The role of innovation in productivity growth across Central and Eastern European countries

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The productivity and innovation performance of European countries has lagged behind their global competitors over past decades and this has raised numerous questions. Can the failure to meet the goals set in the strategy 'Europe 2020' be attributed to the inabilities of firms to exploit their innovations optimally or should the roots of this failure be looked for in low investment in R&D? Does financial support stimulate innovation efforts and increases returns to innovation? Where is the difference between the drivers of innovations between 'old' EU members and 'new' EU members? These questions are particularly interesting for the new EU members which are seriously lagging behind.

This paper investigates the drivers of innovation and how they feed through into productivity at the firm-level for three European countries – Bulgaria and Romania as 'new' EU member countries and Germany as 'old' EU member country and some kind of a role model that should be followed up in innovation and productivity. This paper presents one of the beginner's attempts to assess and compare the individual determinants of the innovation process in mature market economies of the European Union and transition economies from Central and Eastern Europe which recently joined the EU. For the analysis we use data from the internationally harmonized Community Innovation Surveys (CIS 2008) which takes account for the period 2006-2008.

In order to determine how much progress the Central and Eastern European countries are making towards increasing productivity and overall competitiveness of the Union, we apply a structural model that describes the link between R&D expenditure, innovation output, and productivity (CDM model). The methodology of this research is based on cross-country comparison using firm-level data from the 2008 internationally harmonized Community Innovation Surveys (CIS 2008). We estimate a structural model that describes the link between R&D expenditure, innovation output and productivity. This model allows for the fact that some firms may undertake innovation efforts but do not report them as R&D. We

estimate a structural model that describes the link between R&D expenditure, innovation output, and productivity. The model is formalized in four equations: the firm's decision to engage in R&D investment; the intensity with which the firm undertakes R&D; the innovation or knowledge production function, where knowledge can take the form of a process or a product innovation; and the output production function, where knowledge is an input. So, the present paper contributes to the literature in three ways. First, it presents the finding for the role of innovation and productivity growth in two CEE countries, using CDM model. Second, it points out the innovation deficits in CEE countries in comparison with productive Germans' firms. Third, the empirical analysis is based on data from Community Innovation Surveys 2008 (CIS 2008).

We try to assess the main drivers of the innovation process in two different institutional settings, associated with process or product innovation activity. Long-term expectations should move in direction by undertaking comprehensive structural changes, such as improving innovation systems in Central and Eastern European countries, to overcome structural differences between individual member states and increase the overall productivity and competitiveness of the Union.

Bearing that caveat in mind, the results from the investigation reveal some interesting regularities and some differences between countries. In terms of firm's decision over whether or not to engage in R&D, the determinants are remarkably different across the countries observed. This suggests that different processes drive firms' decision to engage in R&D in these three European countries. Operating in international markets and developing different types of cooperation arrangements appears to be important only for German firms, and not for Bulgarian or Romanian. Factors that are the same drivers to continuous engagement in R&D in all three countries are receiving national or EU funding and being a large firm.

Unsurprisingly, firms' greater R&D effort per employee in all three countries makes them more likely to be product innovators. As far as process innovation is concerned it is only attributable to firms operating in Germany with higher investment per employee. Physical investment is very important driver of process innovation in all three countries. The effects from suppliers and competitors over process and product innovation are mixed across all three countries. Information from customers for product innovation and setting high environmental standards for both process and product innovation appear to be very important factors.

In contrast to the large differences found for R&D equations and the knowledge production equations, the results for labor productivity are quite similar across the three European countries. Process innovation is associated with higher productivity in both Germany and Bulgaria. For Romania there is now such connection. On the other hand, product innovation is associated with higher productivity in Bulgaria and Romania, but not in Germany.