Curbing Tax Flight?

Aggregate Effects of Taxing Entrepreneur Migration

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Abstract

This paper examines the trade-offs policymakers face when imposing out-migration taxes to prevent tax flight. Exploiting an increase in the wealth tax rate in Norway at the top of the wealth distribution, I document significant migration responses. The out-migration rate of affected households increased from 0.2% in the pre-period to more than 2% in the year of the reform. Out-migration not only erodes the the tax base, but 40% of out-migrating households are firm owners. Firms of out-migrating owners experience, on average, a 12.6% decrease in firm revenues compared with firms whose owners remain. To analyze the aggregate effects of the reform and the effectiveness of out-migration taxes, I develop a dynamic equilibrium model where heterogeneous entrepreneurs make forward-looking savings and location choices. Entrepreneurs who operate their firm in a different location than their country of residence may incur a haircut to their productivity. Leveraging quasi-experimental evidence from the reform to estimate the key model parameters, my model reveals that the wealth tax reform reduces aggregate output by 1.3% in the long-run. Introducing a tax on the market value of the firm upon out-migration curbs tax flight, especially among more productive entrepreneurs, and increases aggregate output.

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1 Introduction

Capital tax flight is seen as an important barrier to taxing the wealthy. When productive entrepreneurs relocate, tax flight not only erodes the tax base but can also reduce domestic output. In response, many countries impose tax liabilities triggered at out-migration, potentially changing how individuals respond to domestic capital taxation. While such policies may reduce tax flight, they may also distort wealth accumulation and migration choices. Yet, despite how prominent this issue is in the public debate, there's surprisingly little evidence in the economics literature on the extent of capital tax flight, the aggregate implications, and whether policies such as out-migration taxes can curb tax flight. This motivates the central question of this paper: How do out-migration taxes affect tax flight and the aggregate impacts of capital taxation?

Understanding how policies to curb tax flight affect the migration response and aggregate implications of capital taxes is challenging for several reasons. First, there are few data sources that simultaneously track the residency, wealth and firm ownership of households over time. Second, while quasi-experimental evidence can be used to draw conclusions about local short-run policy effects of a single policy, a quantitative model is needed to draw conclusions about the long-run aggregate and equilibrium effects of combining two distinct policies.

I address these challenges using Norway as a laboratory. Norway is an ideal setting because it is a small country where capital tax flight is a central policy concern, and it levies a wealth tax that incentivizes wealthier households to out-migrate. Using panel data that track households and their firms over time, I combine quasi-experimental evidence on the migration behavior of wealthy households with a dynamic equilibrium model to study the effects of wealth and out-migration taxes. In 2022, the newly elected government significantly increased domestic capital tax rates on wealthy households leading to an outflow of tax revenue. Using a difference-in-differences design, I show that the out-migration rate of affected households increased from 0.2% to over 2%, with no significant change in the comparison group. More than 40% of out-migrating households are active firm owners. I find that the location of wealthy households has meaningful consequences for domestic firms: when owners out-migrate, their firm experiences a 12.6% decrease in revenue relative to firms whose owners remain.

To study the aggregate implications of this policy change, I build a model where entrepreneurs make forward-looking savings and migration choices, and decide whether and where to operate their firms. This model builds on Angeletos (2007), Moll (2014), and Guvenen et al. (2023). At the heart of the model are agents who differ in their entrepreneurial productivity across locations and face collateral constraints in financing production. These two features generate productivity dispersion across firms and heterogeneity in the returns to wealth among entrepreneurs. Entrepreneurs who choose to operate their firm in a different location than they are currently residing can incur a *haircut* to their productivity, reflecting a potential losses in the span-of-control or monitoring capabilities when managing operations at a distance, as in Giroud (2013).

The stationary equilibrium of this economy has several properties that are useful to characterize the aggregate effects of tax policies. First, aggregate output is governed by the quality-adjusted capital stock of the economy which is comprised of the average productivity and wealth of two groups: *resident* owners, who operate firms where they reside, and *expat* owners, who operate firms from abroad. The productivity haircut reduces the quality-adjusted capital stock of expats. On the other hand, expat entrepreneurs also face lower tax rates, which increases their rate of wealth accumulation over time. These two opposing forces imply that the overall impact of tax flight on domestic aggregate output is ambiguous.

Second, I show that the aggregate effects of capital taxation in a setting where entrepreneurs can out-migrate have two main components: (i) a wealth effect from the migration responses and the resulting changes in the growth rate of wealth (ii) composition effects driven by changes in firm location, entry, and exit. The migration response is therefore a key component in shaping the aggregate effects of capital taxes in this economy. Out-migration taxes levied on the market value of the firm upon out-migration reduce both the level of out-migration and the migration response to wealth taxes.

Armed with these conceptual insights, I return to the empirical setting and show how the reduced-form evidence is informative about the key model parameters. First, the out-migration response to the capital tax reform inform the (common) utility cost of moving and the role of return differentials in location decisions. Second, the change in revenues following owner out-migration informs the magnitude of the productivity haircut. I estimate the key model parameters by replicating the reduced-form estimates within the model.

Using the calibrated model, I present two sets of quantitative results. First, I examine how wealth taxes affect measures of tax flight. I find that more productive entrepreneurs are more likely to out-migrate when the wealth tax rate at the top of the distribution increases. Given the large migration response in the data, the long run stock of entrepreneurs residing in the home country decreases significantly. As a result, long-run wealth tax revenue falls by more than 80%. I decompose this decline into three channels: a mechanical effect capturing changes in tax rates holding the distribution of entrepreneurs fixed; a distributional effect reflecting changes in the wealth distribution; and a tax flight effect reflecting changes in the share of entrepreneurs residing in the home country. This decomposition reveals that the majority of revenue loss is driven by tax flight. Introducing a 1% tax on the market value of the firm upon out-migration reduces out-migration rates, dampening the decline in wealth tax revenue and increases other components of tax revenue.

In the second set of results, I estimate the aggregate effects of the wealth tax reform. I find that although the long-run stock of entrepreneurs located in the home country decreases significantly, overall output losses by only 1.3%. The modest output decline reflects two offsetting forces. Although the reform reallocates wealth from resident to expat owners, the heightened wealth accumulation of productive expat owners dampens the output loss from the productivity haircut. By reducing the out-migration rate of more productive entrepreneurs, introducing a 1% out-migration tax increases aggregate output such that the net effect of the wealth tax reform on aggregate output becomes positive.

Literature. This paper contributes to the growing theoretical and quantitative literature in macroeconomics on aggregate and equilibrium effects of capital taxation when returns are heterogeneous across entrepreneurs (Benhabib et al. 2011; Guvenen et al. 2023; Guvenen et al. 2024; Gaillard and Wangner 2022; Boar and Knowles 2022; Boar and Midrigan 2023). These papers assume a closed economy. In contrast, I develop a model in which two small open economies differ in their tax policies and study how the interaction of two different tax policies affect tax flight and aggregate outcomes. My key theoretical contribution is to incorporate the migration decisions of entrepreneurs and location decisions of firms, two important features of tax systems in small open economies.

On the empirical side, I build on the literature documenting international migration responses to taxation. There are many studies documenting the elasticity of out-migration across countries with respect to changes in labor income taxation (Akcigit et al. 2016; Kleven et al. 2014; Kleven et al. 2013). However, there are relatively fewer studies examining changes in capital taxation (Brülhart et al. 2022; Agrawal et al. 2025), especially across countries. Advani et al. (2025)

find a modest increase in out-migration following a tax hike on wealthy individuals who were temporary residents in the UK. In contrast, I focus on a change in wealth taxes, which affected permanent residents at the top of the wealth distribution. Jakobsen et al. (2025) find that wealthy individuals in Sweden were less likely to out-migrate following the repeal of the wealth tax. In the Norwegian context, I estimate an elasticity of out-migration with respect to wealth taxation on the higher end of what the literature finds. Using the theoretical framework, I show that this elasticity is a key input into understanding the extent of tax flight following tax reforms, but it is inherently reduced form in nature because it depends on the institutional context and can be altered by policy.

This paper relates to an older literature in public finance studying tax incidence in open economies (Bradford 1978; Kotlikoff and Summers 1987; Clausing 2013). One central idea in this literature is that the mobility of a factor of production is a key determinant in whether it bears the burden of a tax. In an open economy where capital is completely mobile, while labor is immobile, labor bears the entire burden of a tax on capital. More recently, Suárez Serrato and Zidar (2016) study this concept in the context of the US corporate income tax and incorporate both firm and labor mobility across states. This paper contributes to this literature by focusing not only on the mobility of the factors themselves, but the mobility of its owners. I show that this distinction is important for characterizing the effects of capital taxation in an open economy.

Outline. The rest of the paper is organized as follows. Section 2 presents an overview of the Norwegian tax system, data and the empirical results. Section 3 describes the model and uses the tractability of the model to analytically characterize the effects of capital taxes when entrepreneurs can out-migrate and firms can relocate. Section 4 discusses identification and estimation of the model parameters using the empirical evidence. Section 5 presents the quantitative results and Section 6 concludes.

2 Institutional Context and Data

In this section, I describe the key features of the Norwegian tax system. Then, I describe the data and sample selection before providing evidence on the out-migration behavior of households before and after the 2022 tax reform.

2.1 Institutional Context

Norway is a small open economy with a well-educated population and low labor income inequality, but relatively high wealth inequality compared to other OECD countries. Generally, Norway runs a fiscal surplus.[1] Tax revenues from oil and gas have been used to build a sovereign wealth fund, which is integrated into the government budget each year to finance public spending. The Norwegian tax system is characterized by a progressive labor income and social security tax, a flat tax rate on capital income and a wealth tax above an exemption amount. Firms pay corporate taxes on their operating profits and pay-roll taxes for employees.

Wealth taxation. Wealth taxes are levied on the book-value of taxable assets minus liabilities above an exemption amount for residents. Most components of wealth, except pension wealth, are subject to taxation, including housing wealth, shares in public and private firms, and deposits. End-of-year domestic wealth is third-party reported for most asset classes to the tax authorities. Shares in publicly listed firms are valued using the stock price at the end of the year, while shares in unlisted firms are valued using the book value of the firm. Although it is difficult to compare the book value of a firm to its market value due to infrequent trading, Grindaker and Vestad (2025) estimates that unlisted shares were, on average, valued at about 70% of their market value in 2021.

Capital and corporate income taxes. Dividends paid out to shareholders are taxed according to the tax residency of the person. Capital gains are taxed at realization, but limited liability firms are exempt from capital gains taxation. In practice, this means most wealthy households own shares using a holding company and pay taxes on their capital gains through corporate income taxes, wealth taxes, and dividend taxes when they extract funds from the holding company. Corporate income taxes are assessed at the end-of-year profits of the firm. Corporate and dividend taxes are designed such that owners of closely held firms will be indifferent between paying out wages and paying labor income taxes vs. retaining the profits and paying out dividends. Over the time period 2016-2021, dividend taxes were increased and corporate taxes were decreased to keep the sum of the two constant over time.

Out-migrating for tax purposes. Personal income and wealth taxes are residency-based and individual bilateral tax treaties determines the tax liability for individuals who migrate in or

[1] Since 1994, the only year with net lending was 2020 during the COVID-19 pandemic.

out of the country. To be considered a non-resident for tax purposes, individuals must maintain a permanent residency abroad, reside in Norway for less than 61 days per year and neither the person nor their close family can own any residential property in Norway. Hence, out-migrating creates physical distance between firms and their owners. After three years as a non-resident for tax purposes, the individual is no longer tax liable to Norway. One key exception is the tax treaty with Switzerland, which allows individuals to no longer be tax liable to Norway from day one. I use this exception in the model later, where the tax liability of the person follows the same timing as the location of the person.

2.2 Data

Below I describe the data and sample selection. Details about the data sources and each of the variables are given in Appendix Section A. I link a set of Norwegian administrative data registries maintained by Statistics Norway using unique identifiers for firms and individuals. This results in a matched panel dataset with information on observable characteristics, residency status, and firm outcomes of individual owners and their firms over the period 2016-2022.

The National Population register covers all individuals who were residents at some point in Norway. For each year, there is detailed information on demographics and importantly their residency status, birth country, and in-migration/out-migration year. I link this database with information from tax records about the individual's labor and capital income, assets and liabilities. This information is third-party reported for domestic assets and liabilities to the tax authorities every year.

Using the Shareholder Registry ("Aksjonærregisteret"), I can track the ownership of all unlisted domestic firms. Both domestic and foreign owners are recorded. To measure ownership, I compute the total value of the shares owned by an individual directly, or indirectly through other firms as a share of the total equity value of the firm. This process allows me to unveil complex indirect ownership structures to reveal the ultimate owners of all domestic firms. Using the firm identifier, I link the ownership data with information about the balance sheet of each firm reported at the end of the year. Finally, I use information on firm characteristics such as industry from the firm registry "Brønnøysund registeret".

To construct the analysis sample, I restrict to Norwegian-born individuals between 25 and 70 years old over the time period 2016-2022. I restrict to households which were liable to the wealth tax and residents in Norway in 2016. In comparison to the general population, this sample is wealthier and older.

2.3 Descriptive Evidence

In the next section, I describe the changes in capital tax rates in 2022 and estimate the migration response. Then, I study the observable characteristics of out-migrating households before turning to how firm outcomes of out-migrating owners change in the years after out-migrating.

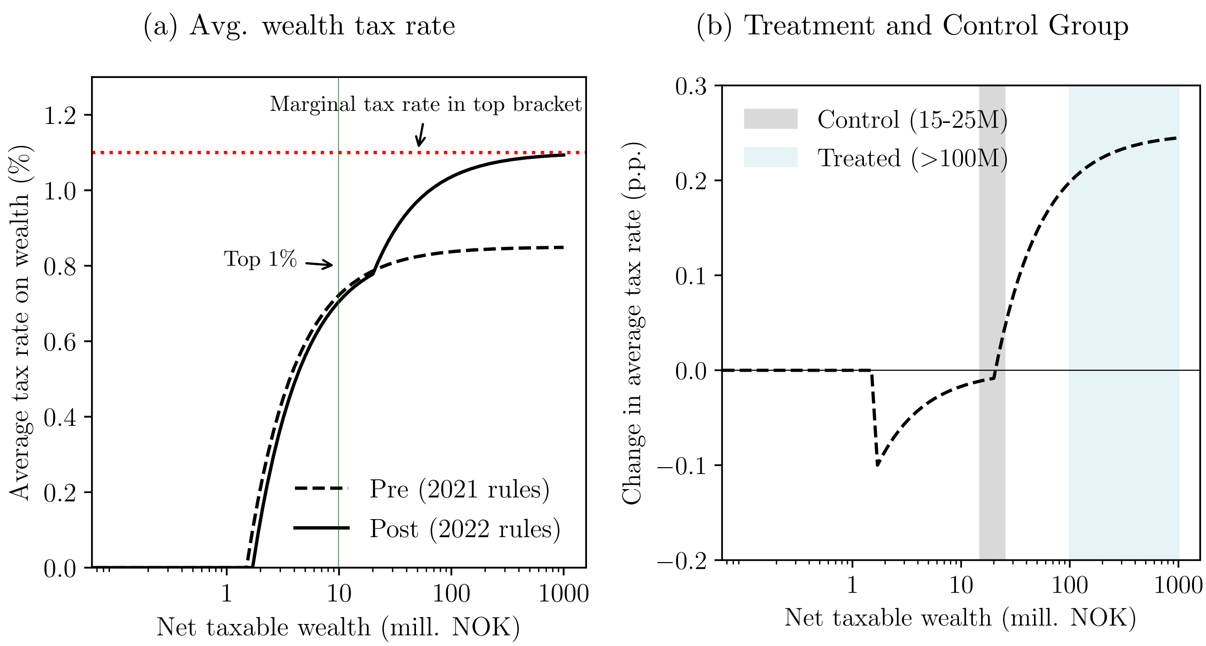
2.3.1 Capital Tax Variation

In 2016, the path of wealth tax rates for the time period 2016 - 2021 was announced. Hence, absent any adjustment costs, the policy regime was relatively stable over this time period. In October 2021, a new government coalition won the election having promised increasing wealth tax rates to redistribute wealth, but did not specify before the election by how much. In November 2021, the new proposal about capital tax rates for 2022 was announced with an increase both in the wealth tax rate and dividend taxes effective in 2022. Specifically, the wealth tax rate above the exemption amount increased from 0.85% to 0.95%, and a new tax bracket was introduced with a 1.1% wealth tax rate above 20 million NOK (about 2 million USD). Dividend taxes increased from 31.64% in 2021 to 35.2% in 2022.

Empirical Strategy. The decision to out-migrate depends on differences in average tax rates, since households compare the present discounted value of consumption across locations. Figure 1a shows the change in the average tax rate across the distribution of net wealth between 2021 and 2022. Households at the top of the distribution face a change in the average tax rate approximately equal to the change in the marginal tax rate. Moderately wealthy households between 15 and 25 million NOK face almost no change in the average tax rate, while households slight above the exemption threshold face a decrease. To estimate the out-migration response to the tax reform, I compare the out-migration rates of very wealthy households with > 100 million NOK in net wealth with moderately wealthy households with between 15 and 25 million NOK in net wealth in a difference-in-differences setup. Both the treatment and control group fall within the top 1% of the net wealth distribution in 2021.

