Distortions and the Life Cycle of Immigrant-Owned Firms*

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May 2026

Abstract

Using administrative data covering the universe of Canadian incorporated firms, we document systematic differences between immigrant and native owned firms over the life cycle. At entry, immigrant firms have lower sales, employment, and capital. Although these gaps narrow with age, they persist even after 20 years of operation. Immigrant-owned firms face substantially higher capital distortions at entry, but these differences disappear within 15 years, whereas labor distortions are smaller yet persist throughout the life cycle. We develop a quantitative general equilibrium model in which immigrants face tighter collateral constraints, higher labor costs, and lower wages than natives. Together, these frictions replicate the observed life-cycle dynamics and cross-sectional differences between immigrant and native firms. While immigrant entrepreneurs gradually overcome financial constraints through self-financing, early-life capital distortions, persistent labor frictions, and wage gaps leave lasting disparities in firm outcomes. These barriers reduce immigrant job creation, lower aggregate productivity, and diminish welfare for both immigrants and native workers.

JEL codes: J15, O1, O4, O5
Keywords: immigrant entrepreneurs, access to finance, TFP, micro data

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1 Introduction

Immigrants make up an increasingly large share of the population in many developed economies. In the US, the immigrant population share rose from 8 percent in the 1980s to 16 percent by 2015, and a similar trend is observed in Canada where the share of immigrants is 23 percent (2021). As their population share has expanded, so has their importance in the labor market, and especially as entrepreneurs who create jobs (Fairlie and Lofstrom, 2015; Azoulay et al., 2022). Correspondingly, it is also well known that immigrants face challenges in the labor market from limited transferability of their skills (human capital) to various forms of barriers which affect their success as entrepreneurs and workers. How effectively immigrants utilize their skills in the presence of these frictions has important implications for aggregate productivity and welfare, and has attracted increasing attention in both academic and policy circles.

Despite the growing economic importance of immigrants, our understanding of the firms they operate and the challenges they face remains limited. We know little about immigrant-owned firms based on representative data spanning full size distribution of firms. How do they perform relative to native owned firms? Do immigrant entrepreneurs face greater barriers to operating a business, such as access to finance or hiring workers? And importantly, are initial differences temporary and quickly overcome—reflecting early stage constraints—or are they persistent over the life-cycle?

In this paper, we document that immigrant firms in Canada under-perform and face greater barriers to operating a business relative to native owned firms. These gaps emerge at the start of a firm and persist over the life-cycle. Importantly, we show this is a robust pattern that holds across the size distribution of firms, and across firms that grow relatively fast. We attribute these differences to disparities in access to finance and persistent labor market frictions that disproportionally affect immigrants. Quantitatively, we find that distortions on immigrant entrepreneurs reduce aggregate output by more than half a percentage point—an

impact larger than many growth-oriented policy reforms undertaken in advanced economies. Equalizing immigrant distortions to native levels are welfare improving overall, where over 90 percent of the population experience welfare gains. However, there are relevant distributional impacts as native entrepreneurs become displaced or downsize.

We use the Canadian Employer–Employee Dynamics Database (CEEDD), which covers the universe of incorporated Canadian firms from 2001–2016. The data allow us to distinguish immigrant and native-owned firms, and track their outcomes over the life cycle using a rich longitudinal panel. We find that immigrant-owned firms are smaller relative to natives, whether measured by sales, capital or labor, and this holds across a fine disaggregation of industries, firm sizes and owner characteristics. At entry (after one year of operation), immigrant sales are 30 percent lower than those of native firms. Over the life-cycle, immigrant firms grow faster but do not fully catch-up (i.e., converge) to native firms even after 20 years of operation. We find larger initial gaps in capital at entry (in the range of 40 percent) and observe faster convergence relative to sales and labor which are more persistent.

To assess the role of distortions on immigrant and native firm performance, we follow the misallocation literature and measure capital and labor wedges using firm-level revenue products (Restuccia and Rogerson, 2008; Hsieh and Klenow, 2009). Immigrant firms face distortions that are 10-15 percent higher than those faced by natives. At entry, immigrants face relatively large capital distortions, but these decline and converge to native levels within 15 years. In contrast, labor distortions are smaller but persist over the life cycle. Accordingly, we interpret this evidence as reflecting financial constraints that can be gradually overcome, alongside labor distortions that reflect more permanent frictions or bias.

These findings are robust across alternative specifications and cuts across the data. For instance, Fairlie et al. (2010) and Green et al. (2023) document that immigrants disproportionally operate as self-employed businesses or as a last resort. Our results hold when excluding self employed firms as well as firms created by investor class immigrants as a precondition for

migration. In addition, these patterns are also evident among educated immigrant business owners as well as firms that survive and grow over a 10-year span. More strikingly, we find that immigrant firm under performance and higher distortions are most evident migrants from non-Western countries, or said differently, among migrants who are visible minorities.

We interpret these findings through a general equilibrium model with heterogeneous producers along the lines of Buera et al. (2011) and Moll (2014) to quantify its impacts on aggregates, immigrant job creation and welfare. People differ in entrepreneurial ability and wealth, and choose between entrepreneurship and wage employment. Consistent with the evidence in Azoulay et al. (2022) and Martellini et al. (2024), we assume a common distribution of entrepreneur ability across immigrants and natives. Entrepreneurs finance capital by using wealth as collateral. We include three broad frictions that disproportionately affect immigrants consistent with our evidence: tighter collateral constraints, a reduced form tax on hiring workers, and an immigrant wage gap.

The calibrated model closely replicates key features of the data, including immigrant-native firm performance across the size distribution and over the life cycle. At entry, immigrants can borrow 30 percent less than a comparable native entrepreneur, but these constraints are largely overcome within 15 years through self-financing. Persistent labor market distortions play an amplifying role and are important to replicate life-cycle differences across immigrants and natives.

In our counterfactual simulations that equalize immigrant access to finance and labor, aggregate output and TFP rise by more than half a percent. This is proportionally large as immigrants account for 20 percent of the population, and we find aggregate impacts above 2 percent when their population share expands to 40 percent. Among immigrants, this equalization raises their output by 80 percent and productivity by 8 percent.

We use our framework to contribute to the debate on immigrant job creation, recognizing their role as entrepreneurs who create jobs and workers who take jobs. While Azoulay et al.

(2022) finds that immigrants are net job creators, we show that in the presence of distortions, immigrant firms operate below optimal scale and are net job takers. Once distortions are equalized, immigrant net job creation exceeds 7 percent and raises total employment by 2 percent consistent with Azoulay et al. (2022). Accordingly, whether immigrants are net job creators depends critically on the frictions they face. We further show that different distortions affect distinct economic margins: easing financial constraints generates larger productivity gains, while reducing labor distortions generates larger employment gains.

Lastly, we assess the distributional welfare impacts of reforms that equalize immigrant access to finance and labor. All immigrants experience welfare gains, and especially among entrepreneurs who operate closer to optimal scale. Native welfare also rises on average, primarily from higher wages due to increased labor demand. However, incumbent native entrepreneurs experience welfare losses from downsizing due to increased competition, while others experience larger losses from exiting entrepreneurship altogether. Although this group accounts for about 12 percent of the total population, their economic influence may shape the political feasibility of such reforms.

In line with these insights, we examine the short- and long-run effects of expanding immigration consistent with current policy debates. When immigrants face existing distortions, expanding immigration reduces TFP, net job creation, and native welfare. In contrast, when these distortions are lowered—even partially—the same expansion increases TFP, net job creation, and native welfare. These results highlight that the gains from immigration depend critically on the barriers immigrants face as entrepreneurs. As such, reducing these barriers is a precondition for realizing the economic benefits from higher immigration.

Our paper adds to a growing literature on the challenges faced by traditionally disadvantaged entrepreneurial groups. For instance, the evidence points to black entrepreneurs facing larger barriers to business expansion and weaker firm performance in the US (Hsieh et al., 2019; Bento and Hwang, 2023; Tan and Zeida, 2024). Likewise, several papers have documented

that female entrepreneurs underperform and face higher barriers to business operation, particularly in accessing finance.[1] Our work emphasises immigrant barriers to entrepreneurship in an advanced immigrant-centred economy like Canada. Importantly, and different from these papers, we examine changes over the life-cycle and the distributional consequences across groups and employment.

We also relate to a small but growing empirical literature using the CEEDD to study immigrant businesses (Green et al., 2016; Fung et al., 2019; Cardoso and Ramanarayanan, 2022; Green et al., 2023). These studies primarily examine self-employed immigrant firms or trade with their country of origin. In contrast, we develop a structural model to provide quantitative evidence on the macroeconomic consequences of immigrant firm under-performance. In fact, aside from Azoulay et al. (2022) who focus on immigrant job creation in the US and Birinci et al. (2024) who focus on immigrant workers in the US, there are limited macro-level studies on immigrant entrepreneurship. More broadly, our work complements recent evidence on rising misallocation in Canada (Chen and Tombe, 2025) by highlighting the role of distortions between immigrant and native firms.

The rest of the paper proceeds as follows. In section 2 we describe our data and present evidence on immigrant firm performance and distortions as a snapshot and over the life-cycle. In section 2.4 we show these patterns are robust to a variety of sensitivity checks. In section 3 we present the model and section 4 presents the calibration, model fit and external validation. Section 5 presents the impacts on aggregate, job creation and welfare from hypothetical reforms that equalize access to finance and labor, in isolation and jointly.

[1] See for instance Cuberes and Teignier (2016); Hardy and Kagy (2018); Morazzoni and Sy (2022); Chiplunkar and Goldberg (2024); Ranasinghe (2024); Lopez and Ranasinghe (2025). In a related context, see Goraya (2023) who examines differential entrepreneurial distortions across caste groups in India.

2 Immigrant and native firms in Canada

2.1 Data

We use the Canadian Employer-Employee Dynamics Database (CEEDD) which is a matched employer-employee database that covers the universe of Canadian firms and individuals, and is based on tax records. The data is longitudinal starting from 2001, and our access to the data goes till 2016. A key feature of the database, through its linkable files, is that it provides detailed and reliable information on immigrants in Canada based on their landing documents. The CEEDD also records firm ownership structures, allowing us to accurately identify firm owners. By linking ownership data with immigrant records and individual tax files, we are able to distinguish between firms owned by immigrants and those owned by natives.

We amalgamate this information to construct a comprehensive sample covering the universe of Canadian private firms across all industries (except for agriculture, mining, and utilities) for the period 2001–2016. Our dataset includes firm-level balance sheet data such as sales, assets, number of workers, intermediate input costs and wage bills, along with industry classification (detailed up to the 4-digit NASIC level) and location (at the provincial level). Additionally, it documents firm owner characteristics such as age, gender, and immigrant status. For immigrant owners, the dataset also reports education level and country of origin, based on their landing documents.

Immigrants in the data refer to individuals who are born outside of Canada and later become permanent residents, some of whom also become citizens, and native refers to a person born in Canada. Accordingly, immigrants correspond to first-generation Canadians, whereas natives correspond to second-generation or higher Canadians. We note that the data does not allow us to distinguish second generation immigrants jointly with business ownership. We define a firm as immigrant-owned if its primary owner—the individual holding the largest ownership share—is an immigrant.[2] Throughout the paper, we use firm and entrepreneur

[2] Alternatively, firms can be defined as immigrant-owned based on: (i) immigrant presence, where at least

interchangeably.

We restrict our analysis to incorporated, single-location firms, and in the Appendix describe the data cleaning process in more detail. The final dataset consists of a panel of over 3 million firm-year observations from 2001-2016, of which 16 percent are immigrant-owned. Tables A.1 and A.2 in the Appendix present summary statistics for the key variables, along with the industry composition of immigrant-owned and native-owned firms.

2.2 Immigrant and native firm performance

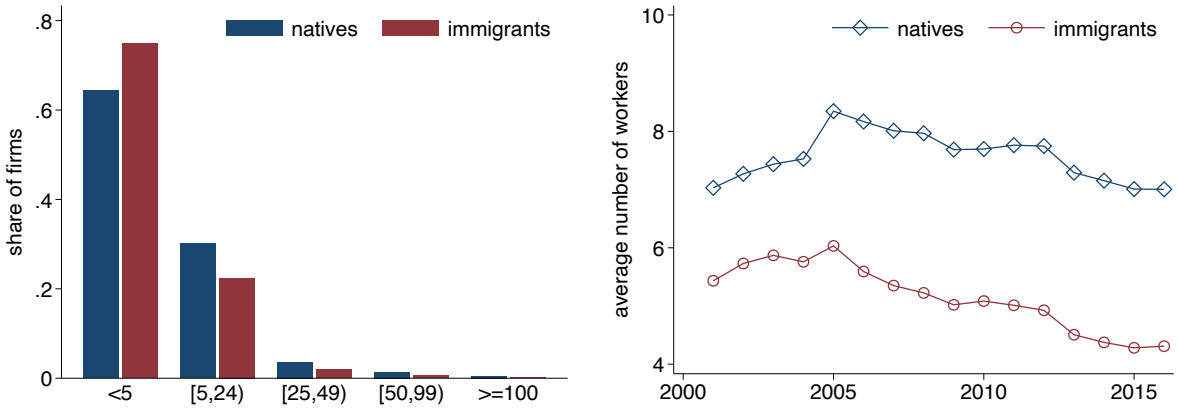
We begin by using the full sample of firms in our data, and pooling across years, to document differences across immigrant and native firms. We later show that our central findings hold across relevant sub-samples in the data.

Figure 1a shows the size distribution of firms (number of workers) across immigrant and native firms. An overwhelming majority of firms in Canada are small, and immigrant firms are disproportionally smaller across the size distribution. For instance, the share of firms with fewer than 5 and 25 workers account for 70 and 95 percent of all native firms, whereas for immigrant firms it is 80 and 98 percent. Figure 1b shows average firm size across years in our sample. Immigrants operate smaller firms and is a pattern that has remained fairly stable over time.[3] For example, in 2011 average firm size for an immigrant firm is 4.7 workers and for a native is 7.2 workers, a relative firm size gap of 1.5 that has also remained stable. It is known that immigrants are more prone to operating self-employed businesses which contributes to their lower size (Fairlie et al., 2010, Green et al., 2023, Doyle et al., 2025). We note however that immigrants operating smaller firms also holds when we exclude self-employed firms for our sample.

one owner is an immigrant; or (ii) immigrant ownership share, based on the share of immigrant owners in a business. Our findings remain robust to using these alternative definitions.

[3]The share of immigrants, both at the population level and among business owners, has increased between 2001 and 2016 (from 20 to 23 percent, and 10 to 25 percent respectively). We account for these trends in our empirical estimates (see Figures 2 and 3) with an interaction of year fixed effects and also cohort fixed effects.

Figure 1: Firm size (number of workers)



(a) Firm size distribution

(b) Average size

To further get at the differences across immigrants and natives, we disaggregate across industries, region and time and control from business owner characteristics. More formally, we run the following regression:

$$\log(y_{it}) = \beta \text{ immigrant}_i + \mathbf{X}_i + \Lambda_t + \varepsilon_{it}, \tag{1}$$

where y_{it} is an outcome of interest for a firm i in year t, immigrant$_i$ is an indicator for whether a firm is immigrant owned, $\mathbf{X}_i$ is a vector of controls for firm and owner characteristics such as gender and age, firm industry fixed effects (at the 4-digit level), location (province) fixed effects and Λ_t are year fixed effects. To the extent that immigrants are more prone to sorting into particular industries and provinces or that the share of immigrants has risen over time will be accounted for by these fixed effects.

Table 1 reports estimates from equation 1 for an immigrant firm ($\hat{\beta}$), relative to natives, when value-added sales, capital used in production (measured by total tangible assets), number of workers (labor), and total wage bill are the dependent variables.[4] The estimates are based on

[4]The number of workers are based on average monthly employment over the past year. The does not distinguish between part-time and full-time positions, nor do they report hours worked. Therefore, in addition to employment, we report the wage bill to account for differences in hours worked and worker quality between native and immigrant firms.

robust standard errors; and our results also hold if we instead cluster by industry and year. We find a significant disparity between immigrant- and native-owned firms, where immigrant firms on average generate 33 percent less value added (log difference = -0.407), use 42 percent less capital (-0.553), and operate firms that employ 30 percent fewer workers (-0.359) and pay 40 percent lower total wages (-0.514). That immigrants operate smaller firms and earn lower income is consistent with the evidence for the US (Kerr and Kerr, 2020, Fairlie and Lofstrom, 2015 and Azoulay et al., 2022). We later show the pattern that immigrants operate smaller firms (whether measured by sales, capital, labor or the wage bill) is one that holds across larger firms and non-self employed firms, smaller firms, accounting for survival, and among highly educated immigrants entrepreneurs.

Table 1: Immigrant firm outcome differences

	(1) Value added	(2) Capital	(3) Labor	(4) Wage bills
Immigrant	-0.407^{***}	-0.553^{***}	-0.359^{***}	-0.514^{***}
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	3,498,932	3,505,469	3,509,497	3,509,496
Adj. R^2	0.106	0.175	0.225	0.119

Notes: The estimates are based on a pooled sample and include the controls in equation (1). Dependent variables are in logs. Standard errors are in parenthesis and ***, **, * denote significance at the 1, 5 and 10 percent level.

