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IMMIGRATION, DIVERSITY AND GROWTH

Mark Gradstein and Moshe Justman

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International migration offers the potential for mutual economic gain—for migrants and their host countries—through an efficient reallocation of human resources and a fruitful meeting of cultures, even as cultural frictions may threaten their shared social fabric. Immigrants and natives have a common interest in prospering through cooperation but may have opposing views on how quickly immigrants should assimilate. Confrontation between the two populations can lead to immigrants culturally disengaging from the mainstream, and retard their economic integration. This paper analyzes these reciprocal cultural and economic effects, indicating the scope for growth-promoting and welfare enhancing assimilation policies.

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Immigration, Diversity and Growth

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Abstract

International migration offers the potential for mutual economic gain—for migrants and their host countries—through an efficient reallocation of human resources and a fruitful meeting of cultures, even as cultural frictions may threaten their shared social fabric. Immigrants and natives have a common interest in prospering through cooperation but may have opposing views on how quickly immigrants should assimilate. Confrontation between the two populations can lead to immigrants culturally disengaging from the mainstream, and retard their economic integration. This paper analyzes these reciprocal cultural and economic effects, indicating the scope for growth-promoting and welfare enhancing assimilation policies.

1. Introduction

Technological change and globalization, wars and revolutions, have unleashed waves of international migration that have intensified both the economic interaction and cultural friction among people of different cultural, religious, racial and ethnic backgrounds, living and working in a shared political economy. In the past, large waves of migration moved from densely populated, land-scarce European countries to sparsely populated areas rich in land and other natural resources; more recently, we see large migration flows from less to more developed nations—from parts of Latin America to the United States and from Africa and the Middle East to Western Europe.[1] These waves of immigration offer the prospect of neoclassical economic gains for the host countries from an efficient reallocation of human resources, labor moving from locations of low marginal product to higher marginal product, and the advantages of added cultural diversity for creativity and innovation.

The economic success of these large movements of people depends on their successful social integration. Some countries have met this challenge successfully, integrating migrant populations and creating conditions that dispose them to productively interact with the native population; others are plagued by religious and ethnic strife between migrants asserting their separate cultural identity and natives valuing their cultural and religious homogeneity. The resulting tensions may lead to segregation of the immigrant population in physical or virtual ethnic enclaves which, while serving the immediate

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[1] Peri (2016) documents increased migration from developing to developed countries in recent decades. In the large majority of most-developed countries, the fraction of foreign-born residents exceeds ten percent.

cultural preferences of both groups, inhibit economic growth.[2]

In this paper, we develop a model that embeds the social interaction between migrants and the host population in an aggregate growth framework, recognizing the reciprocal effect between social diversity and economic growth, and provides a welfare framework for assessing policy responses. It rests on three central assumptions.[3] The first posits that while some diversity is beneficial for productivity, there is a point beyond which social polarization has a negative, growth-retarding effect. That some diversity is beneficial finds support in historical studies by Ager and Brueckner (2013), Tabellini (2019) and Sequeira et al. (2019) who report that cultural diversity driven by immigration fostered growth in the United States, specifically during the mass migrations of the late nineteenth and early twentieth centuries;[4] and in Hornung's (2019) use of exogenous variation in immigration to identify a beneficial effect of ethnic diversity on textile production in eighteenth century Berlin. It is consistent with Peri's (2012) findings, of productivity benefits of immigration to the US; with Freeman and Huang (2015) reporting higher-valued scientific output from research conducted in ethnically heterogeneous teams; and with Alesina et al.'s (2016) finding that diversity stemming from migration is conducive to a higher long-term

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[2] On ethnic segregation shaping occupational choices and economic fortunes see, for example, Cutler and Glaeser (1997), and Lazear (1999). The "melting pot" and "salad bowl" embody two opposing perspectives on social integration.

[3] We abstract here from the issue of skill interaction in production between immigrants and natives. The question of whether these skills are complementary or not has been a subject of voluminous work, reviewed in surveys by Borjas (1995) Kerr and Kerr (2011) and Abramitsky and Boustan (2016).