The main identification assumption is that the out-migration rates of moderately wealthy households would have evolved the same as the out-migration rates of very wealthy households

Figure 1: Illustration of Empirical Strategy



Notes: Sub-figure (a) plots the average tax rate on net wealth, absent any valuation discounts in 2021 vs. 2022 across the net wealth distribution. The green line indicates the net wealth of the top 1% in 2021. The red dotted line indicates the marginal tax rate in the top tax bracket in 2022. Sub-figure (b) plots the change in the average tax rate between 2021 and 2022 across the net wealth distribution. The grey shaded area highlights the definition of the control group, while the blue shaded area highlights the definition of the treated group. In both sub-figures, the x-axis is on a log-scale.

in absence of the reform. Figure 2a plots the out-migration rates of the two groups around the reform year. Out-migration rates for both groups are relatively low before 20220, where the out-migration rate of households in the treatment group increases significantly. To implement the difference-in-differences design, I estimate the following regression:

$$Y_{i,t} = \sum_{s \neq 2020} \beta_s \mathbf{1}[t = s, \text{Treated}(i) = 1] + \text{Treated}_i + \tau_t + \varepsilon_{i,t} \tag{1}$$

where $Y_{i,t}$ is an indicator for whether the household out-migrated in year t and Treated is an indicator for whether the household is in the treatment group. τ_t are time fixed effects which eliminates any aggregate trends or other changes in tax rules that are common across the two wealth groups. Figure 2b plots the change in the out-migration rate between the two groups relative to 2020 for each year. In the years before the reform, the out-migration rates of the two groups are relatively similar, while in the year of the reform the difference between the two groups is about 0.025 relative to the baseline year. These changes in migration behavior also map into large changes in aggregate tax revenue. Figure 2c shows that out-migrating households accounted for a large share of wealth tax revenue in 2021: about 2.3%, while it was below 1% in the five years before.

Selection into out-migration. Table 1 presents the observable characteristics of out-migrating households compared with households who do not out-migrate within the treatment group. All characteristics are measured in the year before the reform. Households who out-migrate resemble stayers in observable characteristics, but their taxable net wealth is substantially higher. Among them, 41% are active firm owners defined as owning at least 20% of a limited liability firm employing at least one other person than the owner itself.

Table 1: Characteristics of Out-Migrating Households in Treated Group

	(1) Stayer	(2) Out-migrates
Age (years)	49.89	49.72
Nr. of children	0.97	0.97
Married	0.66	0.66
Net wealth (mill, NOK)	271.78	568.38
Dividend share of income	0.50	0.76
Firm owner	0.50	0.41

Notes: This table presents the observable characteristics of households in the treatment group. Additional details on variable construction are provided in Appendix A.

First stage. To interpret the migration response to a tax reform, it is common in the public finance literature to scale the migration response by the reform-induced change in the effective tax rates to obtain an elasticity. To do so requires computing the effective tax rate in the treatment and control groups. Since the change in dividend taxes is easily avoided in the short-run, I focus on the change in the effective wealth tax rate in the two groups. I assume that the wealth tax is fully avoided upon out-migration and that any other changes in the tax code are common across the two groups. In this case, the implied semi-elasticity is -10.16. This means that a one percentage point increase in the effective wealth tax rate increases the out-migration rate at the top of the wealth distribution by more than 10 percentage points.

There are several reasons to interpret this elasticity with caution. First, the magnitude of the estimated semi-elasticity is large compared with the literature. In Sweden, Jakobsen et al.

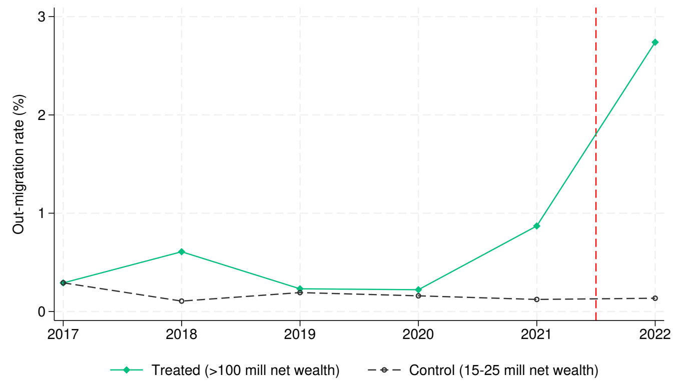
(2025) estimate a semi-elasticity of -0.17 using the repeal of the wealth tax. The key difference between the Swedish and Norwegian context is that private business wealth is subject to the wealth tax in Norway, while in Sweden it was exempt. In Denmark, where private business wealth was subject to taxation, they find a similar elasticity using a reduction in the wealth tax rate in 1989 and the repeal in 1996. Yet, the institutional environment governing migration within Europe was substantially different in the 1990s than it is in the 2020s. The costs of communicating internationally have also substantially decreased in the last 30 years, potentially affecting both the utility costs of out-migrating as well as the ability of firm owners to monitor the day-to-day operations of their firm from abroad.

Second, following the outflow of wealthy individuals after the wealth tax reform, the government tightened the capital gains rules upon out-migration. Before 29 November 2022, individuals could out-migrate from Norway with unrealized capital gains, return after five years, and realize those gains tax-free. After that date, this option was removed, though the capital gains tax could still be deferred indefinitely upon out-migration. The change was announced and implemented on the same day, but migration behavior may still have adjusted in anticipation. For these reasons, I consider the difference-in-differences estimate an upper bound on the long run migration response to the tax reform in the quantitative section.

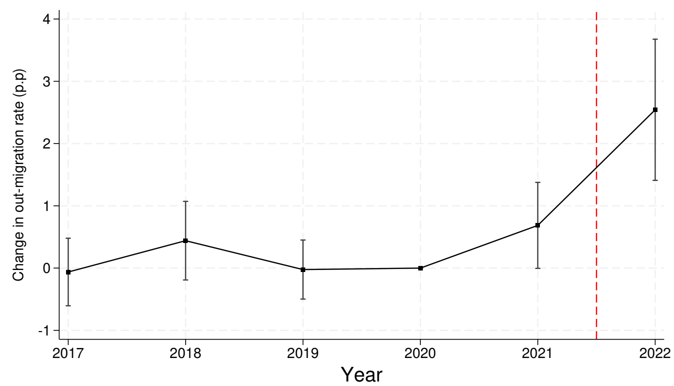
Implications. Intuitively, the out-migration response is informative about the net cost of moving for treated households. Since the pre-reform out-migration rates are low it suggests that the utility costs to out-migrating are high. The relatively large out-migration response when the return differential between locations increases suggests that differences in preferences over amenities in the two locations are less important in households' migration decisions.

In Section 4, I show that this reduced form elasticity does not map directly into any economic primitives in the model. Through the lens of the model, the out-migration response will depend both on the productivity type and therefore the cost to the firm of moving, as well as wealth when the change in the tax schedule is non-linear. By comparing households in the affected tax bracket with households in the unaffected tax bracket the overall DiD coefficient will both capture the impact of the reform, but also differences in the elasticities across different groups.

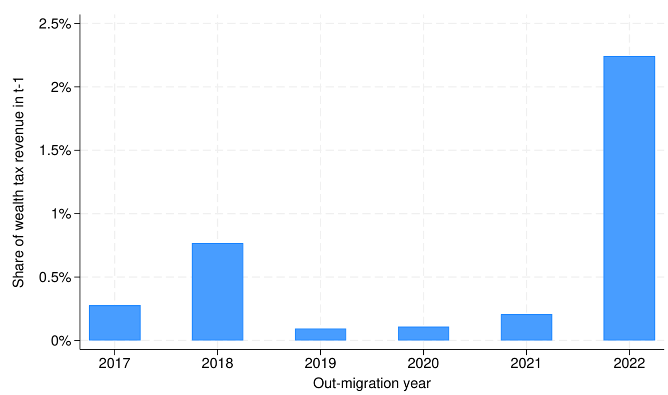
Figure 2: Migration Response to the 2022 Wealth Tax Reform



(a) Raw Out-Migration Rates



(b) Dynamic DiD



(c) Wealth Tax Revenue

Notes: Sub-figure (a) plots the raw out-migration rates of the treatment and control group. Sub-figure (b) plots the estimated coefficients β_s from Equation (1) along with 95% confidence intervals constructed using standard errors clustered at the household level. The y-axis shows the percentage point change in the probability of out-migrating in each year relative to the out-migration rate in 2020. Sub-figure (c) plots the wealth tax revenue paid by out-migrating households the year before they out-migrate as a fraction of the total collected wealth tax revenue. The x-axis is the year the household out-migrate. The red dotted line indicates the tax year the reform was implemented.

2.3.2 Firm Owners

More than 40% of out-migrating households in the treated group are active firm owners. In this section, I examine selection of firm owners into out-migration and changes in firm outcomes around the year the owner out-migrates. Since it is still too close to the reform to observe firm outcomes for out-migrating firm owners affected by the tax reform, I focus on out-migration events in the pre-period 2016-2020.

Firm characteristics. Figure 3 compares the characteristics of firms with out-migrating owners with firms where the owners stay. The characteristics are measured in the year before out-migrating. Out-migrating owners, on average, operate more productive and larger firms. Out-migrating owners are also less attached to their firms: owners who are CEOs or board chairs are less likely to out-migrate, while owners of multi-owner firms are more likely to out-migrate. This suggests that owners that may be more important to the firm are less likely to leave in the first place.

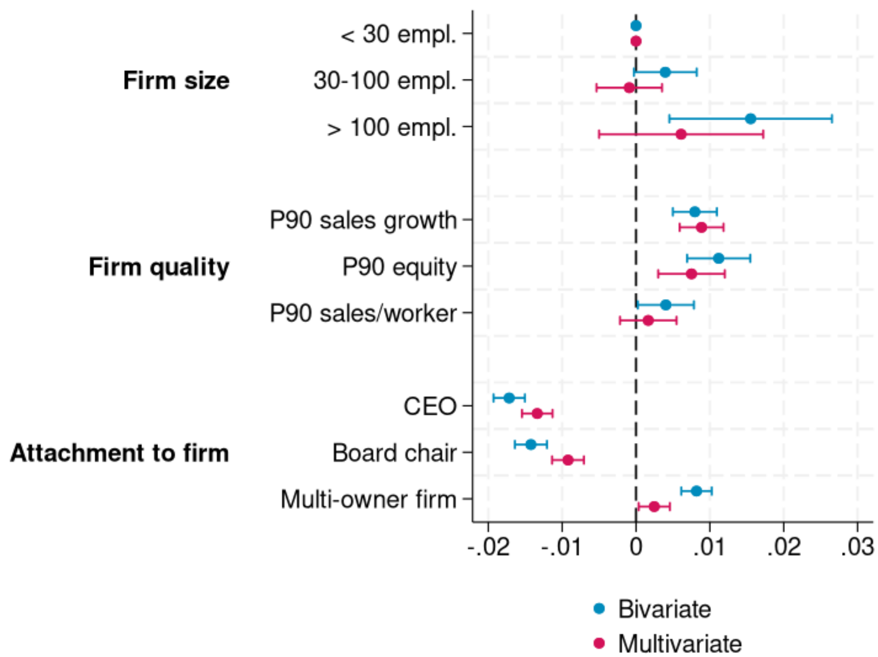


Figure 3: Selection of Firm Owners into Out-migration

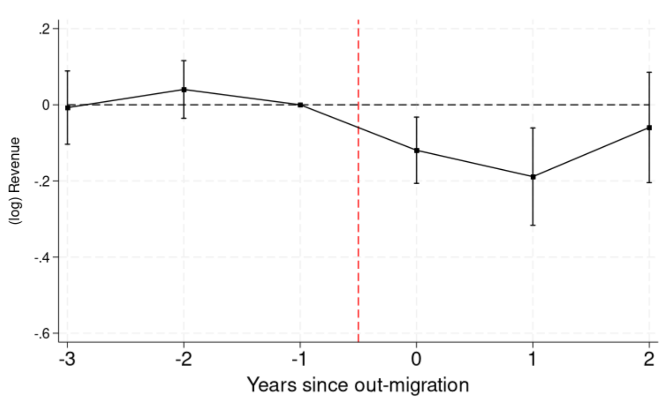
Notes: This figure plots the relationship between firm ownership and the likelihood of out-migration. The multivariate regression includes all the variables in one regression including year and industry fixed effects. The error bars represent 95% confidence intervals constructed using standard errors clustered at the owner-level. Additional details on variable construction are provided in Appendix A.

Firm outcomes after owner out-migrates. Although the decision to out-migrate is endogenous, it is still informative to examine descriptively what happens to firms when their owners leave. I consider out-migration events between 2016 and 2020. If several owners within a firm out-migrates during the time-period, I choose the first out-migration event. To construct the comparison group, I follow Jakobsen et al. (2025) and use all firms where no owners out-migrated over the time period. I randomly assign a placebo out-migration year for these firms. Let i denote the firm and s the year relative to the year the owner out-migrated. I estimate the following dynamic event study specification:

$$y_{i,s} = \psi_i + \sum_{s \neq -1} \beta_s \mathbf{1}[\text{Out-migrates}_i, t = s] + \tau_s + \gamma' X_{i,t} + \varepsilon_{i,s} \tag{2}$$

where $y_{i,s}$ is the (log) revenue of firm i in year s relative to when the owner out-migrated, ψ_i are firm fixed effects, τ_s are event time fixed effects and $X_{i,t}$ includes year by industry fixed effects which are included to increase the precision of the estimates. Figure 4 plots the estimated coefficients β_s, with $s = -1$ normalized to zero. In the year the owner out-migrates, the revenue of the firm is approximately 10% lower than in the year before out-migrating, conditional on not exiting. Averaging the coefficients over the post-period, the firm experiences a 12.6% revenue loss in the three years after the owner out-migrates. Around 5% of out-migrating owners exit (or relocate) in the two first years after the owner out-migrates compared with firms where the owner stays.

Figure 4: (log) Revenue after out-migration



Notes: This figure plots the estimated coefficients β_s from Equation (2). The error bars represent 95% confidence intervals constructed using standard errors clustered at the owner-level. The red dotted line indicates when the owner out-migrates. The y-axis shows the change in (log) revenue of the firm relative to year $t-1$ before the owner out-migrates.

However, firms may experience a revenue loss because out-migration is costly for the firm or because they experience a negative productivity shock affecting both the owner's migration decision and revenue. In Section 4, I show how to interpret the difference-in-differences estimand through the lens of the model.

2.3.3 Learning about the Aggregate Effects of the Tax Reform

To aggregate from the micro data evidence requires additional assumptions about the economic environment. One approach in the literature is to do a back-of-the-envelope calculation (Jakobsen et al. 2025). Specifically, by combining the out-migration elasticity with the impact of migration on firm outcomes and multiplying by the share of the aggregate outcome controlled by the relevant population:

$$\frac{d\log Y}{d\log \tau^A} = \underbrace{\frac{NY^w}{Y}}_{\text{Share of } Y} \times \underbrace{\frac{\partial Y}{\partial N} \cdot \frac{1}{Y^w}}_{\text{Avg. effect of out-migration on affected firms}} \times \underbrace{\frac{\partial \log N}{\partial \log \tau^A}}_{\text{Stock elasticity}}$$

where Y is aggregate output, N is the stock of wealthy individuals and Y^w is output of firms owned by wealthy individuals.

The challenge with this approach is that the migration elasticity and therefore the aggregate effect is specific to the policy experiment implemented. This makes it challenging to extrapolate to counterfactual policies such as an out-migration tax without knowledge of the underlying economic primitives. In the next sections, I address this challenge by building and estimating an equilibrium model of joint migration and savings choices. I discipline the model using the micro data and use it to draw inference about the aggregate effects of the wealth tax reform and examine how the introduction of an out-migration tax alters the effects.

3 A Model of Entrepreneur's Migration and Savings Choices

In this section, I develop a model to analyze the main trade-offs in capital taxation when entrepreneurs can migrate and firms can relocate. Motivated by the descriptive evidence, the model features entrepreneurs who are heterogeneous in location-specific productivity, leading to selection into out-migration. The model shares key features with Moll (2014), extended to a small open economy where both entrepreneurs and firms are mobile across countries.

3.1 Setup

Time is discrete and indexed by $t = 0, 1, 2, \ldots$. There are two types of agents: workers and entrepreneurs. There are two countries indexed by $n \in N$, both small open economies, a "domestic" or "home" country (H) and a "foreign" or "other" country (x). The home country government imposes taxes, while the other country is tax-free. Agents discount the future at rate β and face an exogenous probability δ of surviving to the next period.

3.1.1 Agents, preferences, and technology

Space. Let n_E denote the location of the entrepreneur and n_F denote the location of the firm, which may not be the same. There is a unit mass of immobile workers in each location. The global mass of entrepreneurs is one, but the share of entrepreneurs in each location will be endogenously determined.

Endowment. Newborn entrepreneurs are endowed with an initial location and a set of entrepreneurial productivities in each location $\mathbf{z}_0 = \{z_0(n)\}_{n \in N}$ inherited from their deceased parent. Initial wealth of each entrepreneur is drawn from a Pareto distribution. This feature generates some mobility in wealth across generations and captures factors influencing wealth dynamics that are outside of the model.

Entrepreneurial productivity is subject to persistent idiosyncratic shocks. At the beginning of each period, the entrepreneur draws her entrepreneurial productivity in each location $\mathbf{z}_t = \{z_t(n)\}_{n \in N}$. Entrepreneurial productivity in each location evolves stochastically over time as a first-order Markov process, where $z(n) \in Z = \{0, z_1, \ldots, z_K\}$ where $0 < z_1 < \cdots < z_K$ and marginal transition probabilities $\pi(z'(n)|z(n))$. Entrepreneurs with $z(n) = 0$ have no entrepreneurial ability in location n. This will generate entry and exit into and out of operating a firm, even in the absence of an explicit occupational choice. Entrepreneurial productivity is independent across locations and across entrepreneurs which means there is no aggregate uncertainty.

Modeling this stochastic variation in productivity has two main advantages. First, it allows taxes to affect the extensive margin of entrepreneurship and the location of firms. Second, it generates the potential for misallocation of capital across space and across entrepreneurs. Differences in migration behavior across productivity types creates the scope for capital taxes to affect the composition of economic activity across space.

Production technology. Each active entrepreneur with entrepreneurial productivity $\mathbf{z}$ residing in location n_E produces a homogeneous good in location n_F using a constant returns to scale technology[2] with capital k and labor ℓ

$$y = (\mu(n_E, n_F) z(n_F) k)^{\alpha} \ell^{1-\alpha}$$

where $\alpha \in (0,1)$ is the capital intensity in production. The *haircut* to productivity $1 - \mu(n_E, n_F) \in [0,1]$ will be a key empirical object which captures the potential productivity effects of operating a firm from afar. If the entrepreneur lives in the same location as she operates her firm, $n_E = n_F$, the haircut is zero. The haircut could capture loss in monitoring capabilities or a loss in the span-of-control caused by being further away from the firm, this has been previously documented in the context of venture capital funds (Lerner, 1995), banks (Mian, 2006), and in the opening of new plants within larger multinational firms (Giroud, 2013).

