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Immigration, trade and productivity in services: Evidence from U.K. firms☆

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ABSTRACT

This paper explores the impact of immigrants on the imports, exports and productivity of service-producing firms in the U.K. Immigrants may substitute for imported intermediate inputs (offshore production) and they may impact the productivity of the firm as well as its export costs. The first effect can be understood as the re-assignment of offshore tasks to immigrant workers. The second can be seen as a cost cutting effect due to immigration, and the third as a trade-cost reducing effect. To test the empirical significance and size of these effects, we exploit differences in immigrant inflows across U.K. labor markets and a new firm-level dataset on U.K. service firms. We find that immigrants increase overall productivity in service-producing firms, revealing a cost cutting impact on these firms. They also reduce the extent of country-specific offshoring, consistent with a reallocation of tasks, and they increase country-specific exports, consistent with a reduction in bilateral communication and trade costs.

1. Introduction

The connections between immigration, productivity, and trade have been the focus of active research in recent years. Several papers have analyzed the role of immigrants in increasing the diversity of skills within firms, as well as the positive productivity effects associated with this diversity (see, for instance, Kerr and Lincoln, 2010; Ortega and Peri, 2014; Peri et al., 2015; and Ghosh et al., 2014). Other papers have focused on the role of immigrants in promoting specialization and the division of labor (Peri and Sparber, 2009; D'Amuri and Peri, 2014; Foged and Peri, 2016). Within this literature researchers have also recognized that immigrants may be substitutes for the performance of tasks offshore (Ottaviano et al., 2013), thereby generating a cost-reduction effect that increases firm productivity in the same manner as offshoring (Grossman and Rossi-Hansberg, 2008). To the extent that this substitution effect exists, it will produce a negative correlation between the employment of immigrants and imports of intermediate goods (i.e., "offshoring"). A separate branch of the literature has instead analyzed the effect of immigrants in promoting goods exports via a reduction in bilateral trade costs, for instance by enhancing information flows, trust and linkages between countries. This literature, pioneered by Gould (1994), has analyzed the country-level relationship between immigration and trade (Dunlevy and Hutchinson, 1999; Mundra, 2005; Head and Ries, 1998; Girma and Yu, 2002, just to name a few) and more recently

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has used cross-regional data within a country, exploiting the differential distribution of immigrants across regions (e.g., Bardhan and Guhathakurta, 2004; Co et al., 2004; Dunlevy, 2006; Millimet and Osang, 2007; Bandyopadhyay et al., 2008; White and Tadesse, 2008; Herander and Saavedra, 2005). [1]

Most of the literature described above has omitted an analysis of trade in services, while focusing narrowly on the manufacturing sector. To the best of our knowledge, no paper has analyzed the impact of immigration on the imports, exports and productivity of firms that trade in services. In the U.K., both immigrants and services exports are relatively concentrated in the same sectors, suggesting there may be a relationship between the two. For example, high-skill immigrants to the U.K. are concentrated in scientific research and development occupations and, correspondingly, the largest category of services trade is professional, scientific and technical activities (see Fig. 1).[2] This suggests that immigrants' origin-country networks may be particularly valuable for selling services in foreign markets. For instance, selling business services abroad requires a relatively nuanced understanding of the idiosyncrasies of country-specific business culture. Similarly, selling legal services abroad requires a deep understanding of the subtleties of a country's legal system. In this respect, delivering services effectively across country borders requires a sophisticated and detailed understanding of the specific foreign markets. Immigrants from those countries may be particularly useful in enhancing and refining that understanding. Hence, this paper addresses a link that has been neglected in the literature and could be very important.

We analyze both the broad impact of an increase in immigration on firm productivity and, more narrowly, of bilateral migrations on firm bilateral imports and exports of services. In doing so, we are able to separately estimate three effects of immigration: a "productivity (or general export promotion) effect", due to the overall cost reduction in production; an "import substitution effect", due to the reduction in the relative cost of having some tasks (services) performed domestically by immigrants rather than being sourced offshore; and a "specific export promotion effect", due to a reduction in the bilateral costs of exporting.