[4] Ager and Brueckner (2013) found that cultural diversity within localities in the nineteenth century contributed to their economic growth. Tabellini (2019) used immigration quotas based on national origin introduced in the 1920s to identify a positive effect of diversity on aggregate economic outcomes.

aggregate level of output.

The latter part of this assumption, that excessive polarization retards growth, is motivated by Easterly and Levine's (1997) influential study of the links between interethnic strife and underdevelopment in Africa. Subsequent research on the relationship between ethnolinguistic fragmentation and growth, reviewed in Alesina and La Ferrara (2005), indicates that these insights apply widely, though possibly not to the most affluent countries. Ashraf and Galor's (2011, 2013) work linking long run patterns of world economic development to the ebb and flow of migration-driven cultural movements of diffusion and assimilation supports both parts of our assumption, indicating a hump-shaped relationship between diversity and growth.[5]

Our second assumption is that immigrants' distinct cultural identity is, in itself, a direct source of utility for immigrants and disutility to natives. Immigrants value their social identity and are eager to pass on their values and traditions to their children. Hence, they may resist efforts to erode their group identity and willingly sacrifice potential economic gains in order to perpetuate their children's separate traditional cultural or religious identity (Bisin and Verdier, 2000; Gradstein and Justman, 2002). Abramitsky et al. (2019) document this empirically, employing the propensity to retain foreign names as a proxy for immigrants' cultural identification. The native population, on the other hand, may experience direct disutility from open displays of the "otherness" of immigrants.[6]

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[5] See Gradstein and Justman (2019) for an overview of the literature on the interaction between cultural diversity and economic development.

[6] Recent examples are bans on Islamic bathing costumes in France and on minarets in Switzerland.

Our third assumption is that the potential economic benefits of reducing immigrants' cultural polarization increase directly with the level of economic resources. On an individual level, immigrants with ample financial or human capital have a stronger incentive and a greater capacity to integrate than poor, less-educated immigrants. On an aggregate level, host countries with greater resources offer both natives and immigrants stronger material incentives to overcome their cultural differences, and are able to direct larger public funds to assimilation efforts.[7] Conversely, migrants to densely populated, resource-poor locations face far greater obstacles to their successful assimilation, perpetuating their poverty and cultural isolation.[8]

The formal framework we propose, which builds on Gradstein and Justman (2002, 2005), indicates conditions and policies that support the successful assimilation of immigrant populations, generating a trajectory of growth that capitalizes on diversity. Absent government intervention, the speed of cultural convergence that immigrants choose may be too slow, as they ignore the external benefit of their social accommodation for the native population; and in extreme cases may find they are better off in the short run by segregating themselves from the mainstream culture.

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[7] The immense economic potential that the Americas and the antipodes offered is a key element of their ability to successfully absorb large waves of culturally diverse immigrants.

[8] Banfield's (1958) pioneering study of a poor community in southern Italy where the primacy of familial loyalties inhibited broader social and economic interaction, vividly illustrates how social isolation can retard growth. Enhanced productive interactions between small family-based units was a necessary condition for economic development, but in their poverty lacked sufficient motivation to cooperate.

Yet the government of the host country can provide incentives for immigrants to accelerate their rate of social convergence. There is scope for Pareto improvement despite immigrants and natives holding opposing views on the desired rate of cultural assimilation, because their marginal rates of substitution between material and cultural utility generally differ—richer and more numerous natives transferring material resources to poorer and fewer immigrants in exchange for more rapid assimilation. The government of the host country will never be able to fully control the cultural orientation of immigrants but it can influence it to some extent, for example through the school system, at a cost that depends on the relative size of the immigrant population, its human capital, and the strength and foreign-ness of immigrants' cultural and religious convictions.

Our contribution to the existing literature is twofold. First, we embed social interactions among natives and immigrants in a tractable economic growth framework, allowing for complementarity between social diversity and investment in human capital. This constitutes a useful framework to explore social and economic assimilation of immigrants and its relationship to economic growth of the host country at the same time. Our second contribution consists of an explicit welfare analysis, with suggested policy implications designed to enhance the economic value of culturally diverse immigrants.