Preferences. Individuals consume a single freely-traded good, taken to be the numeraire. A representative worker residing in country n has preferences over consumption c and hours worked h given by

$$u^w \equiv \log c - \frac{h^{1+\frac{1}{\eta}}}{1+\frac{1}{\eta}}$$

where η is the (Frisch) elasticity of labor supply.

Entrepreneurs have idiosyncratic preferences for which location they live in. In each period, entrepreneurs receive preference shocks for where to live in the next period $\xi = \{\xi(n)\}_{n \in N}$. These shocks are independent over time and distributed Type 1 Extreme Value (T1EV) with shape parameter ν. These shocks capture any shifts in tastes or moving costs that are independent across entrepreneurs and time. The parameter ν will be a key parameter to estimate in the data and governs the relationship between return differentials across countries and migration behavior. As $\nu \to \infty$, migration behavior becomes insensitive to changes in the returns in each location and is only driven by idiosyncratic preferences. Entrepreneurs also face utility costs or preferences for amenities of residing in location n common to all entrepreneurs denoted by

[2] Cagetti and de Nardi (2006) consider entrepreneurs who operate a decreasing returns to scale production function. This makes the model more empirically realistic, but at the expense of analytical tractability as profits are no longer linear in wealth.

$\kappa(n_E)$. I assume that entrepreneurs have logarithmic (log) utility for consumption and that consumption and location preferences are additively separable.

Investment. Entrepreneurs operate a linear investment technology which transforms final goods x into investment goods as follows

$$k' = x + k$$

For convenience, I assume that there is no depreciation.

3.1.2 Market Structure

Financial markets. Workers are hand-to-mouth. Entrepreneurs in both locations can save and borrow using a risk-free international bond with interest rate r. Borrowed funds can be used both for production and consumption. Entrepreneurs face no borrowing constraints for consumption. Borrowed funds used for production are subject to a collateral constraint

$$k \leq \lambda a$$

where the parameter $\lambda \in (0, \infty)$ captures how stringent the borrowing constraints are. The collateral constraint is important for capturing the empirical fact that some entrepreneurs keep operating their firms even though they out-migrate, even if the productivity haircut is non-zero. In the absence of collateral constraints, only the most productive entrepreneur would operate in each country.

Labor markets. Entrepreneurs hire labor in a competitive labor market where the firm is located at wage rate $w(n_F)$.

3.1.3 Government and Taxes

The government runs a balanced budget and uses the tax revenue to fund lump-sum transfers to workers. In the *baseline economy*, the home country imposes a flat-rate tax on labor income τ^L, beginning-of-period book value of wealth τ^A, and firm profits τ^c. In the *wealth tax reform-*

economy, the home country imposes a non-linear wealth tax schedule given by:

$$\tilde{\tau}^A(a) \equiv \begin{cases} \tau_0^A a & \text{if } a \leq a^{\text{threshold}} \\ \tau_0^A a^{\text{threshold}} + \tau_1^A a & \text{if } a > a^{\text{threshold}} \end{cases}$$

In the main counterfactual, the *out-migration tax economy*, I consider a tax liable when out-migrating τ^o assessed on the market value of the firm Π valued at the beginning of the period she out-migrates.

The out-migration tax follows proposals in Norway and current practices in other countries, where capital gains accrued while residing in the country are taxed upon out-migration. For owners of private firms, the tax base is the market value of the firm. This specification implicitly assumes that the firm's market value is zero when the entrepreneur enters the home country. Given that out-migration rates are very low empirically, this assumption is largely without loss of generality for most entrepreneurs.

3.1.4 Agents' decision problems

Representative worker. Given labor income taxes and transfers, the representative worker in location n chooses hours $h(n)$ to maximize

$$\max_{h(n)} \quad \log\left((1-\tau^L(n))w(n)h(n) + T(n)\right) - \frac{h(n)^{1+\frac{1}{\eta}}}{1+\frac{1}{\eta}} \tag{3}$$

Entrepreneurs. Every period, the entrepreneur makes four decisions: (i) the scale of their firm k, ℓ, (ii) in which location to operate the firm n_F, (iii) consumption c, (iv) and next period's location n'_E. I describe each of the choices sequentially.

Timing. At the beginning of each period, an entrepreneur with wealth a residing in location n_E observes her productivity in each location $\mathbf{z}$. Based on the productivity draws, she decides in which location to operate her firm n_F and the scale of her operations k, ℓ. She draws the preference shocks for next period's location $\xi(n'_E)$, receives her entrepreneurial income and jointly decides how much to consume c and her location in the next period n'_E. At the end of the period, she switches location if she decided to do so and pays any owed out-migration tax on the market value of her firm, measured at the beginning of the period.

Scale of operations. An entrepreneur producing in location n_F while she resides in location n_E with productivity $\mathbf{z}$, wealth a chooses capital k and labor ℓ to maximize current-period profits subject to the collateral constraint

$$\max_{k,\ell} \quad (\mu(n_E, n_F) z(n_F) k)^{\alpha} \ell^{1-\alpha} - rk - w(n_F)\ell, \quad \text{s.t } k \leq \lambda a \tag{4}$$

The wage w depends on the location of the firm n_F because labor is hired locally, while the rental rate r is international and therefore exogenous. It follows that individual labor demand is given by

$$\ell^{\star} = \left(\frac{1-\alpha}{w(n_F)}\right)^{\frac{1}{\alpha}} \mu(n_E, n_F) z(n_F) k$$

The component of profits common to all firms located in location n is given by:

$$\bar{\pi}(n) \equiv \left(\frac{1-\alpha}{w(n)}\right)^{\frac{1-\alpha}{\alpha}}$$

The profit maximization problem conditional on operating in location n_F is

$$\max_{k} \quad \bar{\pi}(n_F) z(n_F) \mu k - rk, \quad \text{s.t. } k \leq \lambda a$$

This problem is linear in capital, which means that the two optimums are at the corner solutions: $k^* = 0, k^* = \lambda a$. That is, the before-tax profits in each firm location n_F are given by

$$\pi(n_F; n_E, \mathbf{z})a = \begin{cases} (\bar{\pi}(n_F) z(n_F) \mu - r)\lambda a & \text{if } \bar{\pi}(n_F) z(n_F) \mu \geq r \\ 0 & \text{otherwise} \end{cases}$$

Firm location and operation choice. The entrepreneur chooses to locate her firm in the location which maximizes profits after corporate taxes

$$n_F^*(n_E, \mathbf{z}) = \text{argmax} \left\{ (1 - \tau^c(n_F)) \pi(n_F; n_E, \mathbf{z}) \right\}$$

If the returns from operating in any location do not exceed the risk-free interest rate, the entrepreneur will choose to stay inactive and save in the risk-free bond with interest rate r. The return on wealth for an entrepreneur residing in location n_E with productivity $\mathbf{z}$ is therefore given by

$$R(n_E, \mathbf{z}) \equiv r + \max\left\{\pi(n_F^*), 0\right\}$$

For later, I define the indicator variable $O(n_E, \mathbf{z}) = 1[\pi(n_F^*) > 0]$, to denote whether an entrepreneur of type $\mathbf{z}$ operates a firm in any location. Notice that neither the decision to operate, nor where to operate depends on assets – only on productivity and the location of the owner. Specifically, the absolute value of productivity determines how good at operating a firm the entrepreneur is in general, and whether she decides to operate the firm or save in the risk-free bond, while her relative productivity in each location determines where she operates and captures differences across entrepreneurs in location-specific comparative advantage and opportunities.

Entrepreneur location and savings choice. Conditional on staying in the current location $n_E = n'_E$, the problem of the entrepreneur is

$$\begin{aligned} V^{\text{stay}}(a, n_E, \mathbf{z}) &\equiv \max_c \ \log c + \beta\delta \mathbb{E}_{\mathbf{z}'}\left[\mathbb{E}_{\xi'}\left[V(a', n_E, \mathbf{z}', \xi')\right]\right] \\ \text{s.t.} \quad & c + a' = (1 + R(n_E, \mathbf{z}))a - \tau^A(a, n_E) \end{aligned} \tag{5}$$

The value of out-migrating from location n_E to location $n'_E \neq n_E$ is given by

$$\begin{aligned} V^{\text{out-migrate}}(a, n_E, \mathbf{z}) &\equiv \max_c \ \log c + \beta\delta \mathbb{E}_{\mathbf{z}'}\left[\mathbb{E}_{\xi'}\left[V(a', n'_E, \mathbf{z}', \xi')\right]\right] \\ \text{s.t.} \quad & c + a' = (1 + R(n_E, \mathbf{z}))a - \tau^o(a, n_E, \mathbf{z}) - \tau^A(a, n_E) \end{aligned} \tag{6}$$

Denote optimal savings if staying as a'_s and if out-migrating as a'_m. We can now reframe the problem as whether to stay in location n or out-migrate to location $k \neq n$

$$V(a, n_E = n, \mathbf{z}, \xi) = \max\left\{V^{\text{stay}}(a, n, \mathbf{z}) + \xi(n), V^{\text{out-migrate}}(a, n, \mathbf{z}) - \kappa(n) + \xi(k)\right\}$$

Using the T1EV distribution of the preference shocks, the expected utility of residing in location

n with wealth a and productivity $\mathbf{z}$ before the realization of the preference shocks is given by

$$\mathbb{E}_{\xi}[V(a,n,\mathbf{z},\xi)] \equiv v(a,n,\mathbf{z}) = \nu \log\left(\exp\left(V^{\text{stay}}(a,n,\mathbf{z})\right)^{1/\nu} + \exp\left(V^{\text{out-migrate}}(a,n,\mathbf{z}) - \kappa(n)\right)^{1/\nu}\right) \tag{7}$$

The share of agents out-migrating to the other location with individual state $(a,n,\mathbf{z})$ is given by

$$q^{E}(a,n,\mathbf{z}) = \frac{\exp\left(V^{\text{out-migrate}}(a,n,\mathbf{z}) - \kappa(n)\right)^{1/\nu}}{\left(\exp\left(V^{\text{stay}}(a,n,\mathbf{z})\right)\right)^{1/\nu} + \left(\exp\left(V^{\text{out-migrate}}(a,n,\mathbf{z}) - \kappa(n)\right)\right)^{1/\nu}} \tag{8}$$

The share of agents staying in location n is given by $1 - q^{E}(a,n,\mathbf{z})$.

Market value of the firm. The decision of where and whether to operate is based on flow profits. However, the out-migration tax is based on market value of the firm at the beginning of the period given by:

$$\Pi(a, n_E = n, \mathbf{z}) = (1-\tau^{c}(n))\pi(n,\mathbf{z})a + \frac{1}{1+r}\mathbb{E}\left[q^{E}(a,n,\mathbf{z})\Pi(a',k,\mathbf{z}') + (1-q^{E}(a,n,\mathbf{z}))\Pi(a',n,\mathbf{z}')\right]$$

where a' is the optimal policy from the entrepreneur's savings problem. The market value of the firm captures not only the current profits to the owner today, but the future expected profits taking into account future productivity shocks, firm and owner location choices. This means that more productive entrepreneurs will generally have a higher market value of the firm than less productive entrepreneurs.

Before defining the equilibrium, it is helpful to consider the shape of the value and policy functions in the benchmark economy where the wealth tax is linear in wealth. This result will be useful when I later describe the aggregate macroeconomic variables:

Lemma 1 (Optimal Savings and Migration).
Suppose $R(n_E,\mathbf{z}) < \infty$ for $n_E \in N$ and $\mathbf{z} \in Z \times Z$, then in the benchmark economy where the wealth tax is linear in wealth:

1. *The market value of the firm is linear in wealth and given by*

$$\Pi(a, n_E, \mathbf{z}) = B(n_E,\mathbf{z})a$$

2. *The policy functions are linear in wealth and given by*

$$a'_s = \beta\delta\left(1 - \tau^A(n_E) + R(n_E, \mathbf{z})\right) a,$$
$$a'_m = \beta\delta\left(1 - \tau^A(n_E) - \tau^O(n_E)B(n_E, \mathbf{z}) + R(n_E, \mathbf{z})\right) a.$$

3. *The value functions are linear in (log) wealth and given by*

$$V^{stay}(a, n_E, \mathbf{z}) = m^{stay}(n_E, \mathbf{z}) + (1-\beta\delta)^{-1}\log a,$$
$$V^{out\text{-}migrate}(a, n_E, \mathbf{z}) = m^{out\text{-}migrate}(n_E, \mathbf{z}) + (1-\beta\delta)^{-1}\log a,$$
$$v(a, n_E, \mathbf{z}) = \nu LSE\left(\frac{m^{out\text{-}migrate}(n_E, \mathbf{z}) - \kappa(n_E))}{\nu}, \frac{m^{stay}(n_E, \mathbf{z})}{\nu})\right) + (1-\beta\delta)^{-1}\log a$$

4. *Out-migration rates in Equation (8) do npt depend directly on wealth* $q^E(a, n, \mathbf{z}) = q^E(n, \mathbf{z})$*.*

where $LSE(x, y) \equiv \log(\exp(x){+}\exp(y))$ *and* $B(n, \mathbf{z}) : N \times Z \times Z \to \mathbb{R}$*,* $m^{stay}(n_E, \mathbf{z}), m^{out\text{-}migrate}(n_E, \mathbf{z}) :$ $N \times Z \times Z \to \mathbb{R}$*.*

Proof. The proof is given in Appendix C. □

The most important take-away from Lemma 1 is that the savings policy functions are linear in current financial wealth a. Lower wealth tax rates, ceteris paribus, increases the growth rate of wealth. Migrating from the home country to the other country, holding returns from the firm fixed, increases the growth rate of wealth in the next period.

The linearity of the policy functions follows from log-utility combined with the linearity of returns and taxes as well as the absence of any borrowing constraints for consumption. In the wealth tax reform economy, where the tax schedule is non-linear, the policy functions are not necessarily linear.

The fourth statement in Lemma 1 shows that in the baseline economy, out-migration rates depend on the productivity type of the entrepreneur and where she is currently residing and will therefore be correlated with, but not depend directly on wealth. More productive entrepreneurs will accumulate more wealth over time, and out-migration rates may therefore be correlated with wealth.

Last, the linearity of the choice-specific savings policy functions means that wealth follows a random growth process as in standard models of wealth inequality with heterogeneous returns

(Benhabib et al. 2011; Beare and Toda 2022). The evolution of wealth over time depends on the sequence of location choices and the productivity draws. Moreover, mortality ensures that the stationary distribution of wealth exists.

3.1.5 Feasibility

Finally, the allocation of labor to firms in each country must be feasible. This means that in each location n, aggregate labor demand must not be greater than aggregate labor supply

$$\int_{n_F=n} \ell(a,n,\mathbf{z})dE^*(a,n,\mathbf{z}) \leq h(n) \tag{9}$$

The distribution of entrepreneurs and the resulting distribution of firms across countries affects the aggregate demand for labor in each country.

3.2 Stationary equilibrium

In a stationary equilibrium in this economy, entrepreneurs choose their savings and location optimally, firms choose their location and inputs, the labor market in each location clears, the government budget constraint in each location is satisfied, and the distribution of entrepreneurs across wealth, location, and productivity types is stationary. I define the equilibrium as:

Definition 1. *Given the risk-free international interest rate r, a* ***stationary recursive competitive equilibrium*** *are value functions $V^{stay}, V^{out\text{-}migrate}, v, \Pi : S \to \mathbb{R}$, policy functions $a'_m, a'_s : S \to \mathbb{R}$, $n_F : S \to N$, $O : S \to \{0,1\}$ and $q^E : S \to [0,1]$, factor demand $k : S \to \mathbb{R}_+, \ell : S \to \mathbb{R}_+$, labor supply $h : N \to \mathbb{R}_+$, factor prices in each location $\{w(n)\}_{n\in N}$ and a stationary measure of entrepreneurs across states $E^*(a, n_E, \mathbf{z})$ such that*

1. *Taking prices and taxes as given, entrepreneurs choose savings and location optimally. Given r, the policy functions a'_m, a'_s, q^E solve the right equations and v is the corresponding value function.*
2. *Entrepreneur input demand k and ℓ maximizes entrepreneur profits in (4)*
3. *Given $w(n)$, workers in each location chooses hours to maximize (3)*
4. *The labor market clears in each location (equation (9) is satisfied)*
5. *The government budget constraint in the home location is satisfied.*

6. *The stationary distribution $E^*(a, n_E, \mathbf{z})$ is consistent with its law of motion*

For more details see Appendix B.1. The stationary equilibrium boils down to an infinite-dimensional, fixed point problem such that the labor market clears in each location. In Computational Appendix D, I describe how I solve the model numerically.

3.3 Characterizing the equilibrium

This economy has several attractive properties in equilibrium. Before turning to the quantitative analysis, I therefore use the analytical tractability of the model to provide some intuition about the mechanisms and aggregate effects of capital taxes in this economy. Before stating the main results, I define some preliminaries and derive an aggregation result in Lemma 2 that will be useful for characterizing the effect of wealth and out-migration taxes in the presence of out-migration.

