Curbing Tax Flight?

Aggregate Effects of Taxing Entrepreneur Migration

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Abstract

This paper examines the trade-off policymakers face when seeking to curb tax-motivated migration through out-migration taxes. I use Norway as a laboratory—a small open economy where tax flight is a key policy concern. Exploiting a recent increase in the wealth tax rate at the top of the wealth distribution, I document a significant migration response. Out-migrating households not only reduce the size of the domestic tax base, but many are firm owners. Firms of out-migrating owners experience on average a 12.6% decrease in firm revenue compared with firms where the owners stay. 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 migration choices. Entrepreneurs who choose to operate their firm in a different location than they are currently residing may suffer a haircut to their productivity. I estimate the key model parameters using the quasi-experimental evidence from the tax reform. In the aggregate, the wealth tax reform increases aggregate output by 8.4% in the long-run by reallocating wealth from resident to expat entrepreneurs. Introducing a tax on the market value of the firm when the entrepreneur out-migrates reduces tax flight, but at the expense of reducing aggregate output.

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1 Introduction

Capital tax flight is often seen as a key barrier for policy makers interested in taxing the wealthy. Yet, the extent of tax flight is shaped by the institutional environment. Several countries impose additional tax liabilities triggered at out-migration – out-migration taxes, potentially changing how individuals respond to domestic capital taxation. While such policies may reduce tax flight, they may also create new distortions. Despite their prevalence, relatively little is known about how such policies affect tax flight and their aggregate economic implications. This motivates a central question: Do out-migration taxes curb capital tax flight of individuals and at what cost?

Understanding how policies to curb tax flight affects the migration response and aggregate implications of capital taxes is challenging to study for several reasons. First, there are few data sources that track the residency, wealth and firm ownership of households over time. Second, quasi-experimental evidence can be used to draw conclusions about local short-run policy effects of already implemented policies, but a theory is needed to draw conclusions about aggregate and equilibrium effects of the two policies. Third, even with a perfect joint experiment of the two tax policies, the estimated effect is specific to the institutional context and experiment and not informative about how additional changes in policy affects tax flight.

I address these challenges using Norway as a laboratory: a small open economy, where capital tax flight is a central concern to policymakers. Moreover, the country imposes a wealth tax that incentivizes wealthier households to out-migrate. I combine quasi-experimental evidence on the migration behavior of wealthy households with a dynamic equilibrium model to study the aggregate effects of policies to curb tax flight. In 2022, the newly elected government significantly increased domestic capital tax rates on wealthy households leading to an out-flow of tax revenue. Using a differences-in-differences design, I show that the out-migration rate of affected households increased from 0.2% to almost 3%, with no significant change in the comparison group, and overall, over 2% of the wealth tax base left the country in one year. I find that the location of wealthy households matters for domestic firms: when firm owners out-migrate their firm, on average, experiences a 12.6% decrease in revenue and firms of out-migrating owners are 5 p.p. more likely to exit than firms of staying owners.

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. The challenge with this approach is that for most tax reforms, the individuals out-migrating are not the only ones affected. In particular, if resident entrepreneurs are forward-looking they will still be affected as there is a chance they will want to out-migrate in the future. The second challenge is that the migration response and therefore the aggregate effect is specific to the policy experiment at hand. This makes it impossible to study counterfactual policies such as an out-migration tax without knowledge of the underlying economic primitives.

For this reason, I build a model where entrepreneurs make forward-looking savings and migration choices, and decide whether and where to operate a firm. I embed forward-looking migration choices in an otherwise standard infinite-horizon (perpetual-youth) model in which entrepreneurs are heterogeneous in their (stochastic) productivity and are subject to collateral constraints. At each point in time, firms make static production and location decisions, while their owners make forward-looking savings and location decisions. This model builds on work by Angeletos (2007), Moll (2014), and Guvenen et al. (2023). At the heart of the model are agents who differ in their entrepreneurial productivity in each location and face collateral constraints in financing production. These two features generate productivity dispersion across firms and heterogeneity in the returns to wealth across entrepreneurs. Entrepreneurs choose (i) whether and where to operate a firm, (ii) the scale of the firm if operating, (iii) savings and (iv) next period's location. Entrepreneurs who choose to operate their firm in a different location than they are currently residing may suffer a *hair-cut* to their productivity, reflecting a potential loss in the span-of-control or monitoring capabilities from operating at a distance as in Giroud (2013).

The stationary equilibrium of this economy has several nice properties that are useful for characterizing 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 in the same country they are residing, and *expat* owners who operate firms from abroad. The quality-adjusted capital stock of expat entrepreneurs is affected by the magnitude of the hair-cut. However, living abroad may

Second, I show that the magnitude of the hair-cut and the semi-elasticity of out-migration with respect to an increase in capital taxation are key inputs in the aggregate economic implications of capital taxation when entrepreneurs can out-migrate. Through the lens of the model, there are two main components of the aggregate effects of capital taxes when entrepreneurs can out-migrate: (i) a wealth effect reflecting changes in migration and the growth rate of wealth, (iii) composition effects driven by changes in firm location and entry/exit. In this context, I show that out-migration taxes assessed on the market value of the firm when out-migrating reduces both the level of out-migration, but also 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 is informative about the (common) costs of moving and the importance of non-pecuniary factors in location decisions. Second, the change in revenue and exit rate of the firms of out-migrating firm owners are informative about the magnitude of the productivity hair-cut as well as the correlation between the productivity of the entrepreneur in the two locations. I calibrate the model in three steps: (1) some parameters are taken from the literature, (2) the distribution of productivity types and transition matrix is calibrated using the empirical distribution of returns from firms in the data, (3) the remaining model parameters are estimated jointly using GMM to relicate the quasi-experimental evidence in the model.

In the first set of quantitative results, I study how an out-migration tax affects tax flight both in the aggregate and for different types of entrepreneurs. I find that more productive entrepreneurs are more likely to out-migrate when the top wealth tax rate increases. Given the large migration response in the data, in the long-run, the stock of entrepreneurs living in the home country decreases significantly. This reduces wealth tax revenue by more than 80% compared with the pre-reform level. I decompose the change in the wealth tax revenue into three channels: a mechanical revenue effect reflecting changes in tax rates holding the distribution of entrepreneurs fixed, a distributional effect reflecting changes in the distribution of wealth across entrepreneurs, and a tax flight effect reflecting changes in the share of entrepreneurs located in the home country. This decomposition reveals .. Introducing a 1% tax on the market value of the firm when out-migrating reduces XX.

