Inefficient Choice under Competition for Status

By Caio Figueiredo*

This paper studies a society where different groups compete over control of the economic agenda and wealth is regarded as a source of social status and political power. I conclude that, under these assumptions choices, optimal individual choices can be lead to a suboptimal economic situation for every player. I also suggest ways in which better institutions can be used to improve the efficiency of the result.

The paper aims to formalize the idea that politicians competing for power may choose against overall economic development. In the model, two different groups of interest compete for power by choosing an economic policy, the policy impacts the wealth of both groups, and relative positions of wealth affect the group's ability to retain the power as the policymaker.

Economic development has become central to modern society and the main objective of most modern nations. A well-meaning head-of-state would desire higher levels of economic development to provide better public services, wealthier nation would also implies that ill-meaning head-of-states have more to extract from the society.

However, some countries, particularly in Latin America, have systematically failed to promote long-term economic growth. In Figure 1 we can observe that during the last decades, while many Asian countries were able to close a significant portion of the income gap between it and West, Latin America lagged behind.

Among the principal explanations for the fact, is the failure of Latin America countries to implement efficiency improving reforms. Including those which the positive affects are consensual among economists.

To illustrate, between 1991-2001 the IMF financially supported Argentina, which gave the organism leverage to promote the implementation of several development-inducing policies, most notably a set of fiscal and monetary best practices. Notwithstanding the good intentions of the organism or the economic soundness of the proposed policies, the program was unsuccessful, and in 2001 the IMF decided to drop its financial support for the Argentinian government, causing a massive country-wise bank run. A more detailed explanation of these events can be found at Lago et al. [2004]. The example is but one of many in Latin America's economic history. Over time many economic sound policies were implemented, with most achieving underwhelming results

The perceived persistence of an inferior status quo is cause of much concern and has attract attention from the economic science. Institutional theory, for ex-

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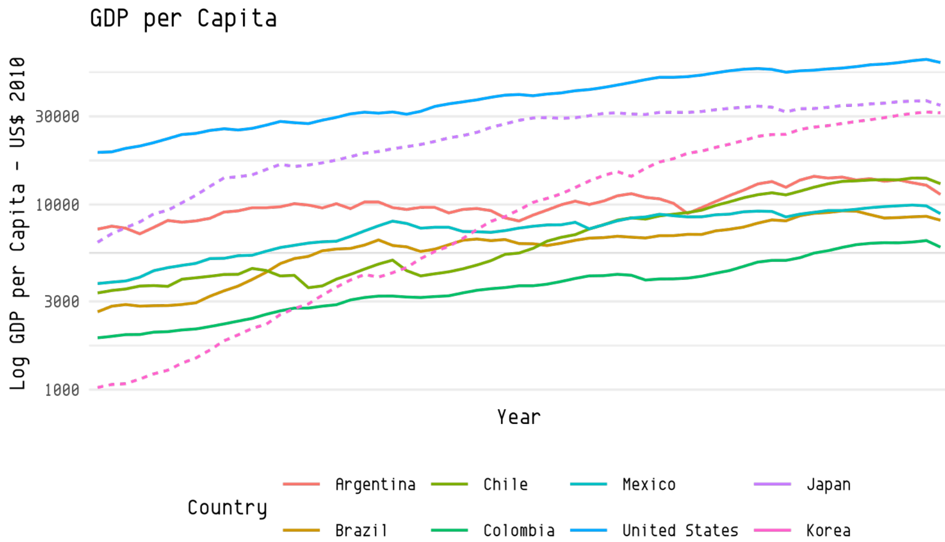


Figure 1. Evolution of the five biggest Latin America Economies in comparison with USA

ample, states that unless a deeper institutional change happens for the interests of the politicians to become aligned with the consequences of economic development, then top-down implementation of economics best practices is bound to fail. Daron Acemoglu and James Robinson in the best-seller *Why Nations Fail* say the following when analyzing the situation in Latin America.

> For example, many economies around the world ostensibly implementing such reforms, most notably in Latin America, stagnated throughout the 1980s and '90s. In reality, such reforms were foisted upon these countries in contexts where politics went on as usual. Hence, even when reforms were adopted, their intent was subverted, or politicians used other ways to blunt their impact. [Acemoglu, 2012]

We could also view the persistent of the status quo as a purely consequence of the decision making process. Studies have suggested that limits to the rationalization process such as limited attention [Dean, Kıbrıs and Masatlioglu, 2017] or time constraints [Geng, 2016] can lead to inefficient decision making.

My model attempts to bridge the Macro view of the Institutional Theory and the Micro view of Status Quo bias literature, by studying the decision process of policy makers competition for power I hope to conditions in which a inefficient choices can be made over long periods of time.

A. Wealth as a driver of Political Power

Wealth has always been an important factor for political influence. In the past, it was common for states to stablish wealth or land based criteria for suffrage. In England, for example, the forty-shilling rule granted suffrage only for those possessing property of an annual rent of at least forty shilling, lasted for centuries and was only fully dismantled during the 20th century [Seymour, 2010]. Similar rules were also present in Latin America. Latin America was no different, during the 19th and 20th many countries maintained electoral taxes, effectively disenfranchising impoverish people [De Ferranti, 2004].

