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May 2023

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CESifo

Impressum:

CESifo Working Papers
ISSN 2364-1428 (electronic version)
Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH
The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute
Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de
Editor: Clemens Fuest
https://www.cesifo.org/en/wp
An electronic version of the paper may be downloaded
· from the SSRN website: www.SSRN.com
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CESifo *Working Paper No. 10410*

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Abstract

We introduce a dynamic model that investigates the persistence and evolution of elite-dominated societies, where inherited political capital determines one's social standing. Our analysis highlights the critical role of the distribution of exit options in the evolution of political inclusiveness across generations. An elite comparatively more mobile than the masses generally entrenches a politically stratified society, whereas a more widespread distribution of exit options can encourage inclusiveness. Under certain conditions differential mobility may still induce political inclusiveness across generations. Exit options across different political entities lead to a joint evolution of local power structures.

JEL-Codes: D720, F420, H260, P160, P480.

Keywords: political dynasties, elite dynamics, exit options, rent-seeking, political spillovers.

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April 2023
We thank Gani Aldashev, Ruben Durante, James Fenske, Jeffry Frieden, James E. Mahon, Dani Rodrik, Ken Shepsle, Daniel M. Smith, seminar audiences at DIAL, Université Laval, Harvard, the Institute for Advanced Studies at Princeton, the Virtual Formal Theory Workshop of the APSA, and participants at various conferences, including DIAL, IIPF, AEE, ADRES, Econometric Society, Quebec Political Economy Conference, Novafrica, and SIOE. A previous version of this paper circulated with the title "Democratic Spillovers: Rent-seeking elites, mobile capital, and the coevolution of political institutions." Arthur Silve is supported in part by funding from the Social Sciences and Humanities Research Council. He also acknowledges IAST funding from the French National Research Agency (ANR) under grant ANR-17-EURE-0010 (Investissements d'Avenir program).

1 Introduction

Who gets to exercise political power? Coined by the sociologist Robert Michels, the 'iron law of oligarchy' posits that political power inevitably gets concentrated among a few select individuals, regardless of the system in place (Michels, 1911, Pareto, 1916, and Mosca, 1923). According to this principle, even democratic societies cannot entirely circumvent the need to delegate significant decision-making authority to a ruling class or elite group.[1] As a matter of fact, the iron law of oligarchy seems to be pervasive in various political structures, from polities of hereditary succession to meritocratic and electoral systems characterized by the persistence and dynastic transmission of political influence within the elite (Geys & Smith, 2017).[2]

Even so, the elite must sometimes accommodate newcomers.[3] The inclusion of outsiders may resolve conflicts between factions (Lizzeri & Persico, 2004, Ghosal & Proto, 2009, and Ansell & Samuels, 2014). Often, though, political inclusiveness arises due to the exercise of *voice*, external pressures and conflicts. A large political economy literature has extensively analyzed these crucial modalities of political regime persistence and change.[4]

In addition to *voice*, *exit* plays also a crucial role in fostering political inclusiveness. As emphasized by Hirschman (1978) and Bates & Lien (1985), exit can act as a significant constraint on arbitrary governments. Indeed, individuals can threaten to relocate to jurisdictions offering more rights and lower taxation (Tiebout, 1956), investors routinely shift capital to minimize taxes and the hold-up problem, and thinkers and innovators may seek refuge in more hospitable nations (Mokyr, 2016). As a result, regimes must adapt or risk losing substantial portions of their population, access to international credit, or falling behind international rivals. Nevertheless, in the political economy literature exit has not garnered nearly as much attention as voice.[5] This paper aims to fill that gap by examining the significance of exit

[1]For additional perspectives, see Bartels (2008), Winters (2011), Gilens (2012), and Schlozman et al. (2012).

[2]An early political science literature already highlights the existence of political dynasties in for example the United States (Laband & Lentz, 1985), Japan (Ishibashi & Reed, 1992), or Brazil (Hagopian, 1996).

[3]Surveys of political entry include Besley (2005), Dal Bó & Finan (2018), and Gulzar (2021).

[4]See for instance the classic references of Acemoglu & Robinson (2001), Acemoglu & Robinson (2006), Boix (2003), and Haggard & Kaufman (2012). For surveys of this literature see Dewan & Shepsle (2008a,b), Blattman & Miguel (2010).

[5]See Sørensen (1997), Shapiro (2003), and Warren (2011) for exceptions.

options in the dynamics of power structures within a society. It provides three main contributions.

First, we introduce a tractable model of the dynamics of an elite-dominated society that allows us to examine the evolution of stratified political structures. In our setup, access to power is determined by the holding of an asset, 'political capital,' that reflects an individual's ability to wield influence in politics. Consistent with the widespread presence of political dynasties, we assume that such a political asset is a family-specific state variable, transmitted and preserved across generations through parental investments. In any given generation, an individual belongs to the elite if their inherited political capital is above a certain threshold. The distribution of political capital across individuals therefore determines the composition of the elite, and in turn the level of redistribution, rents and incomes within society. The resulting allocation of resources then influences the pattern of parental transmission of political capital across lineages, ultimately shaping the distribution of political capital for the next generation.

In this framework, we investigate the persistence and change of political power across generations. Specifically, we characterize the dynamics of the distribution of political capital within society. Although this typically involves a high-dimensional system of state variables, our analysis hinges on the consideration of two simple conditions. The first one is a 'No-entry' condition, which characterizes the socioeconomic circumstances that inhibit upward political mobility of family lineages into the elite group over time. Conversely, the second one is a 'No-exit' condition that describes situations preventing downward political mobility of family lineages out of the elite. Examining these two conditions jointly enables us to describe through simple phase diagrams the full evolution of political power in a given society, as well as its socioeconomic implications in terms of resource allocation.

Second, we examine the impact of various distributions of exit options among domestic actors on political inclusiveness. A widespread availability of outside options in society imposes discipline on elite rent-seeking. Dynamically, this enables new family lineages to transmit enough political capital to become politically effective and join the elite. Over time, this process unfolds until political rents tend to disappear. In contrast, a distribution of outside options biased in favor of current elite members (an apt description for many developing countries) tends to amplify local rent-seeking activities by this elite. Dynamically, this supports the persistence of stratified political structures that would otherwise have dissipated, and may even intensify the concentration of power within a smaller influential group. We also show however that in some cases, the elite might prefer not too have better exit options than the rest of society, as such a pattern creates a coordination problem among its members. Interestingly, this discussion helps us reconcile two seemingly contradictory lines of thought in international political economics. On the one hand, following Hirschman (1978), a whole line of research in public economics argues that mobility is expected to discipline arbitrary and inefficient government policies, though this may come at the cost of a 'race to the bottom' and the underprovision of essential public goods.On the other hand, according to the 'dependency theory school,'[6] the mobility of resources across nations alters class relations patterns in Southern 'periphery' countries, allowing rent-seekers to hijack policies for purposes other than economic development, and ultimately reinforcing the political divide between Northern 'core' countries and the Southern 'periphery' countries (Cardoso & Faletto, 1979). Our analysis suggests that both perspectives can be right depending on how exit options are distributed in the society.

Finally, we use our framework to discuss the possibility of political spillovers and the coevolution of elite patterns across nations. Indeed, when outside options are uniformly distributed, a strategic complementarity arises between the institutional structures of different countries. Extending our setup to the analysis of a two-country world, we show that wider political access in one country may lead to wider political access in another. Conversely, when outside options are narrowly distributed, a neighbor with extensive political access and robust institutions may have a dysfunctional influence on the domestic politics of an elite-dominated society. Our analysis therefore suggests the existence of clusters of countries with better institutions (in terms of reduced rent-seeking and political inclusiveness) when mobility disciplines governments, as well as some countries where rent-seeking and political stratification might be intensified by the presence of an orderly neighbor. Depending on the shape of the distribution of exit options within countries, economic mobility across jurisdictions may facilitate or may hamper the diffusion of politically and socially inclusive institutions.

Our paper relates to several lines of research. First, we contribute to the recent literature on political dynasties and their implications for policy making. Building

[6]See Ghosh (2019) for a recent account of dependency theory.

upon the seminal study by (Dal Bó et al., 2009), which provided causal evidence of an incumbency effect on the likelihood of establishing a political dynasty in the United States, a rapidly growing body of research has examined the persistence of dynastic political power across various national and local contexts. This persistence can be attributed to the ability of political elites to maintain their power through electoral advantages.[7] Building upon this empirical micro-oriented literature, we provide here a first formal set-up to analyze the structural two-way interactions between political dynastic effects, rent-seeking policy and the resulting allocation of resources in the society.

Our paper also highlights the importance of *exit* as an engine of political change paved by policy competition. In this way, we connect to the abundant public economic literature that analyzes the positive and negative consequences of tax competition when there is resource mobility across jurisdictions (Brennan & Buchanan, 1977, 1980, Zodrow & Mieszkowski, 1986, Wilson, 1986, 1987, and Wilson & Wildasin, 2004,).[8] More specifically, we contribute to the political economy perspective discussing the distributional and political consequences of policy competition for the location of capital (Mahon, 1996, Edwards & Keen, 1996, Boix, 2003, and Simmons et al., 2006).[9] Compared to that literature, we explicitly analyze the implications of various degrees of exit options for the intergenerational transmission of political power and the dynamics of political inclusiveness.

Closer to us, two pieces of work consider the role of exit options in an oligarchic society. In a context of imperfect property rights, Braguinsky & Myerson (2007) highlights the importance for an elite to allocate its assets abroad, while implementing at the same time rent-seeking policies that affect growth at home. Pond (2018) indicates that the threat of revolution may prompt an elite to provide improved exit options to mitigate expressions of discontent. Different from these works, our set-up

[7] Examples include for the United States Feinstein (2010), for Japan Asako et al. (2015) and Smith (2018), for the Philippines Querubin (2016) and Mendoza et al. (2012), for Ireland Smith & Martin (2016) and Scully (2018), for Norway Fiva & Smith (2018), for the United Kingdom Van Coppenolle (2017), for Argentina Rossi (2017), for Brazil Bragança et al. (2015), for India Chandra (2016) and George & Ponattu (2018), for Bihar in India Dar (2018), and in nondemocratic settings for Punjab Cheema et al. (2009) and for Pakistan Malik et al. (2022). See Geys & Smith (2017) for a recent review of the literature.

[8] For surveys of the literature see Wilson (1999), and Keen & Konrad (2013). Recent contributions include Yang (2018) and Brülhart & Jametti (2019).

[9] See also Ihori & Yang (2012), Alzer & Dadasov (2013), Challe et al. (2019), and Kim et al. (2021).

highlights how variations of exit options matter for the transition away (or not) from oligarchic structures and the size of the elites in societies.

As already mentioned, our analysis of institutional spillovers across countries relates to issues raised by the dependency theory school on the coevolution of institutions between 'core' and 'periphery' in a 'world system' (Panther, 2014 and Wallerstein, 2020). Along this perspective, we connect to a recent formal economic literature suggesting that international interactions may lead to self-reinforcing institutional specialization. For instance, Acemoglu et al. (2017) provide a rationale for asymmetric institutional coevolution between countries enjoying international technological spillovers. They show how "cut-throat" capitalism in some countries may favor the development of comprehensive social welfare systems of other countries. In the same vein, Guimaraes & Sheedy (2020) argue that there is a symbiotic relationship between countries who uphold the rule of law and those that choose extractive institutions. Our framework is complementary to this line of research, as we also highlight the possibility of international institutional spillovers, but in terms of the persistence of power structures within and across nations, and their implications for global rent-seeking policies.[10]

The plan of the paper is the following. Section 2 introduces the model of an elite-dominated society with endogenously evolving power structures across generations. In sections 3 and 4, we compare what happens in two societies where outside options are respectively uniformly distributed in the population and restricted to the elite. In section 5, we consider the case of a small country (whose policies do not matter for the world at large) that can attract foreign investors. In section 6, we extend our framework to a two-country set-up with international resource mobility and policy competition. Finally, we conclude in section 7.

