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CRONY CAPITALISM AS AN ELECTORAL OUTCOME

Crony capitalism as an electoral outcome [*]

Dmitry Veselov[†]

Abstract

When property rights are poorly secured, crony relations i.e. the tight connection between the owners of major firms and the government are the primary informal mechanism securing the property. However, this institutional framework creates high entry barriers on markets. We propose a theory that explains why in a democracy the majority of voters may prefer this type of institutions. This paper develops a simple voting model with heterogeneous agents, which differ in their skills and wealth endowment. We show that if the policy space is two-dimensional, the wealthy elite and low-skilled workers may form a majority coalition, supporting the regime with high-entry barriers. In this case, the wealthy elite agrees on a higher level of redistribution, preferred by the least skilled agents. We compare the possibility of this outcome for different voting rules, and prove that the electoral support of crony capitalism is more likely for countries with a low level of human capital and high income and skill inequality. The model is also able to explain different effects of democratization process on the institutional structure of the society.

JEL Classification: D30, D71, D72, O10, P16

Keywords: barriers to entry, electoral rules, income inequality, skills inequality, crony capitalism.

1   Introduction

For the last thirty years, a large group of countries in Latin America, East Asia, and Eastern Europe has democratized their political regimes. The transition towards democracy can be a transition towards prosperity if it provides conditions for the broad support of growth enhancing institutions

and policies. At the same time, in many new democracies, inefficient economic institutions persist (i.e., Acemoglu and Robinson (2008)). These kind of institutions can be defined also as crony capitalism. Haber (2013) describes crony capitalism as an economic system which creates rents for politically connected economic agents thanks to preferential subsidies, monopoly rights or protection from international competition. The monopoly rights in economic markets are also related to differences in credit conditions, legal environment, property rights protection between incumbents and new entrants (Acemoglu (2008)).

A democracy does not guarantee a free-entry regime on markets. Differences between democratic countries are high in terms of the costs of creating businesses or a business environment (Djankov (2009)). For example, South Korea and Argentina have been democratic countries since the end of the 1980s according to the Polity IV index, however, the place in the ranking of Doing Business Indicators (2018) is 4 for South Korea and 117 for Argentina (in the Starting business ranking, 9 and 157).

This paper proposes a theoretical explanation of the cases, when the electoral majority can support crony capitalism. It develops a simple, one period politico-economic model with the following properties. A society consists of agents, heterogeneous in their wealth and skill level. At the beginning of the period, agents vote for politicians or parties that propose a set of policies in a two-dimensional policy space. A policy space includes the tax on profits and the size of barriers to entry of new firms to the markets, which is a binary variable. In the no-entry regime, only incumbent firms can invest in new projects that increase firms' productivity. In the free-entry regime, there is an investment race between incumbent firms, owned by capitalists and new entrants. Firms behave in monopolistically competitive markets. The free-entry regime does not imply lower mark-ups for firms, but it provides additional incentives for incumbent firms to increase productivity to avoid competition with new entrants. We analyse potential equilibria in different set-ups. A Downsian model of political competition, the plurality rule, run-off elections, a model with ideological parties and the case of sequential voting are considered to find conditions for the electoral support of the no-entry regime in economic markets.

The main conclusion we have is that democratization does not necessarily lead to the elimination of barriers to entry on markets. The high redistribution no-entry policy could be a stable political outcome, supported by a majority, consisting of the owners of incumbent firms (capitalists) and low-skilled workers. The political equilibrium is determined by an average skill level, the costs of redistribution for capitalists, and by the size of inequality in skills and pre-tax incomes. In societies with a high level of economic inequality, the winning coalition of capitalists and the least-skilled workers support the no-entry regime. This result can partially explain the robust negative relationship between the level of economic inequality and the quality of economic institutions in

democratic countries. As Table 1 shows, democratic countries have a lower quality of economic institutions, if income distribution is more unequal [1].

	β coef.	St. error
Control of corruption	-0.06	0.003
Rule of law	-0.06	0.003
Regulatory quality	-0.048	0.003
Government effectiveness	-0.057	0.003
Voice and accountability	-0.046	0.003

Table 1: The β coefficient of the bivariate regression of Gini coefficient of inequality in incomes on the quality of institutions in a panel of countries

The model is capable of explaining the phenomenon according to which the middle class preferences do not determine the social outcomes. In the two-dimensional case, a higher rate of skill inequality increases the probability of coalition formation between the low-skilled workers and capitalists. The winning coalition does not include the middle class (high-skilled workers), and lower class agents determine the equilibrium level of redistribution. This fact explains the empirical findings of Scervini (2012) stating that the middle class does not play a decisive role in redistribution, as postulated by the median-voter hypothesis. The model also shows that in economies with a low rate of return on projects the rise of income inequality not only increases the preferences towards higher redistribution, as predicted by Meltzer and Richard (1981), Alesina and Rodrik (1994), Persson and Tabellini (1994), but also decreases the political support for a free-entry policy.

The model explains the tendency towards the politics of macroeconomic populism in democracies. Historical cases of macroeconomic populist policies in Latin America are described in Dornbusch and Edwards (1990) and Sachs et al. (1989). Acemoglu et al. (2013) propose a political theory of populism in which politicians choose policies left of the median voter to signal that they are not corrupt. Hereby, we propose an alternative explanation of left to the median policies as an equilibrium outcome.

The results of the model shed light on the ambiguous relationship between political regimes and economic growth. The empirical studies related to the effect of transformation in political regimes, from dictatorship to democracy, on institutions and economic growth give mixed results. Accord-

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[1]The political regime is democratic in our sample, if the score of the polity2 variable is higher than zero in the the policy IV dataset. We use pooled regression estimation in a panel of data for 2004-2013 years. The negative correlation between the level of economic inequality and the quality of institutions remains robust to the inclusion of the set of control variables (continents dummy, initial levels of ln GDP per capita).

ing to Barro (1996) democratization does not lead to higher economic growth, and Polterovich and Popov (2005) show that democratization even leads to lower growth in countries with poor institutions of law and order. Doucouliagos and Ulubaşoğlu (2008) summarize the empirical studies of democracy and growth using meta-regression techniques. They show that most of the studies do not find a direct effect of democratization on growth, even though, democratization indirectly influences development through different channels, including the human capital channel, political stability and the level of economic freedom. Acemoglu et al. (2019) find that democratization does cause positive changes in GDP per capita, but only in the long run and the effect of democratization is stronger for countries which start out with higher levels of education. Our results provide the theoretical basis for the empirical finding of Acemoglu et al. (2019) which stated that the level of education positively influences the expected benefits from democratization.

One of the explanations of high entry barriers on markets is the result of the influence of special interest groups either on a candidate platform or on the government in office (Grossman and Helpman (1994), Grossman and Helpman (1996), Mukoyama and Popov (2014)). In an extension of the baseline model, we take into account the possibility of incumbent firms to lobby the no-entry regime after the elections through informal payments. In our set-up, this possibility gives additional votes to the non-liberal party, that supports crony capitalism. The higher the probability for politicians to be corrupt after the elections, the higher is the voters' support for the non-liberal party. This result shows that in countries with high levels of corruption perception, the no-entry equilibrium will be more probable.

The paper is structured in the following way. Section 2 discusses the related literature. Section 3 describes the basic framework of the model. Section 4 describes the investment race between incumbents and new entrants and the effects of political choice on the results of this race. Section 5 describes electoral preferences of agents. Section 6 discusses the political equilibrium in the simple Downsian model of political competition and its basic results. Section 7 analyzes results for alternative voting rules. Section 8 considers the electoral outcomes in the model with possibilities of lobbying, concluding with section 9.

2   Related literature

This paper is related to various strands of literature. Krusell and Rios-Rull (1996) elaborated a dynamic model in which agents directly vote on the level of barriers to entry. They show that the economy experiences cycles of growth and stagnation depending on the decision of incumbents to create artificial barriers to entry in markets. Following them, we consider barriers to entry as an

electoral outcome and as a binary variable, but we consider a two-dimensional political space and the median voter theorem can not be applied. Parente and Zhao (2006) and Mukoyama and Popov (2014) consider barriers to entry on markets a result of the influence of special interest groups. We focus on the general-interest political economy model for understanding the electoral support of crony capitalism. The influence of special interest groups is considered in the extension to the baseline model.

Acemoglu and Robinson (2008) introduce a notion of 'captured' democracy in which, despite the presence of *de jure* democratic political institutions, economic institutions remain extractive. According to their argument, at the onset of democratization, political elites are capable of investing in alternative ways of influencing policy-making, that is lobbying, agenda manipulation, and thus, strongly opposed to changes in economic institutions. In this set-up, high barriers to entry is a result of the asymmetric power distribution between elites (owners of incumbent firms), and other citizens (Acemoglu (2008)).