In the second set of results, I estimate the aggregate effects of the wealth tax reform. I find that even though the stock of entrepreneurs located in the home country decreases significantly, overall output of firms producing in the home country actually increases. This increase is driven by the additional wealth accumulation of expat entrepreneurs which is used for collateral in domestic firms and increases production.

I decompose the change in the quality-adjusted stock using a similar decomposition as in the theoretical results, adjusted to a non-linear tax reform. The change in the quality adjusted stock of expats is XX.

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). These papers assume a closed economy and focus on the aggregate effects of different capital tax policies in isolation. 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. The key theoretical contribution is to incorporate forward-looking migration choices, a key feature of tax systems in small open economies. This paper is also one of the few papers in the literature to estimate parameters of a heterogeneous agent macro model using quasi-experimental evidence from panel data (Abbott et al. 2019, Luo and Mongey 2019).

On the empirical side, I build on the literature documenting international migration responses to taxation, reviewed by Kleven et al. (2020). While there are many studies documenting the elasticity of across-country out-migration with respect to changes in labor income taxation, there are relatively fewer studies examining changes in capital taxation (Brülhart et al. 2022; Agrawal et al. 2025). 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. Jakobsen et al. (2025) find that wealthy individuals in Sweden were less likely to out-migrate following the abolishment of the wealth tax. In the Norwegian context, I estimate an elasticity of out-migration with respect to capital 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 is inherently reduced form in nature because it depends on the institutional context.

This paper relates to an older literature in public finance studying tax incidence in open economies (Bradford 1978; Kotlikoff and Summers 1987; and more recently, 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. In the model, I differentiate between the mobility of firms and their owners whose locations need not be the same. 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 institutional setting, data and presents the empirical results. Section 3 describes the model and main theoretical results. Section 4 discusses identification and estimation of the model parameters. 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 descriptive 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 capital and 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 assessed 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 wealth is third-party reported for most asset classes to the tax authorities.

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

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 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 dividend and corporate income 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 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. 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, country of residence, 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 date and destination country. 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. 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 use the capital tax variation to study the migration response to the tax reform. Then, I study the observable characteristics of out-migrating households and how firm outcomes of out-migrating owners change in the years after out-migrating.

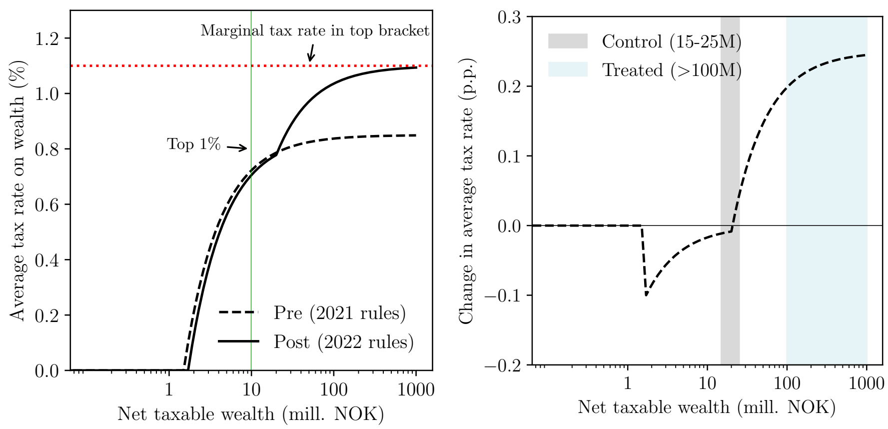
2.3.1 Capital Tax Variation

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.

Empirical Strategy. For the decision of whether to out-migrate, what matters is the difference in average tax rates because a household is comparing the present discounted value of consumption in the two 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 differences-in-differences setup. 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 in absence of the reform. implement the differences-in-differences design, I estimate the following regression:

Figure 1: Illustration of Empirical Strategy

(a) Avg. wealth tax rate (b) Treatment and Control Group



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.

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

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 that are common between the two wealth groups. One key challenge for the estimation is the potential contamination of the treatment and control groups due growth in wealth over time. In particular, mean reversion or forward-looking savings behavior might mean that households in the treated group are unaffected by the reform and symmetrically for the comparison group. To address this concern, I instrument treatment group status in each year with the treatment group status in 2016 and show that the estimated coefficients are very similar.

Figure 2a 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. The change is relatively similar when using treatment status in 2016 as an instrument for treatment status in year $t-1$. These changes in migration behavior also maps into large changes in aggregate tax revenue. Figure 2b 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.

First stage. To interpret the migration response to a tax reform, it is common in the 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 to the two groups. In this case, the implied semi-elasticity is XX.

The magnitude of the estimated semi-elasticity is large compared with the literature. In Sweden, Jakobsen et al. (2025) estimate a semi-elasticity of YY, while There are several reasons the true change in the effective tax rate could have been larger between the treatment and control group, upward-biasing the semi-elasticity. Moreover, the short-run migration response might be higher than the long-run response. I therefore consider the differences-in-differences estimate an upper bound on the long-run migration response to the tax reform.

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 cost of moving is 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 matters less for the decision of whether to out-migrate. However, households in the comparison group may be affected as well due to equilibrium effects or if they anticipate to grow wealthy in the future.

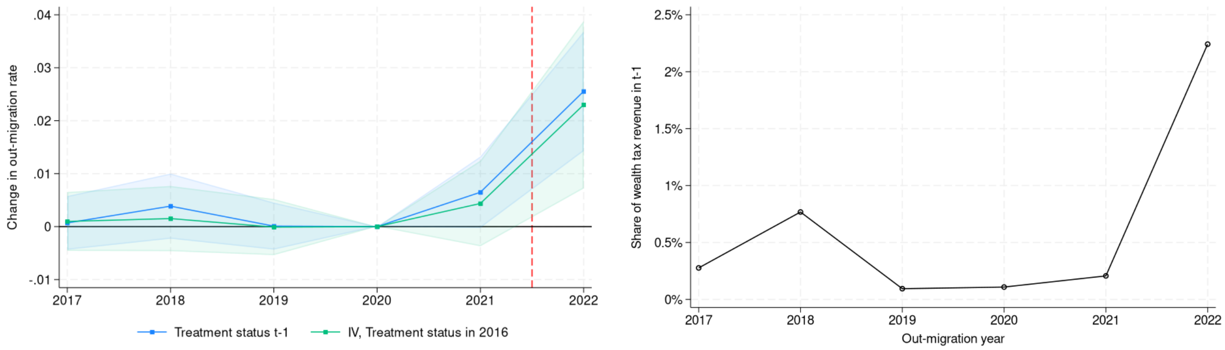
In section 4, I show that the reduced form elasticity does not map directly into any economic primitives in the model. Through the lens of the model, the out-migration response will depend both on the productivity type and therefore the cost to the firm of moving, as well as wealth in the case of a non-linear tax. 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.

