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INVESTMENT IN KNOWLEDGE-BASED CAPITAL AND ITS IMPACT ON PRODUCTIVITY[1]

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RESEARCH OBJECTIVES

In recent years, there has been increased evidence showing that innovation and productivity growth are underpinned by investment in knowledge-based capital (KBC) which comprises a broad range of intangible assets such as: computerised information (computer software, and data sets); research and development (R&D); intellectual property assets (designs, copyrights, patents, licences); branding; organisational know-how; and employees' skills.

Against this background, this research has three objectives: (i) to review the relevant international evidence and to provide an analytical framework for the analysis of investment in KBC and its impact on productivity in Ireland and other EU advanced economies; (ii) to better understand Ireland's performance with respect to investment in KBC and benchmark it against other EU countries; (iii) to assess the role of policy measures aimed at incentivising private investment in KBC and to identify Ireland's specific areas of strengths and weaknesses.

KEY RESEARCH FINDINGS

The international evidence indicates that investment in KBC is sizeable and has increased over time in many advanced economies, including Ireland. Over 2000-

[1]This Bulletin summarises findings from research published in Siedschlag, I., Lawless, M., and Di Ubaldo, M. (2017), "Investment in Knowledge-Based Capital and its Contribution to Productivity Growth: A Review of International and Irish Evidence", available online http://www.esri.ie/publications/investment-in-knowledge-based-capital-and-its-contribution-to-productivity-growth-a-review-of-international-and-irish-evidence-2. This research has been funded under the joint Research Programme on "Enterprise Exporting, Innovation and Productivity" undertaken by the Economic and Social Research Institute, Enterprise Ireland and the Department of Jobs, Enterprise and Innovation. The views expressed here are those of the authors and they may not necessarily coincide with the views of Enterprise Ireland and the Department of Jobs, Enterprise and Innovation.

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2013, the contribution of investment in intangible capital to the productivity growth rate was 40% in Ireland, 30% in EU countries and 33% in the US.

Investment in KBC is an important driver of labour productivity in Ireland's enterprises. The evidence shows that the impact is substantial with a 10 per cent increase in investment in knowledge-based capital per employee found to increase firm productivity by 2 per cent. The research results indicate that the size of the impact is larger for Irish-owned firms, increasing productivity by 3.6 per cent in comparison to 2.4 per cent for foreign-owned firms.

Investments in various types of KBC assets have different effects on productivity across Irish-owned and foreign-owned firms. The largest productivity gains for Irish-owned firms are found when investment is undertaken in R&D intangible assets and in organisational and branding capital. For foreign-owned firms, the largest productivity gains are linked to investment in non-R&D intangible assets such as computer software, intellectual property assets and organisational and branding capital.

The effect of investment in KBC on productivity appears to be stronger in manufacturing firms than in services firms. In the manufacturing sector, investment in almost all KBC types is positively associated with productivity increases with the largest effect being found for investment in computer software followed by investment in intellectual property assets, investment in R&D and investment in organisational capital. In the services sector, while investments in various KBC categories are positively linked to labour productivity, the strength of this link is statistically significant only in the case of investment in computer software.

POLICY IMPLICATIONS

Incentivising more investment in KBC could lead to stronger enterprise innovation and productivity performance. It is widely acknowledged that given its intangibility, this type of investment is frequently associated with market and systemic failures that lead to underinvestment. To the extent that higher investment in KBC is desirable, policies focused on economic conditions that enable investment in KBC could be beneficial. Ireland already performs well on a number of economic conditions which are shown to foster investment in KBC such as the quality of human capital, the openness and quality of its research system, and an enabling business environment with respect to openness to trade and flexible labour markets. To strengthen this environment further, the research also suggests that improvements in the system of finance supports for innovation and lowering barriers to competition could add to the incentives for investment in KBC.

A comprehensive policy approach to enterprise supports for investment in knowledge-based capital would be beneficial. This research highlights that while policy measures aimed at incentivising investment in R&D are important to foster productivity growth, incentivising investment in a broader range of intangible assets such as computer software, copyrights, patents and licences, as well as firm-specific human and organisational capital would be beneficial.

***A differentiated policy approach for groups of firms with similar characteristics is supported by evidence*.** In this context, Ireland's approach to enterprise policies which recognises the different behaviour and support requirements for Irish-owned and foreign-owned enterprises is supported by the evidence provided by this research.

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