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POLITICAL REGIMES AND INEQUALITIES
What is the relationship?

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ABSTRACT

The relationship between political regimes and inequalities has been studied from both theoretical and empirical perspectives. This paper reviews the existing literature on the subject in order to assess the effects of political regimes on inequalities as well as the effects of inequalities on political regimes. On the one hand, we expect democracy to have a positive relationship with equality; on the other hand, we expect inequalities to have a positive effect on the level of democracy. My reading of the theoretical literature suggests that the results are heterogeneous. I present the mechanisms through which one might expect redistributive effects on incomes in a democracy and accordingly demonstrate that democracy does not necessarily reduce inequalities if it is captured by either interest groups or the middle class. I further present how inequalities drive social unrest, which might force a society to become more democratic, and in what way good economics characteristics lead to a democratic society. Empirical analyses on the linkage also provide inconclusive results about the effects of political regimes on inequalities and the effects of inequalities on political regimes. All things considered, I found different results depending on the sample or methods used.

The originality of this thesis has been checked using the Turnitin OriginalityCheck service.

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1. INTRODUCTION

Louis Brandeis, member on the Supreme Court of the United States from 1916 to 1939, said: "We can either have democracy in this country or we can have great wealth concentrated in the hands of a few, but we can't have both.". But is there a relationship between political regimes and economic performance? Researchers have long tried to seek this relationship; in particular, the link between political structure and economic growth (see e.g. Barro, 1994; Tavares and Wacziarg, 2001 or Acemoglu et al., 2019) or between political regimes and income distribution (see e.g. Putterman, 1996; Boix, 2003 or Acemoglu et al., 2014) have been examined. Many studies have advocated that democracy helps reduce inequalities of income by extending political power (Weede, 1982 or Muller, 1988). Far from a consensus on the relationship between democracy and inequality, it has also been suggested that inequalities could undermine democratic political regime (Dahl, 1977). On the other hand, it has also been argued that both factors have no bearing on each other (Jackman, 1975 or Bollen and Jackman, 1985).

In line with these questions, this master thesis seeks to review the literature on the relationship between political regimes and inequality and the direction of the causality. First, the relevant theoretical literature is presented to determine the different arguments explaining how democracy might affect inequality and how inequality might impact democracy. Then, I review the empirical studies to assess if it is consistent with the theory.

One expects a political system to impact income redistribution through laws, institutions, and policies in effect in that system (Acemoglu, 2008). For instance, it is anticipated that nondemocratic regimes, where political power is concentrated within a limited segment of the population, will experience greater inequalities (Acemoglu et al., 2014, p.1886). A typical nondemocratic regime is an authoritarian regime and according to Kaufman Purcell (1978), it has three main characteristics: limited diversity in the political body, which implies political power to be in the hand of an elite or a group of elites; low subject mobilization of the population,

which means the authoritarian leader has significant decision-making autonomy; and the low political participation (Kaufman Purcell, 1978, p.30).

On the other hand, according to Lenski (1966), the idea that a democratic society is more equal is based on three characteristics these societies have: universal adult right to vote; the right of political opposition and the possibility for disadvantaged group to form and engage in collective action (Lenski, 1966, p.318). Indeed, in a democratic regime, mobilization is moderate and legal rulership predominates. Decision-makers have less autonomy and the political participation will be higher (Kaufman Purcell, 1973, p.37). However, a democratic society often has populist tendencies, with certain groups taking advantage of the circumstances that political power is more equally distributed to expropriate assets (Acemoglu, 2008, p.2).

In this paper, I will look at the relationship between political regimes and inequality. I will especially focus on the direction of the causality to assess if the effects go in the direction of political regimes affecting inequality, or inequality affecting political regimes. Theoretically, I present the model of Meltzer and Richard (1981), whose argument is that democracy has a redistributive effect on income through the extension of the voting right toward poorer segments of society. Then, I identify why democratization might not lead to a reduction of inequality when democracy is captured by an elite or the middle-class to their advantage. I also present models of inequality influencing political regimes; first a mechanism highlighted by two papers of Acemoglu and Robinson (2001, 2002) on how the threat of a revolution might lead to democratization and then in what way intrinsically good economics characteristics lead to a democratic society.

