



# Do rising class differentials in earnings increase productivity? Evidence for non-production and production employees in U.S. manufacturing industries<sup>☆</sup>

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## ABSTRACT

Quantitative sociological research rarely investigates productivity but it is pertinent to the study of inequality and social stratification. In this analysis, we focus on the earnings differential between non-production and production employees and evaluate the extent to which it has a net effect on productivity across U.S. manufacturing industries. Contrary to assumptions of traditional economics, the findings indicate that this earnings differential increased significantly since the 1980's but actually had a negative effect on productivity. There is also some evidence that this effect has become more negative in recent years. We interpret these findings as suggesting that, rather than inexorably enhancing economic efficiency, rising earnings differentials between non-production and production employees partly derive from changes in the relative bargaining power of these two class categories in the labor market.

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## 1. Introduction

Rising earnings inequality is generally recognized as an important trend in the U.S. (Jencks, 2002; Krueger, 2003; Tomaskovic-Devey, 2014; Weeden & Grusky, 2014). From both a theoretical and a policy point of view, understanding the economic nature of rising inequality is important. If the higher earnings of some workers primarily reflect their greater efforts, skills, and consequent productivity, then the implications of rising inequality are much different than if it derives from monopolistic bargaining power, organizational advantages or “winner-take-all” processes which enable some employees to extract salaries that are well above that needed for the market to clear (Frank & Cook, 1995; Hirsch & Soucey, 2006; Sakamoto & Kim, 2010; Stainback, Tomaskovic-Devey, & Skaggs, 2010). In the latter case where rising inequality does not substantially enhance productivity, implementing policy instruments to reduce inequality would typically be less economically costly and would actually improve economic

efficiency. On the other hand, if rising earnings inequality raises productivity, then this relationship would need to be considered in the evaluation of policy proposals to ameliorate inequality (e.g., via “living wage” legislation or increased taxes on high earners) because reductions in productivity could possibly lead to reduced employment and less tax revenue to redistribute (Krueger, 2003).

Generally speaking, from a broader theoretical point of view, the study of social stratification and inequality would be enhanced by bringing the study of productivity brought back in to contemporary sociological research (Sakamoto & Kim, 2014). Although a significant issue in classic writings by Marx and Weber as well as in many of the 20th century works of Sørensen and Lenski, productivity was somewhat discarded from the contemporary sociology.<sup>1</sup> Generally defined as the ratio of economic outputs relative to inputs, productivity is inherently related to the distribution of earnings and the generation of the economic surplus (Sakamoto & Kim, 2014). Despite its relevance for understanding rising inequality, productivity is typically ignored in quantitative sociological research.<sup>2</sup>

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<sup>1</sup> The term “productivity” does not appear in the index of either of the massive editions of *The Handbook of Economic Sociology* (Smelser & Swedberg, 1994, 2005).

<sup>2</sup> There are a few quantitative sociological studies of the relations between productivity and inequality (Liu & Sakamoto, 2005; Kim & Sakamoto 2008; Sakamoto & Kim 2010, 2014; Tomaskovic-Devey et al., 2015).

### 1.1. The neoclassical economic perspective

In contrast to sociologists, economists have more extensively considered the link between productivity and wages. The neoclassical economics model portrays the economy as a large set of competitive markets in which the typical firm operates primarily as a price-taker. The labor market is one of these competitive markets, and it allocates a particular factor of production (i.e., labor) where the wage refers to the price for another unit of labor of a given quality. Firms seek to maximize profits by employing appropriate quantities of factor inputs (i.e., labor and capital). Given competitive markets, labor and capital are employed (at least in “the long run”) on the basis of their contributions to increasing productivity relative to their respective costs where the latter are understood in terms of supply and demand considerations (Granovetter, 1981).<sup>3</sup>

According to this model, firms that attempt to pay below the wage set by market competition will eventually be unable to attract and retain adequately productive workers. Firms that attempt to pay above the wage set by the market competition will be unable to meet their costs and will be ultimately driven out of business. As originally formulated by Becker and Chiswick (1966) and then more fully analyzed by Mincer (1974), the immediate proximate determinants of the distribution of wages are the distribution of marginal products of workers which in turn reflects the distribution of labor productivity via human capital investments.

In short, according to neoclassical economics, inequality is caused by productivity. Specifically, inequality reflects variations in productivity. Wage differentials in the labor market are assumed to derive from worker differences in productivity that reflect variation in such factors as skill level, educational attainment, cognitive and non-cognitive skills that relate to job performance, work experience, and job training that affect a worker’s value to the firm.

