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Love of Variety and Immigration

DOI 10.1515/bejeap-2015-0125

Submitted December 29, 2015; published online February 2, 2016

Abstract: This paper develops a political-economic analysis of immigration in a host country that operates in a direct democracy regime. It shows that, in a monopolistic competitive environment with differentiated capital intensive goods, labor liberalization is more likely to come about in the societies that have more taste for variety. Moreover, in a host country with a strong preference for variety, workers and capital owners may share the same positive stance toward labor liberalization. It follows that the latter is impossible in a perfect competitive environment. Finally, in a dynamic inter-temporal setting with strategic voters, it demonstrates that the median voter is willing to accept fewer immigrants in the first period, in order to preserve her domestic political influence in the next period because of the naturalization of immigrants. In this way, the median voter maximizes her gains from immigration by accepting more immigrants in total.

Keywords: immigration, long-run general equilibrium, direct democracy, perfect competition, monopolistic competition, factor price equalization

JEL Classification: D41, D72, F12, F22, J61, O24

1 Introduction

Labor liberalization is currently the subject of intense debate. According to Hatton and Williamson (2005), the proportion of the world's population that has migrated increased slowly from 2.3 % in 1965 to 2.9 % in 2000. On the other hand, average industrial tariff rates around the world have fallen over the last half century from about 40 % to 3 %. Over the last 30 years the ratio of exports of goods and services to gross domestic product (GDP) has doubled. In a short essay, Rodrik (2002) concluded that, since the gains from immigration are much larger than those of further liberalization of trade and capital movement, the policymakers at the World Trade Organization (WTO), International Monetary Fund (IMF), World Bank and Organization for Economic Co-operation and

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Development (OECD) should spend more energy on the liberalization of labor movements across countries.¹

This paper combines trade and political economy models in order to analyze welfare effects of immigration in a developed country that operates in a direct democracy regime. I show that the combination of a host country's wealth, income distribution and taste for variety produces a rich set of predictions on its immigration legislation. In particular, wealthy countries with more equal income distribution are more likely to support immigration. In addition, societies with a strong preference for variety tend to be pro-immigration. In such a case, it is theoretically possible for owners of capital and workers to be allies in their liberal attitudes toward immigration.

The liberalization of labor in the world generally is controlled by the domestic policies applied by the host countries of immigrants. There are only three countries – Cuba, North Korea and Myanmar – that prevent their citizens from applying for jobs abroad. Most economic immigrants, originating in large part from developing countries, move into developed (host) countries because of wage differences.² It is assumed that the liberalization of labor in a two-country world depends on the outcome of the election of an immigration proposal in a host country, where a majority of votes is required in order for the proposal to pass.³

1 However, there are only few empirical studies that estimate the welfare effects of immigration. For example, Zachariadis (2012), Cortes (2008), and Lach (2007) provide empirical evidence indicating that immigration improves the welfare of the natives because it reduces the average prices. Felbermayr, Hiller, and Sala (2010), using a cross section of countries, provide empirical evidence suggesting that immigration increases per capita income of the host countries. Peri (2012) theoretically and empirically analyzes the long-run impact of immigration on employment, productivity and skill bias in the United States. He shows that immigration may increase total factor productivity in the United States. Gauthier-Loiselle and Hunt (2010) find robust empirical evidence suggesting that immigration can boost innovation. Hiller (2013), using matched employee–employer data from Denmark over the 1995–2005 time period, find that immigration could make the host country better off because it increases productivity of the native firms that hire foreign employees.

2 Ortega and Peri (2009), using data from 14 OECD host countries and 74 developing countries during 1980–2005, find that migration flows from an origin to a host country are increasing in their income per capita gap. They also show that migration laws in the host countries that made entry more restrictive significantly reduced migration flows.

3 Note that the direct democracy regime is not just a theoretical notion. The constitutions of most developed countries allow for the provision of direct legislation. For example, Switzerland has held a lot of ballots at the federal level. Some of them are related to immigration issues (see Frey 1994; and Feld and Kirchgassner 2000). Also, in the United States, despite the fact that it does not permit referenda at the national level, a number of states (such as California, Florida, New England, New York, to name a few) have held state-wide referenda or ballot; see Feldmann (1999).

The median voter, who is defined as the individual with the median capital endowment, decides the outcome of the proposal because she represents the attitude of the majority.

I blend the median voter framework with two different static and dynamic trade models. First, I use a Heckscher–Ohlin trade model with complete specialization. The capital abundant country, which is the host country of immigrants, produces differentiated and capital-intensive goods. The labor abundant country, which is the origin country of immigrants, produces a labor-intensive good. In this environment, it is reasonable for labor unions always to lobby against immigration, and for capital owners always to lobby pro-immigration.

Second, I employ a love of variety framework, as in Helpman-Krugman (1985), where the capital intensive and differentiated goods are produced under increasing returns to scale, while the labor-intensive good is produced under constant return to scale.⁴ I show that the likelihood of labor liberalization is increasing in the degree of taste for variety in a host country. This is because immigration provides benefits to all residents of the host country due to the availability of more varieties at cheaper prices.⁵

Third, I analyze the immigration proposal in a dynamic inter-temporal setting with strategic voters. The liberalization of labor in this dynamic approach is to proceed in two stages. In the first stage, the immigration proposal is voted upon, where voters have the option to accept or deny the entry of all available immigrants or to impose a quota on immigration. If in the first period the immigration proposal passes, then a new immigration proposal will be reevaluated by a new, poorer median voter due to the naturalization of the immigrants accepted in the first period. Since voters are considered forward looking, with perfect vision and complete information regarding the future, they are fully aware that the volume of immigrants accepted in the first period may affect the outcome of the immigration proposal in the second period. Thus, the median voter, depending on how much she discounts her future expected utility, could be less liberal to immigration in the first period in order to preserve her domestic political dominance in the second period. Furthermore, I show that the host country imposes a lower quota on immigration in the first period when it is

⁴ The assumption of the existence of the increasing return to scale sector is not just a theoretical notion; for more details, see Antweiler and Trefler (2002). They use trade data from 72 countries over 5 years (1972, 1977, 1982, 1987 and 1992) and show that one-third of all goods-producing industries exhibit increasing returns to scale.

⁵ The claim that individuals are better off under the availability of more and cheaper varieties is not just a theoretical notion. Various studies provide empirical evidence suggesting that gains from imported varieties in the United States are about 2.4 % of its GDP (see, for example, Broda and Weinstein 2004, 2006).

completely specialized in the production of differentiated goods than when it produces only a homogenous good.

In the burgeoning literature on labor liberalization and its effects on the world economy, there are numerous studies. For instance, Freeman (1996) argues that capital owners benefit from immigration and, therefore, lobby for labor liberalization. On the other hand, workers suffer cost rather than reap benefits from immigration, primarily because their wages will go down. Thus, workers lobby against labor liberalization. In the present paper, I show that the existence of the same, positive attitude toward immigration between workers and capital owners may occur because of the high preference for variety that societies obtain.

In an influential paper in the literature of political economy, Benhabib (1996) provides a simple one-sector, two-factor model, which, under direct democracy regime, explains why the individuals who depend mostly on labor income support raising the capital to labor ratio through immigration. He assumes that there are always individuals ready to immigrate to the host country. In this paper working with two economies, where their factor endowments are outside the factor price equalization (FPE) parallelogram, I endogenize the international movement of workers that is absent in Benhabib (1996).

Ortega (2005, 2010) extends Benhabib (1996) using a dynamic political economy model of immigration. He shows that there exists a trade-off between skill-complementary immigration and the resulting shift in the political power because native voters realize that immigrants earn the voting rights in the future, which may affect future legislations. This is similar to the dynamic model developed in this paper. However, in my model, I assume a homogenous labor force in both countries. Thus, in my dynamic setting, it is the presence of immigrants and not their skill distribution (Ortega 2005) that, paradoxically, encourages native voters to accept fewer immigrants in the first period.

Economies of scale have been at the center stage in the international trade literature since Krugman (1979, 1980). However, they are generally absent from the international migration literature. To the best of my knowledge, in addition to the present paper, there are only two studies that analyze the welfare consequences of immigration with endogenous product varieties (Iranzo and Peri 2009; Giovanni, Levchenko, and Ortega 2015). While both studies share the same finding with this paper, suggesting that the presence of immigrants allows for more and cheaper varieties in the host country, the mechanism is different. In Iranzo and Peri (2009), the most productive citizens of the Eastern European countries immigrate to the Western European countries, contributing to the rise of the total production of the differentiated goods in the latter countries. Thus, there are more and cheaper varieties due to immigration. Giovanni, Levchenko,

and Ortega (2015) find that immigration brings more varieties in the host country due to its labor productivity differences with the origin country. They also introduce remittances in their model and find that this additional channel is responsible for welfare improvement in the origin country of immigrants.⁶

This paper is different from Iranzo and Peri (2009) and Giovanni, Levchenko, and Ortega (2015) due to three reasons. First, the lack of FPE in a free trade world in my setup is due to the existence of very dissimilar factor endowments between the host and the origin country of immigrants, while in their papers, there is no FPE due to technological/productivity differences between two countries. Second, they use an application of a Melitz (2003) model with heterogenous labor, where the biggest firms are the most productive ones. Thus, the presence of productive immigrants results in the creation of new and productive firms in the differentiated sector. However, in my setup, firms are symmetric and labor is homogenous in both countries. Consequently, immigration will create more symmetric firms. Third, in their models, there is only one factor of production, labor. In my model, there are two factors of production, capital and labor.

The result of this paper, suggesting that an immigration proposal may find unanimous support in the host country because it will increase the number of varieties and lower their prices, broadly complements the very recent but burgeoning empirical literature on welfare effects of immigration. For instance, Dustmann and Glitz (2015), using data on the universe of Western Germany social security records, investigate the effects of substantial immigration on Western Germany's reaction of firms and industries during 1985–1995. They show that the large scale of immigration in the Western Germany is responsible for the net creation of new firms. Moreover, they find that immigration does not lead to any scale adjustment on the industry level. Furthermore, immigration does not expand the productivity of existing firms, but is responsible for the creation of new firms. This is consistent with a choice of a demand function similar to Krugman (1979), with symmetric firms for the differentiated goods that I employ in my model.