Preliminaries. Define the wealth share of a type $\mathbf{z}$ entrepreneur residing in location n as

$$\omega(n, \mathbf{z}) = \frac{\int adE^*(a, n, \mathbf{z})}{\bar{A}}$$

where $\bar{A} \equiv \sum_n \sum_{\mathbf{z}} \int adE^*(a, n, \mathbf{z})$. The evolution of the wealth shares over time is completely determined by the rates of wealth accumulation in each country and the out-migration rates. The total financial wealth of entrepreneurs residing in H is given by:

$$A^H = \int adE^*(a, H, \mathbf{z}) = \bar{A} \sum_{\mathbf{z}} \omega(H, \mathbf{z})$$

Conditional on residing in location n, there are three mutually exclusive groups of entrepreneurs: (i) inactive, (ii) operate in home as a resident entrepreneur, (iii) operate in foreign as an expat entrepreneur. I define the wealth share of each group $i \in \{\text{inactive}, \text{resident}, \text{expat}\}$:

$$\omega^i(n, \mathbf{z}) = \mathbf{1}[\text{Group}(n, \mathbf{z}) = i]\omega(n, \mathbf{z})$$

Last, I define the quality-adjusted capital stock of residents and expats as

$$Q^{\text{resident}} = \lambda \bar{A} \sum_{\mathbf{z}} \omega^{\text{resident}}(H, \mathbf{z}) z(H), \quad Q^{\text{expat}} = \lambda \bar{A} \sum_{\mathbf{z}} \omega^{\text{expat}}(x, \mathbf{z}) z(H)$$

The quality-adjusted capital stock of inactive residents is zero by construction. In comparison, the capital stock used by firms in the home country is given by:

$$K^H \equiv \lambda \qquad \underbrace{\bar{A}[\omega^{\text{resident}}(H,\mathbf{z}) + \omega^{\text{expat}}(x,\mathbf{z})]}_{\text{Financial wealth used as collateral in firms located in } H}$$

This means that quality-adjusted capital stock takes into account how capital is allocated across entrepreneurs of different productivity.

3.3.1 Aggregation

I now characterize the aggregate variables of the home economy. This result will be important for understanding the effects of capital taxes in this economy.

Lemma 2 (Aggregate Variables in Equilibrium).
In a stationary recursive equilibrium, total output produced by firms located in country H is given by

$$Y \equiv Q^\alpha h^{1-\alpha}$$

where the quality-adjusted capital stock is defined as $Q^{resident} + \mu Q^{expat}$.

Proof. See Appendix C.2. □

The aggregation follows naturally from Lemma 1. Lemma 2 illustrates that output is not only determined by the total amount of capital used by the entrepreneurs in their firms, but also by the quality of the firms captured by the location-specific productivity of the entrepreneur. Because of the collateral constraint, the financial wealth of the entrepreneurs a determines the stock of capital used by firms in the home country and consequently output produced.

3.4 A Rationale for Out-Migration Taxes

Next, I characterize the effect of wealth taxes on tax flight and aggregate outcomes. For tractability, I consider a small (linear) change in the wealth tax rate. In the quantitative section, however, I consider a non-linear tax reform to capture the capital tax changes implemented in Norway in

2022. Motivated by the Norwegian empirical context, I assume that any additional tax revenue is distributed as lump-sum transfers to workers to balance the government budget constraint.

3.4.1 The Migration Response to Wealth Taxes

Proposition 1 characterizes the out-migration response to a small change in the wealth tax rate.

Proposition 1 (Wealth Tax Out-Migration Semi-Elasticity).
Holding returns fixed, the semi-elasticity with respect to the wealth tax rate for productivity type $\mathbf{z}$ *is given by:*

$$\varepsilon(\mathbf{z}) \equiv \frac{\partial \log q^E(H,\mathbf{z})}{\partial \tau^A} = -\frac{(1-q^E(H,\mathbf{z}))}{\nu} \underbrace{\left[\frac{1}{c_m(n,\mathbf{z})} - \frac{1}{c_s(n,\mathbf{z})}\right]}_{\textit{Diff. in marginal utility}} + \beta\delta\mathbb{E}_{\mathbf{z}'} \underbrace{\left(\frac{\partial v(a'_m, x, \mathbf{z}')}{\partial \tau^A} - \frac{\partial v(a'_s, H, \mathbf{z}')}{\partial \tau^A}\right)}_{\textit{Diff. in avg. utility between locations}}$$

Suppose types are fixed across time, then $\varepsilon(\mathbf{z}) > 0$*.*

Proof. See Appendix C.3 for the proof. □

The semi-elasticity is comprised of two main components: (i) the difference in current period marginal utility between staying and out-migrating and (ii) the discounted expected difference in the average utility between locations. In the absence of an out-migration tax, the current period consumption is the same across locations and the semi-elasticity is completely determined by changes in future returns. If the share of entrepreneurs of the productivity type remaining in the home country is larger, the response will be larger. The semi-elasticity is not necessarily the same across the entrepreneur population, entrepreneurs with different productivity types will respond differently to changes in the wealth tax rate.

Second, when types are permanent it is possible to show that the semi-elasticity is positive: increasing the wealth tax rate in the home country increases out-migration to the other country, for all productivity types.

The total effect of the wealth tax reform on tax revenue not only depends on the migration response, but also on the wealth of those who out-migrate, the behavior of entrepreneurs staying in the home country and equilibrium effects in the labor market. In the next proposition, I summarize the revenue-effects:

Proposition 2 (Revenue Effects).
Suppose there is no out-migration tax and consider a small change in the wealth tax rate, then:

1. *The change in wealth tax revenue is given by:*

$$\frac{dT^A}{d\tau^A} = 1 + \tau^A \frac{dA^H}{d\tau^A}$$

2. *The change in labor income tax revenue is given by:*

$$\frac{dT^L}{d\tau^A} = \tau^L \left[\underbrace{\frac{dh^*}{d\tau^A} w(H)}_{\textit{Labor supply response}} + \underbrace{\frac{dw(H)}{d\tau^A} \cdot h^*}_{\textit{Equilibrium effect}} \right]$$

3. *The change in corporate income tax revenue is given by:*

$$\frac{dT^C}{d\tau^A} = \tau^C \left(\frac{dY}{d\tau^A} - r \frac{dK^H}{d\tau^A} \right)$$

Proof. See Appendix C.4 for the proof. □

The first statement considers the effects on wealth tax revenue. All entrepreneurs residing in the home country, regardless of where and whether the firm is operative, are included in the wealth tax base. This comprises both inactive entrepreneurs, resident entrepreneurs and expat entrepreneurs operating a firm located in the foreign country. We can decompose the change in the aggregate wealth of entrepreneurs residing in H into the change in the equilibrium stock of entrepreneurs residing in H, $E^*(H)$ and their average wealth $\bar{a}^H$:

$$\frac{dA^H}{d\tau^A} = \frac{d\bar{a}^H}{d\tau^A} E^*(H) + \frac{dE^*(H)}{d\tau^A} \bar{a}^H$$

Statements (2) and (3) of Proposition 2 show that changes in the wealth tax rates affect other sources of tax revenue. Revenue from labor income is affected by equilibrium changes in the labor market and labor supply responses from changing the transfers to workers. Revenue from corporate income taxes is affected by changes in aggregate profits from firms located in the home country.

3.4.2 Aggregate Impacts of Wealth Taxes with Migration

Next, I consider the effects on aggregate output of firms located in the home country.

Proposition 3 (Aggregate Effects of Wealth Taxes).

Consider a small change in the wealth tax rate, the change in total output is given by:

$$\frac{d \log Y^H}{d\tau^A} = \alpha \frac{d \log Q}{d\tau^A} + (1 - \alpha) \frac{d \log h}{d\tau^A}$$

The change in the quality-adjusted capital stock is given by

$$\frac{d \log Q}{d\tau^A} = \frac{1}{Q} \left[\frac{dQ^{resident}}{d\tau^A} + \mu \frac{dQ^{expat}}{d\tau^A} \right]$$

where:

$$\frac{dQ^i}{d\tau^A} = \underbrace{\lambda \bar{A} \sum_{\mathbf{z}} z(H) \frac{d\omega(n, \mathbf{z})}{d\tau^A} \boldsymbol{1}[Group(n, \mathbf{z}) = i]}_{\textit{Wealth effect}} + \underbrace{\lambda \bar{A} \sum_{\mathbf{z}} z(H) \omega(n, \mathbf{z}) \frac{d \boldsymbol{1}[Group(n, \mathbf{z}) = i]}{d\tau^A}}_{\textit{Composition effect}}$$

Proof. See Appendix C.5 for the proof. □

Proposition 3 shows that wealth taxes affect the quality-adjusted capital stock of residents and expats through two main channels: a wealth effect and a composition effect.

Wealth effect. Wealth taxes reallocate wealth across entrepreneurs residing in different locations and across different productivity types. Recall that (in the absence of out-migration taxes), next period's financial wealth is given by:

$$a' = \beta\delta(1 - \tau^A(n_E) + R(n_E, \mathbf{z}))a$$

Keeping before-tax returns constant, there are two opposing forces shaping the wealth effect. First, out-migrating entrepreneurs face no wealth taxes in the next period because they reside in the other country which increases their rate of wealth accumulation. Entrepreneurs who stay in the home country face a lower rate of wealth accumulation. As a result, the option to out-migrate weakens the impact of wealth taxes on wealth accumulation by resident entrepreneurs.

Composition effect. Wealth taxes affect the residence of entrepreneurs, but also the location of firms through the productivity haircut. If there is a productivity haircut, entrepreneurs out-migrating to reduce their wealth tax burden may relocate their firm to avoid the productivity haircut. Even in the absence of the haircut, firms may relocate because wealth taxes affect equilibrium wages and therefore the location-specific component of profits.

Productivity haircut. A larger haircut (smaller μ) decreases the contribution of expats in the home economy, all else equal. However, it does not follow that reducing the share of expat owners is necessarily positive. Keeping returns constant, expat owners are able to accumulate wealth at a faster rate.

A large migration response to the wealth tax is not necessarily negative for output if the productivity haircut is small and the positive effects from expat wealth accumulation are large.

3.4.3 Curbing Tax Flight using Out-Migration Taxes

In contrast to a closed economy with no out-migration, the increase in both wealth tax revenue and total tax revenue may be smaller or even decline if the extent of tax flight is large. Moreover, the haircut to productivity creates a rational for out-migration also to affect the domestic economy, through not only the revenue effects. This creates a scope for policies which aim to curb tax flight. In this section, I turn to considering the effects of introducing an out-migration tax assessed on the market value of firms.

Proposition 4 (Out-Migration Tax).

Suppose before-tax returns and productivity types are fixed over time:

1. *The semi-elasticity with respect to the out-migration tax is negative*

$$\frac{\partial \log q^E(H, \mathbf{z})}{\partial \tau^o} < 0$$

2. *If* $1 - q^E(H, \mathbf{z}) > 1/(2\beta\delta)$,

$$\frac{\partial \varepsilon(\mathbf{z})}{\partial \tau^o} < 0$$

Proof. See Appendix C.6 for the proof. □

Proposition 4 shows that taxing the market value of the firm when out-migrating reduces out-migration rates for all productivity types and weakens the migration response to changes in the wealth tax rate. Ultimately, the effect of wealth and out-migration taxes on tax flight and the aggregate economy is a quantitative question. Hence, in the next section I discuss how to use the reduced form evidence to estimate the key model parameters.

4 Identification and Estimation

In this section, I return to the empirical evidence to show how the outcomes of firms after the owner out-migrates is informative about the productivity haircut. I also show how the reduced form elasticity of out-migration with respect to the wealth tax reform are informative about moving costs. Last, I estimate the model parameters.

4.1 Information from Capital Tax Variation

Proposition 1 illustrates that changes in the wealth tax rate τ^A is informative about the dispersion of the preference shocks ν. In addition, the choice probabilities in Equation (8) indicate that the cross-sectional out-migration and in-migration rates are informative about the moving costs $\kappa(n_E)$. However, in general, none of the three data moments uniquely identify any parameter. Through the lens of the model, we can write the DiD comparison in response to the wealth tax reform from Section 2.3.1 as:

$$\begin{aligned}\beta^{\text{DiD}} \equiv\, & \mathbb{E}_1[q_t^E(a, H, \mathbf{z}; \tilde{\tau}^A)|a_{i,t-1} > 100] - E_0[q_{t-1}^E(H, \mathbf{z}; \tau^A)|a_{i,t-1} > 100] \\ & - \big(\mathbb{E}_1[q_t^E(a, H, \mathbf{z}; \tilde{\tau}^A)|a_{i,t-1} \in [15, 25]] - \mathbb{E}_0[q_{t-1}^E(H, \mathbf{z}; \tau^A)|a_{i,t-1} \in [15, 25]]\big)\end{aligned}$$

where the expectation is taken over the stationary distribution under the two tax regimes. Notice that in contrast to the benchmark economy, the out-migration rates in the reform economy depend on wealth. The DiD estimand is generally not equal to the structural semi-elasticity from Proposition 1 aggregated across the population. The main differences arise because in the case of a non-linear tax schedule, the elasticities differ across the wealth distribution and the reduced-form elasticity is a combination of the elasticity of different groups. For this reason, I use the DiD estimate as a moment in the estimation of the underlying economic primitives.

Another challenge in mapping the model to the data is transitional dynamics. The empirical DiD estimate identifies the reform's immediate, on-impact effect, whereas the current version of the model focuses on steady-state comparisons. In ongoing work, I am extending the framework to incorporate the full transition path following the policy change. This requires solving the economy off the steady state, which is computationally demanding given the model's dimensionality and endogenous wealth and mobility decisions. Implementing and calibrating these transitional dynamics is therefore a substantive undertaking and remains work in progress.

4.2 Information from Firm Outcomes of Out-Migrating Owners

To draw inference about the haircut to firm productivity I use information from the difference-in-differences estimate from out-migrating firm owners in Section 2.3.2. Recall that the output of a firm j in year t is given by:

$$y_{j,t} = \bar{\pi}_t(n_F)\mu(n_E, n_F)z_{j,t}(n_F)\lambda a_{j,t}$$

Denote an indicator for whether firm j is operative in the same location in period t and $t-1$ as $S_j = O(j,t) \times O(j,t-1) \times 1[n_F(j,t) = n_F(j,t-1)]$. The DiD estimand (conditional on survival) is defined as

$$\mu^{\text{DiD}} \equiv \mathbb{E}[\Delta \log \tilde{y}_{j,t} | S_j = 1, n_E(j,t) \neq n_E(j,t-1)] - \mathbb{E}[\Delta \log \tilde{y}_{j,t} | S_j = 1, n_E(j,t) = n_E(j,t-1)]$$

where the observed revenue is given by $\log \tilde{y}_{j,t} = \log y_{j,t} + \eta_{j,t}$ and $\eta_{j,t}$ is i.i.d measurement error. However, through the lens of the model, the decision to out-migrate depends on changes in productivity over time. In addition, the wealth of entrepreneurs available as collateral in the firm may increase when the entrepreneur out-migrates. We can decompose the DiD estimand into the average productivity haircut for out-migrating entrepreneurs plus a selection and wealth effect:

$$\begin{aligned}
\mu^{\text{DiD}} = & \underbrace{\mu}_{\text{haircut}} \\
& + \underbrace{\mathbb{E}[\Delta \log z_{j,t} | S_j = 1, n_E(j,t) \neq n_E(j,t-1)] - \mathbb{E}[\Delta \log z_{j,t} | S_j = 1, n_E(j,t) = n_E(j,t-1)]}_{\text{Selection into out-migration}} \\
& + \underbrace{\mathbb{E}[\Delta \log a_{j,t} | S_j = 1 n_E(j,t) \neq n_E(j,t-1)] - \mathbb{E}[\Delta \log a_{j,t} | S_j = 1 n_E(j,t) = n_E(j,t-1)]}_{\text{Wealth accumulation}}
\end{aligned}$$

This decomposition illustrates that the DiD estimand is informative about the haircut parameter but does not directly identify it. To obtain a more direct estimator for the haircut, I use the firm's sales-to-equity ratio which eliminates the wealth accumulation effect:

$$\log\left(\frac{y_{j,t}}{a_{j,t}}\right) = \log \bar{\pi}_t(n_F) + \log \mu(n_E, n_F) + \log z_{j,t}(n_F) + \log \lambda$$

where $\eta_{j,t}$ is i.i.d measurement error. I exploit this expression in the estimation of the model parameters by replicating the difference-in-differences comparison in the model and estimating the value of the productivity haircut which matches the DiD estimate.

4.3 Estimation

I estimate the model in three steps: first, I externally calibrate some parameters, second, I use the empirical transition matrix and distribution of private equity returns in the data to estimate the transition matrix and values of productivity types. Third, I jointly estimate the remaining parameters by matching the reduced form micro estimates in the model.

Externally calibrated parameters. The model period is one year. I set the discount rate β to 0.98 and the survival probability δ to 0.98. I set the capital share in production to $\alpha = 1/3$ and the elasticity of labor supply to $\eta = 2$. I set the risk-free interest rate to 1%. In the benchmark economy, I set the tax rates to mimic the Norwegian tax system in the period 2016-2021. In particular, I consider flat-rate taxes $\tau^L = 22\%$ on labor income and $\tau^C = 22\%$ on corporate income.

Directly matched moments. I use the transition matrix of returns for resident entrepreneurs to estimate the probability of transitioning between productivity types. In particular, I define $z_0 = 0$ as individuals who are inoperative and split the return distribution of resident entrepreneurs into quartiles and then compute the share of agents transitioning between each bin in each year and average over the time period 2016-2020. To estimate the productivity types, I use the distribution of returns to private business wealth in the data. Last, I calibrate the tightness of the collateral constraint λ to the aggregate non-financial corporate debt to output ratio in Norway in 2016.

Joint estimation. The remaining parameters, which include the location preference parameters and productivity haircut, are estimated jointly using GMM. As described in the earlier sections, the reduced form moments do not map one-to-one to primitive model parameters. For this reason, I re-create the reduced form experiments using the model and find the parameters that match these model-implied moments. Table 2 summarizes the targeted data moments and the estimated parameters are presented in Table 3. The model closely replicates the out-migration revenue event study and matches the pre-reform out-migration rates fairly well, but overestimates the in-migration rate. The calibration underestimates the migration response to the wealth tax reform, which I consider a strength of the current calibration.

Table 2: Data Moments

Description	Source	Targeted Moment	Model
Wealth tax reform			
Mean out-migration rate 2016–2020	Internal	0.0020	0.0031
Mean in-migration rate 2016–2020	Internal	0.0004	0.0027
Migration response (treated - control)	Internal	0.0254	0.0173
Firm outcomes after out-migrating			
Out-migration revenue/equity event study	Internal	-0.128 (0.073)	-0.126
Other moments			
Aggregate debt to output	IMF	166%	171%

Notes: Internal refers to moments estimated using the data set described in Section 2. This table reports the targeted moments in the GMM estimation.