The rest of the paper proceeds as follows. Section 2 introduces the model; section 3 characterizes single-period and steady-state equilibria; section 4 introduces a normative analysis and considers the scope for public policy; and section 5 offers concluding remarks.

2. Model

Consider an economy of successive generations in discrete time, $t = 0, 1, 2, \ldots$, populated by a unit measure of households indexed by $0 \leq i \leq 1$, each household comprising a parent and a child, with all individuals living for two generation periods. There are two groups indexed by $j = h, m$, the host population and a migrant group, where q is the share of migrants in the population, and we assume they are in the minority, $q < \frac{1}{2}$.[9] Households are characterized by their income and social orientation. Denote the income of household i in group j in period t by y_{ijt}, and assume that initially all members of each group have the same income, with immigrants poorer than natives, $y_{m0} < y_{h0}$. Social orientation is a scalar p, and we assume that the social orientation of the host population is fixed at $p = 0$ throughout. Denote the social orientation of immigrant parent i in period t by p_{it}, and their average social orientation in period t by π_t —this is also the level of social polarization— and assume that it is initially equal to $p_{i0} = 1$ for all immigrants, so $\pi_1 = 1$.

Parents make all decisions. In each period, they divide their household income y_{ijt} between consumption c_{ijt} and investment in their children's human capital, $k_{ij,t+1}$:[10]

$$y_{ijt} = c_{ijt} + k_{ij,t+1} \tag{1}$$

and immigrants determine their children's social orientation $p_{i,t+1}$. To fix ideas, assume that $p_{i,t+1}$ is a function of the home environment, p_{it} and the cultural orientation of the school the

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child attends, $s_{i,t+1}$, $p_{i,t+1} = \beta\, p_{it} + (1 - \beta)\, s_{i,t+1}$, where $0 < \beta < 1$.[11] We assume that schooling is private and decisions on the size and direction of investment in human capital are individual and mutually independent, though they are inter-connected, as children's social orientation affects productivity and as well as directly affecting parental welfare.

The productivity of individual human capital is achieved through interaction with other individuals, and is a function of the social distance between them. Denote the productivity of an interaction between two individuals from the same group by $\underline{d}$; and the productivity of interaction between a native and an immigrant with cultural orientation p by $d(p)$, where d is a positive, twice-differentiable, monotonically declining, concave function with $1 > d(0) > \underline{d} \geq d(1) > 0$.[12] Thus when the social distance between natives and immigrants is small enough, interaction between a native and an immigrant is more productive than interaction within each group; and the productivity of human capital is maximized when natives and immigrants interact after removing all social barriers. However, the productivity of interaction decreases with social distance, and beyond some degree of polarization, interaction may be less productive than segregation.

Denote the productivity of individual i in group j in period t by Φ_{ijt}. In each period each individual has many interactions with other individuals, and we take Φ_{ijt} to equal the average productivity of i's interaction with other individuals in the cohort, weighted by

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[11] On parents reinforcing language or religious barriers through separate education systems see Carvalho and Koyama (2016). See also Aspachs et al. (2008), Clots-Figueras and Masella (2013) and Cantoni et al. (2017) on education shaping preferences and attitudes.

[12] We assume the same function d for both groups to simplify the exposition though generally polarization may have different economic implications for the two populations.

their relative frequencies, assuming for simplicity that these weights depend only on group identity. Denote by ω_{ht} the relative frequency of a native interacting with another native in period t, and by $\omega_{hmt} = 1 - \omega_{ht}$ the frequency of a native interacting with an immigrant; and similarly by ω_{mt} the relative frequency of an immigrant interacting with another immigrant in period t, and by $\omega_{mht} = 1 - \omega_{mt}$ the frequency of an immigrant interacting with a native. In a fully integrated economy, individuals interact with equal probability with all other individuals in their cohort, so that these frequencies equal the population frequencies: $\omega_m = q$ and $\omega_h = 1 - q$. In a fully segregated economy, individuals interact only with individuals in their own group, so that $\omega_{ht} = \omega_{mt} = 1$.[13] Generally, $q \leq \omega_{mt} \leq 1$ and $1 - q \leq \omega_{ht} \leq 1$, with larger values of ω_{ht} and ω_{mt} corresponding to greater economic segregation. For conciseness we focus our attention to either a fully integrated or fully segregated economy.

