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Heterogeneous Capital Ownership, Partial Democracy and Political Support for Immigration

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Abstract

This paper analyzes and compares equilibrium immigration levels of some popular political economy models in the context of unequal capital holdings. We show that immigration rises (falls) with inequality in a limited (inclusive) democracy where only a small (large) fraction of the population has voting rights. Furthermore, we highlight the similarities between a campaign-contributions model and a partial-democracy model in terms of their predictions about immigration policy. In particular, we show that extension of voting rights in a partial democracy has qualitatively similar implications on immigration policy as reducing the relative weight on campaign contributions.

JEL codes: F22, F66, J61

Keywords: Legal immigration policy; Inequality in capital ownership; Partial democracy; Voter support for immigration; Campaign contributions; Lobbying.

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1. Introduction

Immigration policy involves a balancing act of efficiency and equity considerations. In reality, legal immigration levels are determined by a government which is subject to both lobbying pressures (as in Grossman and Helpman, 1994 for trade policy, henceforth referred to as GH) and voter/constituents' pressures (as in the case of Mayer, 1984, also for trade policy). In addition, it is possible that a nation does not extend voting rights to the entire population and therefore is a *partial democracy*, where voters may not be fully representative of the population. How does the inequality of capital holding affect support for immigration in such different political contexts? We use a simple framework to address some elements of this broad question and thereby complement the rich extant literature on the political economy of immigration.

Along the lines of Mayer (1984) we first show that the purely efficiency driven optimal immigration level exceeds the median voter's desired immigration level if the median voter holds less than the per capita level of capital. Next, considering a partial democracy where a subset of the richest members of the population constitutes the voting population, we show that the effect of inequality on immigration critically depends on the position of the median voter of the partial democracy relative to the median individual of the entire population. Finally, we consider a GH type campaign contributions model and show that it shares some similarities with the partial democracy model in terms of predictions about equilibrium immigration.

2. Model

A nation is populated by N individuals, with each individual $i \in [0, N]$ possessing a unit of labor. In addition, each individual possesses a share $s(i)$ of the aggregate capital endowment $\bar{K}$ of the economy, where $s(i) \geq 0$, such that an individual's capital endowment is $s(i)\bar{K}$. Potential immigrants in this economy hold no capital. A single numeraire good X is produced in this economy with labor (L) and capital (K) using a constant-returns-to-scale (CRS) technology

$$X = F(L, K),\ F_L > 0,\ F_K > 0,\ F_{LL} < 0 \text{ and } F_{KK} < 0, \tag{1}$$

The nation's technology and endowments are such that at full employment the wage rate w exceeds the wage rate in a source nation, such that the nation can choose its desired immigration level.

Individuals derive unit marginal utility from their consumption $x(i)$ of the numeraire good and incur an immigration assimilation cost $a(I)$, which is increasing and convex in the immigration level I.[1] Under these assumptions, individual i's s utility function is:

$$u(i) = x(i) - a(I). \tag{2}$$

Denoting r to be the rental rate on capital, the income of individual i is:

$$y(i) = w + s(i) r\bar{K}. \tag{3}$$

The individual's budget constraint dictates that $x(i) = y(i)$, such that Eq. (2) reduces to:

$$u(i) = w + s(i) r\bar{K} - a(I). \tag{4}$$

Let us arrange $i \in [0, N]$ in increasing order of capital share, such that $s'(i) \geq 0$.[2] At immigration level I, aggregate labor supply is $L = N + I$, such that full employment and firm profit maximization imply $w = F_L(N + I, \bar{K}) = w(I)$, where $w'(I) = F_{LL}(N + I, \bar{K}) < 0$. In addition, noting that the production function is CRS, we get $r\bar{K} = F(L, \bar{K}) - wL$, which, noting that $L = N + I$ and $w = F_L$, implies that $r = r(I)$, with $r'(I) = -\dfrac{Lw'(I)}{\bar{K}} > 0$. Thus, Eq. (4) reduces to:

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[1] The immigration assimilation cost can be thought of as a per capita congestion cost, insignificant at low levels of immigration but rising rapidly beyond a certain immigration level, such that $a(I = 0) = a'(I = 0) = a''(I = 0) = 0$.