[10]See also Chatterjee (2017) and Belloc & Bowles (2017) for analyses showing how international economic integration can have 'symmetry breaking' implications across countries with institutional (and cultural) consequences.

2 Political dynamics in the shadow of exit

2.1 Setup: composition of the elite

We start with the structure of a single economy inspired from Ades & Verdier (1996). Each individual has one offspring and population size is stationary and normalized to 1. Non-overlapping generations are altruistically linked by a 'joy of giving' motive for political capital. Preferences are described by a common utility function $U(c_t, b_{t+1})$, where c_t is consumption at time t and b_{t+1} is the stock of political capital left to the unique child born at time $t+1$. U is twice continuously differentiable, increasing in each argument c_t and b_{t+1}, strictly concave, and homothetic.

Each individual is endowed with one unit of a resource, which they can allocate at home or abroad. Using the resource abroad involves some installment friction costs due to imperfect mobility across jurisdictions. The resource is subject to taxation, where taxation should be broadly understood, as in Acemoglu (2006, p. 516), as reflecting the various costs (taxes, bribery, extortion, factor price manipulations, financial repression or violations of property rights) that are associated to the local elite extracting rents from the economy.

At birth, individuals are endowed with a stock of political capital b_t transmitted by their parents in period $t-1$. This stock of political capital determines whether an individual belongs to the ruling elite, can effectively participate in the decision to set the level of taxes τ in the economy, and get a share of the rents, unlike those who remain in the masses. To be into the ruling elite at time t, an individual must have a level of political capital b_t larger than a threshold $\pi > 0$. π determines the degree of inclusiveness or exclusiveness of politics.

In a given period t, a politico-economic equilibrium is obtained in the following way. In the first stage, the distribution function of political capital F_t determines the size of the political elite $1 - z_t = 1 - F_t(\pi)$. The distribution $F_t(.)$ is the state variable of the dynamic system at time t, and z_t is the fraction of individuals who are not part of the elite in period t (ie. the masses). The model is naturally recursive. In stage 2, the elite sets an extractive proportional tax rate τ_t which applies to all output in the economy. In doing so, it considers the reaction of all agents in society, and take into account the external environment of the country. In stage 3, the masses (individuals not politically active) and the elite (politically active) allocate their resource endowment at home and possibly abroad. Then they produce, consume, and invest to build up the political capital for the next generation. This pattern of investment in political capital generates the recursive dynamics of a lineage in terms of political power across generations (ie. the evolution of political dynasties).

The timing of events is as indicated in Fig. 1.

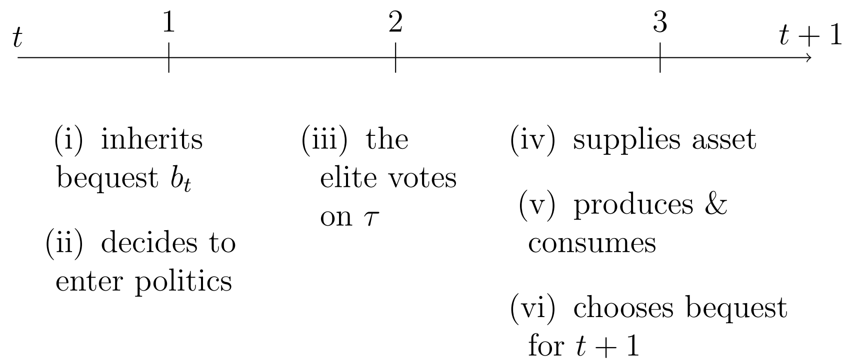

FIGURE 1: The timing of the stage game

2.2 Income, consumption, and political capital

In stage 3, for a given income I_t, agents decide their consumption and the resources $m_t \geq 0$ they invest into the political capital of their offspring, solving the following problem:

$$\begin{aligned} &\max_{c_t, m_t} U(c_t, b_{t+1}) \\ \text{s.t. } \; &c_t + b_{t+1} = I_t + b_t(1-\delta) \\ &m_t = b_{t+1} - b_t(1-\delta) \geq 0. \end{aligned}$$

where $\delta \leq 1$ is the depreciation rate of political capital in a lineage. The income I_t has one or two components: an economic income M_t, and possibly a rent R_t when the agent belongs to the elite. Elite members share equally the rents collected through taxation. We denote $N_t \equiv M_t + R_t$ the disposable income of members of the elite.

Thanks to the assumption that $U(c_t, b_{t+1})$ is homothetic, the marginal rate of substitution U_1'/U_2' between c_t and b_{t+1} is an increasing function $\psi(b_{t+1}/c_t)$. We let

$\rho \equiv \psi^{-1}(1)$.[11] This yields:

$$\begin{cases} c_t = \min\left\{\frac{1}{1+\rho}(I_t + b_t(1-\delta), M_t + \chi R_t\right\} \\ m_t = \max\left\{\frac{\rho}{1+\rho}I_t - \frac{1}{1+\rho}b_t(1-\delta), 0\right\} \\ b_{t+1} = \max\left\{\frac{\rho}{1+\rho}(I_t + b_t(1-\delta)), b_t(1-\delta)\right\}. \end{cases} \tag{1}$$

For political lineages that actively invest in political capital (ie. $m_t > 0$), consumption c_t and political capital b_{t+1} left to the generation born at $t+1$ are both a fixed proportion of disposable income I_t and depreciated political capital $b_t(1-\delta)$ received from the previous generation. As a result, the indirect utility of any agent is isomorphic to its wealth: $V_t \equiv V(I_t + b_t(1-\delta))$, where $V(.)$ is an increasing function.

2.3 Political mobility and the boundaries of the elite

In this section, we consider the period-to-period evolution of the size of the elite. In the first stage, individuals are part of the elite or remain in the masses depending on $b_t \geq \pi$ and the size of the masses writes as $z_t = F_t(\pi)$. The political capital left at time t by agents that belong respectively to the elite and to the masses is given by Eq. 1, with $b_t \geq \pi$ (ie., members of the elite, who derive a political rent, are simply the individuals who inherited $b_t \geq \pi$). The two corresponding equations describe the dynamics of political capital accumulation for both the elite and the masses, as a function of political inclusiveness, ie., the size of the elite $1 - z_t$. Three cases are dynamically possible (a formal presentation of the three cases is provided in Lemma 1 in Appendix A).

A shrinking elite: If $\rho N_t < (1+\delta\rho)\pi$ (case illustrated on the left panel of Fig. 2), then individuals with $b_t \in \left[\pi, \min\left\{\frac{\pi}{1-\delta}, \frac{1+\rho}{\rho(1-\delta)}\pi - \frac{N_t}{1-\delta}\right\}\right]$ can pay the cost of entering the elite, but they do not provide high enough a bequest b_{t+1} for their children to overcome the elite threshold at time $t+1$. Individuals such that $b_t < \pi$ are members of the masses. They leave an even lower bequest than dropping out members of the elite: their children remain in the masses. From any such t to $t+1$, the size of the elite is therefore non-increasing, and in a lineage of the elite, the political capital left to the successor decreases.

[11] These properties are not essential to our analysis, but are convenient to derive explicit analytical expressions throughout.

A stable elite: If $\rho M_t \leq (1+\delta\rho)\pi < \rho N_t$ (case illustrated on the middle panel of Fig. 2), then individuals that inherited a political capital $b_t \geq \pi$ are members of the elite . They leave a political capital $b_{t+1} > \pi$ to their offspring, who are able to remain in the elite. Individuals that inherited an amount of political capital $b_t < \pi$ are members of the masses. They transmit a stock $b_{t+1} < \pi$ to their children, who consequently remain in the masses. From any such period t to $t+1$, the size of the elite is unaffected. In any dynasty, the political capital stock left to successors moves closer to $\frac{\rho}{1+\rho\delta}M_t$ for a member of the masses, and to $\frac{\rho}{1+\rho\delta}N_t$ for a member of the elite.

A more inclusive elite: Finally, if $(1+\delta\rho)\pi < \rho M_t$ (case illustrated on the right panel of Fig. 2), then individuals that inherited a political capital level $b_t \in \left[\frac{1+\rho}{\rho(1-\delta)}\pi - \frac{M_t}{1-\delta}, \pi\right)$ cannot enter the elite themselves, but they provide a level of political capital to their children $b_{t+1} > \pi$ which allows the latter to enter the elite at time $t+1$. Individuals who are already in the elite in generation t also transmit enough political connections to their offspring to enable them to remain in the elite at time $t+1$. From any such period t to $t+1$, the size of the elite is therefore non-decreasing. In a dynasty of individuals who are in the masses, the political bequest left to the successor increases.

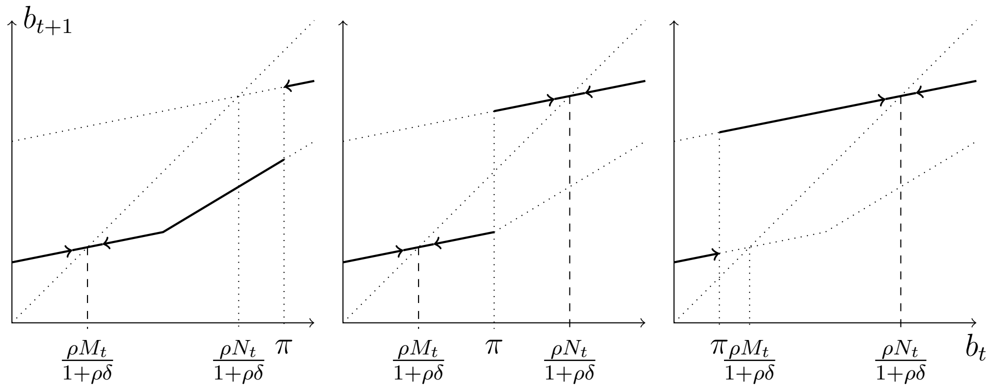

FIGURE 2: Political dynamics at high, intermediate, and low π with political rents.

3 Political dynamics with uniform mobility

Consider now how incomes are obtained. Agents decide how to allocate their unit of resource, $l_t \in [0,1]$ abroad and $1-l_t$ in the home country, taking into account the domestic return to production (normalized to 1), the productive return abroad $r < 1$. the domestic tax rate τ_t, and a quadratic cost $\phi l_t^2/2$ of investing abroad.[12]

Specifically, given the indirect utility function $V_t = V(I_t + b_t(1-\delta))$ for a given individual endowed with a level of political capital b_t, the optimal resource allocation maximizes the economic income component M_t, with $M_t \equiv (1-\tau_t)(1-l_t)+rl_t-\phi l_t^2/2$.