In period t, the productivity of a native is $\Phi_{ht} = \omega_{ht} \underline{d} + (1 - \omega_{ht}) d(\pi_t)$, and of immigrant i, $\Phi_{imt} = \omega_{mt} \underline{d} + (1 - \omega_{mt}) d(p_{it})$, with income derived via the production function

$$y_{ijt} = A \, k_{ijt}^{\Phi_{ijt}} \tag{2}$$

so that the marginal product of human capital depends on the social context in which it is used; $A > 0$ captures general economic conditions for growth. As $p_0 = 1$ initially, and $d'(1) < 0$, reducing polarization in an integrated economy raises productivity for both groups.

Immigrant parents' direct preferences regarding their children's orientation have two aspects. They suffer a psychic cost from the social distance between their children and

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[13] Consistency of ω_h and ω_m requires that $q(1 - \omega_h) = (1 - q)\omega_m$.

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themselves, which for simplicity is assumed linear in social distance, $\sigma |p_{it} - p_{i,t+1}|$; and they experience disutility from the anticipated erosion of their group's social identity, equal to $\theta |\pi_t - \pi_{t+1}|$, $\sigma, \theta \geq 0$.[14] Thus immigrant parents in period t choose $k_{im,t+1}$ and $p_{i,t+1}$ to maximize their utility:

$$U_{imt} = \log(c_{imt}) + \log(y_{im,t+1}) - \sigma |p_{it} - p_{i,t+1}| - \theta |\pi_t - \pi_{t+1}| \tag{3}$$

subject to the budget constraint (1) and given the production function (2). Positive utility is derived from current consumption and from the child's anticipated future income; disutility stems from the distance in social orientation between parent and child, and from the erosion of group identity (which is not subject to individual control).

Native parents derive positive utility from current consumption and from their child's anticipated future income, and disutility from the anticipated cultural otherness of immigrants, amplified by the size of the immigrant population, $\xi \, q \, \pi_{t+1}$, $\xi \geq 0$. In each period t, native parents choose (only) the level of investment in their children's human capital, $k_{ih,t+1}$, to maximize their utility:

$$U_{iht} = \log(c_{iht}) + \log(y_{ih,t+1}) - \xi \, q \, \pi_{t+1} \tag{4}$$

subject to the budget constraint (1) and given the production function (2). Parents make these decisions individually, and we explore equilibrium sequences of decisions on $k_{ih,t+1}$ $k_{im,t+1}$ and $p_{i,t+1}$ that are mutually consistent in each period.

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[14] Thus it is never in an immigrant's interest to increase polarization in the next generation. Erosion of cultural identity at the individual and sub-group level will be equal *ex post* but not *ex ante*.

3. Analysis

In this section, we characterize the market equilibrium of our model absent policy interventions. To obtain closed form solutions, we assume a specific form for the productivity function, $d(p) = d_0 - \frac{1}{2}\alpha p^2$ where $1 > d_0 > \alpha > 0$, and so $d`(p) = -\alpha p$. We posit that initial uniformity in income and social orientation will imply that the same holds in subsequent periods; and omit household indexes where this causes no confusion. Under these assumptions, the productivity of native and immigrant households in period 1 is:

$$\Phi_{h1} \;=\; \Phi_{h1}(\pi_1) \;=\; \omega_{h1}\,\underline{d} \;+\; (1 - \omega_{h1})\,d(\pi_1) \tag{5}$$

$$\Phi_{im1} \;=\; \Phi_{im1}(p_{i1}) \;=\; \omega_{m1}\,\underline{d} \;+\; (1 - \omega_{m1})\,d(p_{i1}) \tag{6}$$

And so: $\partial\Phi_{im1} / \partial p_{i1} = -\,(1 - \omega_{mt})\,\alpha\,p_{i1}$.

