Creative Destruction and Persistence of Inefficient Institutions in Democracies

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Abstract

This paper develops a simple quality-ladder model with heterogeneous agents differing in their skills and wealth endowment to explain the persistence of barriers to entry in democracies. In the model agents vote for a rate of redistribution and for the level of barriers to entry, which protect incumbent firms from competition with new entrants. Political regimes differ in the distribution of votes between agents and political equilibrium is determined as the majority core voting equilibrium. The analysis of the model shows that if a society democratizes, under certain conditions this leads only to the rise of redistribution, rather than to the elimination of barriers to entry. In this equilibrium the middle class become a political outsider and the level of redistribution is determined by the least skilled agents. We show that this outcome is more probable for countries with a low level of human capital and high inequality in incomes and in skills.

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1 Introduction

For the last thirty years a large group of countries in Latin America, East Asia and Eastern Europe have democratized their political regimes. The transition towards democracy could be a transition towards prosperity, if it provides conditions for the wide support of growth enhancing institutions and policies. At the same time, in many new democracies old inefficient economic institutions persist (i.e. Acemoglu and Robinson (2008)).

The empirical studies related to the effect of changes in political regimes from dictatorship to democracy on institutions and economic growth give mixed results. According 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. Acemoglu et al. (2014) find that

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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. Doucouliagos and Ulubasoglu (2008) summarize the empirical studies of democracy and growth, using meta-regression techniques. They show that most of the studies does not find the direct effect of democracy on growth, however, democratization influences indirectly on development through different channels, including human capital channel, political stability and the level of economic freedom.

One way to explain the effect of democratization on economic institutions and growth is to consider its effect on barriers to entry. Barriers to entry, which protect incumbents from competition with new entrants, is one of the form of extractive economic institution which creates rent for narrow groups of agents at the costs of economic efficiency. Barriers to entry can be measured simply as costs of creating a new firm (Djankov et al., 2002), however, a broader definition of barriers to entry includes also the differences in credit conditions, legal environment, property rights protection between incumbents and new entrants (Acemoglu, 2008).

In autocracies the costs of entry (creating a new business and dealing with licenses) are on average higher than in democracies (Djankov, 2008). At the same time, differences between de jure democratic countries are very high in terms of the costs of creating business or business environment. For example, South Korea and Argentina have been democratic countries since the end of 1980s according to Polity IV index, however, the place in the ranking of Doing Business Indicators (2012) is 8 for South Korea and 124 for Argentina (in Starting the business ranking, 8 and 154).

In this paper we propose a theoretical explanation for persistence of institutions which impede economic growth (in our case, the barriers to entry) and poor economic performance in democracies. In our model a society consists of shareholders of incumbent firms (elite) and workers. Workers are heterogeneous in their human capital level. Some workers have also the entrepreneurial talent, which helps to organize new firms. Barriers to entry prevent the creation of new firms and, thus, permit incumbents to escape an R&D contest with new entrants¹.

At the beginning of the period agents vote for the set of policies in a two-dimensional policy space, including the profit tax rate and the level of barriers to entry. The profit tax is collected from all firms and is redistributed to workers. In a free-entry regime as new firms carry the costs of investment in technological adoption there is a threshold level of profit tax rate, for which investments in new technology for them are profitable. We show that the policy preferences of high-skilled workers and low-skilled workers differ: high-skilled workers prefer zero entry barriers and relatively low redistribution rate, whereas low-skilled workers prefer high redistribution rate and high entry barriers. The shareholders of incumbent firms (capitalists) vote

¹In Schumpeterian growth models (Aghion, Howitt, 1992, 1998) the patent system is a necessary institute for the existence of innovations and growth. In the case of the free copying of new technology potential innovators have zero interest to invest in new projects as the expected profits from these projects is always negative because of the free-rider problem. Therefore, patent protection is needed to assure a positive rate of innovations and growth. Here, we focus the barriers in the research sector. Barriers to entry in our model protect incumbent firms from a R&D contest with new entrants, and hence, in some cases, discourage technological progress
for the barriers to entry and zero redistribution rate.

The main result of the model is that democratization does not necessary lead to the elimination of barriers to entry. The high redistribution no-entry policy could be a stable political outcome supported by the majority consisting of the shareholders of incumbents firms (capitalists) and low-skilled workers. The political equilibrium is determined by the average skill level, *de-facto* political power distribution (the extent of democratization) and by the level of inequality in skills and pre-tax incomes. In an economy with a high average level of skills and low inequality of skills and income, all workers prefer zero barriers to entry and, hence, the democratization leads to zero entry barriers, enhances competition and growth.