We do this in the context of the U.K., the world's second most popular immigrant destination (in absolute numbers) and the second largest service trader (in value). In 2013, approximately half a million immigrants arrived in the U.K.[3] Fig. 2 documents the average share of foreign-born workers for several U.K. local labor markets with above-average immigrant inflow over the period 2001–2007. The labor markets represented in the figure, and used as geographical units in the rest of the paper, are Travel to Work Areas (or TTWAs for short), defined to encompass areas within which people both work and live. There is a significant geographic heterogeneity in the presence of immigrants across TTWAs, which generates a corresponding heterogeneity in the supply of the specific skills that they bring to the labor market, variation that we leverage in our analysis.

Fig. 3 shows the population share of foreign-born and of newly arrived foreign born between 1993 and 2015, and indicates rapid growth beginning in the late 1990s and especially over the decade 2000–2010. This is a period when newly arrived immigrants produced an increase in the share of foreign-born in the population of about 4%, and it covers the period that we focus on in our empirical analysis.

Fig. 4 documents the trend in services imports and exports as a share of UK GDP, over the same period. Here, we see that services imports and exports as a share of GDP were rising. In particular, beginning in the mid-1990 's, and spanning the entire 2000–2010 decade, imports and exports of services in the UK increased significantly as a share of GDP.

In the empirical analysis, we exploit services trade data at the firm level, where we link information on firm characteristics with information on the destination of the exports and origin of the imports for each firm. We further link this firm data with data from the U.K. Labour Force Survey (LFS), which describes worker characteristics across local labor markets (TTWAs). In our analysis, inflows of new immigrants into a TTWA represent changes in the immigrant supply in the local labor market and we analyze their impact on productivity, imports and exports of U.K. firms.

To begin, in Section 4 we document two stylized facts that help us identify some key features of our model. In that section, we first show that there is a significant *negative* correlation between the change in the share of immigrants from specific countries and the change in imports of intermediate services from those countries. Second, we show that there is a significant *positive* correlation between the change in the share of immigrants from specific countries and exports of final services to those countries.

Motivated by these facts, in Section 5 we develop a simple model in which the presence of immigrants may generate these correlations. First, in the model immigrants substitute for offshoring intermediate services (generating an "import substitution effect").[4] Second, by complementing and diversifying skills, immigrants may increase firm productivity, reduce firm labor costs and thus promote total firm exports (a "productivity" or "general export promotion effect"). Finally, they may reduce the specific cost of exporting to their country of origin by improving communication and delivery of the service (a "specific export promotion effect"). The import substitution effect is also very likely to be country-specific, due to the specificity of traded services. On the other hand, the overall productivity effect is generated by immigrants' skills. Hence, we can distinguish between these effects by exploring the impact of an exogenous increase in the share of immigrants on firm productivity and, separately, on the level of firm imports from, and exports to, the countries of origin of those immigrants. The literature has thus far not attempted to separate these effects from one another, and service-producing and service-exporting firms, which are deeply affected by country-specific knowledge and the skills of immigrants, are an ideal testing ground for these ideas.

Our main empirical findings, described in Section 7, confirm the implications of the model and can be summarized as follows. We find: (i) a bilateral import-substitution (offshore-reduction) effect of immigrants that is largest for language-intensive, culture-specific services; (ii) a bilateral export-promotion effect of immigrants, particularly for language-intensive, culture-specific services; (iii) a positive productivity effect of aggregate immigration. Consistent with the notion that the complementarity between immigrants and services exports may exceed that between immigrants and goods exports, our estimates indicate an elasticity that is near the upper end of the distribution of goods export elasticities found in the literature. Specifically, we find that a 10% increase in the bilateral share of immigrants increases exports by around 3 to 4%. We find the reverse effect with respect to imports: a 10% increase in the bilateral immigrant share reduces intermediate services imports by approximately 1 to 2%. We use the estimated effects to perform simple

[1] See Felbermayr et al. (2015) for a review of the literature and Genc et al. (2012) for a meta-analysis of the findings. Much less developed is the analysis of the impact of immigrant workers using firm-level export data. In fact, the only paper we are aware of is Parrotta et al. (2016), who analyze the impact of ethnic diversity on exports using Danish firm-level data.

[2] The other major occupations for high skill immigrants to the U.K. are health occupations and computer programming (see Office for National Statistics, 2013).

[3] Source: Office of National Statistics.

[4] We note that, anecdotally, this is consistent with stories told in several sectors. For instance, many Silicon Valley firms argue that they face a trade-off between hiring software engineers from sub-contractors in Bangalore versus sponsoring H1B work visas for the same workers in the U.S.