We propose an alternative explanation for the existence of inefficient institutions in new democracies, according to which a majority coalition of agents blocks the elimination of the barriers to entry in markets, even if political power is distributed more equally. We focus on the potential coalition between the owners of incumbent firms and low-skilled workers. The possibility of the potential coalition between the richest and poorest parts of the society in a multi-dimensional policy space is considered in the literature. Levy (2005) found that education spending can be supported by the rich and young segment of the poor. Roemer (1998) shows that in the economy with two political issues (tax policy and religion) the position of parties on classical issue like redistribution changes significantly. Esteban and Ray (2008) shows that capitalists and unskilled workers may cooperate in the presence of ethnic conflict and within-group inequality increases the conflict potential. We contribute to this literature by considering the political economy of barriers to entry in a two-dimensional policy space.

The model also underlines the difference between electoral and liberal democracy (a democracy with free-entry regime). The reasons of the existence of illiberal democracies are considered by Zakaria (2003), Wintrobe (2018), Rodrik and Mukand (2019, forthcoming) among others. In our set-up, illiberal democracies are supported by a majority of voters in the societies with a low level of skills and a high level of income and skill inequality.

The paper is related to the debate about the role of institutions and human capital in economic development. One strand of the literature underlines the role of economic institutions in providing economic development (North et al. (1990), Acemoglu et al. (2001)), others support the role of human capital as a fundamental determinant of differences in income per capita among countries

(Glaeser et al. (2004), De Pleijt and Van Zanden (2016), Galor and Moav (2004)). In our set-up institutions (barriers to entry) are endogenous and determined by the preferences of agents. Therefore, the level of human capital and human capital distribution among agents determines the quality of institutions and economic performance. This view is close to the paper of Rajan and Zingales (2006), who stress that the education reforms are one of the primary factors for success of the market reforms.

The paper also related with studies analysing the role of inequality in determining the institutional quality (Sokoloff and Engerman (2000), Glaeser et al. (2003), Gradstein (2007), Mizuno et al. (2017) among others). In our set-up, a higher level of inequality provides a condition for the formation of the coalition between the richest and poorest parts of the society supporting a high-redistribution, no-entry policy.

3 Basic framework

3.1 Agents and preferences

Two office-motivated candidates, A and B, compete for the election. Each of them chooses a policy platform, which consists of two policy variables: the level of barriers to entry for new firms and the level of redistribution from firm owners to workers. The level of barriers to entry is a binary variable, $X = \{B, NB\}$. The entry of new firms is either forbidden (B) or not (NB). Each candidate also proposes a profit tax rate, τ^2. Tax incomes are used to finance lump-sum transfers to workers, to ensure that the government budget is balanced.

Two candidates propose their policy platform simultaneously by maximizing the expected number of votes. Candidates credibly commit to realizing the chosen platform in the case of winning the elections. Each voter votes sincerely for her preferred candidate. The majority of votes determines the winner. If two candidates get equal votes, the winner is randomly determined. If voters are indifferent to the choice between the two candidates, they choose one randomly.

The polity consists of two groups of agents: owners of incumbent firms (the capitalists, C), and the workers (W). Agents are risk-neutral, and they maximize their expected pay-off. The size of the group of capitalists equals N, and the size of the group of workers is $L > N$. Workers

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[2]In a model with the taxation of individual incomes, agents' preferences, regarding the desired policies, will be the same, except the preferences of high-skilled workers. High-skilled workers will be less interested in the high level of taxes. Nevertheless, the qualitative features of the model stay the same.

are heterogeneous regarding their level of skills, which are distributed among them with a given continuous cumulative distribution function (C.D.F.) [3].

Each capitalist owns one incumbent firm and maximizes the level of after-tax profits by taking into account the costs of investment in new technology. The capitalists' pay-off is equal to

$$V_C = \pi(1 - \tau) - Inv, \tag{1}$$

where π is the level of profits, Inv - the costs of investment in new technology. All incumbent firms are symmetric and so, the pay-off does not differ among capitalists.

Workers maximize their own pay-off (V_k), consisted of the sum of wages, transfer payments. Moreover, in the free entry regime each of the workers has a small identical probability (ζ) to create a firm, which is a new entrant to the market. Therefore, pay-offs of workers also include the expected after-tax profits of a new entrant[4]

$$V_k = wh_k + g + \zeta\pi_e, \tag{2}$$

where w is a wage per unit of skills, h_k - the skill level of individual k and π_e is the expected after tax-profits of a new entrant. As the government budget is balanced, transfer payments equal to the total taxes divided by the number of workers, $g = \tau\pi N/L$[5].

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[3]For technical tractability we assume that the continuum of workers of a size L exists and so the function H is continuous

[4]At this stage we have several simplifying assumptions to make a model more tractable, which can by relaxed. Firstly, we can assume that workers and entrepreneurs are different people as in Veselov (2013). In this set-up entrepreneurs are a group with its own preferences. This group prefers a free-entry regime with zero taxes, $(NB, 0)$, but if it is not a sizable group of agents, main results stay the same. For example, in the model with two competitive parties, entrepreneurs always vote for the liberal party, and so they are not swing voters. Secondly, we can assume that the probability to create a new firm depends on the skill level of workers. In our set-up it does not change the results at all. However, in the richer framework, with a replacement in the equilibrium, high skilled workers, who become entrepreneurs with a higher probability vote for lesser redistribution. It does not alter the main result of the paper. Thirdly, it is possible to have an occupation choice among agents, either to be an entrepreneur or to be a worker. In this richer set-up there are alternative costs to be an entrepreneur, and so, it can be seen as an increase of I, but it does not change the qualitative results.

[5]As all firms are symmetric, in the equilibrium all active firms on the market will have the same level of profits, π

3.2 Production structure

There is a single good, produced by labor and specialized intermediate inputs, according to the following production function

$$Y = (H/N)^{1-\alpha} \int_{i=1}^{N} A(i)^{1-\alpha} x(i)^{\alpha}, \tag{3}$$

where Y is the output of the general good, H is the quantity of skill-adjusted labor engaged in production, $H = \int_{k=0}^{L} h_k$, and $x(i)$ is the quantity of intermediate input i, $A(i)$ is the quality of intermediate input i, N measures the number of intermediate inputs, which is equal to the number of incumbent firms in the economy, owned by capitalists, and $1 - \alpha$ is the share of labor income in the total output of the general good[6]. The general good can be used interchangeably as consumption, an input in intermediate goods production or investment input. Producers of the general good are perfect competitors on all markets, so the equilibrium price of intermediate inputs $p_x(i)$ is equal to the marginal product in producing the general good

$$p_x(i) = \alpha A(i)^{1-\alpha} (H/N)^{1-\alpha} x(i)^{\alpha-1}. \tag{4}$$

The production of each particular type of intermediate inputs is performed by an unconstrained monopolistic firm [7] that uses one unit of the general good to produce one unit of input. A monopolistic firm maximizes its profit by choosing the level of production of intermediate inputs

$$\max_{x(i)} \{p_x(i)x(i) - x(i)\}. \tag{5}$$

In this case, from the monopolist problem, the equilibrium price of the intermediate input is equal to $1/\alpha$, and the equilibrium quantity $x(i)$ equals

$$x(i) = \alpha^{2/1-\alpha} A(i) H/N. \tag{6}$$

We assume that all firms are symmetric, $A(i) = A$. Putting equation (6) into (3) we obtain the equilibrium output of the general good

$$Y = \alpha^{\frac{2\alpha}{1-\alpha}} AH. \tag{7}$$

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[6]For this type of the production function the number of varieties of intermediate inputs (N) does not influence workers productivity because of the increased specialization effect. A higher number of varieties of intermediate inputs increases the specialization costs, which eliminate the positive direct effect on the output (i.e. Bucci (2011))

[7]The alternative assumption about the competitive fringe in each intermediate input sector gives the same qualitative results

From (5) and (6) the level of profit for each monopolistic firm equals

$$\pi = (1 - \alpha)\alpha^{\frac{1+\alpha}{1-\alpha}}AH/N. \tag{8}$$

The level of profits is proportional to the aggregate level of skills and to the quality of the intermediate input. In a competitive labor market the skill adjusted wage rate (w) equals the marginal product of labor

$$w = \alpha^{2\alpha/(1-\alpha)}A. \tag{9}$$

The equilibrium output of the general good can be divided by wages, monopolistic profits and inputs in the intermediate goods production sector

$$Y = wH + \pi N + xN. \tag{10}$$

From (3), (8), (9) the shares of wages and profits in the final output are constant and the ratio of total profits to total wages equals α, which is a measure of the level of inequality in incomes between capitalists and workers. The rise of the level of technology (A) increases the wages and profits by the same size. However, the distribution of gains from the increase in the level of technology will be determined by the distribution of skills among workers, and by the level of inequality of incomes between capitalists and workers, α.

