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Immigration with imperfect competition: a comment

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Abstract

Chao and Yu (2002) study immigration impact in a host country in the presence of imperfect competition. In their two sector model, when the monopolized non-traded service sector is skilled labor intensive, skilled labor immigration improves the welfare of the host country residents but unskilled immigration can be welfare-reducing. This paper considers immigration impact with monopolistic competition, which is another popular way of modeling imperfect competition. Using a simplest possible general equilibrium model of monopolistic competition with skilled and unskilled workers, it is shown that immigration of skilled workers can be welfare-reducing for the native skilled workers, although it does improve the welfare of the unskilled. Specifically, it depends on the 'sigma', the elasticity of substitution between the varieties. On the other hand, immigration of unskilled workers improves the welfare of the skilled workers, while it does not affect the native unskilled workers. I would like to point out that immigration impact can be very different depending on the type of imperfect competition.

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1. Introduction

Chao and Yu (2002) study immigration impact in a host country in the presence of imperfect competition. Their model has two sectors. One is a competitive traded good sector and the other is a monopolized non-traded service sector. When the service sector is skilled labor intensive, skilled labor immigration improves the welfare of the host country residents but unskilled immigration can be welfare-reducing. This provides a rationale for policies favoring skilled immigration. Subsequent studies citing the paper went on to study topics including undocumented immigration (Carter(2005)), immigration under unionization (Zhao and Kondoh (2007)), and household and political economy of immigration policy (Contreras (2011)).

Inspired by Chao and Yu (2002) this paper considers immigration impact in a simplest possible general equilibrium model of monopolistic competition, which is another popular way of modeling imperfect competition. It is well known that population increase typically expands the varieties of goods available to consumers, hence improving welfare in a monopolistically competitive economy. However, when a distinction is made between skilled and unskilled workers, as in Forslid and Ottaviano (2003), immigration of skilled workers can be welfare-reducing for the native skilled workers, although it does improve the welfare of the unskilled. Specifically, it depends on the 'sigma', the elasticity of substitution between the varieties. On the other hand, immigration of unskilled workers improves the welfare of the skilled workers, while it does not affect the native unskilled workers.

The result that skilled immigration can hurt the native skilled economically, which is in contrast to Chao and Yu (2002), is not only a theoretical exercise of imperfect competition but is also consistent with recent empirical findings on the native skilled workers' hesitation on admission of skilled immigrants. For example, based on the 2002-2003 round of the European Social Survey (ESS) Facchini and Mayda (2012) find, among other points, that more educated natives are less likely to favor skilled immigration. An industry level study by Glied and Sarkar (2009) on the U.S. medical profession shows how such professional societies regulate the inflow of foreign professionals.

According to a policy survey by the United Nations (2009), although 27 percent of Governments reported promoting the admission of highly skilled workers, the rest either intend to remain unchanged or reduce the number of highly skilled migrants. In fact, except for traditional immigration countries such as New Zealand, Australia, and Canada, that have some types of points-based system of evaluating the skills of immigration applicants, skills are not necessarily the main criterion in selecting immigrants in other nations including the United States. The result in this paper may provide an economic reasoning for why countries have not totally shifted towards promotion of skilled immigration.

The result also suggests that if skilled labor immigration reduces welfare, it needs to be accompanied by unskilled labor immigration in order to maintain the welfare of native residents. This may support immigration policies that welcome skilled immigration but at the same time do not necessarily shut down unskilled immigration, which can be observed in various countries.

In the next section, I present a monopolistic competition model that distinguishes between skilled and unskilled workers, following Forslid and Ottaviano (2003), to derive welfare implications of immigration, modeled as an exogenous increase of skilled and/or unskilled workers. The results are summarized in Table I, followed by a conclusion.

2. A monopolistic competition model with skilled and unskilled workers

2.1 One sector Forslid-Ottaviano model

There are two factors of production, skilled and unskilled workers. A firm producing a particular variety requires a fixed number (F) of skilled workers and c units of unskilled workers per unit output. The firm thus faces increasing return to scale. The skilled workers can be considered as human resources that are needed to set up firms that produce particular varieties. Increase in the amount of skilled workers therefore contributes to the creation of new firms/varieties. Its total cost for producing a given amount q is then $C(q)=Fw_S+cq$, where w_S is the skilled workers' wage and the unskilled workers' wage is set equal to 1. The firms are assumed to be monopolistically competitive.