2.3.2 Selection into Out-migration

How many individuals out-migrate in response to changes in domestic tax policy is important for understanding the implications for tax revenue. However, it may also matter who leaves and their importance for the domestic economy. I therefore compare the observable characteristics of out-migrating households with households who do not out-migrate before and after the tax-reform. Characteristics of those who out-migrate are measured in the year before they out-migrate.

Households. Table 1 presents that observable characteristics of out-migrating households compared with households who do not out-migrate over the time period 2016-2022. Out-migrating households are on average younger, less likely to be married, and wealthier. They are less likely to be operating an active firm in the year before they out-migrate and derive a larger

Figure 2: Migration Response to the 2022 Wealth Tax Reform



(a) Dynamic DiD of out-migration response

(b) Wealth Tax Revenue

Notes: Sub-figure (a) 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 change in the probability of out-migrating in each year relative to the out-migration rate in 2020. Sub-figure (b) 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.

share of their income from capital instead of labor. Households out-migrating in the year of the tax reform are more likely to have been firm owners in the past and wealthier than households out-migrating in the pre-period. Even though the number of active firm owners out-migrating is relatively low, XX

Firms. 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 own, on average, more productive and larger firms. Out-migrating owners are also less attached to their firms: owners who are also 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.

2.3.3 Firm Outcomes of Out-Migrating Owners

While the firm owners who out-migrate are a selected group, it is still interesting to compare descriptively what happens to their firms in the years around when they out-migrate. I consider out-migration events between 2016 and 2021. If several owners within a firm out-migrates during the time-period, I choose the first out-migration event.[2] 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

[2] In the data, there are only XX such events.

Table 1: Characteristics of Out-Migrating Households

	(1) Stayers	(2) Out-migrating 2016-2021	(3) Out-migrating 2022
Age (years)	56.1	44.2	48.8
Married	.829	.792	.838
Nr. of children	1.87	1.97	2
Capital income share	.0913	.221	.343
Net wealth (mill, NOK)	5.59	5.85	62.5
Active firm owner	.083	.0319	.0319
Firm owner in the past	.137	.0541	.156

Notes: This table presents the observable characteristics of households in the sample. Column (1) includes all households who do not out-migrate between 2016 and 2022. Column (2) includes all those who out-migrated for the first time between 2016 and 2021 and Column (3) includes all who out-migrated for the first time in 2022. Additional details on variable construction are provided in Appendix A.

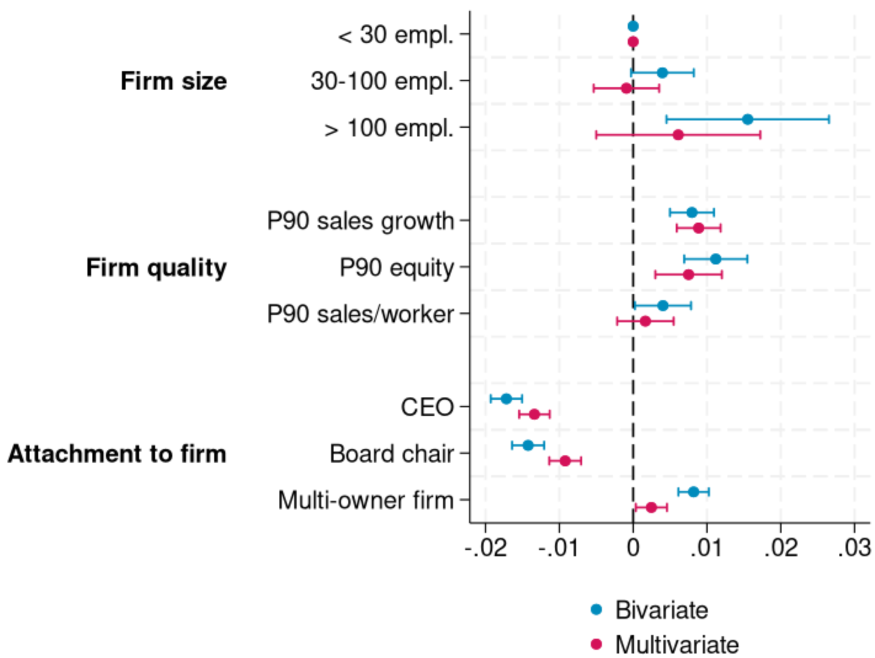


Figure 3: Selection of firm owners into out-migration

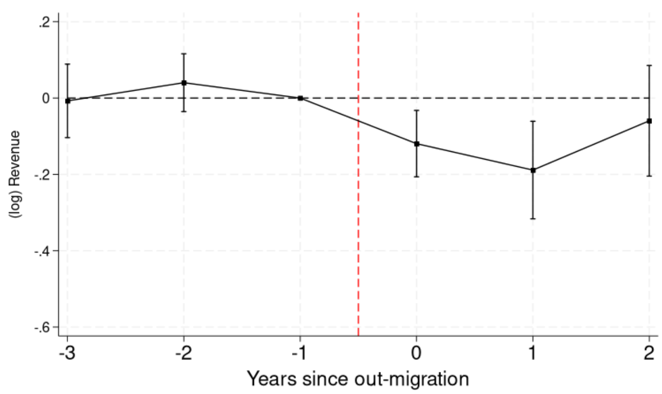
Notes: This figure plots the relationship between firm ownership and the likelihood of out-migration. The multivariate regression includes all the variables in one regression including year and industry fixed effects. The error bars represent 95% confidence intervals constructed using standard errors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

event study specficiation:

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

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 $X_{i,t}$ include year by industry fixed effects to increase precision of the estimates. Figure 4 plots the estimated coefficients β_t, 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. On average, 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, out-migrating owners may either experience a large revenue loss because the productivity hair-cut is large or because they experience a negative productivity shock affecting both their migration decision and revenue.

2.3.4 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. 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:

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

where Y is aggregate output, N is the stock of wealthy individuals and Y^w is output of firms owned by wealthy individuals. For example, Jakobsen et al. (2025) find that in the context of the repeal of the wealth tax in Sweden the aggregate effects on output were small because even though the average effect on firm outcomes of expats were in the same magnitude around 10%, the change in the stock of entrepreneurs was small and the entrepreneurs' share of aggregate output was small.