We next examine whether these differences across immigrant and native firms are persistent over the life-cycle of a firm. While much of the previous literature has documented immigrant-native differences based on cross sectional data, the panel structure of the CEEDD allows us to follow firms and document how these differences evolve over time. To this end, we amend our regression to explicitly account for differential effects across immigrant and native firm age as follows:

$$\log(y_{itac}) = \sum_a \beta_a \text{ immigrant}_i \times \text{age}_a^f + \sum_a \gamma_a \text{ age}_a^f + \mathbf{X}_i + \Lambda_t + \Gamma_c + \varepsilon_{itac}, \tag{2}$$

where age_a^f is a vector of indicators for firm age, and with the same set of controls $\mathbf{X}_i$ from equation (1), as well as year fixed effects Λ_t and cohort fixed effects Γ_c. We also include an interaction between year FEs and the immigrant indicator to control for any differential changes to immigrant firms over the sample period.[5]

The estimated coefficients for γ_a capture the life-cycle profile of native-owned firms while the coefficients $\beta_a + \gamma_a$ capture the profiles of immigrant-owned firms. Even though our dataset spans 16 years (2001-16) we report firms up to 20 years of age since many are incumbent businesses at the start of CEEDD.[6] To be clear, our estimates are based on an unbalanced panel that includes all surviving firms at any age—that is, firms are included in the regressions until their point of exit.

Figure 2 panels (a)–(d) plot the life-cycle profiles for value added sales, capital, labor, and wage bill for immigrant and native firms.[7] All estimates are presented relative to a one-year old native firm with comparable characteristics, based on our controls, which we refer to as a benchmark firm. We highlight three main patterns in the data for value added, and note these patterns also hold for capital, labor, and wage bill. First, firm sales rise with age for both immigrant and native firms. Second, a one-year old immigrant firm has lower sales relative to a comparable native firm (about 40 percent lower), and it takes more than 10 years for immigrant firm value added to equal that of a benchmark firm. Third, our estimates imply some degree of convergence where the gap between immigrant and native sales shrink over their life-cycle. Nevertheless, even after 20 years of operation, and contingent on surviving, there remain substantial gaps between immigrant and native firm sales.

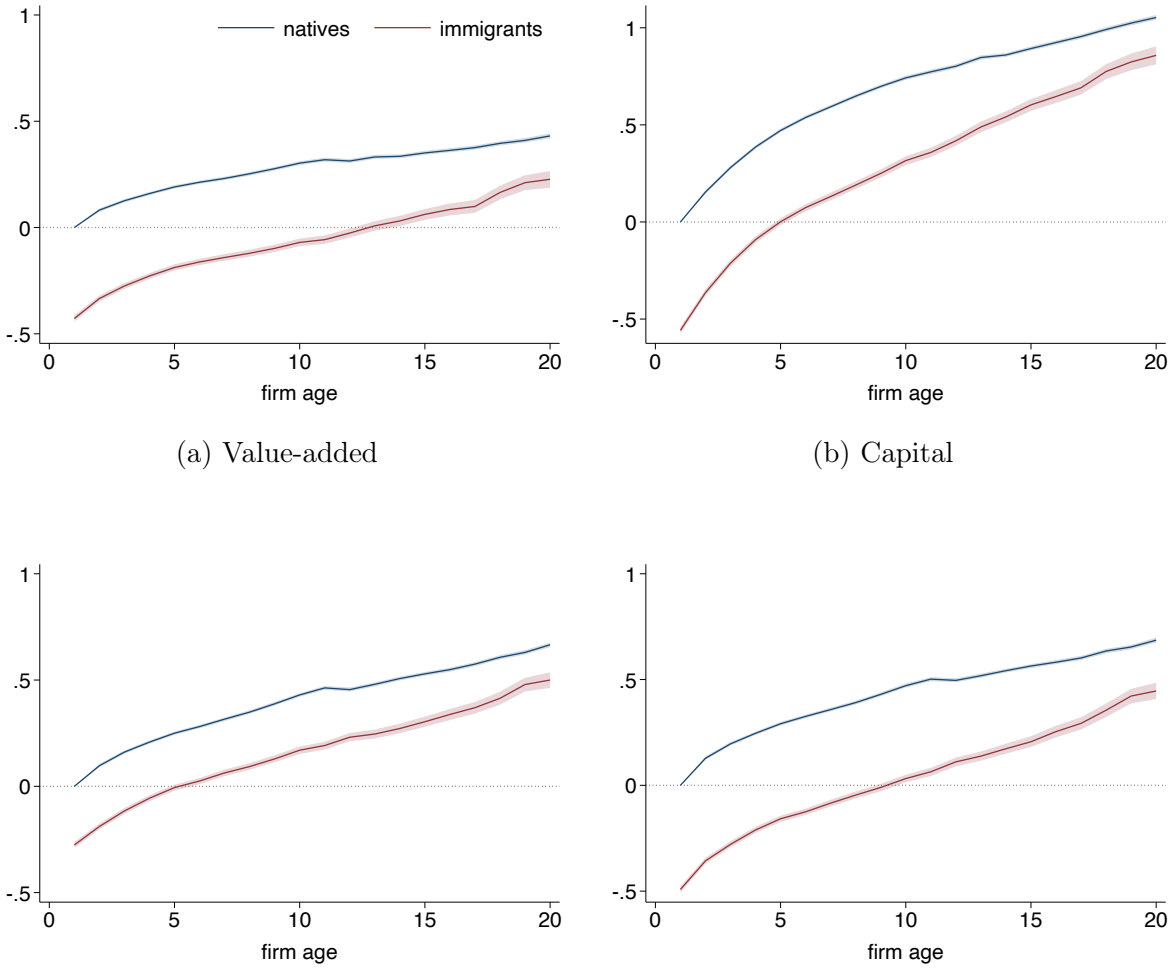
We also highlight several features for capital and labor. While a one-year old immigrant firm

[5]Since age, time, and cohort effects are collinear by construction, we cannot include all three fixed effects simultaneously. We address this by approximating cohort effects with a linear cohort trend and an indicator for whether a firm was founded in a recession year. The results reported here are robust to alternative methods, including normalizing either year or cohort fixed effects.

[6]We can report firms up to 28 years of age though there are fewer observations for these later years. We have also verified that our results hold when focusing on entrants after 2001.

[7]Appendix Figure A.1 presents the estimated differences in these outcomes between immigrant and native firms ($\hat{\beta}_a$) over the life cycle.

Figure 2: Firm performance over life cycle



(a) Value-added

(b) Capital

(c) Number of workers

(d) Wage bills

Notes: Solid lines are the estimates for immigrant ($\hat{\gamma}_a + \hat{\beta}_a$) and native ($\gamma_a$) firms over the life-cycle based on equation (2). Shaded areas represent the 95% CIs. Figure A.1 in the appendix shows the estimated differences between immigrant and native firms ($\hat{\beta}_a$) over the life cycle.

has less capital and fewer workers relative to a comparable native firm, it takes fewer years to catch-up to the benchmark firm (about 6 and 7 years respectively). In addition, while the immigrant gap in the first year is largest for capital, the estimates show faster convergence in capital relative to that for labor (and sales), where after 20 years the gap in capital between an immigrant and native firms is approximately 18 percent. We also stress that while the estimates suggest a narrowing gap between immigrants and natives later in the life-cycle,

these gaps are presumably larger as our estimates do not account for higher exit rates among immigrant firms early in the life-cycle.[8]

2.3 Distortions across immigrant and native entrepreneurs

A key insight from the misallocation literature is that frictions or distortions on production, especially when they systematically vary across firms, can have important impacts on the allocation of resources across firms and on aggregate (Restuccia and Rogerson, 2008; Hsieh and Klenow, 2009). We now use the insights from this literature to interpret the observed differences in sales, capital and labor across immigrant and native firms. This can be especially relevant in our context if immigrant business owners face barriers from the supply side, especially early in the life of a firm, which may account for the patterns documented in Figure 2.[9] Such barriers can be related to capital such as restricted or more costly access to finance, and/or related to labor and output such as access to workers or delays obtaining licenses and permits. We abstract from demand-side frictions and focus our analysis on supply-side factors that can be more carefully measured in our data.

We focus on the average revenue product of capital (ARPK) and the average revenue product of labor (ARPL) following Hsieh and Klenow (2009), Morazzoni and Sy (2022), Goraya (2023) and Tan and Zeida (2024), which are associated with frictions or distortions that affect production. As is standard, we use the wage bill as a proxy for labor inputs when calculating ARPL to account for differences in worker quality and hours worked across the two groups of firms. Higher values for ARPK are indicative of a firm facing high capital distortions on production, and high values for ARPL imply high labor market distortions. A key feature of these measures are they are independent of firm productivity; that is, any differences in

[8] In the data, immigrant firms have higher exit rates in the first five years of the life-cycle. If low productivity immigrant firms are more likely to exit in the early years—assuming a common distribution of talent—this would suggest surviving immigrant firms are more productive on average later in the life-cycle and imply wider gaps relative to natives had they not exit.

[9] We use the term 'barriers' to broadly to encompass challenges to integration and adaptation to Canadian cultural norms and practices, as well as overt and subtle forms of discrimination.

ARPK and ARPL are due to capital and labor market frictions, and not attributable to differences in immigrant and native firm productivity.

Table 2: ARPK and ARPL differences

	(1) ARPK	(2) ARPL
Immigrant	0.145***	0.107***
	(0.002)	(0.001)
Observations	3,495,416	3,498,931
Adj. R^2	0.158	0.067

Notes: The estimates are based on a pooled sample and include the controls in equation (1). Dependent variables are in logs. Standard errors are in parentheses and ***, **, * denote significance at the 1, 5 and 10 percent level.

We now estimate equation (1) using the log of ARPK and ARPL as dependent variables. Table 2 reports the estimates. The ARPK estimate is positive and shows that immigrant firms face a 15 percent higher capital distortion relative to native firms. Similarly, the estimate for ARPL is also positive, albeit smaller in magnitude, suggestive of sizable labor market distortions faced by immigrant entrepreneurs relative to natives. Consistent line with the misallocation literature, this evidence suggests that immigrant entrepreneurs face higher distortions in capital and labor markets–namely, higher barriers to accessing capital and hiring workers. These frictions may contribute to their lower use of capital and labor in production, and ultimately, to their lower value-added sales.

To further examine how these distortions vary over the life-cycle we estimate the regression from equation (2) with the log of ARPK and ARPL as dependent variables. Figure 3 panel (a) plots the estimates of capital distortions for immigrant and native firms over the life-cycle—the left panel shows ARPK estimates relative to a benchmark (1 year old) native firm, and the right panel shows the level difference between natives and immigrants.[10] Again, we

[10] An alternate view is that differences in ARPK, after controlling for the capital to labor ratio, can reflect variations in pricing markups charged by firms as shown by Tan and Zeida (2024), where a lower ARPK is

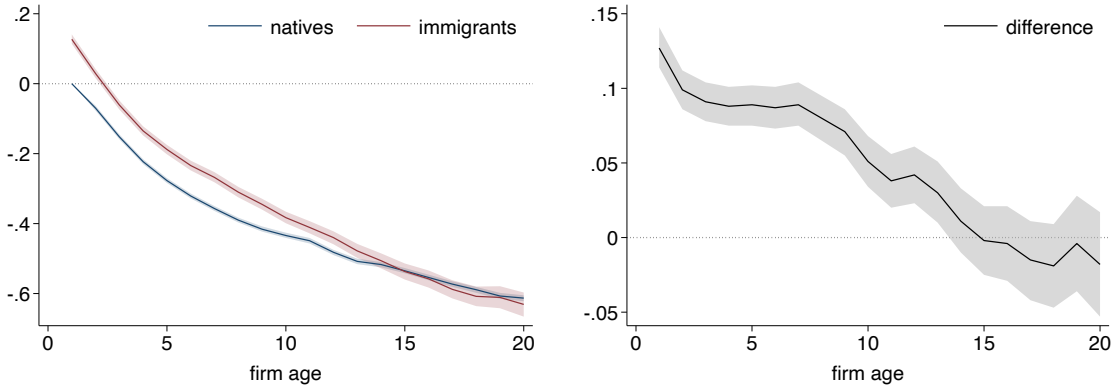
note that our estimates are based on an unbalanced panel of surviving firms at each age. We highlight three key patterns based on our estimates. First, capital distortions fall over the life-cycle of a firm, and this holds for both immigrants and natives. Second, a one-year old immigrant firm faces higher capital distortions (about 15 percent higher) relative to a comparable native firm. And it takes about 3 years for an immigrant firm to face the same capital financing friction as a one-year old native firm. Third, while immigrant firms initially face relatively higher capital distortions this gap narrows over time and fully closes by year 15 of a firm's life (the right panel shows the ARPK difference narrows to zero). Said differently, capital distortions fall at a faster rate for immigrant firms such that there are no measured differences in access to finance between immigrant and native firms later in the life-cycle. Despite this convergence, this does not imply capital distortions are unimportant for understanding differences in sales, capital and labor. This is because (i) higher capital distortions early in the life-cycle can have lasting impacts on firm outcomes, and (ii) the estimates do not account for immigrant firms that may have exited as a result of higher costs to finance capital as shown in Haltiwanger et al. (2013).

Figure 3, panel (b), presents estimates of labor distortions based on ARPL over the life cycle, and where the left and right panels show values relative to the benchmark firm and level differences over time. Similar to capital distortions, labor related distortions decline as firms age for both immigrant and native owned firms. However, unlike capital distortions, the gap in labor distortions is more persistent. Even after 20 years, immigrant firms face labor distortions that are 3 percent higher than native firms. Moreover, during the first 10 years of a firm's life cycle the relative gap in ARPL is quite flat—there is little to no relative decline in the labor distortion between the two groups—which is contrast to the capital distortion based on ARPK.

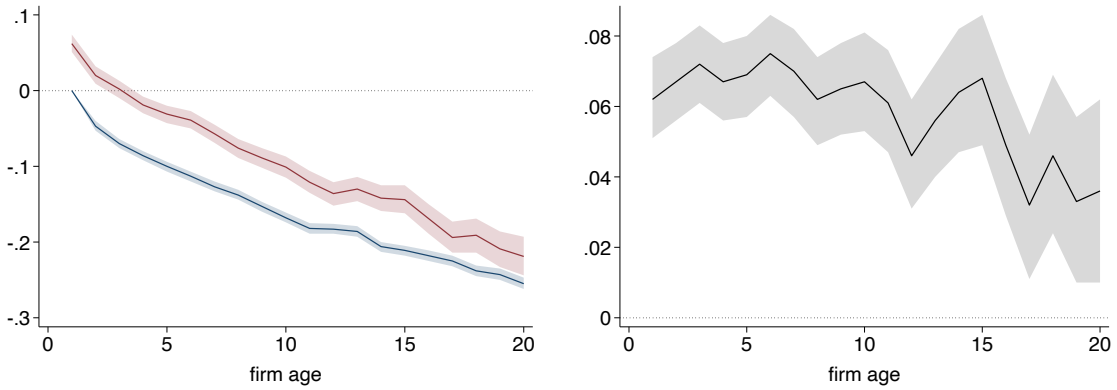
We emphasise these results, especially its life cycle patterns, noting that much of the literature

indicative of a lower markup. Under this approach, we find perhaps surprisingly that immigrant entrepreneurs exhibit marginally higher markups (about 3 percent) compared to native firms, and this persists up to 15 years of a firm's life cycle.

Figure 3: Distortions over the life cycle



(a) ARPK



(b) ARPL

Notes: Solid lines are the estimates for immigrant ($\hat{\gamma}_a + \hat{\beta}_a$) and native ($\gamma_a$) firms over the life-cycle based on equation (2). Shaded areas represent the 95% CIs. Figure A.1 in the appendix shows the estimated differences between immigrant and native firms ($\hat{\beta}_a$) over the life cycle.

that examines immigrant and native firm differences cannot assess capital or labor market distortions due to data limitations. Because our data includes firm capital and wage bills, and because our data is longitudinal, we can evaluate how these frictions vary across immigrants and natives both as a snap shot and track its evolution over the firm's life-cycle.

Overall, we find that immigrant firms are smaller, use less capital in production and earn lower sales relative to native firms. These patterns hold consistently across the life-cycle of these firms. We also show, based on ARPK and ARPL, that immigrant firms face greater

financial barriers, particularly in their early in the life cycle, while the gaps in labor-related barriers remain persistent throughout the life cycle.