One-period equilibrium. We begin with a one-period analysis, focusing on mutually consistent decisions in a Nash equilibrium, where each household conditions its decisions on the assumed choices of other households and acts as if it has no effect on their decisions. Immigrant households' choice of p_{i1} and k_{im1} does not depend on other households' choices, but native households' choice of k_{ih1} depends on what they anticipate π_1 will be.

Consider, first, a segregated economy where $\omega_h = \omega_m = 1$. As immigrants' choice of social orientation has no effect on productivity they choose $s_1 = 1$, and as $\omega_m = 1$ we have $\pi_1 = 1$, and $\Phi_1 = \underline{d}$ for both groups. First-order conditions then determine investment: $k_{j1} = y_{0j}\,\underline{d} / (1 + \underline{d})$ for $j = h, m$, and the utility of native and immigrant households is:

$$U_h \text{(seg)} = (1 + \underline{d}) \log(y_{h0}) + \log(A) + g(\underline{d}) - \xi q \tag{7}$$

$$U_m \text{(seg)} = (1 + \underline{d}) \log(y_{m0}) + \log(A) + g(\underline{d}) \tag{8}$$

where $g(x) = x \log x - (1 + x) \log (1 + x)$ is a declining function of x. Note that this leaves natives worse off than they would be without immigration, as they have no economic gain from it and only the disutility of a foreign cultural presence.

In an integrated economy, an interior solution must satisfy:

$$k_{j1} = y_{j0} \, \Phi_j \, (\pi_1) / (1 + \Phi_j \, (\pi_1)), \quad j = h, \, m \tag{9}$$

$$(1-q) \, \alpha \, (1- \beta) \, \pi_1 \log (k_{m1}) - (1 - \beta) \, \sigma = 0 \tag{10}$$

where $\pi_1 = \beta + (1-\beta) \, s_1$ for some $s_1 < 1$, and productivity is $\Phi_m \, (\pi_1) = q \, \underline{d} + (1-q) \, d(\pi_1)$ and $\Phi_h \, (\pi_1) = (1-q) \, \underline{d} + q \, d(\pi_1)$. An interior solution exists if:

$$(1-q) \, \alpha \, (1- \beta) \log (y_{m0} \, \Phi_m \, (1) / (1 + \Phi_m \, (1)) - (1- \beta) \, \sigma > 0$$

or, equivalently, if initial immigrant income y_{m0} exceeds the threshold value:

$$y_{m0} > \underline{y} = (1 + 1/(q\underline{d} + (1-q)d(1)) \, e^{\sigma / \alpha(1-q)} \tag{11}$$

Alternatively, if $y_{m0} \leq \underline{y}$, we have a corner solution in which $\pi_1 = s_1 = 1$, and investment is $k_j = y_{j0} \, \Phi_j \, (1- \gamma(1 - q)) / (1 + \Phi_j(1- \gamma(1 - q)))$ for $j = h, \, m$. In either case, the utility level of a native parent in an integrated economy is:

$$U_h \text{(int)} = (1 + \Phi_h \, (\pi_1)) \log y_{h0} + \log A + g(\Phi_h \, (\pi_1)) - \xi \, q \, \pi_1 \tag{12}$$

And the utility level of an immigrant parent is:

$$U_m \text{(int)} = (1 + \Phi_m \, (\pi_1)) \log y_{m0} + \log A + g(\Phi_m \, (\pi_1)) - (\sigma + \theta) \, (1 - \pi_1) \tag{13}$$

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Note that in an integrated economy with an interior solution, immigrants find there is too little polarization, as with uncoordinated choices of social orientation parents ignore their external effect on the general erosion of their cultural identity; and the host population finds that there is too much polarization, as immigrants ignore the benefits of their reduced polarization for native households—both economic benefits and the direct benefit from the reduced presence of a foreign culture.