In the Norwegian context, unless changes in demographics turn the migration stock elasticity positive one would conclude that the overall effects of wealth taxes on aggregate output were negative. The challenge with this approach is that for most tax reforms, the individuals out-migrating are not the only ones affected. In particular, if resident entrepreneurs are forward-looking they will still be affected as there is a chance they will want to out-migrate in the future. The second challenge is that the migration elasticity and therefore the aggregate effect is specific to the policy experiment at hand. This makes it impossible to study counterfactual policies such as an out-migration tax without knowledge of the underlying economic primitives.

In the next sections, I address these challenges 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. In the end, I re-visit the back-of-the-envelope calculation and show how it compares to the results from the structural exercise.

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. Motivated by the descriptive evidence, the model features entrepreneurs who are heterogeneous in location-specific productivity, leading to selection in 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. I allow entrepreneurial productivity to be potentially correlated across locations using a Gaussian copula with correlation ρ, but independent and identically distributed 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 both in the home country, but also whether out-migrating entrepreneurs keep operating their firm as in the empirical section. 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 and thereby aggregate productivity.

Production technology. Each active entrepreneur with entrepreneurial productivity $\mathbf{z}$ living in location n_E produces a homogeneous good in location n_F using a constant returns to scale technology[3] 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 *hair-cut* 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 hair-cut is zero. The hair-cut could capture loss in monitoring

[3] 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.

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 living 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 living in location n common to all entrepreneurs denoted by $\kappa(n_E)$. 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. Agents 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 hair-cut 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, firm profits τ^c. In the *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 empirically very low, 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 living 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 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

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

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 living 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 $k \neq n$

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

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 and firm and owner location choices. This means that more productive entrepreneurs will generally have higher market values of wealth 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*

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

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

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

4. *Out-migration rates in Equation (8) are independent of wealth $q^E(a, n, \mathbf{z}) = q^E(n, \mathbf{z})$.*

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

The proof is given in Appendix C. Increasing wealth taxes, holding everything else fixed, decreases the growth rate of wealth proportionally. The linearity of the policy functions is a consequence of log-utility together with the linearity of returns and taxes. A direct consequence of Lemma 1 is that wealth taxes only affect savings through the after-tax return on savings. The coefficients $m^{\text{stay}}, m^{\text{out-migrate}}$ capture both current return differences across locations, but also differences in expected future returns. Log-utility and the absence of any borrowing constraints for consumption also implies out-migration rates are independent of wealth, conditional on the productivity type and current location. However, different types will have different returns to wealth and therefore different levels of wealth. For this reason, one could still observe out-migration rates that differ by wealth.

Last, the linearity of the choice-specific savings policy functions means that wealth faces 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 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 living in location n as

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

where $\bar{A} \equiv \sum_n \sum_{\mathbf{z}} \int a dE^*(a, n, \mathbf{z})$. The evolution of the wealth shares over time is completely determined by savings and out-migration rates. Conditional on living 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 $i \in \{\text{inactive}, \text{resident}, \text{expat}\}$:

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

The mass of entrepreneurs in group i is given by:

$$\phi^i = \int \mathbf{1}[\text{Group}(n, \mathbf{z}) = i] dE^*(a, n, \mathbf{z})$$

Shifts in the mass of entrepreneurs of each group is driven by the mass of each productivity type and their choice of where and whether to operate. 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 to the capital stock used by firms in the home country, the 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

$$Y \equiv (Q)^{\alpha} (hL)^{1-\alpha}$$

where the quality-adjusted capital stock is defined as $Q^{resident} + \mu Q^{expat}$ and the wealth distribution in each location has a Pareto upper tail.

Proof. See Appendix C.2. □

The aggregation follows naturally from the linearity of the policy functions established in 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. The amount of wealth invested in the home country affects output because of the collateral constraint governing how much capital can be rented.

The second take-away from Lemma 2 is how the productivity hair-cut affects aggregate output. A larger hair-cut (smaller μ) decreases the total quality-adjusted capital stock in the home economy, all else equal. However, it does not follow that reducing the share of expats in the economy is necessarily positive as the wealth share of expats may be larger due to higher after-tax returns to saving in the other country.

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.

Proposition 1 (Aggregate Effects of Wealth Taxes).
Consider a small change in the wealth tax rate, the change in total output is given by:

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

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:

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

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

Proposition 1 shows that wealth taxes has two main effects on the quality-adjusted capital stock. First, it reallocates wealth across entrepreneurs living in different locations and of different productivity types. The potential reallocation of wealth from low productivity entrepreneurs to high productivity entrepreneurs in response to wealth taxes is well-known in the literature and has been coined the "use it or lose it" effect of wealth taxes (Guvenen et al. 2023).

The reallocation of entrepreneurs and wealth across countries is new and specific to the open economy context studied in this paper. In particular, the change in the wealth shares are governed by the migration response and savings response of each type. A large migration response to the wealth tax is not necessarily negative for output if the productivity hair-cut is small and the wealth tax re-distributes wealth from residents to expats which increases the wealth available to use as collateral and therefore wealth accumulation and output of firms in the home country.

The composition effect is also novel to this paper. Wealth taxes affects the location of entrepreneurs, but also the location of firms through the productivity hair-cut. If there is a productivity hair-cut, entrepreneurs out-migrating to reduce their wealth tax burden may relocate their firm with them if the firm is equally productive abroad to avoid the productivity hair-cut. Even in the absence of the hair-cut, firms may relocate if wealth taxes affects equilibrium wages and therefore the location-specific component of profits.

Proposition 1 shows that the migration response to wealth taxes is a key component for understanding the aggregate effects through the wealth and composition effects. The next proposition characterizes the effects of wealth taxes on out-migration rates:

Proposition 2 (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:*

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

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

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

Proposition 2 characterizes the out-migration response to a small change in the wealth tax rate. 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 that type is staying 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. This theoretical result implies that the reduced form elasticity estimated in Section XX can be hard to interpret when returns are heterogeneous across entrepreneurs.

