



Why has wage inequality evolved so differently between Japan and the US? The role of the supply of college-educated workers



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ABSTRACT

Why has wage inequality not changed in Japan while it has secularly increased in the US over the last few decades? Pointing to the difference in the trends of the college wage premium in the two countries as a proximate cause, this study assesses the importance of the supply factor as a determinant of the college wage premium. The wage differential between college and high-school graduates decreased slightly from 0.35 to 0.34 log point in Japan, while it increased from 0.43 to 0.65 log point in the US between 1986 and 2008. During this period, the number of college graduates grew twice as fast in Japan as in the US. Estimations of labor demands for different educational backgrounds and simulations based on counterfactual supply trends reveal that the more rapid increase of college graduates in Japan than in the US explains about 60% of these contrasting trends. The difference in post-war fertility trends largely explains the difference in the supply increase of college graduates between the two countries.

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1. Introduction

This study examines the importance of the supply factor as a determinant of the college wage premium by comparing the premiums of Japan and the US. The wage gap between high-school graduates and college graduates has evolved differently between Japan and the US over the last few decades. The college premium decreased from 0.35 to 0.34 log point in Japan between 1986 and 2008, while during the same period, it increased from 0.43 to 0.65 log point in the US. This paper demonstrates that the supply

increase of college-educated workers in Japan, which outpaced that in the US, explains about 60% of the contrasting trends. If the supply growth in the US had been that of Japan, the return to college should have increased by only 0.08 point instead of the actual 0.23 point. We argue that a fertility decline in the 1950s and 1970s in Japan, combined with a steady increase of college capacity, contributed to the more rapid supply increase of college-educated workers.

The secular increase of wage inequality in the US attracts much attention from academics, and numerous studies demonstrate that the increase in the return to education is a leading proximate cause of rising overall wage inequality. To explain the increase of the college wage premium, previous studies point out that both skill-biased

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technological change (SBTC) and the outsourcing of production processes increase the demand for college graduates relative to high-school graduates.¹

The demand growth for college-educated workers relative to high-school-educated workers alone cannot determine the wage gap between them, because relative supply growth plays an equally important role (Topel, 1997). Indeed, Card and Lemieux (2001) downplay the role of demand growth and emphasize the importance of supply stagnation; they argue that the stagnated growth of college graduates in the US, the UK, and Canada increased the return to college education among youth. Exploiting the interstate variation in the growth of college graduates, Fortin (2006) further shows that a faster growth of college graduates in a state suppresses the growth of the college wage premium.

These two studies convincingly demonstrate the importance of supply as a determinant of the college wage premium; their evidence, however, is not yet definitive. As for Card and Lemieux (2001), all three Anglo-Saxon countries, for example, experienced a stagnation of the supply of college graduates in the early 1980s, and this timing overlapped with the timing of skill-biased technological progress that particularly affected younger workers. The overlap of the timings for supply slowdown and demand growth makes the identification of supply and demand factors fundamentally difficult and could lead to an overestimate of the role of supply. As for Fortin (2006), the interstate mobility of college-educated workers could presumably result in an underestimation of the impact of relative supply on relative wage, because college-educated workers tend to migrate to states where the relative demand for them is strong. Being aware of this potential bias, Fortin used lagged college enrollment as the instrumental variable for the relative supply of college graduates in a state and indeed found significant upward bias in the OLS estimates. The IV estimates, however, are arguably not free from attenuation bias, considering the interstate goods trade that presumably results in compressed wage differentials between college and high-school graduates due to the factor price equalization. Interstate migration for college attendance may also contribute to the compressed wage differentials. Therefore, the wage premiums in two large independent economies with different trends in the supply of college graduates must be compared to quantify the impact of the supply factor on the college wage premium. Identifying the role of the supply of college graduates on the college wage premium is important for its implications on higher-education policy; enhancing accessibility to higher education could suppress wage inequality and promote productivity growth.

¹ See Katz and Murphy (1992), Murphy and Welch (1992), Bound and Johnson (1992), Autor, Katz, and Krueger (1998), Autor, Katz, and Kearney (2008), and Goos and Manning (2007) for support of the SBTC hypothesis. Card and DiNardo (2002) offer a counterargument to the SBTC hypothesis. Katz and Autor (1999, chap. 26) place less emphasis on the effect of international trade as an explanation for wage dispersion. Feenstra and Hanson (2008) dispute this claim by pointing out the importance of trade in intermediate inputs.

Selecting Japan as a comparison country is attractive for two reasons. First, in contrast to the stagnation of the supply growth of college graduates in the US, the UK, and Canada, the supply of college graduates among youth has increased secularly over the last two decades in Japan. The standard approach in the literature, such as Card and Lemieux (2001), attributes increased wage differentials between college and high-school graduates to either relative demand growth for college graduates or a decreasing relative supply of them, based fundamentally on functional form assumptions. A Japan and US comparison sheds light on the role of supply, because the two large advanced economies share a similar relative demand growth for college graduates but have contrasting relative supply trends.

Second, the demand-supply framework well describes wage determination in Japan, because the wages of Japanese workers are determined in decentralized employer–employee bargaining in the absence of a centralized bargaining institution and industrial/craft unions (Koeniger, Leonardi, & Nunziata, 2007). Indeed, the results of a subsequent data analysis indicate that an exogenous increase of the college-graduate supply decreases the equilibrium of the college wage premium (see the Appendix for a detailed discussion on the institution of wage determination in Japan). Moreover, the statutory minimum wage in Japan had been so low compared with the male wage distribution before the 2007 revision of the Minimum Wage Act that it virtually cannot explain the evolution of male wage inequality during the analysis period (Kambayashi, Kawaguchi, & Yamada, 2013). The market-based wage determination makes Japan an appropriate comparison group to assess the importance of the supply factor in a simple demand–supply framework. In contrast, many large continental European countries would not be useful in assessing the simple demand–supply framework, because their wages are determined through central wage bargaining (Boeri & van Ours, 2013; Fortin & Lemieux, 1997).

Rigorous empirical studies find that a stable wage inequality in Japan has existed for the last three decades.² This sharply contrasts with the experience of the US, which is characterized by an increased upper-tail wage dispersion throughout the 1980s and 1990s, as reported by Autor et al. (2008). A leading proximate cause for the difference in the trends in wage inequality across the two countries is their respective different trends in the return to education. In contrast to the increase in the return to education in the US, Noro and Ohtake (2006), Kambayashi et al. (2008) and Yamada and Kawaguchi (2015) identify a stable or declining return to education in the 1990s and the 2000s in Japan. No paper to date, however, offers a structural explanation of the different evolutions of the return to education between Japan and the US over the last two decades. This paper demonstrates that the difference in the supply increase of college-educated workers explains about 60% of

² Katz and Revenga (1989), Genda (1998), Shinozaki (2002), Ohtake (2005), Noro and Ohtake (2006) and Kambayashi, Kawaguchi, and Yokoyama (2008). Lise, Sudo, Suzuki, Yamada, and Yamada (2014) report an increased wage inequality among men in the 2000s, but the wage differential between the 90th percentile and the 50th percentile increased only slightly, from 1.9 in 1991 to 2.0 in 2008.

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