In a single-issue election with one-peaked voter preferences, if two parties compete for the majority of voters, then they optimally locate at the median voter (unique core point). At the same time, in a multi-issue election there is the problem of the intransitivity of majority preferences. To solve this problem, modern multi-dimensional voting models consider the institutional arrangements which restrict the possibilities of coalition formation and, thus, solve the problem of intransitivity of collective preferences (Levy, 2005, Fernández, Levy, 2008), or use probabilistic voting models (f.e. Bernasconi, Profeta, 2012). In our set-up we analyze the simple majority core voting equilibrium and do not restrict coalition formation. According to Schumpeter (1943) the central feature of democracy is political competition and the free entry of new parties into the political process. In our approach democracy is also a dictate of the majority. Political equilibrium is defined as majority core voting equilibrium (as, for example, in Fernández, Rogerson (1995)), in which a stable coalition of agents choose the policy. All other agents, which do not belong to the stable majority coalition, do not influence social decision-making. Therefore, the difference between authoritarian regimes and democracy is simply the difference between the set of agents, which have the possibility to effect social choice. Democratization means also the extension of franchise and broader distribution of political power between agents.

The model is capable of explaining the phenomenon, according to which the middle class can be political outsiders. 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 the equilibrium level of redistribution is determined by lower class agents. This fact explains the empirical finding of Scervini (2012) stating that the middle class does not play a decisive role in redistribution, as postulated by the median-voter hypothesis. Our analysis also shows that the rise in income inequality not only increases the preferences towards higher redistribution, but also decreases the political support for free-entry policy, as the gains from economic growth become distributed more unequally.

This paper complements the analysis of Acemoglu and Robinson (2008), in which authors explain the persistence of inefficient institutions in new democracies through the distribution of *de facto* political power. They 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 etc. and, thus, make a strong opposition to the changes in economic institutions. We propose an alternative explanation, according to which a new coalition of agents resists to the changes in barriers to entry, even if political power is distributed more equally. The model explains also the tendency towards the politics of populism in new democracies. Democratization can even lower growth if it does not lead to the changes in the economic institutions and only increases the redistribution, which is potentially distortionary. Our results also provide the theoretical basis for the empirical finding of Acemoglu et al. (2014) stating that the level of education influences positively the expected benefits from democratization. In the model the persistence of barriers to entry in new democracies is possible only for low skilled economies.

The paper is structured in the following way, section 2 describes the basic framework of the model, the innovation race between incumbents and new entrants and the effects of political choice on the results of this race. Section 3 describes types and preferences of agents, section 4 discusses the political equilibrium and the basic results. section 5 concludes.

2 Economic framework

The economy is inhabited by one-period lived agents, who maximize current pay-offs. All agents are divided into $N$ capitalists and $L$ workers. Each capitalist is an owner of one incumbent firm, which produces an intermediate input from the final good. Incumbent firms produce a version of an intermediate input and each from them is a monopoly in its market and gets a profit $\pi$. Workers are employed only in the production of the final goods, which are produced in a competitive market using labor and intermediate inputs. The final good is used as a consumption good, as a raw material in the production of intermediate inputs and as an input in innovation activities\textsuperscript{2}. Each worker supplies inelastically 1 unit of labor in a perfectly competitive labor market. Workers differ in the level of skills, the worker $k$ gets the wage $wh_k$, where $w$ is the skill-adjusted wage rate and $h_k$ is the individual skills level. The distribution of skills is exogenous and constant over time.

At the beginning of the period a polity, consisted of all agents, make political decisions about the level of redistribution and the level of barriers to entry. The policy set is two-dimensional, it consists of the entry regime, either to block the entry of new firms ($B$) or not to block ($NB$) and a profit tax $\tau$, which provides the redistribution from capitalists to workers. All collected profit taxes are distributed between workers as lump-sum transfers.

After elections, firms make investment decisions. Incumbent firms are able to invest in a risk-free

\textsuperscript{2}The general equilibrium framework of the model is presented in Appendix A
Note: The pay-off of incumbents and new entrants is represented in round brackets. Investments can be positive (I) or zero (NI). The white arrow underlines the fact that new entrants are capable of making investments only in the NB-regime.

projects, which increase the quality of an intermediate input and their profits by $\gamma > 1$. The costs of the project is equal to $c\pi$ units of final goods. There is no credit market imperfections and projects are realized if the expected profits from them are positive. If investment projects in all industries are realized both profits and wages increase by $\gamma$ times.

If incumbent firms do not invest in the projects, in the free-entry regime they risk being replaced by new entrants. For each sector there is one entrant, who is able to invest in the same project with a given probability of success $\lambda \leq 1$, where $\lambda$ measures the level of entrepreneurial talents of potential innovators.

If the new entrant is successful, the incumbent will loose the market in the competition with a new more efficient entrant. At the same time, incumbents have first-mover advantage, if they invest in the project, they are immune to competition. The following assumption guarantees that $\lambda$ is sufficiently high, such that the entry threat can be credible.

**Assumption 1.** $\lambda \gamma > \gamma - 1$

The investment race between incumbents and new entrants is represented in figure 1. Three cases are possible. As soon as the following inequality holds

$$\gamma(1 - \tau) - c \geq 1 - \tau,$$  \hspace{1cm} (1)

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As it is shown in Appendix A the costs of innovation are also proportional to the current complexity of innovation.