Second, I review the empirical evidence on this topic. For both the effects of political regimes on inequality and the effects of inequality on political regimes, I aimed to find papers with different methods and samples. The majority of former studies only measure a correlation, while more recent ones take endogeneity and control for different variables into account.

This paper proceeds as follows. In the next section, I discuss the theoretical connections between political regimes and inequality. Section 2.1 presents the effects of political regime on inequality and section 2.2 the effects of inequality on political regime. Section 3 reviews the existing empirical literature: Section 3.1

presents an empirical survey of the impact of political regimes on inequalities and section 3.2 then reviews the empirical literature on the impact of inequalities on political regimes. Section 4 concludes.

2. RELATIONSHIP BETWEEN POLITICAL REGIMES AND INEQUALITIES: THEORETICAL CONSIDERATIONS

In this part, I will focus on the theoretical aspects. I will introduce models of the relationship between political regimes and inequalities. These associations will be divided into two sections; I will first present the effects of political regimes on inequalities, followed by the effects of inequalities on political regimes.

2.1. MODELS EXPLAINING THE EFFECTS OF POLITICAL REGIMES ON INEQUALITIES

Impacts of political regimes on inequalities might happen through different mechanisms, some of which will be described in this thesis. I will start with the redistributive effects of democracy presented by Meltzer and Richard (1981) and remodeled by other authors. Next, I will present how democracy may be captured by interest groups and, therefore, does not reduce inequalities. Finally, I will demonstrate how redistribution works under autocratic regimes.

2.1.1. THE REDISTRIBUTIVE EFFECTS OF DEMOCRACY

The first mechanism introduced is the one of Meltzer and Richard (1981). They use the median voter theorem to assess how a democracy may diminish inequalities. This theorem, which is a simple way to model the functioning of a democratic society, assumes that the median voter always gets their most preferred policy (Congleton, 2002, pp.2-3). Under the assumption that the median voter's position is more leftist in democracies than in non-democracies, we can expect democracies to have lower level of inequalities than there is in non-democracies. Indeed, if a tax is determined by the initial distribution of income and the median voter's position,

the revenue of this tax is distributed proportionately in the population. Since the median voter is shifted toward poorer segments of society, through the extension of the voting franchise, inequalities may be expected to decrease through redistribution (Timmons, 2010, pp.4-5). In order to give a more pedagogical understanding of this theory, I will also present a simplified version of the model which has been further developed in the paper of Acemoglu et al. (2014).

The main assumption Meltzer and Richard (1981) make in their model is that democracy has a redistributive effect on incomes. They argue that a change in the voting rules could possibly change the income tax rate. When political power is extended toward poorer segments of society, the median voter will be shifted in this part of the population. Therefore, votes for redistribution increase, and consequently, inequalities are reduced.

The basic framework

In the example of a society with a large number of agents, prices, wages, and tax rates are taken as given and differences in productivity are reflected by differences in endowment. Agents only differ in their endowment of income y (with its mean being $\bar{y}$), which consist of productivity x and the time they allocate to labor n. $F(y)$ is the distribution function of income in the society, or the fraction of the population whose income is less than y.

The government only has one policy instrument, which is a tax τ imposed on all individuals. The tax is proportional to earned income since productivity cannot be directly observed. As emphasized before, the revenue of the tax is then used to finance lump-sum redistribution of r units of consumption per capita.

Maximization problem of the agent

The rational agent wants to maximize their utility; the maximization problem under the constraint presented in (2.2) is the following:

$$\max_{n\in[0,1]} u(c,l) = \max_{n\in[0,1]} u[r + nx(1-\tau), 1-n], \qquad (2.1)$$

with c for consumption, l for leisure, r the revenue of the tax, n the number of worked hours, x the productivity and τ the tax. Agents are price taker in the labor market, take τ and r as given and select n to maximize their utility.