In the economic modeling of productivity, technological change is traditionally assumed to be factor neutral (i.e., the productivity of all factor inputs is stipulated to proportionately increase equally over time). In recent decades, however, some economic studies (e.g., Autor & Katz, 1999) have postulated that rising inequality has occurred because of skill-biased technical change that derives from an increasing productive complementarity between the use of complex capital investments (e.g., automation, advanced communication and information technologies) and higher skilled labor. This complementarity is known as skill-biased technical change (SBTC) which postulates an increase in the relative productive value of skilled workers (e.g., workers who are more educated, more able, more motivated or have greater cognitive skills). The ratio of the wages of highly skilled workers to the wages of low skilled workers rises because of the heightened relative productivity of the former group due to technological developments (e.g., widespread use of various sophisticated computerized applications).<sup>4</sup>

From an empirical point of view, the increasing differential between college-educated workers and workers without a college degree is a notable trend in recent decades (Acemoglu & Autor, 2011). In general, the economic returns to advanced work skills, ability, education, and cognitive capacities seem to have increased (Lemieux, 2010). High-skilled workers are now earning more than ever before while the wages of low-skilled workers are not increasing in real terms due to reductions in the demand for workers who lack sophisticated or technical work skills (Krueger, 2003). This change in the demand for workers’ skills is sometimes argued to

result in increased wage inequality in recent decades (Autor, Katz, & Kearney, 2006; Lemieux 2010).

As a generic process that may be influencing the evolution of wage inequality, SBTC is a relevant consideration for our research. Nonetheless, sociologists and many economists agree that SBTC is not the sole and probably not the most important source of rising wage inequality. SBTC cannot explain all aspects of rising wage inequality such as its timing being lagged years after technological change was being already implemented into firm production processes; that female workers use technology more but their wage differentials relative to white men do not seem to reflect that usage; that wage inequality was fairly stable for several years from the late 1990’s into the 2000’s but technological usage continued to expand greatly; and that earnings inequality varies significantly across nations that are equally advanced in terms of the application of advanced technologies in production (Card & DiNardo, 2002; DiPrete, Goux, Maurin, & Quesnel-Vallee, 2006; Leicht, 2008).

In sum, the neoclassical economics perspective emphasizes the importance of productivity as the most important cause of rising inequality. According to the SBTC model, inequality increases because of heightened market demand for higher skilled workers who tend to be more educated and more productive but scarcer in supply. But even without that particular formulation of the productivity which may be quite exaggerated, the more general neoclassical economics perspective still emphasizes the supply and demand of human capital skills as the driving force behind the distribution of wages. The implication of this economic explanation is that if the level of wage inequality were significantly reduced by policy makers (e.g., by increasing minimum wages or imposing higher taxes) then productivity would decline because of the consequent inefficiencies that would be created due to the distortion of market forces. To the extent that market forces are seriously abrogated, then unemployment would increase, economic growth would be reduced, and the average wage in the labor force could ultimately decline.

### 1.2. Organizational perspectives from sociology

In contrast to the neoclassical economic approach, sociological perspectives assume that institutional forces shape or disrupt competitive market processes (Baron & Bielby, 1980; Kalleberg, Wallace, & Althaus, 1981; Williamson, 1981; Fernandez, 2001; Avent-Holt & Tomaskovic-Devey, 2010; Calnitsky, 2014; Tomaskovic-Devey 2014).<sup>5</sup> Sociologists emphasize that labor processes internal to the organization are largely ignored by neoclassical economists who believe that firms are operating according to abstract production functions which are only technical in nature and do not depend on specific workers or particular human resource practices. As stated by Sørensen (1994:504), “in labor economics, the standard neoclassical theory, treats the firm as a ‘black box’ by assuming that firms do what markets tell them to do, making them quite uninteresting for analysis.”

The organizational perspective from sociology is skeptical of the neoclassical economic emphasis on the effectiveness of competitive markets to force out firms that deviate from paying according to the marginal revenue products as envisioned by production functions (Granovetter, 1986; Spilerman, 1986; Kalleberg & Berg, 1987). Sørensen argues that “nothing prevents a firm from satisfying the dictates of marginal productivity theory and still not paying individual workers according to the current productivity. All the theory requires is that variation in total costs satisfies the marginal pro-

<sup>3</sup> This summary is necessarily greatly simplified. Any standard microeconomics text would provide a much more detailed discussion.

<sup>4</sup> Economics studies are not monolithic and somewhat different interpretations of this evolving literature may be cited. Our summary only refers to the most common interpretation which highlights key issues for our research concerns.

<sup>5</sup> Our discussion is highly selective given our research concerns and space constraints. Broader summaries are provided by Granovetter and Tilly (1988), Berg and Kalleberg (2001), and Leicht (2008).

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