2.4 Sensitivity

We now consider several sensitivity tests to assess whether the patterns we have documented are robust across various cuts to the data. In particular, we repeat our analysis from above by restricting the sample to larger and more committed firms, smaller firms, accounting for immigrant talent, accounting for differences across manufacturing and service sectors, and lastly, we document that much of immigrant firm underperformance and high distortions on production are experienced by immigrants who are visible minorities (non-Western countries). We discuss our main findings below and report all results in the Appendix. For the sake of brevity, we present select life cycle panels from Figures 2 and 3, and note that all of the omitted panels and cross-sectional regressions have consistent results to the ones we discuss.

Entrepreneurial talent. The literature on immigration offers competing views regarding immigrant talent, one that points to immigrants as more entrepreneurial and innovative due to strict selection standards required for migration (Fairlie and Lofstrom, 2015; Azoulay et al., 2022; Martellini et al., 2024), while others point to immigrants as less talented businesses owners due to limited acclimation in their new society, outside options or under recognition of their experience (Kerr and Kerr, 2020). In our regressions we are unable to control for entrepreneurial talent. Hence, that immigrant firms under-perform relative to natives (lower sales and inputs in production) could be because they are less productive business owners or have less entrepreneurial talent. In contrast, if immigrant entrepreneurs are more talented on average our baseline estimates in Figure 2 would understate the immigrant-native sales and input gaps. We note again that high distortions among immigrants, however, is not a story about differences in talent since ARPK and ARPL are measures independent of entrepreneur productivity.

We now restrict the sample to high educated (college/university) immigrants and compare them relative to the *full* sample of natives.[11] Figure B.2 shows that the life-cycle patterns continue to hold when excluding low educated immigrant entrepreneurs. Notably, educated immigrants appear to converge more quickly to natives compared to the baseline results that include all immigrants—it takes about 10 years, rather than 15, for the gap in access to finance to disappear. This is consistent with the idea that educated immigrant entrepreneurs are more likely to pursue capital-intensive ventures where they are initially financially constrained but overcome these constraints more rapidly than their less-educated counterparts.

'Committed' and larger firms. That immigrant firms under-perform (based on sales, capital and labor), and face higher barriers to capital and labor can be due to fundamental differences in their motive for entrepreneurship. For instance, immigrants may be less committed to growing their business and have different preferences for entrepreneurship than standard profit maximization motives. In addition, immigrants may pursue entrepreneurship due to a lack of employment opportunities ('out of necessity') or as a way to gain permanent residency (Fairlie et al., 2010; Doyle et al., 2025). We note that our results are based on incorporated businesses where these concerns are presumably less pertinent. Nevertheless, we address these concerns in three ways. First, we exclude from our sample immigrants whose entrance criteria into Canada required establishing a business, and thereby focus on immigrants that voluntarily choose entrepreneurship. Second, we exclude low growth firms to plausibly remove less serious or committed entrepreneurs. And third, we restrict the sample to larger firms.

One issue is the importance of investor class immigrants in Canada that may influence our results.[12] These are immigrants that are required to start a business as a precondition for

[11] Education levels are available for immigrants through their landing documents, however, there is no education-related information for natives in the CEEDD.

[12] Under Canada's Business Immigration Program foreigners with previous business experience and/or sufficient funds for business investment—broadly referred to as investor class immigrants—were given an alternate and expedited route to migrate to Canada. As documented in Fairlie et al. (2010) and Green et al. (2023), these firms account for less than 10 percent of all immigrant firms and many of them do not survive

permanent residency, and so a concern is that these immigrants set up 'ghost' firms with no serious entrepreneurial intent. Figure B.3 reports the results when we exclude investor class immigrants. Our estimates are essentially identical to our baseline results implying that investor class immigrants are not driving our results; we also verify that our results hold when focusing exclusively on investor class immigrants (i.e., remove all other immigrant firms), suggestive that investor class immigrants are not more 'entrepreneurial' than immigrants using standard methods for migration consistent with Green et al. (2023).

To focus on committed and serious entrepreneurs, we restrict the sample to firms that survive for at least ten years and show evidence of meaningful growth. We implement two alternative restrictions. First, we exclude firms that, after ten years of operation, fall below the 10th percentile of firm size (measured by number of workers) within their cohort.[13] Second, we exclude firms that remain self-employed at age ten. Both restrictions ensure that we focus on firms that not only survive but also demonstrate sustained economic growth, thereby filtering out dormant or short-term entrepreneurs. Table B.3 shows that our baseline findings persist in these restricted samples: immigrant firms under-perform and exhibit higher capital and labor distortions even among those that survive and grow.

As a final approach, Table B.4 reports life-cycle patterns for a subset of larger firms. We focus on two alternative samples: (i) firm-year observations in which firms have more than two workers, and (ii) firms whose average size over their life cycle exceeds the 10th percentile within their cohort. These subsamples are similar in spirit to the earlier restrictions but have the advantage of relying on simple, transparent cutoff rules and do not require firms to survive for at least ten years. They are intended to exclude self-employed and small family-run firms, which are known to be more prevalent among immigrant entrepreneurs (Green et al., 2023). The results show that patterns for value-added and capital remain broadly consistent with

beyond 2 to 3 years.

[13] Alternatively, we could exclude firms whose 10-year *growth rates* fall within the bottom 10th percentile of their industry. Results are robust to this specification. While one could apply a higher threshold, this risks excluding firms that grow slowly due to the very distortions we seek to measure.

our baseline estimates, though the estimated differences between immigrant and native firms are smaller. Capital and labor distortions, as measured by ARPK and ARPL, also follow similar trends: capital distortions are higher among immigrant firms (though the initial gap is smaller than in the baseline) and decline over time, while labor distortions remain relatively flat throughout the life cycle. Thus, while some of the observed differences in earlier figures are indeed driven by small and self-employed immigrant firms, there remain sizable and statistically significant gaps in firm performance and capital and labor market distortions once these firms are excluded. In addition, it is useful to again emphasize the measures for ARPK and ARPL are independent of productivity, and it may well be that self employed and small immigrant firms remain as such because high capital and labor distortions preclude firm expansion.

Smaller firms. In contrast to the above, it may be that large firms, who are disproportionally native, earn high sales and have easier access to capital and labor that skew our results. To address this we restrict our analysis to firms that have fewer than 100 workers, in essence removing any impacts driven by very large firms. As shown in Table B.5, the estimates are essentially unchanged implying that our results are not due to the disproportionate number of large native firms. While not reported, we also find that our baseline results hold across other size thresholds and ranges.

Manufacturing and Services Industries. It is also documented that immigrants operate in a narrow set of sectors, ranging from high skill industries such technology and professional services to more low skill industries such food service and restaurants (Green et al., 2016; Fairlie and Lofstrom, 2015; Kerr and Kerr, 2020). We now re-run our analysis for firms in manufacturing and services separately. We also emphasize that all our prior estimates include industry fixed effects at the 4-digit level. Although less precisely estimated due to a smaller sample size, the estimates for manufacturing exhibit similar patterns to our baseline results; the estimates for services, which account for the majority of observations, is very close to

our baseline results (Table B.6). When comparing across manufacturing and services, the relative gaps between immigrants and natives in sales and capital are larger in services both initially and over the life-cycle. However, the relative gaps in ARPK are modestly larger in manufacturing over the life-cycle consistent with manufacturing being capital intensive and immigrants facing relatively larger financing constraints in these industries. We also find that ARPL differences are modestly larger in manufacturing perhaps because these firms are larger. Again, these estimates should be interpreted in the context of the smaller sample size for manufacturing and entrepreneur selection across these broad industries.

Region of origin. Lastly, we briefly examine firm outcomes and distortions by immigrant region of origin. We group immigrant entrepreneurs into two regions—Asia, Africa, and Latin America, and the West (United States, United Kingdom, and Western Europe)—and compare their outcomes with native entrepreneurs in Canada. As shown in Table B.7, immigrants from the West share similar outcomes and distortions to native firms throughout the life cycle. In contrast, immigrants from Asia, Africa, and Latin America exhibit sizable gaps in firm outcomes and distortions over the life cycle, consistent with our baseline results on immigrant firms (Figure B.4).

These findings suggest that firm under-performance and higher distortions are concentrated among immigrants from poorer, often non-English-speaking regions—that is, visible minorities. This points to institutional background and cultural proximity as potentially important determinants of immigrant entrepreneur performance.[14] We leave a deeper investigation of these sources and differences for future work.

[14]By 'culture' we mean language, customs, and behavioral expectations common in Canadian society. Because we cannot identify second-generation immigrants in the data, we cannot fully disentangle the role of cultural factors. In addition, we are unable to verify whether migrants from the West are visible minorities.

3 Model

We now present a model of financial frictions along the lines of Buera et al. (2011) and Moll (2014). People are heterogeneous in entrepreneurial ability, face borrowing constraints, and choose between entrepreneurship and wage employment. We extend the model in three ways to capture differences between natives and immigrants. First, access to finance is modeled through collateral constraints on borrowing capital that differ across the two groups. Second, immigrant entrepreneurs face a labor hiring distortion that raises the effective cost of employing workers. Third, immigrant workers face a wedge in wage employment that lowers the effective wage received by workers, consistent with the empirical evidence that immigrants earn lower wages (Doyle et al., 2025). Aside from these distortions, natives and immigrants are otherwise identical, including in their distribution of entrepreneurial ability. As such, differences in outcomes arise solely from the distortions they face. We use this framework because it can jointly replicate the empirical patterns documented in the data while remaining sufficiently tractable to quantify the effects of financial and labor hiring distortions on entrepreneurship, firm performance, and aggregate productivity.

3.1 Environment

There are N_n native people and N_m immigrant people, where n and m denote native and immigrants, and we normalize the native population, $N_n = 1$. Natives and immigrants differ in entrepreneurial ability/productivity for operating a business $z \in Z$ drawn from a distribution $F(z)$, and also in their asset holdings $a \in A$. The cumulative distribution over productivity and assets is $\varphi(z, a)$. We consider a dynamic setting where entrepreneur productivity is constant with probability γ, and with probability $1 - \gamma$ they draw a new productivity from $F(z)$; in this sense, γ controls the persistence of entrepreneur productivity and is to reflect changes in entrepreneur skill or demand for their products. Assets evolve according to savings decisions. Each person has one unit of time that is inelastically supplied,

either operating a business as an entrepreneur or working for a wage. Throughout, we assume a common distribution of ability and its dynamics across native and immigrant people.[15]

3.2 Firm production

Entrepreneurs/firms operate in a perfectly competitive environment producing a homogenous good y taking prices as given. Production requires capital and labor inputs, which are complementary with entrepreneur productivity, decreasing returns to scale and based on $y_{ji} = z_{ji}\left(k_{ji}^{\alpha}\ell_{ji}^{1-\alpha}\right)^{\eta}$, where $j \in \{m, n\}$ denotes whether a person is an immigrant or native, and i is an individual. For notation ease, we drop the i subscript and note optimal choices are individual and group specific. The problem of an entrepreneur is

$$\pi_j(a, z) = \max_{k,\ell} \; y_j - (1 + \tau_j^{\ell})w\ell_j - (r + \delta)k_j, \quad s.t. \quad k \leq \lambda_j a, \tag{3}$$

where r and δ are the real interest and depreciation rate, and w is the wage. Entrepreneurial profit depends on entrepreneur ability z and assets a. There are two 'distortions' entrepreneurs face that are immigrant and native specific, one related to finance λ_j and one that affects the implicit cost of labor τ_j^{ℓ}.

We follow a large literature on financial frictions and model differential access to finance, i.e., the ability to borrow capital for production, as a collateral constraint that depends on entrepreneur assets and the level of financial market development (Buera et al., 2011; Moll, 2014; Midrigan and Xu, 2014). This constraint is less binding the higher an entrepreneur's assets a, and is scaled by an overall measure of access to finance $\lambda_j \in [1, \infty)$. When $\lambda_j = 1$ entrepreneurs cannot borrow from financial intermediaries and must finance capital entirely using their own assets, and when $\lambda_j = \infty$ financial frictions are absent and entrepreneurs

[15] A fairly large literature documents that working age immigrants are on average more educated and more entrepreneurial relative to natives, suggestive of higher immigrant entrepreneur ability on average (Fairlie et al., 2010; Fairlie and Lofstrom, 2015; Martellini et al., 2024). Assuming a common distribution of productivity is conservative as it would understate the quantitative impacts we present later, especially in the context that immigrants face higher barriers to business operation.

can borrow capital independent of their assets. Higher values of λ_j therefore imply a higher degree of access to finance.

If immigrants face more restricted access to finance, say due to discrimination, lack networks or are less familiar with norms and practices, this would be captured by $\lambda_m < \lambda_n$. Hence, λ_j captures differences in access to finance across natives and immigrants, while variation in a capture differences in access to finance within each group. An entrepreneur is financially constrained when $k(a, z) < k^u$, where k^u denotes unconstrained capital without financial frictions ($\lambda_j = \infty$). As entrepreneurs accumulate assets over the life cycle, borrowing constraints gradually wane and firms operate closer to their unconstrained scale. The speed of this convergence will depend on λ_j, where lower access to finance slows this process.

We also include a reduced form implicit tax on labor τ_j^ℓ that differs across native and immigrant entrepreneurs. In particular, $\tau_m^\ell > \tau_n^\ell$ implies that immigrant entrepreneurs face higher effective labor costs relative to native entrepreneurs. We interpret this distortion broadly as capturing barriers to hiring faced by immigrant-owned firms, including worker preferences, discrimination, communication frictions, or other factors that raise the effective cost of employing labor. We assume that differences in τ_j^ℓ are time invariant, consistent with the life-cycle patterns for ARPL documented in the data.

3.3 Occupation choice and savings

People choose whether to be an entrepreneur or worker based on the occupation that provides the highest current-period payoff. As firm decisions are within-period and because we abstract from irreversibility and adjustment costs, the occupation choice is static and on a period by period basis. As such, immigrants and natives choose their occupation each period based on

$$E_j(a, z) = \max\{\pi_j(a, z), (1 - \tau_j^w)w\}, \tag{4}$$

where $E_j(a,z)$ is a person's income and we denote $e_j(a,z)$ as an indicator for choosing entrepreneurship. We model discrimination in wage employment as a worker-side wedge τ_j^w, that reduces the effective wage received by workers in group j, while leaving firms' labor costs unchanged. This reduced-form wedge, in the spirit of Hsieh et al. (2019), is to capture labor market frictions that lower the returns to wage employment for immigrants, including discrimination, occupational mismatch, or barriers to working in jobs appropriate to one's skills.

Inter-temporal choice. The dynamic problem faced by immigrants and natives is to choose consumption and savings in response to anticipated productivity shocks. Hence, a person's choice of asset accumulation is based recursively on the following Bellman equation

$$v_j(a,z) = max_{c,a' \geq 0} \ \{u(c) + \beta\{\gamma v_j(a',z) + (1-\gamma)\mathbb{E}v_j(a',z')\}\} \tag{5}$$

$$\text{s.t.} \quad c + a' \leq E_j(a,z) + (1+r)a,$$

where the expectation operator is over next period productivity z' which occurs with probability $1-\gamma$, $u(c)$ is a standard utility function for consumption, and $v_j(a,z)$ is the value function.

Before describing the equilibrium, we note that we have assumed immigrants and natives use common technologies in production and have common preferences. Conceptually, differences in inputs across immigrants and natives can be attributed to differences in production technologies (α or η) which we assume away and load entirely to the frictions on production (λ_j and τ_j^ℓ). Likewise, we also assume common preferences based on their utility function and abstract from differences in leisure. These assumptions allows us to measure the quantitative importance of these differential frictions on production and is a standard approach taken in the misallocation literature. Importantly, we think these are reasonable stances to take given that our results in Section 2 are robust to controlling for a fine level of industry

disaggregation (at the 4-digit ISIC level), entrepreneur commitment and talent.

3.4 Equilibrium

We focus on stationary competitive equilibrium for this economy which consists of an invariant distribution over assets and productivity for immigrant and native people $\varphi_j(a,z)$, policy functions $\{c_j(a,z),\ a'_j(a,z)\}$, policy functions for entrepreneurs $\{k_j(a,z),\ \ell_j(a,z)\}$, occupation choice $\{e_j(a,z)\}$ such that given prices and a stochastic process for productivity,

(a) immigrant and native input choices in production solve the entrepreneur's problem described in equation (3), with resulting optimal production $y_j(a,z)$ and profit $\pi_j(a,z)$;

(b) occupation choice is based on (4) with $e_j(a,z)$ an indicator for an entrepreneur;

(c) immigrant and native specific policy functions $c_j(a,z)$ and $a'_j(a,z)$ solve the intertemporal problem described in (5);

(d) capital and labor market clearing are based on

$$\sum_j N_j \int_{e_j(a,z)=1} k_j(a,z)\varphi_j(da,dz) = \sum_j N_j \int_{e_j(a,z)=0} a\varphi_j(da,dz) \equiv K;$$

$$\sum_j N_j \int_{e_j(a,z)=1} \ell_j(a,z)\varphi_j(da,dz) = \sum_j N_j \int_{e_j(a,z)=0} \varphi_j(da,dz);$$

(e) goods market clearing is

$$\sum_j N_j \int c_j(a,z)\varphi(da,dz) + \delta K + \Theta = \sum_j N_j \int_{e_j(a,z)=1} y_j(a,z)\varphi(da,dz),$$

where Θ is the sum of firm labor taxes and immigrant worker wage taxes;

(f) and lastly, a stationary joint distribution $\varphi_j(a,z)$ specific to immigrants and natives

induced by the savings policies and the stochastic process for productivity that satisfies;

$$\varphi_j(a,z) = \gamma \int_{\{(\tilde{a},\tilde{z})|\tilde{z}\leq z, a'(\tilde{a},\tilde{z})\leq a\}} \varphi_j(d\tilde{a},d\tilde{z}) + (1-\gamma)F(z) \int_{\{(\tilde{a},\tilde{z})|a'(\tilde{a},\tilde{z})\leq a\}} \varphi_j(d\tilde{a},d\tilde{z}).$$

4 Calibration

We now evaluate the quantitative implications of our framework for understanding differences across immigrant and native entrepreneur outcomes and their aggregate implications. In light of the evidence presented in Section 2, we assume immigrants and natives are identical across preferences, technology used in production and entrepreneurial ability. The only source of differences across groups are in their access to finance λ_j, the cost of hiring workers τ_j^{ℓ}, and immigrant wage bias τ_m^w, which allow us to quantify the importance of these specific channels.