The total effect of the wealth tax reform on tax revenue not only depends on the migration response, but also on who out-migrates, their wealth, 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 3 (Tax Flight).
Suppose there is no out-migration tax and consider a small change in the wealth tax rate from $\tau^A = \tau_0^A$ to $\tau^A = \tau_0^A + d\tau^A$. The change in the total tax revenue in the home country is given by:

$$\frac{d\mathcal{T}}{d\tau^A} = \frac{dT^A}{d\tau^A} + \frac{dT^L}{d\tau^A} + \frac{dT^c}{d\tau^A}$$

where T^A is wealth tax revenue, T^L is labor income tax revenue, T^c is corporate tax revenue and:

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

$$\frac{dT^L}{d\tau^A} \equiv \frac{dw(H)}{d\tau^A}\cdot h^*\tau^L + \frac{dh^*}{d\tau^A}w(H)\tau^L$$

$$\frac{dT^C}{d\tau^A} \equiv \sum_{\mathbf{z}} \frac{d\pi(H,\mathbf{z})}{d\tau^A}\omega^{resident}(H,\mathbf{z}) + \pi(H,\mathbf{z})\frac{d\omega^{resident}}{d\tau^A} + \frac{d\pi(x,\mathbf{z})}{d\tau^A}\omega^{expat}(x,\mathbf{z}) + \pi(x,\mathbf{z})\frac{d\omega^{expat}(x,\mathbf{z})}{d\tau^A}$$

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

In contrast to the wealth invested in the home country, the wealth tax base consists of entrepreneurs located in the home country. This comprises both inactive entrepreneurs, resident entrepreneurs and expat entrepreneurs operating a firm in the foreign country. Ultimately, the extent of tax flight depends on the effect on the stock of entrepreneurs located in the home country and their wealth. Changes in labor income tax revenue comes from equilibrium effects in the home labor market and labor supply effects from the transfer.

Last, corporate tax revenue changes too from the same channels. Equlibrium effects in the home labor market affects the common component of profits and wealth and composition effects impact the amount of wealth invested in firms and therefore the aggregate corporate profits in the home economy.

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 hair-cut 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 curb tax flight. In the next section, I consider one such policy and show how it may reduce tax flight.

3.4.1 Curbing Tax Flight using Out-Migration Taxes

Having established that wealth taxes induces out-migration and its effects on the aggregate economy, 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, an increase in the out-migration tax τ^o:

1. *Decreases out-migration rates*

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

2. *Decreases the wealth tax semi-elasticity if* $1 - q^E(H, \mathbf{z}) > 1/(2\beta\delta)$

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

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 hair-cut. 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 2 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) tells us 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 identifies each 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:

$$\beta^{\text{DiD}} \equiv \mathbb{E}_1[q_t^E(a, H, \mathbf{z}; \tau_1)|a_{i,t-1} > 100] - E_0[q_{t-1}^E(H, \mathbf{z}; \tau_0)|a_{i,t-1} > 100]$$
$$- \left(\mathbb{E}_1[q_t^E(a, H, \mathbf{z}; \tau_1)|a_{i,t-1} \in [15, 25]] - \mathbb{E}_0[q_{t-1}^E(H, \mathbf{z}; \tau_0)|a_{i,t-1} \in [15, 25]]\right)$$

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. In the limit as $a \to \infty$, the tax schedule is linear and out-migration rates are independent of wealth.

The DiD estimand is generally not equal to the structural semi-elasticity from Proposition 2 aggregated across the population. The main differences arises because the 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. In Section 5, I compare the reduced-form DiD estimate with the model-implied migration response aggregates across the wealth and productivity distribution.

4.2 Information from Firm Outcomes of Out-Migrating Owners

To draw inference about the hair-cut to firm productivity I use information from the difference-in-differences estimate from out-migrating firm owners in Section 2.3.3. Recall that the output of a firm j m 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 hair-cut for out-migrating entrepreneurs plus a selection and wealth effect:

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

This decomposition illustrates that the DiD estimand is informative about the hair-cut parameter but does not directly identify it. In the extreme, even if there is a large hair-cut the overall DiD estimand may ultimately be positive if more productive entrepreneurs are more likely to out-migrate and accumulate more wealth due to saving taxes abroad.

To obtain a more direct estimator for the hair-cut, I use the firm's sales–to-equity ratio which 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 differences-in-differences comparison in the model and estimating the value of the productivity hair-cut 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 a year. I set the discount rate β to 0.98 and the survival probability δ to 0.98 such that the adjusted discount rate is consistent with annual data. I set the capital share in production to $\alpha = 1/3$ and the elasticity of labor supply to $\eta = 2$. In the benchmark economy, I set the tax rates to mimic the Norwegian tax system in the period 2016-2022. 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 2006-2020. Appendix E.2 provides more details about the estimation of the transition probabilities. I calibrate the relative level of each productivity type to match the average return in each quantile. Last, I calibrate the tightness of the collateral constraint λ such that aggregate corporate debt to output in the home country is equal to XX%.

Joint estimation. The remaining parameters including the location preference parameters, productivity hair-cut, and the correlation between home and foreign productivity 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. The estimated parameters are presented in Appendix Table E.2.

Table 2: Data Moments

Description	Source	Data	Model
Migration			
Top 1% out-migration rate 2016–2020	Internal	0.0020	0.0088
Top 1% in-migration rate 2016-2020	Internal	0.0012	0.0032
Out-migration response to 2022 wealth tax rate increase θ^{DiD}	Internal	0.0254 (0.0058)	0.0167
Firm outcomes after out-migrating			
Out-migration revenue/equity event study μ^{DiD}	Internal	-0.128 (0.073)	-0.126
Differential firm exit rate between out-migrating and staying owners	Internal	0.050 (0.024)	0.001

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

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.

5.1 Tax "Flight"

I begin by examining the effects on measures of tax flight. Figure 5a 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 will be higher.

Figure 5b shows the overall effect of the reform on wealth tax revenue, for different values of the out-migration tax.

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:

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

I normalize by T_0^A to report the effects in percentage terms. Table 3 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 living in the home country).

