Workforce Aging, Age Diversity, and Productivity: Implications Across Key Economic Sectors

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Abstract:

Population ageing is one of the most important structural trends affecting labour markets in Europe. As the workforce becomes older, understanding how employee age and age diversity influence firm performance has become increasingly relevant for both researchers and policymakers. However, empirical findings on the relationship between workforce ageing and firm productivity remain partial and inconclusive with mixed results suggesting that the productivity implications of workforce ageing may depend on organizational and sectoral contexts.

The aim of this study is to examine the relationship between workforce ageing, age diversity, and firm productivity in Slovenian firms. In addition to analysing the overall relationship between age structure and firm performance in the economy, the study also explores whether these relationships differ across sectors, particularly between manufacturing and service activities, and in firms operating in activities associated with the bioeconomy as defined by the European Commission. Following established conceptualizations of workforce diversity, we distinguish between two dimensions of age diversity: age separation, capturing differences between younger and older employees, and age variety, reflecting the distribution of employees across age groups. These dimensions may affect productivity through different mechanisms. Social categorization theory suggests that large age gaps can lead to subgroup formation and coordination challenges, whereas information and decision-making theory highlights the potential benefits of diverse knowledge, experience, and perspectives brought by employees of different ages.

The empirical analysis relies on a matched employer–employee dataset covering Slovenian firms with at least 10 employees over the period 2006–2016. Firm-level performance models are estimated using panel data regressions with fixed effects, where firm productivity is measured as the natural logarithm of value added per employee. Workforce ageing and diversity are captured by the average age of employees, the standard deviation of age (age separation), and Blau's heterogeneity index (age variety), while controlling for workforce composition (gender structure, educational attainment) and firm characteristics (firm size, capital intensity of production, firm's profitability and its export orientation).

By comparing the productivity implications of workforce ageing across manufacturing, services, and bioeconomy-related activities, the study contributes to the literature on workforce diversity and firm performance and provides insights for designing age-inclusive human resource strategies in ageing economies.

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Keywords:

Age diversity, firm productivity, sectoral differences, bioeconomy, matched employer–employee data.