



Inequality Between and Within Skill Groups: The Curious Case of India

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Summary. — Wage inequality has risen in India over the past three decades. A similar phenomenon has been documented widely for other developing countries. However, unlike in other countries, which saw widening wage structures both between and within skill groups, I show that inequality in India increased between groups but fell within them over the period 1983–2005. Returns to education increased with the wages of college graduates rising relative to high school graduates who, in turn, earned increasingly more than less educated workers. But workers within education groups witnessed lower wage dispersion over time. Defining demographic groups more narrowly, by additionally including characteristics such as experience, gender, industry, and state, among others, regression results show that inequality increased between them while simultaneously declining within them, as indicated by a compression of the residual wage inequality. Decomposition analysis attributes the decline in wage dispersion within groups to falling returns to unobservable characteristics. This, previously undocumented, divergent trend in inequality between and within skill groups in India cannot be explained by the three main arguments in the extant literature for why developing countries have witnessed a rise in wage inequality in recent decades following trade liberalization—greater imports of skill-complementary technology, offshoring, and reallocation of skilled labor toward exporting firms. I provide several pieces of suggestive evidence to argue that reduction in labor market frictions and growth in offshored tasks from developed countries that are routine in content, but performed by high-skilled workers, can lead to the divergent trends in inequality between and within groups. Compositional changes in the labor force do not account for the inequality patterns witnessed in India.

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1. INTRODUCTION

As in many other developing countries, wage inequality has been increasing in India over the last three decades, especially following trade liberalization in the early 1990s. During 1983–2005, while workers at the 10th percentile saw their real weekly wages increase by 0.75 log points, those at the 90th percentile gained 0.8 log points in real weekly wages.¹ However, while inequality increased *between* observable skill groups, it declined *within* these groups (see Figure 1).² This divergent trend in between- and within-group inequality has not been seen in other developing countries and is inconsistent with previously offered explanations for the rise in inequality in these countries. In this paper, I comprehensively document the evolution of wage inequality in India. I argue that these trends may be caused by growth in offshoring of routine tasks from developed countries and reduced labor market frictions.

India began deregulating its economy in the 1980s with measures such as industrial delicensing. Following a financial crisis in 1991, its trade regime was phenomenally liberalized. As liberalization and other structural reforms proceeded through the next two decades,³ India rapidly integrated with the world economy. Using nationally representative household level data for the period 1983–2005, I show that wage inequality increased in India, especially in the post liberalization years, and especially in the upper half of the wage distribution. Defining demographic groups narrowly along several observable characteristics, I show that inequality increased between these groups. Further, relative wages of highly educated groups of workers increased despite an increase in their relative supply, indicating an increase in demand for these workers. The growing demand for skilled workers is also reflected in upgrading of the skill composition of the workforce within all two-digit industries. However, I find that inequality within these observable skill groups declined over time—as reflected in a decline in residual wage inequality. Results also show that

this fall in within-group inequality is mainly driven by a decline in returns to unobservable skills.

The rising between-group wage inequality is not unique to India, and can be rationalized by two main theories offered in previous literature. One explanation is trade-induced skill-biased technological change (SBTC) or “skill-biased trade”—with more open trade regimes, developing countries increase imports of modern machinery that embodies skill-biased technology, increasing the productivity and wages of skilled relative to unskilled workers.⁴ Another explanation is offshoring of tasks from developed countries that are low-skill intensive from their perspective but are performed by relatively skilled workers in developing countries.⁵

However, the falling within-group inequality is unique to India, and stands opposite to the rising trend documented for other developing countries including Brazil (Helpman, Itskhoki, Muendler, & Redding, 2017; Krishna, Poole, & Senses, 2012; Menezes-Filho, Muendler, & Ramey, 2008), Colombia (Attanasio, Goldberg, & Pavcnik, 2004), China (Xing & Li, 2012), and Indonesia (Lee & Wie, 2013). As I explain below, this pattern also cannot be explained by the skill-biased trade and offshoring hypotheses. It also goes against the predictions of recent work by Helpman, Itskhoki, and Redding (2010a, 2010b, HIR henceforth) and Helpman *et al.* (2017) who integrate models of firm heterogeneity with search and matching frictions to show that trade liberalization induces a reallocation of higher ability workers toward exporting firms that are more productive and pay higher wages, thereby increasing residual wage inequality among observationally equivalent workers.

