



# Global engagement and the occupational structure of firms



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## ARTICLE INFO

### Article history:

Received 4 April 2016

Accepted 26 August 2017

Available online 8 September 2017

### JEL:

F1

F2

### Keywords:

Occupational structure

Globalization

Multinational Enterprises

Exporters

Offshoring

## ABSTRACT

Global engagement can impact firm organization and the occupations firms need. We use a simple task-based model of the firm's choice of occupational inputs to examine how that choice varies with global engagement. We reveal a robust and causal relationship between global engagement and the skill mix of occupations within firms, using Swedish matched employer-employee data that link firms and the labor force for 1997–2005. Taking an instrumental variable approach, we find that increased export shares (driven by higher world import demand) skew the labor mix more toward high-skill occupations. Our results suggest that global engagement may require firms to employ more skilled labor to undertake complex tasks embodied in international businesses, which have further implications for the demand for specific occupational skills and overall wage dispersion.

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## 1. Introduction

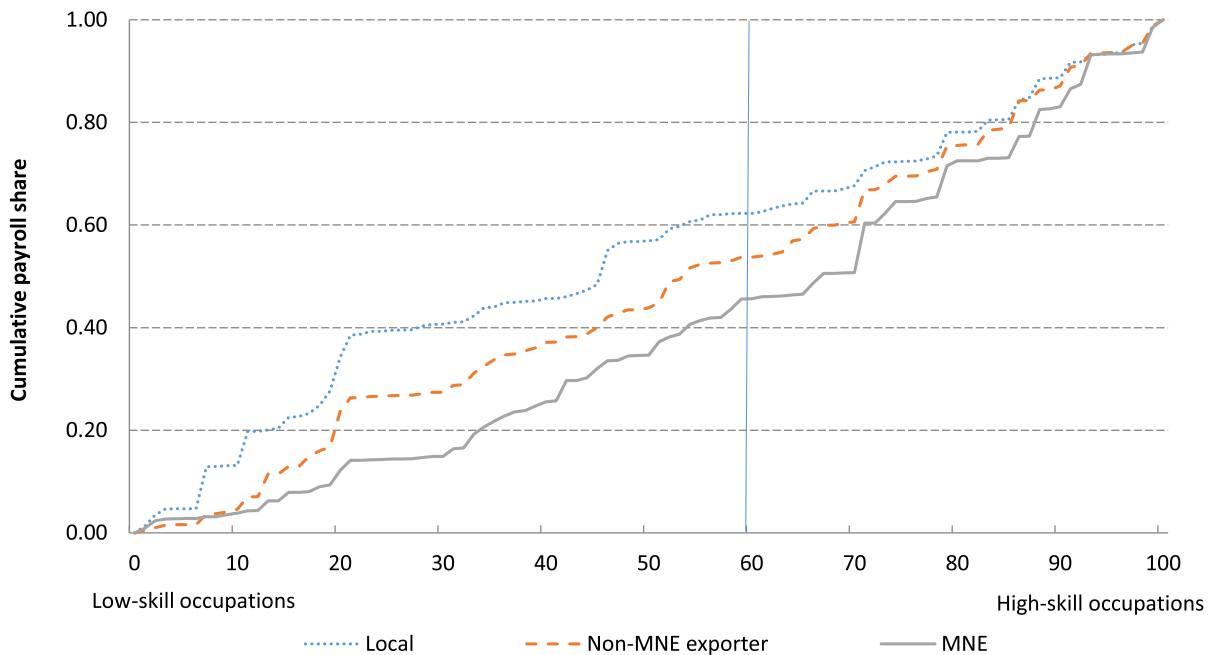
It is well documented that multinational firms are more skill intensive than purely local firms,<sup>1</sup> and exporters are more skill intensive than non-exporters.<sup>2</sup> However, less is known about the exact nature of, and the mechanism behind, the differences in skill intensities. Due to data limitations, previous studies usually define production workers as the unskilled and non-production workers as the skilled. Further, although the established evidence suggests a strong correlation between exporters/multinationals and skill intensity, it remains unclear to what extent international activities can affect the skill mix within firms. This is important since the systematic differences in skill mix across firms can have implications for the dynamics of aggregate labor markets as the degree of globalization changes. If the distribution of firms *within* sectors changes in concert with the process of globalization, those cross-firm differences in skill mix may imply changes in the demand for workers with different skills and thus their wages.

