On the Macroeconomic and Welfare Effects of Illegal Immigration

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Abstract

Allowing for heterogeneity in skills, this study explores the macroeconomic and welfare effects of illegal immigration on the native born within a dynamic general equilibrium framework with labor market frictions. My model departs from the existing literature by allowing for job competition between domestic unskilled workers and illegal immigrants. To perform quantitative analysis, I calibrate the model to U.S. data. The calibration exercises suggest that, in the long run, illegal immigration has asymmetric welfare impacts on native labor: it can benefit the skilled but at the same time harm the unskilled.

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1 Introduction

Illegal immigration is a contentious issue facing most developed economies. In the United States, for instance, scholars have heatedly debated the pros and cons of illegal immigration for years. The main economic argument in support of immigration is that it helps increase the supply of labor, reduces the cost of production and hence is good for the economy. Primary opposing arguments include supposed high rates of use of welfare programs, immigrant poverty and job competition. Much of the discussion is motivated by concerns about the welfare effects of illegal immigration on the native born. However, most research applying partial-equilibrium analysis has only addressed slices of this problem through analyzing the effects of immigration on labor-market outcomes. There is only a small set of theoretical studies that address this issue of illegal immigration in a general equilibrium context. These studies have noticeable limitations. Among them, Ethier (1986), and Bond and Chen (1987) carry out the analysis within a static context and they pay particular attention to problems and prescriptions for border control. Following the Ramsey tradition, subsequent research supplements the literature by investigating this issue within a one-sector dynamic general equilibrium framework. These studies include Hazari and Sgro (2003), Moy and Yip (2006), and Palivos and Yip (2007).

One common limitation among the existing studies is that they assume full employment in the domestic labor market. These models thus ignore the effect of illegal immigration on the employment opportunities of domestic workers. In fact, one common argument in general against immigration is that immigrants harm the employment opportunities of native workers. Empirical evidence in Borjas et al. (2007) shows that the unemployment rates of native workers are largely affected by the presence of immigrants using the data drawn from the 1960-2000 U.S. Censuses. Their analysis indicates that a 10-percent immigrant-induced increase in the supply of a particular skill group is associated with a reduction in the black employment rate of 3.5 percentage points, and a 1.6 percentage point reduction in the employment rate of white men. Therefore, theoretical studies failing to address this issue cannot capture the whole picture of the effects of illegal immigration.[1]

[1] In the existing literature, an exception is Palivos (2009). The author ends the paper by introducing a minimum wage in a growth model to analyze the issue of illegal immigration. In the model, the skilled and unskilled are pooled together in the same household. Therefore, it's impossible to see how illegal immigration affects different skill groups in different ways, which can however be explained in the present work. In addition, we quantitatively show the effects of illegal immigration in an environment where there is unemployment.

The primary objective of this paper is to develop a dynamic general equilibrium model that can be used to evaluate the displacement effects of illegal immigration on native workers.

To analyze the displacement effects of illegal immigration, we need to first generate unemployment in the model economy. Adding frictions in labor market is the typical way to generate unemployment in the literature. To this end, this study builds upon the contributions of Shi and Wen (1997) and models illegal immigration in a standard dynamic general equilibrium model with labor market frictions. One key feature of my model that differentiates it from the previous literature is that I allow domestic workers and illegal immigrants to search for jobs at the same time, which in turn leads to job competition between them and consequently increases the unemployment of native workers.

In the model economy, each domestic and immigrant labor has three alternative, mutually exclusive uses of one indivisible unit of time: searching for a job, working for a firm, or enjoying leisure. However, only domestic workers can invest and hold capital. Firms hire both immigrant and domestic workers. Given the fact that the average U.S. immigrant have much less schooling than the average native worker,[2] I employ a CES production function in which immigrants are treated as imperfect substitutes to domestic workers in terms of their production skills as in Bentolila et al. (2008). The labor markets are subject to search-matching frictions. Once unemployed domestic workers and job vacancies are matched, the terms of employment contracts are determined through bilateral bargaining. I assume that firms are able to distinguish illegal immigrants from domestic workers and face a punishment for hiring the former if being caught and that illegal immigrants have no bargaining power. The wage rate for illegal immigrants is thus equated to the wage rate of domestic workers minus the expected value of the punishment, as well as the difference in their marginal product of labor. I characterize the search equilibrium and then find the stationary equilibrium.

To develop the quantitative implications of the model, I numerically solve and calibrate the model to match some key statistics of the U.S.economy over the period of 1951 to 2005. I find that the presence of illegal immigration has four effects. Those effects can be summarized as follows: (1) An exploitation effect. When there is an increase in the number of illegal immigrants, a greater number of unemployed illegal immigrants are searching for jobs. In contrast, the change in the

[2] See Hanson (2009) for a comprehensive survey.

number of domestic workers searching for jobs is small. This leads to a tighter labor market which in turn triggers more intense competition for jobs. To successfully secure a job, both domestic and foreign labor would have to lower their wages. This raises the firm's profits which are then distributed only to domestic households as dividends as illegal immigrants are prohibited from owning any assets. (2) A capital-consumption effect. This is due to the fact that in the domestic economy some capital has to be used to produce output for the consumption of illegal migrants. (3) A wage-depressing effect. As mentioned above, when more illegal immigrants enter into the economy, the competition for jobs becomes more severe. Thus, the wages for domestic labor are pushed down. (4) A displacement effect. As unemployed domestic labor and migrants compete for jobs, the chance for unemployed domestic workers to find a job is reduced. Previous studies on this topic often focus their attention only on (1) and (2) (for instance, see Hazari and Sgro (2003)). Therefore, their conclusions can be misleading.