New firms can be organized by high-skilled workers with entrepreneurial skills or by foreign companies, that look for new markets. Both interpretations are possible.
the rate of return on investments is so high, that incumbent firms will invest in the project even in the B-regime. In this case the type of the entry regime does not influence economic outcomes. In the opposite case, the entry threat is credible only if the expected profits from investment projects for new entrants are positive.

\[ \lambda \gamma (1 - \tau) - c \geq 0 \]  

(2)

If the entry threat is credible, incumbents always will use their first mover advantage and invest in projects, to avoid the possibility of being replaced by the new entrant\(^5\). Figure 2 describes three economic equilibria of the model. In the areas 1 and 3 the entry regime does not effect the investment level. In the area 2, incumbents make investments only in the NB-regime to escape competition with new entrants. Two threshold tax rates exist. If \( \tau > \tau' \) new entrants do not invest in new projects even if barriers to entry are absent. From (2)

\[ \tau' = 1 - c / (\lambda \gamma). \]  

(3)

For \( \tau < \hat{\tau} \) the incumbent firms make investment even in the B-regime. From (2)

\[ \hat{\tau} = 1 - c / (\gamma - 1). \]  

(4)

From assumption 1 \( \hat{\tau} \) is always less than \( \tau' \) and so, the area 2 of figure 2 is not an empty space.

As soon as investment projects are realized, firms produce goods and pay wages to workers. In order to limit the redistribution possibilities, we follow Acemoglu (2008) by supposing that firms can hide their

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\(^5\)To show this, let us compare the expected profits of incumbent firms in the case when the entry threat is credible. Incumbent firms will use their first mover advantage, if \( \gamma (1 - \tau) - c \geq (1 - \lambda) (1 - \tau) \). For \( c < \lambda \gamma (1 - \tau) \) this inequality always holds.

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profits from taxation. The costs of hiding is $\delta$ per unit of profits. This assumption guarantees that the actual tax rate does not exceed $\delta$, in the opposite case firms will hide profits and the total amount of tax incomes will drop to zero.

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

1. The entry regime ($B, NB$) and a tax rate $\tau$ are chosen in the political process. This decision is not renegotiable;
2. A patent race between incumbents and new entrants occurs;
3. Firms produce goods and pay wages;
4. All producers decide whether to hide profits;
5. Redistribution and consumption occurs.

3 Agents preferences in a policy space

This section describes agents’ political preferences in a two-dimensional policy space $\{J, \tau_J\}$, where $J \in \{B, NB\}$, $\tau_B \in [0, 1]$, $\tau_{NB} \in [0, \tau']$. These preferences determine the endogenous choice of policy variables, which will be specified in the next section. The NB-regime is defined as the regime with zero entry barriers and the credible entry threat ($\tau \leq \tau'$).

3.1 Capitalists’ preferences

The capitalists’ pay-off consists of the after-tax profits of incumbent firms. In the B-regime the pay-off of capitalists equals

$$V_{cB}^{\tau} = \max\{(1 - \tau)\pi; [\gamma(1 - \tau) - c]\pi\}. \quad (5)$$

As the entry threat is absent incumbent firms freely choose whether to invest in the project or not and the capitalists’ pay-off is the highest possible gain from these two alternatives. As it is shown previously in the NB-regime incumbent firms always use their first-mover advantage and invest in projects. Therefore, the capitalists’ pay-off in the NB-regime equals

$$V_{cNB}^{\tau} = [\gamma(1 - \tau) - c]\pi. \quad (6)$$

The formulas (5), (6) hold for $\tau \leq \delta$. If $\tau > \delta$ the incumbent firms will hide profits and the capitalists’ pay-off will be the same as in the case of $\tau = \delta$. 

7
Figures ?? describe the capitalists pay-offs in the B- and NB-regimes for different level of profit tax ($\tau$). If the rate of return on projects is relatively low, such that $c > \gamma - 1$, (fig.?), the B-regime is always better for capitalists, than the NB-regime. If the entry threat is credible, incumbent firms will invest in the project only to escape competition and so they get lower profits, than in the B-regime. If the rate of return on projects is sufficiently high $c < \gamma - 1$ (fig. 4) for a low tax rate $\tau \leq \hat{\tau}$ capitalists are indifferent between the two entry regimes, as in both regimes incumbent firms will invest in the project and get the same level of profits. For $\tau > \hat{\tau}$ capitalists always prefer the B-regime.

Figure 3: Capitalists pay-off if $c > \gamma - 1$ and $\tau' < \delta$

![Figure 3](image1)

Figure 4: Capitalists pay-off if $c < \gamma - 1$ and $\tau' < \delta$

![Figure 4](image2)

In all cases capitalists’ bliss-point is (B,0). They are indifferent between (NB,0) and (B,0) if $\tau \leq \hat{\tau}$.

The following lemma is helpful for the next discussion.

**Lemma 1.** Capitalists prefer no-entry, high redistribution policy (B,$\delta$) to the free-entry, moderate redistribution policy (NB,$\tau'$) if

$$1 + c - c/\lambda - \delta > 0,$$

which means that 1) the probability of success ($\lambda$) for new entrants’ investment projects is high; 2) the maximum redistribution rate ($\delta$) is low; 3) the costs of innovations ($c$) are low.