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<sup>1</sup> For example, see Markusen (1995), and Barba-Navaretti and Venables (2004), for a survey; Lipsey and Sjöholm (2004) on Indonesia; Heyman et al. (2007) on Sweden.

<sup>2</sup> For example, see Bernard and Jensen (1997) on the U.S.; Alvarez and Lopez (2005) on Chile; Munch and Skaksen (2008) on Denmark.



**Fig. 1.** Cumulative distribution of payroll by firm types.

*Note:* This figure shows the aggregate distribution of payroll across occupations by skill levels for three types of firms: multinationals (MNEs), non-MNE exporters, and Local firms (i.e., non-MNEs that do not export). The horizontal axis is the skill percentile ranking of occupations based on average wages for 1997. The vertical axis is cumulative payroll shares.

In this paper, we reveal detailed patterns of the skill mix across firms with different degree of global engagement, and investigate the causal effect of global engagement on the skill mix at the firm level. To this end, our empirical investigation uses comprehensive and detailed Swedish matched employer–employee data spanning 1997–2005, which is further merged with Swedish Foreign Trade Statistics that contain information on firms’ import and export activities. The data cover all Swedish firms and a representative sample of the labor force, including information on worker occupations at a very detailed level (100 occupations), which allows us to examine labor specialization at a detailed occupational level.

Initial results are displayed in Fig. 1 which shows the aggregate distribution of payroll shares by skill levels for three different firm types: MNEs, which are the most globally integrated firms; non-MNEs that do not export (i.e., Local firms), which are the least globally integrated; and non-MNE exporters, which represent an intermediate degree of global integration. The horizontal axis is the skill percentile ranking of occupations based on the average occupational wages for all firms in 1997. The vertical axis is the cumulative payroll share accounted for by the skill category indicated on the horizontal axis. Compared to Local firms, the distribution of payroll share for MNEs and non-MNE exporters is more skewed toward high-skill occupations, e.g., managers, professionals specialized in finance and sales, computing, and engineering. For instance, Local firms allocate roughly 40% of payroll expenditures to occupations above the 60th skill percentile. The corresponding figures for MNEs and Exporters are roughly 60% and 50%, respectively.

To guide the empirical investigation, we use a task-based model of the firm’s choice of occupational inputs to examine how that choice varies with global engagement. Our model builds on Chaney and Ossa’s (2013) framework in which production requires a series of tasks to be completed and firms design their production chain to minimize costs. We depart from Chaney and Ossa by assuming that it is costlier to train workers to perform more complex tasks. Within the structure of our model, firms skew employment and payroll shares toward occupations engaged in more complex tasks. Assuming that increased global engagement is associated with additional fixed costs (e.g., Melitz 2003; Helpman et al., 2004) and the additional fixed cost is intensive in the use of more complex specializations, we derive the main proposition that *for more globalized firms, total payroll expenses will be further skewed towards higher-skilled occupations with specialization in more complex tasks*. In this paper, we quantify this relationship between global engagement and the occupational structure of firms.

Our estimations confirm a robust and causal relationship between the degree of international integration and the skill mix of occupations at the firm level. We measure the skill mix using an index computed as a weighted average of the skill rankings of each occupation, with firm–occupation–year specific payroll shares as the weight. We first focus on a sample of exporters to estimate the impact of increased export shares on the skill mix. Taking an instrumental variable approach, we find that increased export shares, driven by higher world demand for the product that the firm is exporting, lead to a shift of payroll expenses toward more skilled occupations. The 2SLS estimate of the coefficient on export shares is significantly positive, and the magnitude is economically large: the implied skill index differential between exporters at the 75th percentile of export shares and those at the 25th percentile is more than half of the 75–25 skill index differentials between

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