Skilled Immigration, Firms, and Policy

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1 Introduction

Firm demand for foreign skilled workers has played a crucial role in generating the rapid increase in the number of skilled immigrants in the U.S. labor force.[1] However, there has been a gap between firm demand, measured by the number of Labor Condition Applications (LCAs) filed by firms in the first stage of the H1-B visa process, and the actual number of H1-B visas issued to foreign skilled workers, and this gap has been growing in recent years (Figure 1). As a result, the visa cap was met in each year since 2004, and visas for foreign skilled workers have been allocated according to a random lottery process (Figure 2). Moreover, the gap between LCAs and the cap has shown a tendency to widen by more in periods of economic expansion.

Kerr et al. (2014) highlight the skewness in demand for foreign skilled workers across firms. The role of demand for foreign skilled workers by heterogeneous firms and the current allocation mechanism of foreign workers across them have implications for how an increase in skilled immigration and changes in immigration policy impact the aggregate U.S. economy. However, these implications are not fully understood in the current literature.

Motivated by this, the goal of this study is to address a set of interrelated questions: First, what are the determinants of the demand of foreign skilled workers by heterogeneous domestic firms and the effects of skilled immigration on domestic labor market outcomes and aggregate output? Second, how do changes in immigration policy (including the visa cap) impact the economy? Third, what would be the effects of moving toward a more market-driven allocation of visas (via auction of permits) for skilled foreign workers, compared to the current random lottery setup?

2 Related Literature

This research will add to the emerging literature that examines the implications of high skilled migration.[2] The contribution to the literature will be twofold. First, the study highlights the role of firm demand. This is particularly relevant when studying skilled immigration, but most studies that analyze the impact of skilled immigration view it as a supply-induced shock and ignore the role of firm demand in endogenously generating skilled immigration. Important exceptions in the empirical literature that highlight the role of firms in the context of skilled immigration are Kerr et al. (2013), and Ottaviano, Peri, and Wright (2015). Kerr et al. (2014) also stress the "need to

[1] Current Population Survey data shows that the number of foreign born with a bachelors degree in the U.S. labor force displayed the sharpest increase (42.44 percent) among all foreign born, during the last decade.

[2] This literature includes Borjas and Doran (2012), Ottaviano, Shih, and Sparber (2015), and Kerr and Lincoln (2010).

increasingly develop a better understanding of the general equilibrium effects of skilled immigration with firms as a central element."

Second, to the best of my knowledge, no previous study has tried to measure the aggregate gain from implementing an alternative immigration policy with a market driven allocation of permits for hiring foreign skilled workers.

3 Methodology

In order to study the first two questions, I propose a dynamic stochastic general equilibrium model with monopolistically competitive heterogeneous firms as in Melitz (2003). Firms produce output by employing skilled domestic and foreign labor, and unskilled domestic labor, using a nested C.E.S. technology. Skilled labor immigration is modeled as an endogenous response to an increase in firm labor demand in the receiving economy (either due to a productivity shock or an easing of immigration policy restrictions). Immigration policy restrictions mimic current U.S. policy: Firms face a hiring cost, there is a cap on the number of foreign workers that can be hired in each period, and skilled foreign workers are allocated according to a random lottery if aggregate demand exceeds the cap. Each period, firms face an ex-ante probability that the foreign skilled workers they hire would be selected in the lottery (in case the cap endogenously binds), and heterogeneous firms would make their hiring decision of skilled workers accordingly. Since a significant proportion of foreign skilled workers on the H1-B visa are temporary workers, the model allows for an exogenous probability of return to the country of origin.

I calibrate the parameters of the model that pertain to immigration to match U.S. data from the Current Population Survey (the average proportion of foreign-born workers with a bachelor degree in the total skilled U.S labor force, the U.S. skill premium, and the share of domestic workers in the U.S. with a bachelor degree), and I rely on existing literature for the values of other parameters. I then solve the model numerically to study dynamics in response to productivity shocks and changes in immigration policy, and I calculate the welfare effects of policy changes (changes in the visa cap or the cost of H1-B applications).

To highlight the intuitive mechanisms of the endogenous lottery process, I solve a baseline, simplified version of the model with symmetric firms and perfectly substitutable foreign and domestic skilled labor.[3] Preliminary results highlight some key insights. Forward looking monopolistically competitive firms are able to increase output and profits over the medium and long term by hiring foreign skilled labor. However, the lottery mechanism distorts their hiring decision: Firms submit applications for too many foreign skilled workers if they do not have to bear the full cost of workers that are eventually not selected in the lottery. This simple model is able to generate mechanisms that replicate Figures 1 and 2. The model also supports conclusions from previous studies that skilled immigration benefits domestic workers that are most complementary to foreign workers, and also that a significant proportion of the welfare gains from an increase in skilled immigration are realized only over the longer run. Moreover, the impact on the welfare of domestic workers depends on how firm profits are distributed across skilled and unskilled workers. A key new insight from modeling the role of the firm explicitly is that the magnitude of overall benefits from easing immigration policy depends on how binding the cap is, and therefore on how firms respond to policy easing. This insight is lost if we analyze the impact of an immigration cap change as a change in labor supply alone.