⁶ Using data from EU countries, Iranzo and Peri (2009) calibrate their model and show that reducing by half the legal costs of migration from the East to the West will cause a cross-border emigration of about 9% of the Eastern European population. This, in turn, will increase the income per natural in the West by 0.3% due to the availability of more and cheaper varieties. Giovanni et al. (2015), calibrating their model using data from 60 countries, show that every host country of immigrants would have been suffering a welfare loss if they had decided to close their doors to legal immigrants. In particular, they show that countries with an aggressive liberal stance toward immigration, such as Australia, Canada and New Zealand have obtained about 510 % improvement in their welfare due to their current levels of immigration compared to a scenario with no immigration at all. This gain in welfare is related to the availability of more varieties with cheaper prices as a result of immigration.

This paper is organized as follows. Section 2 demonstrates a political economic analysis of immigration in a perfect competitive environment. Section 3 describes a political economic analysis of labor's liberalization, using a love of variety framework. Section 4 provides an extension of the model in a dynamic environment with two periods. Section 5 concludes. Proofs are located in the Appendix.

2 Immigration Proposal under Perfect Competition

In this section, I employ a framework similar to Mayer (1984), in which a majority of voters is required to pass a proposal, and I incorporate it with a two-factor Heckscher–Ohlin trade model. For each country, $i \in [1, 2]$, I obtain the cost function for each good $j \in [X, Y]$ by solving

$$C_{ji}(w_{ji}, r_{ji}) = \min_{L_{ji}, K_{ji}} [(w_{ji}L_{ji} + r_{ji}K_{ji})]$$

$$\text{s. t. } j_i = K_{ji}^\psi L_{ji}^{1-\psi}$$

All the parameters are assumed to be positive and $\beta, \gamma \in (0, 1)$, where $\psi \equiv \gamma$ when j corresponds to X and $\psi \equiv \beta$ when j corresponds to Y ; $j \equiv (X; Y)$ denotes the capital-intensive good and the labor-intensive good, respectively; and $i \equiv (H; O)$ denotes the host and the origin country of immigrants, respectively. Under free trade, there is no FPE because the factor endowments of the two countries are sufficiently different. The total amount of each good produced from both countries is $j = j_O + j_H$, where the stock of capital and labor that are used to produce both homogenous goods within each country are $K_i = K_{X_i} + K_{Y_i}$ and $L_i = L_{X_i} + L_{Y_i}$, respectively. As a result, the income of each individual in each country can be written as $I_i = w_i + r_i\theta_{q_i}$, where w_i , r_i are the returns to one unit of labor and capital, respectively, and θ_{q_i} denotes the capital ownership of a voter. For simplicity, I assume that all individuals have the same skill level and supply one unit of labor, but that they own different levels of capital.⁷ They spend all their income on the two goods. Please note that throughout the paper, I drop the subscript of the host country when necessary for presentation purposes. An

⁷ There are a number of papers in the literature that focus on the role of heterogeneous labor force over the immigration legislation. For example, Grether, de Melo, and Muller (2001) and Bilal, Grether, and de Melo (2003) use a three-factor, two-household, two-sector trade model to show that low-skill and high-skill households have contradictory attitudes toward immigration. See also Ortega (2005) for similar results.

individual (q) owns θ_q capital and the number of individuals is given by the measure of $N(\theta_q)$, which is defined on $(0, \theta_1, \theta_2, \dots, \theta_L]$, where θ_q is strictly increasing in q . But, in the labor abundant country (R_O), I assume that some citizens own no capital at all. The number of these citizens is represented by Ω in the equation of the labor stock in the origin country. Only a portion of its citizens (Λ) is willing to immigrate to the host country in order to obtain FPE. Thus, Λ (where $\Lambda < \Omega$) represents the required volume of potential immigrants who will cross the borders and work in the host country in order to achieve FPE across both countries. The labor and capital stocks of each country are

$$\{R_H\} \rightarrow \begin{cases} K_H = \int_0^{\theta_{LH}} N(\theta_{qH}) \theta_{qH} d\theta_{qH} \\ L_H = \int_0^{\theta_{LH}} N(\theta_{qH}) d\theta_{qH} \end{cases}, \quad \{R_O\} \rightarrow \begin{cases} K_O = \int_0^{\theta_{LO}} N(\theta_{qO}) \theta_{qO} d\theta_{qO} \\ L_O = \Omega + \int_0^{\theta_{LO}} N(\theta_{qO}) d\theta_{qO} \end{cases} \quad [1]$$

The identical preferences of each individual are represented by the following utility function:

$$U_q = X^\mu Y^{(1-\mu)}, \quad \text{where } \mu \in (0, 1) \quad [2]$$

Using the basic Heckscher–Ohlin assumptions, I look at scenarios where K_i and L_i are very dissimilar between R_H and R_O . A sufficient condition for this to hold is that the endowments of both countries lie outside the intersection of the cones of diversification of the country with the lowest and the country with the highest capital–labor ratio.⁸ For simplicity, I assume that the host country is specialized in producing the capital-intensive goods, while the origin country is specialized in the production of the labor-intensive good. Thus, the wage in the host country exceeds the wage in the origin country. If some individuals move from the labor-intensive to the capital-intensive country, the factor endowments of both countries will change. The more dissimilar the factor endowments between two countries, the higher the volume of immigrants needed in order to achieve FPE.⁹

⁸ It is important to focus on cases where FPE is invalid because such cases allow the existence of immigration as an economic phenomenon. Other ways to get incentives for individuals to immigrate would be technological differences across countries (Iranzo and Peri 2009; Qirjo 2010; Giovanni, Levchenko, and Ortega 2015). In addition, institutional differences across countries also could provide incentives for immigration (Qirjo 2015).

⁹ Also, I assume that there are no illegal immigrants in the host country. For simplicity, this assumption is used to assure the theoretical fact that if the immigration proposal passes, then the wages of immigrants in the host country will be equal to the wages of the natives. Nonetheless, the dynamic model introduced in Section 4 provides some intuition about the existence of illegal immigrants in the host country. See the last paragraph of Section 4.

Since I am considering an immigration proposal in a direct democracy, I focus on the changes of the indirect utility of each voter caused by immigration. I assume that voters behave as rational agents and are perfectly informed about the factor endowments of both countries.¹⁰ Therefore, voters know that even though every citizen of the origin country could be a potential immigrant, only a fraction of the origin country's population will emigrate. In other words, individuals in both countries understand that only if Λ individuals (not more) move from the origin to the host country, the wage of all citizens in both countries will be equalized.

I consider the price of the labor-intensive good as numeraire ($P_Y = 1$ and $P_X = p$). Using the profit-maximizing conditions, I find the indirect utility of each individual (denoted by V_q) in the host country before and after immigration. Please note that throughout the paper the superscript $*$ denotes the values of a variable after immigration and the underscript m corresponds to the median voter. Thus, the immigration proposal will pass only and only if $\frac{V_m^*}{V_m} > 1$ or $\frac{I_m^*}{I_m} \left(\frac{p}{p^*}\right)^\mu > 1$. Using the definition of capital and labor stocks shown in eq. [1], we can find the capital owned by the median voter in the host country, with the help of the following equation:

$$\frac{\int_0^{\theta_m} N(\theta_q) d\theta_q}{\int_0^{\theta_L} N(\theta_q) d\theta_q} = 0.5 \quad [3]$$

Therefore, Proposition 1 can be established as follows:

Proposition 1: *In the absence of the price effect, immigration is beneficial to the median's voter utility if and only if the positive effect on her returns to capital outweighs the negative effect on her wage.*

This proposition implies that, in a perfectly competitive environment, a society that consists of more capital owners will push toward the liberalization of the labor market. This is closely related to the results in Benhabib (1996), although in the present model there are two sectors and two countries where the level of immigration is bounded from above because of the achievement of FPE. Furthermore, each immigrant owns no capital and there is no capital

¹⁰ In order to avoid the issue of individuals' expectations about the voting behavior of other individuals, I assume that all voters participate in every election regardless of their belief on the power of their own vote on the outcome of the election. For more details on this issue, see Matsusaka (1992) and Kessler (2005).

accumulation.¹¹ However, immigration also will affect the prices of both goods. The immigration proposal will pass only if it improves the real income of the median voter. Since labor is homogenous but voters are heterogenous in terms of their capital ownership, using the median voter theorem, I can identify the critical level of capital that the median voter must possess in order for the immigration proposal to pass. This is shown in the following corollary:

Corollary 1: *If the capital endowment of the median voter (θ_m) is higher than a critical level of the capital $\left[\bar{\theta} \equiv \frac{w - (1+\lambda)^\xi w^*}{(1+\lambda)^\xi r^* - r}\right]$, then the immigration proposal will pass.*

Corollary 1 implies that the immigration proposal passes only if $\theta_m > \bar{\theta}$, where $\xi \equiv \gamma\mu + \beta(1 - \mu)$. In this environment, it is reasonable for labor unions always to lobby against immigration and for capital owners always to lobby pro-immigration. But, the median voter's income of a typical host country comes from the returns of her labor services. Assuming that developed countries apply some degree of direct democracy rule when evaluating an immigration proposal, their median voters may value something else in addition to their income. This might very well be the society's taste for variety. I analyze this argument in the following section.