Those four effects interact with each other and work together to determine the relationship between the long-run level of consumption of domestic citizens and the share of illegal immigrants. Specifically, due to the increased labor market competition arising from illegal immigrants, the probability for unemployed domestic workers to find a job is reduced and the wages for domestic labor are pushed down. This indicates that the displacement and wage-depressing effects work together in the same direction to reduce domestic consumption. Owing to these two effects, firms make more profits. As the owners of the firms, domestic households receive more dividends which can be used for their consumption. Therefore, the exploitation effect adds to domestic consumption. The capital-consumption effect results in a decline in domestic consumption. As illegal immigrants do not save, capital accumulation declines as the share of illegal immigrants increases. Clearly, there are two opposing forces at work. Namely, the exploitation effect tends to increase domestic consumption, while the other effects work in an opposite direction, leading to a decline in domestic consumption. The net impact of illegal immigration on domestic consumption hinges upon the relative magnitude of the two driving forces. Under the baseline parameterization, the exploitation effect always dominates as the share of illegal immigrants increases. Thus, this gives rise to a monotonic increasing relationship between the long-run level of consumption of domestic citizens and the share of illegal immigrants. This result makes a sharp contrast with that of Palivos (2009). By introducing a minimum wage in an optimal growth model to analyze the issue of

illegal immigration, Palivos shows that illegal immigration necessarily lowers the long-run level of per-capita consumption and thus welfare of domestic citizens.

In order to shed some light on the welfare effects of illegal immigration, I compute the consumption-equivalent level of utility of domestic households and find that illegal immigration has a positive welfare effect. In particular, I compare two scenarios: (1) the economy stays at the steady state with no illegal immigrants forever; and (2) at $t = 0$, the host country admits a certain fraction of illegal immigrants and the economy gradually converges to the new steady state. The welfare measure of illegal immigration is calculated for a wide variety of combinations of labor supply elasticity and population share of illegal immigrants. For instance, I find that the domestic households would require a 1.77-percent increase in their consumption under scenario (1) in every period when the labor supply elasticity is 0.4 and when there is an increase in the population share of illegal immigrants from zero to 5 percent. The model also generates a prediction on employment opportunities of domestic workers. It predicts that employment opportunities of domestic workers are strongly negatively affected in the long run. Specifically, a greater number of domestic workers will leave the labor force when there is an increase in illegal immigration. In contrast, the labor force participation rate for illegal immigrants experiences a slight decrease. This result turns out to be qualitatively supported by the existing empirical evidence (for instance, see Borjas et al. 2007).

In reality, the debate over illegal immigration has also concerned with its asymmetric effects. That is, illegal immigration can affect different skill groups in different ways. It can benefit the skilled but at the same time harm the unskilled. For example, illegal immigrants can lower unskilled wages/employment but raise skilled wages/employment, due to the fact that immigrant labor could work as a substitute (complement) to unskilled (skilled) domestic labor. In the above-examined model, I study the impacts of illegal immigration by assuming that there is only one type of domestic labor. As a result, the above study might not capture the asymmetric effects of illegal immigration. To remedy this shortcoming, I go one step further by taking heterogeneity in skills into consideration. To this end, I extend the baseline model and consider a more elaborate version of the search model by allowing for two types of labor, skilled and unskilled, to compete in two separate markets for jobs and illegal immigrants could then compete only with unskilled domestic labor. The asymmetric impacts of illegal immigration on domestic workers can therefore be analyzed in a search-matching framework. Based on the quantitative results, I document the following findings.

(1) An inflow of illegal immigrants leads to a higher wage, and slightly lower unemployment for skilled domestic labor. However, illegal immigration deteriorates the labor market position of unskilled workers by raising their wage and unemployment, owing to the fact that their skills are perfect substitutes. (2) The effects of illegal immigration on the tightness of labor market vary across two skill groups. The model predicts that skilled labor faces a less tight labor market with an increase in illegal immigration. By contrast, the job competition between illegal immigrants and unskilled domestic workers results in a tighter labor market for unskilled workers. (3) Considering the above-addressed four channels through which domestic consumption can be affected, the model shows that the outcome of an immigrant supply shock is a steady increase in domestic consumption for the skilled as well as a steady reduction in domestic consumption for the unskilled. (4) In terms of welfare effects, illegal immigration induces a welfare gain to the skilled households, whereas it is welfare reducing for the unskilled households.

The remainder of the paper is structured as follows. Section 2 presents the search-theoretic model of unemployment and analyzes the search equilibrium. Section 3 performs a welfare analysis of illegal immigration on domestic citizens and discusses the quantitative implications of the model. Section 4 studies the extended model with heterogeneity in skills. Finally, Section 5 offers some concluding remarks.