4.1 Parameterization

In calibrating the model we assume utility is of the constant relative risk aversion (CRRA) type with parameter σ. Regarding ability, people draw a new ability with probability $1-\gamma$ from $F(z)$, which we assume is Pareto with shape parameter ν. In total, there are 14 parameters to calibrate in our setting. Several of these parameters are set exogenously following much of the literature and the remaining parameters are jointly calibrated by simulating the model to match a set of relevant moments in the data for Canada.

Exogenous parameters: We set six parameters apriori $(\sigma, \alpha, \delta, N_m, N_n, \tau_m^w)$. For the CRRA utility function, we set $\sigma = 1.5$ which is a standard value used in the literature. We assume a depreciation rate for capital equal to 6 percent ($\delta = 0.06$) and assume the share of production inputs accruing to capital is $\alpha = 1/3$. Immigrants accounted for 18 percent of the population in 2002 and 22 percent of the population in 2016 (Statistics Canada). As such, we target the midpoint of this range, normalize $N_n = 1$ and set $N_m = 0.25$ to reflect this population share. For the immigrant worker wage distortion, we set $\tau_m^w = 0.2$ to be consistent with the

evidence of a 25 percent native worker wage premium in Canada (Statistics Canada, and see also Doyle et al., 2025). We think this is conservative as it targets only wage differences and does not account immigrant 'under-employment' below their skill level.

Jointly calibrated parameters: This leaves us with eight parameters to jointly calibrate $(\beta, \eta, \gamma, \nu;\ \lambda_m, \lambda_n, \tau_m^\ell, \tau_n^\ell)$, where the first four apply across all entrepreneurs, and the last four are specific to immigrant and native entrepreneurs. While these parameters jointly affect our targeted data moments, they primarily influence a specific moment so we describe these to motivate their relevance. The discount factor β affects the equilibrium interest rate which we target at 4 percent. The targets for the remaining parameters, aside from λ_n, are based on the CEEDD. The span of control parameter η affects the entrepreneurship rate, where higher values generate lower rates of entrepreneurship. As such, η is chosen to match an entrepreneurship rate of 12.4 percent. Regarding the productivity process, γ controls the persistence and the Pareto shape parameter ν controls future draws. Accordingly, we choose γ to target a firm exit rate of 13 percent and ν to target the employment share among the top 10 percent of firms, which is 54 percent.

The collateral constraints λ_j's have a direct impact on external finance (i.e., how much firms can borrow), and because the constraints can differ across natives and immigrants, it also affects the share of capital among these groups. Following the literature on access to finance, and noting that natives account for the majority of firms, the native collateral constraint λ_n is chosen to match an external finance to GDP ratio of 1.20 based on the Global Financial Development Database (Beck et al., 2000, 2009). For the immigrant collateral constraint, we choose λ_m to match a 10 percent immigrant share of capital relative to all firms. Lastly, the distortion on labor affects the number of workers firms hire, where higher values lower labor demand. Accordingly, we normalize the native labor distortion $\tau_n^\ell = 0$, and choose the immigrant labor distortion τ_m^ℓ to match an immigrant share of labor (workers hired) equal to 11 percent. As such, τ_m^ℓ should be interpreted as the additional hiring friction immigrant firms face relative to native firms.

Table 3: Model Fit

Target Moments	Data	Model	Parameter
General parameters:			
Interest rate	0.04	0.04	$\beta = 0.89$
Entrepreneurship rate	0.12	0.13	$\eta = 0.75$
Employment share, top 10%	0.54	0.54	$\nu = 4.99$
Exit rate	0.13	0.13	$\gamma = 0.17$
Immigrant and native specific parameters			
External Finance to GDP	1.20	1.17	$\lambda_n = 3.87$
Imm. share of capital	0.10	0.10	$\lambda_m = 2.44$
Imm. share of labor	0.11	0.10	$\tau_m^\ell = 0.11$

Notes: τ_n^ℓ is normalized to zero.

4.2 Model Fit

Table 3 reports the model fit from the joint calibration and accompanying parameter values. The model does well matching each of the data moments, and the parameter values are all within the range of values used in the literature (e.g., Buera et al., 2011). The immigrant and native collateral constraints are $\lambda_m = 2.44$ and $\lambda_n = 3.87$, implying that for a given level of wealth immigrants can borrow about 2/3 the level of a native entrepreneur; or alternatively, natives can borrow about 60 percent more than an immigrant entrepreneur. The weighted collateral constraint for Canada is $\lambda_{Can} = 3.69$ implying that Canada is a financially developed country, but still where many firms remain financially constrained. The immigrant distortion on hiring workers is $\tau_m^\ell = 0.105$ implying that immigrant entrepreneurs pay 11 percent more to hire a worker relative to natives owners. Again, this distortion can reflect lack of networks to find suitable workers to explicit biases workers may have for being employed at an immigrant owned firm.

External Validation. We also evaluate the model performance along non-targeted relevant moments (also from the CEEDD) on immigrant and native firm outcomes, and across the firm size distribution . Table 4 shows that measures of firm volatility (one-year autocorrelation for capital and the standard deviation of annual capital growth) are consistent with the data, implying our approximation of the productivity process is consistent with

Table 4: Model External Validation

Non-Targeted Moments	Data	Model
Top 5% income share	0.27	0.31
One-year autocorrelation (capital)	0.963	0.958
S.D. of annual capital growth (capital)	0.399	0.352
ARPK gap	0.17	0.22
ARPL gap	0.07	0.10
Avg. firm size (native/immigrant)	1.56	1.37
Immigrant share of		
Firms	0.159	0.129
Output	0.106	0.107

Notes. The ARPK gap is calculated as the difference between aggregate output to capital for immigrants relative to natives, in logs. And similarly for the ARPL gap.

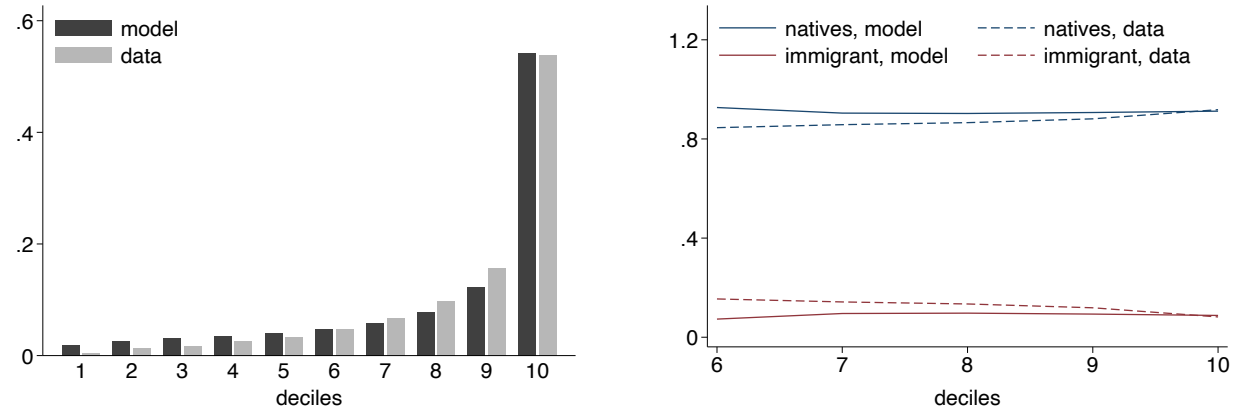
the dynamics implied by the data. The model also closely replicates an income share of 30 percent among the top 5 percent of earners, an often targeted statistic in this class of model. Across native and immigrants entrepreneurs, the three frictions in our model are sufficient to replicate average ARPK and ARPL differences between groups (and across the life-cycle as we show later), as well as the share of immigrant firms and their output. An implication is that immigrants operate smaller firms, where these frictions account for about 2/3 of the immigrant-native firms size gap.

Figure 4 shows the model predictions across the size distribution of firms by deciles (based on workers). While our calibration targets the labor share among the top decile of firms, panel (a) shows the model does well matching labor shares across the size distribution of all firms. Panel (b) shows the immigrant and native share of workers in each decile of the size distribution, where we focus on the top five deciles which account for 85 percent of total output.[16] Importantly, the model accurately reproduces that immigrant firms are disproportionally under-represented at the top deciles of the distribution. Likewise, the model also generates that immigrants have higher ARPK in each decile relative to natives (not reported), and notably, these gaps widen at the upper deciles.[17] This implies that highly

[16]The model matches immigrant and native shares of labor in each decile closely except for the initial decile where immigrant (native) shares are over (under) predicted.

[17]ARPL gaps are flat across deciles since τ_j^{ℓ} is constant.

Figure 4: Firm size distribution and employment shares



(a) (b)

Notes: Panel (a) shows the share of labor across deciles (based on labor) for all firms (immigrants and natives). Panel (b) shows immigrant and native shares of labor in each decile for the top 50 percent of firms in the firm size distribution.

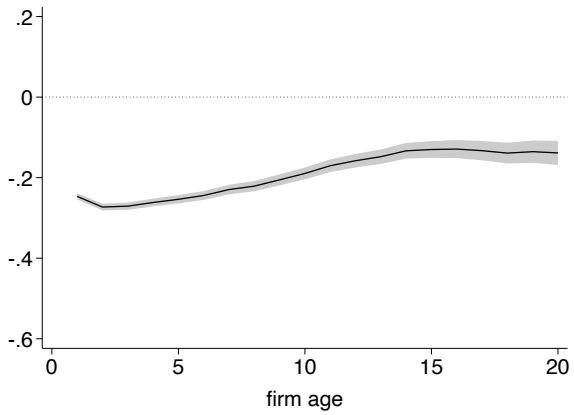
productive immigrant firms are especially constrained by limited access to finance, suggestive of large aggregate implications.

Life cycle. While we have shown that the calibrated benchmark closely replicates immigrant firm performance on average and across the size distribution, we now examine immigrant and native firm outcomes over the life-cycle predicted by the model relative to the data. To do so, we simulate the model across native and immigrant entrepreneurs, track their evolution over life-cycle, and regress outcomes over time across these groups.

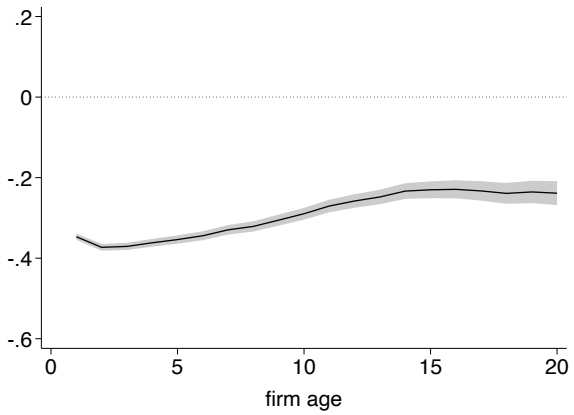
Figure 5 shows the regression estimates for immigrant entrepreneurs (relative to natives) for firm output, labor, capital and ARPK over the life-cycle. Although these estimates are not directly comparable to their empirical counterparts in Figures 2 and 3, they nevertheless generate patterns across firm age that are consistent with the data.[18] Specifically, immigrants have lower output, labor, capital and higher ARPK at the start of a firm, and these gaps gradually narrow over the life-cycle but do not fully close. Importantly, and consistent with

[18]The estimates in Figures 2 and 3 account for a host of controls the model cannot include. We note the regression estimates without controls for owner characteristics, industry, time and cohort fixed effects also share patterns consistent with Figure 5.

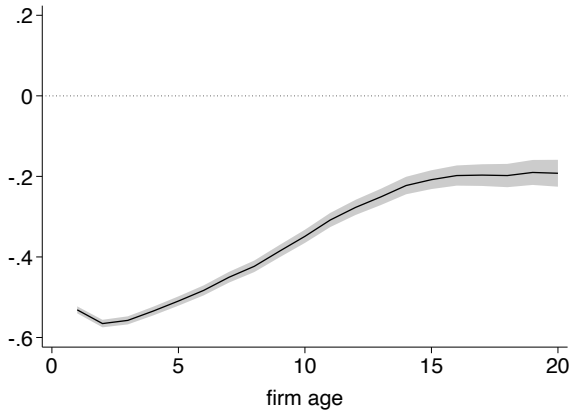
Figure 5: Model generated differences in Immigrant outcomes over the life-cycle



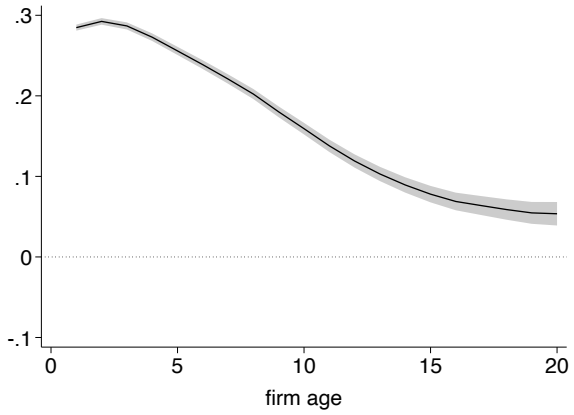
(a) Output



(b) Labor



(c) Capital



(d) ARPK

Notes: Each panel shows the predicted difference in an outcome of interest between immigrant and native firms over the life-cycle based on a regression of simulated data. See text for further details.

our evidence, this narrowing is much stronger for capital and ARPK than for output and labor gaps. While note shown, ARPL gaps do not narrow over time (since τ_m^ℓ is constant) which is also consistent with our evidence. The three frictions we have emphasised in our model—differences in access to finance, hiring costs and wages—are jointly necessary for generating these life-cycle patterns, as removing any one of these frictions would cause the model to miss along a specific dimension.[19]

Taking all of this together, we view our calibrated benchmark economy as one that closely replicates key features of the immigrant entrepreneur experience in Canada, specifically in regards to differences in their firm outcomes, across the size distribution and over the life-cycle.

5 Quantitative analysis

We evaluate the long-run quantitative impacts of immigrants facing higher barriers to entrepreneurship, with a particular focus on its aggregate impacts, net job creation and welfare within and across groups. Throughout, we examine policies that equalize immigrant access to finance and labor market distortions, while maintaining differences in immigrant wages, as our focus is on the impacts of distortions on entrepreneurship.[20] We then use our setting to evaluate the transitional impacts of broadening immigration policy following the recent policy discourse in North America and Europe.

[19]For example, our modeling of collateral constraints with self-financing allow for a sharper narrowing in capital and ARPK, differences in entrepreneur labor market frictions τ_j^ℓ generate persistent gaps later in the life-cycle, and differences in wages τ_m^w affect selection and how quickly these gaps converge. In a version of the model without wage gaps ($\tau_m^w = 0$), positive selection causes immigrant-native gaps in outcomes to converge too quickly and are smaller overall, and these differences cannot be adequately offset by larger entrepreneurial distortions.

[20]We find similar impacts when immigrant wages are also equalized, and discuss the importance of this channel when relevant.

5.1 Equalizing access to finance and labor

Aggregate impact. Table 5 reports the quantitative impacts on aggregate output, productivity and capital from reforms that lower immigrant barriers to entrepreneurship to the level faced by native firms. Column (1) shows the effects of equalizing immigrant access to finance ($\lambda_m = \lambda_n$), column (2) shows the effects of removing immigrant barriers to hiring workers ($\tau_m^\ell = 0$), and column (3) shows the combined effects of these two policies. In this sense, these columns quantify the aggregate losses in Canada from immigrants facing higher barriers to entrepreneurship, which we find to be over 1 percent of output. All results are reported relative to the benchmark economy.

