

# Essays on technological change and income distribution

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## SUMMARY

Over the last several decades, there has been extensive evidence of the rise in income inequality in advanced economies. First, the empirical evidence documented a decrease in the share of labour. Second, income dispersion among individuals increased, pulled by the rise in the share of income accrued by the individuals in the upper tail of the income distribution and the wage divergence between high-skilled and lower-skilled workers. The empirical and theoretical literature has extensively analysed the role of technological change behind these trends, concluding that the recent advances in technological change are both capital- and skilled-biased.

This work adds to this debate by analysing the relationship between technological change and income distribution using the tools provided by the economics of knowledge. The recent advances in the economics of knowledge have inspired a vivid debate among economic professionals, but the implications for income distribution have often been neglected. In this work, the intrinsic characteristics of the innovation process and their implications for the functional and personal income distributions are analysed.

Advanced economies experienced a radical change from an industrial economy to a knowledge economy. The main hypothesis of this work is that the direction of technological change has become increasingly knowledge-intensive. The knowledge economy is characterized by the systematic generation of knowledge as input and its exploitation as output. However, the transition towards greater knowledge centrality has major implications for income distribution. The knowledge-intensive direction contrasts the classical view of the capital- and skilled-biased direction of technological change that was the primary explanation for the high levels of wage inequality during the last decades of the 20th century. On the other hand, over the most recent decades, the intensive use of knowledge in the production process has triggered different mechanisms that affect economic growth and income distribution.

The scope of the work is to shed light on and analyse the implications of the knowledge-intensive direction for income distribution. The work is articulated as follows.

First, I focused on the characteristics of the innovation process to articulate the hypothesis that when technological change is based on bottom-up processes exploiting and valorising workers' competence, the direction of technological change is labour- rather than- capital-biased. The econometric analysis based on a sample of European regions confirms that where the rate of technological change based upon subsequent and localized improvements is fast, the share of income going to

labour is higher. These results question the collective wisdom finding a generalized decline in the labour share of income due to capital-augmenting technological change.

Second, the existing contributions to the direction of technological change debate neglect the changes in the elasticity of substitution as an additional source of biased innovation. On the contrary, our results point to an increase in the elasticity of substitution over time within advanced economies. Therefore, the decline of the labour share may also be driven by institutional and market factors making labour more substitutable by capital.

Finally, the analysis of top income inequality and the growing disparities even within high-skill groups has been documented, but little effort has been provided to understand its causes. The work also attempts to explain the increasing wage dispersion, concentrated mainly among workers engaged in non-routine cognitive tasks, with the consequences of the increased demand for knowledge-based services. Therefore, the results in this chapter support previous descriptive evidence of the rising top income shares due to scale-based phenomena in knowledge-based sectors.

Finally, the findings' relevance, policy implications, and avenues for future research are discussed in the last section.