3.3 Investment opportunities

Let us suppose that both incumbent firms and new entrants have access to the investment projects, raising the level of technology by γ. The cost of the investment project is proportional to the current complexity of technology and equals, ψA, where $\psi > 0$. For each sector, there is one incumbent firm which belongs to a capitalist, and there is one potential new entrant, created by workers[8]. Following Aghion et al. (2007) we assume that the incumbent firms have first-mover advantage. If they invest in projects, they gain a patent, that protects them from a competition with new entrants. If incumbent firms do not invest in the project, in the free-entry regime, new entrants can invest into the same project and replace the incumbent firm in the market. The financial markets are perfect, and the project is financed if the net present value of it is positive. Hereby we model a patent race mechanism, if one of the firms invests in new technology and gains a patent, it is not possible to replace it in the market unless the new entrant does not have a better technology. Only one firm gets a patent and so, in our framework, the free-entry regime does not lower the level of

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[8]Without the loss of generality, we assume that, for each sector, there is one potential entrepreneur among workers and so, $\zeta = N/L < 1$.

mark-ups in the markets, but create additional incentives to invest in new technology intensifying the competition between incumbent firms and potential new entrants[9].

After that, all investment projects are realized, all functioning firms produce goods and pay wages to workers and distribute after-tax profits to firm-owners (capitalists or entrepreneurs). The government collects taxes and pays transfer payments to workers, such that the budget is balanced. Each firm can hide their profits from taxation. The cost of hiding is $\delta\pi$, where $\delta < 1$[10]. This assumption guarantees that the actual tax rate in the equilibrium does not exceed the marginal costs of hiding. Therefore, δ measures the ability of the government to collect taxes and limit the redistribution possibilities in the society.

The timing of the model can be summarized in the following way:

1. Two politicians (A, B) choose their policy platforms, consisting of the entry regime (B, NB) and a tax rate τ;

2. Elections are held, and the winner is determined by the majority of votes;

3. Each incumbent firms' owner (a capitalist) decides either to invest or not (I, NI) in a given project;

4. In the free-entry regime for each sector new entrants decide either to invest or not (I, NI) in the project;

5. All operating firms decide whether to hide profits from taxation or not;

6. All operating firms produce goods and pay wages to workers and after-tax profits to their owners;

7. Finally, redistribution occurs and agents get their final pay-offs.

4 Economic equilibrium

The basic framework can be considered as a game consisting of $N + L + 2$ players: politicians A, B, capitalists C and workers W. Figure 1 shows the game in the extended form for a given realized policy platform. We solve this game by backward induction, and firstly find agents' optimal investment and hiding strategies when the political outcome is given.

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[9]We follow the endogenous growth literature, showing that investment in new technologies is profitable in the market economy only if there is some market power of innovators to get flow of profits from a new technology (i.e Aghion and Griffith (2008))

[10]δ also measures the State capacity to collect taxes. Therefore, we can expect that, in developed countries, δ will
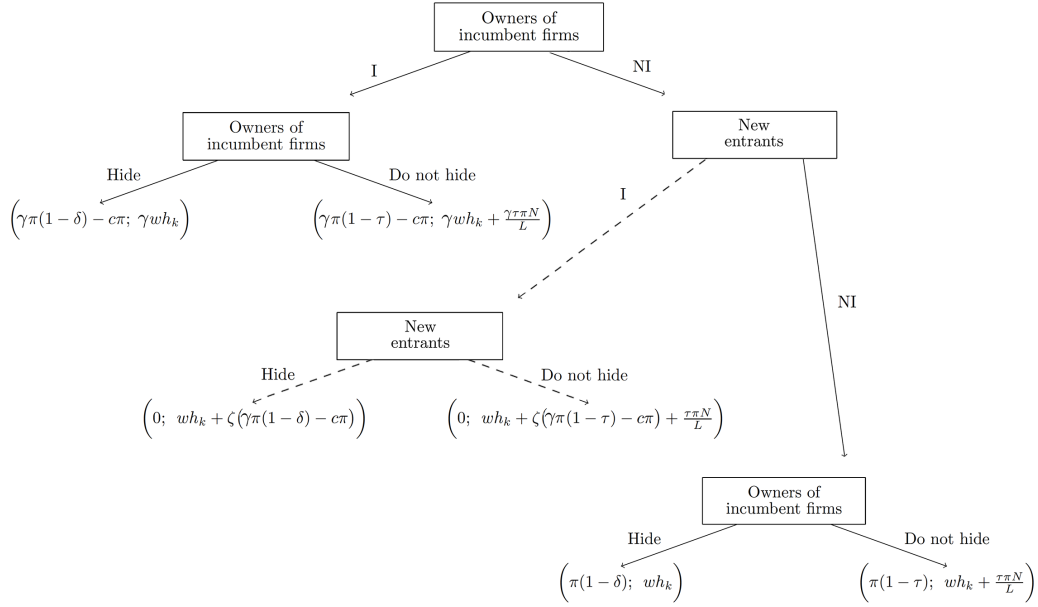
Figure 1: The game in the extended form for a given realized policy platform. Pay-offs of capitalists and workers are shown in brackets. Dash lines mean that these strategies can be used only in the NB-regime.

Agents' hiding decision is straightforward. As the cost of hiding is linear, capitalists and entrepreneurs, running an operating firm, hide their profits only if the tax rate exceeds δ. In the opposite case, they do not hide profits from taxation. Let us now find the optimal investment strategies of agents.

In the no-entry regime (B), only incumbent firms decide whether to invest in projects or not. As all agents are risk-neutral, incumbents will invest only if the rate of return on projects is sufficiently high, such that

$$\gamma(1-\tau)\pi - \psi A \geq (1-\tau)\pi. \tag{11}$$

From (8) we can redefine the costs of the project in units of current profits as $c\pi$. Therefore, incumbent firms invest in the new projects in the no-entry regime, only if

$$\gamma(1-\tau)\pi - c\pi \geq (1-\tau)\pi, \tag{12}$$

where $c = \psi A/\pi = \psi N/(H(1-\alpha)\alpha^{\frac{1+\alpha}{1-\alpha}})$. From (12) incumbent firms make investment in the no entry regime only if $\tau \leq \widehat{\tau}$, where

$$\widehat{\tau} = 1 - c/(\gamma-1). \tag{13}$$

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be higher. Moreover, the globalization leads to a lower δ as it gives opportunities for a capital flight.

In the free-entry regime if an incumbent firm in a given sector has not realized the investment project, an entrepreneur invests in the project only if

$$\gamma(1 - \tau)\pi - \psi A \geq 0. \tag{14}$$

By using the fact that $c\pi = \psi A$ we gets the following participation constraint for entrepreneurs

$$\gamma(1 - \tau) - c \geq 0. \tag{15}$$

From (15) the entry of new firms in markets is credible only if the tax rate is not very high such that, $\tau \leq \tau'$, where

$$\tau' = 1 - c/\gamma. \tag{16}$$

The NB-regime is defined as the regime with free entry and a credible entry threat, $\tau \leq \tau'$. From (13) and (16) $\tau' > \widehat{\tau}$. In the free entry regime new entrants are ready to invest for a broader range of tax rates than incumbent firms. This result can be explained by the replacement effect (Arrow (1962)). New entrants have more incentives to invest than incumbent firms because new entrants take into account the fact that they crowd out the incumbent firm and gain the whole market.

However, in the NB-regime, incumbent firms take into account the entrepreneurs threat and always use their first-mover advantage and invest in the project for $\tau \leq \tau'$. As $\tau' > \widehat{\tau}$, for a range of a tax rate $(\widehat{\tau}, \tau')$, incumbent firms do not invest in the no-entry regime but do invest in the free-entry regime to escape competition with a potential entrant. Incumbent firms' investment decisions in all possible cases are summarized on figure 2.
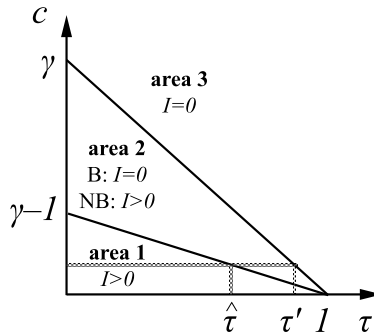

Figure 2: Investment decisions of incumbent firms

Proposition 1. *1. In the NB-regime, for a low level of taxes ($\tau \leq \tau'$) incumbent firms use their first mover advantage and invest in projects. New entrants create a credible threat to incumbent firms, but do not invest in projects in the equilibrium ($\pi_e = 0$). For higher tax rates ($\tau \geq \tau'$) neither incumbent firms nor entrepreneurs invest in projects.*

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2. *In the B-regime, incumbent firms invest in new projects only if the tax rate is sufficiently low, such that $\tau < \hat{\tau}$.*

5   Agents' payoffs and preferences in a policy space

Knowing the economic outcomes for each set of policy variables, we can describe agents' political preferences in a two-dimensional policy space $\{X, \tau_X\}$, where $X \in \{B, NB\}$, $\tau_B \in [0, 1]$, $\tau_{NB} \in [0, \tau']$.

