Referee report: "The Macroeconomic Consequences of Artificial Intelligence: A Theoretical Framework"

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Overview

This article aims to improve the neoclassical production function and task-based model. The authors Huang, Hu and Dong, from now on referred to as HHD, claim that they improve the neoclassical production function by adding the elasticity of substitution between labor and artificial intelligence, and by considering the difference in impact when artificial intelligence is complementary or a substitute to traditional labor. The task-based model is also explored and finally the authors look at how the long-term economic growth rate is affected by artificial intelligence.

Assessment

The topic of this paper, i.e. how artificial intelligence affects the economy, is very relevant. This paper provides some nice intuition behind how artificial intelligence affect wages, employment and economic growth. However, this paper brings very few new insights to the academic literature on artificial intelligence, as most of the work is a simplified replication of previously published models.

The authors claim that one contribution of this paper is the introduction of the elasticity of substation between labor and artificial intelligence capital into the neoclassical production function and task-based model. This is however already a feature in several previous papers, with the latest contribution being in Lankisch, Prettner and Prskawetza (2019), from now on LPP (2019) and Prettner (2019). Most of section 2.1 follows LPP's (2019) reasoning and modelling, see their section 3. A simple model of automation and wage inequality. The only difference between LLP (2019) and this article is that HHD makes LLP's model marginally simpler by assuming that there is only one type of labor instead of two types like LLP. This would be equivalent to assuming $\beta=1$ in LLP eq. (1). HHD's results in the main part of section 2 on the neoclassical production function are thus identical to LLP's if one assumes that $\beta=1$.

The same applies to the discussion on the growth rate in section 4, this is also largely a replication of LLP (2019) result section with a simplification regarding the number of types of labor.

Thus, most of the section on the neoclassical production function is a slightly simplified replication of previous published work.

With regards to the section "The develop of artificial intelligence and the creation of new tasks", as this is also a simplification of Acemoglu and Restrepo's work, the academic contribution of this section is also rather limited.

References

Lankisch, Clemens & Prettner, Klaus & Prskawetz, Alexia, 2019. "How can robots affect wage inequality?," Economic Modelling, Elsevier, vol. 81(C), pages 161-169.

Prettner, Klaus, 2019. "A Note On The Implications Of Automation For Economic Growth And The Labor Share," Macroeconomic Dynamics, Cambridge University Press, vol. 23(03), pages 1294-1301, April.