Table 3: Model parameters

Parameter		Value
Panel A. Parameters calibrated outside the model		
Discount rate	β	0.98
Survival probability	δ	0.98
Capital intensity	α	1/3
Risk-free interest rate	r	0.01
Elasticity of labor supply	η	2.0
Panel B. Parameters calibrated inside the model		
Collateral constraint	λ	0.844
Dispersion of preference shocks	ν	0.268
Utility moving cost	$\kappa(H), \kappa(x)$	6.597, -3.752
Productivity hair-cut	$1-\mu$	0.118

Notes: This table reports the value of the externally calibrated and internally estimated parameters.

5 Quantitative Analysis: Taxing Out-Migration

In this section, I provide quantitative results using the estimated model on the Norwegian data. I show that in the context of the Norwegian wealth tax reform, out-migration taxes would have decreased the semi-elasticity with respect to the wealth tax thereby reducing tax flight. Second, I quantify the aggregate effects of the wealth tax reform on the Norwegian economy.

Tax Flight. I begin by examining the effects on measures of tax flight. Figure 5 plots the change in out-migration rates for the unproductive type, the most productive type and in the aggregate (integrated over the stationary distribution). More productive entrepreneurs (in the home country) are more likely to out-migrate than less productive entrepreneurs in response to increasing the wealth tax rate above 20 mill NOK. Moreover, these entrepreneurs are also more responsive to changes in the wealth tax rate at the top of the distribution. Introducing a 1% tax on the market value of the firm upon out-migrating decreases out-migration rates regardless of productivity, but the decline is relatively larger for more productive entrepreneurs. This is because the firms of more productive entrepreneurs are more valuable and therefore the total tax liability for these entrepreneurs will be higher.

Table 4: Change in Macro Variables and Tax Revenues from Benchmark Norwegian Economy

	(1) Wealth tax reform economy	(2) Out-migration tax economy	(3) Wealth tax reform + out-migration tax
(A) Tax Revenues			
Wealth tax revenue (T^A)	-87.55%	29.16%	-85.44%
Mechanical revenue effect	23.0%	-	23.0%
Distributional effect	2.29%	14.2%	1.38%
Tax flight	-108.5%	11.5%	-103.8%
Labor income tax revenue (T^L)	17.79%	-5.63%	17.20%
Corporate tax revenue (T^C)	-0.69%	4.04%	0.76%
(B) Macroeconomic Quantities and Prices			
Aggregate output (Y)	-1.31%	4.18%	0.18%
Quality-adjusted capital stock of residents (Q^{resident})	-76.97%	31.03%	-72.95%
Quality-adjusted capital stock of expats (Q^{expat})	79.44%	-18.89%	76.96%
Labor supply (h^*)	17.79%	-5.63%	17.20%

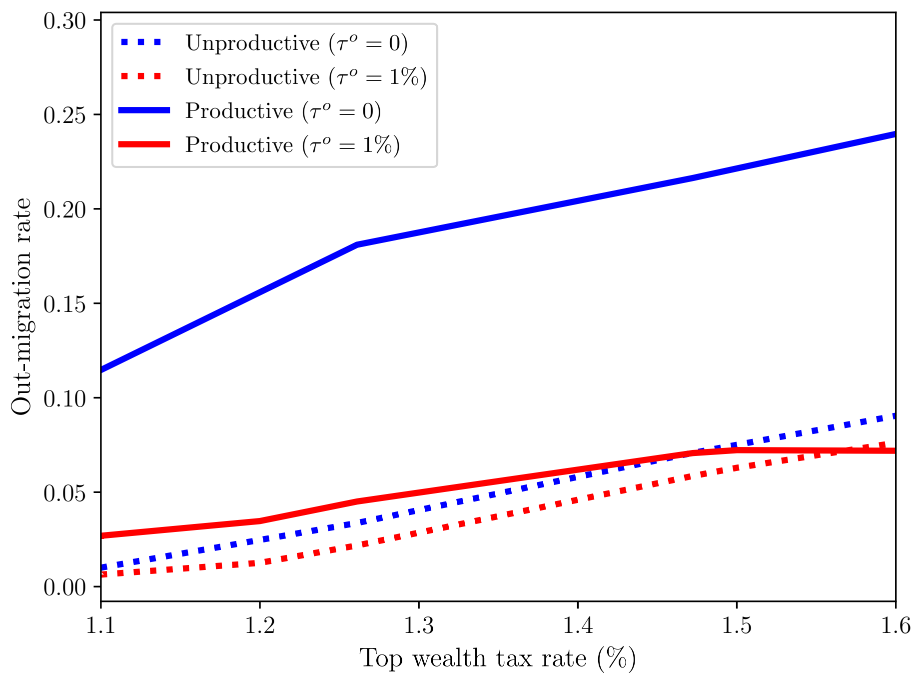
Notes: This table reports the percentage change in macroeconomic quantities, prices, and tax revenues in the three different economies. The wealth tax reform economy refers to the economy with a 0.95% wealth tax rate below 20 mill NOK and 1.1% wealth tax rate above 20 mill NOK. The out-migration tax economy refers to the economy with a 1% out-migration tax on the market value of firms. The decomposition for T^A shows the mechanical, migration, and general equilibrium components of the wealth tax revenue change.

Panel A of Table 4 shows the overall effect of the reform on wealth tax revenue, with and without the out-migration tax. The long run drop in wealth tax revenue from the baseline economy to the wealth tax reform economy is sizable. For both economies, increasing the out-migration tax increases the wealth tax revenue collected. We can decompose the overall effect on wealth tax revenue into three different channels: (i) the mechanical revenue effect from increasing the wealth tax rate, keeping the wealth distribution and number of tax payers fixed (ii) changes in average taxes rates due to changes in the wealth distribution, (iii) changes in the number of tax payers, keeping the average tax rate fixed:

$$
\begin{aligned}
T_1^A - T_0^A = & \underbrace{\int \tilde{\tau}^A(a) - \tau^A a dE_0^*(a, H, \mathbf{z})}_{\text{Mechanical revenue effect}} \\
& + \underbrace{E_1^*(H)\left[\frac{\int \tilde{\tau}^A(a) dE_1^*(a, H, \mathbf{z})}{E_1^*(H)} - \frac{\int \tilde{\tau}^A(a) dE_0^*(a, H, \mathbf{z})}{E_0^*(H)}\right]}_{\text{Distributional effect}} \\
& + \underbrace{(E_1^*(H) - E_0^*(H))\frac{\int \tilde{\tau}^A(a) dE_0^*(a, H, \mathbf{z})}{E_0^*(H)}}_{\text{Tax flight}}
\end{aligned}
$$

I normalize by T_0^A to report the effects in percentage terms. Panel A of Table 4 presents the results from the decomposition. The decline in the wealth tax revenue is primarily driven by the long run change in the number of tax payers (entrepreneurs residing in the home country).

Figure 5: Out-Migration Rates



Notes: This figure plots the change in the out-migration rate between the baseline and reform economy for unproductive types and the most productive type in the economy. The blue line indicates when the out-migration tax is 0.0%, while the red line indicates when the out-migration tax is 1.0%. The x-axis varies the wealth tax rate for the top wealth tax bracket, for households with net wealth above 20 million NOK.

Aggregate Effects. Next, I quantify the effects on aggregate quantities. Panel B of Table 4 reports the results. Column (1) reports the aggregate effects of the wealth tax reform, increasing the top wealth tax rate to 1.1% for households with more than 20 mill NOK in net wealth. While the stock of entrepreneurs located in the home country decreases significantly in the long run, aggregate output is only 1.3% lower than in the baseline economy. Although there is a large reallocation of wealth from resident to expat owners which reduces the quality-adjusted capital stock through the productivity haircut, there is a countervailing force. Expat owners face lower wealth tax rates which increase their rate of wealth accumulation. Since additional wealth allows the entrepreneurs to rent more capital, this increases production in the long run. In addition, the negative aggregate effects on output are dampened by the increase in labor supply following the reduction in tax revenues and consequently transfers to workers.

Column (2) of Table 4 reports the percentage change in macroeconomic quantities from introducing a 1% tax on market value of firm upon out-migrating relative to the baseline economy. Because it reduces the out-migration rate of more productive entrepreneurs, the out-migration tax increases the quality-adjusted capital stock and consequently aggregate output. Combining the two tax reforms in Column (3) leads to a net positive effect of the wealth tax reform on aggregate output.

6 Conclusion

This paper examined the aggregate implications of capital tax flight in response to wealth taxes. To analyze the extent of capital tax flight and its aggregate implications, I combined quasi-experimental evidence from a wealth tax reform in Norway with a dynamic equilibrium model of entrepreneurs' savings and migration choices.

The analysis suggests that capital tax flight can dampen the domestic behavioral response to wealth taxes. Introducing policies to curb tax flight reduces the mobility of more productive entrepreneurs, changing the aggregate impacts of the wealth tax reform. More broadly, the analysis highlights the importance of viewing behavioral responses to taxes as shaped by the institutional environment and potentially altered by other policies.

While the empirical estimates in this paper are specific to Norway, the theoretical framework is fairly general and can be used to analyze the aggregate impacts of capital taxes for small open economies more generally. Using reduced form evidence on the migration behavior around capital tax reform, the paper shows how to draw inference about the aggregate effects of the policy and conduct counterfactuals.

Examining transitional dynamics is an important avenue of on-going research. Does the interaction of out-migration taxes with capital taxes depend on the timing and sequence of policy responses? Is the short-run migration response to capital taxes larger than the long run response? Moll (2014) suggests that the speed of transition in these types of economies can be slow and that analyzing steady state transitions only may be misleading.

In addition, this paper focused on the *positive* question: what are the effects of imposing out-migration taxation tax flight and aggregate macroeconomic quantities. A natural follow-up question is the *normative*: when may policies to curb tax flight be desirable from the perspective of a global or domestic social planner? In a follow-up paper I answer this question by building on the framework in this paper and introduce several rationales policy makers have in mind when designing these taxes such as investment in productive public goods.

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A Data Appendix

A.1 Variable Definitions

B Model Appendix

B.1 Equilibrium definition

Law of motion for the distribution of entrepreneurs. The probability distribution of entrepreneurs with heterogeneous wealth and productivity across space is denoted by $E(a, n_E, \mathbf{z})$, where $a \in A = [0, \infty)$ is the level of assets, $n_E \in N$ denotes the current location, and $\mathbf{z} \in Z \times Z$ captures the vector of productivity types. The state space is defined as $S = A \times N \times Z \times Z$, define the σ-algebra $\Sigma_S = B(A) \times \mathcal{P}(N) \times \mathcal{P}(Z) \times \mathcal{P}(Z)$, where $B(A)$ denotes the Borel σ-algebra on A, and $\mathcal{P}(X)$ denotes the power set of a finite set X. Then (S, Σ_S) is a measurable space and for any measurable set $\mathcal{S} \in \Sigma_S$, the function $E(\mathcal{S})$ denotes the measure of agents in $\mathcal{S}$. To describe how agents transition across states, define the *transition function* $Q : S \times \Sigma_S \to [0, 1]$,

Table A.1: Variable Definitions

Variable	*Description*
(a) National Population register	
Out-migrated in year t	Resident in January 1st in year t, non-resident in January 1st in year $t+1$
Age	Year - birth year
Nr. of children	Nr. of children under the age of 18 years old
(b) Tax return register	
Capital income share	Reported taxable capital income divided by total taxable income
Net wealth (mill, NOK)	Taxable value of assets net of liabilities
(c) Ownership register	
Ownership share	Value of the individual's equity shares in the firm, divided by the total value of issued equity December 31st
Firm owner	$>20\%$ Ownership in a limited liability firm with at least one employee excluding the owner
Multi-owner firm	More than one registered owner December 31st
(d) Accounting data	
Active firm	Positive sales and at least one employee other than the owner
Sales	Reported income from sales to customers
Sales growth	Change in (log) sales between year t and year $t-1$
Equity	
(e) Role register	
CEO	An indicator for whether the person is the CEO of the firm
Board chair	An indicator for whether the person is the chair of the corporate board of the firm
(f) Employer-employee data	
Firm size	Number of individuals receiving earnings from the firm excluding the owner

where $Q(s, \mathcal{S})$ gives the probability that an agent currently in state $s = (a, n_E, \mathbf{z})$ moves to the set $\mathcal{S} \in \Sigma_S$ in the next period, conditional on surviving. Formally,

$$Q^{\text{alive}}(s, \mathcal{S}) = \sum_{\mathbf{z}'} \pi(\mathbf{z}', \mathbf{z}) \Big[q^E(a, n_E, \mathbf{z}) \cdot \mathbf{1}\left[(a'_m, k, \mathbf{z}') \in \mathcal{S}\right] + (1 - q^E(a, n_E, \mathbf{z})) \cdot \mathbf{1}\left[(a'_s, n_E, \mathbf{z}') \in \mathcal{S}\right] \Big],$$

where a'_m and a'_s denote the next-period asset levels under migration and staying, respectively, and $k \in N$, $k \neq n_E$ is the destination location in the case of migration. The associated T^* operator yields the following law of motion for the distribution of entrepreneurs:

$$E_{k+1}(\mathcal{S}) = T^*(E_k)(\mathcal{S}) = \delta \int_S Q^{\text{alive}}(s, \mathcal{S}) E_k(ds) + (1 - \delta) \int_{\mathcal{A}} \sum_{n \in \mathcal{N}, \mathbf{z} \in \mathcal{Z}_0 \times \mathcal{Z}_1} \psi_0(a, n, \mathbf{z}) da \quad \text{(B.1)}$$

where ψ_0 is the entry distribution of newborn entrepreneurs.

Equilibrium Definition. Given the risk-free international interest rate r, a **stationary recursive competitive equilibrium** consists of value functions $V^{\text{stay}}, V^{\text{out-migrate}}, v, \Pi : S \to \mathbb{R}$, policy functions $a'_m, a'_s : S \to \mathbb{R}$, $n_F : S \to N$, $O : S \to \{0, 1\}$ and $q^E : S \to [0, 1]$, factor demand $k : S \to \mathbb{R}_+, \ell : S \to \mathbb{R}_+$, labor supply $h : N \to \mathbb{R}_+$, factor prices in each location

$\{w(n)\}_{n \in N}$ and a stationary measure of entrepreneurs across states $E^*(a, n_E, \mathbf{z})$ such that

1. Taking prices and taxes as given, entrepreneurs choose savings and location of residency optimally. Given r, the policy functions a'_m, a'_s, q^E solve the right equations and $v, V^{\text{stay}}, V^{\text{out-migrate}}$ are the corresponding value function.
2. Entrepreneur input demand k and ℓ maximizes entrepreneur profits in (4)
3. Given $w(n)$, workers in each location choose hours to maximize (3)
4. The labor market clears in each location (equation (9) is satisfied for $n \in N$)
5. The government budget constraint in the home location is satisfied:

$$\int \tilde{\tau}^A(a)\, dE^*(a, H, \mathbf{z}) + \tau^L w(H) h^* + \tau^C \int_{\mathbf{1}[n_F = H] O(n, \mathbf{z})} \pi(n, \mathbf{z}) a \, dE^*(a, n, \mathbf{z})$$
$$+ \tau^o \int q^E(a, H, \mathbf{z}) \Pi(a, H, \mathbf{z})\, dE^*(a, H, \mathbf{z}) = T(H)$$

6. The stationary distribution $E^*(a, n_E, \mathbf{z})$ satisfies the law of motion in (B.1)

C Proofs

Preliminaries. Recall that the migration problem is given by

$$\max \left\{ V^{\text{out-migrate}}(a, n_E, \mathbf{z}) - \kappa(n_E) + \xi^{\text{out-migrate}}, V^{\text{stay}}(a, n_E, \mathbf{z}) + \xi^{\text{stay}} \right\}$$

An entrepreneur living in location n_E with assets a and productivity $\mathbf{z}$ will choose to out-migrate if:

$$\frac{V^{\text{out-migrate}}(a, n_E, \mathbf{z}) - \kappa(n_E) - V^{\text{stay}}(a, n_E, \mathbf{z})}{\nu} \geq \frac{\xi^{\text{stay}} - \xi^{\text{out-migrate}}}{\nu}$$

The difference between two T1EV variables is distributed Logit

$$q^E(a, n_E, \mathbf{z}) = \frac{\exp(V^{\text{out-migrate}}(a, n_E, \mathbf{z}) - \kappa(n))^{\frac{1}{\nu}}}{\exp(V^{\text{out-migrate}}(a, n_E, \mathbf{z}) - \kappa(n_E))^{\frac{1}{\nu}} + \exp(V^{\text{stay}}(a, n_E, \mathbf{z}))^{\frac{1}{\nu}}}$$

C.1 Proof of Lemma 1

Proof. I will use guess and verify. Suppose that the value functions are given by

$$V^{\text{stay}}(a,n,\mathbf{z}) = m^{\text{stay}}(n,\mathbf{z}) + D\log a, \tag{C.2}$$

$$V^{\text{move}}(a,n,\mathbf{z}) = m^{\text{out-migrate}}(n,\mathbf{z}) + D\log a, \tag{C.3}$$

$$\Pi(a,n,\mathbf{z}) = B(n,\mathbf{z})a \tag{C.4}$$

for $n \in N$. To simplify notation, denote

$$\text{LSE}(x,y;\nu) = \nu\log[\exp(x/\nu) + \exp(y/\nu)]\,.$$

Substituting the guess in Equation (C.2) into the expected utility function in Equation (7) yields:

$$v(a,n,\mathbf{z}) = \text{LSE}\big(m^{\text{stay}}(n,\mathbf{z}),\, m^{\text{out-migrate}}(n,\mathbf{z}) - \kappa(n)\big) + D\log a.$$

The first-order conditions are

$$\frac{1}{c_s} = \beta\delta D\frac{1}{a'_s}, \qquad \frac{1}{c_m} = \beta\delta D\frac{1}{a'_m}.$$

Rearranging,

$$a'_s = \frac{\beta\delta D\big[(1-\tau^A(n) + R(n,\mathbf{z}))a\big]}{1+\beta\delta D}, \qquad a'_m = \frac{\beta\delta D\big[(1-\tau^A(n) - B(n,\mathbf{z})\tau^o + R(n,\mathbf{z}))a\big]}{1+\beta\delta D}.$$

