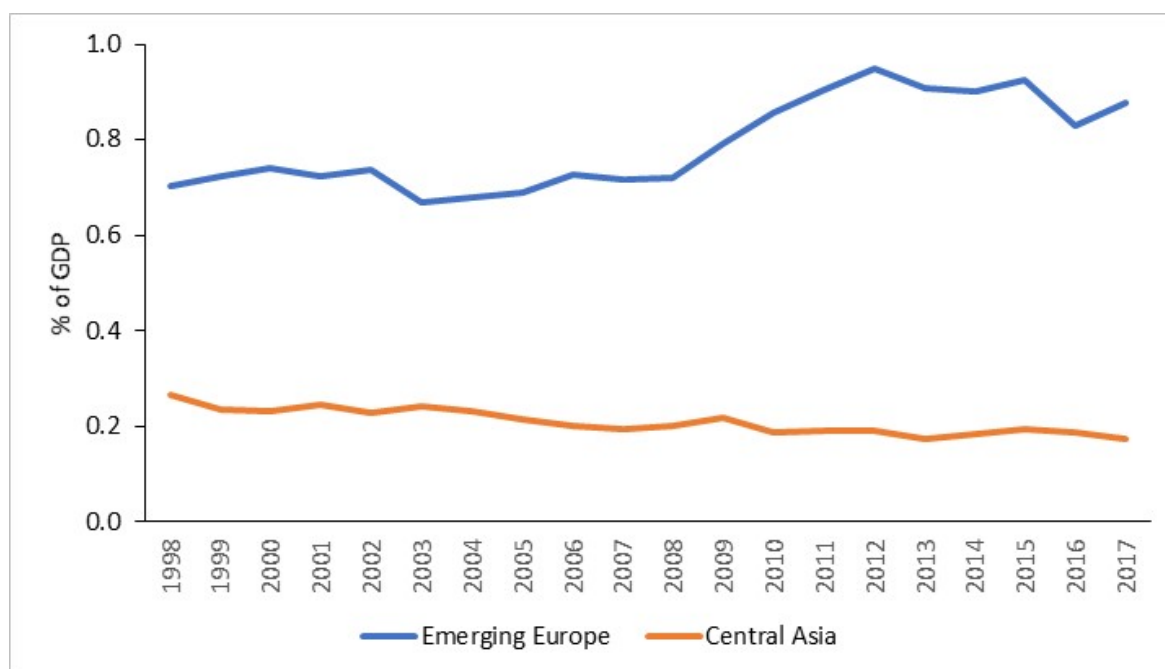
Evidence from the fifth round of the European Bank for Reconstruction and Development (EBRD)-World Bank (WB) Business Environment and Enterprise Performance Survey (BEEPS) and EBRD-European Investment Bank (EIB)-WB Enterprise Surveys is in line with country-level data showing that R&D activity tends to be weaker in less-developed

² These notes are largely based on European Bank for Reconstruction and Development (EBRD) (2014 and 2017).

³ For the purposes of this box, emerging Europe includes Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, North Macedonia, Hungary, Kosovo, Latvia, Lithuania, Moldova, Montenegro, Poland, Romania, the Russian Federation, Slovak Republic, Slovenia, Turkey, and Ukraine. Central Asia includes Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan.

economies. Countries in emerging Europe spent on average 0.9% of gross domestic product (GDP) on R&D in 2017, compared with 0.3% in Central Asia (Figure 1). The averages mask large differences across countries: Slovenia spent 1.9% of GDP on R&D, while the Kyrgyz Republic, Tajikistan, Mongolia, and Kazakhstan managed just above 0.1% of GDP.