3 Immigration Proposal under Monopolistic Competition

In this section, I assume that there are a number of varieties of the capital-intensive good X produced under increasing return to scale with a fixed cost of

¹¹ It should be noted that, unlike Benhabib (1996), in this static setting, there are not any sharp changes over immigration policy due to the shape of voters' preferences over immigration levels. In Benhabib (1996), there is only one section, immigrants may bring their capital levels to the host country, and there is an unlimited supply of immigrants. However, in the present model, there is a limited supply of immigrants because there are no incentives for international labor movements after the achievement of FPE. In addition, labor is homogenous, and only immigrants who own no capital at all will immigrate to the host country. Furthermore, after immigration, the existence of FPE assures that the host country remains as a capital abundant country and the origin country of immigrants still is classified as a labor abundant country. In other words, even after immigration, the host country will continue to export the capital intensive good into the origin country and import the labor-intensive good from the former country.

production. However, good Y is still produced in a perfectly competitive environment. I also assume that each individual has identical homothetic preferences where more varieties are preferred to less. However, the cost of having more variety because of immigration is dissimilar for different voters. The capital owners enjoy more variety and higher income as a result of immigration. Thus, they only reap benefits from labor liberalization. On the other hand, workers benefit from the availability of more variety, but also suffer costs related to the fall of their wages because of immigration.

As in the previous section, the endowments of both countries lie outside the intersection of the cones of diversification of the country with the lowest and the country with the highest K/L ratio, such that it ensures complete specialization in both countries. Therefore, wages are lower in the origin country compared to the host country. Under free trade, the origin country is specialized in producing X and the host country is only producing Y .

Goods in the industry X are assumed to be differentiated products produced under increasing returns to scale ($\eta > 1$) with constant elasticity of substitution between each variety and with a fixed cost of production (a) measured in the unit of X .¹² If x denotes an individual variety, then its production function is

$$x = A_x K_x^{\eta\gamma} L_x^{\eta(1-\gamma)} - a \quad [4]$$

I denote by n the number of varieties, where x is produced under a monopolistic competitive model using a demand function similar to that described in Krugman (1979).¹³ I briefly describe the general equilibrium in this model. The identical preferences of each individual in both countries can be represented by the following utility function:

$$U_q = \left(\sum_{v=1}^n D_v^\varepsilon \right)^{\mu/\varepsilon} Y^{(1-\mu)} \quad [5]$$

Note that $\left(\sum_{v=1}^n D_v^\varepsilon \right)^{\frac{1}{\varepsilon}} \equiv U_x$ indicates the SDS (Spence–Dixit–Stiglitz) subutility function, v denotes the index of varieties of the capital-intensive good, D symbolizes the consumption of one individual variety and σ represents the cross-price elasticity of substitution between a pair of varieties ($0 < \varepsilon < 1$; $\varepsilon = (1 - \frac{1}{\sigma})$; $\sigma > 1$).

¹² The inclusion of such a fixed cost is necessary in this particular production function in order to assure the existence of a positive optimal level of production for each differentiated good.

¹³ See Levy (1997) for an application of a similar model in a political economy approach evaluating a proposition on trade liberalization. For a detailed description of such demand functions also see Norman (1976), Krugman (1979, 1980), Dixit–Norman (1980, Ch. 9), Helpman and Krugman (1985, Ch. 6), Wong (1995, Ch. 14) and Feenstra (2004, Ch. 5).

In this monopolistic competitive setup, firms are symmetric because of the assumption of the constant cross-price elasticity between varieties, and therefore, each of them produces the exact level of output (x) simply by equalizing marginal revenue with marginal cost and the relative equilibrium price with the entry conditions:¹⁴

$$x = \frac{\eta\alpha(\sigma-1)}{\sigma-\eta(\sigma-1)} \quad [6]$$

Note that the optimal amount of each variety produced in the host country (x) should be positive, which is true for $\frac{\sigma}{\sigma-1} > \eta$. The aggregate amount of varieties is equal to the product of the number of firms (n) with the optimal level of output (x) that each firm produces. Thus, $X = nx$.

All voters have identical and homothetic preferences where more varieties are preferred to less. Since different voters obtain dissimilar levels of capital, they will react differently when evaluating the immigration proposal. As in the previous section, the median voter represents the majority of the voters. The ratio of the indirect utilities of the median voter after and before the immigration proposal is presented as follows:

$$\frac{V_m^*}{V_m} = \left(\frac{I_m^*}{I_m}\right) \left(\frac{p^*}{p}\right)^{-\mu} \left(\frac{n^*}{n}\right)^{\left(\frac{\mu}{\sigma-1}\right)} \quad [7]$$

In terms of eq. [7], the immigration proposal passes only if the ratio of indirect utility of the median voter after immigration to the ratio of her indirect utility before immigration is higher than unity. In order to understand the intuition behind the approval of the immigration proposal, I split the ratio of eq. [7] into two effects, the “*real income effect*” and the “*variety effect*”. The real income effect is that portion of the indirect utility that remains if societies have no love for variety whatsoever. This effect consists of two subeffects, which I label as the “*income effect*” and the “*price effect*.” Thus, in the absence of the variety effect, the immigration proposal will pass only if the real income of the median voter will increase due to immigration. This is shown by the following equation:

14 The assumptions that labor is homogenous and that there are two factors of production are crucial for the median voter analysis described in this paper because they allow the identification of the median voter and, therefore, the outcome of the election over the immigration proposal. If I assume instead that there are two factors of production but firms are heterogenous in their productivity levels as is labor, similar to the setup of Bernard, Redding, and Schott (2007), it is impossible to array voters in a single dimension. In other words, in the latter setting one cannot use the median voter theory because she cannot identify the median voter, or a key voter who determines the outcome of a referendum.

$$\frac{I_m^*}{I_m} \left(\frac{p^*}{p} \right)^{-\mu} = \frac{w^* + r^* \theta_m}{w + r \theta_m} (1 + \lambda)^\xi \quad [8]$$

The ratio of immigrants to host country's labor force is represented by λ , which also denotes the portion of emigrants from the origin country who are willing to immigrate to the host country in order to achieve FPE. Recall from the definition of the median voter, demonstrated in eq. [3] and in the equations shown in eq. [1], that Λ represents the volume of immigrants. Consequently, $\lambda \equiv \frac{\Lambda}{\Omega} = \frac{|L_o^* - L_o|}{L_o} = \frac{L_H^* - L_H}{L_H} = \frac{\Lambda}{L_H}$. The second term on the right-hand side of eq. [8] represents the price effect and always is higher than unity. This shows that, in this model, the price effect always will be positive. Thus, voters enjoy lower prices per variety because of immigration.

The remaining effect of the ratio in eq. [7] in the case where the real income effect of the median voter does not change as a result of immigration is called the variety effect. The latter effect is defined as the portion of the indirect utility that represents the gain that each consumer enjoys because of the availability of more varieties caused by immigration. This gain is represented by $\left(\frac{n^*}{n} \right)^{\left(\frac{\mu}{\sigma-1} \right)}$ and it is shown to be equal to

$$\left(\frac{n^*}{n} \right)^{\left(\frac{\mu}{\sigma-1} \right)} = (1 + \lambda)^\tau \quad [9]$$

where $\tau \equiv (1 - \gamma) \left(\frac{\mu}{\sigma-1} \right)$. Note that the right-hand side of eq. [9] is positive because $\lambda > 0$ by definition. Voters always enjoy more varieties and, therefore, more gains in their indirect utility function as a result of immigration. Thus, if the other two effects cancel each other, the liberalization of labor is supported by all voters since it will increase the welfare of all agents in the economy. So far I have shown that the variety effect always is positive and higher than unity. The same stands for the price effect. Therefore, the following propositions are established.

Proposition 2: *The critical level of the median voter's capital necessary for the approval of the immigration proposal in the monopolistic competitive case ($\tilde{\theta}$) always is lower than that of the perfect competitive case ($\bar{\theta}$) because of the variety effect.*

This proposition introduces the notion that in a monopolistic competitive environment, the level of median voter's capital loses the previous exclusive power over the liberalization of labor because of the variety effect. The latter effect pushes the median voter in the host country toward the liberalization of labor. This can be described by the following proposition.

Proposition 3: *The higher the love of variety in a society, the more open to immigration is the host country.*

In order to understand the spirit of Proposition 3, one can analyze the immigration proposal in an extreme scenario, where the median voter of the host country owns no capital at all. Under this extreme scenario, it is theoretically possible that even the host country's labor unions might favor the approval of the immigration proposal. The key factor that could make the workers in the host country push for the liberalization of labor is related to the variety effect. Voters will vote pro-immigration only if the positive effect of the variety gains outweighs the negative real income effect. In other words, it is theoretically possible that the median voter will be pro-liberalization of labor, even in the extreme case when her entire income comes from her wage. This scenario is true for societies that have a very strong love for variety.¹⁵ Put differently, the gains from having more varieties as a result of immigration overcome the losses that workers are going to suffer for having a lower wage due to immigration.

If the workers are pro-labor liberalization, the capital owners will be more than happy to vote pro-immigration since their welfare will increase by more. In a nutshell, in a monopolistically competitive environment, it is theoretically possible that the liberalization of labor benefits both workers and the capital owners of the host country, unlike in perfect competition.