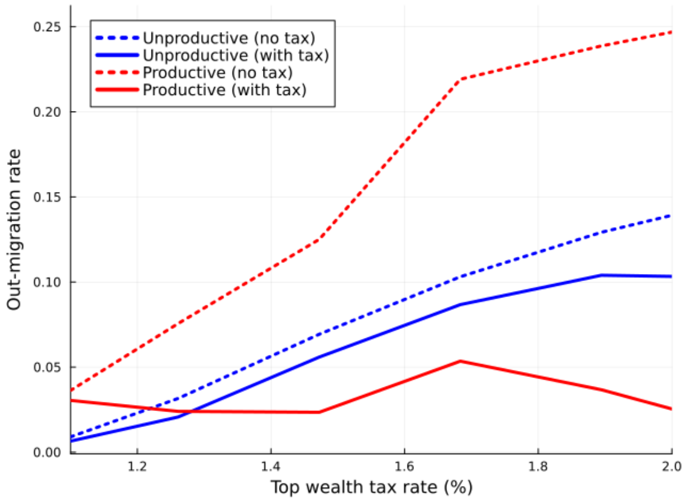
Table 3: Change in Tax Revenues from Benchmark Norwegian Economy

Tax Type	Wealth tax reform	Out-migration tax	Wealth tax + Out-migration tax
Wealth tax revenue (T^A)	-83.0%	25.7%	-79.4%
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)	10.8%	-3.25%	11.0%
Corporate tax revenue (T^C)	9.11%	0.84%	3.81%
Total tax revenue ($\mathcal{T}$)	-28.6%	9.5%	-27.9%

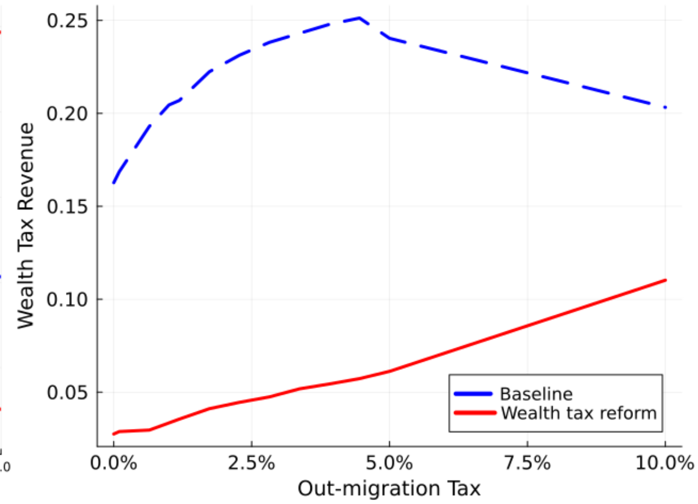
Notes: This table reports the percentage change in tax revenues across the three economies. The decomposition for T^A shows the mechanical, migration, and general equilibrium components of the wealth tax revenue change.

Figure 5: Tax "Flight"

(a) Migration rates



(b) Wealth tax revenue



Notes: Sub-figure (a) 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%. Sub-figure (b) plots wealth tax revenue as the out-migration tax on the market value of the firm increases. The blue line indicates the baseline economy with a linear 0.85% wealth tax rate, while the red line indicates the wealth tax reform economy which 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. .

5.2 Aggregate Effects

Next, I quantify the effects on aggregate quantities. Table 4 reports the results. Aggregate output in the wealth tax reform economy is 8.4% higher than in the baseline economy. This positive effect is driven by the reallocation of capital from resident to expat entrepreneurs. Expat entrepreneurs accumulate more wealth over time due to lower wealth taxes which are available to use in the firms as collateral. Even with an estimated productivity hair-cut of 11.8%, the additional wealth available to domestic firms compensates such that the overall effect on aggregate output is positive. Being able to relocate abroad, dampens the negative effect on the growth rate of wealth.

How much of the change in the quality-adjusted stock is driven by changes in the wealth of residents vs. changes in the composition of residents? I consider a decomposition similar to Proposition 1 adapted to the non-linear tax setting, where the change in output is decomposed into the change in the quality-adjusted capital stock of residents and expats and a labor supply effect. The full decomposition is described in Appendix C.6.2. Figure **??** shows the resulting decomposition. The large increase in the quality-adjusted capital stock of expats is primarily driven by the wealth effect where changes in migration rates over time reallocates wealth towards expat entrepreneurs. Changes in firm location and entry/exit dampens the decrease in the quality-adjusted capital stock of resident entrepreneurs. Taken together, this decomposition suggests XX.

Table 4: Change in Macro Variables from Benchmark Norwegian Economy

	Percentage Change from Baseline				
	Quantities				Price
	Y	Q^{resident}	Q^{expat}	h^*L	w
Wealth tax reform economy	8.42%	-66.3%	97.8%	10.8%	3.13%
Out-migration tax economy	1.04%	28.3%	-26.5%	-3.25%	0.00 %
Wealth tax reform + out-migration tax	3.10%	-59.4%	88.8%	11.04%	5.28%

Notes: This table reports the change in macroeconomic quantities, labor input, and prices 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.

6 Conclusion

This paper studied the aggregate effects of tax-induced out-migration in a small open economy. Out-migration taxes may curb tax flight, but at the expense of reducing aggregate output. Estimating the key model parameters using quasi-experimental evidence from Norwegian administrative data I find that the net effect of out-migration taxes in the Norwegian context would have been positive.

Examining transitional dynamics is outside of the scope of this paper, but an interesting avenue for future 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 XX.

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,

In this paper I focused on out-migration taxes in the form of a tax on the market value of the firm paid upon out-migration. This framework and approach was specifically focus on owners of privately owned firms where the market value is based on the future stream of profits. An interesting avenue for further research would be to examine the behavior of investors who out-migrate in response to taxes. Their location could matter for the domestic economy if the degree of home bias is strong and firms rely on XX for financing.

References

Abbott, Brant, Giovanni Gallipoli, Costas Meghir, and Giovanni L. Violante, "Education Policy and Intergenerational Transfers in Equilibrium," *Journal of Political Economy*, December 2019, *127* (6), 2569–2624.

Advani, Arun, David Burgherr, and Andrew Summers, "Taxation and Migration by the Super-Rich," May 2025.

Agrawal, David R., Dirk Foremny, and Clara Martínez-Toledano, "Wealth Tax Mobility and Tax Coordination," *American Economic Journal: Applied Economics*, January 2025, *17* (1), 402–430.

Angeletos, George-Marios, "Uninsured idiosyncratic investment risk and aggregate saving," *Review of Economic Dynamics*, January 2007, *10* (1), 1–30.

Beare, Brendan K. and Alexis Akira Toda, "Determination of Pareto Exponents in Economic Models Driven by Markov Multiplicative Processes," *Econometrica*, 2022, *90* (4), 1811–1833.

Benhabib, Jess, Alberto Bisin, and Shenghao Zhu, "The Distribution of Wealth and Fiscal Policy in Economies With Finitely Lived Agents," *Econometrica*, 2011, *79* (1), 123–157. _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.3982/ECTA8416.

Bradford, David F., "Factor prices may be constant but factor returns are not," *Economics Letters*, January 1978, *1* (3), 199–203.

Brülhart, Marius, Jonathan Gruber, Matthias Krapf, and Kurt Schmidheiny, "Behavioral Responses to Wealth Taxes: Evidence from Switzerland," *American Economic Journal: Economic Policy*, November 2022, *14* (4), 111–150.

