

# IARIW-ESCoE Conference

## “Measuring Intangible Assets and Their Contribution to Growth”

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### AI, Intangibles and productivity

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The research aims to provide a full picture of what happens to AI under the production channels at sector level. First, this paper will focus on the AI productivity puzzle and in particular the role of intangibles in enhancing the productivity of AI. It is argued by the research that intangible investments, which are commonly unmeasured in most cases, are in fact the key missing piece of the puzzle. It is the lack of intangible investments that results in the benefits of AI technology invisible. Based on the concerns, this research would extend the scope of “complementary changes” on AI productivity paradox, by embracing concept of intangible assets first proposed by Corrado 2005. It will put forward to explain the differences in productivity or output growth as a result from AI uptake, combined with the heterogeneity of investment accumulation in broad sets intangible assets, which have been insufficiently taken into account in traditional productivity estimations. Also a thorough investigation on different categories of intangibles will be provided. It will compare the relative importance of intangibles which are innovative capital and economic competences in terms of exploiting the benefits of AI ( impact on the growth of labour productivity).

Secondly, combined with the effects from intangibles, this study would also uncover some insights on possible channels regarding how AI technology enable firms to become more productive through relationship with different inputs including labour and capital. This study aim to unfold more explicit underlying mechanisms based on a number of concerns, including labour augmentation, labour substitution, labour and capital efficiency, etc. For instance, in terms of labour inputs, on one hand, AI could take over some tasks that humans currently operate and save labours. On the other hand, AI as a multi-purpose technology may provide better offerings for products and services or innovation, competitive prices, boosting output and level of inputs such as employment and capital.

H1: The investment in intangible capital is a major complementary driver of the successful exploitation of AI and can explain the productivity paradox.

H2: Innovative capital is more important than economic competences for the exploitation of AI.

H3: Digital based improvements in business process due to AI & big data may lead to further tangible cost reduction via the increase in the efficiency of capital utilisation (capital productivity).

H4: AI may positively influence labour productivity through cost reduction via:

- a. Substituting existing labour and / or
- b. By improving current labour efficiency (labour productivity).

This paper is conducting at sector level Pannel data analysis. The methodology which is the Cob Douglas production function (Data and formulas) and results part is contained in the paper' main content.