This implies consumption is given by:

$$c_s = \frac{1}{1+\beta\delta D}(1-\tau^A(n) + R(n,\mathbf{z}))a, \quad c_m = \frac{1}{1+\beta\delta D}[(1-\tau^A(n) - \tau^o(n)B(n,\mathbf{z}) + R(n,\mathbf{z}))a]$$

Substituting the policy functions into the value functions in Equations (5) and (6):

$$V^{\text{stay}}(a,n,\mathbf{z}) = -\log(1+\beta\delta D) + \log(1-\tau^A(n) + R(n,\mathbf{z})) + \log a + \beta\delta\mathbb{E}[v(a',n,\mathbf{z}')],$$

$$V^{\text{out-migrate}}(a,n,\mathbf{z}) = -\log(1+\beta\delta D) + \log(1-\tau^A(n) - \tau^o(n)B(n,\mathbf{z}) + R(n,\mathbf{z}))a) + \beta\delta\mathbb{E}[v(a',k,\mathbf{z}')].$$

Replacing the LHS with the guess of the functional form of the value function:

$$
\begin{aligned}
m^{\text{stay}}(n, \mathbf{z}) + D \log a = & - \log(1 + \beta\delta D) + \log(1 - \tau^A(n) + R(n, \mathbf{z})) + \log a \\
& + \beta\delta \mathbb{E}\big[\mathrm{LSE}\big(m^{\text{stay}}(n, \mathbf{z}'),\, m^{\text{out-migrate}}(n, \mathbf{z}') - \kappa(n)\big)\big] \\
& + \beta\delta D \log\left(\frac{\beta\delta D(1 - \tau^A(n) + R(n, \mathbf{z}))a}{1 + \beta\delta D}\right), \\
m^{\text{out-migrate}}(n, \mathbf{z}) + D \log a = & - \log(1 + \beta\delta D) + \log(1 - \tau^A(n) - \tau^o(n)B(n, \mathbf{z}) + R(n, \mathbf{z})) + \log a \\
& + \beta\delta \mathbb{E}\big[\mathrm{LSE}\big(m^{\text{stay}}(n, \mathbf{z}),\, m^{\text{out-migrate}}(n, \mathbf{z}) - \kappa(n)\big)\big] \\
& + \beta\delta D \log\left(\frac{\beta\delta D(1 - \tau^A(n) - \tau^o(n)B(n, \mathbf{z}) + R(n, \mathbf{z}))a)}{1 + \beta\delta D}\right).
\end{aligned}
$$

Rearranging and matching coefficients:

$$
D = \frac{1}{1 - \beta\delta}.
$$

Substituting into the policy functions:

$$
\begin{aligned}
a'_s &= \beta\delta(1 - \tau^A(n) + R(n, \mathbf{z}))a, \\
a'_m &= \beta\delta(1 - \tau^A(n) - \tau^o(n)B(n, \mathbf{z}) + R(n, \mathbf{z}))a, \\
c_s &= (1 - \beta\delta)(1 - \tau^A(n) + R(n, \mathbf{z}))a, \\
c_m &= (1 - \beta\delta)(1 - \tau^A(n) - \tau^o(n)B(n, \mathbf{z}) + R(n, \mathbf{z}))a.
\end{aligned}
$$

To solve for the coefficients $m^{\text{stay}}(n, \mathbf{z})$ and $m^{\text{out-migrate}}(n, \mathbf{z})$, collect the coefficients in the following system of equations. Denote:

$$
A \equiv \beta\delta D \log(\beta\delta) - \log D.
$$

$$
\begin{aligned}
m^{\text{stay}}(H,\mathbf{z}) &= A + \log\bigl(1-\tau^A + R(H,\mathbf{z})\bigr) \\
&\quad + \beta\delta\,\mathbb{E}_{\mathbf{z}'}\Bigl[\mathrm{LSE}\bigl(m^{\text{stay}}(H,\mathbf{z}'),\, m^{\text{out-migrate}}(H,\mathbf{z}') - \kappa(H)\bigr)\Bigr],
\end{aligned} \tag{C.5}
$$

$$
\begin{aligned}
m^{\text{stay}}(x,\mathbf{z}) &= A + \log\bigl(1 + R(x,\mathbf{z})\bigr) \\
&\quad + \beta\delta\,\mathbb{E}_{\mathbf{z}'}\Bigl[\mathrm{LSE}\bigl(m^{\text{stay}}(x,\mathbf{z}'),\, m^{\text{out-migrate}}(x,\mathbf{z}') - \kappa(x)\bigr)\Bigr],
\end{aligned} \tag{C.6}
$$

$$
\begin{aligned}
m^{\text{out-migrate}}(H,\mathbf{z}) &= A + \log\bigl(1-\tau^A - \tau^o B(H,\mathbf{z}) + R(H,\mathbf{z})\bigr) \\
&\quad + \beta\delta\,\mathbb{E}_{\mathbf{z}'}\Bigl[\mathrm{LSE}\bigl(m^{\text{stay}}(x,\mathbf{z}'),\, m^{\text{out-migrate}}(x,\mathbf{z}') - \kappa(x)\bigr)\Bigr],
\end{aligned} \tag{C.7}
$$

$$
\begin{aligned}
m^{\text{out-migrate}}(x,\mathbf{z}) &= A + \log\bigl(1 + R(x,\mathbf{z})\bigr) \\
&\quad + \beta\delta\,\mathbb{E}_{\mathbf{z}'}\Bigl[\mathrm{LSE}\bigl(m^{\text{stay}}(H,\mathbf{z}'),\, m^{\text{out-migrate}}(H,\mathbf{z}') - \kappa(H)\bigr)\Bigr].
\end{aligned} \tag{C.8}
$$

For $\beta\delta < 1$, this is a standard fixed point problem where we can use Banach's fixed point theorem to prove that the system of equations has a unique solution.

Plugging into the moving probabilities

$$
q^E(n,\mathbf{z}) = \frac{\exp(m^{\text{out-migrate}}(n,\mathbf{z}) - \kappa(n))^{\frac{1}{\nu}}}{\exp(m^{\text{out-migrate}}(n,\mathbf{z}) - \kappa(n))^{\frac{1}{\nu}} + \exp(m^{\text{stay}}(n,\mathbf{z})^{\frac{1}{\nu}}}
$$

Last, we want to solve for $B(n,\mathbf{z})$. Recall that the market value of the firm is given by

$$
\Pi(a,n,\mathbf{z}) = (1-\tau^c)\pi(n,\mathbf{z})a + \frac{1}{1+r}\mathbb{E}\left[q^E(a,n,\mathbf{z})\Pi(a',k,\mathbf{z}') + (1-q^E(a'n,\mathbf{z})\Pi(a',n,\mathbf{z}')\right]
$$

Plug in the functional forms:

$$
\begin{aligned}
\Pi(a,n,\mathbf{z}) &= (1-\tau^c)\pi(n,\mathbf{z})a + \frac{1}{1+r}\mathbb{E}\left[q^E(n,\mathbf{z})B(k,\mathbf{z}')a'_m + (1-q^E(n,\mathbf{z})B(n,\mathbf{z})a'_s\right] \\
&= a\Biggl((1-\tau^c)\pi(n,\mathbf{z}) + \frac{1}{1+r}\mathbb{E}\Biggl[q^E(n,\mathbf{z})B(k,\mathbf{z}')(1-\tau^A - \tau^o B(n,\mathbf{z}) + R(n,\mathbf{z})) \\
&\quad + (1-q^E(n,\mathbf{z})B(n,\mathbf{z})(1-\tau^A + R(n,\mathbf{z}))\Biggr]\Biggr)
\end{aligned}
$$

Matching coefficients:

$$B(H,\mathbf{z}) = (1-\tau^c)\pi(H,\mathbf{z}) + \frac{1}{1+r}\mathbb{E}\Bigg[q^E(H,\mathbf{z})B(x,\mathbf{z}')(1+R(x,\mathbf{z}))$$
$$+ (1-q^E(H,\mathbf{z}')B(H,\mathbf{z}')(1-\tau^A+R(H,\mathbf{z}))\Bigg]$$
$$B(x,\mathbf{z}) = \pi(x,\mathbf{z}) + \frac{1}{1+r}\mathbb{E}\Bigg[q^E(x,\mathbf{z})B(H,\mathbf{z}')(1-\tau^A-\tau^o B(H,\mathbf{z}')+R(H,\mathbf{z}))$$
$$+ (1-q^E(x,\mathbf{z})B(x,\mathbf{z}')(1+R(x,\mathbf{z}))\Bigg]$$

As before, this is a standard fixed point problem, which as long as $1/(1+r)<1$ has a unique solution. Now, assume $\mathbf{z}'=\mathbf{z}$. Then:

$$B(H,\mathbf{z}) = (1-\tau^c)\pi(H,\mathbf{z}) + \frac{1}{1+r}\Bigg[q^E(H,\mathbf{z})B(x,\mathbf{z})(1+R(x,\mathbf{z}))$$
$$+ (1-q^E(H,\mathbf{z})B(H,\mathbf{z})(1-\tau^A+R(H,\mathbf{z}))\Bigg]$$
$$B(x,\mathbf{z}) = \pi(x,\mathbf{z}) + \frac{1}{1+r}\Bigg[q^E(x,\mathbf{z})B(H,\mathbf{z})(1-\tau^A-\tau^o B(H,\mathbf{z})+R(H,\mathbf{z}))$$
$$+ (1-q^E(x,\mathbf{z})B(x,\mathbf{z})(1+R(x,\mathbf{z}))\Bigg]$$

Rearrange:

$$B(H)[1-\frac{1}{1+r}(1-q^E(H)(1-\tau^A+R(H)] = (1-\tau^c)\pi(H) + \frac{1}{1+r}q^E(H)(1+R(x))B(x)$$
$$B(x)[1-\frac{1}{1+r}(1-q^E(x))(1+R(x)] = \pi(x) + \frac{1}{1+r}q^E(x)B(H)(1-\tau^A-\tau^o B(H)+R(H))$$

Then:

$$B(H) = [1-\frac{1}{1+r}(1-q^E(H)(1-\tau^A+R(H)]^{-1}(1-\tau^c)\pi(H)$$
$$+ [1-\frac{1}{1+r}(1-q^E(H)(1-\tau^A+R(H)]^{-1}\frac{1}{1+r}q^E(H)(1+R(x))B(x)$$
$$B(x) = [1-\frac{1}{1+r}(1-q^E(x))(1+R(x)]^{-1}\pi(x)$$
$$+ [1-\frac{1}{1+r}(1-q^E(x))(1+R(x)]^{-1}\frac{1}{1+r}q^E(x)B(H)(1-\tau^A-\tau^o B(H)+R(H))$$

Define two helper variables to ease notation:

$$\delta_x = [1 - \frac{1}{1+r}(1 - q^E(x))(1 + R(x)]$$
$$\delta_H = [1 - \frac{1}{1+r}(1 - q^E(H)(1 - \tau^A + R(H)]$$

Then:

$$B(H) = \frac{1}{\gamma_x}(1 - \tau^c)\pi(H) + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1 + R(x))B(x)$$
$$B(x) = \frac{1}{\gamma_H}\pi(x) + \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)B(H)(1 - \tau^A - \tau^o B(H) + R(H))$$

Substitute:

$$\begin{aligned} B(H) = {} & \frac{1}{\gamma_x}(1 - \tau^c)\pi(H) \\ & + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1 + R(x))\left[\frac{1}{\gamma_H}\pi(x) + \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)B(H)(1 - \tau^A - \tau^o B(H) + R(H))\right] \end{aligned}$$

Expand:

$$\begin{aligned} B(H) = {} & \frac{1}{\gamma_x}(1 - \tau^c)\pi(H) \\ & + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1 + R(x)) \cdot \frac{1}{\gamma_H}\pi(x) \\ & + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1 + R(x)) \cdot \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)B(H)(1 - \tau^A - \tau^o B(H) + R(H)) \end{aligned}$$

Rearrange:

$$\begin{aligned} 0 = {} & \frac{1}{\gamma_x}(1 - \tau^c)\pi(H) \\ & + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1 + R(x)) \cdot \frac{1}{\gamma_H}\pi(x) \\ & + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1 + R(x)) \cdot \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)B(H)(1 - \tau^A - \tau^o B(H) + R(H)) - B(H) \end{aligned}$$

Expand:

$$
\begin{aligned}
0 = & \frac{1}{\gamma_x}(1-\tau^c)\pi(H) + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1+R(x)) \cdot \frac{1}{\gamma_H}\pi(x) \\
& + \left[\frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1+R(x)) \cdot \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)(1-\tau^A+R(H)) - 1\right] B(H) \\
& - \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1+R(x)) \cdot \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)\tau^o B(H)^2
\end{aligned}
$$

For $\tau^o > 0$, this is a quadratic equation with solution:

$$
B(H) = \frac{-b + \sqrt{b^2 - 4ac}}{2a}
$$

where

$$
\begin{aligned}
c &\equiv \frac{1}{\gamma_x}(1-\tau^c)\pi(H) + \frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1+R(x)) \cdot \frac{1}{\gamma_H}\pi(x) \\
b &\equiv \left[\frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1+R(x)) \cdot \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)(1-\tau^A+R(H)) - 1\right] \\
a &\equiv -\frac{1}{\gamma_x}\frac{1}{1+r}q^E(H)(1+R(x)) \cdot \frac{1}{\gamma_H}\frac{1}{1+r}q^E(x)\tau^o
\end{aligned}
$$

As long as $\gamma_x, \gamma_H > 0$, the discriminant is positive and a solution exists. When $\tau^o = 0$, the equation is linear and the solution is given by:

$$
B(H) = \frac{-c}{b}
$$

□

C.2 Proof of Lemma 2

Proof. The total output produced by firms operating in H is given by:

$$
Y = \int y(a, n_E, \mathbf{z})\mathbf{1}[n_F(n_E, \mathbf{z}) = H]O(n_E, \mathbf{z})dE^*(a, n_E, \mathbf{z})
$$

Firm output is given by:

$$y(a, n_E, \mathbf{z}) = \begin{cases} \bar{\pi}(n_F(n, \mathbf{z}))z(n_F(n, \mathbf{z}))\mu(n_E, n_F(n_E, \mathbf{z})))\lambda a & \text{if } O(n_E, \mathbf{z}) = 1 \\ 0 & \text{otherwise} \end{cases}$$

Hence:

$$Y = \int \bar{\pi}(H)z(H)\mu(n_E, H, \mathbf{z}))\lambda a dE^*(a, n_E, \mathbf{z})$$

Using the definition of the wealth shares and Q^{resident} and Q^{expat}:

$$\begin{aligned} Y &= \bar{\pi}(H)\lambda \left[\bar{A} \sum_{\mathbf{z}} \mathbf{1}[n_F(H, \mathbf{z}) = H]O(H, \mathbf{z})z(H)\omega(H, \mathbf{z}) + \bar{A} \sum_{\mathbf{z}} \mathbf{1}[n_F(x, \mathbf{z}) = H]O(x, \mathbf{z})z(H)\omega(x, \mathbf{z})\mu \right] \\ &= \bar{\pi}(H) \left[Q^{\text{resident}} + Q^{\text{expat}} \right] = \bar{\pi}(H)Q \end{aligned}$$

where the second equality follows from the definitions of the marginal distributions and the optimal output of each individual firm. Similarly, the total labor demanded by firms operating in the home location is given by:

$$\begin{aligned} \int \ell(a, n, \mathbf{z})\mathbf{1}[n_F(n_E, \mathbf{z}) = H)O(n_E, \mathbf{z})dE^*(a, n_E, \mathbf{z}) &= \int \left(\frac{1-\alpha}{w(n_F)} \right)^{\frac{1}{\alpha}} \mu z(n_F)\lambda a dE^*(a, n, \mathbf{z}) \\ &= \left(\frac{1-\alpha}{w(n_F)} \right)^{\frac{1}{\alpha}} Q \end{aligned}$$

In equilibrium, the labor market in H must clear:

$$h = \left(\frac{1-\alpha}{w(H)} \right)^{\frac{1}{\alpha}} Q$$

Rearranging:

$$\alpha \left(\frac{h}{Q} \right)^{\frac{1-\alpha}{\alpha}} = \bar{\pi}(H)$$

Plugging into the expression for output we get the desired result:

$$Y = Q^{\alpha}(h)^{1-\alpha}$$

$\square$

C.3 Proof of Proposition 1

Proof. Taking logs and differentiating the moving probabilities in Equation (8):

$$\frac{\partial \log q^E(a,H,\mathbf{z})}{\partial \tau^A} = \frac{1}{\nu}\frac{\partial V^{\text{out-migrate}}(a,H,\mathbf{z})}{\partial \tau^A} - \frac{1}{\nu}\frac{\partial v(a,H,\mathbf{z})}{\partial \tau^A}.$$

Using the Envelope condition:

$$\begin{aligned}\frac{\partial \log q^E(a,H,\mathbf{z})}{\partial \tau^A} = {} & \frac{1}{\nu}\frac{\partial V^{\text{out-migrate}}(a,H,\mathbf{z})}{\partial \tau^A} \\ & - \frac{1}{\nu}\left[q^E(a,H,\mathbf{z})\frac{\partial V^{\text{out-migrate}}(a,H,\mathbf{z})}{\partial \tau^A} + \big(1-q^E(a,H,\mathbf{z})\big)\frac{\partial V^{\text{stay}}(a,H,\mathbf{z})}{\partial \tau^A}\right].\end{aligned}$$

Rearranging:

$$\frac{\partial \log q^E(a,H,\mathbf{z})}{\partial \tau^A} = \frac{1-q^E(a,H,\mathbf{z})}{\nu}\left[\frac{\partial V^{\text{out-migrate}}(a,H,\mathbf{z})}{\partial \tau^A} - \frac{\partial V^{\text{stay}}(a,H,\mathbf{z})}{\partial \tau^A}\right].$$