The proof followed directly from the properties of pay-off functions. The intuition behind this result is the following. If the probability of success ($\lambda$) for new entrants’ is high or the costs of the project is low
then the maximum tax rate in the free-entry regime \( (\tau') \) is relatively high. Therefore, the policy \((NB, \tau')\) become less attractive for capitalists, bearing the burden of higher tax rate. On the opposite, a higher *delta* makes the policy \((B, \delta)\) less attractive.

### 3.2 Workers’ preferences

The pay-off of workers consists of wages and lump-sum transfers. For \( \tau < \delta \) firms do not hide their profits and lump-sum transfers for each worker equal \( \tau \pi N/L \). If incumbent firms do not invest in new projects (the \( B \) regime with \( \tau > \hat{\tau} \)) workers’ pay-off \((V^{NI}_k)\) equals

\[
V^{NI}_k = wh_k + \tau \pi N/L. \tag{8}
\]

In the \( B \)- and \( NB \)-regime with \( \tau \leq \hat{\tau} \), investment projects are realized and wages, profits and transfer payments increase proportionally by \( \gamma \). Therefore, workers’ pay-offs \( V^I_k \) equal

\[
V^I_k = \gamma[wh_k + \tau \pi N/L]. \tag{9}
\]

It is important to note that pay-offs differ within workers due to different level of skills. Higher skilled workers get higher salaries, but also benefit more from the technological progress. Therefore, there is a potential disagreement between the high-skilled workers and low-skilled workers, who consider transfer payments as the main source of income. The formal analysis of this claim is presented in Proposition 1.

Let define \( \bar{h} \) as the average level of skills within workers, and \( \alpha \) is the ratio of total profits to total wages.

\[
\alpha = \pi N/(w\bar{h}L). \tag{10}
\]

The next proposition follows

**Proposition 1.** Workers bliss points

1. For high rate of return if \( c < \lambda(\gamma - \delta) \) all workers prefer the \( NB \)-regime with the highest possible redistribution rate \( \tau = \min\{\tau', \delta\} \).

2. For intermediate rate of return if \( \lambda(\gamma - \delta) < c < \lambda \gamma \) the bliss point for the group of relatively high skilled workers with \( h_k \geq h' \) is \((NB, \tau')\), for the rest of workers \((h_k < h')\) the bliss point is \((B, \delta)\), where

\[
h' = \bar{h}\alpha(\delta - \gamma + c/\lambda)/(\gamma - 1). \tag{11}
\]

3. For low rate of return if \( c > \lambda \gamma \) the entry is not possible and all workers prefer the maximum redistribution rate \((B, \delta)\).
The result of proposition 1 is illustrated in figures 5, 6. We define two groups of workers of a size $L_1, L_2$, with the identical within-group bliss points. As soon as the net gains from technological progress concentrate mostly in the hands of firm-owners and high-skilled workers, the group of relatively low-skilled workers ($L_1$) prefers the no-entry regime with the maximum redistribution rate $(B, \delta)$. The group of relatively skilled workers ($L_2$) prefer a lower rate of redistribution and the free-entry regime with positive investments $(NB, \tau')$.

Figure 5: Redistribution supporters’ ($L_1$) pay-off, $h_k < h'$

![Figure 5](image1.png)

Figure 6: Growth supporters’ ($L_2$) pay-off, $h_k > h'$

![Figure 6](image2.png)

The size of both groups depends on the skills distribution between workers. From (??) the more right-skewed the skills distribution is, the higher the number of supporters of $(B, \delta)$ policy between workers. A higher share of wages in total revenues (lower $\alpha$) decreases the gain from redistribution, but increases the gain from economic growth for all workers, and, finally, increases the number of supporters of the policy $(NB, \tau')$ between workers. The rate of return of projects also matters. A higher $\gamma$ or lower $c$ also increases the number of workers, supporting the free-entry regime.
4 Political equilibrium

In this section we study how political regimes influence the political equilibrium and the economic behavior of agents. The main goal is to analyze the effect of democratization on political and economic outcomes. We assume that economic policy is determined by a majority coalition of voters. Political regimes differ in distribution of votes between agents. A perfect democracy is a political regime, in which all agents have the identical number of votes. Therefore, political power is equalized between all agents. In imperfect democracy or oligarchy capitalists have relatively higher number of votes, than workers. Let $\beta$ measures the number of capitalists’ votes, $\beta \geq 1$. The total number of votes, therefore, equals $N\beta + L$. Democratization in this case leads to the extension of the franchise to workers as their relative number of votes increases. If $\beta = 1$ each agent has one vote, which is a perfect democracy case. For $\beta > L/N$ capitalists are decisive voters and a political regime is an oligarchy.

Majority core voting equilibrium A political equilibrium is a combination ($J^*$) of an entry regime, tax rate and transfer payments, such that there is no a strict majority of voters, who prefer another feasible combination $J$ to $J^*$.