Whether in the elite or in the masses, individuals choose a similar amount of the resources $l_t = l(\tau_t)$ to allocate abroad, with:

$$l(\tau_t) \equiv \begin{cases} 0 & \text{when } \tau_t \leq 1-r \\ (\tau_t + r - 1)/\phi & \text{when } 1-r \leq \tau_t \leq 1-r+\phi \\ 1 & \text{when } 1-r+\phi \leq \tau_t. \end{cases} \tag{2}$$

We obtain then easily M_t the disposable income of an individual in the masses as a function M of τ_t, and $R_t = \tau_t(1-l_t)/(1-z_t)$ the rents received by each elite member as a function R of τ_t:

$$M(\tau_t) \equiv \begin{cases} 1-\tau_t & \text{when } \tau_t \leq 1-r \\ 1-\tau_t + (1-r-\tau_t)^2/(2\phi) & \text{when } 1-r \leq \tau_t \leq 1-r+\phi \\ r-\phi/2 & \text{when } 1-r+\phi \leq \tau_t. \end{cases} \tag{3}$$

and

$$R(\tau_t) \equiv \begin{cases} \tau_t/(1-z_t) & \text{when } \tau_t \leq 1-r \\ \tau_t(1-r+\phi-\tau_t)/(\phi(1-z_t)) & \text{when } 1-r \leq \tau_t \leq 1-r+\phi \\ 0 & \text{when } 1-r+\phi \leq \tau_t \end{cases} \tag{4}$$

We also obtain the disposable income of an individual in the elite as $N_t = N(\tau_t) \equiv M(\tau_t) + R(\tau_t)$.

This illustrates that the masses benefit from lower rent seeking taxes, higher returns abroad, and lower costs to invest abroad. We present this in a more formal format in Lemma 2 in Appendix A.[13] It is maybe less intuitive that the elite favors (and sets) an intermediate level of taxes and outside options (ie. returns and costs of

[12]We assume that $r < 1$, to allow for the possibility that in equilibrium agents may allocate no resources abroad, but this is not essential to our main argument.

[13]This feature is not contingent on our analytical specification, and except when we explicitly say so, this paper's results are not contingent upon it. We make this explicit in the proof of the lemma.

investing abroad). Intuitively, increasing the tax rate from low levels brings in more revenue, while at higher levels, it simply leads to more tax evasion. Better outside options, ie. a higher return r or a lower cost of investing abroad ϕ, have two opposed effects for the elite: less revenue R_t on the one hand, but a higher direct income M_t on the other hand (see Lemma 3 in Appendix A). In practice, as the analysis that follows reveals, the elite never set the tax rate high enough (ie. $\tau_t \geq 1 - r + \phi$ in our analytical specification, the tax rate that effectively annuls rents) for the latter effect to dominate, and consequently we can simplify the analysis by stating that the elite benefits from reduced outside options.

3.1 Equilibrium policy

In stage 2 of the game, the elite chooses τ_t to maximize its utility, which is equivalent to maximize its disposal income $N(\tau_t)$. The solution to the program of the elite is then given by $\tau_t^u = \tau^u(z_t)$, with

$$\tau^u(z_t) \equiv \begin{cases} 1 - r & \text{when } \phi z_t \leq 1 - r \\ (1 - r + \phi)z_t/(1 + z_t) & \text{when } \phi z_t \geq 1 - r. \end{cases} \quad (5)$$

The elite faces three motives when setting the tax rate: rent extraction from the masses, tax flight when taxes are too high, and the loss of income on its own resource. The larger the size of the elite $1 - z_t$, the less its members benefit individually from rent extraction, and consequently the lower the optimal tax rate $\tau_t^u(z_t)$. Similarly, the better the outside options (larger r and/or lower ϕ), the lower the tax rate $\tau_t^u(z_t)$ (Lemma 4 in Appendix A).

Substituting $\tau_t^u(z_t)$ into M_t and N_t, we find the expression of equilibrium disposable incomes $M_t = M^u(z_t)$ and $N_t = N^u(z_t)$, as functions of the distribution of political power, with:

$$\begin{aligned} M^u(z_t) &\equiv \begin{cases} r & \text{when } \phi z_t \leq 1 - r \\ r - \frac{(\phi z_t + 1 - r + 2\phi)(\phi z_t - 1 + r)}{2\phi(1+z_t)^2} & \text{when } \phi z_t \geq 1 - r \end{cases} \\ N^u(z_t) &\equiv \begin{cases} (1 - r z_t)/(1 - z_t) & \text{when } \phi z_t \leq 1 - r \\ 1 + \frac{\phi^2 z_t^2 + 2\phi z_t^2(1-r) + (1-r)^2}{2\phi(1-z_t)(1+z_t)} & \text{when } \phi z_t \geq 1 - r. \end{cases} \end{aligned} \quad (6)$$

We plot these two functions in Fig. 3. Visibly, the elite is better off when it is exclusive, while on the opposite, members of the masses are worse off. At the same time, taking into account the reaction of the elite, the masses benefit from better outside options (ie. higher returns r and lower costs of investing abroad ϕ), to the detriment of the elite (see Lemma 5 in Appendix A) – even though the outside options are uniformly distributed and thus equally available to the elite.

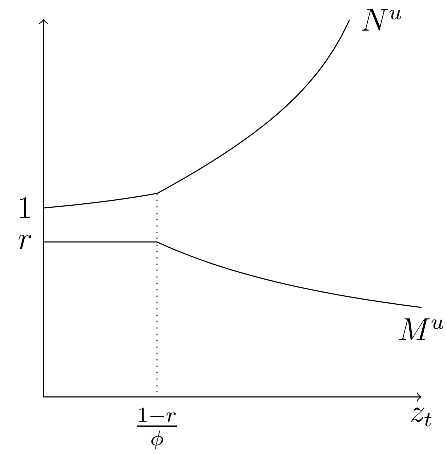

FIGURE 3: Disposable income in the masses and in the elite as functions of the exclusiveness of the elite.

3.2 Composition and evolution of the elite

In subsection 2.3, we identified three possible situations in terms of the dynamics of political lineages: a narrowing elite, a stable elite, and a widening elite. No offspring whose parents are in the masses can hope to reach elite status if and only if $\rho M^u(z_t) \leq (1+\delta\rho)\pi$. We call this the 'No-entry' condition. Conversely, no offspring whose parents are in the elite falls out from the elite if and only if $(1+\delta\rho)\pi \leq \rho N^u(z_t)$. We call this the 'No-exit' condition. The geometry of these two conditions in Fig. 4 is the direct result of Lemma 5.

We can now describe the dynamics of political inclusiveness and the long run steady state structure of society formally, in the following proposition. It is easier to follow with the help of a simple phase diagram, which we provide in Fig. 4. We plot the size of the masses z_t on the horizontal axis and the parameter $(1+\delta\rho)\pi/\rho$ on the vertical axis (a larger z_t means a more exclusive elite). The qualitative features of our analysis do not depend on our choice of analytical specification, but we find that it clarifies the presentation to include formal analytical conditions to describe the partitioning of the parameter range.

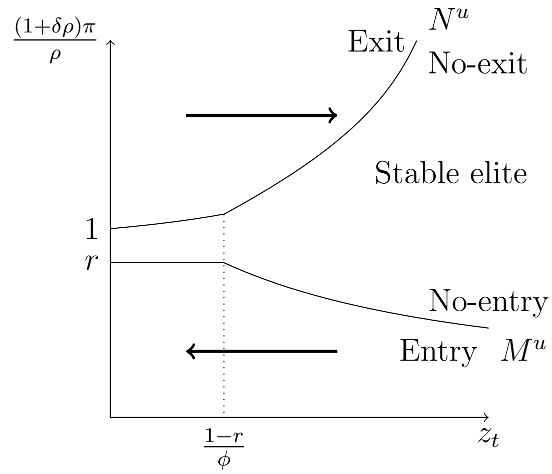

FIGURE 4: Changing elite boundaries with uniformly distributed outside options.

Proposition 1 (Political dynamics with uniform mobility)

1. *when* $(1+\delta\rho)\pi \leq \rho M^u(1)$, *for any initial condition* $z_0 \in [0,1)$, *the elite counts new members generation after generation, converging towards full political integration with* $\lim_{t\to\infty} z_t = 0$;
2. *when* $\rho M^u(1) < (1+\delta\rho)\pi \leq \rho M^u(0)$, *there exists a threshold* $\tilde{z}^u_M \equiv M^{u-1}((1+\delta\rho)\pi/\rho) \in (0,1)$ *such that if* $z_0 > \tilde{z}^u_M$, *the elite is stationary and stable; and if* $z_0 \leq \tilde{z}^u_M$, *the elite counts new members generation after generation, converging towards full political integration with* $\lim_{t\to\infty} z_t = 0$;
3. *when* $\rho M^u(0) < (1+\delta\rho)\pi \leq \rho N^u(0)$, *for any* $z_0 \in (0,1)$, *the elite is stationary and stable;*
4. *when* $\rho N^u(0) < (1+\delta\rho)\pi$, *there exists a threshold* $\tilde{z}^u_N \equiv N^{u-1}((1+\delta\rho)\pi/\rho) \in (0,1)$ *such that if* $z_0 \geq \tilde{z}^u_N$, *the elite is stationary and stable; and if* $z_0 < \tilde{z}^u_N$, *the elite sheds members generation after generation, until the time* t *when* $z_t \geq \tilde{z}^u_N$, *after which the elite is stationary and stable.*

In Prop. 1, item 1 and part of item 2 (ie. when $z_0 \leq \tilde{z}^u_M$) highlight a monotonically increasing inclusiveness of politics over time. The society converges towards full political inclusion. As the size of the elite expands, taxation decreases and rents shrink. At the limit, a perfectly inclusive society means that membership into the elite is irrelevant. On the other hand, the second part of item 2 (ie. when $z_0 > \tilde{z}^u_M$), item 3, and the first part of item 4 (ie. when $z_0 \geq \tilde{z}^u_N$) exhibit a stationary process, a stable stratified social structure, and enduring, self-reproducing political dynasties. Only within groups do we see a homogenization process of transmission of political capital. Finally, the last part of item 4 (ie. when $z_0 < \tilde{z}^u_N$) indicates a monotonically increasing exclusiveness path of politics, that goes on until the elite is small enough, and rents high enough to prevent any further depletion of the elite.

Elite dynamics depend on the initial distribution of political power z_0, access to, and transmission of political power (parameters π, ρ, and δ), as well as the opportunity to shift resources abroad away from elite rent-seeking (parameters r and ϕ).

Specifically, $(1 + \delta\rho)\pi/\rho$ captures a 'technological' restrictiveness index for the formation of political dynasties. It depends on the minimal political requirements to be part of the elite π, how quickly political capital depreciates δ, and the intrinsic motivation ρ (ie."joy of giving") to transmit political capital over generations. At a low initial level, an increase of this elite restrictiveness index may move the dynamics of elite formation from the region of elite enlargement (ie. z_t decreasing) to the region of stable elite with no further entry. At a higher level, another increase in $(1 + \delta\rho)\pi/\rho$ shifts the system from the stable elite region to the region of shrinking elite (z_t increasing). In this case, the elite needs to shed some of its members before the social structure stabilizes, leading to a more exclusive elite and a more polarized society in the long run.

The configuration of the various regions in Fig. 4 is also influenced by the parameters r and ϕ, which represent the opportunities to transfer resources abroad. When these opportunities are more prevalent (ie. r is low and/or ϕ is high), the No-entry curve M^u shifts upward, while the No-exit curve N^u moves downward (this is a direct consequence of Lemma 5 in Appendix A). As a consequence, the region of a stable elite shrinks. Generally, improved opportunities for resource flight help discipline rent extraction by the elite. This characteristic resembles Tiebout's policy competition, although it extends it into the political domain.

With the contraction of the stable elite region (with z_t remaining constant), the outcome could be either broader political inclusiveness or a smaller, more constrained elite, depending on the technology parameters of political dynasty formation. For high values of $(1+\delta\rho)\pi/\rho$, the No-exit frontier curve N^u acts as the relevant constraint. The disciplining effect on rent-seeking income strengthens this constraint, makings it more challenging for current elite lineages to transmit their power across generations. This results in the elite shedding some members before stabilizing at a reduced size. On the other hand, for low values of $(1+\delta\rho)\pi/\rho$, the No-entry frontier M^u serves as the relevant constraint. The disciplining effect on rent-seeking relaxes this constraint, enhancing the transmission of political capital in mass lineages more than in elite lineages. This leads to entry into the elite, further limiting opportunities for rent extraction over time.

