Trade and the distribution of human capital [☆]

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Abstract

We develop a two-country, two-sector model of trade where the only difference between the two countries is their distribution of human capital endowments. We show that even if the two countries have identical aggregate human capital endowments the pattern of trade depends on the properties of the two human capital distributions. We also show that the two distributions of endowments also completely determine the effects of trade on income inequality. We also look at a simple majority voting model. It turns out autarky and free trade with and without compensation may be the voting outcome.
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1. Introduction

The impact of trade on income inequality has been a topic widely discussed in both academic and policy forums. What has triggered interest in this topic is a growing concern among industrialized nations about their ability to sustain high standards of wellbeing in the face of competition from low wage countries. These issues have been addressed theoretically by models

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in which trade occurs because of differences in technologies and endowments.[2] However, it has also been noted that a large volume of international trade takes place between rich countries and they have similar technologies and endowments.[3]

In order to address these issues in a way that accounts for these facts we develop a two-country, two-sector model of trade where the only difference between the two countries is in their *distribution* of human capital endowments.[4] Their technological capabilities and the preferences of their consumers are identical.[5] In each country there is a primary sector where output is produced using labor and a high-tech sector that uses human capital as its input. We will demonstrate that even if the two countries have identical aggregate human capital endowments they will trade with the patterns of trade depending on the properties of the two human capital distributions.[6]

We will also show that together, the two distributions of endowments also completely determine the effects of trade on income inequality. More specifically, we will find that inequality always rises in the country that exports the high-tech product and declines in the country that exports the primary commodity.

Next, we explore the welfare implications of our model. We compare total welfare under autarky with the corresponding welfare under free trade and find that, unless the marginal utility of income is constant, there exist free-trade equilibria that are welfare reducing. If we allow income redistribution, then there are always long-term gains from trade for each member of society as long as losers are compensated.[7]

Finally, we ask what outcome would emerge in a simple majority voting framework. We find that in the absence of redistribution, autarky or free trade could be the equilibrium choice of a majority of the population. There is also an equilibrium in which free trade is chosen but overall welfare declines. In that case, free trade is preferred by the majority but the losses of the losers outweigh the gains of the winners.

If, in addition to voting on free trade, we also allow voters to vote on whether there should be income redistribution that ensures no member of society loses from trade, then autarky can never be an equilibrium. However, there still is an equilibrium in which free trade is chosen, redistribution fails to be approved and overall welfare declines. We begin by developing the model.

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[2] Both the theoretical and empirical literatures are extensive and have recently been reviewed by Feenstra and Hanson (2001).

[3] See Brander (1981), Davis (1995), Grossman and Maggi (2000) and Krugman (1979) for theoretical attempts to account for this observation.

[4] We consider differences in both means (aggregate endowments) and variances.

[5] Yeaple (2005) has a model in which worker heterogeneity, technology differences and trade costs jointly determine firm heterogeneity.

[6] Bond (1986) considered a trade model where firm heterogeneity arises because of variations in entrepreneurial ability. He analyzed the relationship between factor intensities, factor returns and patterns of trade, however, he kept the distribution of ability fixed throughout the paper. To our knowledge, Ishikawa (1996) was the first to explore the relationship between the distribution of human capital and the patterns of trade. However, he has restricted his attention to countries that differ in aggregate endowments while we are also interested in differences in the variance of the two distributions. Grossman and Maggi (2000) using production technologies where workers' talents can be complementary in some sectors and substitutable in others have also found that the distribution of human capital can potentially matter for a country's patterns of trade. This is in contrast with our paper where as long as the distributions differ the two countries can benefit from trade. In addition, both of the above papers focus on trade patterns while we are also interested on trade's consequences for inequality and welfare. Lastly, distributions also matter in Grossman (2004) but in his model firms are not perfectly informed about workers' productivity and their output is not verifiable by their employees.

[7] Here, we completely ignore any short-term adjustment costs as the economy moves from one regime to another. See Davidson and Matusz (2006, 2004) and Davidson, Matusz, and Nelson (2006) for interesting work in this area.