The Transformation of Tasks and Skills under Additive Manufacturing: A First Look at Evidence from Job Vacancies

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The use of additive manufacturing (AM) is rising rapidly, and as old equipment is retired, AM will likely become an important part of the economy. This general-purpose technology is poised to transform the location of production, supply chains, transportation systems, design and manufacturing processes, the look and feel of products, and organizations (Baumers and Holweg 2019, Friesike et al. 2018, Ben-Ner and Siemsen 2017). AM production processes and tasks differ substantially from those under traditional manufacturing (TM). However, there is no systematic evidence on how work differs under the two technologies. Does AM expand or restrict creativity, does it make jobs simpler or more complex, is it upskilling or deskilling, does it increase or reduce the skill gap between engineers and operators, as compared to TM? We provide the first analysis to address these questions. We focus on all 1,577 manufacturing establishments that sought to hire both AM and TM workers – to control for unobservable heterogeneity – between January 2014 and December 2019. Within-plant and within-occupation comparisons reveal that AM postings reflect considerably more complexity and require substantially more cognitive, social and advanced technical skills than TM postings. Thus, at this time, AM represents an upskilling technological change, in contrast with recent skill-biased technological changes that had contributed to rising inequality. This transformation of tasks and skills may have favorable effects on future worker well-being, wage levels and inequality.The demand for AM employees, while still very low, is growing at a fast pace. Figure 1 illustrates the growth in the number of AM and TM job postings for core manufacturing occupations (engineers, technicians and operators) in the US from 2014 to 2019.

References

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Figures

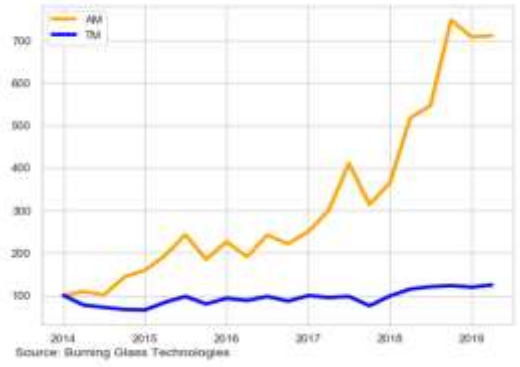

Figure 1: Evolution of Additive Manufacturing and Traditional Manufacturing Job Vacancies