High-Skilled Immigration and Consumer Welfare

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Economists and policy-makers have long debated the impacts of immigration on the wages of domestic workers. But despite the important theoretical implications of how immigrants may affect consumers in destination countries, there is little empirical evidence about the effects on consumer welfare. In this paper, we study how high-skill migration to the United States under the H-1B visa program affected consumer welfare via changes in prices and the varieties of products produced by firms. This new evidence will help us quantify the overall benefits from immigration, and inform policy on high-skill migration.

Migration policy in the United States has, over time, tilted toward high-skill immigration as exemplified by the H-1B visa program. The Immigration Act of 1990 established the H-1B visa program for temporary workers in "specialty occupations." Yet, there are significant costs to hiring a worker from abroad, and the number of visas is capped each year.[1] The U.S. General Accounting Office 2011 survey estimates the legal and administrative costs associated with each H-1B hire to range from 2.3 to 7.5 thousand dollars. It therefore seems reasonable to assume that employers must expect some cost or productivity advantage when hiring foreigners.

That there are productivity and cost advantages of hiring foreign workers is documented by a long literature on the impacts of high-skill migration. Advantages are seen in worker wages Bound et al. (2015), but importantly, given the nature of tasks done by high-skill migrants, there are substantial impacts on innovation and patenting Kerr and Lincoln (2010); Hunt and Gauthier-Loiselle (2010).

Innovation and low production-costs will potentially increase the output of firms and the varieties of products supplied while lowering quality-adjusted output prices. These dynamics in the output market will raise consumer welfare, and to the best of our knowledge, have not been examined in detail. In this paper, we exploit detailed product- and firm-level data to study the effect of high-skilled immigration on customer welfare in the consumer goods sector over the period 2006–2014. Using a dataset that contains information on the product portfolio of each firm and the characteristics of each product, we document new facts on the relationship between immigration and product variety.

We rely primarily on two datasets. The first is the Nielsen Retail Measurement Services scanner dataset, which consists of more than 80 billion observations of weekly prices, quantities, and store information generated by point-of-sale systems. The data consist of approximately 1.4 million distinct products identified by a 12-digit universal product code (UPC), produced by about 25,000 distinct firms. We identify the firm owning each UPC by obtaining information from GS1 US, the single official source of barcodes in the United States. The GS1 data contains the list of all U.S. barcode prefixes along with information on the firms that own them. Our combined dataset allows us to have revenue, price, and

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quantity for each product of a firm's portfolio, and to study how firms change prices of their incumbent products and create new products over time.

We combine the Nielsen data with the universe of H-1B visas granted between 2006 and 2014, which includes both new visas and renewals. This data is available from the US Department of Labor and documents the date of filing, the name and street address of the firm, the start and end date, the job title and code, the wage rate, the location of the worker, and the prevailing wage in that occupation. We merge the two datasets at the firm level by matching them on their names.

We begin our empirical analysis by first measuring the firm's propensity to hire H-1B workers in the first year of our data. There are large fixed costs to hiring the first set of H-1B workers as Human Resources departments need to familiarize themselves with the process of filing a Labor Conditions Application (LCA) based on survey-determined prevailing wages, and preparing documents for Immigration Services.[2] This produces variation across firms in the likelihood of hiring an H-1B worker. We combine this propensity at the firm level with yearly fluctuations in the total number of visas. The year-by-year changes are driven by not just new approvals, but also renewals of old visas. This implies that policy changes in the past (for instance, the 2004 change in the cap and the 2009 restrictions under the American Recovery and Reinvestment Act) will also show up in total visas granted many years down the line. That there is variation is evident in the numbers: in 2006, the first year of our data, there were 271 thousand H-1Bs granted, and this number dropped to 193 thousand in 2010. In 2014, however, there were 316 thousand H-1Bs granted. We exploit the interplay between these two sources of variation while conditioning on time-invariant differences across all firms, and yearly shocks that are common to all firms.

In the first-stage estimation, we relate the number of H-1B visas for firm i in year t ($H1B_{it}$) to the interaction between the number of visas granted to that firm at baseline ($H1B_{i0}$) and the total number of H1Bs granted in a given year ($TotalH1B_t$). We condition on firm ψ_i and year fixed effects μ_t.

$$H1B_{it} = \beta_0 + \beta_1 H1B_{i0} \times TotalH1B_t + \mu_t + \psi_i + \epsilon_{it} \tag{1}$$

We then use this predicted change in H1B visas at the firm level to study the impact on firm-level prices and product variety. In order to quantify the change in customer welfare, we use the canonical Dixit and Stiglitz (1977) framework.

Our work closely relates to a few strands in the literature. First, in the context of immigration Cortes (2008) finds that low-skill immigration lowers the prices of non-tradable goods and services like housekeeping and gardening. On the other hand, Saiz (2007) shows immigration raises rents and housing prices in US cities. Bound et al. (2016) use a general equilibrium model to quantify the overall welfare effects of the H-1B program, including lower prices. In contrast, we use evidence from micro-data to causally estimate the effects of high-skill migration at the firm level on tradable products. Second, a few papers have recently started utilizing the firm-level scanner data. Argente et al. (2018) find that product creation and destruction are procyclical, and the decline in product reallocation contributed importantly to the slow growth experienced after the Great Recession. As predicted by Schumpeterian growth theories, the rate of product reallocation depends on the innovation efforts of the firms. Fracassi et al. (2017) investigate the effects of private equity on consumers using the scanner data and find that firms acquired by private equity increase sales via additional products, benefiting consumers. Our paper investigates how the increased supply of talent from abroad, in the context of the H-1B program, benefits consumers through firm-level responses in prices and product varieties.

Notes

[1]By the mid-1990s, the cap of 65,000 visas was binding and the allocation was filled on a first come, first served basis. The cap was raised to 115,000 in 1999 and to 195,000 for 2000-2003, and then reverted back to 65,000 thereafter. The 2000 legislation that raised the cap also excluded universities and non-profit research facilities from it, and a 2004 change added an extra 20,000 visas for foreigners who received a masters degree in the US.

[2]In order to hire a foreigner on an H-1B visa the firm must first file a Labor Condition Application (LCA), and pay them the greater of the actual compensation paid to other employees in the same job or the prevailing compensation for that occupation. After which, the H-1B prospective must demonstrate to the US Citizenship and Immigration Services Bureau (USCIS) in the Department of Homeland Security (DHS) that they have the requisite amount of education and work experience for the posted positions. USCIS then may approve the petition for the H-1B non-immigrant for a period up to three years, which can be extended up to six years.

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