4 Political dynamics with captive masses

In the previous section, we assumed that members of the masses and the elite could equally shift their resources abroad: outside options were uniformly distributed in the population. In this section, we posit that due to their better financial, social, and political connections, elite members generally have easier access to international capital markets and investments abroad than individuals within the masses, who tend to have fewer connections. To capture this idea, we consider a scenario where an elite member can transfer their resources abroad at no cost (ie. $\phi_N = 0$), while a member of the masses still faces an adjustment cost of $\phi_M = \phi > 0$.

Now, for a member of the elite, the optimal value of resources shifted abroad is $l_t^N = l^N(\tau_t)$, with:

$$l^N(\tau_t) \equiv \begin{cases} 0 & \text{when } \tau_t \leq 1-r \\ 1 & \text{when } 1-r < \tau_t. \end{cases} \tag{7}$$

Meanwhile, for a member of the masses, the optimal value of resources shifted abroad is $l_t^M = l^M(\tau_t) \equiv l(\tau_t)$, the same as in Eq. 2.

In this new configuration, political rents come only from taxing the masses. The elite chooses τ_t to maximize their disposable income with captive masses $N_t^c = N^c(\tau_t)$:

$$N^c(\tau_t) \equiv \begin{cases} (1 - z_t + z_t\tau_t)/(1 - z_t) & \text{when } \tau_t \le 1 - r \\ r + \tau_t z_t(1 - r + \phi - \tau_t)/(\phi(1 - z_t)) & \text{when } 1 - r < \tau_t \le 1 - r + \phi \\ r & \text{when } 1 - r + \phi \le \tau_t. \end{cases} \tag{8}$$

With the necessary calculations, and defining $\tilde{z}^c \equiv 4\phi(1 - r)/(1 - r + \phi)^2$, we can show that N^c takes its maximum at $\tau_t^c = \tau^c(z_t)$, with:

$$\tau^c(z_t) \equiv \begin{cases} 1 - r & \text{when } z_t < \tilde{z}^c \text{ or } \phi \le 1 - r \\ (1 - r + \phi)/2 & \text{when } z_t \ge \tilde{z}^c \text{ and } 1 - r < \phi \end{cases} \tag{9}$$

This is Lemma 6 in Appendix A. With no cost for the elite of investing abroad, τ^c either maximizes rent extraction from the masses while the elite hides its resources abroad (for an exclusive elite), or is the maximal tax rate that avoids any tax evasion (for an inclusive elite). The elite may opt to set the tax rate at $1 - r$, which is the maximum tax rate that keeps elite resources in the tax base, or at $(1 - r + \phi)/2$, the tax rate that maximizes rent extraction from the masses, while members of the elite transfer their resources abroad. The choice between these two tax rates depends on which scenario results in higher income for the elite, and on whether the elite would actually transfer resources abroad with a tax rate of $(1 - r + \phi)/2$ (it would not if ϕ is low, ie. if it is cheap for masses to transfer resources abroad).

Substituting $\tau^c(z_t)$ into M_t and N_t^c, we find the expression of equilibrium disposable incomes with captive masses $M_t^c = M^c(z_t)$ and $N_t^c = N^c(z_t)$, with:

$$\begin{aligned} M^c(z_t) &\equiv \begin{cases} r & \text{when } z_t < \tilde{z}^c \text{ or } \phi \le 1 - r \\ r - (\phi - 1 + r)(3\phi + 1 - r)/(8\phi) & \text{when } z_t \ge \tilde{z}^c \text{ and } 1 - r < \phi \text{ and} \end{cases} \\ N^c(z_t) &\equiv \begin{cases} (1 - r z_t)/(1 - z_t) & \text{when } z_t < \tilde{z}^c \text{ or } \phi \le 1 - r \\ r + (\phi + 1 - r)^2 z_t/(4\phi(1 - z_t)) & \text{when } z_t \ge \tilde{z}^c \text{ and } 1 - r < \phi. \end{cases} \end{aligned} \tag{10}$$

Similar to the case of uniformly distributed outside options, the mobile elite remains better off when it is exclusive, while the captive masses are worse off. That being said, a comparison of the optimal tax rates in each case reveals some interesting differences.

Most interestingly, this comparison highlights that the elite is not necessarily better off with a preferential outside option (see Lemma 7 in Appendix A for more details). This comes from a coordination problem: while the tax rate is a collective decision, tax evasion is decided at the individual level. The elite must weigh the benefits of a tax rate that induces a larger base, including other elite members, against a higher tax rate that maximizes revenue extraction from the masses. When the cost of transferring resources abroad is low for the masses, (ie., $\phi \leq 1-r$), as long as the elite is inclusive enough (ie., $z \leq \tilde{z}^c$), a broader base is appealing with a tax rate lower that the one chosen with uniform exit options. A more exclusive elite chooses a higher tax rate, knowing that all of its members will choose to evade taxes abroad. Paradoxically, in such a case, the elite would be collectively better off without a preferential outside option. In our chosen specification, we see the coordination problem arise for intermediate levels of inclusiveness (ie. $(1-r)/\phi < z \leq 2(1-r)(2\phi+1-r)/(\phi^2-2\phi(1-r)-(1-r)^2)$, as we show in the proof of Lemma 7).

From the previous discussion, we infer the corresponding No-entry and No-exit conditions. As before, the dynamics of political inclusiveness are highlighted in a simple phase diagram in Fig. 5, to which we superimpose Fig. 4 for ease of comparison.

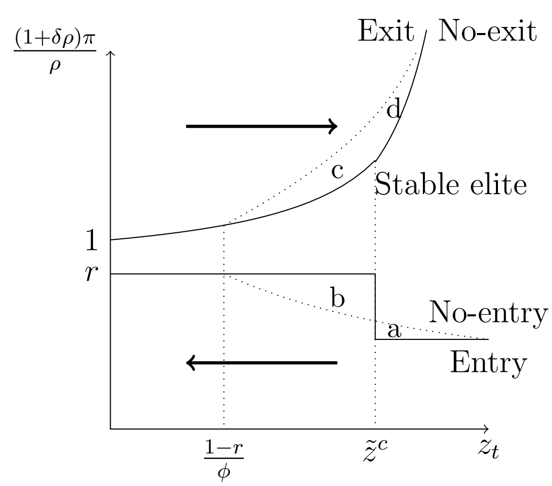

FIGURE 5: Changing elite boundaries with captive masses when $1-r > \phi$.

With the help of Fig. 5, it is again easy enough to characterize the dynamics and the long-run, steady-state structure of a society with preferential exit options for the elite. Formally:

Proposition 2 (Political dynamics with captive masses)

1. *when* $(1+\delta\rho)\pi \leq \rho M(1)$*, for any initial condition* $z_0 \in [0,1)$*, the elite counts new members generation after generation, converging towards full political integration with* $\lim_{t\to\infty} z_t = 0$*;*

2. *there exists a threshold* $\tilde{z}^c_M \equiv \tilde{z}^c \in (0,1)$ *such that, when* $\rho M(1) < (1+\delta\rho)\pi \leq \rho M(0)$*, if* $z_0 > \tilde{z}^c_M$*, the elite is stationary and stable; and if* $z_0 \leq \tilde{z}^c_M$*, the elite counts new members generation after generation, converging towards full political integration with* $\lim_{t\to\infty} z_t = 0$*. Note that* $\tilde{z}^c_M > \tilde{z}^u_M$ *iff* $\rho M^u(\tilde{z}^c) < (1+\delta\rho)\pi$*;*

3. *when* $\rho M(0) < (1+\delta\rho)\pi \leq \rho N(0)$*, for any* $z_0 \in (0,1)$*, the elite is stationary and stable;*

4. *when* $\rho N(0) < (1+\delta\rho)\pi$*, there exists a threshold* $\tilde{z}^c_N \equiv N^{c^{-1}}((1+\delta\rho)\pi/\rho) \in (0,1)$ *such that if* $z_0 \geq \tilde{z}^c_N$*, the elite is stationary and stable; and if* $z_0 < \tilde{z}^c_N$*, the elite sheds members generation after generation, until the time* t *when* $z_t \geq \tilde{z}^c_N$*, after which the elite is stationary and stable. Note that* $\tilde{z}^c_N \leq \tilde{z}^u_N$ *iff* $(1+\delta\rho)\pi/\rho$ *is not too high.*

Our discussion primarily concentrates on the areas where Fig. 5 differs from Fig. 4. In area "a" of Fig. 5, as the elite becomes more exclusive, it transfers its resources abroad at no cost, and maximizes rent extraction from the masses. This prevents lineages in the masses from attaining elite status over time. In such a scenario, preferential exit options enable the preservation of a stratified social and political structure that would otherwise have been untenable from a power dynamics perspective.

However, preferential exit options do not automatically imply greater stability for the elite or a higher likelihood of a stratified society. In fact, in area "b" of Fig. 5, a lower tax rate aimed at preventing elite flight results in higher income for the masses, which highlights the coordination issue mentioned earlier. These lineages of the masses may then be able to invest enough resources into the political capital of their offspring, allowing them to join the elite, generation after generation. Without the preferential outside option, such lineages though would have been confined to the masses. When this occurs, the preferential exit options available to elite members paradoxically undermine the stratified social structure that they, as a group, benefit from.

Correspondingly, income in the elite is lower than it would be without the preferential outside option. In area "c" of Fig. 5, this implies in particular that the elite sheds some of its member lineages—those who do not invest enough in their offspring's political capital to maintain their elite status. This, in turn, intensifies the social stratification of the corresponding society.

Interestingly, the elite can be destabilized by a preferential outside option even when it chooses to allow some capital flight. Specifically, in area "d" of Fig. 5, the equilibrium tax level on the economy leads to a complete resource flight from elite members. The domestic tax base and associated rent income are then reduced to the point that some current elite families cannot transmit enough political capital to their offspring to remain politically influential. As the size of the elite subsequently decreases, this further exacerbates the social stratification of the corresponding society. However it is important to note that this destabilization does not always occur. In fact, an exclusive enough elite (ie., z_t large enough) often benefits from a preferential outside option (see the proof of Lemma 7 in Appendix A). Our discussion thus suggests that preferential exit options tend to destabilize intermediate-sized elites, while potentially helping to consolidate more exclusive ones.

5 Political dynamics with foreign investors

The elite may also consider that by setting a low enough tax rate, in addition to preventing resource flight, it may actually also attract foreign resources. To discuss this possibility, let us assume for simplicity that L^* foreign investors face the same investment adjustment cost, ϕ, as (now all) nationals face when transferring resources abroad.

