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Globalization and imperfect labor market sorting

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ABSTRACT

This paper focuses on the ability of the labor market to efficiently match heterogeneous workers to jobs within a given industry and the role that globalization plays in that process. Using matched worker–firm data from Sweden, we find strong evidence that openness improves the matching between workers and firms in industries with greater comparative advantage. This suggests that there may be significant gains from globalization that have not been identified in the past — globalization may improve the efficiency of the matching process in the labor market. These results remain unchanged after adding controls for technical change at the industry level or measures of domestic anti-competitive regulations and product market competition. Our results are also robust to alternative measures of the degree of matching, openness, and the trade status of an industry.

1. Introduction

This paper is an empirical exploration of how well the labor market matches good workers with good firms within a given industry, focusing in particular on the degree to which increased globalization might impact that process. Our work is motivated by earlier research that has attempted to empirically measure the correlation between firm and worker quality combined with relatively recent theoretical work suggesting that globalization can influence this correlation differentially based on an industry's degree of comparative advantage.[1]

The idea of matching heterogeneous agents dates back to the classic paper by Becker (1973) on the marriage market.[2] Becker introduced the issue by pointing out that men differ in a variety of attributes including physical capital, intelligence, education, wealth and physical characteristics and it is unclear how these men ought to be matched with similarly heterogeneous women. Becker argued that under reasonable assumptions about the household production function, positive assortative matching — the matching of men and women with similar attributes — would be optimal. Similar issues apply to the labor market where even in narrowly defined industries firms differ in the technologies they use, the skill-mix of their workforces, and the wages that they pay (Doms et al., 1997) and workers differ in education, physical attributes and ability. A large literature has developed in search theory devoted to finding conditions under which positive assortative matching is optimal in labor markets with two-sided heterogeneity

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[1] See for example Abowd et al. (1999), Goux and Maurin (1999), Gruetter and Lalive (2004), Barth and Dale-Olsen (2003) for the empirical motivation; and Davidson et al. (2008) and Helpman et al. (2010) for the theoretical motivation.

[2] Closely related to the matching problem described by Becker is the "assignment problem" associated with early models by Tinbergen (1951) and Roy (1951) (see Sattinger, 1993 for a survey). Becker is concerned with one-to-one matching — matching males and females in the marriage market or a single worker with a firm in the labor market. Assignment models focus on firms that hire multiple workers and then assign those workers to a variety of tasks.

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and conditions under which the market outcome yields the optimal pattern of sorting (e.g., Shimer and Smith, 2000; Legros and Newman, 2002, 2007). The pioneering work of Abowd et al. (1999) offered a methodology that could be used to test for positive assortative matching and a good deal of research in labor economics that followed focused on whether labor markets are characterized by this type of matching. Most of this work has produced surprising results that suggest that a great deal of matching may be inefficient.[3]

This is an important issue in international trade, where the implications of firm and worker heterogeneity have been major topics of research over the past two decades.[4] In particular, the results derived in Davidson et al. (2008) as well as in Helpman et al. (2010) suggest that increased globalization could have an effect on the matching of firms and workers. Specifically, Davidson et al.'s (2008) analysis suggests that increased openness to international trade affects the correlation between worker and firm productivity: increasing this correlation in "comparative-advantage" industries; but weakening it in "comparative-disadvantage" industries. Similarly, Helpman et al. (2010) show that in their setting greater openness strengthens the correlation between firm productivity and average worker ability; a result that is consistent with greater openness resulting in an increase in positive assortative matching.

These theoretical results, discussed in more detail below, provide the motivation for undertaking the empirical analysis in this paper where we ask if there is any empirical evidence whatsoever linking globalization to firm-worker matching. This is the heart of the matter. Has the quality of worker–firm matches changed over time? If so, can any of that change be attributed to changes in the degree to which an economy is engaged globally? If globalization is found to have an effect, is that effect industry-specific, depending on whether the industry is export-oriented (a comparative-advantage industry) or import-competing (a comparative-disadvantage industry)?

The data requirements to carry out this type of analysis are demanding. We need extensive information about workers, firms, and their employment relationships over time. We are able to meet these demands by combining data from Statistics Sweden's annual salary survey with a variety of other data registers to obtain a comprehensive view of Swedish industries, workers, and firms. This matched employer–employee data spans a decade, so we are able to track workers as they either remain employed with the same firm throughout the sample, transit to new firms, or exit the labor force. The data set is extensive, including roughly 50% of the workforce and all firms in Sweden with more than 20 employees, and rich in details concerning worker and firm characteristics. The data set is also characterized by considerable worker mobility, allowing us to avoid the issue of "limited mobility bias" that has been associated with previous empirical studies of assortative matching using linked employee–employer data (see Andrews et al., 2008).