[2] For simplicity of exposition we also assume that individuals with some capital have distinct capital endowments.

$$u\left(I;i\right)=w\left(I\right)+s\left(i\right)r\left(I\right)\bar{K}-a\left(I\right). \tag{5}$$

Notice that for an individual without any capital holding [i.e., $s\left(i\right)=0$], any immigration is undesirable because $w'\left(I\right)<0$. Among capital holders who support some immigration, differentiating Eq. (5) and using $r'\left(I\right)=-\frac{Lw'\left(I\right)}{\bar{K}}>0$, we get the most desired immigration level of an individual as:

$$u_I\left(I;i\right)=w'\left(I\right)\left(1-s\left(i\right)L\right)-a'\left(I\right)=0,\ I^i=I\left(s\left(i\right)\right);\ I'\left(s\left(i\right)\right)=\frac{w'\left(I\right)L}{u_{II}}>0. \tag{6}$$

where sufficient convexity is assumed in the assimilation cost function to ensure that $u_{II}<0$.[3] Thus, the desired immigration level for all capital holders who benefit from some immigration is increasing in their share of the nation's capital endowment.

2.1 *Utilitarian Government Objective Function*

Aggregate utility of the residents is:

$$U\left(I\right)=\int_0^N u\left(i\right)di=w\left(I\right)N+r\left(I\right)\bar{K}-Na\left(I\right). \tag{7}$$

Recalling that $\bar{K}r'\left(I\right)=-Lw'\left(I\right)$ and $L=N+I$, the government's utilitarian optimal immigration level I^* is defined by the first order condition:

$$U'\left(I\right)=-Iw'\left(I\right)-Na'\left(I\right)=0.^4 \tag{8}$$

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[3] Because $u_{II}\left(I=0;i\right)=w''\left(I=0\right)\left(1-s\left(i\right)N\right)-sw'$ can be positive, $u_I\left(I=0;i\right)=0$ does not necessarily imply an optimum of zero desired immigration. For example, if $s\left(i\right)=1/N$, then $u_I\left(I=0;i\right)=0$. However, this is a local minimum because $u_{II}\left(I=0;i\right)=-w'/N>0$.

[4] We assume that $a\left(I\right)$ is sufficiently convex at the optimal immigration level ($I>0$) for the second-order-condition to be satisfied. In addition, note that $U'\left(I=0\right)=0$, but $U''\left(I=0\right)=-w'\left(I=0\right)>0$, therefore $I=0$ here represents a minimum.

The first term on the right-hand-side of Eq. (8) is the aggregate gains for citizens from a lower wage bill that has to be paid to immigrants, while the second term is the aggregate assimilation cost. At the optimal immigration level, the aggregate marginal gain is exactly balanced by the aggregate marginal assimilation cost.

Notice that the utilitarian optimum abstracts from distributional considerations, with some citizens without capital being strictly worse off after any immigration.

2.2 *The Median Voter Model with Full Democracy*

The median voter's ideal immigration level is given by Eq. (6). How does this immigration level compare with the immigration level at the utilitarian optimum? Assuming that the median voter holds some capital and using Eq. (8),

$$u_I\left(I;\frac{N}{2}\right)_{\Big|I=I^*} = w'\left(I^*\right)\left(1-s\left(\frac{N}{2}\right)\left(I^*+N\right)+\frac{I^*}{N}\right)\geq 0 \Leftrightarrow s\left(\frac{N}{2}\right)\geq\frac{1}{N}. \tag{9}$$

Eq. (9) establishes that if the median voter has exactly the average amount of capital $\bar{K}/N$, then the median voter's desired optimum and the utilitarian optimum converge, otherwise the median voter's desired optimum is less (greater) than the utilitarian optimum depending on whether the median voter's share is less (greater) than the per capita level. We discuss next the effect of inequality on support for immigration in a median voter context using a partial democracy model, where the case of full democracy is nested in the analysis.

2.3 *The Median Voter Model with Partial Democracy*

We follow the approach of Milner and Kubota (2005) and Tavares (2008) and assume that in a partial democracy only the *d* richest people can vote. As we increase *d*, we extend the franchise bringing in more people into the fold of democracy. When $d = N$, we have full democracy.

However, when $d < N$, we focus on the median voter of the subset of these richest voters. The median voter of this subset $i \in \left[N-d, N\right]$ is $i = N - \frac{d}{2}$, so an increase in *d* represents greater democracy or an extension of the franchise. Note that $\frac{\partial s\left(N-\left(d/2\right)\right)}{\partial d} = -\frac{1}{2}s'\left(N-\left(d/2\right)\right) < 0$, such that using Eq. (6) we conclude that an extension of the voting franchise must reduce the political economy driven immigration level in a partial democracy. We now turn our attention to the effect of a change in inequality of capital holding on immigration policy.