In the short run, segregation is not all bad for immigrants. Especially when initial immigrant income is below the threshold $\underline{y}$, so that a corner solution holds in the integrated economy, immigrant parents are always better off in a segregated economy;[15] and even when initial income is above the threshold, parents may prefer segregation for the cultural stability it offers, which they value. However, segregation perpetuates cultural polarization which retards current and future income growth by lowering productivity and depressing investment; and this effect is mutually reinforcing, as low levels of investment weaken the economic incentive for cultural integration. This can lock future generations in a low-level equilibrium trap, which is explored below in the analysis of long-term steady states.

Summarizing thus far:

Proposition 1. The equilibrium level of social polarization in an integrated economy is too small from the immigrants' perspective and excessively large from the natives' point of view. Segregation, although resulting in a lower level of output than integration, may

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[15] See Cutler and Glaeser (1997) for additional theoretical and empirical work on the potential benefits and costs of segregation. Edin et al. (2003) and Damm (2009) provide evidence that less able immigrants self-select into segregated ethnic enclaves; and that this may have been ultimately beneficial for immigrants.

nevertheless be advantageous for immigrants in the short run.

Steady-state analysis. The preceding analysis of first-period equilibrium carries over to subsequent periods, t and $t+1$, leading to a recursive formulation of the economy's evolution described by multiple iterations of such single-period analyses, which lead to four possible steady states.[16] Two low-level steady states:

- a segregated steady state with maximal polarization; and

- an integrated steady state with maximal polarization;

and two higher-level steady states (both integrated):

- an integrated steady state with less than maximal polarization; and

- a steady state where immigrants are fully assimilated in the native culture.[17]

We denote steady-state values by bold type. In a segregated, low-level steady state with maximal polarization we have $\boldsymbol{\pi} = 1$ and for both groups $\boldsymbol{y}\,(\text{seg}) = A^{1/(1-\underline{d})}\,[\underline{d}\,/\,(1+\underline{d})]^{\underline{d}/(1-\underline{d})}$. This holds if $\boldsymbol{y}(\text{seg}) < \underline{\boldsymbol{y}}(\text{seg}) = (1+1/\underline{d})\,e^{\sigma\,/\,\alpha(1-q)}$, which holds if σ and q are large enough, i.e., when the immigrant share is large and immigrants have a strong affinity for their culture, and the autonomous productivity parameter A is small enough.

The low-level steady state of an integrated economy, where $\boldsymbol{\pi} = 1$, is characterized by income levels

$$\boldsymbol{y}_j(\text{int}) = A^{1/(1\,-\,\Phi j(1))}\,[\Phi_j\,(1)\,/\,(1+\Phi_j\,(1))]^{\Phi j(1)\,/\,(1\,-\,\Phi j(1))} \quad j = h,\,m$$

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[16] Detailed derivations, omitted for brevity, are available on request.

[17] This requires $d'(0) > \sigma$, or public intervention. If $d'(0) = 0 < \sigma$, as we posit, full assimilation is not a market equilibrium.

and holds if:

$$(1 - q) \, \alpha \, \pi \log \left[y_m (\text{int}) \, \Phi_m (1) / (1 + \Phi_m (1)) \right] - \sigma \; < \; 0 .$$

This holds if $y_m(\text{int})$ as defined above is below a threshold $\underline{y}(\text{int})$ greater than $\underline{y}(\text{seg})$.[18]

The following conclusions can then be drawn, similar to the one-period analysis: [19]

Proposition 2.

a) In both a segregated and integrated economy, a low-level equilibrium exists when the immigrant share is large, immigrants have a strong affinity for their culture, and autonomous productivity is weak.

b) Immigrants prefer the low-level steady state of the segregated economy to the low-level steady state of the integrated economy. This is because polarization is maximal in both cases, and steady-state output is greater in the segregated economy.

c) Natives also prefer the segregated equilibrium to the low-level integrated equilibrium, for the same reason.

d) Productivity and output are higher for natives than for immigrants.[20]

e) Natives prefer no migration to migration with maximal polarization, whether the economy is segregated or, *a fortiori*, integrated.