During the transition to democracy political power diffuses to a larger group of voters, therefore, capitalists loose the dominant political power $\beta < L/N$ and, by definition of political equilibrium, in order to influence policy outcomes they need to form a stable winning coalition with workers. A potential effect of democratization on barriers to entry, redistribution and investments is summarized below.

Case 1. One-dimensional conflict.

1.1. The highest rate of return ($c < \min\{\gamma - 1; \lambda(\gamma - \delta)\}$).

In this case all workers prefer the NB-regime with a maximum possible redistribution rate. The highest rate of return guarantees that even in an oligarchy incumbent firms make investments. The transition to democracy results in more redistribution, but does not influence the investment rate, which is positive for both regimes. This case describes democratization in growth-miracle countries, especially in East Asian countries like South Korea or Japan. At the beginning of a take-off even authoritarian regimes in these countries were characterized by high growth rates.

2.2. The lowest rate of return, $c > \lambda \gamma$.

This is a poverty trap case, even a decrease in barriers to entry does not provide incentives to invest in projects. All workers prefer $(B, \delta)$ policy and all capitalists prefer $(B, 0)$ policy. There is a one-dimensional distributional conflict between capitalists and workers. This case describes the transition to democracy in the least-developed countries, which usually leads to the redistribution of wealth and incomes without positive changes in investment climate.
Case 2: Two-dimensional conflict.

The policy space is two dimensional for an intermediate level of a rate of return. In this case two scenarios of democratization are possible. In the first one the extension of franchise to workers leads to the elimination of entry barriers. If \( c < \lambda (\gamma - \delta) \) all workers have an identical bliss-point \((NB, \tau')\) and the transition to democracy guarantees that a society choose the free entry regime with a positive rate of investment and economic growth. All workers are consolidated as there is no conflict of interest relative to the proffered policy within workers. Even if a democratic regime is imperfect, and each capitalist has a larger number of votes, than a worker, workers constitute an encompassing majority (in Olson terminology) which set the free-entry regime with a positive profit tax(\( \tau' \)).

However, for \( c > \lambda (\gamma - \delta) \) there are already three groups of agents with different bliss-points: capitalists prefer \((B, 0)\) policy, relatively high-skilled workers prefer \((NB, \tau')\) and relatively low-skilled workers prefer \((B, \delta)\). If one of the groups have majority of votes, the political equilibrium is trivial. A majority of pro-growth workers prefer the free-entry policy\(^6\) and a majority of pro-redistributive workers chooses the \((B, \delta)\) outcome.

Otherwise, as soon as there is a disagreement between workers relative to their preferred policy under some conditions a majority coalition include the richest group of society (capitalists) and the poorest group of society (low-skilled workers). This claim is formally proved in the next proposition.

Let us define \( h_{km} \) as the level of skills of the worker who simultaneously belongs to a minimum majority coalition of capitalists and the least-skilled workers, and also has a maximum level of skills within the members of this coalition.

**Proposition 2.** Let us consider the case, when \( L_1, L_2, \beta N \) is less than one half of the voters. Three political outcomes are possible.

a) \( \{B, \delta\} \) is a majority core equilibrium, which is supported by the coalition of capitalists and the least-skilled workers. This happens if the distribution of skills is highly skewed, democratization is partial and the ratio of total profits to total wages(\( \alpha \)) is sufficiently high such that the following inequality holds

\[
(\gamma - 1)h_{km}/\overline{h} \alpha < 1 + c - \gamma;
\]

and \( \delta \in (\delta_1, \delta_2) \), \( \delta_1 = (\gamma - 1)h_{km}/\overline{h} + \gamma \tau' \), \( \delta_2 = 1 + c - c/\lambda \)

b) There is no a stable equilibrium if condition \((??) \) holds and \( \delta > \delta_2 \).

c) In all other cases \( \{NB, \tau'\} \) is a majority core equilibrium.

\(^6\)From proposition 1 high-skilled workers form a majority if

\[
(\gamma - 1)h_{L-S/2}/\overline{h} \alpha > 1 + c - \gamma,
\]

where \( h_{L-S/2} \) is the level of skills of the least-skilled worker in a majority of high-skilled workers.
Proof. see Appendix B

In most of the cases the political equilibrium exists and is unique. From the proposition 2, there exists a sufficient condition which guarantees the existence and the uniqueness of political equilibrium\footnote{In a two-dimensional case $c < \lambda \gamma$. Therefore, $\delta_2 = 1 + c - c/\lambda$ is always lesser than $1 + \lambda \gamma - \gamma$. As a result, The inequality (??) is a sufficient condition for $\delta < \delta_2$.}

$$\delta < \lambda \gamma + 1 - \gamma. \tag{14}$$

In the case of three groups of voters, If $\delta$ is high, such that the condition (??) is violated, each majority coalition of voters is unstable. Intuitively, a high level of redistribution $\delta$ make the coalition of capitalists and low-skilled workers unstable, as capitalists are not interested in very high rate of redistribution and prefer to form a coalition with skilled-workers to set medium-redistribution rate with free-entry of firms. For a high probability to be replaced by new entrants ($\lambda$) capitalists tolerate a higher rates of redistribution. So, from (??) for $\lambda = 1$, the coalition of capitalists and the least-skilled workers is always stable regardless of the level of redistribution ($\delta$).