In facts, the classical work [Plato, 2021] already recognizes the importance that wealth plays in politics. Plato's work describes how wealth concentration drives the transformation a timocracy (The governments of the honorable) in a oligarchy (The government of the wealthy) which in turn is transformed in a democracy (The government of the people) by the rising conflicts between the wealthy and the poor.

We shouldn't however believe that wealth importance in politics is a thing of the past or exclusive to oligarchic regimes. Modern western democracies still possess many avenues in which wealth can be used to influence politics. Wealth can also be used to create think tanks, finance favorable academic works; buy favorable media, support lobby groups, finance political campaigns, and, ultimately, to corrupt politicians.

There are others, subtler ways, in which wealth increases an individual political influence: Wealthier people have, on average, more free time, education and interest to participate in the political discourse. Wealthier individuals also share time, space and interest with other wealthier individuals facilitating the formation of political organizations. Moreover, organization of few wealthy individual will often have the same of more influence than an organization of thousand of low income workers.

As an illustration, the median member of the House in the United States is estimated to have a net worth four times greater than the median American, the median member of the Senate is worth fourteen times greater than the same metric[1], whereas members of the Supreme Court have historically come from medium-high to high income, highly educated families [Abraham, 2007].

The idea that a small but wealthier group of individuals can exert greater political power is explored extensively in the works of Vilfredo Pareto (1848–1923), Gaetano Mosca (1858–1941), and Robert Michels (1876-1936), co-founders of the influential Italian school of elitism[2].

Competition for power is another key characteristic of Latin American societies: High degrees of inequality [De Rosa, Flores and Morgan, 2020] has

[1] Congressman net worth data is estimated from personal financial disclosures and are provided by The Federal Reserve provides OpenSecrets.org. Data for the general public

[2] See [Nye, 1977]

fostered high levels of mistrust between economic classes[3] driving highly polarized choices of economic policies.

B. Literature Review

The central question of this paper can be framed as a problem of bias towards the status quo. Why do governments fail to adopt policies that economists consider to be efficiency-enhancing? As mentioned before, there is substantial literature detailing that limits to the rationalizations can lead to status quo bias on the individual level.

The work of Fernandez and Rodrik [1991] translates the problem to the context of countries. The model demonstrates how individual-level uncertainty leads to inefficient choices. That is, an economic policy that benefits most of the population might be ignored because individuals are uncertain about their ability to benefit from the policy. My paper arrives at similar results but as a consequence of individuals competing for power, an adversarial nature that complicates comprising solutions.

In a 2008 paper, Acemoglu and Robinson presents a model in which elites and the citizens compete for political power, which is determined by the political institutions that allocate de jure power but also by the investment the groups make in de facto political power. Political power can influence the economic policy and the future of political institutions.

The paper highlights two main comparative static results: First, when the elite has less to gain from using repressive methods, equilibrium institutions are more likely to favor the citizens. Second, more democratic advantages for the citizens can, paradoxically, lead to greater domination of politics by the elites. Both effects are also present in my paper.

The main difference between the two papers lies in the dynamics. In Acemoglu, Daron, and Robinson's paper, the source of dynamic is the institutional policy, with players being able to choose between democracy and nondemocracy. On the model presented in this paper, the wealth level is relevant state variable. A difference that implies that players can invest in long-term power consolidation.

Moreover, In ADR's paper, the channel in which wealth increases political power is costly. A group has to invest wealth with the sole purpose of increasing political power. I choose to make this effect costless, highlighting the effect that wealth has in increasing a person's status through education, social network, or institutional privilege.

Finally, my model utilizes a more straightforward economic policy structure than ADR's. In ADR's paper, the economic policy consists of the allocation of a public good and the choice of an economic institution that favors the workers or the elites. In contrast, this paper focuses only on an economic policy that

[3]Furtado [2007] describes the situation in Brazil, Nutini and Isaac [2009] describe it for Mexico

affects the players' wealth levels.

The importance of relative wealth is a highlight in an experimental paper by Güth, Schmittberger and Schwarze [1982]. The idea is also explored by Cole, Mailath and Postlewaite [1992], which studies the effects on saving and growth in a society that wealth is treated as status and influences individuals' payoff on non-transactional markets (such as marriage). Levin [2006] proposes a straightforward way in which relative wealth affects individual choices by modeling how *envy* and *shame* can affect agents' utilities functions. My papers build up on the idea explored by these papers by linking the importance of relative wealth to the persistence of bad economic policies.

I. Example

Before presenting the formal model, I will discuss a brief example. There is a society where two groups, namely it *Player 1* and *Player 2*, compete for control of the policy-making process over two periods. The players derive utility from their wealth at period two but are inequity averse in the form of a Fehr-Schmidt utility function:

$$u_i(w) = w_i - 0.5max\{w_j - w_i, 0\} \tag{1}$$

where w_i represents period two wealth of Player i and w_j period two wealth of the other Player. The last term captures the lost of utility due to envy towards wealth inequality.

At each period, a player is randomly chosen as the policymaker, but players with higher wealth have a higher chance of being chosen. That is, let $p_1(\frac{w_1}{w_2})$ be the probability of Player 1 be the policymaker at any period given the wealth vector (w_1, w_2), then p is strictly increasing function. Henceforth, the player that manages to control policy will be referenced as the policymaker and the remaining player as the follower.