Determination of the optimal tax rate

In a society using universal suffrage with majority rule, the voter with the median income is decisive. Such individual has to find a tax rate that maximizes their own utility. However, the lump-sum transfer T is determined by the government budget constraint, and the tax should also balance the government budget. The government only spends money on redistribution of income, which suggests:

$$T \leq \tau\bar{y} - C(\tau)\bar{y}, \tag{2.2}$$

with T representing the government budget constraint and the transfer to all agents, τ the tax rate, $\bar{y}$ the mean individual income and $C(\tau)$ capturing the distortionary costs of taxation.

The tax rate τ is to be found so that it maximizes the median voter's utility (equation 2.1) given the government budget (equation 2.2). Therefore, under those circumstances:

$$0 = \bar{y} + \tau\frac{d\bar{y}}{dt} - \hat{y}, \tag{2.3}$$

The preferred post-tax income of each individual, which is found by solving the first-order condition, is the following:

$$\hat{y} = (1 - \tau)y + \tau\bar{y} - C(\tau)\bar{y}. \tag{2.4}$$

This equation implies that the higher the income, the lower the preferred tax rate. Indeed, the tax is imposed on the income and then used to redistribute to all agents, so that individual with higher income do not want to be taxed more and also do not need more transfer.

Extension of the voting franchise

Nonetheless, if it is assumed that only agents with a higher income than y_q, the qth percentile of the income distribution have the right to vote, the remaining agents, therefore, will be disenfranchised. That said, in the case of a further transition to democracy with an extension of the franchise, $y_{q'}$ becomes lower than y_q. Thus, the tax rate $\tau_{q'}$ is then higher than τ_q and the resulting post-tax income distribution $F_{q'}$ is more equal since it is more focused around its mean than F_q (Acemoglu et al., 2015, pp.1890-1892).

The main result

All things considered, the outcome of the model of Meltzer and Richard (1981) is that democratization increases the number of voters with relatively low income. The position of the decisive voter depreciates the distribution of income, and therefore, while increasing the demand for a higher taxation, results in a more significant redistribution (Meltzer and Richard, 1981).

2.1.2. LIBERAL DEMOCRACY AND THE ROLE OF INTEREST GROUPS

A democratization does not necessarily lead to reduction in inequality. This argument is discussed in this subsection along with the role of the interest groups. I will first focus on how the democracy might be captured by an elite and will then present the way middle-class population can take advantage of the democracy.

2.1.2.1. *THE CASE WHERE DEMOCRACY IS CAPTURED BY THE ELITES*

The first possible mechanism is presented by Acemoglu et al. (2011). They establish a model of inefficient states in which the rich elite influences the public bureaucracy. They show that when a society begins as nondemocratic but is, however, likely to democratize, the rich population will feel threatened. Thus, in order to limit redistribution, they will find it profitable to choose an inefficient organization which will enable them to capture democratic politics. Moreover, bureaucrats will most likely vote for the rich because they receive rents and expect

bureaucratic reform if the poor were to come to power. Therefore, a coalition emerges between the rich elite and bureaucrats. In addition to this, not only do inefficient states expand, but they also persist. Indeed, bureaucrats vote for the elite, which does not reform the bureaucracy. This leads to an elite that captures democracy by establishing an inefficient state structure, which will not only induce less redistribution, but also limited public good provision (Acemoglu et al., 2011)

Albertus and Menaldo (2013) also argue that democracy can often be captured by elites and may therefore not be able to redistribute to a greater extent than autocracies. If a democratization happens when elites are considered as weak, the relationship between democracy and redistribution will emerge (Albertus and Menaldo, 2013, pp.576-577). However, during transition, a powerful elite will manage to create institutions that copy their strength. As a result, an elite-biased democracy in which the economic elite succeeds in exploiting their power in an effective way, will equally manage to manipulate political outcomes. They can do so through powerful lobbying or vote buying (Albertus and Menaldo, 2013, p.581). Thus, an elite-biased constitution, even if it is a democracy, might reduce redistribution. As a matter of fact, the probability of right-wing executives is higher because of the over-representation of elite interests related to these constitutions. Moreover, the elite will support institutions and electoral rules that facilitate powerful interests to defend their control in local politics (Albertus and Menaldo, 2013, p.584).