Cagetti, Marco and Mariacristina de Nardi, "Entrepreneurship, Frictions, and Wealth," *Journal of Political Economy*, 2006.

Clausing, Kimberly A., "Who Pays the Corporate Tax in a Global Economy?," *National Tax Journal*, March 2013, *66* (1), 151–184.

Gaillard, Alexandre and Philipp Wangner, "Wealth, Returns, and Taxation: A Tale of Two Dependencies," *SSRN Electronic Journal*, 2022.

Giroud, Xavier, "Proximity and Investment: Evidence from Plant-Level Data*," *The Quarterly Journal of Economics*, May 2013, *128* (2), 861–915.

Grindaker, Morten and Ola Lotherington Vestad, "Latente eierinntekter 2011-2022," 2025.

Guvenen, Fatih, Gueorgui Kambourov, Burhan Kuruscu, and Sergio Ocampo-Diaz, "Book-Value Wealth Taxation, Capital Income Taxation, and Innovation," Technical Report w32585, National Bureau of Economic Research, Cambridge, MA June 2024.

_ , _ , _ , Sergio Ocampo, and Daphne Chen, "Use It or Lose It: Efficiency and Redistributional Effects of Wealth Taxation," *The Quarterly Journal of Economics*, April 2023, *138* (2), 835–894.

Jakobsen, Katrine, Henrik Kleven, Jonas Kolsrud, Camille Landais, and Mathilde Munoz, "Taxing Top Wealth: Migration Responses and their Aggregate Economic Implications," 2025.

Kleven, Henrik, Camille Landais, Mathilde Muñoz, and Stefanie Stantcheva, "Taxation and Migration: Evidence and Policy Implications," *Journal of Economic Perspectives*, May 2020, *34* (2), 119–142.

Kotlikoff, Laurence and Lawrence Summers, "Tax Incidence," 1987.

Lerner, Josh, "Venture Capitalists and the Oversight of Private Firms," *The Journal of Finance*, 1995, *50* (1), 301–318.

Luo, Mi and Simon Mongey, "Assets and Job Choice: Student Debt, Wages and Amenities," Technical Report w25801, National Bureau of Economic Research, Cambridge, MA May 2019.

Mian, Atif, "Distance Constraints: The Limits of Foreign Lending in Poor Economies," *The Journal of Finance*, 2006, *61* (3), 1465–1505.

Moll, Benjamin, "Productivity Losses from Financial Frictions: Can Self-Financing Undo Capital Misallocation?," *American Economic Review*, October 2014, *104* (10), 3186–3221.

Serrato, Juan Carlos Suárez and Owen Zidar, "Who Benefits from State Corporate Tax Cuts? A Local Labor Markets Approach with Heterogeneous Firms," *American Economic Review*, September 2016, *106* (9), 2582–2624.

Young, Eric R., "Solving the incomplete markets model with aggregate uncertainty using the Krusell-Smith algorithm and non-stochastic simulations," *Journal of Economic Dynamics and Control*, 2010, *34* (1), 36–41. Publisher: Elsevier.

Émilien Gouin-Bonenfant and Alexis Akira Toda, "Pareto extrapolation: An analytical framework for studying tail inequality," *Quantitative Economics*, 2023, *14* (1), 201–233.

A Data Appendix

A.1 Variable Definitions

Table A.1: Variable Definitions

Variable	*Description*
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
Capital income share	
Net wealth (mill, NOK)	
Ownership share	
Firm owner	$> 20\%$ Ownership in a limited liability firm with at least one employee excluding the owner
Active firm	
Firm size	
Sales	
Sales growth	
Equity	
Sales/worker	
Sales/equity	
CEO	
Board chair	
Multi-owner firm	

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* $Q : S \times \Sigma_S \to [0, 1]$, 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 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

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

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

the market value of the firm is given by:

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

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:

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

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

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

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:

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

Rearranging and matching coefficients:

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

Substituting into the policy functions, we obtain the first result in Lemma 1:

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

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

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

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

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

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

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

I will now prove that these equations have a unique solution using Banach's fixed point theorem. We can stack the coefficients in a vector

$$\mathbf{m} = \begin{bmatrix} m^{\text{stay}}(H, \mathbf{z}) \\ m^{\text{stay}}(x, \mathbf{z}) \\ m^{\text{out-migrate}}(H, \mathbf{z}) \\ m^{\text{out-migrate}}(x, \mathbf{z}) \end{bmatrix}.$$

Let $\mathcal{M}$ denote the space of bounded functions $m : N \times Z \times Z \to \mathbb{R}$. Define the operator $\mathcal{T} : \mathcal{M} \to \mathcal{M}$. Then, we can write:

$$\mathbf{m} = \mathcal{T}(\mathbf{m})$$

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:

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

Matching coefficients:

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

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:

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

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:

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

Plug in:

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

This is a quadratic equation with solution:

$$B(H) =$$

□

C.2 Proof of Lemma 2

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

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

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:

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

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:

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

Rearranging:

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

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

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

□

C.3 Proof of Proposition 1

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

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

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:

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

Now:

$$Q^{\text{resident}} = \int_{\mathbf{1}[\text{Group}(n,\mathbf{z})=\text{Resident}]} \lambda a z(H) dE^*(a,n,\mathbf{z})$$

Denote the mass of resident entrepreneurs:

$$\gamma^{\text{resident}} = \sum_{\mathbf{z}} \int \mathbf{1}[\text{Group}(H,\mathbf{z}) = \text{Resident}] E^*(a,H,\mathbf{z}) da$$

Then, by Leibnitz' rule:

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

□

C.4 Proof of Proposition 2

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:

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

Rearranging and substituting the value functions from Equations (5) and (6) we obtain the first statement in Proposition 2:

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

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

$$\begin{aligned}\frac{\partial \log q^E(H,\mathbf{z})}{\partial \tau^A} = -\frac{(1-q^E(H,\mathbf{z})}{\nu}\Bigg[&\frac{-1}{1-\tau^A-\tau^O B(H,\mathbf{z})R(H,\mathbf{z})} + \frac{1}{1-\tau^A+R(H,\mathbf{z})} \\ &+ \beta\delta\left(\frac{\partial m^{\text{out-migrate}}(H,\mathbf{z})}{\partial \tau^A} - \frac{\partial m^{\text{stay}}(H,\mathbf{z})}{\partial \tau^A}\right)\Bigg]\end{aligned}$$