Rearranging and substituting the value functions from Equations (5) and (6) we obtain the first statement in Proposition 1:

$$\begin{aligned}\frac{\partial \log q^E(a,H,\mathbf{z})}{\partial \tau^A} = \frac{1-q^E(a,H,\mathbf{z})}{\nu}\Bigg[& -\frac{1}{1-\tau^A-\tau^o B(H)+R(H,\mathbf{z})} + \frac{1}{1-\tau^A+R(H,\mathbf{z})} \\ & + \beta\delta\,\mathbb{E}_{\mathbf{z}'}\left(\frac{\partial v(a_m',x,\mathbf{z}')}{\partial \tau^A} - \frac{\partial v(a_s',H,\mathbf{z}')}{\partial \tau^A}\right)\Bigg].\end{aligned} \tag{C.9}$$

Suppose types are fixed over time such that $\mathbf{z}' = \mathbf{z}$. Using Lemma 1, the semi-elasticity in Equation (C.9) simplifies to:

$$\frac{\partial \log q^E(H,\mathbf{z})}{\partial \tau^A} = \frac{1-q^E(H,\mathbf{z})}{\nu}\left[\frac{\partial m^{\text{out-migrate}}(H,\mathbf{z})}{\partial \tau^A} - \frac{\partial m^{\text{stay}}(H,\mathbf{z})}{\partial \tau^A}\right].$$

Recall that the m coefficients satisfy the following fixed point equations (suppressing the dependence on $\mathbf{z}$ to save notation):

$$m^{\text{stay}}(H) = \log(1 - \tau^A + R(H)) + \beta\delta v(H)$$
$$m^{\text{out-migrate}}(H) = \log(1 - \tau^A - \tau^o B(H) + R(H)) + \beta\delta v(x)$$
$$m^{\text{stay}}(x) = \beta\delta v(x)$$
$$m^{\text{out-migrate}}(x) = \beta\delta v(H)$$

Denote $x_1 \equiv \frac{\partial m^{\text{stay}}(H)}{\partial \tau^A}$, $x_2 = \frac{\partial m^{\text{out-migrate}}(H)}{\partial \tau^A}$, $x_3 = \frac{\partial m^{\text{stay}}(x)}{\partial \tau^A}$, $x_4 = \frac{\partial m^{\text{out-migrate}}(x)}{\partial \tau^A}$. Denote $MU^s \equiv -(1 - \tau^A + R(H))^{-1}$ and $MU^m \equiv -(1 - \tau^A - \tau^O B(H) + R(H))^{-1}$. Hence,

$$x_1 = MU^s + \beta\delta v'(H)$$
$$x_2 = MU^m + \beta\delta v'(x)$$
$$x_3 = \beta\delta v'(x)$$
$$x_4 = \beta\delta v'(H)$$

Taking the difference between x_2 and x_1:

$$x_2 - x_1 = MU^m - MU^s + \beta\delta(v'(x) - v'(H))$$

From the Envelope conditions:

$$v'(H) = (1 - q^E(H))x_1 + q^E(H)x_2$$
$$v'(x) = (1 - q^E(x))x_3 + q^E(x)x_4$$

Hence:

$$v'(x) = (1 - q^E(x))\beta\delta v'(x) + q^E(x)\beta\delta v'(H)$$
$$v'(x) = \beta\delta q^E(x)\gamma_x v'(H)$$

where $\gamma_x \equiv \frac{1}{1-\beta\delta(1-q^E(x))}$. And:

$$v'(x) - v'(H) = (\beta\delta q^E(x)\gamma_x - 1)v'(H)$$

Now solve for $v'(H)$: And:

$$\begin{aligned}
v'(H) &= (1 - q^E(H))[MU^s + \beta\delta v'(H)] + q^E(H)[MU^m + \beta\delta v'(x)] \\
(1 - \beta\delta(1 - q^E(H)))v'(H) &= (1 - q^E(H))MU^s + q^E(H)MU^m + \beta\delta q^E(H)v'(x) \\
v'(H) &= \gamma_H[(1 - q^E(H))MU^s + q^E(H)MU^m] + \beta\delta q^E(H)\gamma_H v'(x) \\
&= \gamma_H[(1 - q^E(H))MU^s + q^E(H)MU^m] + (\beta\delta)^2 q^E(H)\gamma_H q^E(x)\gamma_x v'(H) \\
(1 - (\beta\delta)^2 q^E(H)\gamma_H q^E(x)\gamma_x)v'(H) &= \gamma_H[(1 - q^E(H))MU^s + q^E(H)MU^m] \\
v'(H) &= \frac{\gamma_H}{(1 - (\beta\delta)^2 q^E(H)\gamma_H q^E(x)\gamma_x)}[(1 - q^E(H))MU^s + q^E(H)MU^m] < 0
\end{aligned}$$

Hence:

$$\begin{aligned}
(v'(x) - v'(H)) &= \beta\delta q^E(x)\gamma_x v'(H) - v'(H) \\
&= (\beta\delta q^E(x)\gamma_x - 1)v'(H) > 0
\end{aligned}$$

Hence, the semi-elasticity is positive as long as:

$$\begin{aligned}
\beta\delta q^E(x) &< 1 - \beta\delta(1 - q^E(x)) \\
\beta\delta q^E(x) &< 1 + \beta\delta q^E(x) - \beta\delta \\
0 &< 1 - \beta\delta \\
\beta\delta &< 1
\end{aligned}$$

Since $\beta \in (0, 1)$ and $\delta \in (0, 1)$ this is always satisfied. $\square$

C.4 Proof of Proposition 2

Total tax revenue is given by

$$\mathcal{T} = T^A + T^C + T^L$$

where

$$
\begin{aligned}
T^A &= \tau^A \int a dE^*(a, H, \mathbf{z}) \\
T^C &= \tau^C \int_{\mathbf{1}[n_F=H]O(n,\mathbf{z})} \pi(n, \mathbf{z}) a \, dE^*(a, n, \mathbf{z}) \\
T^L &= \tau^L w(H) h^*
\end{aligned}
$$

We can write wealth tax revenue in terms of the wealth share of entrepreneurs living in H:

$$
T^A = \tau^A \bar{A} \sum_{\mathbf{z}} \omega(H, \mathbf{z})
$$

Taking the derivative with respect to the wealth tax rate:

$$
\frac{dT^A}{d\tau^A} = \bar{A} \sum_{\mathbf{z}} \omega(H, \mathbf{z}) + \tau^A \bar{A} \sum_{\mathbf{z}} \frac{d\omega(H, \mathbf{z})}{d\tau^A}
$$

We can write total corporate income tax revenue as:

$$
\begin{aligned}
T^C &= \int \pi(n, \mathbf{z}) a \mathbf{1}[n_F(n, \mathbf{z}) = H] dE^*(a, n, \mathbf{z}) \\
&= \int (\bar{\pi}(H) z(H) \mu - r) \lambda a \mathbf{1}[n_F(n, \mathbf{z}) = H] dE^*(a, n, \mathbf{z}) \\
&=
\end{aligned}
$$

$$
\begin{aligned}
T^C &= \tau^C \left[Y - r\lambda \int a \mathbf{1}[n_F = H] O(n, \mathbf{z}) dE^*(a, n, \mathbf{z}) \right] \\
&= Y - r\lambda \bar{A} \sum_{\mathbf{z}} \left[\omega^{\text{resident}}(H, \mathbf{z}) + \omega^{\text{expat}}(x, \mathbf{z}) \right]
\end{aligned}
$$

Taking the derivative with respect to the wealth tax rate:

$$
\frac{dT^C}{d\tau^A} = \tau^C \left(\frac{dY}{d\tau^A} - r\lambda \bar{A} \sum_{\mathbf{z}} \left[\frac{d\omega^{\text{resident}}(H, \mathbf{z})}{d\tau^A} + \frac{d\omega^{\text{expat}}(x, \mathbf{z})}{d\tau^A} \right] \right) + \int_{\mathbf{1}[n_F=H]O(n,\mathbf{z})} \pi(n, \mathbf{z}) a \, dE^*(a, n, \mathbf{z})
$$

C.5 Proof of Proposition 3

Proof. From Lemma 2, aggregate output produced by firms operating in the home location is given by:

$$Y = Q^{\alpha}(h)^{1-\alpha}$$

Consider a change in the wealth tax rate from $\tau^A = \tau_0^A$ to $\tau^A = \tau_0^A + d\tau^A$. Taking logs and differentiating with respect to the tax rate, the following is exact:

$$\frac{d\log Y}{d\tau^A} = \alpha\frac{d\log Q}{d\tau^A} + (1-\alpha)\frac{d\log h}{d\tau^A}$$

And since $Q = Q^{\text{resident}} + \mu Q^{\text{expat}}$:

$$\frac{d\log Q}{d\tau^A} = \frac{1}{Q}\left[\frac{dQ^{\text{resident}}}{d\tau^A} + \mu\frac{dQ^{\text{expat}}}{d\tau^A}\right]$$

Recall that:

$$\begin{aligned}
Q^{\text{resident}} &= \int_{\mathbf{1}[\text{Group}(H,\mathbf{z})=\text{Resident}]} \lambda a z(H) dE^*(a, H, \mathbf{z}) \\
Q^{\text{expat}} &= \int_{\mathbf{1}[\text{Group}(x,\mathbf{z})=\text{expat}]} \lambda a z(H) dE^*(a, x, \mathbf{z})
\end{aligned}$$

Rewriting in terms of the wealth shares:

$$Q^{\text{resident}} = \lambda\bar{A}\sum_{\mathbf{z}} \omega(H,\mathbf{z}) z(H) \mathbf{1}[\text{Group}(H,\mathbf{z}) = \text{Resident}]$$

Using the product rule:

$$\frac{dQ^{\text{resident}}}{d\tau^A} = \lambda\bar{A}\sum_{\mathbf{z}} z(H)\left[\frac{d\omega(H,\mathbf{z})}{d\tau^A}\mathbf{1}[\text{Group}(H,\mathbf{z}) = \text{Resident}] + \frac{d\mathbf{1}[\text{Group}(H,\mathbf{z}) = \text{Resident}]}{d\tau^A}\omega(H,\mathbf{z})\right]$$

Hence:

$$\frac{dQ^{\text{resident}}}{d\tau^A} = \lambda\bar{A}\sum_{\mathbf{z}} z(H)\frac{d\omega(H,\mathbf{z})}{d\tau^A}\mathbf{1}[\text{Group}(H,\mathbf{z}) = \text{Resident}]$$
$$+ \lambda\bar{A}\sum_{\mathbf{z}} z(H)\frac{d\mathbf{1}[\text{Group}(H,\mathbf{z}) = \text{Resident}]}{d\tau^A}\omega(H,\mathbf{z})$$

□

C.6 Proof of Proposition 4

Proof. First,

$$\frac{\partial \log q^E(H,\mathbf{z})}{\partial \tau^o} = \frac{(1-q^E(H,\mathbf{z}))}{\nu}\left[\frac{\partial m^{\text{out-migrate}}(H,\mathbf{z})}{\partial \tau^o} - \frac{\partial m^{\text{stay}}(H,\mathbf{z})}{\partial \tau^o}\right]$$

Proof of (1). The proof of statement (1) follows the same reasoning as Proposition 1. The main difference lies in the derivative of the marginal utilities. Recall that the m coefficients satisfy the following fixed-point equations (suppressing the dependence on $\mathbf{z}$ to simplify notation):

$$\begin{aligned}
m^{\text{stay}}(H) &= \log(1-\tau^A + R(H)) + \beta\delta v(H),\\
m^{\text{out-migrate}}(H) &= \log(1-\tau^A - \tau^o B(H) + R(H)) + \beta\delta v(x),\\
m^{\text{stay}}(x) &= \beta\delta v(x),\\
m^{\text{out-migrate}}(x) &= \beta\delta v(H).
\end{aligned}$$

Denote

$$x_1 \equiv \frac{\partial m^{\text{stay}}(H)}{\partial \tau^o}, \quad x_2 \equiv \frac{\partial m^{\text{out-migrate}}(H)}{\partial \tau^o}, \quad x_3 \equiv \frac{\partial m^{\text{stay}}(x)}{\partial \tau^o}, \quad x_4 \equiv \frac{\partial m^{\text{out-migrate}}(x)}{\partial \tau^o}.$$

Define

$$MU^m \equiv -\frac{B(H)}{1-\tau^A-\tau^O B(H)+R(H)}.$$

Hence:

$$x_1 = \beta\delta v'(H)$$
$$x_2 = MU^m + \beta\delta v'(x)$$
$$x_3 = \beta\delta v'(x)$$
$$x_4 = \beta\delta v'(H)$$

Taking the difference between x_2 and x_1:

$$x_2 - x_1 = MU^m + \beta\delta(v'(x) - v'(H))$$

From the Envelope conditions:

$$v'(H) = (1 - q^E(H))x_1 + q^E(H)x_2$$
$$v'(x) = (1 - q^E(x))x_3 + q^E(x)x_4$$

Hence:

$$v'(x) = (1 - q^E(x))\beta\delta v'(x) + q^E(x)\beta\delta v'(H)$$
$$v'(x) = \beta\delta q^E(x)\gamma_x v'(H)$$

where $\gamma_x \equiv \frac{1}{1-\beta\delta(1-q^E(x))}$. And:

$$v'(x) - v'(H) = (\beta\delta q^E(x)\gamma_x - 1)v'(H)$$

Now solve for $v'(H)$:

$$v'(H) = \frac{\gamma_H}{(1 - (\beta\delta)^2 q^E(H)\gamma_H q^E(x)\gamma_x)}[q^E(H)MU^m] < 0$$

where $\gamma_H \equiv \frac{1}{1-\beta\delta(1-q^E(x))}$. Hence:

$$
\begin{aligned}
v'(x) - v'(H) &= \beta\delta q^E(x)\gamma_x v'(H) - v'(H) \\
&= (\beta\delta q^E(x)\gamma_x - 1)v'(H) < 0
\end{aligned}
$$

Therefore, the overall sign is negative as long as $(\beta\delta)^2\gamma_H q^E(x)\gamma_x < 1$

Proof of (2). From the proof of Proposition 1, the wealth tax elasticity is given by:

$$
\varepsilon(\mathbf{z}) = \frac{1-q^E(H,\mathbf{z})}{\nu}\left[\frac{\partial \log c_m}{\partial \tau^A} - \frac{\partial c_s}{\partial \tau^A} + \beta\delta\left(\frac{\partial v(x)}{\partial \tau^A} - \frac{\partial v(H)}{\partial \tau^A}\right)\right].
$$

Suppressing dependence on $\mathbf{z}$ to save notation and differentiate with respect to the out-migration tax:

$$
\frac{\partial \varepsilon}{\partial \tau^o} = \frac{1-q^E(H,\mathbf{z})}{\nu}\left[\frac{\partial^2 \log c_m}{\partial \tau^o\, \partial \tau^A} - \frac{\partial^2 c_s}{\partial \tau^o\, \partial \tau^A} + \beta\delta\left(\frac{\partial^2 v(x)}{\partial \tau^o\, \partial \tau^A} - \frac{\partial^2 v(H)}{\partial \tau^o\, \partial \tau^A}\right)\right].
$$

Consider first the effect on the difference in marginal utilities:

$$
\frac{\partial^2(\log c_m - \log c_s)}{\partial \tau^o \partial \tau^A} = \frac{B(H)}{(1-\tau^A-\tau^o B(H)+R(H))^2} > 0
$$

Then, consider the effect on the difference in average utility between locations:

$$
\frac{\partial v(x)}{\partial \tau^A} - \frac{\partial v(H)}{\partial \tau^A} = (\beta\delta q^E(x)\gamma_x - 1)\frac{\partial v(H)}{\partial \tau^A}
$$

Differentiate with respect to the out-migration tax:

$$
\frac{\partial^2 v(x)}{\partial \tau^o\, \partial \tau^A} - \frac{\partial^2 v(H)}{\partial \tau^o\, \partial \tau^A} = \beta\delta\frac{\partial q^E(x)\gamma_x}{\partial \tau^o}\frac{\partial v(H)}{\partial \tau^A} + (\beta\delta q^E(x)\gamma_x - 1)\frac{\partial^2 v(H)}{\partial \tau^A \partial \tau^o}
$$

Since $\partial v(H)/\partial \tau^A > 0$, first term is positive:

$$
\begin{aligned}
\frac{\partial(q^E(x)\gamma_x)}{\partial \tau^o} &= \frac{\partial q^E(x)}{\partial \tau^o}\gamma_x + \frac{\partial \gamma_x}{\partial \tau^o}q^E(x) \\
&= \frac{\partial q^E(x)}{\partial \tau^o}\gamma_x + q^E(x)\left[\frac{\beta\delta}{(1-\beta\delta(1-q^E(x)))^2}\right] > 0
\end{aligned}
$$

The sign of the second term is determined by the sign of $\frac{\partial v^2 v(H)}{\partial \tau^o \tau^A}$. From the proof of Proposition 1:

$$\frac{\partial v'(H)}{\partial \tau^A} = \frac{\gamma_H}{(1-(\beta\delta)^2 q^E(H)\gamma_H q^E(x)\gamma_x)}[(1-q^E(H))MU^s + q^E(H)MU^m] < 0$$

Denote the numerator $A(\tau^o)$ and the denominator $B(\tau^o)$. By the quotient rule:

$$\frac{\partial v^2 v(H)}{\partial \tau^o \tau^A} = \frac{A'B - B'A}{B^2}$$

The sign of the derivative is the sign of the numerator. Solving for the numerator:

$$\begin{aligned}
A'B &= B\frac{\partial \gamma_H}{\partial \tau^o}\big[(1-q^E(H))MU^s + q^E(H)MU^m\big] + B\gamma_H \frac{\partial\big[(1-q^E(H))MU^s + q^E(H)MU^m\big]}{\partial \tau^o} \\
&= B\big[(1-q^E(H))MU^s + q^E(H)MU^m\big]\frac{\beta\delta}{\big(1-\beta\delta(1-q^E(H))\big)^2}\frac{\partial q^E(H)}{\partial \tau^o} \\
&\quad + B\gamma_H\Bigg[-\frac{\partial q^E(H)}{\partial \tau^o}MU^s + (1-q^E(H))\frac{\partial MU^s}{\partial \tau^o} \\
&\qquad + \frac{\partial q^E(H)}{\partial \tau^o}MU^m + q^E(H)\frac{\partial MU^m}{\partial \tau^o}\Bigg].
\end{aligned}$$