5.1   Capitalists' preferences

The capitalists' pay-off consists of the after-tax profits of incumbent firms. As it will be shown below, for $\delta < \tau'$ all workers have the same bliss-point and so, the capitalists' preferences will not effect the outcomes. Let us consider the case, when $\delta > \tau'$. In the B-regime the pay-off of capitalists equals

$$
V_c^B = \begin{cases} (1 - \delta)\pi & \text{if } \tau \geq \delta \\ (1 - \tau)\pi & \text{if } \delta > \tau > \hat{\tau} \\ [\gamma(1 - \tau) - c]\pi & \text{if } \hat{\tau} \geq \tau \geq 0 \end{cases} \tag{17}
$$

as incumbent firms invest in new project only for $\tau \leq \hat{\tau}$ in the B-regime. In the NB-regime for $\tau_{NB} \in [0, \tau']$ and $\delta > \tau'$ it equals

$$
V_c^{NB} = [\gamma(1 - \tau) - c]\pi \tag{18}
$$

Figure 3 describes the capitalists' payoffs in the B- and NB-regimes for different levels of profit tax (τ). For a given entry regime the capitalists' payoff is the monotonically decreasing function of the level of tax. For a given tax rate, incumbent firms always weakly prefer the no-entry regime to the free-entry regime as the potential entry of new firms lowers their expected profits.

From (17), (18), $V_C(NB, \tau') = 0$ and $V_C(B, \tau) > 0$ for any $\tau \in [0, 1]$. In the free-entry regime incumbent firms invest in the project even if the tax rate is τ', and so the expected after-tax profits from this investment are zero. Otherwise, they will be replaced by a new entrant and get the same zero pay-off.

Therefore, on a two-dimensional policy space, there is a discontinuity in the capitalists' preferences regarding the tax rate. If the tax rate exceeds τ' the entry of new firms is impossible and capitalists gain more than in the case of (NB, τ') policy. This property generates additional support for redistribution among capitalists. The intuition of this result is the following: in the free-entry regime with a maximum tax rate (τ') the expected profits for both incumbent firms and new entrants are zero. At the same time, if the tax rates are higher than τ', there are no incentives for new entrants to invest in new projects and so, incumbent firms benefit from their monopolistic position in the market despite that the level of taxes is relatively high.
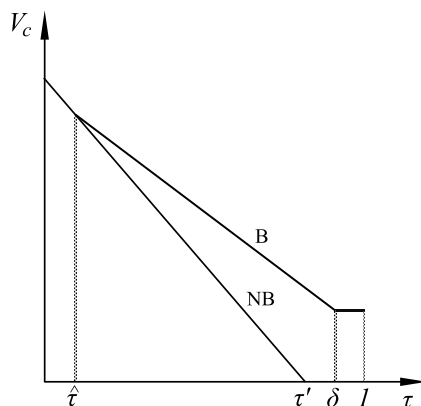

Figure 3: Capitalists' pay-off functions for $\tau' < \delta$.

5.2 Workers' preferences

The pay-off of workers consists of wages, lump-sum transfers and expected profits from new entrants. As in the equilibrium, new entrants only create a credible threat for incumbent firm-owners, but do not invest themselves, the expected profits from new entrants are zero $(\pi_e = 0)$[11].

For $\tau > \delta$ firms hide profits and the only source of incomes for workers is wages. For $\tau \leq \delta$ firms do not hide their profits and workers get lump-sum transfers, $\tau \pi N / L$. If incumbent firms invest in new projects both wages and transfer payments of workers are increased by γ. Therefore, worker

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[11]If we assume that the project is risky i.e capitalists may fail to create a new techonology with some probability, new entrants may replace incumbent firms in the equilibrium. This assumption complicates the structure of the model, but does not effect qualitative predictions of the model. As the probability to be entrepreneur is small for a worker, agents bliss-points remain the same.

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k pay-off in the B regime equals

$$
V_k^B = \begin{cases} wh_k & \text{if } \tau > \delta \\ wh_k + \tau\pi N/L & \text{if } \widehat{\tau} < \tau \le \delta \\ \gamma[wh_k + \tau\pi N/L] & \text{if } 0 \le \tau \le \widehat{\tau} \end{cases} \tag{19}
$$

Worker k pay-offs in the NB-regime for $\tau \in [0, \tau']$ and $\tau' < \delta$ equals

$$
V_k^{NB} = \gamma[wh_k + \tau\pi N/L], \tag{20}
$$

as in the NB-regime incumbents firms always invest in new projects.

Pay-offs differ among workers due to different level of skills. Higher skilled workers get higher salaries, but also benefit more from the firms' investments in new projects. Therefore, there is a potential disagreement between the high-skilled workers and low-skilled workers, for whom transfer payments are their main source of income. The formal analysis of this claim is presented in Proposition 2.

Let us define $\overline{h} = H/L$ as the average level of skills among workers. As $c = [\psi N/L]/[\overline{h}(1 - \alpha)\alpha^{\frac{1+\alpha}{1-\alpha}}])$ given the number of capitalists (N) and workers (L) the higher the average level of skills, the lower the relative costs of investment projects, c, and the higher the rate of return on projects. Therefore, we can find the relationship between the average level of skills in the society and the preferences of workers in the political space.

Proposition 2. *Workers' bliss points*

1. *For the highest average level of skills if $c \le \gamma - \gamma\delta$ all workers prefer (NB, δ) policy.*

2. *For a high average level of skills if $\gamma - \gamma\delta < c \le \gamma - \delta$ all workers prefer (NB, τ') policy.*

3. *For a low average level of skills if $\gamma - \delta < c < \gamma$ the bliss point for the group of workers, L_S, with $h_k \ge h'$, is (NB, τ'). The bliss point for the group of workers, L_U, with $h_k < h'$, is (B, δ), where*

$$
h' = \overline{h}\alpha(\delta - \gamma + c)/(\gamma - 1). \tag{21}
$$

4. *For the lowest average level of skills if $c \ge \gamma$ all workers prefer (B, δ) policy.*

Proof. See Online Appendix. $\square$

The intuition of this result is straightforward. The rate of return of projects is tightly connected with an average level of skills ($\overline{h}$) in the economy. An average level of skills influences positively

the potential gains of firms from investment projects and influences positevely the potential gains of workers from the realization of the investment projects. Moreover, if the average level of skills is higher, firms can pay a higher level of taxes (τ') in the free-entry regime. This also raises the incentives for workers to support the free-entry regime.

From that point we define two groups of workers with sizes L_S, L_U, with identical within-group bliss points. From proposition 2 the size of both groups depends on parameters of the model.

Corollary 1. *For $\gamma - \delta < c < \gamma$,*

1. *The size of the group of supporters of (NB, τ') policy among workers, L_S, is positively related to the size of innovations (γ); is positively related to an average level of skills; negatively related to the maximum redistribution rate (δ); negatively related to the ratio of total profits to total wages (α); and negatively related to the costs of innovations (ψ).*

$$dL_S/d\overline{h} > 0, dL_S/d\gamma > 0, dL_S/d\delta < 0, dL_S/d\alpha < 0, dL_S/d\psi < 0$$

2. *The more right-skewed the skills distribution is, the higher is the number of supporters of (B, δ) policy among workers.*

Proof. See Online Appendix. □

6 Political equilibrium in a Downsian model

6.1 The case of homogenous workers

Now we consider the optimal behavior of two office-motivated politicians A and B, who propose a policy platform on two-dimensional policy space. Each of politicians maximizes the expected number of votes. In Downsian model of two-parties competition, if Nash equilibrium in pure strategies exist, both parties propose the Condorcet winner policy. Therefore, the result is the same as in the case of direct democracies, in which agents freely form majorities coalition to support one of the policies from 2-dimensional policy space. As a benchmark case, we assume initially that all workers have the identical skills level $h_k = \overline{h} = h$. Therefore, there are two homogenous groups of voters: capitalists and workers. In a democracy, workers hold the majority of votes and so the electoral outcome is determined by their preferences. From Corollary 1 it follows that the level of skills determines the electoral outcome. For a high-skilled labor force, the electoral outcome is a liberal democracy with free-entry and low redistribution rate (NB, τ'), for a low-skilled labor

force, workers prefer no-entry high redistribution policy (B, δ). Other parameters of the model, such as the size and costs of innovations (γ, ψ) and the ratio of total profits to total wages (α) also influence worker preferences and the political equilibrium. A lower rate of return on projects or a higher share of profits in total income leads to the existence of majority, supporting the no-entry high redistribution policy (B, δ).