Then the policymaker makes a choice. It can implement one of two alternatives policies: The *inclusive policy* will cause both players' wealth to grow at an equal and high rate. Meanwhile, an *extractive policy* will drive an asymmetrical wealth growth, in which the policymaker's wealth grows at a higher rate than the follower. To strengthen the point, I will assume that the policymaker's wealth growth under the extractive policy is lower than the growth under the inclusive policy.

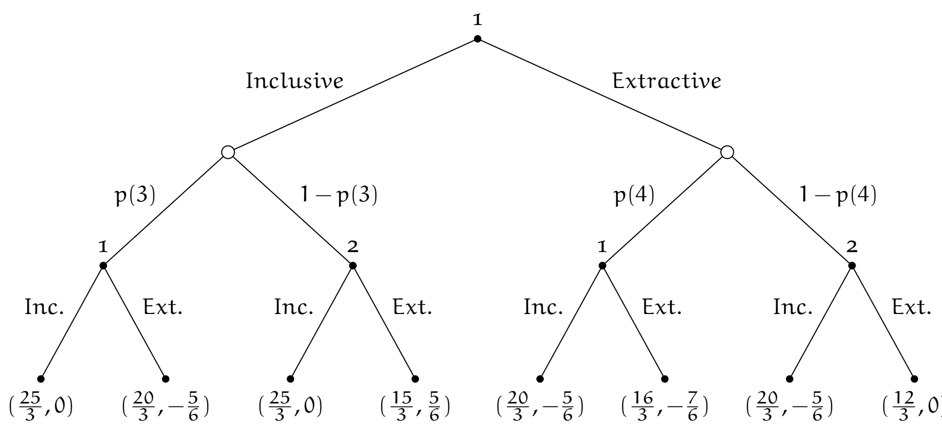
The names *inclusive* and *extractive* policies reference the Institutional Economic Theory use of inclusive and extractive institutions. Inclusive institutions promote fairer representation and are believed to be conducive to economic development. On the other hand, extractive institutions consolidate wealth and power in the hands of the ruling elite and can hinder economic growth.

For this example we will let $(\frac{5}{3}, \frac{5}{3})$ and $(\frac{4}{3}, 1)$ be the growth vectors associated with each policy, the first element of the vector represents the growth rate of policy maker and the second element the growth rate of the follower. That is, given a growth vector (g_1, g_2) and a welth vector (w_1, w_2), the resulting, next period wealth level is $(w_1 g_1, w_2 g_2)$.

Therefore the trade-off for the policymaker is between choosing a higher wealth for the next period by using the inclusive policy or choosing o higher probability of retaining power by choosing the extractive policy.

Finally assume that before the beginning of the game Player 1 is 3 times higher than Player 2, which wealth is normalized to 1.

The game starts with Player 1 as the policymaker, it chooses one of the policies, the wealth levels are updated, and the next policymaker is chosen at random. Finally, period 2's policymaker chooses his policy, and the game ends. The following tree summaries the structure:



(2)

First, notice that for Player 2, the extractive policy dominates the inclusive policy; this is because no matter what decision Player 1 chooses, wealth inequality will cause significant envy disutility for Player 2, which can be mitigated by choosing the extractive policy.

Player 1 may have up to two actions. In the second period, the inclusive dominates the extractive policy independently of what happened before [4]. Now, let's consider Player 1 problem at the first period: In equilibrium, he will believe that Player 2 will play his dominant strategy, the extractive policy, so we can write the period 1 expected value of playing each policy as:

[4]This is because Player 1 has no envy disutility since it cannot be surpassed in wealth. Had shame be included in this model, the result might differ

$$V_I = \frac{25}{3}p(3) + \frac{15}{3}(1 - p(3))$$
$$V_E = \frac{20}{3}p(4) + \frac{12}{3}(1 - p(4)) \tag{3}$$

Remmember that $p(x)$ is the probability that Player 1 keeps the policymaker status at period 2, given he is x times wealthier than Player 2. Therefore, as long as the following condition is met:

$$10p(3) < 8p(4) - 3 \tag{4}$$

then Player 1 best strategy at period 1 is to play the extractive policy, and the final equilibrium is one in which both players always play the extractive policy. The result, therefore, is *Pareto inefficient* since if all players had played the inclusive strategy, Player 1 would be better off, and Player 2 would not be worse. In the language that we are using in this paper, the final state is one of economic underdevelopment.

The example illustrates the role of inequality and competition for power in economic policy decisions and how these factors can drive the perpetuation of extractive policies and the resulting underdevelopment. However, the result in this section is heavily dependent on the fact that Player 2 is envious of Player 1 wealth. In the next section, I will build a model that relaxes this assumption and explicitly the conditions necessary for this to happen.

II. The model

There are two players, A and B, with wealth levels denoted by w_A and w_B respectively. Let the vector $w = (w_A, w_B)$ denote the current wealth level of both players and $W \subseteq \mathbb{R}^2_+$ be the space of w. The players derive utility from their wealth, disregarding inequality driven disutility such as envy or shame, but also have derives utility from being the policymaker:

$$u_i(w_i, \lambda) = w_i + \mathbb{1}(\lambda = i)\rho : i \in \{A, B\} \tag{5}$$

where $\lambda \in \{A, B\}$ denotes who is the current policymaker. ρ is the utility for being the policymaker, in the real world being the policymaker can have many direct advantages, such a financial payment or a higher level prestige. I assume that $\rho > 0$, the assumption guarantees that, all else constant, players always desire to be the policymaker. However since rho doesn't interact with wealth it will not play a major role in the dynamics of this result.