Equalizing access to finance in column (1) has sizeable impacts, raising aggregate output by 0.3 percent and TFP by 0.6 percent. Equalizing immigrant access to labor in column (2) has larger impacts on output and capital but smaller impacts on TFP. In this regard, consistent with the misallocation literature, limited access to finance generates larger impacts on TFP than labor market frictions because it affects firms differentially both within and across groups. Our results also highlight an interaction between these frictions that amplifies their aggregate impacts. In column 3, when both frictions are equalized, aggregate output and capital rise by 1.1 and 1.2 percent—exceeding the sum of their individual impacts—and TFP rises by 0.7 percent. These impacts reflect improved resource allocation across firms as distortions fall under these reforms. Overall, these impacts are proportionally large recognizing that immigrants account for 20 percent of the population (we later report larger quantitative impacts when immigrants account for a larger share of the population). In fact, the aggregate impacts of improving immigrant access to finance and labor are comparable to a policy that raises financial development in Canada to the levels observed in the US.[21]

As the reforms we consider redirects resources across and within groups, Table 5 also reports

[21] Following Buera et al. (2011), we consider a counterfactual that uniformly raises access to finance for all entrepreneurs—while maintaining relative differences between natives and immigrants, as well as existing labor and wage distortions—to approximate external finance to GDP ratios in the US.

Table 5: Aggregate Outcomes

	(1)	(2)	(3)
		Policies that Equalize	
	Finance	Labor	Both
	$\lambda_m = \lambda_n$	$\tau_m^\ell = 0$	$\lambda_m = \lambda_n$ & $\tau_m^\ell = 0$
Aggregate impacts			
Output, Y	0.3	0.5	1.1
Capital, K	0.1	0.4	1.2
Productivity, TFP	0.6	0.2	0.7
Impacts on Immigrants			
Output Y_m	39.0	35.5	83.3
Capital, K_m	56.2	38.3	107.9
Productivity, TFP_m	5.6	2.6	8.1
Impacts on Natives			
Output, Y_n	-4.3	-3.6	-8.6
Capital, K_n	-5.7	-3.5	-9.9
Productivity, TFP_n	-0.4	-0.3	-0.9

Notes. Reported are percentage changes relative to the benchmark economy, on aggregate and by group.

the differential impacts across natives and immigrants. Immigrant output and capital rise in each scenario, increasing by 80 to 110 percent when both finance and labor are equalized. As access to capital and labor improves (both ARPK and ARPL fall) more immigrants enter entrepreneurship and incumbents expand. For natives, although they are not directly affected by these reforms, equilibrium effects induce some native firms to exit and others to contract such that their output and capital fall by 8-10 percent. So, while reforms that equalize immigrant access to finance and labor raise aggregate output and TFP in the range of 1 percent—which is substantial for any policy reform implemented in an industrialized economy—they nevertheless come at the expense of native entrepreneurship.

To further illustrate these differential impacts across groups, we decompose TFP into a selection effect—capturing changes in average productivity and the number of firms—and a misallocation effect. We formerly show this decomposition in Appendix C. When both distortions are equalized, we find close to a one-to-one displacement of native entrepreneurs by immigrant entrepreneurs such that native output falls and immigrant output rises. As

natives exit, the increase in average productivity is offset by the decline in the number of firms, causing native TFP to fall by 0.9 percent. For immigrants, entry lowers average productivity but is more than offset by more firms and lower misallocation, raising immigrant TFP by 8 percent. About one-third of this increase reflects improved resource allocation and two-thirds reflects selection.

Overall, our results point to an extensive-margin mechanism in which immigrant entry largely replaces native entrepreneurship. The prominence of this selection effect is due to the immigrant wage distortion in our setting. For instance, when this distortion is also removed, misallocation accounts for 1/2 of immigrant TFP gains (instead of 1/3).

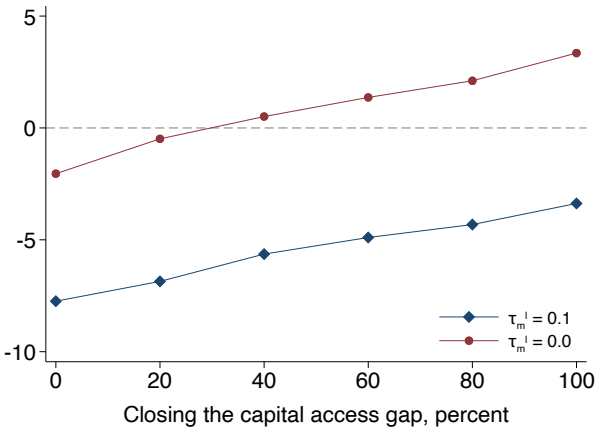
Net job creation. Recently, immigration policy debates have focused on whether immigrants are net job 'creators' or 'takers' relative to the native population (Azoulay et al., 2022). A common pro-nationalist narrative is that immigrants take more jobs than they create and are therefore detrimental to native labor market outcomes. We evaluate this claim within our framework, which explicitly accounts for distortions immigrants face in entrepreneurship.

Figure 6 shows the impact on immigrant net job creation in the benchmark economy, and how it changes as immigrant distortions vary. We consider cases when $\tau_m^\ell = \{0.0, 0.1\}$, and where immigrant access to finance improves according to $\tilde{\lambda}_m = (1-s)\lambda_m + s\lambda_n$, $s \in [0,1]$, where s traces the convergence in access to finance. The case when $\tau_m^\ell = 0.1$ and $s = 0$ corresponds to the benchmark economy, and $\tau_m^\ell = 0.0$ and $s = 1$ corresponds to the policy reform that equalizes immigrant access to finance and labor (Table 5, column 3).

In the benchmark economy, immigrants are disproportionally under-represented as entrepreneurs, and even when they start firms, they are smaller than optimal which lowers the number of jobs they create. As such, immigrant net job creation is -8 percent.[22] Keeping labor distortions fixed at the benchmark level ($\tau_m^\ell = 0.1$), when access to finance improves (as $s \to 1$)

[22] In our environment there is no unemployment or labor force exit, so this number should not be interpreted as a literal displacement of native workers. Rather, a negative value indicates that immigrants are net suppliers of labor, while natives are net job creators.

Figure 6: Immigrant Net Job Creation



Notes: Net job creation is defined as total labor demand by immigrant entrepreneurs less labor supplied by immigrant workers, divided by total immigrant and native labor demand.

immigrant net job creation rises from more entry and firm expansion, but is still below zero (negative). That is, when immigrants face distortions on hiring workers, improving access to finance alone is insufficient for immigrants to become net job creators (and vice-versa). When both immigrant access to labor and finance is improved, immigrant net job creation becomes positive, and when distortions are fully equalized ($\tau_m^\ell = 0.1$ and $s = 1$), net job creation is 3 percent. Although this comes from marginal entrepreneurs entering because they earn lower wages ($\tau_m^w > 0$), it nevertheless means that immigrants create more jobs than they take.[23]

As such, when distortions on entrepreneurship are equalized our results run counter to the narrative that immigrants take away native jobs (though a byproduct is native entrepreneurship falls). Or said differently, immigrants 'take away' more jobs than they create only when they face higher barriers to entrepreneurship. In this sense, our results are consistent with Azoulay et al. (2022) that immigrants are net job creators in an 'undistorted' setting, but in addition, our framework points to the importance of how distortions can offset their role as job creators.

[23]This wage distortion is crucial for generating net job creation, as in the absence of all distortions net job creation is zero for both groups.

Welfare. So far, we have examined the impacts of reforms that lower immigrant capital and labor distortions on entrepreneurship and aggregate outcomes. We now turn to the broader distributional consequences of these reforms, focusing on welfare effects across the entire population (entrepreneurs and workers). Figure 7 reports the changes in welfare for immigrants (panel a) and natives (panel b), relative to their baseline, measured using the consumption-equivalent variation (CEV).[24] As before, we show the impact on welfare from reforms that equalize immigrant access to capital, equalize access to labor, and their combined effects.

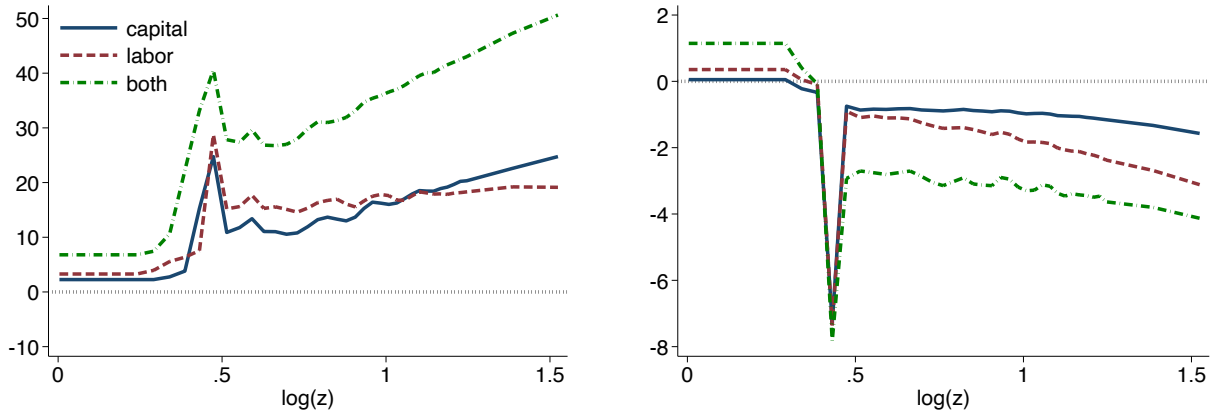
Panel (a) shows that each reform raises immigrant welfare with the largest gains arising when both access to capital and labor are equalized. On average, immigrant welfare rises by 10 percent, but there is considerable within group variation. Immigrant entrepreneurs benefit the most as distortions are lowered. Individuals who switch into entrepreneurship see welfare gains of 20-40 percent (around the kink in panel a) which exceed those of many higher ability entrepreneurs. However, the largest welfare gains are among the most productive entrepreneurs—upward of 50 percent—as they expand closer to their optimal capacity. Lastly, immigrant workers, who are at the lower tail of the ability distribution and account for 85 percent of all immigrants, experience welfare gains of 2-8 percent from higher equilibrium wages.

The welfare effects for natives are more nuanced. Native entrepreneurs incur losses as resources are reallocated toward immigrant entrepreneurs while native workers experience welfare gains. The most productive entrepreneurs see relatively modest welfare losses, in the range of 1–4 percent, whereas those at the margin that exit (around the kink in panel b) are the most adversely affected with welfare losses of 6–7 percent. Native worker welfare rises, just as for immigrant workers, from higher wages.[25] Since workers account for over 88

[24]CEV is defined as the percentage change in consumption in the benchmark allocation that would make agents indifferent between the benchmark and the allocation under the policy reform.

[25]The wage increase is common to both immigrants and natives. However, the percentage welfare gains differ because immigrant workers begin from a lower base, $(1-\tau_m^w)w$. A similar rationale applies for the large immigrant entrepreneur welfare gains.

Figure 7: Welfare effects from closing the immigrant-native gap



(a) Immigrants (b) Natives

Notes: Reported is the CEV for each person relative to the benchmark economy. All immigrants experience welfare gains from these reforms, whereas welfare gains are positive only for native workers. Impacts for immigrant entrepreneurs are proportionally larger from each reform due to their lower profit in the benchmark economy.

percent of the native population, native welfare on average rises by 0.8 percent.

Our results show that both groups—and a majority of the overall population—benefit from reforms that equalize immigrant access to capital and labor. As such, these policies would be expected to receive broad support. Nonetheless, an important segment of the native population—incumbent entrepreneurs who experience lower profits or exit entrepreneurship—experience welfare losses. This group is therefore likely to be the most resistant to policies that promote equal access to finance and labor markets for immigrants. Importantly, their access to economic and political resources may allow them to advocate against reforms that improve opportunities for immigrant entrepreneurs.

5.2 Expanding immigration

In industrialized economies, the share of immigrants has risen over time, although recent political backlash has prompted governments to scale back their immigration targets.[26] We

[26]For instance, the Government of Canada in 2024 announced a 20-27 percent reduction in immigration targets. Similar debates over immigration have taken place in Australia, Germany, the United Kingdom and

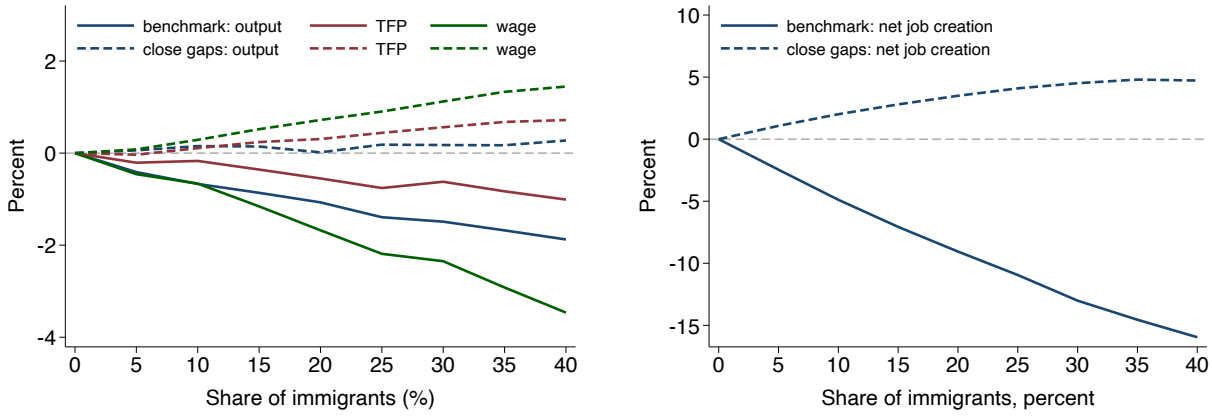
conduct two exercises to study the impacts of alternative immigration policies. First, we evaluate the long-run impact of raising immigrant shares to show how the aggregate effects depend on the barriers to immigrant entrepreneurship. Second, we study the transition dynamics following a rapid increase in immigration, focusing on differences between the short run and the long run. We conduct these exercises both in the benchmark economy with distortions on immigrant entrepreneurship and in a counterfactual economy where they are removed.

Immigrant population shares – steady-state comparison. Figure 8 shows steady-state outcomes as the immigrant population share varies from 0 to 40 percent, which spans the range observed in industrialized economies. This exercise can be thought of as showing the long-run aggregate impacts of alternate immigration shares in Canada, or for countries that share a similar immigration experience. Panel (a) reports, for each immigrant population share (relative to the case with zero immigrants), output per capita, TFP, and wages under two scenarios: (i) with benchmark distortions (λ_m and τ_m^ℓ), and (ii) when distortions on immigrant entrepreneurship are equalized ($\lambda_m = \lambda_n$ and $\tau_m^\ell = 0$).[27] A clear pattern is that with distortions, an increase in the immigrant share reduces output per capita, TFP, and wages; and when these distortions are removed, the effects reverse and higher immigrant shares are associated with increases in all three outcomes. In the benchmark economy, the negative effects of distortions are amplified by a larger immigrant population, leading to greater misallocation and lower productivity. When immigrants account for 40 percent of the population, distortions reduce output per capita by 2 percent and TFP by 1 percent. In contrast, when immigrant entrepreneurs face the same access to capital and labor as native entrepreneurs, higher immigrant shares lead to modest gains in output per capita and TFP. One caveat is that distortions may themselves depend on immigrant shares—plausibly lower when immigrant shares are high and higher when they are low. As we do not account for

the United States.

[27]Because a larger immigrant population mechanically increases aggregate output, we report output per capita to account for changes in population size.

Figure 8: Expanding Immigrant Population Shares



(a) Aggregate Impacts

(b) Net Job Creation

Notes: The solid lines show the impacts of expanding immigration when immigrant barriers to entrepreneurship are based on the benchmark economy. The dashed lines show the impacts when immigrant barriers to entrepreneurship are equalized to native levels.

this, it implies our estimates may understate losses at low immigration shares and overstate them at high shares.

Equalizing distortions at higher immigrant shares also leads to sizable wage gains, with equilibrium wages rising by up to 5 percent. This reflects stronger labor demand from immigrant entrepreneurs once constraints are removed. Consistent with the earlier welfare analysis, these results imply that natives on average—and native workers in particular—benefit from higher immigration when distortions are reduced. In contrast, with distortions, wages decline and native welfare falls on average, even though native entrepreneurs benefit.

Figure 8 panel (b) shows the impact on immigrant net job creation. In the presence of distortions, higher immigration lowers net job creation and is -15 percent when immigrants account for 40 percent of the population. When distortions are equalized, immigrant net job creation becomes positive, reaching up to 5 percent.[28]

[28] As noted earlier, an immigrant wage gap is crucial for generating positive net job creation. Without this wage gap, net job creation is zero, although wages are higher.