4 Immigration Proposal in a Dynamic Setting

If the immigration proposal is approved, it seems reasonable to assume that immigrants, with time, will earn the right to vote. Furthermore, I assume that immigrants remain in the host country forever. For simplicity, I consider the

¹⁵ For example, some host countries are more ethnically diverse than others due to past historical events, and/or geographical locations. We would expect that these countries would have a stronger taste for variety than others. Therefore, these countries would be more liberal to immigration compared to otherwise similar countries. In the real world, one may compare Switzerland to Austria. Assuming that the median voters in Switzerland and Austria are equally rich in terms of their real income, we would expect the former to be more open to immigration than the latter because Switzerland is more ethnically diverse than Austria. Consequently, the former would have stronger taste for variety than the latter. In context of my model, this implies that Switzerland will have a higher parameter μ than Austria because of the existence of a higher ethnic diversity in the former country. The simplest way to formally implement this argument in my model is to use the following equality $\mu = \zeta\varpi$, where $1(\zeta)0$ is a constant term and the parameter $0 < \varpi < 1$ denotes the fraction of ethnic diversity in a host country.

procedure of the liberalization of labor in two stages, where I assume that there exists population growth in the origin country of immigrants. Thus, the labor force in the second period in the origin country is

$$L_{O2} = \left(\Omega_2 + \Omega_1 - \frac{\Lambda_1}{\Omega_1} \right) + \int_0^{\theta_{LO}} N(\theta_{qO}) d\theta_{qO}$$

where $\Omega_2 > 0$, $\Omega_1 > 0$, $\frac{\Lambda_1}{\Omega_1} \geq 0$, $\frac{\Lambda_2}{\Omega_2 + \Omega_1 - \Lambda_1/\Omega_1} \geq 0$. Ω_1 and Ω_2 represent the volume of individuals who own no capital in the first period and in the second period, respectively, in the origin country of immigrants. Λ_2 denotes the volume of individuals in the origin country in the second period who are willing to move to the host country in order to achieve FPE. Λ_1 denotes the volume of immigrants who moved into the host country in the first period after the approval of the immigration proposal. The ratios of immigrants to the host country's labor force who are accepted in the first and in the second periods are denoted by $\lambda_1 = \frac{\Lambda_1}{L_{H1}}$ and $\lambda_2 = \frac{\Lambda_2}{(1+\lambda_1)}$, respectively. If the immigration proposal passes in the first period, the only thing that has changed in the second period is the total number of voters. All immigrants bring only their labor service and no capital. Therefore, the new median voter will be poorer than the old one. Voters, in the first period, realize that if the immigration proposal is approved, all immigrants are accorded their voting rights in the second period. They also have perfect information on the volume of potential immigrants (Λ_2) who are willing to move into their country in the second period. Thus, voters are not myopic as they were in the previous sections because of the static structure of the models, but are considered forward looking. In order to analyze the immigration proposal in this dynamic environment, I consider a simple two-stage game.¹⁶ In both the first and second stages, the immigration proposal is put to a vote.

The nature of the immigration proposal is different from the static game. Now, the median voter has the option to accept fewer immigrants than the volume of immigrants needed to achieve FPE in the first stage in order to

¹⁶ I exogenously assume that immigrants gain their voting rights in the second period (similar to Dolmas and Huffman 2004; Ortega 2005; and one part of Ortega 2010). Other studies have analyzed political economy models, where their main scope is to determine whether the voting rights should be granted to immigrants. For example, Mariani (2013) shows that the optimal timing of immigrants' naturalization relies on factors such as quantity, productivity and preference of immigrants, and the median age and the political structure of the host country of immigrants.

preserve her political dominance in the second period. In other words, she can impose quotas on immigration in the first period. In the second period, the immigration proposal is reevaluated by a new, poorer median voter. In this period, the median voter only decides on whether to accept or reject the volume of immigrants that assures FPE in both countries. In other words, in this dynamic setting, Λ_1 represents the volume of immigrants who were accepted in the first period, which is not necessarily equal to the volume of immigrants required for FPE. However, in the second period, the potentially new median voter evaluates the effects of the international movement of all potential immigrants (Λ_2) who are essential for the achievement of FPE.

The voters are fully aware that they may lose their political influence in the second period. Consequently, I show in the following analysis that voters' preferences over continuous immigration depend on their initial capital ownership, the volume of immigrants accepted in the first period, the volume of immigrants willing to move in the second period in order to achieve FPE and on voters' future discounting factor.¹⁷ To illustrate this, consider a host country with a capital-rich median voter. She fully acknowledges the fact that admitting immigrants will increase her income. However, in the second period, this flow of immigrants will increase the political influence of the workers. This could lead to a rejection of the immigration proposal in the second period because the new and poorer median voters may vote against immigration. Thus, the old median voter, in the first period, votes to maximize her aggregate utility subject to her income level and her influence on the future political power. I formalize the voter's behavior toward immigration in this dynamic setting in the following sections.

¹⁷ In this model, I ignore any taxation and redistribution issues that voters also may consider when evaluating an immigration proposal that is continuously put on vote (see, for example, Dolmas and Huffman 2004; Ortega 2005, 2010). These studies show that immigrants can modify future redistributive policies in the host country of immigrants. In particular, Dolmas and Huffman (2004) find that higher inequality in capital's distribution forces the median voter to vote against immigration. In this scenario, the median voter could support higher tax rates due to immigration because higher inequality may place the median voter in the low income category. In Ortega (2005), natives also can reject an immigration proposal in a dynamic setting if they suspect that immigrants will tilt the political balance that supports more redistribution. Ortega (2010), endogenizing the redistribution policy in a dynamic setting, shows that the redistributive taxation policies definitely can change native voters' attitude toward immigration because it revises the relationship between individual consumption and immigration flows.

4.1 Dynamics under Perfect Competition

In this section, both goods are produced under perfect competition. The forward-looking median voter solves the following problem:¹⁸

$$\begin{aligned} \max_{X_t, Y_t} U_{mt} &= \sum_{t=1}^2 \delta_t X_t^\mu Y_t^{(1-\mu)} \\ \text{s. t. } \{ &(pX_t + Y_t = I_m) \text{ and } (\theta_{m2} > \bar{\theta}) \} \end{aligned}$$

where θ_{m2} is the new median voter's capital ownership in the second period, δ_t denotes the discounting factor of the median voter in time t , where $\delta_1 = 1$ in the first period and $0 < \delta_2 < 1$ in the second period.¹⁹ Recall from Section 2 that $\bar{\theta}$ is the median voter's critical level of capital that makes her indifferent to labor liberalization in the static game. Hence, the following conditions must be satisfied, $\theta_{m1} > \bar{\theta}$, for the approval of the immigration proposal in the first period. Thus, $\theta_{m2} > \bar{\theta}$ represents the necessary condition for the perseverance of political dominance of the (old) forward-looking median voter in the second period. Therefore, the following inequality should be satisfied:

$$\frac{V_{mt}^*}{V_{mt}} = \frac{V_{m1}^* + V_{m2}^*}{V_{m1} + V_{m2}} > 1 \quad [10]$$

The real income of the median voter after immigration consists of her wage, the price change and the product of the return to capital with her level of capital. The forward-looking median voter chooses the volume of immigrants she is willing to accept in the first period, and simultaneously assures that the immigration proposal must pass in the second period when the new median voter evaluates it. Using the discounting factor and the fraction of immigrants to the

18 In the United States, the legal immigrants are accorded voting rights approximately 5 years after they obtain their Green Card. Also, in most of the European Union countries, legal immigrants earn their voting rights in approximately 4–5 years, depending on the origin country of immigrants.

19 In general, since each period could be a half-decade, the discounting factor could be interpreted as a discounting value of the forward-looking median voter's expected utility due to immigration in the second period. However, one also may interpret the discounting factor as altruism in a generation sense (similar to Ortega 2005, 2010), where voters discount their children's expected utility in the second period. However (different from Ortega 2005, 2010), individuals do not accumulate any capital (skills) at all during both periods, but pass on their capital to their children as a bequest. Ortega (2005) calibrates the discounted factor to be 0.5. If I use the latter calibration in my model, then I can write the discounting factor as $\delta_t = 1/t$.

host's country labor force needed to achieve FPE, I can write inequality (10) as follows:

$$\theta_{m1} > (1 + \lambda_1) \frac{w_2 - \delta_2(1 + \lambda_2)^\xi w_2^*}{\delta_2(1 + \lambda_2)^\xi r_2^* - r_2} \quad [11]$$

Thus, the critical level of capital owned by the old median voter that is needed to preserve her political dominance in the second period is represented by the right-hand side of eq. [11]. First, I analyze the scenarios where the forward-looking median voter has no incentives to restrain the size of immigration in the first period. Second, I describe the most interesting case, where I present the values of δ_2 and λ_2 that are required for the forward-looking median voter to strategically accept fewer immigrants than the volume of immigrants necessary for the achievement of FPE in the first period. In this way, the old median voter preserves her political dominance in the second period because the new median voter will accept all the immigrants who are required for FPE. All these conditions are summarized in the following proposition.

Proposition 4:

a) *Under perfect competition, the forward-looking median voter will impose no quotas on immigration if either set of the following inequalities described by 1 or 2 are true, where the equal sign is valid only when $\theta_{m1} > 0$.*

$$1. \quad \delta_2 \geq \left(\frac{1}{1 + \lambda_2} \right)^\xi \frac{w_2}{w_2^*}, \text{ or } \lambda_2 \geq \left(\frac{w_2}{\delta_2 w_2^*} \right)^{\frac{1}{\xi}} - 1$$

$$2. \quad \delta_2 < \left(\frac{1}{1 + \lambda_2} \right)^\xi \frac{r_2}{r_2^*}, \text{ or } \lambda_2 < \left(\frac{r_2}{\delta_2 r_2^*} \right)^{\frac{1}{\xi}} - 1$$

b) *The forward-looking median voter will impose immigration quotas in the first period when $\left(\frac{1}{1 + \lambda_2} \right)^\xi \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1 + \lambda_2} \right)^\xi \frac{w_2}{w_2^*}$, or $\left(\frac{r_2}{\delta_2 r_2^*} \right)^{\frac{1}{\xi}} - 1 < \lambda_2 < \left(\frac{w_2}{\delta_2 w_2^*} \right)^{\frac{1}{\xi}} - 1$, where the immigration quotas will be lower, the lower is λ_1 , and/or the higher is θ_{m1} .*

In part (a) of Proposition 4, the first inequality of 1 implies that there are no quotas on immigration in the first period because a very patient forward-looking median voter, who values her future expected utility immensely, will support immigration in the second period where all voters benefit from the price effect $(1 + \lambda_2)^\xi$, despite the wage fall due to immigration. The second inequality of part 1 shows again that there will be no immigration quotas in the first period when there are extremely high levels of the ratio that indicates the share of immigrants

to native's labor force in the second period despite the decrease of the median voter's wage due to immigration.