[2]Bound et. al (2013) develop a dynamic model that features a role for firm demand for foreign skilled workers. However, they do not analyze the implications of firm heterogeneity as their focus is on the computer science market.

[3]The steady state for this version of the model can be solved analytically.

In order to answer the third question, I model a market driven allocation of permits for hiring foreign skilled workers through an auction mechanism, as proposed by Peri (2012). A multi-unit ascending-bid auction of permits implies that the equilibrium cost of hiring foreign skilled workers endogenously responds to economic conditions. Such an auction mechanism leads to a reallocation of foreign skilled workers to more productive firms, and thus leads to gains in aggregate productivity. In order to measure the gain from adopting such an auction system, I plan to use the calibrated model to measure how much closer this alternate policy would bring the economy's equilibrium allocation to the social planner's optimal allocation.

I am currently working to refine the model with heterogeneous firms and the auction mechanism, and I will turn next to its solution and the implementation of positive and normative exercises.

4 Conclusion

The general equilibrium macroeconomic framework I propose—featuring heterogeneous firms and a realistic modeling of the current skilled immigration policy setup—facilitates a better understanding of the aggregate impacts of skilled immigration and changes in immigration policy. This has key implications for evaluating alternative policies, such as the introduction of a market-based mechanism for visa allocation. In the future, I plan to extend the model to study additional questions on the interaction between skilled immigration and firms—for instance, the relationship between skilled immigration and offshoring of jobs in the high-tech sector.

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5 Figures

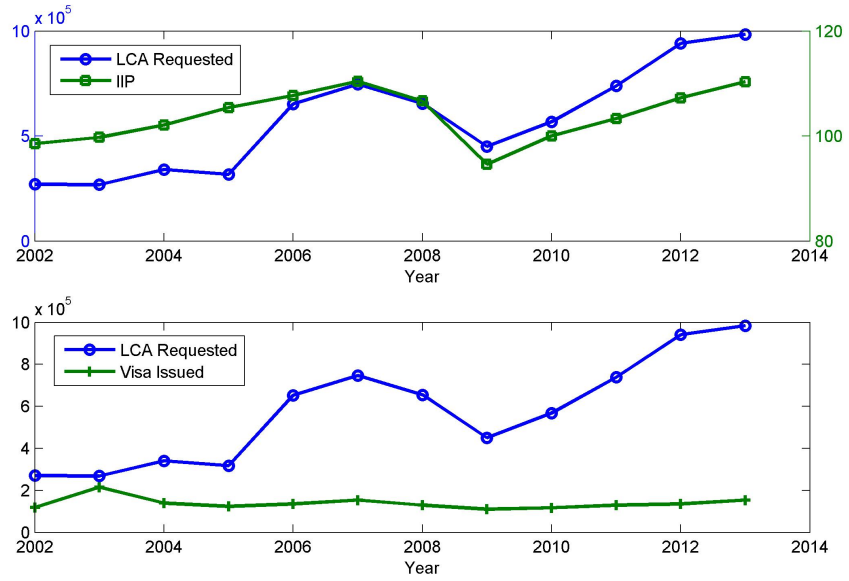


Figure 1: Demand for Foreign Skilled Labor over the Business Cycle and Visas Issued. IIP refers to Index of Industrial Production. Source: LCA database, Department of Labor. Visa data from the Department of State.

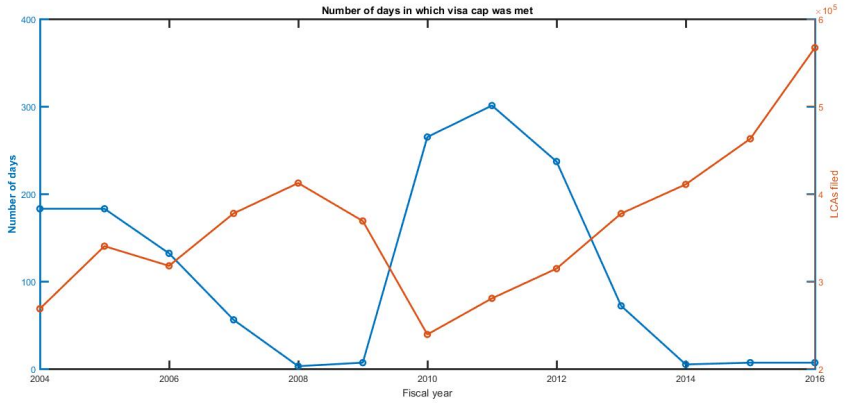


Figure 2: Firm demand for H1-B foreign skilled labor (orange line) vs number of days in which cap for H1-B visa petitions was met (blue line). The cap was met in less than a week in the years in which firm demand was higher.

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