6.2   The case of heterogeneous workers

If workers differ in their level of skills, a society consists of three groups of voters with heterogeneous interests including capitalists, workers, supporting (NB, τ') policy and workers, supporting (B, δ) policy (C, L_S, L_U). Let us arrange all workers according to their skills level and define h_q the skills level of the highest skilled worker from q least-skilled workers (quantile of distribution), where $h_0 \leq h_q \leq h_L$. From proposition 2 the next lemma follows.

Lemma 1. *The formation of a majority coalition in the model with heterogeneous workers.*

1. *In an economy with a high-skilled labor force, such that $h' < h_{(L-N)/2}$, a majority of votes belongs to workers with the bliss point (NB, τ').*

2. *In an economy with a low-skilled labor force, such that $h' > h_{(L+N)/2}$, a majority of votes belongs to workers with the bliss point (B, δ).*

3. *In an economy with an intermediate level of skills, such that $h_{(L-N)/2} < h' < h_{(L+N)/2}$, there is not a single group of agents with identical bliss points which hold a majority of votes.*

In an economy with heterogeneous skills level, we have the same results as in the model with homogeneous workers, except one interesting case. If neither workers, supporting (B, δ) policy, nor workers, supporting (NB, τ') policy form the majority, politicians need to take into account the policy preferences of capitalists. This creates opportunities for a potential coalition of low-skilled workers and capitalists.

Proposition 3. *If there is no single group of agents with an identical bliss point which holds a majority of votes, two political outcomes are possible:*

1. *(B, δ) is a Condorcet winner policy, supported by the coalition of capitalists and low-skilled workers with a bliss-point (B, δ). This is true if either $h_{(L+N)/2} \leq h''$ or $\delta \leq 1 + c - \gamma$, where*

$$h'' = \overline{h}\alpha(1 + c - \gamma)/(\gamma - 1).$$

2. *If $h_{(L+N)/2} > h''$ and $\delta > 1 + c - \gamma$ there is no Nash equilibrium in pure strategies in the game between two politicians, A and B.*

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Proof. see Online Appendix. ∎

In multidimensional voting models, the Condorcet winner policy usually does not exists as multi-dimensionality leads to dissipation of the core (McKelvey and Wendell (1976)). For a high rate of return on projects and a high maximum rate of redistribution, there is a potential majority coalition of capitalists and high-skilled workers, supporting the $(NB, \tau_{NB} < \tau')$ regime. However, this coalition is not stable, as all workers prefer a higher level of redistribution, (NB, τ'). Majority, consisting of capitalists and the least-skilled workers strictly prefer (B, δ) to (NB, τ'). So, in this case, there are no Nash equilibria in pure strategies.

Figure 4 illustrates a numerical example of political equilibria in the model for different level of relative costs of the project (c) and maximum potential redistribution rates (δ). Suppose that, the distribution of skills between workers is approximated by the log-normal distribution. We set $\gamma = 1.2$, $\alpha = 1/2$ (which is consistent with a one-third share of capital income in value added. The ratio of the number of capitalists to the number of workers (N/L) equals 0.3. In Area A the rate of return is so high that majority of workers prefer (NB, τ') policy, in Area B the opposite is true, the majority of workers prefer (B, δ) policy. Area C describes a case, when capitalists and low-skilled workers form a majority, supporting (B, δ) regime. In Area D there is no Nach equilibrium in pure strategies at all as there is no a Condorcet winner.
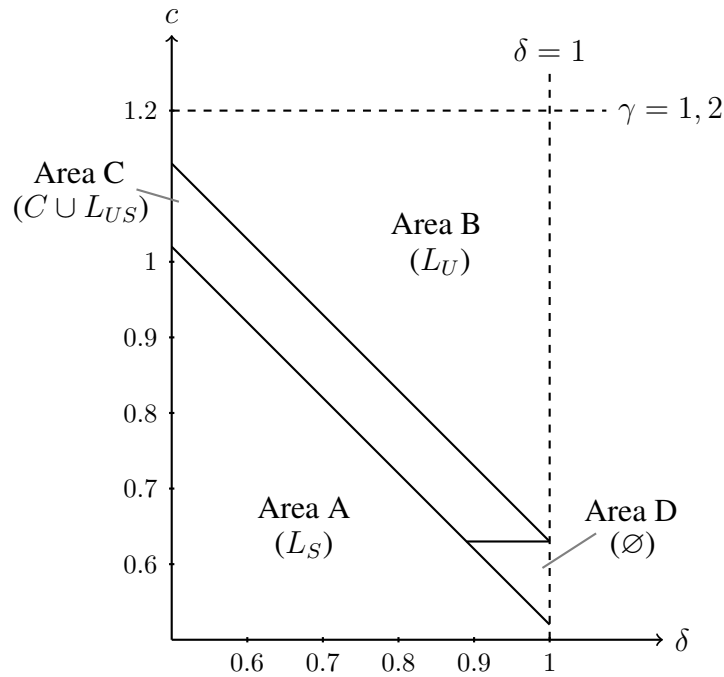

Figure 4: Electoral equilibria for different set of parameters. Majority coalitions are shown in brackets

There are several determinants of the electoral equilibrium. A higher average level of skills leads to a higher rate of return on projects (or a lower level of c). In this case, firms are ready to invest in the projects for a higher threshold level of tax, τ', and more workers prefer the free-entry regime, such that the group L_S forms a majority.

The inequality in skills distribution also matters. The figure 5 describes two alternative distribution functions for a level of skills. An average level of skills is the same for both distributions, but the size of groups L_U, L_S differs in two examples.
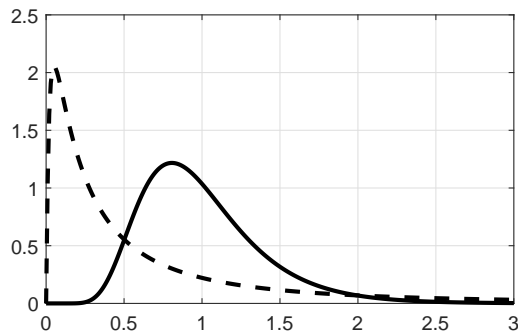

Figure 5: Examples of skills distribution functions

If the skills distribution is unequal, such that there is a high number of workers with low skills and a small number of workers with a very high level of skills, the no-entry regime is more probable; as the size of the group L_U is higher. Higher inequality in incomes between capitalists and workers (α) implies that workers are more interested in redistribution and so, there are more supporters of the (B, δ) policy. Finally, a higher maximum level of redistribution (δ) also leads to the increase of the group of workers, preferring (B, δ) policy. Now we turn our attention to the robustness of these results to the changes in voting rules.

7   Alternative voting rules

7.1   Ideological parties

In this section, following Krasa and Polborn (2010), Krasa and Polborn (2014) we consider the model of representative democracy with two ideological parties. The objective of the parties is to maximize the number of votes in elections. One liberal party credibly commits to set the free-entry regime. The other non-liberal party ideological position implies that the no-entry regime should be established. The ideological positions of both parties are fixed. However, they can choose the tax rate freely from the range $0 < \tau_{NB} < \tau'$ for the liberal party (R) and from the range $0 < \tau_B < \delta$

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for the non-liberal party (P). As before $\tau' < \delta$ and so the P party is ready to set a higher rate of redistribution than the liberal party if it is needed to win an election [12].

The timing of the model stays the same as in the baseline model. As agents' preferences towards the policy outcomes are the same as in the baseline model, we go directly to the political equilibrium results.

Proposition 4. *In the model with ideological parties*

1. *If either $\delta \leq 1 + c - \gamma$ or a number of votes belonging to capitalists is sufficiently low, $N \leq \overline{N}$, the R-party sets (NB, τ') policy and the P-party sets (B, δ) policy.*

2. *If $\delta > 1 + c - \gamma$ and a number of votes belonging to capitalists is sufficiently high, $(N + L)/2 > N > \overline{N}$, there is no Nash equilibrium in pure strategies in the game between two parties.*

Proof. See Online Appendix. □

The intuition of this result is the following. When capitalists hold a lesser number of votes, both parties compete for workers' votes, and so, they set the highest possible tax rates. As the party R credibly commits to ensuring the free-entry regime it sets a lower maximum tax rate (τ'). In this case, new projects are still profitable for new entrants. For a higher number of capitalists, both parties compete for capitalists' votes. If the party P, for example, proposes a policy (B, δ), the party R has incentives to set the policy $(NB, \tau^*_{NB} < \tau')$ to attract capitalists on its side. The party P also lowers the tax rate to attract capitalists, and, finally, even if one of the parties attracts the capitalists' votes, another party sets the highest possible tax rate to attract a larger number of workers' votes. We get a cycle and so there is no Nash equilibrium in pure strategies at all. For $\delta \leq 1 + c - \gamma$ a liberal party can not attract the votes of capitalists in any case as $V_C(NB, 0) \leq V_C(B, \delta)$ and the only alternative for a liberal party is to attract the votes of high-skilled workers by choosing (NB, τ') policy.