If the elite can set a different tax rate on foreign resources, then such resource inflows would obviously increase the elite revenue. However, the elite would not change the optimal tax rate on domestic resources (except through the existence of spillovers that we do not consider here). As a result, rent-seeking on foreign resources will not help with upward political mobility. This may actually help prevent downward political mobility, and consolidate a stratified social structure. Compared to the dynamics described in Fig. 4, the elite is now stable for a larger region compared to the benchmark case.[14]

[14]Indeed, it is easy to see that additional resources coming from rent-seeking on foreign investors

The case where the elite cannot discriminate between residents and nonresidents is less straightforward. Foreign investors invest a fraction l_t^* of their resource to invest in the country to maximize their after tax economic income: $M_t^* \equiv (1-\tau_t)l_t^* + r(1-l_t^*) - \phi l_t^{*2}/2$. This fraction is given by $l_t^* = l^*(\tau_t)$, with:

$$l^*(\tau_t) \equiv \begin{cases} 0 & \text{when } \tau_t \geq 1-r \\ (1-r-\tau_t)/\phi & \text{when } 1-r-\phi \leq \tau_t \leq 1-r \\ 1 & \text{when } \tau_t \leq 1-r-\phi. \end{cases} \quad (11)$$

The elite chooses $\tau_t^f = \tau^f(z_t)$ to maximize the income of its individual members $N_t^f = N^f(\tau_t)$, possibly including tax revenue from foreign investors and the whole domestic population. $N^f(\tau_t) \equiv M^f(\tau_t) + R^f(\tau_t)$, with $M^f(\tau_t) \equiv M(\tau_t)$, as given by Eq. 3, and $R^f(\tau_t) \equiv \tau_t((1-l^f(\tau_t)) + l^*(\tau_t)L^*)/(1-z_t)$, with $l^f(\tau_t) \equiv l(\tau_t)$, as given by Eq. 2. We can then find the value $\tau_t^f = \tau^f(z_t)$ that maximizes $N^f(\tau_t)$ (we provide the analytical expression of $\tau^f(.)$ in Lemma 8 in Appendix A).

In line with intuition, an exclusive elite (ie., a high enough z_t) with limited prospects for attracting foreign investors (ie., L^* low enough), will set the tax rate to extract rents from the domestic population, even at the cost of resource flight from its own residents. Conversely, when the pool of foreign investors is large enough relative to the size of the masses, and the elite is not too exclusive, then $\tau^f(z_t)$ is set low enough to attract foreign investors and to broaden the tax base. Finally, when the cost of transferring assets abroad is high enough (ie., above $1-r$), the pool of foreign investors is narrow enough relative to the masses, and the elite is not too exclusive, the equilibrium tax rate $\tau^f(z_t)$ neither leads to resource flight nor attracts foreign investors.

For our analytical specification, the different types of situations are illustrated in Fig. 6 which plots the different resource regimes (outflows, inflows, no flows) with the relative numbers of foreign investors on the x-axis and the elite size on the y-axis (see Lemma 8 in Appendix A for a formal analysis).

Comparing the optimal taxes $\tau^f(z_t)$ and $\tau^u(z_t)$ set respectively with and without foreign investors reveals that the elite chooses a lower tax rate when it aims to attract foreign investors. This happens only when attracting foreign investors' inflows is more advantageous to the elite than simply taxing the domestic population. In fact, an

shift up the boundary curve N^u of the No-exit condition, with no effect on the the boundary curve M^u of the No-entry condition.

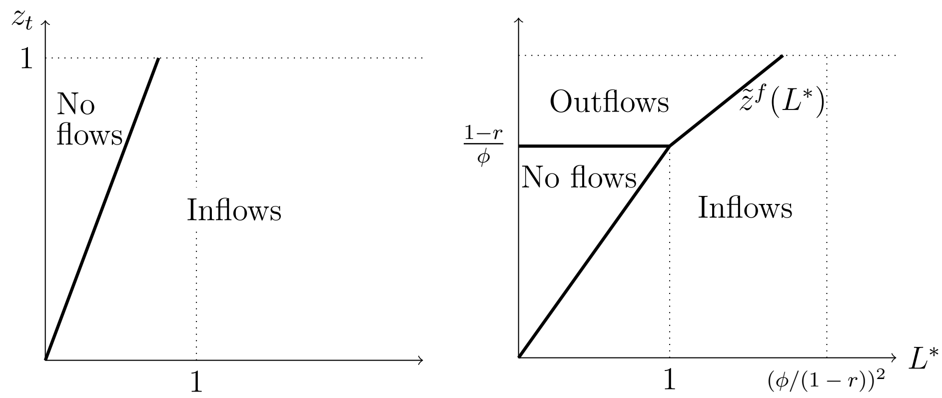

FIGURE 6: The movement of capital flows with foreign investors. Left: $\phi \leq 1 - r$. Right: $\phi > 1 - r$. Note: $\tilde{z}^f(.)$ is not necessarily linear, even in the chosen parameterization.

exclusive elite prefers to set a high tax rate on the population, and extract correspondingly more revenue, unless a large pool of foreign investors more than compensates for it (see Lemma 9 in Appendix A).

Substituting $\tau^f(z_t)$ into M_t^f and N_t^f provides equilibrium disposable incomes with foreign investors $M_t^f = M^f(z_t)$ and $N_t^f = N^f(z_t)$. Following the same logic as before, we can derive the corresponding No-entry and No-exit conditions for the dynamics of elite and inter-generational transmission of political power. The dynamics of political inclusiveness are depicted in a simple phase diagram in Fig. 7, and for ease of compariso, we superimpose Fig. 4 onto it.

With the help of Fig. 7, it is easy enough to characterize the dynamics and long-run steady-state structure of a society with foreign resource inflows. Formally:

Proposition 3 (Political dynamics with foreign investors)

1. *when* $(1 + \delta\rho)\pi \leq \rho M^f(1)$, *for any initial condition* $z_0 \in [0, 1)$, *the elite counts new members generation after generation, converging towards full political integration with* $\lim_{t\to\infty} z_t = 0$*;*

2. *when* $\rho M^f(1) < (1 + \delta\rho)\pi \leq \rho M^f(0)$, *there exists a threshold* $\tilde{z}_M^f \equiv {M^f}^{-1}((1 + \delta\rho)\pi/\rho) \in (0, 1)$ *such that if* $z_0 > \tilde{z}_M^f$, *the elite is stationary and stable; and if* $z_0 \leq \tilde{z}_M^f$, *the elite counts new members generation after generation, converging towards full political integration with* $\lim_{t\to\infty} z_t = 0$*;*

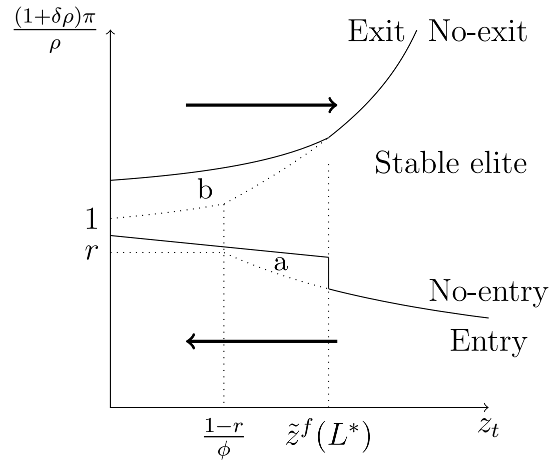

FIGURE 7: Changing elite boundaries with foreign investors, with $\phi > 1 - r$ and $L^* > 1$.

3. *when* $\rho M^f(0) < (1+\delta\rho)\pi \leq \rho N^f(0)$, *for any* $z_0 \in (0,1)$, *the elite is stationary and stable;*

4. *when* $\rho N^f(0) < (1+\delta\rho)\pi$, *there exists a threshold* $\tilde{z}^f_M \equiv {N^f}^{-1}((1+\delta\rho)\pi/\rho) \in (0,1)$ *such that if* $z_0 \geq \tilde{z}^f_M$, *the elite is stationary and stable; and if* $z_0 < \tilde{z}^f_M$, *the elite sheds members generation after generation, until the time* t *when* $z_t \geq \tilde{z}^f_M$, *after which the elite is stationary and stable.*

Again, we focus our discussion on the areas where Fig. 7 differs from Fig. 4. In area "a" of Fig. 7, the elite sets a lower tax rate to attract foreign investors. Members of the masses are then able to invest enough resources into the political capital of their offspring to allow the latter, generation after generation, to enter into the elite. Without access to foreign resources, the offspring would have been confined to the masses. In that situation, the elite becomes progressively more inclusive.

At the same time, access to foreign capital increases the tax base. These additional resources increase income in the elite. In area "b" of Fig. 7, this helps some lineages of the elite to avoid downward political mobility—falling out of the elite. An inclusive enough elite may therefore be able to use the rents extracted on foreign nationals to stabilize itself. This is an alternative interpretation of the empirical findings of Challe et al. (2019), who found that capital inflows were followed with institutional decline in Southern Europe.

These two opposite results—resource inflows leading to either greater political inclusiveness or consolidation of stratified political structures—may explain why an aggregate effect of financial liberalization on institutional development has remained elusive (see in particular Demir, 2016). Our work explains why foreign investors may exacerbate institutional problems in countries with very low institutional quality, and at the same time help improve institutions in emerging countries, in line with the recent evidence in Igan et al. (2022).

These two mechanisms may not extend to exclusive elite, especially when the pool of foreign investors is small. In that case, an exclusive elite may prefer setting a higher tax rate, increase rent extraction from its own population, even at the cost of forgoing foreign resources inflows.

6 The coevolution of power structures

The previous sections indicate that the capacity of individuals in a society to shift resources abroad has important implications on the transmission of political power across lineages. Clearly, the same features apply to other jurisdictions: the return on resources invested there depends on the political dynamics of that place, and specifically on how taxation and rent-seeking of the local elite evolves as well. It is then quite natural to expect that variations in the transmission of political capital in one country matters for the transmission of political capital in another one, when these entities are somewhat economically integrated.

To investigate this issue, let us now switch to the case of a world economy with two countries in interactions, each characterized by simple political lineage dynamics as described before. For simplicity, assume that the two countries are symmetric: They share the same fundamental parameters of dynastic transmission of political power (ie: same values of π, δ, and ρ). Also assume that all individuals in each country i have access to the same technology allowing them to allocate resources in the other country (ie. the same adjustment cost parameter ϕ).

Each country i has a local elite of size z_t^i at time t, that implements a tax rate τ_t^i. The timing is as before. In each period t, the current elites in a given country i implements its optimal tax rate τ_t^i, taking as given the tax rate τ_t^j picked up by the elite in the other country j. Once tax rates are implemented, individuals decide how much resources to shift abroad, after which there is consumption and transmission of political capital to the next generation of individuals. We look at the joint dynamics of elite size (z_t^i, z_t^j) over time given these economic and political interactions.

Now, whether the individual is in the elite or in the masses, the optimal amount of resources l_t^i placed in country i is given by:

$$l_t^i = \begin{cases} 0 & \text{when } \tau_t^i \leq \tau_t^j \\ (\tau_t^i - \tau_t^j)/\phi & \text{when } \tau_t^j \leq \tau_t^i \leq \tau_t^j + \phi \\ 1 & \text{when } \tau_t^j + \phi \leq \tau_t^i \end{cases} \tag{12}$$

As before, M_t^i is the disposable income of an individual in the masses, and $N_t^i \equiv M_t^i + R_t^i$ the disposable income of an individual in the elite, with

$$R_t^i = \begin{cases} 2\tau_t^i/(1 - z_t^i) & \text{when } \tau_t^i \leq \tau_t^j - \phi \\ \tau_t^i(1 + (\tau_t^j - \tau_t^i)/\phi)/(1 - z_t^i) & \text{when } \tau_t^j - \phi \leq \tau_t^i \leq \tau_t^j + \phi \\ 0 & \text{when } \tau_t^j + \phi \leq \tau_t^i \end{cases} \tag{13}$$

and

$$M_t^i = \begin{cases} 1 - \tau_t^i & \text{when } \tau_t^i \leq \tau_t^j \\ 1 - \tau_t^i + (\tau_t^i - \tau_t^j)^2/(2\phi) & \text{when } \tau_t^j \leq \tau_t^i \leq \tau_t^j + \phi \\ 1 - \tau_t^j - \phi/2 & \text{when } \tau_t^j + \phi \leq \tau_t^i. \end{cases} \tag{14}$$

The analysis is solved backward. In each country, given tax rates (τ_t^i, τ_t^j), individuals decide how much resources to keep at home and to put abroad. This determines the disposable generational incomes for a member of the masses M^i and for an elite member N^i. Correspondingly, one obtains the political capital dynamics in each economy as in Fig. 2.