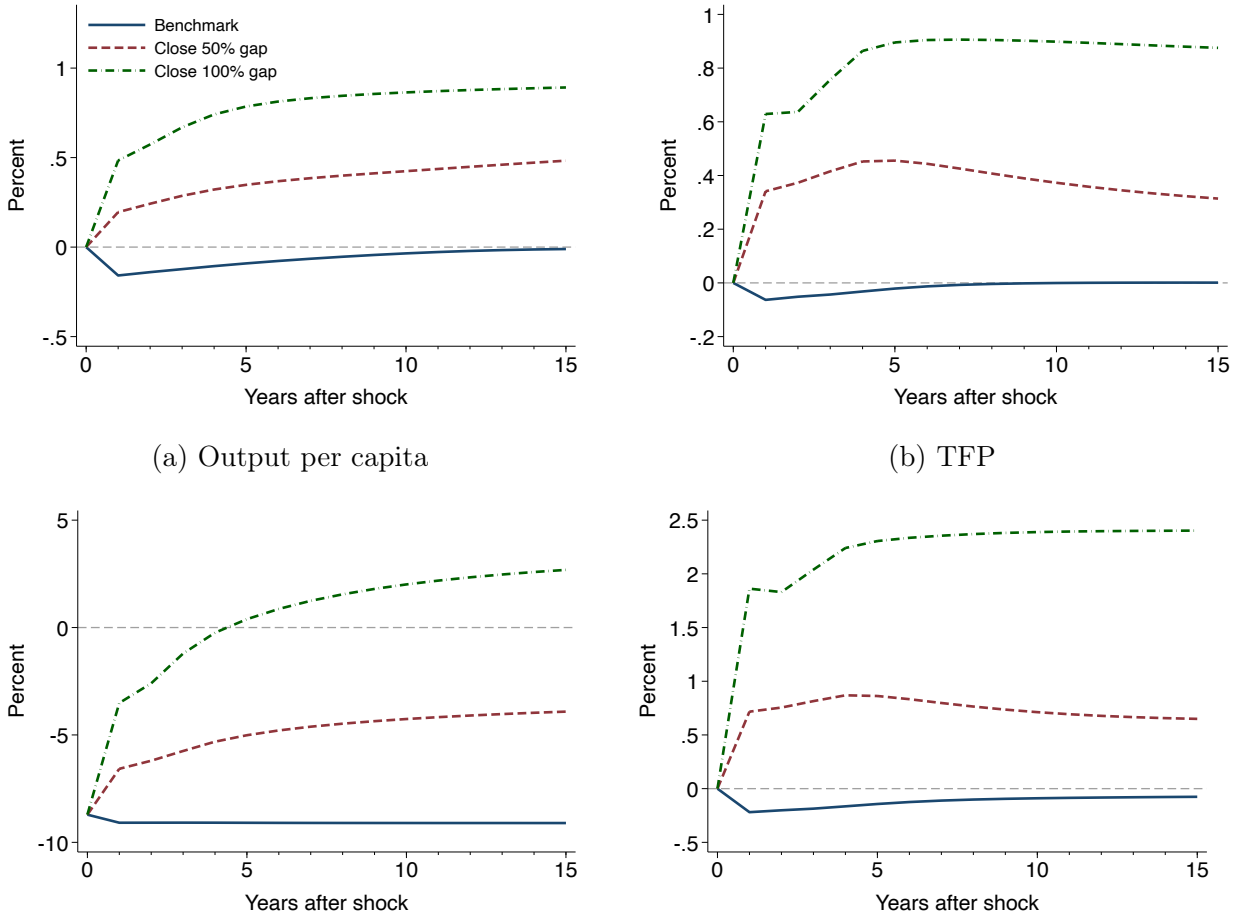
Increasing immigration – transition We next consider an increase in immigration where the immigrant population share rises from 20 to 21 percent, corresponding to a 5 percent increase in the immigrant population. This policy broadly reflects Canadian immigration targets during the pandemic to promote recovery and foster growth. Although this policy was later halted due to housing and infrastructure constraints, we nevertheless examine its implications in the context of our setting.

Figure 9 shows the dynamics of output per capita, TFP, net job creation, and wages from a one-time permanent increase in the immigrant population share to 21 percent in the first period.[29] We consider three scenarios where immigrant entrepreneur distortions are at the benchmark level, when they are partially reduced and when they are fully equalized, and report all results relative to the benchmark. Panel (a) shows that when distortions are at the benchmark level, output per capita is 0.2 percent lower after the increase in immigration. The initial decline is mostly overcome in later periods as new immigrants gradually sort into entrepreneurship, overcome capital constraints, and expand—consistent with the life-cycle pattern of immigrant firms in the model. In contrast, if the distortion gaps are halved for immigrant entrepreneurs, output per capita rises and is 0.4 percent higher 10 years after the immigration expansion, and when distortions are fully equalized output is 0.9 percent higher. Panel (b), which plots TFP dynamics, shows a similar pattern.

Panel (c) and (d) show net job creation and wages. In the presence of distortions, immigrant net job creation falls from -8 to -10 percent, as the influx of immigrant workers reduces the equilibrium wage by 0.25 percent and lowers native welfare. When distortions are lowered, immigrant net job creation rises and becomes positive when distortions are equalized. Correspondingly, in either of these scenarios increased immigrant entrepreneur labor demand raises the equilibrium wage such that native welfare rises on average.

[29] This is to reflect a rapid increase in immigration similar to what was proposed by the Canadian government. We have also considered larger and more gradual increases in immigration, and find similar, albeit more gradual, impacts.

Figure 9: An increase in immigration – Transition



(a) Output per capita

(b) TFP

(c) Net Job Creation

(d) Wage

Notes: Each panel shows the transition impacts when the immigrant population share rises from 20 to 21 percent in year 1. We show scenarios for when immigrant entrepreneur distortions are at the benchmark level, when the distortion gap is lowered by 50 percent, and when fully equalized.

The insights from these two experiments point to the following: Expanding immigration in the presence of immigrant specific distortions lowers output per capita, TFP, wages, and net job creation, and reduces native welfare on average. These negative effects are strongest in the short run, immediately following the increase in immigration. By contrast, when these distortions are reduced, higher immigration raises output, TFP, and job creation, and also benefits natives by raising their welfare. These results provide important context for the immigration debate: the economic gains from immigration depend critically on the barriers immigrants face in entrepreneurship. Accordingly, policy should focus as much on reducing these distortions as on expanding immigration itself.

6 Conclusion

Using administrative data covering the entire size distribution of firms, we document that immigrant firms under perform and face higher distortions relative to native firms. These gaps are initially large, narrow over the life cycle but persist 15-20 years after entry. Consistent with these patterns, we build a quantitative model where immigrants face tighter financing constraints and higher labor costs. Although financial constraints ease over time, early-life capital distortions and persistent labor frictions generate lasting disparities in immigrant firm outcomes. Quantitatively, these distortions lower aggregate productivity and immigrant job creation. In addition, equalizing immigrant distortions to native levels is on net welfare improving, but a byproduct is that native entrepreneurs are worse off.

While our analysis highlights the macroeconomic consequences of barriers to immigrant entrepreneurship, several important questions remain. One is to examine how distortions differ by immigrant country of origin. Although we find that visible minority immigrants face higher distortions on average, a more systematic analysis by country of origin is needed to identify which groups are most disadvantaged and to assess the broader implications for inequality. In addition, given the evidence of higher immigrant labor distortions, further re-

search should examine immigrant firm access to workers and their skill composition between immigrant and native owned firms. We leave these important questions for future research.

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Appendix

A Additional tables and figures

In using the CEEDD, we impose several sample restrictions. We limit our sample to incorporated firms. We exclude unincorporated firms because information on capital is unreported and note that these firms account for a small share of businesses and an even smaller share of total output. Additionally, following Fung et al. (2019) we restrict our sample to firms classified as simple enterprises (i.e., single-location firms).[1] This restriction has minimal impact on sample size, as over 99.9 percent of firms are single-location enterprises.

There are rare instances of mixed ownership—where immigrants and natives are primary owners that have equal ownership shares in a firm—which we classify as immigrant owned. In addition, a very small number of firms (less than 1 percent of the total observations) transitioned between immigrant-owned and native-owned, and vice-versa, presumably due to the sale of their business, during their life-cycle. We omit these observations from our sample and note that their exclusion does not change our results.

Lastly, we drop firms where there is missing information on wage bills, assets, sales, intermediate input costs, employment, firm age, industry categories, location, owner gender and age. Additionally, we exclude observations with negative values for the first five variables. The final dataset consists of a panel with over 3 million firm-year observations, of which 16 percent are immigrant-owned, covering the period from 2001 to 2016. Table A.1 presents summary statistics and Table A.2 presents the industry composition of immigrant-owned and native-owned firms.

Table A.1: Summary Statistics, CEEDD

Variable	Mean	SD
Assets (thous. CAD)	874.7	4,191.1
Tangible assets (thous. CAD)	850.0	4,134.6
Number of workers	7.1	19.7
Revenue (thous. CAD)	1,295.2	5,833.1
Intermediate inputs cost (thous. CAD)	768.7	5,091.3
Value added (thous. CAD)	526.5	1,839.8
Payroll (thous. CAD)	259.0	733.2
Gross profits (thous. CAD)	489.6	1,307.4
Firm age	10.0	7.1
Average revenue product of capital (ARPK), log	-0.2	1.1
Average revenue product of labour (ARPL), log	0.7	0.9

Notes: The table reports summary statistics for the final CEEDD firm sample of approximately 3.5 million firm-year observations. Monetary amounts are in thousands of current-year US dollars. "log" denotes natural logarithms.

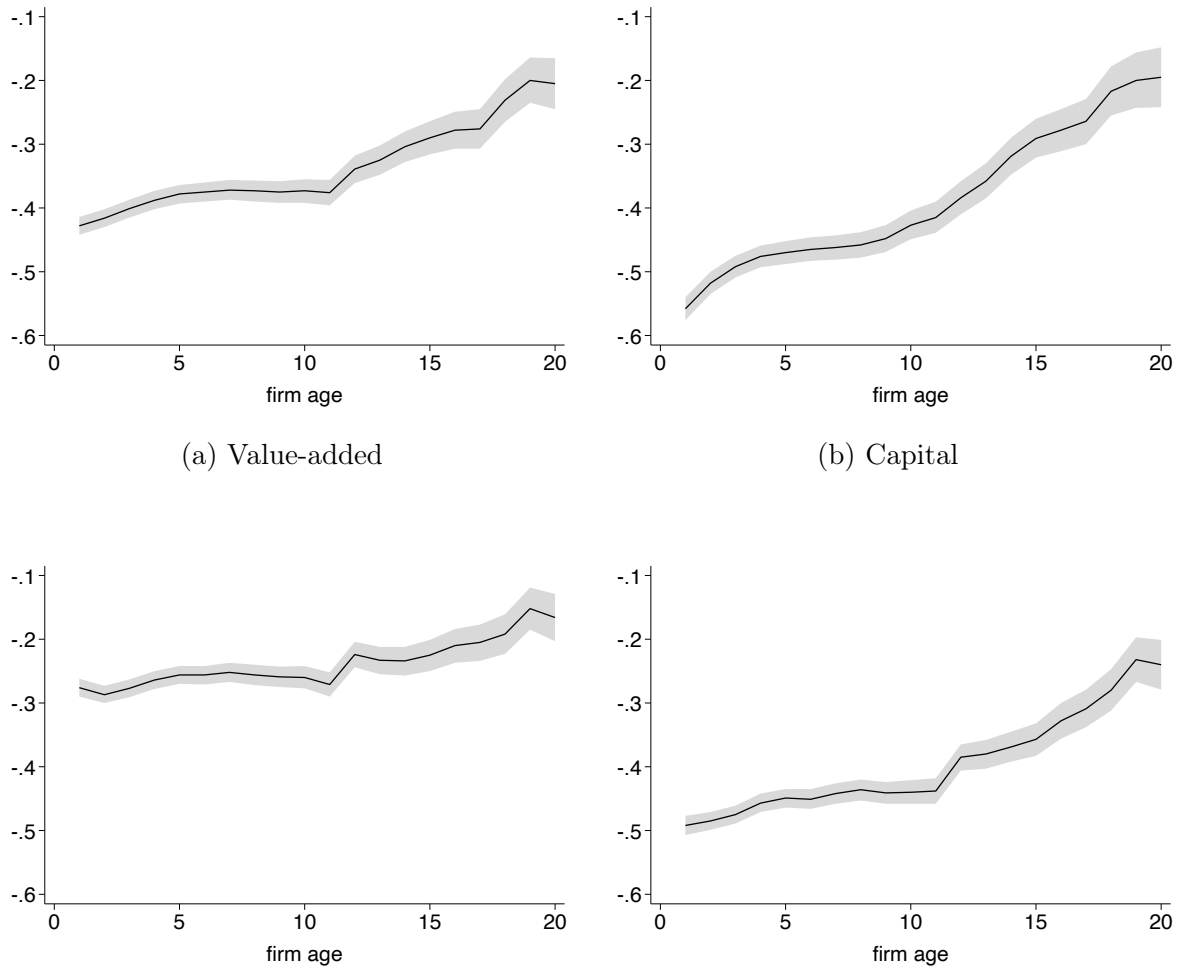
[1] In the CEEDD, financial information—including balance sheet items and income statements—is reported at the firm level, while ownership data are recorded at the establishment (location) level. As a result, linking ownership information to firm-level financials is only feasible for single-location enterprises.

Table A.2: Industry distribution of immigrant- and native-owned firms

NAICS		Immigrant (%)	Native (%)	Imm/Native
55	Management of companies	0.45	1.78	0.25
71	Arts, entertainment and recreation	0.41	1.09	0.38
52	Finance and insurance	1.53	3.19	0.48
23	Construction	8.73	16.82	0.52
53	Real estate and leasing	2.18	3.70	0.59
32	Manufacturing (wood, paper, petro-chem)	0.95	1.62	0.59
33	Manufacturing (metal, mach. and equip.)	2.40	3.61	0.66
81	Other services	4.61	6.93	0.67
45	Retail trade (general and misc)	1.79	2.61	0.69
51	Information	0.89	1.18	0.75
56	Administrative and waste services	4.00	5.03	0.79
41	Wholesale trade	5.14	5.86	0.88
31	Manufacturing (food, beverage, textile)	1.09	0.95	1.15
61	Educational services	0.87	0.74	1.18
54	Professional, scientific and tech. svcs	19.71	15.90	1.24
49	Transportation (ground, pipe, warehouse)	0.46	0.37	1.24
62	Health care and social assistance	13.41	9.05	1.48
44	Retail trade (vehicle and parts)	10.90	9.64	1.13
48	Transportation (air and support services)	10.42	5.05	2.06
72	Accommodation and food services	10.07	4.87	2.07

Notes: In the third and fourth columns of this table, each percentage is the share of that ownership group's firms operating in the indicated 2-digit NAICS industry, so every column sums to 100. The last column shows relative representation, defined as immigrant share ÷ native share. Values above 1 indicate immigrant over-representation, while values below 1 indicate under-representation. Industries are ordered by their relative-representation value. Note also that the Canadian NAICS is slightly different from US ones. For instance, wholesale trade is designated as 41 in Canada; in the US, it is 42.

Figure A.1: Difference between immigrant and native firms over life cycle



(a) Value-added

(b) Capital

(c) Number of workers

(d) Wage bills

Notes: Solid lines are the estimates for the difference between immigrants and natives ($\hat{\beta}_a$) firms over the life-cycle based on equation (2). Shaded areas represent the 95% CIs.

B Sensitivity of the empirical findings

This section complements Section 2.4 in the main text by providing additional detail on the robustness of our baseline empirical findings. For brevity, we report only selected statistics from the life cycle patterns shown in Figures 2, 3, and A.1. All estimates are based on Equation (2), using different subsamples of native and immigrant firms depending on the focus of each exercise.

In some of the sensitivity exercises, we compare a subsample of immigrant-owned firms to the full sample of native firms. In those cases, we often plot the life cycle patterns separately for natives, immigrants, and the immigrant subsample, to allow for a clear comparison between the full and restricted immigrant samples (see, for instance, Figure B.2). In other exercises, the sample restriction is applied to both immigrant and native firms. In this case, we typically report results in a table, showing only the differences between immigrant and native firms at selected points in the life cycle (see, for instance, Table B.3).

As noted in the main text, we present a limited set of statistics to reduce redundancy in reporting. However, the patterns hold for other omitted outcomes—such as employment and wage bills—as well as for the cross-sectional regressions shown in Table 1.