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[18] $\underline{y}(\text{int}) \; > \; \underline{y}(\text{seg})$ because $\Phi_m(1) < \underline{d}$

[19] All draw on the observation that $y_j(\text{int})$ is an increasing function of $\Phi_j(1)$, and $\Phi_j(1) < \underline{d}$ for $j = h, m$.

[20] This follows from our assumption that immigrants are in the minority ($q < \frac{1}{2}$), and $\underline{d} > d(1)$.

A high-level steady state holds if there is a level of polarization π such that $d(\pi) < \underline{d}$, and steady state outputs y_h and y_m that satisfy:

$$y_j(\text{int}) = A^{1/(1 - \Phi_{j(\pi)})} [\Phi_j(\pi) / (1 + \Phi_j(\pi))]^{\Phi_{j(\pi)}/(1 - \Phi_{j(\pi)})} \quad \text{for } j = h, m$$

$$(1 - q)\, \alpha\, \pi \log [y_m(\text{int})\, \Phi_m(\pi) / (1 + \Phi_m(\pi))] - \sigma = 0$$

When both a low-level and higher-level steady state coexist in an integrated economy, the steady state that is realized in a market equilibrium, absent intervention, will depend on immigrants' initial income level: when it is sufficiently low, the economy converges to the low level steady state, and if it is high enough, the higher level steady state is realized.

4. Normative analysis and policy implications

The market equilibrium described in section 3 is potentially inefficient in three ways: excessive polarization in interior equilibria; convergence to the low-level equilibrium; and myopic segregation. We now consider each and suggest policy responses.

Excessive polarization. In each period in which an interior equilibrium is realized, both natives and immigrants are dissatisfied with the level of polarization: natives want less than the equilibrium level, immigrants want more. Yet, though they are diametrically opposed in this regard, as their marginal rates of substitution between material and cultural utility are generally different, there is scope for a Pareto improvement, where natives materially incentivize immigrants to assimilate more rapidly, such as through free public schooling. Free public schooling for all children in the mainstream culture, and subsidized adult education, especially language instruction, played a pivotal role in absorbing the waves of

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immigration to the United States during the Mass Migration in the late nineteenth and early twentieth century (Cubberley, 1947; Bowles and Gintis, 2011).[21] The Americanization Movement had the explicit goal of culturally assimilating immigrants and socializing them into American reality.[22] Recent scholarship exploits the timing of compulsory schooling legislation to show that public schooling was effective in this regard (Lleras-Muney and Shertzer, 2015; Bandiera et al., 2019).

To see this formally, consider an integrated economy at an interior equilibrium,[23] where a payment b is made to immigrants on condition that they reduce polarization by $\Delta\pi$, and financed by a tax T on natives such that $T = bq / (1-q)$.[24] Then the marginal effect of this policy on a native is:

$$\Delta U_h = -(1/c_h)\, bq / (1-q) + \xi q \Delta\pi$$

and its effect on an immigrant is:[25]

$$\Delta U_m = (1/c_m)\, b - \theta \Delta\pi$$

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[21] This has the twofold effect of directly moving the next generation closer to the mainstream culture as well as immediately increasing immigrants' disposable income, which itself accelerates growth and assimilation.

[22] In the words of Franklin K. Lane, Secretary of the Interior, quoted in Hill (1919): "[One can promote Americanization] by teaching American history in the American tongue, by giving American standards, by letting American boys and girls know that the history of the United States is not a mere series of fugitive incidents, remote, separated, unrelated, but is a philosophy going through the history of I40 years; by teaching them that those men in America are noble who contribute to the elevation of American ideals and that those men are ignoble who do not add to the march of this philosophy of mankind."

[23] Though Pareto improvement is also possible in a segregated economy, there is more scope for improvement in an integrated economy.

[24] While such policies are often formulated in general terms, applying to all and funded by all, benefits are aimed at immigrants and financed by progressive taxes paid mostly by natives.

[25] As immigrants are maximizing their utility the marginal effect of reduced polarization is the external effect.

