

Winners and Losers in the Knowledge Economy: The Role of Intangible Capital

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Intangibles are increasingly seen as the “missing input” in the knowledge economy and it is now widely accepted that traditional productivity measurement that focuses on labour and tangible capital inputs only does not account adequately for key factors explaining differences in productivity across firms, industries and countries. Much existing economic study of intangibles focuses on measurement at the macroeconomic level. But, intangibles are embedded in the firm. Much of the micro-analysis of intangibles has been ad hoc, typically relying on indicator variables and capturing limited aspects of intangible capital. In this paper we construct a dataset of UK firms 2002-2015, including measures of a broad set of capitalised intangible investments. We then investigate how these firm-specific knowledge assets contribute to the differential productivity performance of firms, both as individual factors of production and in combination with other factors.

The data we use is the Annual Respondents Database (ARDX), the Business Enterprises Research and Development database (BERD) and the Annual Survey of Hours and Earnings (ASHE). Our focus is on larger firms (with 250 employees or more), for whom we have significantly better data than smaller and medium sized firms. The ARDX is a census of larger firms and a survey of smaller and medium sized firms in the UK and includes information on firms’ output, employment, purchases of intermediates, as well as information on tangible capital acquisitions and disposals. The ARDX also includes information on firms’ acquisitions and disposals of software and databases (both purchased and own account) and purchases of advertising and marketing services. We link in information on firms’ external and intramural expenditures on R&D from BERD, making adjustments to tangible capital expenditures where these are associated with R&D expenditures. We use the ASHE, a survey of UK employees, to estimate the proportion of each firm’s labour costs associated with management expenditure. Together this information allows us to construct estimates of firms’ investments and capital stocks using the Corrado, Hulten & Sichel categorisation of intangible assets into: economic competencies, digitised information, and intellectual property.

Using these data we find intangible investment of similar magnitudes to that in the macro intangibles literature on average across firms. But, the distribution of these investments is highly skewed, with relatively few high performers accounting for the majority of aggregate intangibles

investment.

We explore the role of intangibles in production. Intangible capital is associated with high returns for those firms that invest in these. We find considerable heterogeneity in returns across broad sectors: High Tech and Low Tech Manufacturing, Knowledge Intensive and Other Services (Eurostat definitions). R&D obtains a higher return in High Tech Manufacturing and Knowledge Intensive Services than in other sectors. Digitised Information has high returns for firms in Other Services, but also for firms in other sectors once we take into account complementarities between Digitised Information and other assets. The returns to Organisational Capital are ubiquitous across broad sectors.

High returns to intangible assets and the observation that many firms do not invest in these points to barriers to investment in these assets. We consider how these may contribute to an explanation of the widening productivity and average wage distribution across firms.