If either $\delta \leq 1 + c - \gamma$ or $N \leq \overline{N}$ the non-liberal party wins elections and sets (B, δ) policy only if the capitalists and workers supporting (B, δ) policy form a majority. From proposition 2 and corollary 1 we know the conditions of the existence of the majority, consisting of low-skilled workers and capitalists.

Corollary 2. *In the model with ideological parties, for $\delta \leq 1 + c - \gamma$ or $N \leq \overline{N}$, the non-liberal party wins the election only if the rate of return on projects is relatively low, an average level of skills is relatively low, the ratio of profits to wages is high, and the skills distribution is more right-skewed. Otherwise, the liberal party wins elections.*

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[12]If $\tau' \leq \delta$ all workers have the same bliss-point (NB, δ) and so the liberal party always wins elections.

7.2 Sequential voting model

Let us consider another political set-up. Assume that elections have two stages. On the first stage (a constitutional stage) voters choose the type of the entry regime (B, NB). On the second stage, they vote for a preferred tax rate. On each stage, voters vote strategically by taking into account their influence on outcomes. All other properties of the model remain the same.

It is easy to see that, as workers hold a majority of votes, on the second stage the electoral outcome is either (B, δ) or (NB, τ') policy. In both cases, the majority, consisting of all workers, prefer the highest possible tax rate.

At the constitutional stage of elections capitalists take into account the results of future votes on taxes and choose between two alternatives, either (B, δ) or (NB, τ'). From (17), (18), $V_C(B, \delta) > V_C(NB, \tau')$ and so they always vote for the B-regime on the first stage. Therefore, the next result holds.

Proposition 5. *In a sequential voting model*

1. *(B, δ) is a political equilibrium, supported by a majority coalition of capitalists and low-skilled workers, if $N + L_U > L_S$.*

2. *(NB, τ') is a political equilibrium, supported by high-skilled workers, if $L_S > N + L_U$.*

There are no incentives for both groups of workers, either L_S or L_U, to manipulate by voting strategically for a policy, which is not their bliss-point. If $N + L_U > L_S$ the bliss point of the group L_U is realised as a political equilibrium and L_S cannot get a better result by changing their preferences on the first stage. If $L_S > N + L_U$, the group of workers L_S is a majority and so the bliss-point of this group is realised in the political equilibrium.

Therefore, the same parameters determine the political outcome. If the rate of return on projects is relatively low, an average skills level is low, the share of profits to wages is high, and the skills distribution is more right-skewed, capitalists and low-skilled workers constitute the majority, supporting the no-entry regime with the highest possible redistribution rate.

7.3 Plurality rule

If the electoral outcome is determined by a simple majority of votes, the qualitative results still hold in most of the cases. The (B, δ) is a political equilibrium, supported by low-skilled workers, if $L_U > max\{N, L_S\}$. Alternatively, the (NB, τ') is a political equilibrium, supported by high-skilled workers, if $L_S > max\{N, L_U\}$. In the last case, capitalists have the highest number of votes

and so, the political equilibrium will be $(B, 0)$. As previously, if the rate of return on projects is relatively low, the share of profits to wages is higher, and there is a high-level of inequality in skills, (B, δ) is realised in the political equilibrium, supported by a simple majority of the least-skilled workers.

7.4 The run-off elections

Let us consider a voting procedure, when there are three candidates, who represent each of groups C, L_U, L_S. These candidates credibly commit to pursue the policy, which is a bliss-point of the group, they represent. There is a two-round system of runoff to elect a single winner, whereby only two candidates from the first round continue to the second round.

The timing of the model and the preferences of agents are the same as in the baseline model, and so, we go directly to the political equilibrium results. If one of the groups of voters holds the majority of votes it is trivial that the winner is the representative of this group. Let us focus on the case, when there is no a single group with the majority of votes.

Proposition 6. *In a two-round system of runoff elections with sincere voting if there is no single group of agents with an identical bliss point which holds a majority of votes, two political outcomes are possible.*

1. *(NB, τ') is a political equilibrium if $N > L_S > L_U$ or $L_S > N > L_U$.*

2. *Otherwise, (B, δ) is a political equilibrium.*

Proof. See Online Appendix. ☐

(NB, τ') may be a political outcome, when voters vote sincerely for their preferred candidate. If the candidate who represents L_U does not progress into the second round, the majority, consisting of all workers, vote for a candidate who represents L_S. However, in strategic voting case capitalists have incentives to manipulate by voting for another candidate (L_U).

Proposition 7. *In a two-round system of runoff elections with strategic voting if high-skilled workers (L_S) do not hold a majority of votes, (B, δ) is the unique political equilibrium, supported by a coalition of capitalists with the least-skilled workers (L_U).*

Proof. See Online Appendix. ☐

Indeed, if $L_S > C > L_U$, as $V_C(NB, \tau') < V_C(B, \delta)$, capitalists have incentives to vote for a candidate, who proposed (B, δ) policy in the first round. Otherwise, the candidate setting (NB, τ')

policy wins the election, which is a worse outcome for capitalists. The same is true, if $C > L_S > L_U$.

As we know the determinants of the size of the groups from the previous sections, the results are identical to the sequential voting model. If the rate of return on projects is relatively low, the average skills level is relatively low, the share of profits to wages is high, and the skills distribution is more right-skewed, either low-skilled workers or capitalists plus low-skilled workers constitute the majority, supporting the no-entry regime with the highest possible redistribution rate.

8   Corrupt politicians and the electoral outcome

In the baseline model, we consider a general-interest approach to politics of barriers to entry. However, there is also strong evidence that entry barriers can be supported by special interest groups (Grossman and Helpman (1994), Grossman and Helpman (1996)). Let us consider the extension of the baseline model in which each politician may be prone to corruption. More concretely, there are two types of politicians: corrupt and honest. Voters do not know the type of each politician. They know that with a probability λ a politician is corrupt and with a probability $1 - \lambda$ a politician is non-corrupt. It the politician is corrupt, after the elections he fixes a price of creating artificial entry barriers in the markets, by maximizing the gains from bribes.

The timing of the model is the following:

1. Two politicians (A, B) choose their policy platforms, consisting of the entry regime (B, NB) and a tax rate τ;

2. Elections are held, and the majority of votes determines the winner;

3. If a politician with a policy platform (NB, τ_{NB}) wins a race, with a probability λ, a winning politician informally sets a price (θ) for capitalists to create a no-entry regime in their industries. Capitalists decide either to pay the bribe or not. With a probability $1 - \lambda$ a winning politician fulfills promises, and the free-entry regime is implemented;

4. Each incumbent firm's owner (a capitalist) decides either to invest or not (I, NI) in a given project;

5. For each sector, if the entry of firms is not forbidden, an entrepreneur decides either to invest or not (I, NI) in the project;

6. All operating firms decide whether to hide profits from taxation or not;

7. All operating firms produce goods and pay wages to workers and after-tax profits to their owners;

8. Finally, redistribution occurs and agents get their final pay-offs.

As economic decisions of agents stay the same, let us focus on the informal mechanism of setting the high barriers to entry. In the free-entry regime with a tax τ' capitalists are ready to pay the bribe only if the following constraint holds

$$\theta \leq V_C(B, \tau') - V_C(NB, \tau') \tag{22}$$

From capitalists' preferences, we get that the participation constraint for capitalists is

$$\theta \leq (1 - \tau')\pi. \tag{23}$$

If a winning politician is corrupt, it is optimal to set a maxumum bribe, θ^*, such that

$$\theta^* = (1 - \tau')\pi. \tag{24}$$

In the case of corruption the de-facto political outcome is (B, τ_{NB}) instead of (NB, τ_{NB}).

Proposition 8. *A higher probability for politicians to be corrupt(λ) increases the number of workers, preferring (B, δ) policy:*

Proof. See Online Appendix. □

As previously, we have three groups of voters with identical within group bliss-points, (L_U, L_S, C). As workers take into account the possibilities of corruption, they decrease their support of politicians, proposing (NB, τ') policy. There are even more chances that crony capitalism is the electoral outcome. If workers anticipate that after elections the policy will be implemented under the influence of special interest groups, they will vote for no-entry, maximum redistribution policy as the second best option.