The first inequality of part 2 shows that the forward-looking median voter will accept the exact volume of immigrants (Λ_1) that is needed for the achievement of FPE in the first period because she discounts the future in such a way that it ignores the benefits of the future price effect and returns on her capital caused by immigration. The second inequality of part 2 shows that the forward-looking median voter has no incentives to impose any quotas on immigration in the first period because the size of future immigration in the second period is extremely low and, therefore, she does not reap enough benefits from her returns on capital ownership.

Part (b) of Proposition 4 states that under certain values of the discounting factor, or the share of potential immigrants to host country's labor force in the second period, the forward-looking median voter imposes a quota on immigration in the first period in order to preserve her political dominance in the second period. Thus, she is assured that the new median voter will accept the immigration proposal in the second period. Therefore, the imposition of the immigration quotas will prevent the achievement of FPE in the first period, but will guarantee the existence of FPE in the second period. Furthermore, part (b) of Proposition 4 also implies that the richer the forward-looking median voter is, the lower the level of the quota imposed on immigration in the first period because the median voter is more likely to retain control over the future immigration proposal despite the naturalization of immigrants who were accepted in the first period.²⁰

4.2 Dynamics under Monopolistic Competition

In this section, the capital-intensive differentiated goods are produced in a monopolistic competitive environment, while the labor-intensive good is produced in a

20 Thus, in this dynamic setting with only two periods, under certain values of δ_2 or λ_2 , the median voter will impose a quota on immigration in the first period in order to preserve her political dominance in the second period. But, how would a median voter behave in a dynamic game when there is infinite number of periods? Under this scenario, if $\left(\frac{1}{1+\lambda_t}\right)^\xi \frac{r_t}{r_t} < \delta_t < \left(\frac{1}{1+\lambda_t}\right)^\xi \frac{w_t}{w_t}$, the forward-looking median voter will impose a quota on immigration in every $(t-1)$ period. Furthermore, she will impose the highest quota level on immigration in the first period. The second highest quota level on immigration will be imposed in the second period and so forth. However, if I define the discounting factor as $\delta_t = \frac{1}{t}$, so that $\delta_t = [1, \frac{1}{2}, \dots, \frac{1}{z}]$, where $z \rightarrow \infty$, it is quite possible that the first inequality of 2, in part (a) of Proposition 4, is satisfied (this is also more likely if $\lambda_t \approx 0$) because $\delta_z \approx 0$. Therefore, under this scenario, we would see no restrictions on immigration in any period as long as $\theta_{m1} > \bar{\theta}_{m1}$ in the first period.

perfect competitive environment. The forward-looking median voter in the host country solves the following problem:

$$\begin{aligned} \max_{X_t, Y_t} U_{mt} &= \sum_{t=1}^2 \delta_t \left(\sum_{v=1}^n D_v^\varepsilon \right)^{\frac{\mu}{\varepsilon}} Y_t^{(1-\mu)} \\ \text{s. t. } &\left\{ (pX_t + Y_t = I_m) \text{ and } (\theta_{m2} > \tilde{\theta}) \right\} \end{aligned}$$

Every other assumption is exactly the same as in the previous section. Analogous to inequality [11], the following portrays the necessary condition for the political dominance of the (old) forward-looking median voter in the second period, but under monopolistic competition:

$$\theta_{m1} > (1 + \lambda_1) \frac{w_2 - \delta_2(1 + \lambda_2)^{(\xi + \tau)} w_2^*}{\delta_2(1 + \lambda_2)^{(\xi + \tau)} r_2^* - r_2} \quad [12]$$

This inequality is always valid if the numerator of the ratio of the right-hand side is negative and the denominator is positive, or when the numerator is positive and the denominator is negative. Therefore, similar to perfect competition, under certain values of δ_2 or λ_2 , the forward-looking median voter will accept all immigrants needed for the achievement of FPE in the first period because she has no reservations that the new median voter will not reverse her political power. However, again, the most intriguing case is when the values of δ_2 and λ_2 are such that they force the forward-looking median voter to strategically accept fewer immigrants than needed for FPE in the first period, in order to be confident that the new median voter in the second period will accept all immigrants required for FPE. I present all these arguments in Proposition 5.

Proposition 5:

- a) Under monopolistic competition, the forward-looking median voter will never limit the size of immigration in the first period if either set of the following inequalities described by 1 or 2 are true, where the equal sign is valid only when $\theta_{m1} > 0$.

$$\delta_2 \geq \left(\frac{1}{1 + \lambda_2} \right)^{(\xi + \tau)} \frac{w_2}{w_2^*} \text{ or } \lambda_2 \geq \left(\frac{w_2}{\delta_2 w_2^*} \right)^{\frac{1}{\xi + \tau}} - 1$$

$$\delta_2 < \left(\frac{1}{1 + \lambda_2} \right)^{(\xi + \tau)} \frac{r_2}{r_2^*} \text{ or } \lambda_2 < \left(\frac{r_2}{\delta_2 r_2^*} \right)^{\frac{1}{\xi + \tau}} - 1$$

- b) *The forward-looking median voter will impose immigration quotas in the first period if $\left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$, or $\left(\frac{r_2}{\delta_2 r_2^*}\right)^{\frac{1}{\xi+\tau}} - 1 < \lambda_2 < \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi+\tau}} - 1$, where immigration quotas will be lower, the lower is λ_1 , but not as low as under perfect competition, and/or the higher is θ_{m1} , but not as high as under perfect competition.*

The intuition behind both parts of Proposition 5 is similar to the ones of Proposition 4. However, comparing all inequalities of part (a) of Proposition 5 with the analogous parts of Proposition 4, we observe that the right-hand sides of inequalities of Proposition 5 are lower in value than the respective inequalities of Proposition 4. This is related to the existence of the variety effect under monopolistic competition, $(1+\lambda_2)^\tau$, which is lacking under perfect competition.

The key message of part (b) of Proposition 5 is that under certain values of δ_2 and λ_2 , the forward-looking median voter will impose a lower quota on immigration in the first period under monopolistic competition compared to perfect competition. This is because under monopolistic competition, future immigration brings gains from variety that are distributed to all voters. Moreover, the rich and forward-looking median voter will be more confident in her perseverance of political dominance in the second period if the host country is producing the differentiated good compared to the homogenous good because of the variety effect caused by immigration.

In this dynamic approach, both models suggest that the capital owners will be in favor of illegal immigration, or they will be tempted to delay as long as they can the required time of the naturalization process for immigrants. Following this strategy, the capital owners will not have to worry about losing their future political influence when lobbying for immigration. On the other hand, the workers in the host country will not always lose from sending illegal immigrants back to their countries of origin. This is related to the future gain of greater political influence that this scenario will garner when lobbying against immigration. Therefore, both models in their dynamic approach intuitively explain the reason why illegal immigrants are more likely to gain their legal status when the workers' representative party controls the government. Nevertheless, more illegal immigrants are more likely to enter the host country when the capital owners' representative party is in power.²¹ However, all

²¹ This is consistent with US immigration history. For example, a number of studies (such as Goldin 1994; Timmer and Williamson 1998; Borjas 1999; Hanson et al. 2002; Martin and Midgley 2003, 2010) provide brief and outstanding accounts of the history of American Immigration Policy before and after World War II.

arguments presented in this paragraph are more likely to happen in a perfect competitive environment than in a monopolistic competitive one.

5 Conclusions

This paper has shown that in a Heckscher–Ohlin setting blended with a median voter framework, in a perfect competitive environment, the liberalization of labor in a host country depends on its level and distribution of capital. Therefore, it is reasonable for labor unions always to lobby against immigration and for capital owners always to lobby in support of immigration.

I have demonstrated that in a monopolistic competitive environment, with differentiated capital-intensive goods, the immigration proposal is more likely to pass in the societies that have more taste for variety because the liberalization of labor creates gains from the availability of more and cheaper varieties. As a result, the median voter's capital level loses some of its exclusive power. Moreover, it has been portrayed that it is theoretically possible for the liberalization of labor to take place independent of the stock and distribution of capital in the host country. This occurs if the variety effect dominates the median voter's real income effect and, therefore, both labor unions and capital owners lobby in support of labor liberalization.

Finally, reexamining the immigration proposal in a dynamic model with forward-looking voters, it is shown that the median voter is willing to impose immigration quotas in the first period in order to be fully assured that she will not lose her political influence in the second period because of the naturalization of the immigrants accepted in the first period. Using this strategy, the median voter increases her gains from immigration by accepting more immigrants in total in the second period. However, under monopolistic competition, the host country will impose a lower quota on immigration in the first period compared to perfect competition due to gains from variety. It is argued that both dynamic frameworks provide a political-economic intuition for the allowance of more illegal immigrants when the capital owners' representative political party controls the government. It is also argued that this dynamic framework intuitively explains the political-economic reason behind the fact that illegal immigrants are more likely to gain their legal status when the workers' representative party is in power. These two arguments are stronger when the immigration proposal is introduced under perfect competition than under monopolistic competition.

In summary, the main message of this paper is that host countries are more liberal toward present and/or future immigration if they are producing differentiated goods in a love of variety framework, as compared to producing

homogenous goods because of gains from varieties created from the liberalization of labor.

Acknowledgments: The author is grateful for invaluable guidance, assistance and comments from Richard Chisik. The author appreciates the very thoughtful and helpful comments from Jesse Bull, Brian Copeland, Cem Karayalcin, Ashok Kotwal, Dmitriy Krichevskiy, Peter Thompson and Constantinos Syropoulos. The author also have benefited from discussions and suggestions by the participants of (1) Political Economy, UBC Seminar, Fall 2011, Vancouver, BC; (2) the 9th Annual International Industrial Organization Conference, April 2011, Boston, MA; and (3) the Canadian Economic Association Conference, June 2011, Ottawa, Canada. All errors and opinions expressed are of the author's. The author would also like to thank the editor and two anonymous referees for valuable suggestions.