Inequality within observable skill groups can exist for several reasons. It may be that workers with the same education and experience level, or other observable characteristics, differ

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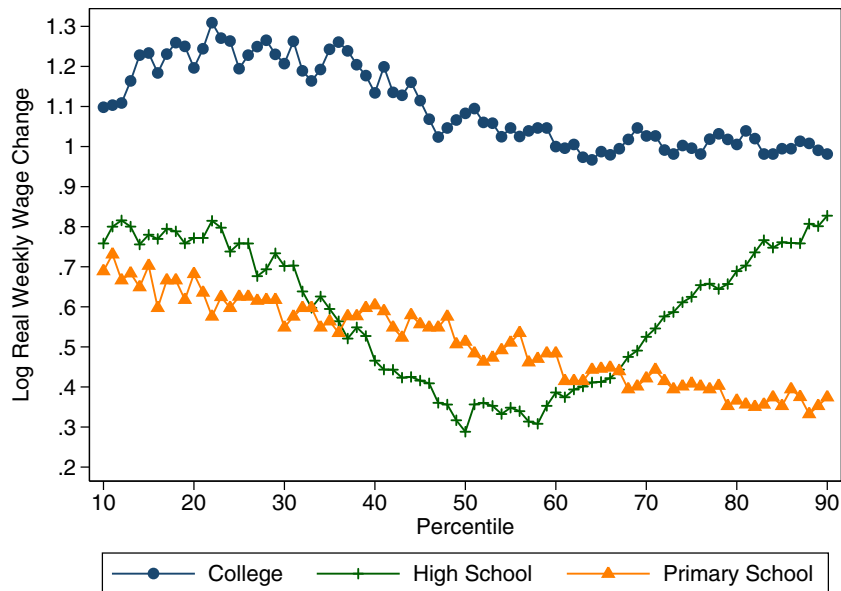


Figure 1. 1983–2005 wage change for education groups. The figure shows the percentile changes in log real weekly wages over 1983–2005 for three education groups. Data report the highest level of schooling attained. Primary educated and high school graduates typically have five and twelve years of schooling, respectively. The group of college graduates includes those with higher degrees. Sampling weights have been used.

in other valuable skills that are unobservable, such as innate ability, quality of education, etc. Or, workers within observable skill groups may, in fact, be fairly homogeneous but witness wage dispersion due to labor market frictions. Thus, a decline in within-group inequality may be caused by (a) falling relative returns to some unobservable skills, (b) compositional changes leading to a decline in the heterogeneity among workers along these unobserved skills, and/or (c) reduction in labor market frictions.⁶ I consider each of these possibilities and suggest that a decline in returns to unobservable skills and labor market frictions are plausible explanations for the divergent trends in between- and within-group inequality in India. I also show that compositional changes cannot account for the decline in residual inequality.

Consider why returns to unobservable skills may be falling. The rising between-group inequality and simultaneously falling within-group inequality suggest that while demand for some skills is increasing, it is falling for others. I propose an explanation for this puzzling trend—the routine nature of tasks offshored to India. In particular, while tasks offshored to India increase the demand for easily observable skills such as education and experience, their routine content does not require finer or soft skills, such as problem solving and teamwork, that are also not observable in the data. Thus, while the returns to easily observable skills such as education and experience increase, causing a widening of between-group inequality, the returns to finer skills fall, so that within-group inequality falls. In Section 4, I discuss this argument in greater detail and provide supporting evidence.

India's labor market is also likely becoming more efficient over time as a result of substantial improvements in transportation and communication infrastructure and structural reforms. If workers within observable skill groups are fairly homogeneous, then falling wage dispersion can be a consequence of reducing labor market frictions. Thus, while offshoring and skill-biased trade increase demand for observable skills, thereby causing between-group inequality to increase, the growing efficiency of the labor markets reduces frictional wage inequality within groups. I discuss this more in Section 4.

A vast literature demonstrates that most advanced countries have witnessed increasing wage inequality, both between and within groups, since the 1980s.⁷ Empirical analyses in these papers show that increasing returns to observable skills, such as education and experience, have increased wage dispersion between observable skill groups. The widening residual wage dispersion is taken as evidence that returns to unobservable skills have also increased. The most prominent explanation for increasing between- and within-group inequality is SBTC, i.e., technological changes, aided by the spread of computers, have increased the productivity of skilled relative to unskilled workers, leading to a rising wage gap.

As mentioned earlier, many developing countries that liberalized their trade regimes have also experienced growing inequality.⁸ This phenomenon is opposite to the prediction of the textbook Stolper–Samuelson theorem. According to the theorem, developing countries abundant in unskilled labor export goods and services intensive in relatively unskilled labor to developed economies and import skill-intensive products. Thus, following trade, the demand for unskilled workers should increase relative to skilled workers leading to a reduction in wage inequality. Recent studies (see, among others, *Attanasio et al., 2004; Berman & Machin, 2000; Tan, 1999; Robbins, 1996*) instead argue that as developing countries increasingly liberalize their trade regimes, they import capital equipment that embodies skill-biased technology developed in advanced countries, leading to greater demand and higher wages for skilled relative to unskilled workers. Thus, developing countries are also witnessing SBTC, albeit trade induced. However, since SBTC entails growing inequality both between and within skill groups, this explanation cannot account entirely for the patterns I document for India.⁹

Another channel by which wage inequality can increase in developing countries following trade liberalization is offshoring. *Feenstra and Hanson (1996)* and *Zhu and Trefler (2005)* present models with the premise that while developed countries offshore tasks that are less skill intensive from their perspective, they are performed by skilled workers in developing countries. Thus, both papers predict that offshoring

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