9   Conclusion

The main conclusion of this model is that an equal distribution of political rights does not necessarily lead to the adoption of institutions that favor free access to markets for new entrants and enhance competition and growth. In countries with a low initial level of skills and high inequality in incomes and skills, a majority of voters choose the high-entry barriers in the markets. In

this case, the preferences of the middle class, consisting of high-skilled workers, do not affect the electoral outcome. This argument is particularly relevant for countries with deep historical roots of wealth inequality and inequality of opportunities, as well as for countries relying on the export of natural resources. The model in this paper is static and so, it can not be applied to the analysis of long-term consequences of the existence of a majority coalition, supporting the no-entry equilibrium. It is interesting to study, under which conditions, societies can escape such a trap in a dynamic set-up.

One argument that we do not consider in our baseline model is the possibility of the endogenous choice of education policies. Saint-Paul and Verdier (1993) show that democracy can provide redistribution in the form of education subsidies, which are beneficial for economic growth. However, a final result will depend on the effect of the education policy on the inequality of incomes between workers. If the gain from education subsidies will be concentrated in the hands of the middle class (like in Fernandez and Rogerson (1995)), a winning coalition of capitalists and low-skilled workers will be stable. Saint-Paul et al. (2016) show in a probabilistic voting model that left-wing parties have incentives to underinvest in education of citizens to maximize future votes on elections. We can expect that the crony capitalism trap potentially exists even if education decisions are endogenous. Moreover, a change in skills distribution is a long process, and, therefore, the benefits from the education policy could be provided only in the long-run.

Appendix. Proofs

Proof of Proposition 2

If $\delta \leq \tau'$ all workers prefer maximum possible redistribution rate δ and the NB-regime, as there is no trade-off between a higher rate of redistribution and opportunities to set a free-entry regime.

For $\tau' < \delta$ there is a trade-off between the free-entry regime with a lower redistribution rate and the no-entry regime with a high redistribution rate. The bliss point for workers is either (NB,τ') or (B,δ). Let us compare the workers pay-off in each case. From (19) and (20)

$$V_k(NB, \tau') = \gamma[wh_k + \tau'\pi N/L], \tag{25}$$

$$V_k(B, \delta) = wh_k + \delta\pi N/L. \tag{26}$$

Workers prefer (NB, τ') policy only if

$$\gamma[wh_k + \tau'\pi N/L] > wh_k + \delta\pi N/L. \tag{27}$$

Dividing the inequality (27) by $w\overline{h}$, where $\overline{h}$ is an average skills level, we get

$$\gamma[h_k/\overline{h} + \tau'\alpha] > h_k/\overline{h} + \delta\alpha. \tag{28}$$

The inequality (28) can be represented as

$$(\gamma - 1)h_k/\overline{h} > (\delta - \tau'\gamma)\alpha. \tag{29}$$

Substituting τ' to the equation (29) we get

$$(\gamma - 1)h_k/\overline{h} > (\delta - \gamma + c)\alpha. \tag{30}$$

For $c < \gamma - \delta$ the inequality (30) holds for every positive h_k. For $c > \gamma$ the investment rate is always zero and all workers prefer the maximum redistribution policy. In the intermediate case there is a threshold level of human capital h', such as

$$h' = \overline{h}\alpha(\delta - \gamma + c)/(\gamma - 1),$$

which divides agents into two groups, the first one with $h < h'$ prefers the B-regime with high redistribution rate δ, and the second one with $h \geq h'$ prefers the (NB, τ') policy.

Proof of Corollary 1

From Proposition 2, if $\gamma - \delta < c < \gamma$ there are two groups of workers L_U, L_S with different bliss-points.

From the definition of threshold h', by taking the derivative of (21), the following conditions hold:

$$dh'/dc > 0, \, , dh'/d\delta > 0, dh'/d\alpha > 0, dh'/d\gamma < 0.$$

From the definition of c, taking the derivative of $\overline{h}, \gamma, \psi$, we get

$$dh'/d\overline{h} < 0, dh'/d\psi > 0$$

As h' defines a threshold level of skills for which individuals with $h \geq h'$ prefer the (NB, τ')

policy, a lower h' leads to a higher number of individuals with bliss-point (NB,τ').

$$dL_S/dc < 0, dL_S/d\gamma > 0, dL_S/d\delta < 0, dL_S/d\alpha < 0.$$

Moreover, the more right-skewed the distribution is, the higher the number of people with $h < h'$ and, hence, the lower the number of supporters of the free-entry regime among workers.

Proof of Proposition 3

To obtain a political equilibrium, we find a Condorcet winner policy outcome. Let us notice that only two types of a stable political equilibrium are possible: a majority coalition chooses either (NB, τ') policy or (B, δ) policy. A majority consisting of all workers will block all other feasible combinations of barriers to entry and tax rates.

1) Let us check, firstly, whether (NB, τ') is a political equilibrium or not. All workers always prefer (NB, τ') to the $(NB, \tau < \tau')$ and $(B, \tau < \tau')$. Thus, the only other potential policy that could be supported by the majority of voters is $(B, \tau > \tau')$. As (NB, τ') is a bliss point for relatively high skilled workers (L_S), only capitalists and low-skilled workers (L_U) could form a coalition to overcome (NB, τ'). It is always the case as $V_C(B, \delta) > V_C(NB, \tau')$. Therefore, if high-skilled workers L_S do not hold a majority, a majority coalition of capitalists and least-skilled workers prefers (B, δ) policy to (NB, τ') policy, and (NB, τ') can not be a political equilibrium.

2) Now we find the conditions under which (B, δ) is a stable political outcome. In this case, there is always a majority consisting of low-skilled workers (L_U) and capitalists, who strictly prefer (B, δ) to (NB, τ'). The only other potential policy that could be supported by the majority of voters is $(NB, \tau < \tau')$. This policy is supported by the coalition of capitalists and high-skilled workers (L_S) if

$$\begin{cases} 0 \le \tau_{NB} \le \tau' \\ V_c(NB, \tau_{NB}) > V_c(B, \delta) \\ V_{kn}(NB, \tau_{NB}) > V_{kn}(B, \delta), \end{cases} \tag{31}$$

where *kn* is a sub-group of workers who have a minimum level of skills and at the same time belong to the majority coalition of high-skilled workers and capitalists. According to the definition of the groups, $h_{kn} = h_{(L+N)/2}$. Therefore, (B, δ) is not a stable political outcome if

$$\begin{cases} 0 \leq \tau_{NB} \leq \tau' \\ \gamma(1 - \tau_{NB}) - c > 1 - \delta \\ \gamma(wh_{(L+N)/2} + \tau_{NB}\pi N/L) > wh_{(L+N)/2} + \pi N\delta/L. \end{cases} \qquad (32)$$

Dividing both sides of the last inequality by $w\overline{h}$ we rewrite the system (32) as

$$\begin{cases} 0 \leq \tau_{NB} \leq \tau' \\ \tau_{NB} < 1 - (1 + c - \delta)/\gamma \\ \tau_{NB} > -(\gamma - 1)h_{(L+N)/2}/(\overline{h}\alpha\gamma) + \delta/\gamma. \end{cases} \qquad (33)$$

If $\delta < 1 + c - \gamma$ the system (33) has no solutions, as for capitalists even the policy $(NB, 0)$ is worse than (B, δ). In this case (B, δ) is a unique Condorcet winner policy, supported by capitalists and low-skilled workers. If $1 + c - \gamma > \delta$ the system (32) has solutions only if

$$h_{(L+N)/2} > h'', \qquad (34)$$

where $h'' = (\overline{h}\alpha)(1 + c - \gamma)/(\gamma - 1)$. In this case, there is a cycle of preferences. (B, δ) is always dominated by $(NB, \tau_{NB} < \tau')$, which is dominated by (NB, τ'), which is dominated by (B, δ). Otherwise, (B, δ) is a Condorcet winner policy, which is the optimal strategy for both parties, A and B.

Proof of Proposition 4

Assume that party R sets the policy (NB, τ_{NB}). Then the party P has two alternatives: either it chooses (B, δ) to maximize potential votes of workers or it chooses $(B, min\{\tau_B^1 - \epsilon, \delta\}$ policy so that $V_C(B, \tau_B^1) = V_C(NB, \tau_{NB})$, where $\epsilon \to 0$. In this case, the party maximizes the number of workers' votes under the constraint that capitalists vote for the party P. From capitalists' preferences from $V_C(B, \tau_B^1) = V_C(NB, \tau_{NB})$ it follows that

$$\tau_B^1 = 1 + c - (1 - \tau_{NB})\gamma.$$

Let us define τ_{NB}^*, such that $V_C(B, \delta) = V_C(NB, \tau_{NB}^*)$, where from (19), (20)

$$\tau_{NB}^* = 1 - (1 - \delta + c)/\gamma.$$

For any parameters $\tau^*_{NB} < \tau'$.