Figure 1 maps capital shares in the population for a linear case using coordinates $\left(i, s\left(i\right)\right)$. The curves *OAB* and *OCD* represent two capital distribution profiles, with the latter curve representing more concentration of capital holding.[5] The positive horizontal intercepts reflect the fact that a fraction of the population does not hold any capital (consistent with much less than 100% stock-market participation in the real world). To ensure that the shares sum to unity the areas of triangles *ABN* and *CDN* must also equal unity.

Consider a high value of *d* such that the median voter $i = N - \frac{d}{2}$, is to the left of the horizontal coordinate of point *P*. Going from curve *OAB* to *OCD* for this median voter will involve a drop in capital share and hence a lower support for immigration. In this case, greater inequality reduces immigration. Now consider a low value of *d* such that the median voter is to the right of the horizontal coordinate of point *P*. In this case, the median voter's share rises and there is greater support for immigration. To summarize, when the democracy is more inclusive/complete, greater inequality tends to reduce immigration, while in a more limited democracy greater inequality is associated with increased support for immigration.[6] Finally,

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[5]It is easy to check that the Gini coefficient associated with curve *OAB* is lower than that associated with curve *OCD*.

[6] When $d = N$, such that we have a full democracy, the requirement that shares must add to one ensures that the median voter is to the left of the horizontal coordinate of point *P*, such that greater inequality must reduce

assume that the median voter (corresponding to both share profiles) is at point *P* and increase *d*. It is clear that $s(i)$ goes down more sharply in the more unequal economy, such that immigration reduction is more pronounced after extension of the franchise in the more unequal economy.

2.4 *Political Contributions Model*

Reflecting the fact that only a fraction of the population participates in the equity market, we consider the case where $\lambda < N$ individuals hold some capital. Eq. (4) is revised to:

$$u(i) = w + s(i) r\bar{K} - a(I), \text{ for } i \in \lambda \text{; and } u(i) = w - a(I), \text{ for } i \notin \lambda; \tag{10}$$

where $i \in [0, N]$. Aggregate utility of the capitalist is:

$$\pi(I) = \int_{N-\lambda}^{N} u(i) di = \lambda w(I) + r(I)\bar{K} - \lambda a(I), \tag{11}$$

because $\int_{N-\lambda}^{N} s(i) di = 1$. Capitalists can pay a surplus, $H(I) = \pi(I) - Z$, as political contribution to the government for an immigration level *I* chosen by the government.[7] As in GH, *Z* is decided so as to ensure that the government's payoff is at least as large as the government's zero-contribution payoff. The government's payoff is:

$$G(I) = H(I) + \alpha U(I), \tag{12}$$

where $U(I)$ is the utilitarian national welfare function defined in Eq. (7) and $\alpha > 0$ is a measure of the weight attached to aggregate utility relative to campaign contributions. Substituting $H(I) = \pi(I) - Z$ in Eq. (12) and rearranging terms we get:

immigration. Also, for multiple linear capital share profiles, a sufficient condition for immigration to go up (down) with an increase in inequality is that *d/2* is smaller (larger) than the horizontal coordinate (measured going left from point *N* in the figure) corresponding to the intersection point of the two profiles reflecting the greatest (least) inequality.

[7] We assume that the group of capitalists coordinates and uses transfers in such a way that all capital holders have at least as much payoff as they have without immigration.

$$G(I)=(\lambda-N)\left[w(I)-a(I)\right]-Z+(1+\alpha)U(I)\,. \tag{13}$$

The first-order condition for the government's desired immigration level is:

$$G'(I)=(\lambda-N)\left[w'(I)-a'(I)\right]+(1+\alpha)U'(I)=0\,. \tag{14}$$

Eq. (14) implicitly defines a GH type political contributions' determined immigration level $I=I^{GH}(\lambda)$. It is straightforward to show that maximizing (13) is equivalent to maximizing the utility of a person who has a share $\frac{1+\alpha}{\lambda+\alpha N}\geq\frac{1}{N}$ of the economy's total capital stock. As $\alpha\rightarrow\infty$, $\frac{1+\alpha}{\lambda+\alpha N}\rightarrow\frac{1}{N}$. Also, clearly, this share falls with α. This share could be that of the voter with the median capital stock within the set of voters in a limited democracy as described earlier (since the capital share of this person is greater than the simple economywide average share, which is great than the economywide median in the presence of inequality). Clearly, increasing α in this framework is equivalent to an extension of the franchise within our median-voter model of a partial democracy, but the upper bound in this case is less than a full democracy. Notice that the utilitarian optimum immigration level I^* is defined by $U'(I)=0$, which, when substituted in Eq. (14) yields

$$\left[G'(I)\right]_{|I=I^*}=(\lambda-N)\left[w'(I^*)-a'(I^*)\right]>0\,, \tag{15}$$

because $\lambda<N$. Thus, political contributions will push the immigration level above I^*. (i.e., $I^{GH}>I^*$). Furthermore, it is easy to check using Eq. (14) that the smaller the extensive margin of capital holding (i.e., λ), the higher the level of I^{GH}. This finding has an Olsonian collective action flavor, that greater concentration of capital holding leads to more lobbying by special interest groups (in this case the lobby of the capitalists). The result is also similar to the impact of an increase in inequality (reduction in λ) in a median voter model under a limited democracy.[8]