Appendix

Proof of Proposition 1

Please note that we drop the subindex that denotes the host county for presentation purposes. If the price effect is absent, note that $\frac{r_m}{L_m} > 1$ if $\frac{dL_m}{dL} > 0$. But $\frac{dL_m}{dL} > 0$ iff $|\frac{\partial w}{\partial L}| < |\frac{\partial r}{\partial L} \theta_m|$. The proof of Proposition 1 consists of three stages: First Stage: Proof of the “if” part:

From the production functions, w and r can be written as $w = (1 - \beta) \left(\frac{K_Y}{L_Y} \right)^\beta$ and $r = \beta \left(\frac{L_Y}{K_Y} \right)^{(1-\beta)}$. Hence, $\frac{\partial w}{\partial L} = -\beta(1 - \beta) K_Y^\beta L_Y^{-(1+\beta)} < 0$ and $\frac{\partial r}{\partial L} = \frac{\beta(1-\beta)}{K_Y^{(1-\beta)} L_Y^\beta} > 0$ since $0 < \alpha, \beta < 1$. So, let $|\frac{\partial w}{\partial L}| < |\frac{\partial r}{\partial L} \theta_m|$ where $\frac{\partial w}{\partial L} < 0$ and $\frac{\partial r}{\partial L} > 0$. Then $[\frac{\partial w}{\partial L} + \frac{\partial r}{\partial L} \theta_m] > 0$.

Second Stage: Proof of the “iff” part:

Let $|\frac{\partial w}{\partial L}| < |\frac{\partial r}{\partial L} \theta_m|$, then $|\frac{\partial w}{\partial L}| \geq |\frac{\partial r}{\partial L} \theta_m|$ and $\frac{\partial w}{\partial L} < 0$; $\frac{\partial r}{\partial L} \theta_m > 0 \Rightarrow \frac{\partial w}{\partial L} + \frac{\partial r}{\partial L} \theta_m \leq 0$, which is a contradiction with stage (1).

Third Stage: Prove that $[\frac{\partial w}{\partial L} + \frac{\partial r}{\partial L} \theta]$ is monotonically increasing in θ for any distribution $N(\theta)$:

Let $f(\theta) \equiv [\frac{\partial w}{\partial L} + \frac{\partial r}{\partial L} \theta]$, so $\frac{df(\theta)}{d\theta} = \frac{\partial r}{\partial L} > 0$. Defining $N(\theta) \in (0, \theta_1, \dots, \theta_m, \dots, \theta_L]$, where each element of this distribution is strictly increasing, then it is obvious that $f(\theta)$ is monotonically increasing in $\theta \forall N(\theta)$.

Proof of Corollary 1

In order to prove this corollary, I have to integrate the price effect and the income effect in order to find the critical level of capital required for immigration proposal to pass.

We know from Proposition 1 that, in the absence of the price effect, immigration proposal will pass if $\theta_m > \frac{w_H - w_H^*}{r_H^* - r_H}$. However, immigration will also change the prices of both goods as shown in the following equation: $\left(\frac{p^*}{p}\right)^{-\mu} = \left(\frac{w_H^*/r_H^*}{w_H/r_H}\right) \left(\frac{K_H/L_H^*}{K_H/L_H}\right)$. If immigration proposal is approved, then FPE is achieved. Hence, $w_H^*/r_H^* = w_O^*/r_O^*$. Moreover, $\frac{K_H/L_H^*}{K_H/L_H} = \frac{L_H}{L_H^*} = \frac{1}{1+\lambda}$ and $\frac{w_O^*}{r_O^*} = \left(\frac{1}{\xi} - 1\right) \frac{K_O}{L_O^*}$, where $\xi \equiv \gamma\mu + \beta(1-\mu)$. Thus, the price effect due to immigration now is equal to $\left(\frac{p^*}{p}\right)^{-\mu} = (1+\lambda)^\xi$. The immigration proposal will pass only if $\frac{r_m^*}{r_m} \left(\frac{p}{p^*}\right)^\mu = \frac{(w_H^* + r_H^* \theta_m)}{(w_H + r_H \theta_m)} (1+\lambda)^\xi > 1$. From here, I can establish the critical level of capital $\bar{\theta} \equiv \frac{w_H - (1+\lambda)^\xi w_H^*}{(1+\lambda)^\xi r_H^* - r_H}$ that makes the median voter indifferent to the immigration proposal.

Proof of Proposition 2

Please note that, similar to the proof of Proposition 1, it should be obvious that I am analyzing the welfare effects of immigration in the host country. Consequently, we drop the subindex that denotes the host country for presentation purposes. In order to prove Proposition 2, I have to show that $\bar{\theta} > \tilde{\theta}$. Let us assume that the opposite is true. Hence, $\bar{\theta} < \tilde{\theta}$. Recall from Corollary 1 that $\bar{\theta} = \frac{w - (1+\lambda)^\xi w^*}{(1+\lambda)^\xi r^* - r}$. Hence, keeping the pre-immigration factor prices exactly at the same values in both models, it can be shown that $\tilde{\theta} = \frac{w - (1+\lambda)^\xi w^*}{(1+\lambda)^\xi r^* - r}$. Therefore, $\frac{w - (1+\lambda)^\xi w^*}{(1+\lambda)^\xi r^* - r} < \frac{w - (1+\lambda)^\xi w^*}{(1+\lambda)^\xi r^* - r}$. This is true only if $(1+\lambda)^\xi > (1+\lambda)^\xi$ {since $w > w^*$ because $\frac{dw}{dL} < 0$. $r < r^*$ because $\frac{dr}{dL} > 0$ } and $w, w^*, r, r^* > 0$. However, $\lambda > 0$ by definition $\left(\lambda \equiv \frac{\Lambda}{L_1} > 0\right)$ and $\zeta > \xi$ because $\xi \equiv \gamma\mu + \beta(1-\mu)$ and $\zeta \equiv \frac{(\sigma-1)[\gamma\mu + \beta(1-\mu)] + \mu(1-\gamma)}{\sigma-1}$ where $\sigma > 1$ and $\gamma, \mu, \beta \in (0, 1)$ from the assumption of the production and demand functions of the differentiated goods. This implies that $(1+\lambda)^\xi < (1+\lambda)^\xi$. This is a contradiction. Thus, $\bar{\theta} > \tilde{\theta}$.

Proof of Proposition 3

It is shown in eq. [9] that the variety effect is $\left(\frac{n}{n}\right)^{\left(\frac{\mu}{\sigma-1}\right)} = (1+\lambda)^\tau$, where $\tau \equiv (1-\gamma)\left(\frac{\mu}{\sigma-1}\right)$. Therefore, the love for variety is positively related to the value of the parameter μ , which denotes the utility weight on capital-intensive goods. This is taken from the SDS subutility function (U_x). Let us denote the variety effect with $f(\mu)$. Thus, $f(\mu) = \left[(1+\lambda)^{1-\gamma}\right]^{\left(\frac{\mu}{\sigma-1}\right)} \Rightarrow \frac{df(\mu)}{d\mu} = \frac{1-\gamma}{\sigma-1} \left[(1+\lambda)^{1-\gamma}\right]^{\left(\frac{\mu}{\sigma-1}\right)} \ln(1+\lambda) > 0$ because $\lambda > 0$, $\sigma > 1$ and $0 < \gamma < 1$.

Proof of Proposition 4

I denote by $\bar{\theta}_{m1}$ the right-hand side of inequality [11], where $\bar{\theta}_{m1} \equiv (1+\lambda_1) \frac{w_2 - \delta_2(1+\lambda_2)^\xi w_2^*}{\delta_2(1+\lambda_2)^\xi r_2^* - r_2}$ is the critical level of capital owned by the forward-looking median voter of the first period which assures that the new immigration proposal will pass in the second period. Also I denote by $\bar{\theta}_s$ the ratio of the right-hand side of inequality [11]. Hence, $\bar{\theta}_s \equiv \frac{w_2 - \delta_2(1+\lambda_2)^\xi w_2^*}{\delta_2(1+\lambda_2)^\xi r_2^* - r_2}$. In order to prove the first part of (a), I find the necessary and sufficient conditions implying that $\bar{\theta}_{m1} < 0$ when the numerator of $\bar{\theta}_s$ is negative and the denominator is positive. In order to prove the second part of (a), I find the necessary and sufficient conditions showing that $\bar{\theta}_{m1} < 0$ when the numerator of $\bar{\theta}_s$ is positive and the denominator is negative. It is obvious that inequality [11] is true if $\bar{\theta}_{m1} < 0$, because $\theta_{m1} \geq 0$. Therefore, there is no need for the forward-looking median voter to impose immigration quotas in the first period because she is absolutely sure that the new median voter after immigrants' naturalization will also accept all immigrants in the next period.

Proof of the First Part of (a)

Thus, in this case $\bar{\theta}_{m1} < 0$ because the numerator of $\bar{\theta}_s$ is negative and the denominator is positive. This condition is satisfied only when $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ & $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*}$, but we know from proposition 1 that $w_2 > w_2^*$ and $r_2 < r_2^*$. Also $w_2, w_2^*, r_2, r_2^*, \lambda_1, \lambda_2$ and ξ are all strictly positive. Thus, if $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ then one is guaranteed that

$\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*}$. Thus, the necessary and sufficient condition for $\bar{\theta}_{m1} < 0$ when the numerator of $\bar{\theta}_s$ is negative and the denominator is positive is when $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ that is equivalent to $\lambda_2 > \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi}} - 1$.

$\bar{\theta}_{m1} = 0$ if the numerator of $\bar{\theta}_s = 0$. The latter is always satisfied if $\delta_2 = \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ which is equivalent to $\lambda_2 = \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi}} - 1$. Thus, as long as $\theta_{m1} > 0$, if $\delta_2 = \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$, inequality [11] is always satisfied. Hence, the forward-looking median voter won't impose immigration quotas in the first period. Therefore, the equal sign on inequalities of the first part of (a) is valid only if $\theta_{m1} > 0$.