The players are making decisions in infinite sequential game. At each period t either A or B is randomly chosen as the *policymaker*. The policymaker can choose the economic policy, which is a vector of growth rates that are applied to *both* players' wealth levels, that is: Given current wealth levels (w_A, w_B) and the policy $(\mu_A, \mu_B) \in M \subseteq \mathbb{R}^2_+$ is chosen, so in the next period, we have $(w_A\mu_A, w_B\mu_B)$.

As in the example, the policymaker has two different choices: inclusive policy and extractive policy. The policies are characterized by the following growth vectors:[5]

$$\begin{aligned} \text{Inclusive Policy} : \mu^I &= (\mu, \mu) \\ \text{Extractive Policy} : \mu^E &= (\gamma\beta\mu, \gamma\mu) \end{aligned} \tag{6}$$

where:

- μ denotes the frontier of possible wealth growth that dictates the standard level of growth. I assume that $\mu > 1$.
- β is the extractive parameter. It denotes the rate of wealth concentration when the extractive policy is chosen. I assume that $\beta \geqslant 1$.
- γ is the extractive policy cost. The lower the γ, the less both players' wealth will grow under the extractive policy.

Define $\omega_i = \frac{w_i}{w_{-i}}$, that is the relative wealth from player i perspective, let Ω be the space of possible ω. The probability of player i be chosen as the policymaker is given by the function $p_i : W \to [0, 1]$, that is:

$$p_i(\omega_i) = P(\lambda = i|w) \tag{7}$$

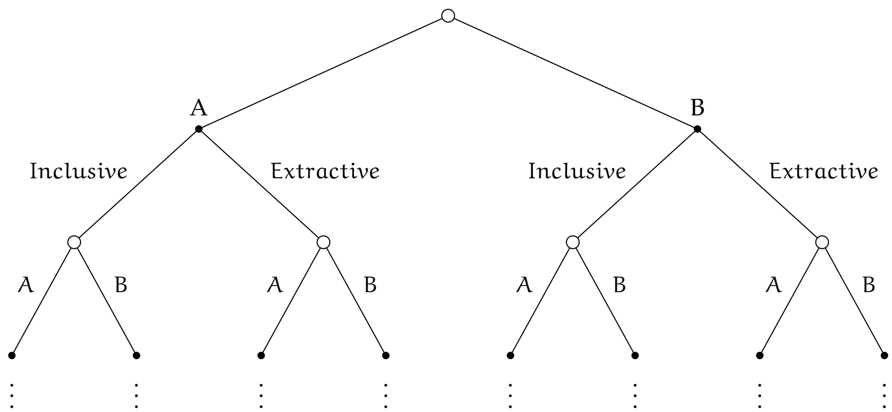
I assume that p_i is continuous and increasing in relative wealth:

- $\frac{\partial p_i}{\partial \omega_i} > 0$.

The point illustrates this paper's base idea that individuals who are relatively more wealthy have increased chances of controlling the policy-making process.

To summarize, the game goes as follows: Nature chooses the policymaker. It chooses the policy among the two possible options: Inclusive or Extractive. The follower does not choose anything. Wealth levels are updated, and the game repeats itself. The following tree illustrates the process:

[5]Note the abusive of notation, when describing policies the first element of the vector denotes the growth rate of the *policymaker*, not of Player A



(8)

At any given period t, the policymaker chooses the option that maximizes its expected utility of the present value of its choice, given by:

$$\mathbb{E}\left[\sum_{\tau=t}^{\infty} \delta^{\tau} u(w_{\tau})\right] \tag{9}$$

where $\delta \in (0,1)$ is the discount rate, w_{τ} is the wealth endowment of the policymaker at period τ.

Since individuals are forward looking, for any period t the chosen policy depends only on λ_t, that is which player is the current policymaker, and w_t, the wealth vector of time t. I will refer to these variables as the *state variable*, $s_t = (\lambda_t, w_t)$. Therefore, we can use the concept of Markov Perfect Equilibrium to describe the solution concept of the game.

A. The cost of extraction

DEFINITION 1: ***Extractive policy condition****: The parameters are such that there is a relative wealth state in which is Extractive Policy is best choice for the policy maker*

The model dynamic characteristic makes it so that a complete and precise expression for the condition is unhelpful to create intuition. Consider, therefore, the worst-case scenario for the extractive policy, in which both players will choose the inclusive policy for all subsequent periods[6]. We can express a sufficient condition as:

[6]This eliminates any future wealth effect from your initial choice. Since the extractive policy increase the chances that the player has the policymaker position in the future, these future wealth effect can only be positive, increasing the net expected utility of the extractive policy

DEFINITION 1: ***Sufficient Extractive policy condition*** *Given parameters:* $\mu^I, \mu^E, \delta, \rho$, *a probability function* p_i *and* $\lambda = i$, $\exists\, w$ *such that:*

$$w_i(\mu_i^I - \mu_i^E)\left(1 + \frac{\delta}{1 - \delta\mu^I}\right) \leqslant \frac{\delta\rho}{1-\delta}(p_i(\omega_i\beta) - p_i(\omega_i)) \tag{10}$$

A derivation of such condition is provided in the Appendix.

