

# Knowledge-based Capital and Productivity Divergence

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This paper seeks to determine whether the growing use of Knowledge-Based Capital (KBC) in production drives the divergence of productivity growth between a group of top performing “frontier” firms and the rest of the economy. We use administrative datasets from Germany that record firm-level production variables and investments in four categories of KBC: software, research and development, intellectual property products and organisational capital. We recover firm-specific productivities and elasticities of KBC by implementing a control function estimation procedure, based on a model that allows for non-linearities in the relationship between KBC and productivity. We find that KBC has a positive effect on firm productivity, which increases with KBC and output size, but not with firm-level productivity. We relate these micro findings to industry-level patterns of productivity dynamics. We find that industries with higher average stocks of KBC, a higher marginal effect of KBC on firm productivity, and more marked increasing returns to scale, are those industries where large firms disproportionately improve their productivity compared to other firms, suggesting that KBC is associated with productivity divergence along the size dimension.