Proof of the Second Part of (a)

In this case $\bar{\theta}_{m1} < 0$ because the numerator of $\bar{\theta}_s$ is positive and the denominator is negative. This condition is satisfied when $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ and $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*}$, but again from proposition 1, we know that $\frac{r_2}{r_2^*} < \frac{w_2}{w_2^*}$. Also $w_2, w_2^*, r_2, r_2^*, \lambda_1, \lambda_2$ and ξ are all strictly positive. Hence, if $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*}$ one is absolutely confident that $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$. Thus, the necessary and sufficient condition for $\bar{\theta}_{m1} < 0$ when the numerator of $\bar{\theta}_s$ is positive and the denominator is negative is $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*}$ which is equivalent to $\lambda_2 < \left(\frac{r_2}{\delta_2 r_2^*}\right)^{\frac{1}{\xi}} - 1$.

Also, if the numerator and the denominator of $\bar{\theta}_s$ are negative then $\bar{\theta}_{m1} > 0$. But this is impossible because the necessary and sufficient conditions that satisfy this scenario are represented in the following inequality: $\left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*} > \delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$. However, the latter inequality is never valid because we know that $\frac{w_2}{w_2^*} > \frac{r_2}{r_2^*}$ and λ_2 and ξ are strictly higher than zero. Hence, if $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ then $\delta_2 \gg \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*}$.

Proof of Part (b)

Here, I have to show that $\frac{\partial \bar{\theta}_{m1}}{\partial \lambda_1} > 0$. From the proof of part (a), we know that $\bar{\theta}_{m1} \equiv (1 + \lambda_1) \bar{\theta}_s$, where $\bar{\theta}_s \equiv \frac{w_2 - \delta_2 (1 + \lambda_2)^\xi w_2^*}{\delta_2 (1 + \lambda_2)^\xi r_2^* - r_2}$. Hence, $\frac{\partial \bar{\theta}_{m1}}{\partial \lambda_1} = \bar{\theta}_s$. Thus, $\frac{\partial \bar{\theta}_{m1}}{\partial \lambda_1} > 0$ only if

$\bar{\theta}_s > 0$. I analyzed the cases when $\bar{\theta}_s \leq 0$ in the proofs of part (a), where I also showed that it is impossible for the numerator and the denominator of $\bar{\theta}_s$ to be both negative. Thus, $\bar{\theta}_s > 0$ only if the numerator and the denominator of $\bar{\theta}_s$ are both positive. Therefore, $\left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$, or $\left(\frac{r_2}{\delta_2 r_2^*}\right)^{\frac{1}{\xi}} - 1 < \lambda_2 < \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi}} - 1$.

I can write inequality [11] as $\theta_{m1} > \bar{\theta}_{m1}$, where I just showed in the above paragraph that $\bar{\theta}_{m1} > 0$ if $\left(\frac{1}{1+\lambda_2}\right)^\xi \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2}\right)^\xi \frac{w_2}{w_2^*}$ or $\left(\frac{r_2}{\delta_2 r_2^*}\right)^{\frac{1}{\xi}} - 1 < \lambda_2 < \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi}} - 1$. Thus, holding $\bar{\theta}_{m1}$ fixed it is straightforward that the higher the θ_{m1} , the higher the probability that inequality [11] is true.

Proof of Proposition 5

I denote by $\tilde{\theta}_{m1}$ the right-hand side of inequality [12], where $\tilde{\theta}_{m1} \equiv (1+\lambda_1) \frac{w_2 - \delta_2(1+\lambda_2)^{(\xi+\tau)} w_2^*}{\delta_2(1+\lambda_2)^{(\xi+\tau)} r_2^* - r_2}$ is the critical level of capital owned by the forward-looking median voter in the first period that preserves her political dominance in the second period. I denote by $\tilde{\theta}_s$ the ratio of the right-hand side of inequality [12]. Hence, $\tilde{\theta}_s \equiv \frac{w_2 - \delta_2(1+\lambda_2)^{(\xi+\tau)} w_2^*}{\delta_2(1+\lambda_2)^{(\xi+\tau)} r_2^* - r_2}$. Analogously to the proof of Proposition 4, in order to prove the first part of a), I find the necessary and sufficient conditions for $\tilde{\theta}_{m1} < 0$ when the numerator of $\tilde{\theta}_s$ is negative and the denominator is positive. In order to prove the second part of (a), I find the necessary and sufficient conditions for $\tilde{\theta}_{m1} < 0$ when the numerator of $\tilde{\theta}_s$ is positive and the denominator is negative. Inequality [12] is always true for any value of λ_1 if $\tilde{\theta}_{m1} < 0$, because $\theta_{m1} \geq 0$.

Proof of the First Part of (a)

$\tilde{\theta}_{m1} < 0$ because the numerator of $\tilde{\theta}_s$ is negative and the denominator is positive. This condition is satisfied only when $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ and $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*}$, but $w_2 > w_2^*$ and $r_2 < r_2^*$. Furthermore, $w_2, w_2^*, r_2, r_2^*, \lambda_1, \lambda_2, \xi$ and τ are all strictly positive. Hence, if $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ then we know that $\delta_2 \gg \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*}$. Thus, if $\tilde{\theta}_{m1} < 0$ because the numerator of $\tilde{\theta}_s$ is negative and the denominator is positive, then $\delta_2 > \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ which is equivalent to $\lambda_2 > \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi+\tau}} - 1$.

$\tilde{\theta}_{m1} = 0$ if the numerator of $\tilde{\theta}_s = 0$. This is always satisfied if $\delta_2 = \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ which is equivalent to $\lambda_2 = \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi+\tau}} - 1$. Thus, inequality [12] under the condition that $\theta_{m1} > 0$ is always satisfied (for any λ_1) if $\delta_2 = \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ or $\lambda_2 = \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi+\tau}} - 1$.

Proof of the Second Part of (a)

$\tilde{\theta}_{m1} < 0$, but now because the numerator of $\tilde{\theta}_s$ is positive and the denominator is negative. This implies that $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ and $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*}$, but we know that $\frac{r_2}{r_2^*} < \frac{w_2}{w_2^*}$ and $w_2, w_2^*, r_2, r_2^*, \lambda_1, \lambda_2, \xi, \tau$ are all strictly positive. Hence, $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*}$ indicates that $\delta_2 \ll \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$. Thus, if $\tilde{\theta}_{m1} < 0$ because the numerator of $\tilde{\theta}_s$ is positive and the denominator is negative, then $\delta_2 < \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*}$ which is equivalent to $\lambda_2 < \left(\frac{r_2}{\delta_2 r_2^*}\right)^{\frac{1}{\xi+\tau}} - 1$.

Analogously to the proof of Proposition 4, one can show that it is impossible for the numerator and the denominator of $\tilde{\theta}_s$ to be simultaneously negative.

Proof of Part (b)

First, I have to show that $\frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1} > 0$. Using the proof of part (a), we know that $\tilde{\theta}_{m1} \equiv (1+\lambda_1)\tilde{\theta}_s$, where $\tilde{\theta}_s \equiv \frac{w_2 - \delta_2(1+\lambda_2)^{(\xi+\tau)} w_2^*}{\delta_2(1+\lambda_2)^{(\xi+\tau)} r_2^* - r_2}$. Thus, $\frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1} = \tilde{\theta}_s$. Hence, $\frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1} > 0$ only if $\tilde{\theta}_s > 0$. I examined the scenarios when $\tilde{\theta}_s \leq 0$ in the proof of part (a), where I also showed that it is impossible for the numerator and the denominator of $\tilde{\theta}_s$ to be both negative. Therefore, $\tilde{\theta}_s > 0$ only if the numerator and the denominator of $\tilde{\theta}_s$ are both positive. The latter is always true only if $\left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2}\right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$, which is equivalent to the following inequality $\left(\frac{r_2}{\delta_2 r_2^*}\right)^{\frac{1}{\xi+\tau}} - 1 < \lambda_2 < \left(\frac{w_2}{\delta_2 w_2^*}\right)^{\frac{1}{\xi+\tau}} - 1$.

In order to prove that the quota on immigration in the first period is higher under perfect competition as compared to monopolistic competition, I must show that $\frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1} > \frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1}$.

$$\frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1} = \frac{w_2 - \delta_2(1+\lambda_2)^\xi w_2^*}{\delta_2(1+\lambda_2)^\xi r_2^* - r_2} \text{ and } \frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1} = \frac{w_2 - \delta_2(1+\lambda_2)^{(\xi+\tau)} w_2^*}{\delta_2(1+\lambda_2)^{(\xi+\tau)} r_2^* - r_2}.$$

Hence,

$$\frac{\frac{\partial \bar{\theta}_{m1}}{\partial \lambda_1}}{\frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1}} = \left(\frac{w_2 - \delta_2(1+\lambda_2)^\xi w_2^*}{w_2 - \delta_2(1+\lambda_2)^{(\xi+\tau)} w_2^*} \right) \left(\frac{\delta_2(1+\lambda_2)^{(\xi+\tau)} r_2^* - r_2}{\delta_2(1+\lambda_2)^\xi r_2^* - r_2} \right)$$

$$\left[\left(\frac{1}{1+\lambda_2} \right)^\xi \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2} \right)^{(\xi+\tau)} \frac{w_2}{w_2^*} \right]$$

If the right-hand side of the latter equality is always higher than one since both ratios are higher than one because $(1+\lambda_2)^\tau > 1$ due to gains from variety caused by immigration. Thus, $\frac{\partial \bar{\theta}_{m1}}{\partial \lambda_1} > \frac{\partial \tilde{\theta}_{m1}}{\partial \lambda_1}$.