In the first stage of period t, contemporaneous elites in the two countries play a strategic game with respect to their tax rates. More precisely, the elite in each country i chooses τ_t^i to maximize their utility $N_t^i \equiv M_t^i + R_t^i$. A few properties of N_t^i facilitate the resolution of this program: N_t^i taken as a function of τ_t^i is continuous, quasi-concave, and differentiable everywhere except at $\tau_t^j - \phi$ and at $\tau_t^j + \phi$. In order to characterize the Nash equilibrium of that game, we first obtain, in a given country i, the preferred tax rate (and corresponding reaction function) τ_t^i for the elite of country i that depends on the tax rate of the other country τ_t^j and the size of the elite z_t^i. The solution to this program gives $\tau_t^i = \tau(\tau_t^j; z_t^i)$, with

$$\tau(\tau_t^j; z_t^i) \equiv \begin{cases} \tau_t^j + \phi & \text{when } \tau_t^j \leq -\phi \\ (\phi + \tau_t^j) z_t^i/(1 + z_t^i) & \text{when } -\phi \leq \tau_t^j \leq \phi z_t^i \\ (\phi z_t^i + \tau_t^j)/2 & \text{when } \phi z_t^i \leq \tau_t^j \leq (2 + z_t^i)\phi \\ \tau_t^j - \phi & \text{when } \tau_t^j \geq (2 + z_t^i)\phi. \end{cases} \tag{15}$$

These reaction functions are represented in Fig. 8. Simple inspection shows that the interaction between the two elites has exactly one Nash equilibrium $\tau_t^{i*} \equiv \tau(z_t^i, z_t^j)$. Moreover it is easy to infer that the fact that $z_t^i \leq z_t^j$ implies that $\tau_t^{i*} \leq \tau_t^{j*}$.

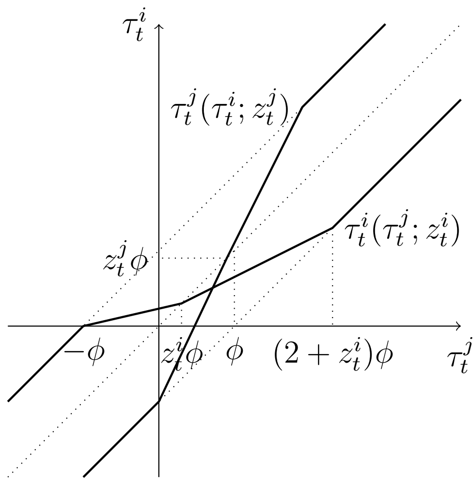

FIGURE 8: Tax equilibrium, with $z_t^i < z_t^j$.

Analytically, $\tau_t^{i*} \equiv \tau(z_t^i, z_t^j)$, is determined by:

$$\tau_t^{i*} \equiv \tau(z_t^i, z_t^j) \equiv \begin{cases} (z_t^i + z_t^j + z_t^i z_t^j)\phi/(2 + z_t^j) & \text{when } z_t^i < z_t^j \\ (2 z_t^i + z_t^i z_t^j)\phi/(2 + z_t^i) & \text{when } z_t^j < z_t^i, \end{cases} \tag{16}$$

and obviously $\tau_t^{j*} = \tau(z_t^j, z_t^i)$ by symmetry. Simple inspection also shows that τ_t^{i*} and τ_t^{j*} are in $(0, \phi)$ and $\tau_t^{i*} - \tau_t^{j*} = (z_t^i - z_t^j)\phi/(2 - z_t^j) < 0$. In equilibrium, it follows that $l_t^i = l(z_t^i, z_t^j)$, with

$$l(z_t^i, z_t^j) \equiv \begin{cases} 0 & \text{when } z_t^i < z_t^j \\ (z_t^i - z_t^j)/(1 + z_t^i) \in (0,1) & \text{when } z_t^j < z_t^i. \end{cases} \tag{17}$$

Correspondingly $l_t^j = l(z_t^j, z_t^i)$. As can be seen, the country with the larger elite also has a lower tax rate, and does not have any resource flight, while the country with the smaller elite has a higher tax rate and some degree of resource flight to the other country. As expected, rent-seeking is a more powerful motive for exclusive elites, and larger masses translate into higher equilibrium rent-seeking rates in both countries. Additionally, because of the reduced incentives to move to a country with a higher tax rate, larger masses in the foreign country translate into a higher tax rate imposed by the domestic elite. Analytically, this corresponds to positive partial derivatives of τ with respect to its arguments z_t^i and z_t^j. The difference in tax rates also increases with the difference in elite size (see Appendix B).

6.1 Composition and evolution of the elite

Much of the analysis of the previous sections in each particular country remains valid in the context of our two-country world. More precisely, equilibrium incomes and rents in country i can be written as functions of z_t^i and z_t^j, with a slight abuse of language and $r \equiv 1 - \tau(z_t^j, z_t^i)$. With these new notations, one may characterize the No-entry and No-exit conditions for two countries in interaction depending only on the degree of inclusiveness of their respective political processes.

As before, $\rho M_t^i = (1 + \delta\rho)\pi$ separates an elite in which new members claim entry from an elite without entry. For each z_t^j, we may consider the size of the masses $Z_1(z_t^j)$ above which there is no entry into the elite in country i, with Z_1 satisfying the following condition: $\rho M(Z_1(z_t^j), z_t^j) = (1 + \delta\rho)\pi$. Similarly, we may consider the size of the masses $Z_2(z_t^j)$ above which there is no exit into the elite in country i, with Z_2 such that $\rho N(Z_2(z_t^j), z_t^j) = (1 + \delta\rho)\pi$.

In the (z_t^j, z_t^i)-plane, conditions $z_t^i \geq Z_1(z_t^j)$ and $z_t^i \geq Z_2(z_t^j)$ characterize respectively the No-entry and the No-exit conditions which are displayed as the corresponding curves in Fig. 9. We can make three observations:

1. The No-entry and No-exit boundaries are downward-sloping curves (see Appendices C and D). A more exclusive elite in country j means a higher tax rate in that country and in equilibrium, a higher tax rate in the other country i. In this latter place, income is then lower for the masses, and it is less likely that the offspring of a member of this group can claim entry into the elite. Conversely, income is higher in the elite, and it is less likely that an elite offspring falls out of the elite.

2. When the transmission process of political dynasties is quite restrictive (ie. $(1 + \delta\rho)\pi/\rho > 1$), the offspring of a member of the masses in country i cannot hope

to get into the elite group, whatever the political inclusiveness in the other country j. This corresponds to the right panel of Fig. 9, where only the No-exit condition is relevant (the No-entry condition is slack everywhere). Conversely, when entering the elite is not that restrictive (ie. $(1 + \delta\rho)\pi/\rho < 1$), the offspring of a member of the elite in one place never falls out, at any level of inclusiveness in the other place. This corresponds to the left panel of Fig. 9, where only the No-entry condition is relevant (the No-exit condition is slack everywhere).

3. Holding political inclusiveness in country j constant, the dynamics of inclusiveness in country i can be easily characterized. When both conditions are slack, ie. in the upper-right section of either panel of Fig. 9, the elite is stable, with neither entry nor exit. In the lower-left section of the left panel, there is no exit, but there is entry into the elite, generation after generation. Finally, in the lower-left section of the right panel, there is no entry, but there is exit out of the elite, generation after generation (until the elite is small enough to stabilize).

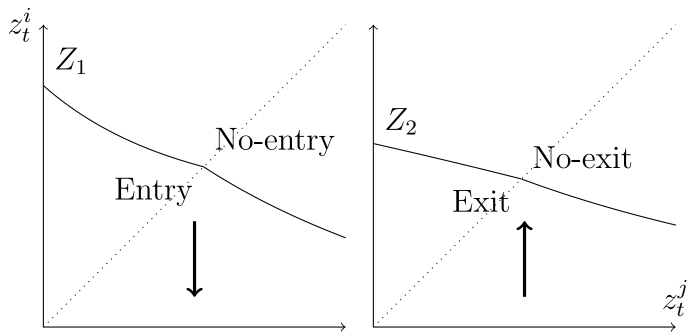

FIGURE 9: Changing elite boundaries in partial equilibrium in country i. Left: $(1 + \delta\rho)\pi < \rho$ (nonrestrictive). Right: $(1 + \delta\rho)\pi > \rho$ (restrictive).

6.2 Elite dynamics and equilibrium

Because of the cost of investing one's resources abroad, we can make a fourth observation:

4. A variation in political inclusiveness in country j has a larger impact on the tax rate, on incomes in the masses and in the elite, and on the No-exit and No-entry conditions in that country than in the other country i. Graphically, this means that the No-entry boundary for country j is 'more vertical' than the No-entry boundary

for country i in the (z_t^j, z_t^i)-plane. The same holds for the No-exit boundaries for countries j and i (see Appendices C and D).

With identical fundamentals $(\pi, \rho, \phi, \delta)$ in the two countries, we capture the dynamics of political inclusiveness for the countries in interaction with a symmetric phase diagram in Fig. 10. As before, the left panel corresponds to a low level of political dynasty restrictiveness, and the right panel to a high level.

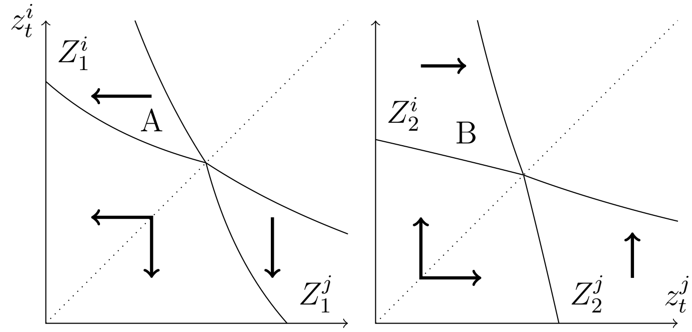

FIGURE 10: Changing elite boundaries in general equilibrium in countries i and j (symmetric case). Left: $(1+\delta\rho)\pi < \rho$. Right: $(1+\delta\rho)\pi > \rho$.

Clearly, Fig. 10 indicates that inclusiveness (ie. low value of z_t) in one country affects the policy and the politics of the other country. First, there is the static policy competitive effect: inclusiveness of politics in country j limits the degree or rent seeking extraction in this country. This impacts the level of extraction in the other country i, through increased exit option opportunities. Consequently, increased inclusiveness in country j enlarges the set of initial conditions in the other country i that lead as well to increasing inclusiveness in such a place (ie. Z_1^i is decreasing). It also means that only a more exclusive elite can stabilize itself in country i (ie. Z_2^i is also decreasing).

More interestingly, Fig 10 also illustrates a dynamic mechanism of political spillovers across countries. First, notice that in the South West region of both panels, the dynamics of political inclusiveness in both regions are evolving in the same direction and feeding back positively on each other. In the left panel, (z_t^i, z_t^j) jointly decrease leading to enlarged elites overtime, while in the right panel, they jointly increase, heading towards more restrictive power structures overtime. Typically in both cases, a larger (resp. smaller) elite in country i constrains more (resp. less) the pattern of rent extraction in country j. This in turn leads to an increased (resp. decreased) size of the elite in the latter place. Power structures evolve in a mutually reinforcing way across countries.