Further, Acemoglu et al. (2014) argue that the rich elite might take action to increase their *de facto* power, and consequently, nullify *de jure* power that poorer agents acquired through democratization. This will be the case under the assumption that the redistribution of income is made between the rich elite (enfranchised) and the rest of the population, the latter being the majority, which is not enfranchised at the beginning. Acemoglu et al. (2014) further suppose that the rich elite has the possibility to strengthen their *de facto* power and therefore control the political system to some extent, under costly investments. When there is a limited franchise, the elite does not need to bear the cost to capture the democracy.

However, when the voting franchise is extended, the larger and poorer segment of the society will impose higher redistribution. Thus, if the cost is not excessively high, the rich elite might find it profitable to set the tax at a stage that is profitable for them. Subsequently, no changes in taxes and redistribution of income will ensue as a result of democratization (Acemoglu et al., 2014, p.1895).

It is, however, noteworthy to mention that democracy can possibly lead to an increase in taxes while not having any relevant effect on inequality. The elite, along with their de facto power, could shift redistribution toward themselves but does not have such power to control taxes. In line with this supposition, democratization would affect inequality only to a small extent, but with a significant impact on taxation (Acemoglu et al., 2014, pp.1896-1897).

2.1.2.2.   THE CASE WHERE DEMOCRACY IS CAPTURED BY THE MIDDLE CLASS

Democracy might not be captured by the elite, but by the middle-class which will be empowered by a democratization. This idea is suggested by Stigler (1970), who presents a law of public expenditures proposed by Aaron Director. The Director's Law argues that "Public expenditures are made for the primary benefit of the middle class and financed with taxes which are borne in considerable part by the poor and the rich" (Stigler, 1970, p.1). Therefore, agents of the middle-class will use this power to redistribute income to themselves, which will limit the impact of democracy on inequalities.

To defend the plausibility of Director's Law, Stigler (1970) cites examples of how the middle-class manages to capture the democracy and hence, uses the state in their favor. For instance, the middle-class benefits from the social security system. Indeed, the latter taxes massively individuals who work early, who die early, who were young when first covered by the law and families in which the wife is working. All these effects tend to favor the middle-class. Furthermore, the authors found out that tax exemptions were mainly given to institutions which serve the middle-class, such as educational and medical institutions (Stigler, 1970).

Acemoglu and Robinson (2014) also discuss this idea. They demonstrate that the increasing power of the elite may limit redistribution and therefore the outcome for inequalities (Acemoglu and Robinson, 2014, p.1901). They suppose that the society is divided between the rich elite, the middle-class and the poor. They also assume that after a democratization, the median voter will be an individual from the middle-class. This will be the case if there are more agents in the middle-class than in the rich one and if the extension of the franchise is limited; or if the median voter is situated in the middle-class and there is development to a full democracy. Unlike the conclusion of the model of redistributive democracy in which the middle-class is empowered, Acemoglu and Robinson argue that the result of the income redistribution is ambiguous and depends on several factors. For instance, if the poor class is large and not excessively poor in comparison to the rich class, inequalities will increase because the burden of taxation is borne by the poor. It also depends on the fortune of the middle-class: if they are significantly poorer than the rich, a more equal society will arise; if they are much richer than the poor, the outcome will be a less equal society (Acemoglu and Robinson, 2014, pp.1898-1900).

2.1.3. REDISTRIBUTION IN AN AUTOCRACY

This subsection focuses on the orientation of the policies chosen by an autocratic government. I will start by presenting the suggestion of Beitz (1982) who claims that redistribution does occur in an autocracy. Then, I will present the idea of Bollen and Jackman (1985) based on the belief that if the state-elites orient their policy toward economic growth, inequalities will rise. Finally, I will present the model of Acemoglu and Robinson (2000) who suggest that redistribution only arises in the case of a revolution threat.

Beitz (1982) suggests that redistribution does occur in an autocracy. This idea is emphasized in the paper by Sirowy and Inkeles (1990). Beitz's argument is that authoritarian regimes are more competent at protecting the interests of the poor and the working-class than democracies. Indeed, Beitz (1982) admits that democracies are more receptive to demands of societal members, although they do not respect their members equally as sources of claims. This prevents the disadvantaged agents

from taking advantage of the political rights. Moreover, inequalities in redistribution of resources are repeated in inequalities of political influence. Thus, authoritarian regimes excel in protecting interests of the disadvantaged who are unable to defend theirs in a democratic society (Sirowy and Inkeles, 1990, p.135).