3. Conclusion

We show that extension of the voting franchise in a partial democracy increases opposition to immigration. On the other hand, greater inequality can either raise or reduce support for immigration depending on the inclusiveness of the democracy in terms of voting rights. Concentration of capital holding raises immigration through lobbying, mirroring immigration expansion in the face of greater inequality in a very limited democracy.

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[8] Recall that in Figure 1 a rise in inequality requires a fall in λ.

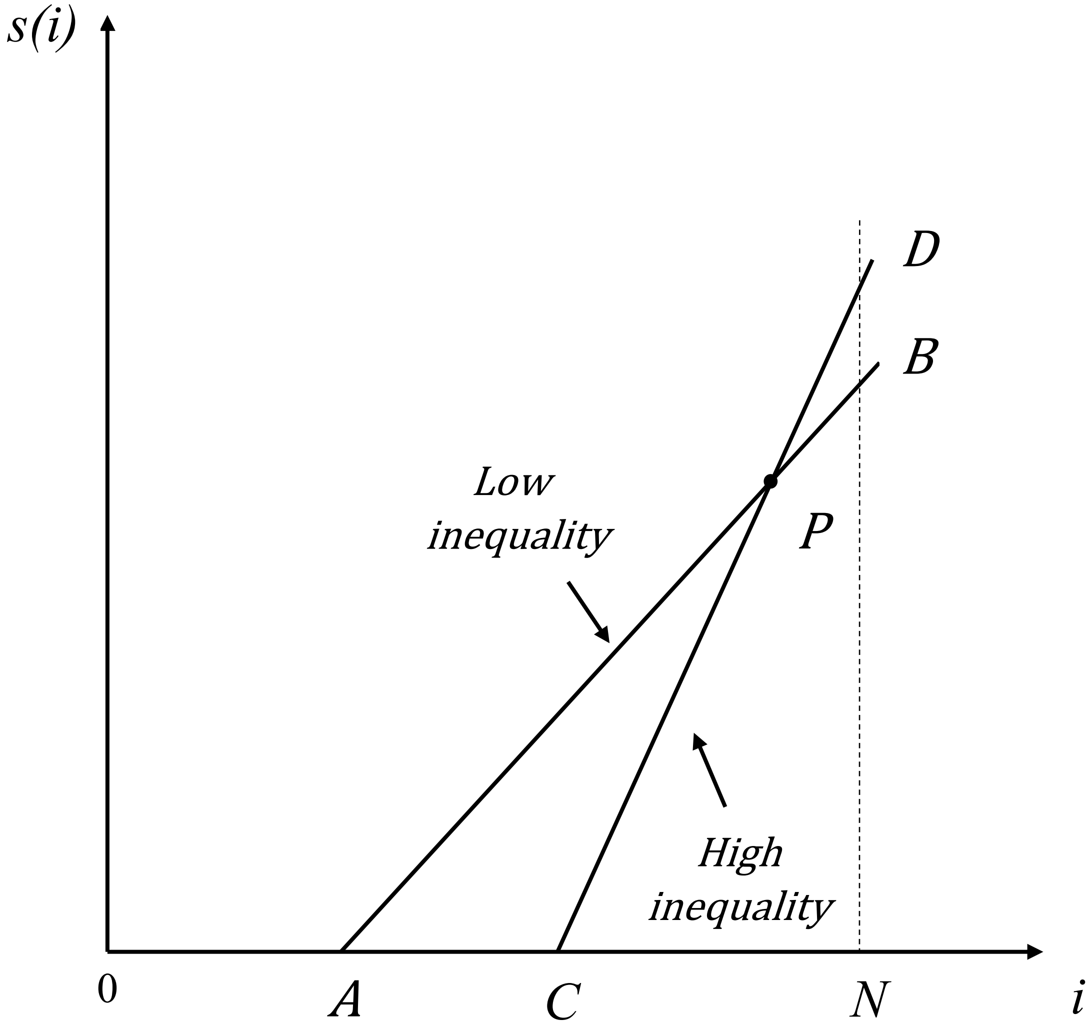

Figure 1 Capital Holding Profiles for Different Inequality Levels