

## **How to close the productivity gap between the US and Europe: A quantitative assessment using a semi-endogenous growth model**

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This paper uses a semi-endogenous growth model to identify possible sources for three interrelated stylised differences between the EU and the US, namely a higher level of productivity and knowledge investment and larger skill premia in the US compared to the EU. Convergence between the US and the EU has been incomplete and the productivity gap seems persistent and is now around 13%. There has been a long debate in the literature about what can explain this productivity gap, but much less has been written about how this gap is related to differences in knowledge investment and skill premia between the EU and the US.

This paper tries to fill this gap by mapping differences in product markets, financial markets and R&D policies onto these three stylised differences using an endogenous growth model. This allows us to look at the relative importance of important structural features distinguishing the two economies for explaining the differences in productivity, knowledge investment and skill premia. Endogenous growth models do obviously suggest that links exist between productivity, R&D investment and skill premia and therefore serve as an appropriate tool to look at all three aspects simultaneously.

In this paper we extend the Jones (1995, 2005) setting for the product-variety paradigm to capture the endogenous development of R&D. The preference for semi-endogenous growth models to fully endogenous structures is also supported by Bottazzi&Peri2007 which finds evidence of weak scale effects as implied by semi-endogenous models of growth. In addition to the R&D framework, our model also includes the disaggregation of labour into three skill-

groups (low-, medium,- and high-skilled) in order to capture differences in human capital endowments.

The analysis in this paper suggests that differences in the functioning of product market are the main causes of productivity differentials between the former EU15 and the US. Another important obstacle to higher productivity levels are entry barriers in innovating sectors. Reducing them would both increase the R&D share and labour productivity in the long run. Another interesting result is the partial ambiguity between estimated mark ups and innovation. While mark up estimates in the final goods production sector can be seen as indicators of a lack of competition and a reduction of mark ups would consequently increase productivity, the interpretation of mark ups in innovating sectors is more complicated. In these sectors mark ups capture innovation rents and they must therefore be seen as the outcome of innovative activities of firms, leading to products which are more complicated to imitate by competitors. The factors which explain productivity and knowledge investment differentials between the US and the EU also explain the difference in the skill premium between high and medium skilled workers. Our analysis thus suggest that closing the productivity gap with the US would be associated with a slightly larger wage inequality. The structural features we have concentrated on in this paper can explain a significant share of the productivity gap between the EU and the US. Our model calibration also shows that there are other differences between the two economies related to human capital endowments. In particular a larger share of high skilled workers and a larger efficiency dispersion across skill groups in the US. These are largely orthogonal to the structural features and policies we have concentrated in this paper and are most likely related to differences in education and migration policies. Assessing the impact of these differences would be an interesting task for future research