Recall that the m coefficients satisfy the following fixed point equations (suppressing the dependence on $\mathbf{z}$ to save 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 $x_1 \equiv \frac{\partial m^{\text{stay}}(H)}{\partial \tau^A}$, $x_2 = \frac{\partial m^{\text{out-migrate}}(H)}{\partial \tau^A}$, $x_3 = \frac{\partial m^{\text{stay}}(x)}{\partial \tau^A}$, $x_4 = \frac{\partial m^{\text{out-migrate}}(x)}{\partial \tau^A}$. 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,

$$\begin{aligned} x_1 &= MU^s + \beta\delta v'(H) \\ x_2 &= MU^m + \beta\delta v'(x) \\ x_3 &= \beta\delta v'(x) \\ x_4 &= \beta\delta v'(H) \end{aligned}$$

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:

$$\begin{aligned} v'(H) &= (1-q^E(H))x_1 + q^E(H)x_2 \\ v'(x) &= (1-q^E(x))x_3 + q^E(x)x_4 \end{aligned}$$

Hence:

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

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. □

C.5 Proof of Proposition 3

C.6 Proof of Proposition 4

Goal: Is out-migration rate increasing or decreasing in the out-migration tax τ^o?

Proof. First,

$$\frac{\partial \log q^E(H,\mathbf{z})}{\partial \tau^o} = \frac{(1 - q^E(H,\mathbf{z}))}{\nu}\left[- \frac{B(H,\mathbf{z})}{1 - \tau^A - B(H,\mathbf{z})\tau^o + R(H,\mathbf{z})} + \beta\delta\mathbb{E}_{\mathbf{z}'}\left(\frac{\partial m(x,\mathbf{z}')}{\partial \tau^o} - \frac{\partial m(H,\mathbf{z}')}{\partial \tau^o}\right)\right]$$

Proof of (1). The proof of statement (1) follows the same reasoning as Proposition 2. 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:

$$
\begin{aligned}
x_1 &= \beta\delta v'(H) \\
x_2 &= MU^m + \beta\delta v'(x) \\
x_3 &= \beta\delta v'(x) \\
x_4 &= \beta\delta v'(H)
\end{aligned}
$$

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:

$$
\begin{aligned}
v'(H) &= (1 - q^E(H))x_1 + q^E(H)x_2 \\
v'(x) &= (1 - q^E(x))x_3 + q^E(x)x_4
\end{aligned}
$$

Hence:

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

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 2, 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 2:

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

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:

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

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:

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

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

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.

□

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 $E_1^*(H) \frac{\int \tilde{\tau}^A(a) dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}$

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

C.6.2 Decomposition of Aggregate Effects

Consider the economy in two different steady states denoted by 0 and 1, respectively. The change in (log) output between the two economies is given by:

$$\log Y_1 - \log Y_0 = \alpha(\log Q_1 - \log Q_0) + (1-\alpha)(\log h_1^* L - \log h_0^* L).$$

The change in the quality-adjusted capital stock of residents can be written as:

$$\begin{aligned} Q_1^{\text{Resident}} - Q_0^{\text{Resident}} &= \lambda \sum_{\mathbf{z}} \int az(H)\mathbf{1}[\text{Group}_1(H,\mathbf{z}) = \text{Resident}]dE_1^*(a,H,\mathbf{z}) \\ &- \lambda \sum_{\mathbf{z}} \int az(H)\mathbf{1}[\text{Group}_0(H,\mathbf{z}) = \text{Resident}]dE_0^*(a,H,\mathbf{z}) \end{aligned}$$

Write it in terms of the normalized distributions:

$$Q_1 - Q_0 = E_1^*(H)\frac{\lambda \sum_{\mathbf{z}} \int az(H)dE_1^*(a,H,\mathbf{z})}{E_1^*(H)} - E_0^*(H)\frac{\lambda \sum_{\mathbf{z}} \int az(H)dE_0^*(a,H,\mathbf{z})}{E_0^*(H)}$$

Add and subtract the cross-terms:

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}, log-spaced around $x = 1$, 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 $\text{LSE}(x,y) \equiv \nu \log(\exp(x/\nu) + \exp(y/\nu))$ and

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

and

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

The first order conditions are given by:

$$\begin{aligned}
-\frac{1}{c_m} + \beta\delta\mathbb{E}\left[q^E(a',k,\mathbf{z}')\frac{\partial V^{\text{out-migrate}}(a',k,\mathbf{z}')}{\partial a'} + (1-q^E(a',k,\mathbf{z}'))\frac{\partial V^{\text{stay}}(a',k,\mathbf{z}')}{\partial a'}\right] &= 0 \\
-\frac{1}{c_s} + \beta\delta\mathbb{E}\left[q^E(a',n,\mathbf{z}')\frac{\partial V^{\text{out-migrate}}(a',n,\mathbf{z}')}{\partial a'} + (1-q^E(a',n,\mathbf{z}'))\frac{\partial V^{\text{stay}}(a',n,\mathbf{z}')}{\partial a'}\right] &= 0
\end{aligned}$$

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 conditions are:

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

And:

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

Hence, the Euler equations are given by:

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

In particular, I use the following algorithm:

1. Construct a grid 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
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:

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

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

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

5. Use the budget constraints to solve for a^*_s and a^*_m:

$$\tilde{c}_s + a'_s = (1-\tilde{\tau}^A(a^*_i,n) + R(n,\mathbf{z}))a^*_i{}_s$$
$$\tilde{c}_m + a'_m = (1-\tilde{\tau}^A(a^*_i,n))a^*_i{}_s - \tau^o\Pi_0(a$$

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:

$$Q^{\text{alive}}$$

Then, to solve for the stationary distribution:

1. Initialize $\bar{a}_0(n, \mathbf{z})$
2. Construct the transition matrix Q_0 as

$$Q_0 = \delta Q^{\text{alive}} + (1-\delta) \int \rho(n, \mathbf{z}) \bar{a}_0(a, n, \mathbf{z})$$

3. Find the stationary distribution as the normalized eigenvector associated with the eigenvalue of one for Q_0.

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 $\{w_0(n)\}_{n \in N}$. Given these prices, compute implied returns and solve the problem of the entrepreneur. Compute the stationary distribution.
2. Compute labor demand
3. Solve for the implied tax revenue
4. Compute labor supply
5. Check market clearing in each location:

E Estimation Appendix

E.1 Estimated parameters

E.2 Productivity types and transition matrix

E.3 Computing the model-implied moments

Table E.2: 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]
Correlation between productivity at home and abroad	ρ	0.725
Productivity hair-cut	μ	0.118

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