The right hand side of the equation express the total expected gain from utility derived from policymaker position the player gets by choosing the extractive policy, and the left hand side express the opportunity cost of the choice, or the expected loss in utility derived from wealth the player has by not choosing the inclusive policy. So as long ρ and the gain in policymaking probability derived by an extractive wealth is low policy, $p_i(\omega_i\beta) - p_i(\omega_i)$ are high enough, or the loss in wealth is low enough the condition is satisfied.

Now we can prove the following lemma:

THEOREM 1: *If the Extractive policy condition is satisfied then:* $\forall \beta, \mu$ *and every state* $s = (w, \lambda)$, *there is* $\gamma^* \in (0, 1)$ *in which:*

1) *If* $\gamma^* < \gamma < 1$, *then the Extractive Policy is the dominant alternative for the policymaker.*
2) *If* $\gamma < \gamma^*$ *then the Inclusive Policy is the dominant strategy for the policymaker.*

In other words, The lemma states that for any set of parameters and given wealth state we have that as long as the cost of the extractive policy is low enough then it will be better for the policymaker to choose the extractive policy.

The lemma helps to illustrate two important points. First is that both policies are viable under the correct set of parameters and wealth states. Second it demonstrates how an institution designer could use the cost of extractive policies to generate higher, more inclusive, economic development.

A detailed proof is given on the Appendix, here is a sketch: We start by proving that the Expected Value of the extractive policy is a continuous and strictly increasing function of γ. Then by setting $\gamma = 0$ we show that the inclusive policy is dominant and by setting $\gamma = 1$ we show that the exclusive policy is dominant, then we use the Intermediate Value Theorem to show that such γ^* must exist.

Now define $G : \Omega \to (0, 1)$ as the function that maps a relative wealth state to the corresponding γ^*, as defined in the Lemma above. The Lemma guarantees that G is well defined.

B. Markov Perfect Equilibrium

We define an additional condition on the behavior policymaker probability function:

DEFINITION 2: ***Probability Limit Condition:***

$$\lim_{\omega \to \infty} \frac{\partial p_i(\omega_i)}{\partial \omega_i} = p < \infty \tag{11}$$

The condition is ruling out explosive gains in policymaking probability at the limits. We can interpret it as decreasing returns of inequality for the policymaker hold on power. And, it has the practical consequence of guaranteeing that as long as w_i goes to infinity, the inclusive policy will eventually become the policymaker's best choice.

We can now show that:

THEOREM 2: $\forall \beta, \gamma, \mu$ *if the extractive condition are satisfied and* p_i *follows the its limit condition there is a Markov Perfect Equilibrium in which both players are choosing the following behavioral strategy:*

$$\mu(\omega) = \begin{cases} \mu^E & \textit{if } \omega < \bar{\omega} \\ \mu^I & \textit{otherwise} \end{cases} \tag{12}$$

where ω *is relative wealth from the policymaker perspective.*

The theorem illustrative the virtuous and vicious cycles that institutions can have in a country's development. Give a set of parameters; if the Extractive Policy condition is meet, this society will lead itself to a state of high inequality through an inefficient path of extractive policies. Once in this state of high inequality, efficient and inclusive policies become an option.

Figure 2 below illustrates a standard path of a game; it was created by simulating 1000 games using the proposed equilibrium strategy. The line depicts a single exemplary game, and the background color illustrates how likely a random game is to be in that state.

The Y-axis expresses the logarithm of the relative wealth in each time period, note that $\log_\beta(\omega)$ describes the net number of extractive policies that were used in favor of player A.[7]

[7]To see that, note: $\omega_t = \frac{w_t^A}{w_t^B} = \omega_0 \frac{(\mu^I)^n (\mu_1^E)^\nu (\mu_2^E)^l}{(\mu^I)^n (\mu_1^E)^l (\mu_2^E)^\nu} = \omega_0 \beta^{(\nu - l)}$; where n is the number of inclusive policies played, ν the number of extractive policies played by player A and l the number of extractive policies played by player B

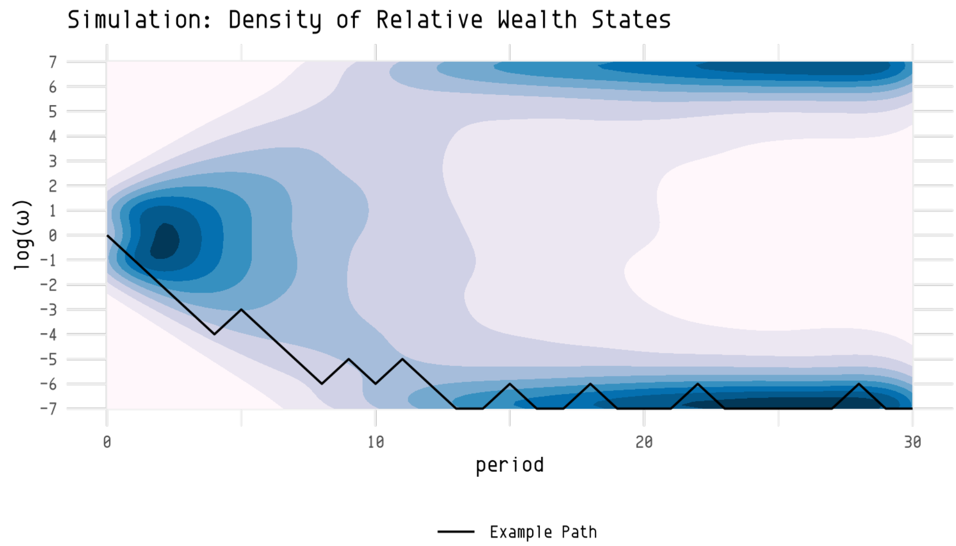


FIGURE 2. EXPECTED EVOLUTION OF A GAME WITH $\omega_0 = 1, \mu^I = 1.1, \mu^E = (1.08, 1.0)$