Figure 1: Gross Domestic Expenditure on Research and Development



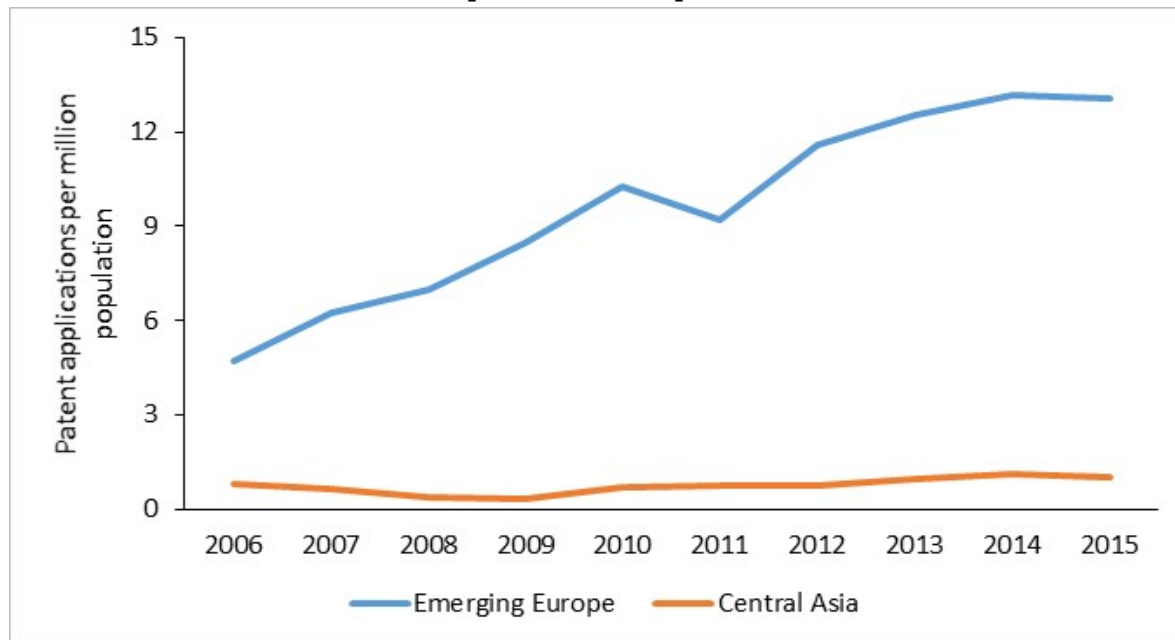
R&D = research and development.

Source: United Nations Educational, Scientific and Cultural Organization.

A common country-level measure of innovation output at the technological frontier is the number of patents that are held by firms or individuals from a given country. While this has the advantage of comparability, it is a narrow measure which captures a limited range of innovations. Not all innovations are patented, and the likelihood of firms or individuals applying for a patent in a given economy will depend on the legal system, local practices, and the sectors in which that economy specializes. The extent to which patents are converted into commercialized innovations will also vary considerably from country to country.

That being said, between 2006 and 2015 patent applications to the United States Patent and Trademark Office per million inhabitants increased almost threefold in emerging Europe, but by less than a third in Central Asia (Figure 2).

Figure 2: Patent Applications to United States Patent and Trademark Office per Million Population