The case of political spillovers is perhaps most vividly illustrated for an initial situation at point A as illustrated in the left panel of Fig. 10. At point A the dynamics of power across countries is such that there is elite entry in country j, but not in country i. As the elite in country j becomes progressively more inclusive, generation after generation, this affects more and more the extraction that the elite in country i can implement. At some point, the level of rent seeking extraction in that country may be low enough that descendants of members of the masses start being able to enter into the elite. From this point onward, reinforcing each other, inclusiveness grows in both countries i and j, until the elite encompasses everyone in both countries. This situation is an interesting case of 'democratization spillovers.' Democratization (in the sense of increasing inclusiveness, until the point where everyone may take part in the political decision-making process) in country j leads to a democratization process in country i that would not have occurred otherwise.[15]

7 Conclusion

In this study, we explored the factors contributing to the persistence and fall of stratified political systems, focusing on the interplay between the distribution of (inherited) political capital and the availability of exit options within the population. Our primary contribution is the development of a flexible formal framework that accounts for the shifting boundaries of an elite, and allows for a tractable characterization of the dynamics of political mobility and political inclusion. In this context, we analyzed the consequences of the structure of exit options on the inter-generational transmission of political power.

We also examined the coevolution of policies, political power structures, and social mobility across interacting countries. In particular, we highlighted conditions under which politically inclusive institutions in foreign countries can promote more polit-

[15]Note that this effect does not happen in the case of increasing political exclusion. At point B in the right panel of Fig. 10, the size of the elite in country i is *already* stabilized. An increasingly exclusive elite in country j allows the elite in country i to implement a higher rate of extraction. Still, while its members are getting increasingly larger rents, the size of the elite in i remains stabilized with the same lineages overtime, while the elite in j sheds some of its members, until it also stabilizes itself.

ical inclusiveness domestically, in line with the so-called disciplining effects of the 'race-to-the-bottom' literature, and its implications for democratic theory (specifically, the few studies that have considered both exit and voice as constraints on authoritarian regimes). Conversely, we also showed that preferential exit options concentrated on a few privileged individuals may prevent such positive spillovers and even intensify rent extraction domestically, consolidating local restrictive elites. This conclusion resonates with the 'dependency theory' school of thought, which argues that a neighboring country with wide political access and sound institutions may play a dysfunctional role in the domestic politics of an elite-dominated society.

Our framework also led to interesting observations, such as the coordination problem faced by an elite that is not too exclusive. Intriguingly, this suggests that the elite may perceive preferential exit options as more of a drawback than a benefit under certain conditions.

In conclusion, this paper contributes to the understanding of the coevolution of political structures and showcases the potential of our setup to address interesting issues in the realm of political change theory. There are several promising avenues for future research, such as incorporating heterogeneity (and conflict) within the elite, examining the impact of public good provision or law enforcement, and unifying the concepts of 'voice' and 'exit' in a single framework. We believe that our model is flexible and tractable enough to pave the way for these extensions, and other exciting lines of inquiry in the study of the political dynamics and the persistence of stratified political systems.

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Appendix

A Formal results of the main text

Lemma 1 *If* $\rho N_t < (1 + \delta\rho)\pi$*, then* $z_{t+1} \geq z_t$*. If* $\rho M_t \leq (1 + \delta\rho)\pi < \rho N_t$*, then* $z_{t+1} = z_t$*. Finally, if* $(1 + \delta\rho)\pi < \rho M_t$*,* $z_{t+1} \leq z_t$*.*

Proof: The main text provides all the elements to establish the Lemma. As a complementary result, in the nondecreasing elite case, we can show that any given lineage that is initially in the masses eventually makes it into the elite. In contrast, except for pathological distribution of the political capital, in the nonincreasing elite case, some elite lineages remain in the elite forever.

Lemma 2 *M is nonincreasing in τ_t, nondecreasing in r, and nonincreasing in ϕ.*

Proof: This result is a simple application of the envelope theorem. It is not contingent upon the analytical specification provided in the main text. It only depends on the following assumptions: the income M_t decreases with taxes τ_t as long as there remain some domestic resources, and it increases with r and decreases with ϕ as long as some resources are transferred abroad.

Lemma 3 *For non-prohibitive tax rates, holding the tax rate constant, N is nonincreasing in r and nondecreasing in ϕ.*

Proof: The effect of taxes and outside options on the income of elite members is akin to a Laffer curve. Now, as long as the elite does not set a prohibitive tax rate, one that yields no rents, the effect of outside options has the same effect on the economic income of the masses and the elite. Better outside options mean a higher economic income, but it also means fewer rents for the elite, compounded by the relative proportion of the two groups. This is why, as long as taxes are not prohibitive, the elite always prefers to limit outside options.

Lemma 4 *In the case $z_t = 0$, ie. when everyone participates politically, the elite is technically indifferent between any tax rate that prevents flight. Everywhere else, τ^u is nondecreasing in z_t, nonincreasing in r, and nondecreasing in ϕ.*

Proof: Simple inspection shows that N is continuous, quasi-concave, and differentiable everywhere except at $1 - r$ and $1 - r + \phi$. First, we note that N is necessarily submodular in outside options and tax rates. As outside options improve, the marginal benefit of increasing the tax rate decreases. Second, we note that N is also necessarily submodular in the size of the elite and tax rates. As tax revenue must be shared among more elite members, the marginal benefit of increasing the tax rate decreases. The lemma is then a simple application of Topkis's theorem.

Lemma 5 *M^u is nonincreasing in z_t, increasing in r, and nonincreasing in ϕ. N^u is increasing in z_t, decreasing in r, and nondecreasing in ϕ.*

Proof: The impact on the elite is another application of the envelope theorem, using the partial derivatives that we found in Lemma 3 for the elite, and in Lemmas 2 and 4 for the masses.

Lemma 6 *With no cost for the elite of investing abroad, if* $z_t < 4\phi(1-r)/(1-r+\phi)^2$ *or if* $1-r \leq \phi$*, the elite chooses* $\tau_t^c = 1-r$*, the maximum tax rate that avoids any tax evasion. If* $z_t \geq 4\phi(1-r)/(1-r+\phi)^2$ *and* $1-r > \phi$*, the elite chooses* $\tau_t^c = (1-r+\phi)/2$*, the tax rate that maximizes rent extraction from the masses while the elite hides its resources abroad.* τ^c *is decreasing in* r *and nondecreasing in* ϕ *and continuous in both variables. It is nondecreasing in* z_t *(in our specification it is piecewise constant and therefore discontinuous).*

Proof: We could have divided this Lemma in two: a first one that solves for the particular specification we have chosen, and one about the more general comparative statics properties of τ^c. Let us consider the two aspects in turn.

N^c is continuous everywhere except at $1-r$, ie. at the point where elite members prefer to transfer their resources abroad, where it 'jumps' downward. It is increasing before, and quasi-concave after (concave until it stabilizes when the tax rate becomes 'prohibitive'). If it takes its maximum between $1-r$ and $1-r+\phi$ (with resource flight), then it takes its maximum at $(1-r+\phi)/2$. For $(1-r+\phi)/2$ to be the maximum, it needs to deliver a higher income to the elite than $1-r$ (without resource flight); it also needs to be greater than $1-r$. This gives us the two conditions. For the construction of Fig. 5, it is useful to note that if $1-r > \phi$, ie. in the case where it is relevant to define $\tilde{z}^c = 4\phi(1-r)/(1-r+\phi)^2$, then we can verify that $\tilde{z}^c > (1-r)/\phi$.

The proof of the general properties of τ^c has the same structure as that of Lemma 4. There is one nuance but it is actually not meaningful. Before, we could treat r and ϕ as two parameters that characterize outside options (the first one positively, the second one negatively). While the masses remain in the same situation, we have now assumed that the elite did not pay a cost ϕ when it transferred resources abroad. This means that the elite is even less in favor of a higher value of ϕ than before. However, this does not affect the logic and conclusions of Topkis's theorem.

Lemma 7 $M^c = r \geq M^u$ *for an inclusive elite, and* $M^c = M(1) < M^u$ *for an exclusive elite.* M *is increasing in* r*, and nonincreasing in* ϕ*.* N^c *is increasing in* z_t*, with* $N^c \geq N^u$ *for an inclusive elite.* N^c *can be either larger or smaller than* N^u *for a more exclusive elite.* N *is decreasing in* r *and nondecreasing in* ϕ*.*

Proof: The behavior of M^c is a direct application of Lemma 6, as is the behavior of N^c for an inclusive elite. To show that N^c can be either larger or smaller than N^u for a more exclusive elite, it is enough to use our particular specification. We find what follows easier with Fig. 5. Let us first consider the case where $(1-r)/\phi < \tilde{z}^c \iff \phi > 1-r$. Then, for z_t between $(1-r)/\phi$ and $\tilde{z}^c$, we simply have $\tau^c = 1-r > \tau^u$, better-off masses, and a worse-off elite. By continuity of N^c (when it is a function of z_t), this remains true in a boundary to the right of $\tilde{z}^c$. This shows that N^c can be smaller than N^u for an intermediately exclusive elite. To examine if that can be true even for a more exclusive elite, we can verify that when the elite sets $\tau_t^c = (1-r+\phi)/2$, ie. with capital flight, $N^c < N^u \iff z_t < 2(1-r)(2\phi+1-r)/(\phi^2 - 2\phi(1-r) - (1-r)^2)$.

This upper boundary is larger than 1 iff $(1-r)/\phi < 3+2\sqrt{3} \approx .15$, which means that in that particular case, N^c remains smaller than N^u even for an exclusive elite. Now, if $(1-r)/\phi > 3+2\sqrt{3} \approx .15$, which is the general case, an elite such that $z_t \geq 2(1-r)(2\phi+1-r)/(\phi^2-2\phi(1-r)-(1-r)^2)$ takes advantage from a preferential outside option.

Lemma 8 *The equilibrium tax rate $\tau^f(z_t)$ of an elite that faces the prospect of attracting L^* foreign investors are as follows. If $L^* \leq 1$,*

$$\tau^f(z_t) \equiv \begin{cases} 1-r-\phi & \text{when } z_t \leq (\frac{1-r}{\phi}-2)L^* \\ \phi z_t/(2L^*)+(1-r)/2 & \text{when } (\frac{1-r}{\phi}-2)L^* \leq z_t \leq \frac{1-r}{\phi}L^* \\ 1-r & \text{when } \frac{1-r}{\phi}L^* \leq z_t \leq \frac{1-r}{\phi} \\ (1-r+\phi)z_t/(1+z_t) & \text{when } z_t \geq \frac{1-r}{\phi}, \end{cases} \tag{A.1}$$

and if $L^* \geq 1$, there exists $\tilde{z}^f \in \left[\max\left\{(\frac{1-r}{\phi}-2)L^*, \frac{1-r}{\phi}\right\}, \frac{1-r}{\phi}L^*\right]$ such that

$$\tau^f(z_t) \equiv \begin{cases} 1-r-\phi & \text{when } z_t \leq \min\{(\frac{1-r}{\phi}-2)L^*, \frac{1-r}{\phi}\} \\ \phi z_t/(2L^*)+(1-r)/2 & \text{when } \min\{(\frac{1-r}{\phi}-2)L^*, \frac{1-r}{\phi}\} \leq z_t \leq \tilde{z}^f \\ (1-r+\phi)z_t/(1+z_t) & \text{when } z_t \geq \tilde{z}^f. \end{cases} \tag{A.2}$$

