



## **POLICY NOTE OF WORKING PAPER 4.16**

### **THE ROLE OF THE EU INTERNAL MARKET ON THE ADOPTION OF INNOVATION**

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#### **OBJECTIVE**

With this paper, our aim is to try to give an answer to the following questions: “Did (and which among) the EU Internal Market (IM) policies lead to a change in the institutional quality of EU member states through changes in trade openness, cooperation and competition? Did this change foster the adoption of innovation across EU member states? What kind of IM regulations, if any, affected the spread of innovation across EU firms and countries?”.

#### **SCIENTIFIC METHODS**

The impact that IM regulations may have on the adoption of innovation is likely to be channelled through the impact that the IM regulations have on some macroeconomic dimensions that have already been highlighted in previous theoretical and empirical literature as important drivers of technology spillovers: (i) Trade, (ii) Cooperation and (iii) Competition. Also, at the same time, these same macro dimensions are the natural target of Internal Market reforms. Logically, then, we expect the IM to affect these 3 institutional macro-dimensions and then, indirectly, to impact also the rate by which innovation is adopted by member states.

Hence, in order to capture the effect of the IM regulation on the adoption of innovation at the EU level we have to carefully analyze the two-stages by which these regulations firstly affect the transmission channels and, secondly, how these channels affect innovation adoption rates. From an econometric point of view a two-stage estimation (which makes use of Instrumental Variables techniques) seems to be the best option to be pursued. In what follows, therefore we are going to estimate a set of first stage regressions which put in relation various IM regulation proxies with the detected transmission channels. Then, once we find a correct specification for the first stage we will use the fitted values of the channels (which will not be endogenous to the error process in the second stage) in order to estimate the indirect impact of the IM regulation on the share of innovation adoption across countries in the second stage estimation.

The analysis of innovation adoption faces the problem that as a concept it is usually proxied by using indirect data on technology spillover. Our approach is different in the sense that we exploit direct survey data on innovation based on the CIS3 survey which concern the innovative activities carried out between 1998 and 2000. The CIS survey can be used to analyse the process of technology spillover by identifying the innovation that relies on an adoption process. The countries covered are all 25 EU member states plus Iceland, Norway and Turkey.

## **POLICY VALUE-ADDED**

The study stresses that the main determinant of innovation adoption is cooperation. The econometric study allowed us analysing what the drivers of this cooperation are from an Internal Market point of view. In particular, a key role seems to be played by the level of trust among people within each country, by the improvement of communications and simplification procedures, as well as by high educational levels. Therefore, policies contributing to reinforce social trust within/across countries especially through “communication and simplification procedures” (within the broadest proxy for “regulatory and administrative opacity”) are likely to develop cooperation among firms and consequently to achieve higher levels of diffusion/adoption. Strengthening human capital also appears as an efficient way to enhance cooperation and consequently innovation adoption.

Along with cooperation, but to a much lesser extent, competition has been identified as another factor likely to affect product innovation adoption directly acquired from external firms. As a result of the impact of competition on product innovation adoption, also productivity levels seem to be affected by differences in the competition level (product, rather than process innovation adoption is shown to impact productivity levels). Econometric estimates of the main drivers of competition show that competition is negatively affected by the level of public ownership within each country, by the level of transfer and subsidies, as well as by the administrative burdens. As a consequence, policies reducing unnecessary rents, administrative burdens and national government controls should be implemented at the EU level in order to achieve higher levels of competition and eventually higher shares of innovation adoption of and eventually productivity.

The third determinant of innovation adoption which emerges as statistically significant in this study is the level of trade. Its negative impact on adoption seems rather small and limited to product innovation adoption acquired directly from external firms. The result is however of difficult interpretation since this channel is probably affecting both innovation creation and adoption at the same time. Concerning the determinants of trade, we have shown that the higher the “price controls” and regulations within each country, the lower the level of trade. The composite index “Freedom to trade” (from the OECD database) exerts on the contrary a positive impact on trade. Therefore, policies reducing price controls or the national government controls on the transport sector are likely to foster international trade. This would however favor the “generation of innovation” more than the “adoption of innovation”