I can now write eq. [12] as $\theta_{m1} > \tilde{\theta}_{m1}$, where $\tilde{\theta}_{m1} > 0$ if $\left(\frac{1}{1+\lambda_2} \right)^{(\xi+\tau)} \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2} \right)^{(\xi+\tau)} \frac{w_2}{w_2^*}$ or $\left(\frac{r_2}{\delta_2 r_2^*} \right)^{\frac{1}{\xi+\tau}} - 1 < \lambda_2 < \left(\frac{w_2}{\delta_2 w_2^*} \right)^{\frac{1}{\xi+\tau}} - 1$. Thus, holding $\tilde{\theta}_{m1}$ fixed, it is obvious that the higher the θ_{m1} , the higher the probability that inequality [12] is valid.

To prove that the forward-looking median voter under monopolistic competition in the first period does not have to be as rich as the one under perfect competition in order for the old median voter to maintain her political dominance in the second period, I must show that $\bar{\theta}_{m1} > \tilde{\theta}_{m1}$.

$\frac{\bar{\theta}_{m1}}{\tilde{\theta}_{m1}} = \left(\frac{w_2 - \delta_2(1+\lambda_2)^\xi w_2^*}{w_2 - \delta_2(1+\lambda_2)^{(\xi+\tau)} w_2^*} \right) \left(\frac{\delta_2(1+\lambda_2)^{(\xi+\tau)} r_2^* - r_2}{\delta_2(1+\lambda_2)^\xi r_2^* - r_2} \right)$. From Proposition 1, $w_2 > w_2^*$ and $r_2^* > r_2$. Hence, if $\left[\left(\frac{1}{1+\lambda_2} \right)^\xi \frac{r_2}{r_2^*} < \delta_2 < \left(\frac{1}{1+\lambda_2} \right)^{(\xi+\tau)} \frac{w_2}{w_2^*} \right]$, the right-hand side of the above equality is always higher than 1 since both ratios are higher than 1 because $(1+\lambda_2)^\tau > 1$. Consequently, $\bar{\theta}_{m1} > \tilde{\theta}_{m1}$.

References

- Antweiler, W., and D. Trefler. 2002. "Increasing Returns and All That: A View from Trade." *American Economic Review* 92 (1):93–119.
- Benhabib, J. 1996. "On the Political Economy of Immigration." *European Economic Review* 40 (9):1737–43.
- Bernard, A. B., S. J. Redding, and P. K. Schott. 2007. "Comparative Advantage and Heterogeneous Firms." *Review of Economic Studies* 74 (1):31–66.
- Bilal, S., J.-M. Grether, and J. de Melo. 2003. "Attitudes Toward Immigration: A Trade-Theoretic Approach." *Review of International Economics* 11 (2):253–67.
- Borjas, G. 1999. *Heaven's Door: Immigration Policy and the American Economy*. Princeton, NJ: Princeton University Press.
- Broda, C., and D. Weinstein. 2004. "Globalization and the Gains from Variety." *Quarterly Journal of Economics* 121 (2):541–85.

- Broda, C., and D. Weinstein. 2006. "Variety Growth and World Welfare." *American Economics Review Papers and Proceedings* 94 (2):139–44.
- Cortes, P. 2008. "The Effects of Low-Skilled Immigration on U.S. Prices: Evidence from CPI Data." *Journal of Political Economy* 116 (31):381–422.
- Dixit, A., and J. Stiglitz. 1977. "Monopolistic Competition and Optimum Product Diversity." *American Economic Review* 67 (3):297–308.
- Dixit, A., and V. Norman. 1980. *Theory of International Trade. A Dual, General Equilibrium Approach*, 265–96. Cambridge, MA: Cambridge University Press.
- Dolmas, J., and G. Huffman. 2004. "On the Political Economy of Immigration and Income Redistribution." *International Economic Review* 45 (4):1129–68.
- Dustmann, C., and A. Glitz. 2015. "How Do Industries and Firms Respond to Changes in Local Labor Supply?" *Journal of Labor Economics* 33 (3):711–50.
- Feenstra, R. 2004. *Advanced International Trade: Theory and Evidence*, 137–73. Princeton, NJ: Princeton University Press.
- Felbermayr, G. J., S. Hiller, and D. Sala. 2010. "Does Immigration Boost Per Capita Income?" *Economics Letters* 107 (2):72–5.
- Feld, L. and G. Kirchgassner. 2000. "Direct Democracy, Political Culture, and the Outcome of Economic Policy: A Report on the Swiss Experience." *European Journal of Political Economy* 16 (2):287–306.
- Feldmann, S. E. 1999. "Legislative Bargaining and the Initiative." Unpublished Manuscript, University of Chicago.
- Freeman, P. G. 1996. "Modes of Immigration Politics in Liberal Democratic States." *International Migration Review* 29 (4):881–902.
- Frey, B. 1994. "Direct Democracy, Politico-Economic Lessons from Swiss Experience." *American Economic Review (Papers and Proceedings)* 84 (2):338–42.
- Gauthier-Loiselle, M., and J. Hunt. 2010. "How Much Does Immigration Boost Innovation?" *American Economic Journal: Macroeconomics* 2 (2):31–56.
- Giovanni, J., A. A. Levchenko, and F. Ortega. 2015. "A Global View of Cross-Border Migration." *Journal of European Economic Association* 13 (1):168–202.
- Goldin, C. 1994. "The Political Economy of Immigration Restrictions in the U. S., 1890–1921." In *The Regulated Economy: A Historical Approach to Political Economy*, edited by C. Goldin, and G. Lebecap. Chicago, IL: The University of Chicago Press.
- Grether, J.-M., J. de Melo, and T. Muller. 2001. "The Political Economy of International Migration in a Ricardo-Viner Model." In *International Migration: Trends, Policy and Impact*, edited by S. Djajic. London: Routledge.
- Hanson, G., K. Scheve, M. Slaughter, and A. Spilimbergo. 2002. "Immigration and the U.S. Economy: Labor Market Impacts, Illegal Entry, and Policy Choices." In *Immigration Policy and the Welfare System*, edited by T. Boeri, G. Hanson, and B. McCormick. Oxford: Oxford University Press.
- Hatton, T. J., and J. G. Williamson. 2005. *Global Migration and the World Economy: Two Centuries of Policy and Performance*. Cambridge, MA: MIT Press.
- Helpman, E., and P. Krugman. 1985. *Market Structure and Foreign Trade*, 115–30. Cambridge, MA: MIT Press.
- Hiller, S. 2013. "Does Immigrant Employment Matter for Export Sales? Evidence from Denmark." *Review of World Economics* 149 (2):369–94.
- Iranzo, S., and G. Peri. 2009. "Migration and Trade: Theory with an Application to the Eastern-Western European Integration." *Journal of International Economics* 79 (1):1–19.

- Kessler, A. 2005. "Representative Versus Direct Democracy: The Role of Informational Asymmetries." *Public Choice* 122 (1):9–38.
- Krugman, P. 1979. "Increasing Returns, Monopolistic Competition, and International Trade." *Journal of International Economics* 9 (4):469–79.
- Krugman, P. 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade." *American Economic Review* 70 (5):950–9.
- Lach, S. 2007. "Immigration and Prices." *Journal of Political Economy* 115 (4):548–87.
- Levy, P. 1997. "A Political-Economic Analysis of Free-Trade Agreements." *American Economic Review* 87 (4):506–19.
- Mariani, F. 2013. "The Political Economy of Naturalization." *Canadian Journal of Economics* 46 (2):656–88.
- Martin, P., and E. Midgley. 2003. "Immigration: Shaping and Reshaping America. Revised and Updated 2nd Edition." Population Bulletin 61, no. 4. Washington, DC: Population Reference Bureau.
- Martin, P., and E. Midgley. 2010. "Immigration in America." Population Bulletin Update (June 2010). Washington, DC: Population Reference Bureau.
- Matusaka, J. G. 1992. "The Economics of Direct Legislation." *Quarterly Journal of Economics* 107 (2):541–71.
- Mayer, W. 1984. "Endogenous Tariff Formation." *American Economic Review* 74 (5):970–85.
- Melitz, M. J. 2003. "The Impact of Trade on Intra-industry Reallocations and Aggregate Industry Productivity." *Econometrica* 71 (6):1695–725.
- Norman, V. 1976. "Product Differentiation and International Trade." Mimeo, Department of Economics, Warwick University.
- Ortega, F. 2005. "Immigration Policy and Skill Upgrading." *Journal of Public Economics* 89 (9):1841–1863.
- Ortega, F. 2010. "Immigration, Citizenship, and the Size of Government." *The B.E. Journal of Economic Analysis & Policy, Contributions Article* 26, 10 (1):1–38.
- Ortega, F., and G. Peri. 2009. "The Causes and Effects of International Labor Mobility: Evidence from OECD Countries 1980–2005." Human Development Research MPRA Paper No. 19183.
- Peri, G. 2012. "The Effects of Immigration on Productivity: Evidence from U.S. States." *The Review of Economics and Statistics* 94 (1):348–58.
- Qirjo, D. 2010. "Essays on Labor Liberalization and its Effects on World Economy." PhD diss., Florida International University.
- Qirjo, D. 2015. "Monitoring, Endogenous Comparative Advantage, and Immigration." *IZA Journal of Migration* 24 (4):1–22.
- Rivera-Batiz, L., and P. Romer. 1991. "Economic Integration and Endogenous Growth." *Quarterly Journal of Economics* 106 (2):531–555.
- Rodriguez-Clare, A. 1996. "The Division of Labor and Economic Development." *Journal of Development Economics* 49 (1):3–31.
- Rodrik, D. 2002. "Final Remarks." In *Immigration Policy and the Welfare System*, edited by T. Boeri, G. Hanson, and B. McCormick. Oxford: Oxford University Press.
- Timmer, A., and J. Williamson. 1998. "Immigration Policies Prior to the 1930s: Labor Markets, Policy Interactions, and Globalization Backlash." *Population and Development Review* 24 (4):739–71.
- Wong, K. 1995. *International Trade in Goods and Factor Mobility*, 625–64. Cambridge, MA: MIT Press.
- Zachariadis, M. 2012. "Immigration and International Prices." *Journal of International Economics* 87 (2):298–311.