B.1 Entrepreneurial talent

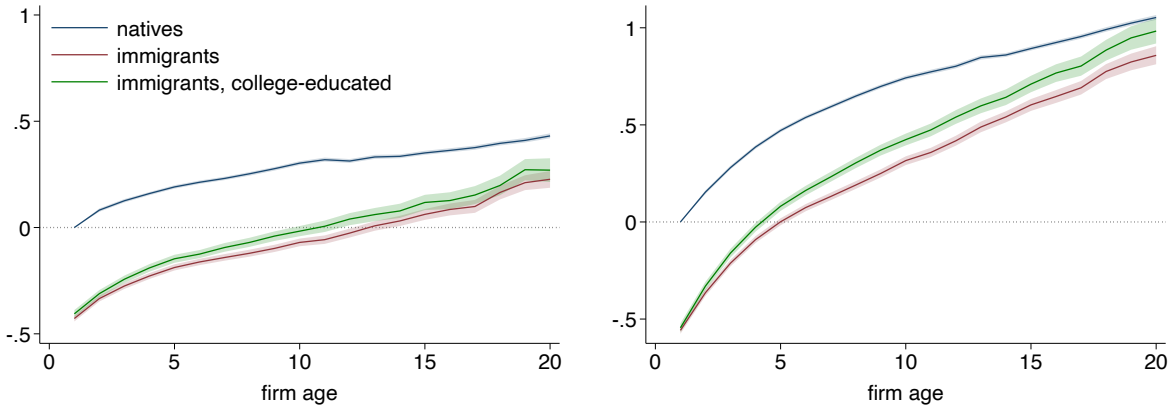
In this section, we compare the life cycle patterns of native-owned firms to those owned by immigrants with at least a college or university degree. To facilitate comparison, Figure B.2 plots the estimated life cycle profiles for three groups: native-owned firms, all immigrant-owned firms, and immigrant-owned firms where the owner has at least a college education. The patterns for the first two groups are identical to those shown in Figures 2 and 3 in the main text.

As shown in Figure B.2a, college-educated immigrant firms (green line) start with lower value-added than native firms (red line), with an initial gap comparable to that observed in the full sample of immigrant firms (blue line). Over the life cycle, educated immigrant firms grow faster than native firms, gradually narrowing the gap. Interestingly, they also slightly outperform the broader immigrant group in value-added growth, allowing them to make slightly more progress in closing the native-immigrant gap than other immigrant firms.

Figure B.2b shows a similar pattern for capital. Firms owned by educated immigrants start with less capital than native-owned firms but accumulate capital more rapidly than both natives and other immigrant firms. In other words, highly educated immigrants catch up faster. By age 20, educated immigrant firms hold 0.07 log points less capital than native firms—a gap that is just over one-third the size of the gap between natives and all immigrant firms (0.20 log points).

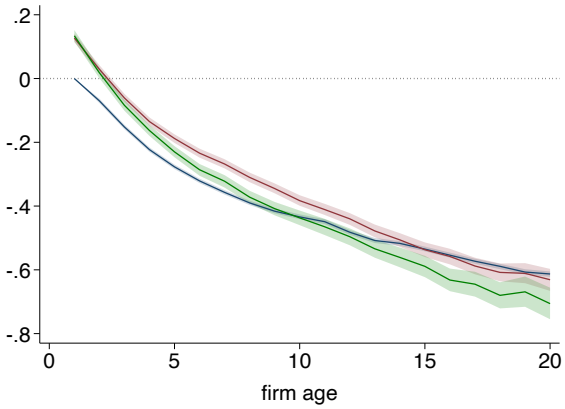
Figure B.2c shows that the ARPK profile for educated immigrant firms is qualitatively similar to the baseline. These firms face larger capital distortions early on, reflected in higher ARPK, but the gap with native firms narrows over time and disappears by around age 10. Notably, educated immigrant firms catch up with natives about five years earlier than

Figure B.2: Firm performance over life cycle, college-educated immigrants

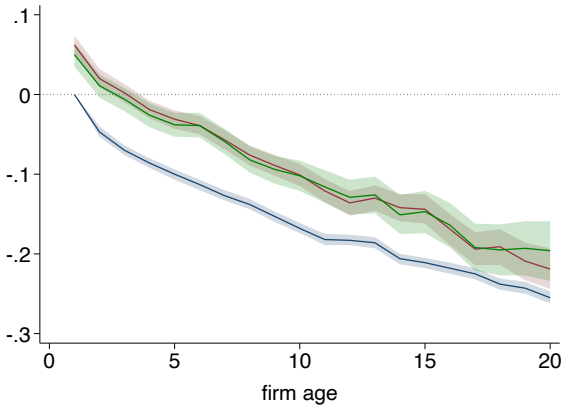


(a) Value-added

(b) Capital



(c) ARPK



(d) ARPL

Notes: Solid lines are the estimates for immigrant ($\hat{\gamma}_a + \hat{\beta}_a$) and native ($\gamma_a$) firms over the life-cycle based on equation (2). Shaded areas represent the 95% CIs.

the full immigrant sample, which closes the gap by age 15. This faster convergence aligns with their quicker capital accumulation and suggests that ARPK differences can decline over time as firms grow and invest more in capital.

While educated immigrants close the ARPK gap with natives much faster than other immigrant firms, this is not the case for ARPL, as shown in Figure B.2d. In fact, the life-cycle profile for educated immigrants is nearly identical to that of the full immigrant sample—the two lines overlap almost entirely. As with the full sample, there is a persistent 0.07 log point gap in ARPL between educated immigrant firms and native firms, which remains even after 20 years. This contrast with the ARPK pattern is striking. It may suggest that while immigrants can gradually overcome capital distortions through investment, labor

distortions—though smaller in size—are much harder to eliminate.

Overall, the life-cycle patterns remain intact when focusing on college-educated immigrant firms. To the extent that higher education serves as a reasonable proxy for entrepreneurial ability, this suggests that the smaller size of immigrant firms is unlikely to be driven by a lack of talent. Instead, the persistence of higher capital and labor distortions faced by educated immigrant entrepreneurs may help explain their smaller scale. Across all dimensions, educated immigrant firms begin their life cycle in a manner remarkably similar to the broader immigrant firm group. However, they grow more rapidly and show faster convergence toward native firms in value-added, capital, and ARPK. Interestingly, higher education does not appear to offer any advantage in overcoming labor market frictions.

B.2 'Committed' and larger firms

Non investor-class immigrants. Canada has an investor immigration program under which permanent residency is granted based on the immigrant's commitment to open and operate a business in Canada. These investor-class immigrants are likely to be wealthier than natives, but they may also be less serious entrepreneurs if business ownership serves mainly as a means to obtain residency. To test whether this group influences our results, we exclude firms owned by investor-class immigrants from the sample and examine whether the main patterns still hold.

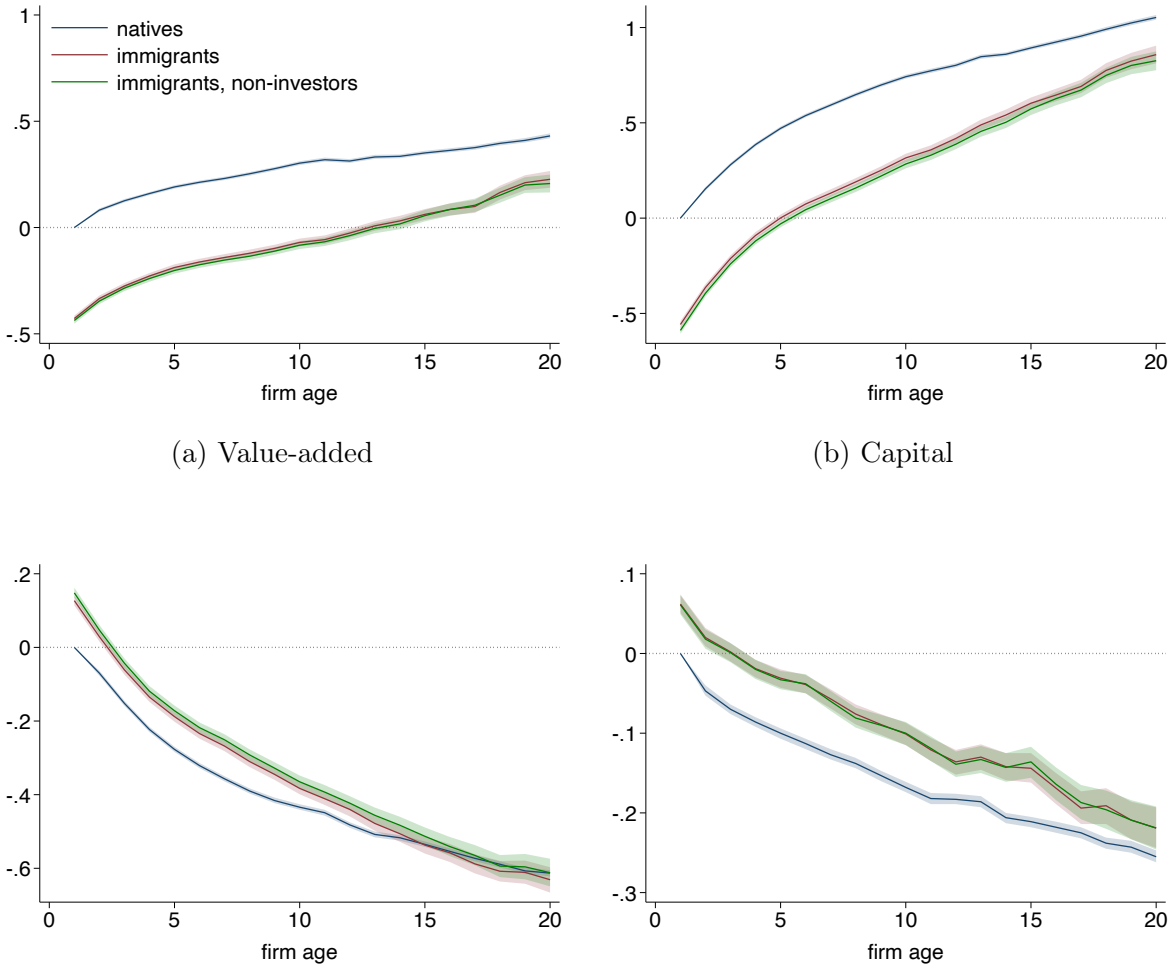
Figure B.3 compares the life-cycle patterns of non-investor immigrant-owned firms to those of native-owned firms and the overall sample of immigrant firms. Interestingly, there is no discernible difference between the non-investor immigrant group and the full immigrant sample. In other words, the native-immigrant gap remains largely unchanged when we restrict the sample to immigrant entrepreneurs who started their businesses by choice rather than as a prerequisite for migration.

Growing and larger firms. Tables B.3 and B.4 present the life-cycle differences between immigrant and native firms at five points in the firm life cycle: ages 1, 5, 10, 15, and 20. Estimates are reported for the full sample (baseline) as well as four restricted subsamples. Importantly, the restrictions used to define these subsamples are applied to both immigrant and native firms. For the sake of conciseness, the table displays only the estimated differences between immigrants and natives ($\hat{\beta}_a$), based on Equation (2). To aid interpretation, the estimates are color-coded: blue (red) indicates a positive (negative) and statistically significant difference at the 95 percent level, while black indicates estimates that are not statistically significant at this level.

In Table B.3, we focus on firms that survive beyond ten years of age. This restriction implies that we exclude firms born after 2006, as our sample ends in 2016 and we cannot observe their ten-year survival. Within this group of long-lived firms, we impose two additional restrictions to focus on those that show signs of growth over the ten-year span. Specifically, we exclude firms that, at age 10, are (i) still self-employed or (ii) fall within the bottom 10th percentile of firm size within their cohort.

The first two panels of Table B.3 show that, in terms of value-added and capital, the estimates

Figure B.3: Firm performance over life cycle, non-investor immigrants



(a) Value-added

(b) Capital

(c) ARPK

(d) ARPL

Notes: Solid lines are the estimates for immigrant ($\hat{\gamma}_a + \hat{\beta}_a$) and native ($\gamma_a$) firms over the life-cycle based on equation (2). Shaded areas represent the 95% CIs.

from this restricted sample are very similar to those from the full sample. Immigrant firms begin their life cycle significantly smaller than native firms but gradually narrow the gap over twenty years, though they do not fully close it. The third panel, which displays capital distortions (ARPK), also follows a pattern similar to the full sample: immigrant entrepreneurs face substantially higher capital distortions at entry, which decline over the life cycle. Notably, the initial ARPK gap is slightly smaller in this subsample—a log difference of 0.09 compared to 0.13 in the full sample. The final panel shows labor distortion (ARPL) gap between immigrants and natives, which remain flat throughout the life cycle for these subsets of firms. The estimated difference in ARPL is comparable to, or slightly larger than, that observed in the baseline, suggesting that labor market frictions persist even among the group of growing immigrant firms.

Table B.3: Difference between immigrant and native firms, surviving and growing firms

Sample	difference at age				
	1	5	10	15	20
Value added					
Full	-0.43	-0.38	-0.37	-0.29	-0.20
Remove self-employed at age 10	-0.46	-0.41	-0.41	-0.32	-0.22
Remove bottom 10 pct at age 10	-0.47	-0.42	-0.41	-0.32	-0.22
Capital					
Full	-0.56	-0.47	-0.43	-0.29	-0.19
Remove self-employed at age 10	-0.54	-0.48	-0.44	-0.34	-0.23
Remove bottom 10 pct at age 10	-0.56	-0.50	-0.46	-0.35	-0.23
ARPK					
Full	0.13	0.09	0.05	-0.00	-0.02
Remove self-employed at age 10	0.09	0.07	0.03	0.02	-0.00
Remove bottom 10 pct at age 10	0.09	0.07	0.04	0.02	-0.00
ARPL					
Full	0.06	0.07	0.07	0.07	0.04
Remove self-employed at age 10	0.09	0.09	0.07	0.08	0.05
Remove bottom 10 pct at age 10	0.10	0.09	0.08	0.08	0.05

Notes: Estimates are the difference between immigrant and native firms ($\hat{\beta}_a$) at firm ages 1, 5, 10, 15, and 20, based on Equation (2). Red (blue) values indicate negative (positive) estimates in $\hat{\beta}_a$ that are statistically significant at the 95% level; black values are not significant at this level. Results are reported for three samples: (i) the full sample; (ii) excluding firms that survive at least 10 years but fall within the bottom 10th percentile of cohort-specific firm size at age 10; and (iii) excluding firms that survive at least 10 years but remain self-employed at age 10.

Table B.4 reports life-cycle patterns for two subsamples that focus on larger firms. The first uses a simple and transparent cutoff: we include only firm-year observations in which the firm has more than two paid employees. This approach is intended to exclude self-employed and family-run firms, which tend to be more prevalent among immigrant entrepreneurs. Importantly, this criterion is applied at the firm-year level—meaning that a firm may be excluded in its early years but included once it grows beyond the threshold of $n > 2$. As a result, firms that start small may enter the sample as they expand, while their earlier years are omitted. While this size-based rule is straightforward to implement, the fact that firms may enter or exit the sample depending on year-to-year fluctuations in size makes the interpretation of life-cycle patterns less transparent. To address this concern, we consider an alternative selection criterion based on firms' average size over the life cycle. Specifically, we restrict the sample to firms whose average size over the years they are observed in the data is above the 10th percentile of their respective cohort. This approach provides a more stable classification and avoids temporary exits or entries due to short-run variation in employment.

Table B.4: Difference between immigrant and native firms, large firms

Sample	difference at age				
	1	5	10	15	20
Value added					
Full	-0.43	-0.38	-0.37	-0.29	-0.20
Remove small firms ($n > 2$)	-0.38	-0.32	-0.32	-0.29	-0.22
Remove bottom 10 pct of each cohort	-0.41	-0.34	-0.35	-0.31	-0.25
Capital					
Full	-0.56	-0.47	-0.43	-0.29	-0.19
Remove small firms ($n > 2$)	-0.37	-0.31	-0.28	-0.21	-0.12
Remove bottom 10 pct of each cohort	-0.50	-0.41	-0.38	-0.29	-0.22
ARPK					
Full	0.13	0.09	0.05	-0.00	-0.02
Remove small firms ($n > 2$)	-0.00	-0.01	-0.05	-0.08	-0.10
Remove bottom 10 pct of each cohort	0.09	0.06	0.03	-0.02	-0.04
ARPL					
Full	0.06	0.07	0.07	0.07	0.04
Remove small firms ($n > 2$)	0.06	0.08	0.07	0.07	0.04
Remove bottom 10 pct of each cohort	0.06	0.07	0.06	0.05	0.04

Notes: Estimates are the difference between immigrant and native firms ($\hat{\beta}_a$) at firm ages 1, 5, 10, 15, and 20, based on Equation (2). Red (blue) values indicate negative (positive) estimates that are statistically significant at the 95% level; black values are not significant at this level. Results are reported for three samples: (i) the full sample; (ii) firm-year observations in which the firm has more than two workers; and (iii) firms whose average size (number of workers) over the life cycle is above the 10th percentile of their respective cohort.

As shown in the top two panels of Table B.4, the subsample of larger firms exhibits life-cycle patterns in value-added and capital that closely mirror those in the full sample. Immigrant firms start significantly smaller than native firms but grow faster over time, gradually narrowing the gap. Labor distortions, as measured by ARPL, also follow a similar pattern as the full sample: the gap is statistically significant and remains persistent even after 20 years of operation. The pattern for capital distortions, however, is more nuanced. In the subsample that excludes the bottom 10 percent of firms within each cohort, immigrant entrepreneurs face a capital distortion (ARPK) that is 0.09 log points higher than that of native firms at entry, with the gap gradually closing by year 15. In contrast, this pattern does not hold in the sample restricted to firm-year observations with more than two employees, where no significant initial difference in ARPK is observed. This discrepancy may partly reflect the nature of the year-by-year selection in that sample, which, as discussed above, can obscure underlying life-cycle dynamics due to fluctuations in firm size.