Let us assume that the inequality (??) holds, therefore, the political equilibrium always exists. Figure ?? summarizes political equilibria for different political regimes ($\beta$) and different rates of return on projects.

Figure 7: The political equilibria

Note: For $c < \lambda (\gamma - \delta)$ all workers prefer the NB-regime. For $\lambda (\gamma - \delta) < c < \lambda \gamma$ there is a conflict of interest within workers. The area ($B, \delta$) becomes larger, if skills distribution between workers becomes more unequal or a share of capitalists income in total revenue increases.

It is shown at the end of Appendix A that the costs of the project ($c$) are negatively related with the average level of skills, which is exogenous in our model. Therefore, the next corollary follows

**Corollary 2.** It exists a threshold average skills level ($\bar{h}^*$), such that in an economy with high-skilled labor force ($\bar{h} \geq \bar{h}^*$) democratization always leads to the elimination of barriers to entry, in an economy with
low-skilled labor force \((\bar{h} < \bar{h}^*)\) barriers to entry remain persistent if 1) democratization is only partial or 2) the inequality in human capital distribution is high or 3) the relative share of wages in total income is low.

To clarify this result let us consider a numerical example in which there is no consensus within workers and so, the level of average human capital is sufficiently low. Suppose that, the distribution of human capital between workers is approximated by the log-normal distribution. We set \(\gamma = 1.5, \lambda = 0.8, c = 0.78\), assuring that \(\tau’ = 0.35\). We set also \(\delta = 0.6\) and \(\alpha = 1/2\). The ratio of the number of capitalists to the number of workers \((N/L)\) equals \(1/10\). Figure ?? describes political outcomes depending on two main factors, the type of political regime \((\beta)\) and the level of inequality in skills, which is measured by the ratio of an average level of skills to the median level of skills \((\bar{h}/h_{med})\).

Figure 8: Majority coalitions and political outcomes in the case of different workers preferences (numerical example)

A partial democratization leads to the formation of a coalition between capitalists and the lowest skilled workers \((L_1 + N)\). Capitalists in this case agree to the maximum redistribution of profits \((\delta)\) to avoid competition of incumbents firms with new entrants. Low-skilled workers also support this policy, as this is the best economic policy for them according to their preferences. Even in a perfect democracy the \(NB\)-regime is not realized in the political equilibrium if an inequality of skills or an inequality of pre-tax incomes between capitalists and workers is sufficiently high. One implication of this result is that, as soon as a coalition of capitalists and low-skilled workers if formed, an equilibrium level of redistribution is chosen by poor, rather than by middle class agents.

5 Welfare maximizing economic policy

High barriers to entry are detrimental for economic growth, because they limit competition between incumbent firms and new entrants and destroys incentives to invest in technological adoption. However, barriers to entry do not always decrease welfare because of the replacement effect, found in the literature on Schumpeterian growth (e.g. Aghion, Howitt, 1998). New firms can overinvest in R&D projects as they do not take
into account losses in current profits of incumbent firms. Assume that the social welfare function is simply the sum of pay-offs of all agents in the economy.

\[ \begin{align*}
W &= wH + \pi N - Z, \\
\end{align*} \] (15)

where \( Z \) is the total R&D spending. If incumbents firms realize new project \( W = \gamma(wH + \pi N) - c\pi \), and \( W = wH + \pi N \) in the opposite case. Investments increase welfare only if

\[ \begin{align*}
(\gamma - 1)(wH + \pi N) - c\pi N > 0
\end{align*} \] (16)

Dividing both parts of inequality on \( wH \), we get

\[ \begin{align*}
(\gamma - 1)(1 + \alpha) - c\alpha > 0,
\end{align*} \] (17)

which can be rewritten as

\[ \begin{align*}
c < (\gamma - 1)(1 + \alpha)/\alpha
\end{align*} \] (18)

If this condition holds investments increase welfare even if welfare function is static as it does not take into account the effect of innovations on productivity in future periods. Therefore, if the share of profit in total value added \( (\alpha) \) is sufficiently small, which means also that the replacement effect is small, the B-regime is always detrimental for welfare.