For utility to increase for all households, both effects must be positive. This implies:

$$c_h \, (1-q) \, \xi \;\; > \;\; b \, / \, \Delta\pi \;\; > \;\; \theta \, c_m$$

Such a policy is feasible if and only if $c_h \, (1-q) \, / \, c_m \; > \; \theta \, / \, \xi.$ The left hand term is greater the smaller is the immigrant share, and the wealthier are natives compared to immigrants; the right hand term is smaller the stronger is the native aversion to immigrant culture and the weaker is immigrants' attachment to their culture. When natives are sufficiently more affluent and numerous than immigrants, they are able to offer immigrants a mutually attractive contractual exchange of material resources for reduced polarization, that can be implemented without coercion to the benefit of both populations.[26] This highlights the interdependency of immigration and absorption policies.

Summarizing,

Proposition 3. Although natives and immigrants hold opposite views in regard to polarization, there is scope for a Pareto improvement where natives materially incentivize immigrants to assimilate more rapidly. This can be achieved, for example, through free or subsidized public schooling.

Convergence to a low-level equilibrium. The low-level equilibrium trap identified in the previous section suggests that a one-time infusion of resources in the form of unconditional

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[26] Natives may want immigrants to actually benefit from these policies if they want to attract more immigrants. Conversely, there is evidence that excessively severe assimilation efforts aimed at immigrants after World War I, induced a backlash that impeded their absorption (Lleras-Muney and Shertzer, 2015; Fouka, 2019).

absorption grants that effectively boost initial income might offer sufficient incentive to promote more rapid assimilation. Such direct absorption grants were at the heart of Israel's absorption of a very large wave of immigrants from the Former Soviet Union in the 1990s. Such policies are more easily implemented the richer is the host country and the smaller is the relative size of the immigrant population, again highlighting the interdependency of immigration and absorption policies.

Myopic segregation. The results of our single-period and steady state analyses highlight crucial differences between short run and long run considerations for both immigrants and natives. First-generation immigrant parents may be better off in a segregated equilibrium with maximal polarization, though utility is lower in the segregated steady state than in the interior equilibrium of a high-level steady state that could be realized in an integrated economy. Natives may similarly face a tension between the short and long run. If immigrants' initial income is low, so that first-generation immigrants prefer segregation, natives are presently better off with no immigration, though autonomous growth (the parameter A) may be strong enough to propel the economy to an integrated, high-income, low polarization equilibrium in which everyone is better off. Policies that are beneficial on average or in the long run, may yet be highly controversial in the short run and therefore politically difficult to implement.

These observations are consistent with the empirical findings of Tabellini (2019) and Sequeira et al. (2019) that historical immigration to the United States had positive material effects. The former finds detrimental short-run social effects of immigration on the natives, and the latter fails to detect adverse long-run effects. Thus, despite prospective

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material gains, natives may oppose immigration because of the perceived short-term negative social effects, even though these negative effects tend to dissipate in the long term.

5. Conclusion

This paper explores the links between economic growth and the absorption of a culturally distinct minority through the lens of a simple formal model that embeds the social interaction between immigrants and the host population in an aggregate growth framework. Absent cultural accommodation on the part of immigrants, immigration reduces the welfare of the host population, at least in the short run, resulting in a low-level equilibrium trap, which leaves immigrants poor and socially polarized. This is more likely to occur when the immigrant share is large, immigrants own few assets, and are strongly committed to their distinct culture. When immigrants are economically integrated and gradually assimilate in the mainstream culture, their rate of assimilation is too slow for the host population and too fast for the immigrants themselves.

This indicates a role for policies which can incentivize immigrants to assimilate more rapidly, natives offering immigrants a mutually attractive exchange of material resources for reduced polarization. One such commonly implemented policy is free or subsidized schooling in the majority culture. Unconditional absorption grants that boost initial income may also promote more rapid assimilation. Such policies are more easily implemented the richer is the host country and the smaller is the immigrant share, the greater the human and financial capital of the immigrants, and the weaker their commitment to a distinct cultural identity. Adding to the difficulty of successfully absorbing a distinct

immigrant community is the tension between immediate cultural costs and future economic benefits.

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