Our empirical approach begins with the construction of a measure of the degree of matching in disaggregated industries using both observed attributes and unobserved fixed effects of workers and firms. The unobserved worker and firm effects are estimated using the approach taken by Abowd et al. (1999) and the literature that has followed. Once constructed, we then explore the degree to which "openness" can explain variation in this variable between industries and over time. Our preferred measure of openness is tariffs. The main advantage of using tariffs is that they can be considered as exogenous after 1995 when Sweden joined the European Union, since it is unlikely that a small country like Sweden can have a substantial impact on the level of tariffs set by the EU. In addition, foreign tariffs are not affected by conditions in Swedish industries. However, "openness" or "globalization" has many dimensions. We therefore test the robustness of our results by constructing alternative measures of openness.

Focusing here on our preferred measure, reducing foreign tariffs imposed on Swedish exports has the largest effect on Swedish exporters, therefore such tariff reductions ought to increase the chances that good workers match with good firms. In contrast, a reduction in Swedish tariffs imposed on foreign imports largely impacts Swedish importers. The intuition from Davidson et al. (2008) suggests that these changes might make it more difficult for good workers to match with good firms.[5]

Fig. 1 gives us a first glance of the Swedish data. Each point in the figure represents one of 73 three-digit Swedish industries. There are 33 comparative-advantage industries each represented by a closed circle and 40 comparative-disadvantage industries each represented by an x.[6] The vertical axis represents the 10-year difference between 1995 and 2005 in the degree of matching within each industry, where a positive difference represents an increase in the strength of correlation between worker and firm quality.[7] The horizontal axis represents the 10-year change in the industry-specific foreign tariff rate. In calculating these differences, we treat reductions in foreign tariffs applied to Swedish goods as positive numbers, so that an increase can be thought of as reduced trade barriers or greater openness.

The dotted and solid lines represent the OLS fitted regression of the change in matching against the change in tariffs without controlling for any other factors. The slope of the dotted line is flat and not statistically different from zero. As a first pass, greater openness had no impact on the degree of matching in Sweden's comparative-disadvantage industries. In contrast, the estimated slope of the solid line is 0.08 with a standard error of 0.05, giving a p-value of 0.135. Without any controls, it appears that there was a positive correlation between greater openness and the quality of matching in Sweden's comparative-advantage industries.

In the analysis to follow, we dig deeper into the data and pool all industries and years to exploit the full information contained in the data set. Controlling for industry and year fixed effects, we identify the effect of openness on the degree of matching by exploiting the within-industry and over-time variation in the measures of openness and the degree of matching. In addition, we investigate the possibility that the effect of openness could be systematically related to the trade status of an industry. Recognizing that there may be a myriad of influences at work, we attempt to isolate the effect of openness by controlling for other industry-level time-varying factors that may affect the degree of matching. For example, both Acemoglu (1999) and Albrecht and Vroman (2002) argue that skill-biased technical change increases the degree of positive assortative matching. Product market competition may also affect the profitability of firms and the degree of matching between firms and workers. Thus, in our investigation of the relationship between openness and assortative matching, we add industry-level controls for those factors.

[3] From an anecdotal perspective, most readers of this article probably know many academic economists who are "under placed", including everyone reading this article.

[4] A number of important papers examine how labor market sorting affects trade issues including Grossman and Maggi (2000), Grossman (2004), Yeaple (2005), Antràs et al. (2006), Kremer and Maskin (2006), Ohnsorge and Trefler (2007), Costinot (2009), and Costinot and Vogel (2010), among others.

[5] As will be described in Section 2, Davidson and Matusz (2012) refine the Davidson et al. (2008) by allowing for a continuum of firm productivities operating in a monopolistically-competitive market. The refined model suggests that intensified import competition may have an ambiguous impact on matching, while increased access to export markets remains to have an unambiguously positive impact on assortative matching.

[6] Comparative-advantage (comparative-disadvantage) industries are defined as having positive (negative) net exports in the initial year of the data (1995). Our sample has 88 three-digit SNI (Swedish Industrial Classification) industries. However, 15 of them have missing information on tariffs for 1995. Also note that in the following empirical analysis, we mainly use a continuous measure of trade status of an industry, which is defined as the value of net exports as a share of total trade in 1995 for that industry. See Section 3.4 for more details.

[7] In the plot, the degree of matching is measured by the correlation coefficient between worker and firm total effects (including both observed and unobserved attributes). See Section 3.2 for details about this measure.

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