6 Conclusion

The main conclusion of this model is that more equal distribution of political rights does not obviously lead to the adoption of institutions, favoring free access to markets for new entrants, enhancing competition and growth. If voters chose both the level of redistribution and the barriers to entry democratization always leads to an increase in income redistribution, however, it decreases the barriers to entry in goods markets only under certain conditions, which includes a high average level of skills, a low inequality in pre-tax income between capitalists and workers and a low inequality of skills between workers. Under these conditions there is a majority of voters, which consists of all workers, supporting a free-entry regime. Democratization in countries with a low initial level of skills and high inequality in wealth and skills results in the populist policies, supporting by the coalition of capitalists and low-skilled workers. Under plausible parameters this policy is not Pareto-efficient as it does not maximize the sum of agents pay-offs. In this case, the middle class consisting of high-skilled workers becomes a political outsider. 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.
One argument, that we do not consider in our baseline model, is the possibility of the endogenous choice of education policies. Saint-Paul, Verdier (1992) show that democracy can provide redistribution in the form of education subsidies, which are beneficial for economic growth. One of the guess is that a final result will depend on the effect of the education policy on the inequality of incomes within workers. If the gain from education subsidies will be concentrated in the hands of the middle class (like in Fernández and Rogerson (1995), Veselov (2012)) a winning coalition of capitalists and low-skilled workers will be stable. 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.

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Appendix A. The general equilibrium set-up

Let us consider a quality-ladders model, which is based on the model of Howitt and Mayer-Foulkes (2005). Assume that there is a single general good, produced by labor and specialized intermediate inputs, according to the following production function

\[ Y = \frac{H}{N^{1-\alpha}} \sum_{i=0}^{N} A(i)^{1-\alpha} x(i)^{\alpha}, \] (19)

where \( Y \) is the output of the general good, \( H \) is the quantity of skill-adjusted labor engaged in production and \( x(i) \) is the quantity of intermediate input \( i \), \( A(i) \) is the current quality of intermediate input \( i \), \( N \) measures the number of intermediate inputs, and \( 1 - \alpha \) is the share of labor income in the total output of the general good.\(^8\)

\(^8\)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, 2009)
The general good can be used interchangeably as consumption or an input in intermediate goods production or R&D 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

\[
p_x(i) = \alpha A(i)^{1-\alpha} (H/N)^{1-\alpha} x(i)^{\alpha-1}.
\]

We assume that the production of each particular type of intermediate inputs is performed by an unconstrained monopolistic firm \(^9\) that uses one unit of the general good to produce one unit of input. Thus a monopolistic firm maximizes its profit by choosing the level of production of intermediate inputs

\[
\max_x \{p_x(i)x(i) - x(i)\}.
\]

In this case from the monopolist problem the equilibrium price is equal to

\[
p_x(i) = 1/\alpha.
\]

From equations (20) and (21) the equilibrium quantity \( x(i) \) equals

\[
x(i) = \alpha^{2/(1-\alpha)} A(i) H/N.
\]

Substituting equation (20) into (21) we obtain the equilibrium output of the general good

\[
Y = \alpha^{2\alpha} A H,
\]

where \( A \) is the average quality of intermediate inputs engaged in production. Therefore, the growth rate of the final output per capita is equal to the sum of the rate of technological progress, which is measured by the average quality of intermediate inputs, and the rate of skills accumulation. From (20) and (21) the level of profit for each monopolist equals

\[
\pi(i) = (1 - \alpha)\alpha^{\frac{2\alpha}{1-\alpha}} A(i) H.
\]

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

\[
w = \alpha^{2\alpha/(1-\alpha)} A.
\]

\(^9\)The alternative assumption about the competitive fringe in each intermediate input sector gives the same qualitative results.
The equilibrium output of the general good can be divided by wages, monopolistic profits and inputs in the intermediate goods production sector

\[ Y = wH + \sum_{i=0}^{N}[\pi(i) + x(i)]. \]  

(27)

From (??), (??), (??) the shares of wages and profits in the final output are constant

\[ wH = (1 - \alpha)Y, \]  

(28)

\[ \sum_{i=0}^{N} \pi(i) = \alpha(1 - \alpha)Y, \]  

(29)

and the ratio of total profits to total wages equals \( \alpha \). Therefore, the rise of the level of technology by \( \gamma \) increases by the same size the wages and profits. Let assume that the costs of the investment project in terms of the general good is proportional to the current complexity of technology. If \( c'A(i) \), from (??) we redefine the costs of the project as \( c\pi(i) \), where

\[ c = c'N/(H(1 - \alpha)\alpha^{\frac{1+n}{1-n}}). \]  

(30)

Therefore, a higher level of total skills \( (H) \) leads to a decrease of the relative costs of the project \( (c) \).

## Appendix B. Proofs

### Lemma 1. Proof

Let us compare the the capitalists’ pay-off for two policy outcomes: \((B, \delta)\) and \((NB, \tau')\). From (??) and (??)

\[ V_c(NB, \tau') = [\gamma(1 - \tau') - c]\pi, \]  

(31)

\[ V_k(B, \delta) = (1 - \delta)\pi. \]  

(32)

The policy \((B, \delta)\) is preferable to \((NB, \tau')\) if

\[ 1 - \delta > \gamma(1 - \tau') - c. \]  

(33)

Substituting \( \tau' \) from we get

\[ G(c, \lambda, \delta) = 1 + c - c/\lambda - \delta > 0 \]  

(34)
It is straightforward to see that $G'(c) < 0$, $G'(\lambda) > 0$, $F'(\delta) < 0$.

