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Skill formation, public expenditure on education and wage inequality: theory and evidence

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Research highlights

- **According to conventional wisdom public spending on education should improve wage inequality.**
- **We examine the validity of the wisdom both theoretically and empirically.**
- **A 2×3 simple general equilibrium model for a small open economy is used for theoretical analysis.**
- **A panel data analysis of data from 13 small OECD countries for the period 2000-2011 has been performed.**
- **The relationship between wage inequality and public spending on education is found to be ambiguous.**

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Abstract: As per the conventional wisdom there should be provision for public assistance for skills acquirement for improving relative wage inequality in the future. Empirical observations on some prominent small OECD countries, however, indicate that the relationship between wage inequality and public spending on education is not necessarily unambiguous. A theoretical underpinning of this empirical observation has been provided in this study in terms of a 2×3 general equilibrium model for a small open economy. Later, the correctness of the theoretical framework and its result have been empirically examined with the help of an unbalanced panel dataset of 13 small developed countries from 2000-2011. This empirical analysis supports the main theoretical result that the relationship between wage inequality and public expenditure could indeed be ambiguous. This finding questions the desirability of providing subsidy on education at least from the perspective of reduction in earnings inequality among the different sections of the working population.

Keywords: Skill formation, Wage Inequality, Education Subsidy, General Equilibrium, Small OECD country, Panel Data.

JEL Classification: J31, I24, I28, D58.

Skill formation, public expenditure on education and wage inequality: Theory and evidence

1. Introduction and motivation

Skill formation is extremely crucial in all countries irrespective of whether developed or developing because it promotes economic growth through human capital formation and also because it is expected to produce an egalitarian effect that comes through lowering of the difference in wages between the two groups of worker differentiated with respect to their skills.¹ The conventional wisdom relating to its egalitarian effect is that skill acquisition, given the size of the workforce, lowers the endowment of unskilled labour in the short run and raises the supply of skilled labour in the future. As the supply of unskilled labour decreases although the endowment of skilled labour does not change relative wages should move in favour of unskilled labour in the short run. In future, unskilled workers going for skill acquisition in the current period become skilled and therefore, the endowment of skilled labour goes up while that of unskilled labour does not change. The wage inequality again must improve because of increased supply of skilled labour. If these arguments are valid then logically it follows that there should be provision for public assistance for skill acquirement from the perspective of reduction in relative wage inequality. In the post-reform regime, the need for this type of public assistance has become critically important given the empirical evidences of strong symmetrical wage movements against unskilled labour in different countries across the globe. Some notable studies in this regard include those of Harrison and Hanson (1999), Curie and Harrison (1997), Robbins (1995), Beyer et al. (1999), Feenstra and Hanson (1997), Wood (1997) and Khan (1998). In this connection, it is important to mention that Beyer et al.(1999), while studying the consequence of trade liberalization on wages in Chile, have found that an increase in the proportion of labour

¹ Different facets of skill formation have been discussed in works like Author (2014), Becker (1964), Brown et al. (2001), Crouch et al. (1999), Heckman and Krueger (2003), and Vanhuyse (2007).

force with higher education exerted downward pressure to reduce the skilled-unskilled wage inequality. Therefore, as per their findings education had some equalizing effects on the wage gap in that country which fortifies the necessity of providing public incentives to skill acquisition.

However, an interesting empirical observation on some small OECD countries has motivated us to reexamine the relationship between wage inequality and the public spending on education both theoretically and empirically in this study.² The data on *ps_edu* are collected from the World Development Indicators published by the World Bank (2014) where as the data on *ed* are obtained from the OECD data library. Here *ed* is considered as a proxy for wage inequality. For most of the small OECD countries (for which recent data are available) this expenditure witnessed an increase in recent times starting from the year 2000.

A closer scrutiny of the dataset on wage inequality and the expenditure on education for the 13 countries, reveals that there is no unambiguous relationship between these two series. For some countries, when expenditure on education had increased, the wage inequality witnessed a downturn. For other countries, the trend has found to be the converse. Even for the same economy, these two variables had moved together in the same direction in some periods, while they moved in opposite directions in other periods.

The simple correlation coefficients between *ed* and *ps_edu* for those countries vary widely between -0.74 and 0.80.

² There is no doubt that the study of the relationship between public spending on education and economic growth is equally important. However, we feel that the aspect of economic growth is a different issue which should be examined separately in a different work.

Therefore, the ambiguity in the relationship between these two variables across countries is clear from both the graphs. This has essentially motivated us to explain theoretically that such an ambiguity in their relationship is indeed possible. Our theoretical analysis has been carried out in terms of a 2×3 full-employment general equilibrium model appropriate for a small open economy where the terms-of-trade (TOT) and population size are assumed not to change over time. This analysis finds that the relationship between relative wage inequality and expenditure on education in a small open economy can indeed be ambiguous.

A pertinent question at this juncture is whether the theoretical structure that we have resorted to is appropriate for explaining the observed phenomenon because it relies heavily on the two assumptions as mentioned above. In reality, TOT index figures and population sizes do change over time and the degrees of openness of different countries to international trade also vary overtime. These considerations kindle us to perform a rigorous econometric analysis of those 13 countries taking ‘TOT’, ‘population size’ and ‘openness’ as control variables in order to focus the relationship between wage inequality and public expenditure on education overtime and across those OECD countries.

Overall, we have found a statistically significant positive relationship between the two variables although in country-specific cases it could be positive, negative or even zero. These findings justify the appropriateness of our theoretical set-up and can question the validity of the general belief relating to the consequence of the public assistance programs, encouraging skill formation, on the relative income inequality among the different sections of the working population.

4. Conclusion

This study has originated from an interesting empirical observation on the relationship between earnings dispersions and public spending on education in some small OECD countries over the recent period, 2000-2011. This relationship appears to be ambiguous which is contrary to the standard wisdom which suggests that spending on education through skill formation must produce some equalizing effects on the relative wages of the different sections of the working population differentiated according to their skills. That an ambiguity in the relationship between wage inequality and public spending on education is plausible has been established theoretically in terms of a two sector, specific factor general equilibrium model reasonable for a small open economy. Then, we have proceeded to empirically examine the aptness of our theoretical set-up with the help of an empirical analysis of 13 small OECD countries. We have taken TOT, population growth and degrees of openness of those countries as control variables and find out the direct consequence of public education expenditure on wage inequality. Our analysis has found a statistically significant positive relationship between those two variables for those 13 countries taken together although in country-specific cases the relationship can be positive, negative, or even zero. These findings are consistent with our theoretical result. Although our analysis is simple it deserves some attention because it questions the desirability of providing public subsidy to assist skill formation from the perspective of improving the relative wage inequality among the working class.

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