C. Promoting Efficient Growth

If both results at hand it becomes clear that:

LEMMA 1: *For any such parameters in which both Extractive and Inclusive Conditions holds we have that*

$$\frac{\partial \bar{\omega}}{\partial \gamma} > 0 \tag{13}$$

That is, the lower the cost of the extractive policy, the bigger the space for inefficient extractive policies.

Real-world examples extract policy costs ranging from blatant corruption to legal actions on paper but contrary in principle to what is desirable in a good administration. These costs can be mitigated by a better set of institutions, like a more transparent government and more inclusive laws.

Therefore, when creating better institutions, we raise the cost of extractive policies, which diminishes the room in which extractive policies become attractive. By raising the costs of an extractive policy enough, one may break the Extractive Policy Condition.

If the condition is not satisfied, the player with lower relative wealth will instead, choose the inclusive policy and, therefore, the player with higher relative wealth has a lot less to fear from losing his policymaker position, leading to an equilibrium in which both players desire more inclusive policies.

Figure 3 bellow illustrate the results, it shows the cutting point for a variety of γ and β values, from the point of view of player A.

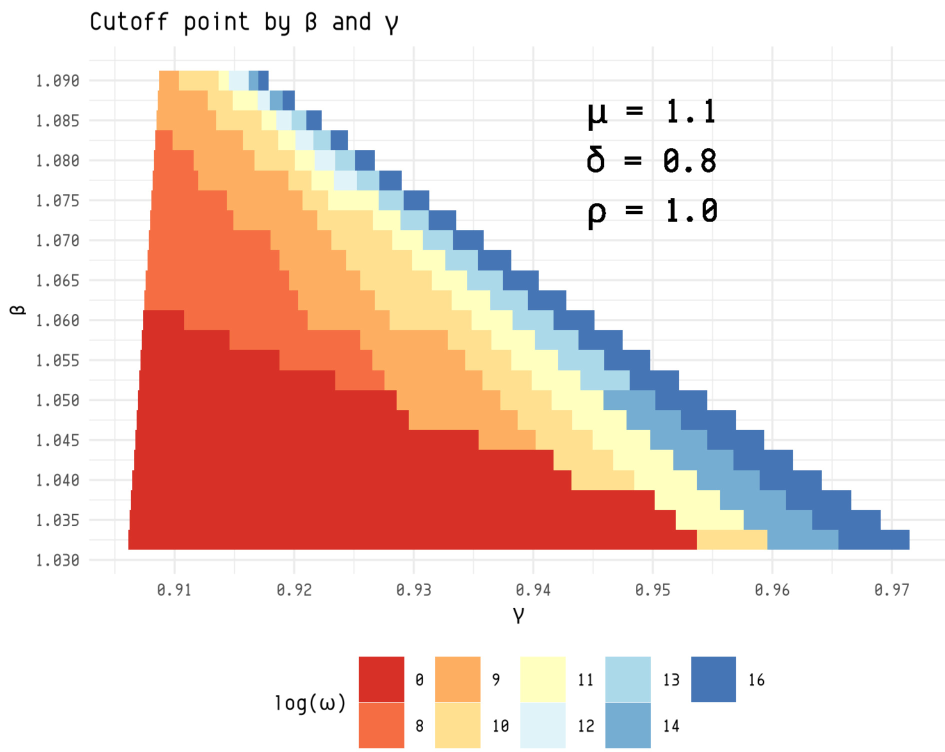


FIGURE 3. BEST CUTOFF STRATEGY GIVEN SET OF PARAMETERS

As noticed before, $\log_\beta(\omega)$ denotes the net number of extractive policies executed in player A favor. Therefore, the colors represent how many extractive policies would be necessary for the player to start playing the inclusive policy.

The Figure illustrates the highlighted effect; higher levels of extraction strategy cost ($\gamma \uparrow$) implies that the policymaker will choose the extractive policies more often. Moreover, by setting γ low enough, the extractive policy might never be chosen.

III. Conclusion

The paper presented a model in which players use wealth to compete for power. In power, players can decide how the form subsequent period wealth growth. The model illustrates that how that competition can lead to inefficient, Pareto-dominated development.

The result could explain the situation in many Latin American countries where economic development has stagnated at a level much lower than that of developed countries.

I also showed that better institutions could diminish or extinguish the space for these inefficiencies leading to higher and more equal development.