With this expression, we obtain the direction of resource flows in equilibrium with the corresponding tax rates. For $L^* > 1$ and $\phi > 1-r$, there exists a threshold $\overline{z}^f(L^*) \in [(1-r)/\phi, 1]$, (with $\tilde{z}^f(L^*) = 1$ for $z_t \geq (\phi/(1-r))^2$), such that:
Resource outflows: *when $L^* \leq 1$ and $z_t > (1-r)/\phi$, or when $L^* > 1$ and $z_t \geq \tilde{z}^f(L^*)$, the elite chooses a tax rate $\tau_t^f = (1-r+\phi)z_t/(1+z_t)$ above $1-r$, that leads to some domestic resource flight. Foreign investors stay out.*
No exchange: *when $(1-r)/\phi L^* \leq z_t \leq (1-r)/\phi$, the elite chooses $\tau_t^f = 1-r$. There is neither inflow nor outflow of resources.*
Resource inflows: *when $L^* \leq 1$ and $z_t < (1-r)/\phi L^*$, or when $L^* > 1$ and $z_t < \tilde{z}^f(L^*)$, the elite chooses a tax rate $\tau_t^f = \phi z_t/(2L^*)+(1-r)/2$ below $1-r$, that avoids any domestic resource flight, and attracts some foreign investors.*

Proof: We follow the same reasoning as in the previous sections. We maximize $N_t^f \equiv N^f(\tau_t) \equiv M^f(\tau_t) + R^f(\tau_t)$, with $M^f(\tau_t) \equiv M(\tau_t)$ and $R^f(\tau_t) \equiv \tau_t((1-l(\tau_t)) + l^*(\tau_t)L^*)/(1-z_t)$. M is given by Eq. 3, l by Eq. 2, and l^* by Eq. 11, which yields the following rather unwieldy expression:

$$N^f(\tau_t) = \begin{cases} 1-\tau_t+\frac{\tau_t(1+L^*)}{1-z_t} & \text{when } \tau_t \leq 1-r-\phi \\ 1-\tau_t+\frac{\tau_t(1+(1-r-\tau_t)L^*/\phi)}{1-z_t} & \text{when } 1-r-\phi < \tau_t \leq 1-r \\ 1-\tau_t+\frac{(1-r-\tau_t)^2}{2\phi}+\frac{\tau_t(1+(1-r-\tau_t)/\phi)}{1-z_t} & \text{when } 1-r \leq \tau_t \leq 1-r+\phi \\ r-\phi/2 & \text{when } 1-r+\phi \leq \tau_t. \end{cases} \tag{A.3}$$

The following properties of N^f do not rely on our particular specification. It is continuous in τ_t. It increases in τ_t below the point where there are no more foreign resources to attract (ie., $\tau_t = 1-r-\phi$ in our specification). It is concave between this point and the point that separates a regime of resource inflows and a regime of resource outflows (ie., $\tau = 1-r$). It is concave between this second point and the point above which there are no more domestic resources to tax (ie., $\tau_t = 1-r+\phi$, at which point it is decreasing). It is constant above.

This shows that there are four values of τ_t that can possibly maximize N^f: the value where the elite attracts all foreign resources (ie., $1-r-\phi$), the value that maximizes the second part of the expression, where the elite attracts some foreign resources (ie., $\phi z_t/(2L^*)+(1-r)/2$), the value where there are neither resource inflows nor outflows (ie., $1-r$), and the value that maximizes the third part of the expression, where the elite allows some outflows (ie., $(1-r+\phi)z_t/(1+z_t)$). From this we can readily derive the whole Lemma, after careful comparison of the value taken by N^f in these four points (and verification that they are indeed inside of the relevant ranges). The details of the computations are not very interesting, but we find it easier to understand the various conditions of the Lemma with Fig. 6.

Lemma 9 *M^f is nonincreasing in z_t, increasing in r, nonincreasing in the cost of investing abroad, and nondecreasing in the cost for foreigners to invest domestically. N^f is increasing in z_t, decreasing in r, nondecreasing in the cost of investing abroad, and nonincreasing in the cost for foreigners to invest domestically. For inclusive enough elites, $M^f > M^u$ and $N^f > N^u$.*

Proof: As above, comparative statics come from the envelope theorem. The comparison between incomes with and without foreign investors comes from a simple comparison from the tax rates that the elite prefers in either case, and extends qualitatively to the general case.

B Comparative statics for equilibrium tax rates

Simple differentiation yields

$$\text{When } z_t^i < z_t^j \quad \partial_1\tau = \phi\tfrac{1+z_t^j}{2+z_t^j} \quad \partial_2\tau = \phi\frac{2+z_t^i}{(2+z_t^j)^2}$$
$$\text{When } z_t^i > z_t^j \quad \partial_1\tau = \phi\tfrac{2+z_t^j}{(2+z_t^i)^2} \quad \partial_2\tau = \phi\frac{z_t^i}{2+z_t^i}$$

from which the signs and inequalities of the main text follow.

C Comparative statics for equilibrium incomes

When $z_t^i < z_t^j$, simple differentiation yields

$$\begin{aligned}\partial_1 M(z_t^i, z_t^j) &= -\partial_1\tau(z_t^i, z_t^j) < 0\\ \partial_2 M(z_t^i, z_t^j) &= -\partial_2\tau(z_t^i, z_t^j) < 0\end{aligned}$$

From this we infer the expression of the derivative of Z_1 when it passes through point (z_t^j, z_t^i) as

$$-\frac{\partial_2 M}{\partial_1 M} = -\frac{2+z_t^i}{(2+z_t^j)(1+z_t^j)}$$

and, identically, when $z_t^i > z_t^j$,

$$\begin{aligned}\partial_1 M(z_t^i, z_t^j) &= -\partial_1\tau(z_t^i, z_t^j) + \frac{\tau(z_t^i, z_t^j) - \tau(z_t^j, z_t^i)}{\phi}(\partial_1\tau(z_t^i, z_t^j) - \partial_2\tau(z_t^j, z_t^i))\\ &= -2\phi\frac{2+z_t^j}{(2+z_t^i)^2} + \frac{z_t^i - z_t^j}{2+z_t^i}\phi\frac{2+z_t^j}{(2+z_t^i)^2} = -\phi\frac{(4+z_t^j+z_t^i)(2+z_t^j)}{(2+z_t^i)^3} < 0\\ \partial_2 M(z_t^i, z_t^j) &= -\partial_2\tau_2(z_t^i, z_t^j) + \frac{\tau_2(z_t^i, z_t^j) - \tau_1(z_t^j, z_t^i)}{\phi}(\partial_2\tau_2(z_t^i, z_t^j) - \partial_1\tau_1(z_t^j, z_t^i))\\ &= -\phi\frac{z_t^i}{2+z_t^i} - \phi\frac{z_t^i - z_t^j}{2+z_t^i}\frac{1}{2+z_t^i} = -\phi\frac{z_t^i(2+z_t^i) + z_t^i - z_t^j}{(2+z_t^i)^2} < 0.\end{aligned}$$

Again we infer the expression of the derivative of Z_1 when it passes through (z_t^j, z_t^i) as

$$-\frac{\partial_2 M}{\partial_1 M} = -\frac{(3z_t^i - z_t^j + {z_t^i}^2)(2+z_t^i)}{(4+z_t^j+z_t^i)(2+z_t^j)}$$

With these two expressions, we have the slope of Z_1 at point (z_t^j, z_t^i). The slope of Z_1^{-1} at the same point is equal to $1/Z_1'$ taken at point (z_t^i, z_t^j). It is easy to verify that the former is larger than the latter:

$$\text{When } z_t^i > z_t^j, \quad 0 > -\frac{2+z_t^i}{(2+z_t^j)(1+z_t^j)} > -\frac{(4+z_t^i+z_t^j)(2+z_t^i)}{(3z_t^j - z_t^i + {z_t^j}^2)(2+z_t^j)}$$
$$\text{When } z_t^j > z_t^i, \quad 0 > -\frac{(3z_t^i - z_t^j + {z_t^i}^2)(2+z_t^i)}{(4+z_t^j+z_t^i)(2+z_t^j)} > -\frac{(2+z_t^i)(1+z_t^i)}{2+z_t^j}$$

How to interpret this property? This ensures that the no-entry condition in country j is necessarily "more vertical" than the no-entry condition for country i in the $(z_t^i, z_t^j)-$plane.

D Comparative statics for equilibrium elite income

When $z_t^i < z_t^j$, $N(z_t^i, z_t^j) = 1 + \frac{\tau(z_t^i, z_t^j)^2}{\phi(1-z_t^i)}$, from which it immediately follows that $\partial_1 N(z_t^i, z_t^j) > 0$ and $\partial_2 N(z_t^i, z_t^j) > 0$. The derivative of Z_2 when it passes through (z_t^j, z_t^i) is

$$-\frac{\partial_2 N}{\partial_1 N} = -\frac{2(1-z_t^i)(2+z_t^i)}{(2+z_t^j)(1-z_t^i+3z_t^j-z_t^i z_t^j)} \in (-1, 0)$$

and, identically, when $z_t^i > z_t^j$,

$$\begin{aligned} N(z_t^i, z_t^j) &= 1 + \frac{\tau_t^i}{1-z_t^i}\left(z_t^i + \frac{\tau_t^j - \tau_t^i}{\phi}\right) + \frac{(\tau_t^j - \tau_t^i)^2}{2\phi} \\ &= 1 + \phi\frac{(1+z_t^i)({z_t^j}^2 + 2z_t^j {z_t^i}^2 + 2z_t^i z_t^j + 3{z_t^i}^2)}{2(1-z_t^i)(2+z_t^i)^2} \end{aligned}$$

and therefore

$$\begin{aligned} \frac{\partial_1 N(z_t^i, z_t^j)}{N(z_t^i, z_t^j) - 1} &= \frac{1}{1+z_t^i} + \frac{1}{1-z_t^i} - \frac{2}{2+z_t^i} + \frac{4z_t^i z_t^j + 2z_t^j + 6z_t^i}{{z_t^j}^2 + 2z_t^j {z_t^i}^2 + 2z_t^i z_t^j + 3{z_t^i}^2} \\ &= \frac{2({z_t^i}^2 + z_t^i + 1)}{(1-{z_t^i}^2)(2+z_t^i)} + \frac{4z_t^i z_t^j + 2z_t^j + 6z_t^i}{{z_t^j}^2 + 2z_t^j {z_t^i}^2 + 2z_t^i z_t^j + 3{z_t^i}^2} > 0 \\ \frac{\partial_2 N(z_t^i, z_t^j)}{N(z_t^i, z_t^j) - 1} &= \frac{2z_t^j + 2{z_t^i}^2 + 2z_t^i}{{z_t^j}^2 + 2z_t^j {z_t^i}^2 + 2z_t^i z_t^j + 3{z_t^i}^2} > 0. \end{aligned}$$

The derivative of Z_2 when it passes through (z_t^j, z_t^i) is

$$-\frac{\partial_2 N}{\partial_1 N} = -\frac{(1-z_t^i)(2+z_t^i)(1+z_t^i)(z_t^i+z_t^j+z_t^i z_t^j)}{{z_t^i}^2 {z_t^j}^2 + {z_t^j}^2 z_t^i + {z_t^j}^2 + z_t^j {z_t^i}^2(4-z_t^i) + 7 z_t^i z_t^j + 2 z_t^j + 3{z_t^i}^2(2-z_t^i) + 6 z_t^j}$$

A closer look at this expression as function of z_t^j and z_t^i reveals that it takes its minimum at the limit where $z_t^i = z_t^j$ both approach 0. This minimum is $-.5 \in (-1, 0)$. Whenever it exists, we have $Z_2'(z_t^j) \in (-1, 0)$. In the $(z_t^i, z_t^j)-$plane, the slope of the no-exit condition in country i is everywhere larger than -1. As a corollary, the slope of the no-exit condition in country j is everywhere below -1.