For $\tau_{NB} \geq \tau^*_{NB}$ the capitalists vote for the party P even if it chooses (B, δ) policy. In this case, the populist party always choose (B, δ) policy to maximize the number of votes. For $\tau_{NB} < \tau^*_{NB}$ party P will try to attract the votes of capitalists and chooses $(B, \tau^1_B - \epsilon)$ instead of (B, δ) only if the number of capitalists' votes is higher than the number of workers' votes that the party P loses by switching the policy platform

$$N > L^P((B, \delta), (NB, \tau_{NB})) - L^P((B, \tau^1_B), (NB, \tau_{NB})),$$

where L^P is the number of workers' votes for the populist party given the strategy profile of both parties.

Therefore, we get the following lemma.

Lemma 2. *For a given policy of the liberal party, (NB, τ_{NB}), the optimal reaction of the non-liberal party is*

1. (B, δ) *policy if either* $\tau_{NB} \geq \tau^*_{NB}$ *or* $N \leq L^P((B, \delta), (NB, \tau_{NB})) - L^P((B, \tau^1_B), (NB, \tau_{NB}))$;

2. (B, τ^1_B) *policy if* $\tau_{NB} < \tau^*_{NB}$ *and* $N > L^P((B, \delta), (NB, \tau_{NB})) - L^P((B, \tau^1_B), (NB, \tau_{NB}))$.

By taking into account workers' pay-off functions, it is possible to estimate the number of voters from the group of workers, switching to the party R, if the party P changes its policy position from (B, δ) to (B, τ'). By substituting the pay-offs functions, we get

$$L^P((B, \delta), (NB, \tau_{NB})) - L^P((B, \tau^1_B), (NB, \tau_{NB})) = \int_{h_1}^{h_2} f(h)dh,$$

where

$$h_1 = c\alpha\overline{h}/(\gamma - 1)$$

$$h_2 = (\delta - \gamma\tau_{NB})\alpha\overline{h}/(\gamma - 1)$$

It is intuitive that for a lower τ_{NB}, the party P loses more votes of workers, switching their position to the level of (B, τ_B). Therefore, it is possible that only for an intermediate value of τ_{NB} the party P has incentives to choose (B, τ_B) instead of (B, δ).

Now let us consider the optimal strategy of the party R in the case, when (B, τ_B) policy is chosen by party P. The party R has two alternatives. To maximize workers' votes, it needs to choose the policy with a maximum possible level of tax, (NB, τ'). Alternatively, it can choose $(NB, \tau^1_{NB} - \epsilon)$ policy such that $V_C(B, \tau_B) = V_C(NB, \tau^1_{NB})$ to maximize the number of workers under the constraint that capitalists also vote for the party R.

From capitalists' preferences

$$\tau^1_{NB} = 1 - (1 - \tau_B + c)/\gamma.$$

For a low τ_B, such that $\tau_B \leq (1 + c - \gamma)$, τ^1_{NB} is negative and, hence, it is impossible for a party R to attract capitalists' votes on its side. Therefore, the following lemma holds.

Lemma 3. *For a given policy of the non-liberal party, (B, τ_B), the optimal reaction of the liberal party is*

1. *(NB, τ') policy if $\tau_B \leq (1 + c - \gamma)$ or if $N \leq L^R((B, \tau_B), (NB, \tau')) - L^R((B, \tau_B), (NB, \tau^1_{NB}))$,*

2. *$(NB, \tau^1_{NB} - \epsilon)$ policy if $\tau_B > (1 + c - \gamma)$ and $N > L^R((B, \tau_B), (NB, \tau')) - L^R((B, \tau_B), (NB, \tau^1_{NB}))$.*

From workers' preferences, we can find the condition, under which the liberal party chooses the policy $(NB, \tau^1_{NB} - \epsilon)$. By subsituting workers' pay-off we get

$$L^R((B, \tau_B), (NB, \tau^1_{NB})) - L^R((B, \tau_B), (NB, \tau')) = \int_{h_3}^{h_3} f(h)dh,$$

where

$$h_3 = \alpha\overline{h}(\tau_B - \gamma + c)/(\gamma - 1),$$

$$h_4 = (1 + c - \gamma)\alpha\overline{h}/(\gamma - 1).$$

If $N < \overline{N}$, where $\overline{N} = L^R((B, \delta), (NB, \tau^*_{NB})) - L^R((B, \delta), (NB, \tau'))$, $((B, \delta), (NB, \tau'))$ is a Nash equilibrium in the game between two parties as neither of the parties deviate from the chosen strategy. For $N > \overline{N}$ and $\delta > 1 + c - \gamma$ if the non-liberal party chooses (B, δ) policy, the R party will choose $(NB, \tau^*_{NB} - \epsilon)$ policy to attract capitalists votes. For the non-liberal party, it's optimal, then, to choose $(B, \delta - 2\epsilon)$ policy to attract capitalists on its side by lowering taxes a little bit. This sequence leads to the cycle as, at some step, the non-liberal party prefers to choose a maximum tax rate (B, δ) to attract workers' votes and, therefore, there is no Nash equilibrium in this case.

Proof of Proposition 6

In a two-round system of runoff elections with sincere voting, if there is no a single group of agents with an identical bliss point which holds a majority of votes, there are 6 potential cases, summarized in Table 2. In the first round, only two candidates with the highest votes stay in the race. In the second round, the group of votes, who vote for the candidate, eliminated in the first round, plays a decisive role. As $V_C(B, \delta) > V_C(NB, \tau')$ and also because $(B, 0)$ is the worst outcome for workers, we have the following results (see Table 2)

Proof of Proposition 7

If voters are strategic, in all cases, considered in Table 2, there are no incentives for workers to manipulate round one. Any deviation from their sincere preferences does not provide to them better results. However, capitalists have the motivation to manipulate, as their candidate cannot win the race. In round two all workers always choose the alternative candidate, not the candidate, who represents the capitalists. In cases $N > L_S > L_U$ and $L_S > N > L_U$, capitalists strategically vote in round one for the candidate, who represents L_U, and this candidate wins elections in round two.

Case	Winner
$L_S > L_U > N$	L_U
$L_U > L_S > N$	L_U
$L_S > N > L_U$	L_S
$L_U > N > L_S$	L_U
$N > L_U > L_S$	L_U
$N > L_S > L_U$	L_S

Table 2: The winner in the two-round system of runoff elections with sincere voting

Proof of Corollary 4

From Proposition 2 if $h' < h_{(L-\beta N)/2}$ the majority of votes belongs to workers with the bliss point (NB, τ'). If $h' > h_{(L+\beta N)/2}$, the majority of votes belongs to workers with the bliss point (B, δ). In the intermediate case, there is no a single group of voters holding a majority of votes. From proposition 3 if there is no a single group of voters holding the majority of votes the political equilibrium exists only if the (B, δ) is a stable political outcome. The (B, δ) is a Condorcet winner policy only if $\delta < 1 + c - \gamma$ or $h_{(L+\beta N)/2} > h''$. Therefore, it exists the threshold average skills level $(\overline{h}^*)$, for which democratization always leads to the elimination of barriers to entry, as L_S group of workers have the majority of votes. Moreover, a lower inequality in skills level or a lower share of profits in total income (α) increases the size of L_S group.

Proof of Proposition 8

As previously, in the political equilibrium, either (NB, τ') or (B, δ) is a Condorcet winner policy as all workers prefer the highest possible rate of redistribution given the level of barriers to entry.

As workers take into account the possibility of corruption, they vote for the (NB, τ') policy only if

$$(1 - \lambda)V_k(NB, \tau') + \lambda V_k(B, \tau') \geq V_k(B, \delta). \tag{35}$$

By substituting workers' pay-offs from (19) and (20), we get

$$(1 - \lambda)\gamma[wh_k + \tau'\pi N/L] + \lambda[wh_k + \tau'\pi N/L] \geq wh_k + \delta\pi N/L. \tag{36}$$

Dividing both parts of inequality by $w\overline{h}$, we get

$$(1 - \lambda)(\gamma - 1)h_k/\overline{h} + (\gamma + \lambda(1 - \gamma))\tau'\alpha \geq \delta\alpha. \tag{37}$$

For a given λ, the rise in the level of skills, h_k, leads to higher gains from the free-entry regime and, hence, increases the number of supporters of the free-entry regime among workers (L_S). There is a threshold level of h^{**}, for which the following equality holds

$$(1 - \lambda)(\gamma - 1)h^{**}/\overline{h} + (\gamma + \lambda(1 - \gamma))\tau'\alpha] = \delta\alpha. \tag{38}$$

As the left-hand side of the equation is the decreasing function of λ, we get

$$dh^{**}/d\lambda > 0, \tag{39}$$

which means that the higher the probability for a politician to be corrupt, the lower the support of (NB, τ') policy among workers.

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