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Mathematical Appendix

Model

B1. Functional Equations

Given the initial state $s_0 = (\lambda_0, w_0)$, any state dependent strategy can be written as $\mu : W \to M$, where W is the space of wealth levels and M the space of economic policies, and the expected final payoff is:

$$E[u_i \mid \mu] = u_i(w_0) + \sum_{t=1}^{\infty} e^{-\delta t} \left[\sum_{\lambda \in \{0,1\}} u\left(w_{t-i}\pi_i(w_{t-1}, \lambda)\right) P(\lambda \mid w_{t-1}) \right] \tag{B1}$$

where

$$\pi_i(w, \lambda) = \begin{cases} \mu(w) & \text{if } \lambda = i \\ \nu(w) & \text{otherwise} \end{cases} \tag{B2}$$

and $\nu(w)$ denotes the strategy player i believe will be choosen when he is not the policymaker. Let $\pi^t(w_0)$ denote a possible wealth state after t rounds a game that started at w_0, I assume that δ is such that:

$$\lim_{t \to \infty} \sum_{\lambda \in \{0,1\}} \delta^t u(\pi^t(w_0)) P(\lambda \mid w_{t-1}) = 0 \tag{B3}$$

Note that $u_i(\pi_i(w_{t-1}, \lambda)) < w_{0,i}\mu^t + t\rho$, so as long as $\delta < \frac{1}{\mu}$ then the condition is satisfied.

It follows that $E[u_i \mid \mu]$ is well defined and can be written as following functional equation:

$$V_i(w,\lambda) = \lambda_i \rho + \max_{y \in \Gamma(w)} \left\{ w' + \delta \left[\sum_{\lambda' \in \{A,B\}} p_\lambda \left(\frac{w'_i}{w'_{-i}} \right) V_i(w', \lambda') \right] \right\} \tag{B4}$$
$$w' := \lambda_i y + (1-\lambda_i) \nu(w)_i$$

where λ_i is a shorthand for $\mathbb{1}(\lambda = i)$ and $\Gamma(w) = \{(w_1\mu, w_2\mu), (w_1\gamma\beta\mu, w_2\gamma\mu)\}$ is the set of feasible values for the wealth levels of each player given a current state.

It is also useful to define the expected value of a relative wealth state before the policymaker is choosen and the payoffs of each possible choice of the policymaker as:

$$V_i(w) = \sum_{\lambda' \in \{A,B\}} p_\lambda \left(\frac{w'_i}{w'_{-i}} \right) V_i(w', \lambda') \tag{B5}$$

$$V_i^I(w) = w_i\mu + \rho + \delta \left[p_i(\omega_i) V_i(w\mu^I, 1) + (1 - p_i(\omega_i)) V_i(w\mu^I, 0) \right] \tag{B6}$$

$$V_i^E(w) = w_i\beta\gamma\mu + \rho + \delta \left[p_i(\beta\omega_i) V_i(w\mu^E, 1) + (1 - p_i(\beta\omega_i)) V_i(w\mu^E, 0) \right] \tag{B7}$$

That is, V^I is the expected payoff of the inclusive policy and V^E of the extractive policy.

B2. Extractive Policy Condition

Now we can rewrite the Extractive Policy Condition as:

DEFINITION 1: ***Extractive Policy Condition:*** *$\exists$ w in which $0 < \frac{w_i}{w_{-i}} < \underline{\epsilon}$ we have that $V^E(w,1) > V^I(w)$*

We can also derive the **Sufficient extractive policy condition** provided in the main text:

DEFINITION 2: ***Sufficient Extractive policy condition*** *Given parameters: $\mu^I, \mu^E, \delta, \rho$, a probability function p_i and $\lambda = i$, $\exists$ w such that:*

$$w_i(\mu_i^I - \mu_i^E) \left(1 + \frac{\delta}{1 - \delta\mu^I} \right) \leqslant \frac{\delta\rho}{1-\delta} (p_i(\omega_i\beta) - p_i(\omega_i)) \tag{B8}$$

Expanding the original condition we have that:

$$w_i(\mu_i^E - \mu_i^I) + \delta(V_i(w\mu^E) - V_i(w\mu^I)) > 0 \tag{B9}$$

Remembers that we have to consider the worst-case scenario for the extractive policy in which only inclusive policy will be played in the future. Therefore, we can use the standard geometric series formula to arrive at:

$$V_i(w\mu^E) = \frac{w_i\mu_i^E}{1-\delta\mu_i^I} + \frac{p_i(\omega\beta)\rho}{1-\delta} \tag{B10}$$

$$V_i(w\mu^I) = \frac{w_i\mu_i^I}{1-\delta\mu_i^I} + \frac{p_i(\omega\beta)\rho}{1-\delta} \tag{B11}$$

Then inputting (B10) and (B11) into (B9) results in the desired condition.

B3. General Results

It will be helpful to stablish some general results, we start by proving the following Lemma:

LEMMA 2: V_i *is strictly increasing in* w_i *and decreasing in* w_{-i}.

PROOF:

For that, let $\mathcal{F}$ be the space of functions from $S = W \times \{A, B\}$ to $\mathbb{R}$ that are continuous in the first argument. Define $T : \mathcal{F} \to \mathcal{F}$ as:

$$\begin{aligned} T_i(f)(w,\lambda) = \max_{y\in\Gamma(w)} \Big\{ & \lambda_i u(y_i, 1) + (1-\lambda_i)u(\nu(w), 0) + \\ & \delta \left[\sum_{\lambda'\in\{A,B\}} p_{\lambda'}(w) f(\lambda_i y + (1-\lambda_i)\nu(w), \lambda') \right] \Big\} \end{aligned} \tag{B12}$$

Note that T_i satisfies Blackwell's sufficient conditions for a contraction, then by the Contraction Mapping Theorem T_i has a unique fix point denoted by V_i.