**Proposition 1. Proof**

If $\tau' \geq \delta$ it is straightforward to see that all workers prefer maximum possible redistribution rate $\delta$ and the NB-regime. If $\tau' < \delta$ 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 $(NB, \tau')$ or $(B, \delta)$. Let us compare the workers pay-off in each case. From (35) and (36)

$$V_k(NB, \tau') = \gamma [wh_k + \tau' \pi N/L], \quad (35)$$

$$V_k(B, \delta) = wh_k + \delta \pi N/L. \quad (36)$$

Workers prefer $(NB, \tau')$ policy only if

$$\gamma [wh_k + \tau' \pi N/L] > wh_k + \delta \pi N/L. \quad (37)$$

Dividing the inequality (37) by $w\overline{h}$ we get

$$\gamma [h_k/\overline{h} + \tau' \alpha] > h_k/\overline{h} + \delta \alpha. \quad (38)$$

The inequality (38) can be represented as

$$(\gamma - 1)h_k/\overline{h} > (\delta - \tau' \gamma)\alpha. \quad (39)$$

Substituting $\tau'$ to the equation (39) we get

$$(\gamma - 1)h_k/\overline{h} > (\delta - \gamma + c/\lambda)\alpha. \quad (40)$$

For $c < \lambda(\gamma - \delta)$ the inequality (40) holds for every positive $h_k$. For $c > \lambda \gamma$ 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 $h'$, which divides agents into two groups, the first one ($h < h'$) prefers B-regime with high redistribution rate $\delta$ and the second ($h \geq h'$) prefers $(NB, \tau')$ policy.

**Proposition 2. Proof**

1) If $c < \lambda \gamma (1 - \delta)$, then, by the definition of $\tau'$, $\tau' > \delta$ and all workers prefer $(NB, \delta)$, which is a stable political outcome.
2.1) For \( \tau' < \delta \) let us check firstly if \( (NB, \tau') \) is a political equilibrium or not. All workers always prefer \( (NB, \tau') \) 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 \( (NB, \tau') \) is a bliss point for relatively high skilled workers, only capitalists and low-skilled workers could form a coalition to overcome \( (NB, \tau') \). This is the case if

\[
\begin{aligned}
\tau_B \leq \delta \\
V_c\{NB, \tau'\} < V_c\{B, \tau_B\} \\
V_{km}\{NB, \tau'\} < V_{km}\{B, \tau_B\},
\end{aligned}
\]  

(41)

where \( km \) is a sub-group of workers who have a maximum level of skills and at the same time belong to the majority coalition of low-skilled workers with capitalists.

(??) is rewritten as

\[
\begin{aligned}
\tau_B < \delta \\
(1 - \tau_B) > \gamma(1 - \tau') - c \\
wh_{km} + \tau_B \pi N/L > \gamma [wh_{km} + \pi N \tau'/L]
\end{aligned}
\]  

(42)

Dividing both sides of the last inequality by \( wh \) we rewrite the system (??) as

\[
\begin{aligned}
\tau_B < \delta \\
\tau_B < 1 + c - \gamma(1 - \tau') \\
\tau_B > h_{km}(\gamma - 1)/(\overline{h}\alpha) + \gamma \tau'
\end{aligned}
\]  

(43)

From (??) there is a policy \( (B, \tau_B) \), which is strictly preferred to \( (NB, \tau') \) by the majority, consisting of capitalists and low-skilled workers, only if the following conditions are satisfied

\[
\begin{aligned}
h_{km}(\gamma - 1)/(\overline{h}\alpha) + \gamma \tau' < \delta \\
h_{km}(\gamma - 1)/(\overline{h}\alpha) < 1 + c - \gamma
\end{aligned}
\]  

(44)

Therefore, only for \( \delta > \delta_1 \) and condition (??) \( (NB, \tau') \) is not majority core voting equilibrium. Let us note that if (??) holds it is straightforward to see that \( \delta_1 \) is always lesser than \( \delta_2 \).

2.2) Let us prove now that if (??) holds and if \( \delta > \delta_2 \), then a majority core equilibrium does not exist. If (??) holds, \( (NB, \tau') \) is always dominated by \( (B, \tau_B > \tau') \), where \( \tau_B \) satisfies (??). At the same time from
$\tau_B < \delta_2 < \delta$. In this case $(B, \delta)$ is always preferable to $(B, \tau_B < \delta)$ by all workers. However, from the pay-offs definition $(NB, \tau')$ is better than $(B, \delta > \delta_2)$ for the majority consisting of high-skilled workers and capitalists. Thus, there is a cycling problem and no stable political equilibrium exists.

2.3) Let us show that if (??) does not hold the majority core voting equilibrium $(NB, \tau')$ is unique. The policy $(J, \tau < \tau')$ cannot be a political equilibrium as all workers strictly prefer $(NB, \tau')$. The policy $(B, \tau_B > \tau')$ is not also an equilibrium as, as soon as the conditions (??) are not satisfied, there is always a strict majority of voters among workers, who strictly prefer $(NB, \tau')$.

References


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