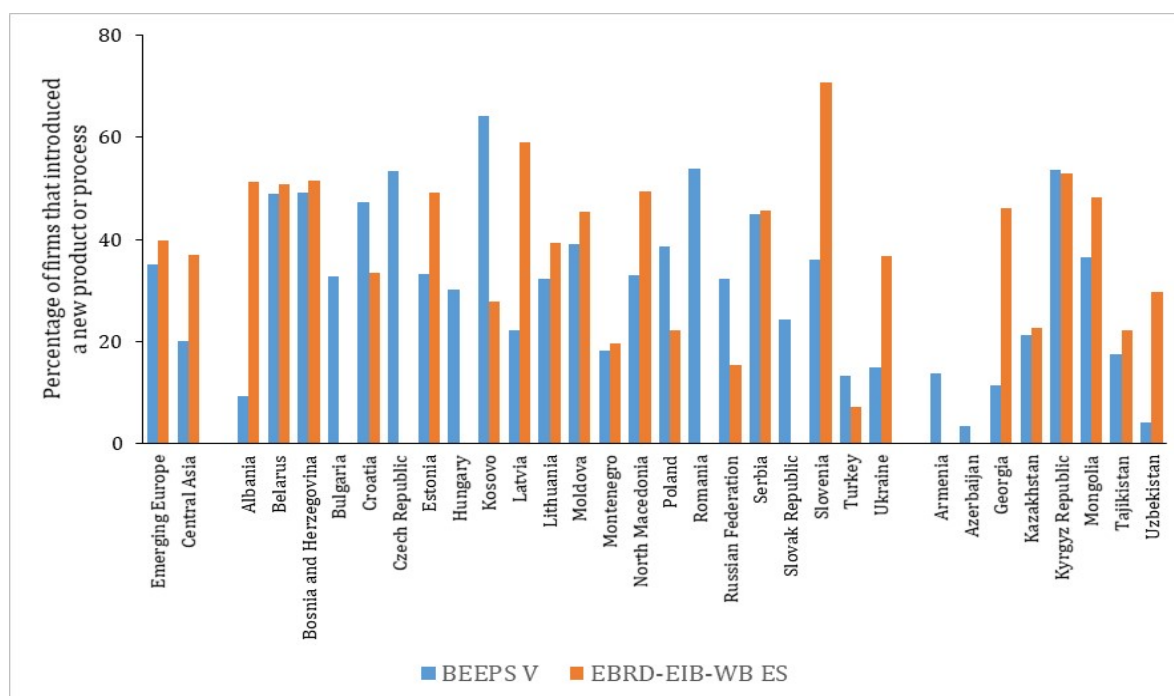


Source: United States Patent and Trademark Office.

Contrary to popular belief, however, innovation is not only about groundbreaking technology and advancing the global technological frontier; most new products or processes stem from the adoption of existing technologies that have been developed elsewhere, possibly with some customization in order to better serve the needs of the local market (EBRD, 2014). Although these innovations do not advance the global technological frontier, they can still significantly improve firms' productivity, thereby contributing to increases in aggregate productivity. Likewise, many people tend to associate innovation with high-tech manufacturing sectors, such as pharmaceuticals, computer, electronic and optical products, aerospace, chemicals, machinery and equipment, and similar. But even low-tech firms, such as those in clothing or food products, can and do innovate in various ways.

To be considered an innovation, a change in a firm's products or processes must be, at the very least, new to the firm itself. Even with this relatively low threshold, just over a third of firms in emerging Europe and about a fifth of firms in Central Asia reported that they introduced a new product or process between 2009 and 2012 (Figure 3). The situation improved in more recent years, where this percentage climbed to 39.7% in emerging Europe and 37% in Central Asia. There are, of course, large differences across countries: in Slovenia, more than 70% of firms engaged in product or process innovation, compared with fewer than 8% of firms in Turkey. Differences among Central Asian countries were not as large.

Figure 3: Percentage of Firms that Introduced a New Product or Process has Increased in Emerging Europe and Emerging Asia



ADB = Asian Development Bank, BEEPS = Business Environment and Enterprise Performance Survey, EBRD = European Bank for Reconstruction and Development, EIB = European Investment Bank, ES = Enterprise Surveys, WB = World Bank.

Note: Based on self-reported data. Emerging Europe and ADB member countries averages are unweighted cross-country averages. ADB member countries include those that are also EBRD member countries. The data indicate the percentage of surveyed firms that have introduced new products in 3 years before the survey took place. Note that EBRD-EIB-WB ES is not yet finalized in countries with missing data.

Source: EBRD-WB BEEPS V, EBRD-EIB-WB Enterprise Surveys and authors' calculations.

There are significant differences between emerging Europe and Central Asia on a number of innovation indicators, particularly on those related to innovation at the technological frontier. Given the differences in the level of economic development as well as the quality of economic institutions, this is not surprising. The gap in the quality of economic institutions such as control of corruption, the rule of law, regulatory quality, and government effectiveness, in particular, matters—it hinders investment and prevents the efficient allocation of resources within the economy (EBRD, 2019). As economies develop and become more reliant on innovation and entrepreneurship, poor quality of economic institutions may become an even greater obstacle to achieving long-term growth.

REFERENCES

European Bank for Reconstruction and Development (EBRD). 2014. *Transition Report 2014: Innovation in Transition*. London.

EBRD. 2017. *Transition Report 2017: Sustaining Growth*. London.

EBRD. 2019. *Transition Report 2019-20: Better Governance, Better Economies*. London.