We can use the following statement to prove our lemma:

Corollary of the Contraction Mapping Theorem: *Given a set* S *and a metric* μ *such that* (S, μ) *is a complete metric space, let* $T : S \to S$ *be a contraction mapping with fixed point* $\nu \in S$. *If* S' *is a closed subset of* S *and* $T(S') \subseteq T(S)$, *then* $\nu' \in S'$. *Additionally, if* $T(S') \subseteq S'' \subseteq S'$, *then* $\nu \in S''$.

I start by letting $\mathcal{F}' \subseteq \mathcal{F}$ be the set of such functions that are increasing in w_i and decreasing in w_{-i}. Note that $\mathcal{F}'$ is a closed subset of $\mathcal{F}$, let $\mathcal{F}'' \subset \mathcal{F}'$ be the space of functions that are strictly increasing in w_1 and decreasing in w_2.

Therefore, we are left to prove that $T(\mathcal{F}') \subseteq \mathcal{F}''$, that is indeed the case. To see it get a non decreasing function f, note that u and Γ are strictly increasing by definition, in the case of Γ increasing means that better options are made available, which implies that y is strictly increasing. By extractive policy condition we have that $\nu(w)$ is weakly increasing,

Finally since, by assumption, $p_A(\omega)$ increases with ω_i and $p_B(\omega)$ decreases and $f(w, A) \geqslant f(w, B)$ we have that $T_i(f)$ is strictly increasing and, therefore, $T(\mathcal{F}') \subseteq \mathcal{F}''$

■

Continuity is another desired characteristic for V, we can guarantee it as long as we assume:

LEMMA 3: *If ν is continuous then V_i is continuous.*

PROOF:

The proof is the same as from Lemma 1, just make $\mathcal{F}, \mathcal{F}', \mathcal{F}''$ continuous and since everything else and ν is continuous the results holds

LEMMA 4: *There exists functions $\bar{V}_i$ and $\underline{V}_i$ that are continuous, strictly increasing on w_i and strictly decreasing w_{-i} such that $\bar{V}_i(w, \lambda) > V_i(w, \lambda) > \underline{V}_i(w, \lambda)$.*

PROOF:

Let $\bar{V}$ be equal to V such that $\nu(w) = w\mu^I$ and $\underline{V}$ to be equal to V in the case that $\nu(w) = w\mu^E$. Therefore, $\bar{V}, \underline{V}$ are continuous and increasing as state by Lemma 1 and 2.

Now see that $\bar{V}_i > V_i$ since ν implies that player $-i$ will always decide in player i's favor and $\underline{V}_i < V_i$ by similar reason.

B4. Theorem 1

THEOREM 1: *$\forall \beta, \mu$ there is $\gamma^* < 1$ in which:*

1) *If $\gamma^* < \gamma < 1$, then there exists an unique MPE in which both players strategy is to choose the extractive policy in all periods.*

2) *If $\gamma < \gamma^*$ then the there exists an unique MPE in which both players stratagies is to choose the inclusive policy in all periods*

PROOF:

Now that we have constructed the basis of our proof and have stablish that the Value is increasing in w.

We first stablish that at $\gamma = 0$ we have that $V_i^E(w, i) = 0, \forall\ w$ and, therefore, the inclusive policy is dominant.

Then note that at $\gamma = 1/\beta$. It must be that $V(w\mu^E, \lambda) > V(w\mu^I, \lambda)$ because, from lemma 1 we have that V is decreasing in $-i$'s wealth and at $\gamma = 1/\beta$ the extractive policy provide the same amount of wealth grow for the policymaker but less for the follower.

Finally we use the fact that V^I is not changing in γ but we can use the previous lemma to state that V^E is strictly increasing in γ. Therefore must be $0 < \gamma^* < 1/\beta$ that satisfies the theorem conditions.

■

B5. Theorem 2

THEOREM 2: $\forall \beta, \gamma, \mu$ *if the extractive condition is satisfied there is a Markov Perfect Equilibrium in which both players are choosing the following behavioral strategy:*

$$\mu(\omega) = \begin{cases} \mu^E & \textit{if } \omega < \bar{\omega} \\ \mu^I & \textit{otherwise} \end{cases} \tag{B13}$$

where ω *is relative wealth from the policymaker perspective.*

PROOF:

From the Extractive Policy Condition and the Inclusive Policy condition we that at $\exists \underline{\epsilon}, \bar{\epsilon} > 0$ such that $0 < \omega < \underline{\epsilon}$ for some small value $\underline{\epsilon}$ the Extractive Policy is dominant, that is $V^E > V^I$ and for $\omega < \bar{\epsilon}$ the Inclusive Policy is dominant, $V^I > V^E$.

Fix a player belief ν such as in the proposed equilibrium, ν is increasing in ω and therefore from Lemma 1 we have that V is strictly increasing in ω_i. Therefore, both V^E and V^I are strictly increasing.

Therefore there must be only one relative wealth point $\bar{\omega}$ is which $V^E(w) > V^I(w)$ for any state w in which $\omega < \bar{\omega}$ and $V^I(w) > V^E(w)$ for any state in which $\omega > \bar{\omega}$..