The assumptions for the consumers are standard. All consumers have the same preferences, which is defined as

$$U=\left[\int_0^n m(i)^{\rho}\,di\right]^{\frac{1}{\rho}},$$

where U is the composite of all the differentiated varieties, n is the mass of varieties, $m(i)$ is the consumption of variety i , and ρ is the substitution parameter. It is assumed that $0<\rho<1$ to ensure the varieties are imperfect substitutes. $\sigma\equiv 1/(1-\rho)>1$ represents the elasticity of substitution between any two varieties. By denoting the price of a variety as $p(i)$ and introducing a price index

$$G\equiv\left[\int_0^n p(i)^{1-\sigma}\,di\right]^{\frac{1}{1-\sigma}}$$

such that total expenditure is GU , indirect utility (or the real wage, ω) can be expressed as $\omega_S=w_S/G$ and $\omega_L=1/G$, for the skilled and the unskilled workers, respectively. These indicate economic welfare in this model.

In the above setting, consumers' utility maximization leads to demand for each variety being $p^{-\sigma}G^{\sigma-1}Y$, where $Y=w_S S+L$. (S and L are the total amount of skilled and unskilled workers, respectively.) Profit maximizing monopolistically competitive firms will set their prices so that marginal revenues equal marginal costs: $p(1-1/\sigma)=c$.

Equilibrium of the model is defined as a situation in which goods and factor markets clear: $q=p^{-\sigma}G^{\sigma-1}Y$, $S=nF$, and $L=ncq$, and due to free entry firm profits are driven down to zero: $pq-C(q)=0$.

Solving for equilibrium, we have

$$G=\left(\frac{F}{S}\right)^{\frac{1}{\sigma-1}}\frac{\sigma c}{\sigma-1} \tag{1}$$

and

$$w_S=\frac{c}{\sigma-1}q, \tag{2}$$

where

$$q=\frac{LF}{cS}\ . \tag{3}$$

The welfare of the skilled and unskilled workers are

$$\omega_S = S^{\frac{2-\sigma}{\sigma-1}} F^{\frac{1}{1-\sigma}} \frac{L}{\sigma c}$$

and

$$\omega_L = \left(\frac{S}{F}\right)^{\frac{1}{\sigma-1}} \frac{\sigma-1}{\sigma c},$$

respectively.

2.2 Immigration impact

Immediately from the above welfare expressions of ω_S and ω_L, immigration of unskilled workers (increase in L) improves the welfare of skilled workers, while leaving the welfare of the unskilled unaffected.

Importantly, the effect of skilled immigration (increase in S) depends on σ, the elasticity of substitution between the varieties, or how close the varieties are. If $\sigma > 2$ ($\sigma < 2$) then the welfare effect of skilled immigration will be negative (positive) on the native skilled workers. If $\sigma = 2$ skilled immigration does not affect the native skilled workers' welfare. Skilled immigration, on the other hand, unambiguously benefits the unskilled workers. These are summarized in Table I.

The result can be explained as follows. As for the unskilled workers, immigration of skilled workers, which leads to the supply of new varieties, drives down the price index G, improving their welfare. (See expression (1).) The skilled workers also gain from this variety increase but also lose from reduced wages. This is because equilibrium skilled wage depends on firm size or per firm output q. New arrival of skilled workers reduces firm size, leading to lower skilled wages. (See expressions (2) and (3).) In the case of skilled workers, therefore, in order for them to gain from skilled immigration the variety increase needs to outweigh their wage decrease. If the varieties are close substitutes (or if $\sigma > 2$) the former is outweighed by the latter, and the native skilled workers incur welfare losses. Unskilled immigration does not affect the varieties available, but since it implies demand increase, firm size increases and raises the skilled wage. Therefore, unskilled immigration benefits native skilled workers.

Table I: Summary of results

		Immigration of	
		Skilled	Unskilled
Welfare effects on	Skilled	Positive if $\sigma < 2$ 0 if $\sigma = 2$ Negative if $\sigma > 2$	Positive
	Unskilled	Positive	0

3. Conclusion

This paper analyzed immigration impact, modeled as an exogenous population increase, in a monopolistically competitive economy. Once a distinction is made between skilled and unskilled workers, skilled immigration can be welfare-reducing for skilled workers when the varieties produced in the economy are close substitutes. Specifically, the native skilled workers lose when $\sigma > 2$. Unskilled immigration does not reduce the welfare of the native population.

The possible negative impact of skilled immigration on native skilled workers from this analysis may be an explanation for recent empirical findings on the attitudes of host country skilled workers and for the observation that strong preference on policy towards skilled immigration is not universal. This is in contrast to the result by Chao and Yu (2002) who also focus on immigration in an imperfectly competitive market to find that skilled immigration tend to improve welfare and unskilled immigration can be welfare-reducing.

Further research is needed since there are numerous kinds of imperfectly competitive markets.

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