Taken together, the results in Tables B.3 and B.4 provide further evidence based on samples of firms that are surviving, growing, and larger in size. These findings reinforce the conclusion

that our baseline results are not driven by firms that remain dormant or small throughout their life cycle, with no intention to expand or grow.

B.3 Small firms

Table B.5 shifts focus to the other end of the firm-size distribution—small firms with fewer than 100 employees—to test whether immigrant-native differences are driven by very large firms. We note that the results are qualitatively similar when we use a lower cutoff, such as 50 employees. As in Tables B.3 and B.4, we apply the same size cutoff to both immigrant and native firms and report the immigrant-native gap at selected ages over the 20-year life cycle. Restricting the sample to smaller firms yields virtually identical life-cycle patterns, indicating that the performance and distortion gaps are not concentrated only in large firms.

Table B.5: Difference between immigrant and native firms, small firms

Sample	difference at age				
	1	5	10	15	20
Value added					
Full	-0.43	-0.38	-0.37	-0.29	-0.20
Remove large firms ($n \leq 100$)	-0.42	-0.37	-0.36	-0.28	-0.19
Capital					
Full	-0.56	-0.47	-0.43	-0.29	-0.19
Remove large firms ($n \leq 100$)	-0.55	-0.46	-0.42	-0.28	-0.18
ARPK					
Full	0.13	0.09	0.05	-0.00	-0.02
Remove large firms ($n \leq 100$)	0.13	0.09	0.05	0.00	-0.02
ARPL					
Full	0.06	0.07	0.07	0.07	0.04
Remove small firms ($n \leq 100$)	0.06	0.07	0.07	0.07	0.04

Notes: Estimates are the difference between immigrant and native firms ($\hat{\beta}_a$) at firm ages 1, 5, 10, 15, and 20, based on Equation (2). Red (blue) values indicate negative (positive) estimates that are statistically significant at the 95% level; black values are not significant at this level. Results are reported for two samples: (i) the full sample; and (ii) firm-year observations in which the firm has less then 100 workers.

B.4 Manufacturing and service industries

Throughout the regressions, we control for 4-digit industry fixed effects, ensuring that comparisons between immigrant and native firms are made within finely defined industries. Table A.2 reports the distribution of immigrant and native firms across 2-digit NAICS industries. The table reveals some degree of industry sorting between the two groups. For instance, 10.42% of immigrant firms operate in industry 48 (Air Transportation and Support Services), compared to only 5.05% of native firms. Conversely, immigrants are underrepresented in heavy manufacturing sectors such as industries 32 and 33. That said, immigrant

firms maintain a substantial presence across the full range of industries, with roughly similar representation to native firms in sectors such as 41 (Wholesale Trade) and 31 (Manufacturing of Food, Beverages, and Textiles).

While the regressions compares immigrant and native firms within 4-digit industries, one remaining concern is whether the observed differences are driven by particular sectors. For example, one might expect capital gaps and capital distortions to be more pronounced in capital-intensive manufacturing, while labor distortions could play a greater role in service industries. To investigate this, Table B.6 reports life-cycle differences between immigrant and native firms separately for the manufacturing and service sectors.

We find that immigrant firms start substantially smaller than native firms in both sectors. At age 1, the value-added gap is 0.37 log points in manufacturing and 0.44 in services, closely mirroring the full-sample gap of 0.43 log points. Over time, these gaps narrow but remain sizable by age 20—0.16 log points in manufacturing and 0.22 in services. Capital exhibits a similar pattern: immigrant firms begin with a deficit of approximately 0.56 log points in both sectors, which declines to about 0.15 in manufacturing and 0.20 in services by year 20. These results suggest that the immigrant-native size gap is not confined to capital-intensive industries but persists across both manufacturing and services with comparable magnitude.

Immigrant manufacturers face a larger initial capital distortion—measured by a 0.20 log point gap in ARPK—than immigrant service firms (0.12 log points). The gap narrows steadily and becomes statistically insignificant by age 15 in both sectors, consistent with the full-sample pattern. The slightly higher starting distortion for manufacturers suggests stronger external-finance constraints in capital-intensive activities, but these frictions diminish as firms age. In addition, the gap in labor distortions (ARPL) is also larger in manufacturing—0.10 log points at age 1—compared to 0.04 in services, and remains positive and statistically significant throughout the life cycle, ending at 0.05 and 0.02 log points, respectively. Unlike ARPK, the ARPL gap shows little convergence, echoing the full-sample finding that labor distortions are harder to overcome.

In summary, the sectoral analysis addresses our initial concern about whether the immigrant-native performance gaps are driven by particular industries. The evidence shows that while there are some differences in magnitude, the fundamental patterns persist across both manufacturing and services. This suggests that the performance gaps we observe reflect broader challenges facing immigrant entrepreneurs rather than sector-specific factors.

B.5 Immigrants of different origins

A distinctive feature of the CEEDD data is that it identifies a business owner's country of origin, which allows us to examine heterogeneity across immigrant groups. We group countries into two broader regional categories: immigrants from the US, UK, and Western European countries—regions that are more economically developed and share strong institutional and cultural ties with Canada, and immigrants from Asia, Africa, and Latin America—regions that account for more recent immigration and are generally less developed, non-English-speaking parts of the world.

Table B.6: Difference between immigrant and native firms, manufacturing and service

Sample	difference at age				
	1	5	10	15	20
	Value added				
Full	-0.43	-0.38	-0.37	-0.29	-0.20
Manufacturing	-0.37	-0.36	-0.25	-0.25	-0.16
Service	-0.44	-0.38	-0.38	-0.30	-0.22
	Capital				
Full	-0.56	-0.47	-0.43	-0.29	-0.19
Manufacturing	-0.56	-0.51	-0.36	-0.31	-0.15
Service	-0.56	-0.47	-0.43	-0.30	-0.20
	ARPK				
Full	0.13	0.09	0.05	-0.00	-0.02
Manufacturing	0.20	0.14	0.10	0.05	-0.01
Service	0.12	0.08	0.05	-0.00	-0.02
	ARPL				
Full	0.06	0.07	0.07	0.07	0.04
Manufacturing	0.10	0.07	0.07	0.08	0.05
Service	0.04	0.05	0.06	0.06	0.02

Notes: Estimates are the difference between immigrant and native firms ($\hat{\beta}_a$) at firm ages 1, 5, 10, 15, and 20, based on Equation (2). Red (blue) values indicate negative (positive) estimates that are statistically significant at the 95% level; black values are not significant at this level. Results are shown for three samples: (i) the full sample; (ii) manufacturing firms; and (iii) service firms.

Table B.7 compares native firms with immigrant-owned firms for the full sample, and from these two regions. The results show that the overall immigrant-native gap in firm performance is largely attributable to differences among immigrants from Asia, Africa, and Latin America. At age 1, businesses from these regions produce less value-added (0.49 log points) and hold less capital (0.62 log points) than native firms. These gaps narrow over time but remain substantial at 20 years—0.28 log points in value-added and 0.19 in capital. In contrast, immigrant firms from the US, UK, and Western Europe begin with much smaller gaps—0.08 log points in value-added and 0.16 in capital—and these differences become statistically insignificant within the first decade.

Capital distortions, as measured by ARPK, follow a similar pattern. Firms from Asia, Africa, and Latin America begin with a 0.12 log point ARPK gap, which declines steadily and turns negative by age 15. Those from the US, UK, and Western Europe start with a smaller gap of 0.08 log points, which becomes insignificant over time. Labor distortions (ARPL) are evident only for immigrant owned firms from Asia, Africa, and Latin America, with a consistent gap of about 0.05-0.07 log points through age 15.

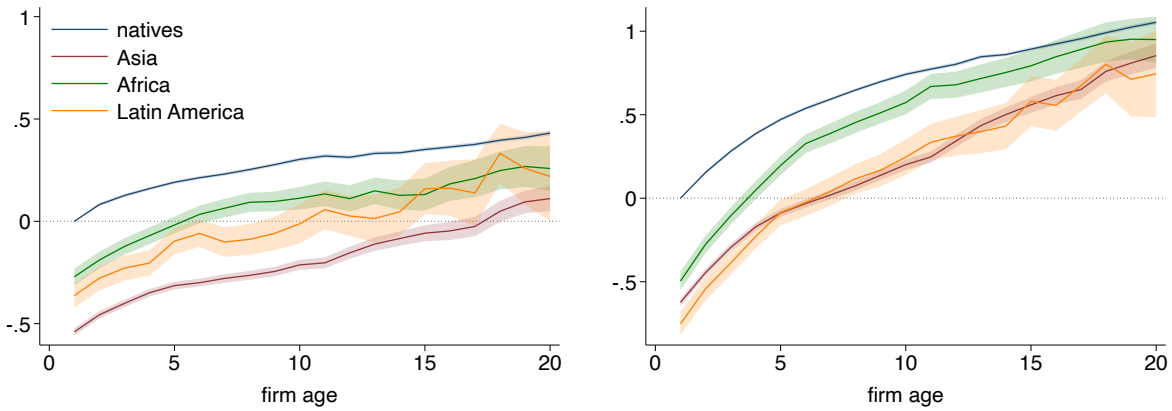
Table B.7: Difference between immigrant and native firms, by origins

Sample	difference at age				
	1	5	10	15	20
Value added					
Full	-0.43	-0.38	-0.37	-0.29	-0.20
US, UK, Western Europe	-0.08	-0.02	-0.03	-0.06	-0.04
Asia, Africa, Latin America	-0.49	-0.45	-0.46	-0.36	-0.28
Capital					
Full	-0.56	-0.47	-0.43	-0.29	-0.19
US, UK, Western Europe	-0.16	-0.06	-0.04	-0.10	-0.10
Asia, Africa, Latin America	-0.62	-0.52	-0.49	-0.30	-0.19
ARPK					
Full	0.13	0.09	0.05	-0.00	-0.02
US, UK, Western Europe	0.08	0.04	0.01	0.04	0.05
Asia, Africa, Latin America	0.12	0.07	0.03	-0.07	-0.10
ARPL					
Full	0.06	0.07	0.07	0.07	0.04
US, UK, Western Europe	0.04	0.03	0.03	0.01	0.02
Asia, Africa, Latin America	0.05	0.07	0.06	0.05	0.03

Notes: Estimates are the difference between immigrant and native firms ($\hat{\beta}_a$) at firm ages 1, 5, 10, 15, and 20, based on Equation (2). Red (blue) values indicate negative (positive) estimates that are statistically significant at the 95% level; black values are not significant at this level. Results are shown for three samples: (i) the full sample; (ii) native-owned firms and firms owned by immigrants from US, UK, and Western Europe; and (iii) native-owned firms and firms owned by immigrants from Asia, Africa, and Latin America.

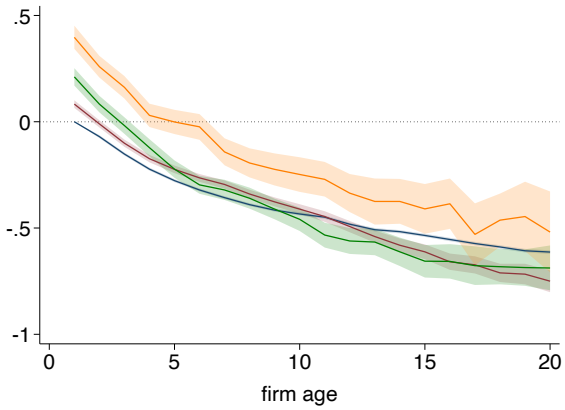
These results mask important differences within the less-developed-region group. Figure B.4 shows substantial heterogeneity in firm outcomes and distortions among entrepreneurs from Asia, Africa, and Latin America. A key pattern is that African entrepreneurs exhibit higher value added and capital over the life cycle than entrepreneurs from Asia and Latin America. Although African entrepreneurs face relatively high capital distortions at entry, these distortions narrow quickly. By contrast, capital and labor distortions for Latin American entrepreneurs remain above those of other immigrant groups throughout the life cycle.

Figure B.4: Firm performance over life cycle, Asia-Africa-Latin America

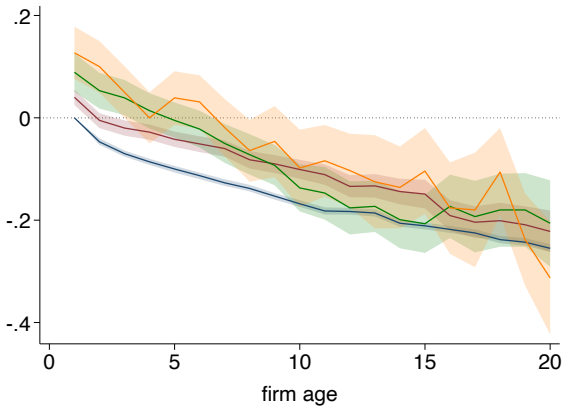


(a) Value-added

(b) Capital



(c) ARPK



(d) ARPL

Notes: Solid lines are the estimates for immigrant ($\hat{\gamma}_a + \hat{\beta}_a$) and native ($\gamma_a$) firms over the life-cycle based on equation (2). Shaded areas represent the 95% CIs.

C TFP Decomposition

For notation ease, let firm output be $y_{ji} = z_{ji}x_{ji}^{\eta}$ where $x_{ji} = k_{ji}^{\alpha}\ell_{ji}^{1-\alpha}$ is a composite input of capital and labor inputs. Based on a standard Social Planner problem, the maximized total output for group j entrepreneurs is

$$Y_j^* = \left(\sum_i z_{ji}^{\frac{1}{1-\eta}} d\mu_{ji}\right)^{1-\eta} X_j^{\eta},$$

where μ_{ji} is the mass of firm i of type j that operates, and $X_j = \sum_i x_{ji}d\mu_{ji}$. Let $M_j = \sum_i d\mu_{ji}$ be the total mass of j firms that operate, and let $\tilde{\mu}_{ji} = \mu_{ji}/M_j$ be the weight of each firm. Then, the total maximized output can be written as

$$Y_j^* = \left(\sum_i z_{ji}^{\frac{1}{1-\eta}} d\tilde{\mu}_{ji}\right)^{1-\eta} M_j^{1-\eta} X_j^{\eta}.$$

Since TFP_j is Y_j/X_j^{η}, and together with the above expression, TFP can be written as

$$TFP_j = \frac{Y_j}{X_j^{\eta}} = \left(\sum_i z_{ji}^{\frac{1}{1-\eta}} d\tilde{\mu}_{ji}\right)^{1-\eta} M_j^{1-\eta} \frac{Y_j}{Y_j^*}.$$

As such, TFP is a composite of an aggregation of firm productivity, the mass of firms that operate, which captures the extensive or selection margin which we call 'entry', and a measure of an output gap that we call 'misallocation'. And so, TFP is a composite of three factors,

$$TFP_j = aggz_j \times entry_j \times misall_j,$$

and taking log differences, this becomes

$$\Delta \log TFP_j = \Delta \log aggz_j + \Delta \log entry_j + \Delta \log misall_j.$$

Table C.8 reports the TFP decomposition for the counterfactual policy that equalizes immigrant access to finance and labor hiring distortions to native levels. We define the selection component as $\Delta \log aggz_j + \Delta \log entry_j$ and the misallocation component as $\Delta \log misall_j$. The selection component captures both changes in the mass of operating firms (extensive margin) and changes in the composition of firms (through $\tilde{\mu}_{ji}$) in the productivity aggregator. Changes in selection alter the distribution of firms and therefore affect both the productivity aggregator and the measured misallocation term, and vice versa. We emphasise that this decomposition is an accounting identity rather than a structural one.

Equalizing distortions for immigrants raises the selection component of immigrant TFP by 6.5 percent—greater entry increases $entry_m$ by 15.9 percent but $aggz_m$ falls by 9.4 percent as the average productivity of entrants declines. The misallocation component rises by an additional 2.9 percent, implying that immigrant TFP increases by 8.1 percent overall.

Table C.8: TFP Decmoposition

	Selection		Misallocation	Combined
	$aggz_j$	$entry_j$	$misall_j$	TFP
Immigrants	-9.4	15.9	2.9	8.1
Natives	2.6	-3.4	-0.0	-0.9
All	0.3	-0.2	0.6	0.7

Notes. Reported is the TFP decomposition when immigrant access to finance and labor hiring frictions are equalized to native levels, corresponding to Table 5 column 3.

For natives, TFP changes are driven primarily by selection effects—greater exit lowers $entry_n$, although this is partially offset by higher $aggz_n$ resulting in a 0.9 percent decline in native TFP. For all entrepreneurs combined, countervailing effects from lower entry and higher average productivity largely offset within the selection component. As natives account for the majority of entrepreneurs, most aggregate TFP gains therefore arise through improvements in the misallocation component.