And:

$$B'A = -(\beta\delta)^2 A\left[\gamma_H\gamma_x q^E(x)\frac{\partial q^E(H)}{\partial \tau^o} + \frac{\partial \gamma_H}{\partial \tau^o}\gamma_x q^E(H)q^E(x) + \frac{\partial q^E(x)}{\partial \tau^o}\gamma_H\gamma_x q^E(H)\right]$$

Combining:

$$\begin{aligned}
A'B - B'A = \frac{\partial q^E(H)}{\partial \tau^o}\Bigg\{& B\big[(1-q^E(H))MU^s + q^E(H)MU^m\big]\frac{\beta\delta}{\big(1-\beta\delta(1-q^E(H))\big)^2} \\
&+ B\gamma_H(MU^m - MU^s) + (\beta\delta)^2 A\gamma_H\gamma_x q^E(x) - (\beta\delta)^3\frac{A\gamma_x q^E(H)q^E(x)}{\big(1-\beta\delta(1-q^E(H))\big)^2}\Bigg\} \\
&+ B\gamma_H\Big[(1-q^E(H))\frac{\partial MU^s}{\partial \tau^o} + q^E(H)\frac{\partial MU^m}{\partial \tau^o}\Big] \\
&+ (\beta\delta)^2 A\,\frac{\partial q^E(x)}{\partial \tau^o}\,\gamma_H\gamma_x q^E(H).
\end{aligned}$$

Hence:

$$
\begin{aligned}
A'B - B'A = \frac{\partial q^E(H)}{\partial \tau^o} \Bigg\{ & B\big[(1-q^E(H))MU^s + q^E(H)MU^m\big] \frac{\beta\delta}{\big(1-\beta\delta(1-q^E(H))\big)^2} \\
& + B\gamma_H(MU^m - MU^s) + (\beta\delta)^2 A\gamma_H\gamma_x q^E(x) - (\beta\delta)^3 \frac{A\gamma_x q^E(H) q^E(x)}{\big(1-\beta\delta(1-q^E(H))\big)^2} \Bigg\} \\
& + B\gamma_H\, q^E(H) \frac{B(H)}{\big(1-\tau^A-\tau^o B(H) + R(H)\big)^2} \\
& + (\beta\delta)^2 A \, \frac{\partial q^E(x)}{\partial \tau^o}\, \gamma_H \gamma_x q^E(H).
\end{aligned}
$$

This is positive if:

$$
\begin{aligned}
& BA\frac{\beta\delta}{(1-\beta\delta(1-q^E(H))} + \frac{B(MU^m - MU^s)}{(1-\beta\delta(1-q^E(H))} \\
& + \frac{Aq^E(x)(\beta\delta)^2}{(1-\beta\delta(1-q^E(H)))(1-\beta\delta(1-q^E(x)))} \left[\frac{1-\beta\delta}{(1-\beta\delta(1-q^E(H))}\right] < 0
\end{aligned}
$$

$$
\frac{1}{1-\beta\delta(1-q^E(H))}\left[\beta\delta BA + B(MU^m - MU^s) + \frac{Aq^E(x)(\beta\delta)^2}{(1-\beta\delta(1-q^E(x)))} + 1 - \beta\delta\right] < 0
$$

Focusing on the inner terms:

$$
\begin{aligned}
\beta\delta BA + B(MU^m - MU^s) + Aq^E(x)\gamma_x(\beta\delta)^2 &< \beta\delta - 1 \\
B\left(\beta\delta A + MU^m - MU^s\right) + Aq^E(x)\gamma_x(\beta\delta)^2 &< \beta\delta - 1
\end{aligned}
$$

This is always satisfied if:

$$
\begin{aligned}
\beta\delta A + MU^m - MU^s &< 0 \\
\beta\delta\gamma_H\left[(1-q^E(H))MU^s + q^E(H)MU^m\right] + MU^m - MU^s &< 0 \\
MU^s\left[\beta\delta\gamma_H(1-q^E(H)) - 1\right] + MU^m\left[\beta\delta\gamma_H q^E(H) + 1\right] &< 0 \\
MU^s\left[\beta\delta\gamma_H(1-q^E(H)) - 1\right] + MU^m\left[\beta\delta\gamma_H q^E(H) + 1\right] &< 0
\end{aligned}
$$

Since $MU^s < 0$ and MU^m, this is always satisfied if:

$$\begin{aligned}
\beta\delta\gamma_H(1 - q^E(H)) - 1 &> 0 \\
\beta\delta\gamma_H(1 - q^E(H)) &> 1 \\
\frac{\beta\delta(1 - q^E(H)}{1 - \beta\delta(1 - q^E(H))} &> 0 \\
\beta\delta(1 - q^E(H)) > 1 - \beta\delta(1 - q^E(H)) \\
2\beta\delta(1 - q^E(H)) &> 1 \\
\beta\delta(1 - q^E(H)) &> \frac{1}{2} \\
1 - q^E(H) &> \frac{1}{2\beta\delta}
\end{aligned}$$

That is, the proportion staying in H is large enough.

$\square$

C.6.1 Decomposition of Wealth Tax Revenue Change

The change in aggregate wealth tax revenue is given by:

$$T_1^A - T_0^A = \int \tilde{\tau}^A(a) dE_1^*(a, H, \mathbf{z}) - \int \tau_0^A a dE_0^*(a, H, \mathbf{z})$$

Let $E_1^*(H)$ denote the share of entrepreneurs living in the home country in the tax reform economy. We can write:

$$T_1^A - T_0^A = E_1^*(H) \frac{\int \tilde{\tau}^A(a)\, dE_1^*(a, H, \mathbf{z})}{E_1^*(H)} - E_0^*(H) \frac{\int \tau_0^A(a)\, dE_0^*(a, H, \mathbf{z})}{E_0^*(H)}$$

Add and subtract $E_0^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}$

$$
\begin{aligned}
T_1^A - T_0^A &= E_1^*(H)\frac{\int \tilde{\tau}^A(a)dE_1^*(a,H,\mathbf{z})}{E_1^*(H)} - E_0^*(H)\frac{\int \tau_0^A(a)\,dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} \\
&+ E_0^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} - E_0^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} \\
&= E_1^*(H)\frac{\int \tilde{\tau}^A(a)dE_1^*(a,H,\mathbf{z})}{E_1^*(H)} - E_0^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} \\
&+ \underbrace{E_0^*(H)\frac{\int \tilde{\tau}^A(a) - \tau_0^A a dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}}_{\text{Mechanical revenue effect}}
\end{aligned}
$$

Next, decompose the first two terms by adding and subtracting $E_1^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}$

$$
\begin{aligned}
&= E_1^*(H)\frac{\int \tilde{\tau}^A(a)dE_1^*(a,H,\mathbf{z})}{E_1^*(H)} - E_0^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} \\
&+ \underbrace{E_0^*(H)\frac{\int \tilde{\tau}^A(a) - \tau_0^A a dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}}_{\text{Mechanical revenue effect}} \\
&+ E_1^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} - E_1^*(H)\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)} \\
&= \underbrace{E_0^*(H)\frac{\int \tilde{\tau}^A(a) - \tau_0^A a dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}}_{\text{Mechanical revenue effect}} \\
&+ \underbrace{E_1^*(H)\left[\frac{\int \tilde{\tau}^A(a)dE_1^*(a,H,\mathbf{z})}{E_1^*(H)} - \frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}\right]}_{\text{Distributional effect}} \\
&+ \underbrace{(E_1^*(H) - E_0^*(H))\frac{\int \tilde{\tau}^A(a)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}}_{\text{Tax flight}}
\end{aligned}
$$

D Computational Appendix

To solve the model, I guess a vector of wages in each location $\{w(n)\}_{n\in N}$. Then, I compute the policy functions and use a fixed point algorithm to find the value functions and implied moving probabilities. Last, I compute the stationary distribution of agents across states using Young (2010)'s histogram method and check for market clearing in both locations.

D.1 Grid

The asset grid has N_A grid points from a_0 to a_{N_a}, where $N_a = 100$, constructed as follows:

$$a_i = \exp\left(\log(a_0) + \frac{i-1}{N_a - 1}\left(\log(a_{N_a}) - \log(a_0)\right)\right)$$

D.2 Policy and value functions

I use an adaptation of the endogenous grid method to solve for the policy and value functions. The problem of the entrepreneur is given by:

$$\begin{aligned}
V^{\text{stay}}(a, n, \mathbf{z}) &= \max_{a'_s} \quad \log c_s + \beta\delta\mathbb{E}_{\mathbf{z}'} v(a'_s, n, \mathbf{z}') \\
\text{s.t. } c_s + a'_s &= (1 + R(n, \mathbf{z}))a - \tilde{\tau}^A(a, n) \\
V^{\text{out-migrate}}(a, n, \mathbf{z}) &= \max_{a'_m} \quad \log c_m + \beta\delta\mathbb{E}_{\mathbf{z}'} v(a'_m, k, \mathbf{z}') \\
\text{s.t. } c_s + a'_m &= (1 + R(n, \mathbf{z}))a - \tilde{\tau}^A(a, n) - \tau^o\Pi(a, n, \mathbf{z}) \\
v(a'_s, n, \mathbf{z}') &= \text{LSE}\left(V^{\text{out-migrate}}(a'_s, n, \mathbf{z}') - \kappa(n), V^{\text{stay}}(a'_s, n, \mathbf{z}')\right) \\
v(a'_m, k, \mathbf{z}') &= \text{LSE}\left(V^{\text{out-migrate}}(a'_m, k, \mathbf{z}') - \kappa(k), V^{\text{stay}}(a'_m, k, \mathbf{z}')\right)
\end{aligned}$$

where $\text{LSE}(x, y) \equiv \nu\log(\exp(x/\nu) + \exp(y/\nu))$. In the benchmark economy, $\tilde{\tau}^A(a, H) = \tau^A a$ while in the wealth tax reform economy:

$$\tilde{\tau}^A(a, n) \equiv 0.008 \cdot a \cdot \mathbf{1}[a \le a^{\text{threshold}}] + \left(0.008 \cdot a^{\text{threshold}} + 0.0011 \cdot (a - a^{\text{threshold}})\right) \cdot \mathbf{1}[a > a^{\text{threshold}}]$$

and the market value of the firm is given by

$$\Pi(a, n, \mathbf{z}) = (1 - \tau^c(n, \mathbf{z}))\pi(n, \mathbf{z}) + \frac{1}{1+r}\mathbb{E}_{\mathbf{z}'}\left[q^E(a', n, \mathbf{z}')\Pi(a', k, \mathbf{z}') + (1 - q^E(a', k, \mathbf{z}')\Pi(a', n, \mathbf{z}')\right]$$

The first order conditions are

$$\begin{aligned}
-\frac{1}{c_s} + \beta\delta\mathbb{E}_{\mathbf{z}'}\left[\frac{\partial v(a'_s, n, \mathbf{z}')}{\partial a'_s}\right] &= 0 \\
-\frac{1}{c_m} + \beta\delta\mathbb{E}_{\mathbf{z}'}\left[\frac{\partial v(a'_m, k, \mathbf{z}')}{\partial a'_m}\right] &= 0
\end{aligned}$$

The Envelope condition is:

$$\frac{\partial v(a,n,\mathbf{z})}{\partial a} = q^E(a,n,\mathbf{z}) \frac{\partial V^{\text{out-migrate}}(a,n,\mathbf{z})}{\partial a} + (1 - q^E(a,n,\mathbf{z}) \frac{\partial V^{\text{stay}}}{\partial a}$$

And:

$$\begin{aligned} \frac{\partial V^{\text{stay}}(a,n,\mathbf{z})}{\partial a} &= \frac{1}{c_s}\left[(1+R(n,\mathbf{z})) - \frac{d\tilde{\tau}^A}{da}\right] \\ \frac{\partial V^{\text{out-migrate}}(a,n,\mathbf{z})}{\partial a} &= \frac{1}{c_m}[(1+R(n,\mathbf{z}) - \frac{d\tilde{\tau}^A}{da}] \end{aligned}$$

Hence, the Euler equations are given by:

$$\begin{aligned} \frac{1}{c_s} &= \beta\delta\mathbb{E}_{\mathbf{z}'}\left[q^E(a'_s,n,\mathbf{z}')\frac{1}{c'_m}[(1+R(n,\mathbf{z}') - \frac{d\tilde{\tau}^A(a'_s)}{da'_s}] + (1-q^E(a'_s,n,\mathbf{z}')\frac{1}{c'_s}\left[(1+R(n,\mathbf{z}')) - \frac{d\tilde{\tau}^A(a'_s)}{da'_s}\right]\right] \\ \frac{1}{c_m} &= \beta\delta\mathbb{E}_{\mathbf{z}'}\left[q^E(a'_m,k,\mathbf{z}')\frac{(1+R(k,\mathbf{z}')}{c'_m} + (1-q^E(a'_m,k,\mathbf{z}')\frac{(1+R(k,\mathbf{z}'))}{c'_s}\right] \end{aligned}$$

I use the following algorithm:

1. Construct grids for a'_s and a'_m.

2. Guess policy functions $c^0_s(a_i,n,\mathbf{z}_k)$ and $c^0_s(a_i,n,\mathbf{z}_k)$, migration probabilities $q^E_0(a_i,n,\mathbf{z})$ and value functions $V^{\text{stay}}, V^{\text{out-migrate}}, \Pi$.

3. Iterate over $\{a'_i,n,\mathbf{z}_k\}$. For any tuple $\{a'_i,n,\mathbf{z}_k\}$, construct the right-hand side of the Euler equations using the guesses:

$$\begin{aligned} B_s(a'_i,n,\mathbf{z}_k) &\equiv \beta\delta\mathbb{E}_{\mathbf{z}'}\left[q^E_0(a'_s,n,\mathbf{z}')\frac{1}{c^0_m}[(1+R(n,\mathbf{z}') - \frac{d\tilde{\tau}^A(a'_s)}{da'_s}] + (1-q^E_0(a'_s,n,\mathbf{z}')\frac{1}{c'_s}\left[(1+R(n,\mathbf{z}')) - \frac{d\tilde{\tau}^A}{d\ldots}\right.\right. \\ B_m(a'_i,n,\mathbf{z}_k) &\equiv \beta\delta\mathbb{E}_{\mathbf{z}'}\left[q^E_0(a'_s,k,\mathbf{z}')\frac{(1+R(k,\mathbf{z}'))}{c^0_m} + (1-q^E_0(a'_s,k,\mathbf{z}')\frac{(1+R(k,\mathbf{z}))}{c^0_s}\right] \end{aligned}$$

4. Use the Euler equations to solve for the values of $\tilde{c}_s$ and $\tilde{c}_m$ that satisfies the Euler equations

$$\begin{aligned} \frac{1}{B_s(a_i,n,\mathbf{z})} &= \tilde{c}_s(a_i,n,\mathbf{z}) \\ \frac{1}{B_m(a_i,n,\mathbf{z})} &= \tilde{c}_m(a_i,n,\mathbf{z}) \end{aligned}$$

5. Use the budget constraints to solve for a_s^* and a_m^*:

$$\tilde{c}_s + a_s' = \left[(1 - \tilde{\tau}^A(a_i^*, n)) + R(n, \mathbf{z})\right] a_{i\,s}^*$$

$$\tilde{c}_m + a_m' = (1 - \tilde{\tau}^A(a_i^*, n)) a_{i\,s}^* - \tau^o \Pi_0(a, n, \mathbf{z})$$

6. Now update guesses of the policy functions and out-migration rates on the original grid using linear interpolation.

7. Repeat until convergence.

D.3 Stationary distribution of agents

To compute the stationary distribution of agents across states $(a, n_E, \mathbf{z})$ I use a modification of Young (2010)'s histogram method to account for wealth growth outside of the asset grid using the Pareto extrapolation algorithm from Gouin-Bonenfant and Toda (2023). I populate the transition matrix conditional on survival Q^{alive} as follows. For a' s.t. $a_{k+1} \leq a' < a_k$, then define:

$$Q^{\text{alive}}(n', a_k, \mathbf{z}'; a, n, \mathbf{z}) = \begin{cases} \pi(\mathbf{z}', \mathbf{z}) q^E(a, n, \mathbf{z}) \left(\frac{a_{k+1} - a'}{a_{k+1} - a_k}\right) & \text{if } n' \neq n \\ \pi(\mathbf{z}', \mathbf{z})(1 - q^E(a, n, \mathbf{z})) \left(\frac{a_{k+1} - a'}{a_{k+1} - a_k}\right) & \text{if } n' = n \end{cases}$$

$$Q^{\text{alive}}(n', a_{k+1}, \mathbf{z}'; a, n, \mathbf{z}) = \begin{cases} \pi(\mathbf{z}', \mathbf{z}) q^E(a, n, \mathbf{z}) \left(\frac{a' - a_k}{a_{k+1} - a_k}\right) & \text{if } n' \neq n \\ \pi(\mathbf{z}', \mathbf{z})(1 - q^E(a, n, \mathbf{z})) \left(\frac{a' - a_k}{a_{k+1} - a_k}\right) & \text{if } n' = n \end{cases}$$

And for a' s.t. $a' \geq a_N$. The full transition matrix is given:

$$Q = \delta Q^{\text{alive}} + (1 - \delta)\psi_0$$

where ψ_0 refers to the initial distribution of agents, discretized in the same way as Q^{alive}. Then, to solve for the stationary distribution I find the normalized eigenvector associated with the eigenvalue of one for Q.

D.4 Prices

To solve for equilibrium prices $\{w(n)\}_{n \in N}$ I implement the following fixed point algorithm:

1. Guess initial wages in each location $\{w_0(n)\}_{n \in N}$.

2. Given these prices, compute implied returns.

3. Solve the problem of the entrepreneur.

4. Compute the Pareto tail of the wealth distribution.

   - If the Pareto tail is less than one, return excess labor demand $= Inf$.

   - If Pareto tail is greater than one, compute the stationary distribution.

5. Compute labor demand in each location.

6. Solve for the implied tax revenue and transfer to workers.

7. Compute labor supply

8. Check market clearing in each location.