Besides, Bollen and Jackman (1985) argue that in autocratic regimes, since there is no political mechanism that holds the elite responsible for the disadvantages agents in the society, they can pursue policies that benefit the minority as long as they want. For instance, if representatives of the land-owning class are included in the regime, it is likely for the latter to disrupt land reform, which intends to reduce inequality. Similarly, monarchies have a low level of political representativeness, which implies greater inequalities. This suggests that in nondemocratic regimes, because the elites are not accountable to the majority, inequalities are more likely to arise (Bollen and Jackman, 1985, p.439).

Lee (2005) suggests that public sector extension is more likely to result in higher inequalities in an autocratic regime (or a limited democracy). He argues that the output depends on the policy: as mentioned before, the motive of the state elite is oriented on economic development, which will counterbalance the redistributive propensity within the use of state resources. Hence, a state-elite focused on growth will not improve global equality in the society. As a matter of fact, their policy will aim to create and develop new industrial forces with the help of infrastructures and low taxes. Thus, state-held resources will be used for this matter and not to improve redistribution and equality (Lee, 2005, pp.160-161).

Lastly, Acemoglu and Robinson (2000) argue that in an autocracy, redistribution takes place only when a democracy imposes a revolutionary threat. The authors found out that many Western societies extended voting rights and thus increased redistribution in order to prevent a democratization.

Let us summarize their argument: suppose that each agent is able to invest to increase their capital and there is a tax rate set by the elite. As long as there is no menace of a revolution in the autocratic society, inequality increases because the

poor cannot accumulate unless they receive transfers. Meanwhile, the rich do accumulate capital and therefore grow their income. When a menace arises, there are different output possibilities and it depends on when this threat arises.

If it arises at some point t for the first time and the transfer from the rich to the poor is enough for the poor to start accumulating, then inequalities decrease. When the menace of a revolution is too conspicuous, the elite is forced to extend the franchise. This results in a democracy where the median voter is poor and votes for a redistributive tax, which he will get from the rich and whereby he will be able to accumulate. Consequently, inequalities decrease. Democratization then happens to be the only solution when the threat appears any time after t (Acemoglu and Robinson, 2000, pp.1178-1180).

On the other hand, the elite can prevent a revolution that arises before t with momentary measures when inequalities are not too important. In this case, the authors demonstrate that when transfers stop because the menace of a revolution is no longer here, inequality grows again. Indeed, this happens since, as already mentioned, the poor are not able to accumulate without transfer, as the transitory redistribution is not enough. If another threat appears later on, then democratization may be the only solution (Acemoglu and Robinson, 2000, p.1180).

The last possibility is a menace or revolution occurring at a time before t but with a transfer high enough to permit the poor to accumulate. The outcome is a nondemocratic development path, and inequalities thenceforth remain constant, as not only do the poor accumulate, but the rich too (Acemoglu and Robinson, 2000, p.1181).

Acemoglu and Robinson's theory (2000) demonstrates that in an autocracy, the franchise is extended because of a menace of revolution as a consequence of inequalities. This is a first indication that the relationship between political regimes and inequalities might go in the other direction[1]. However, the model reveals that it is only when the franchise is extended that inequalities drop. Inequalities do decrease if the elite chooses to initiate temporary measures, but they rise again as soon as the transfer stops, which delays the democratization. In the only case in

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[1] This will be the subject of the next section.

which democratization is avoided, inequalities do not decrease but stay constant (Acemoglu and Robinson, 2000).

2.2. MODELS EXPLAINING THE EFFECTS OF INEQUALITIES ON POLITICAL REGIMES

As already mentioned, it is also possible that inequalities influence the political regime of a society. We already briefly suggested how in an autocracy – where inequalities are supposed to be higher than in a democracy, more redistribution occurs when the poor pose a revolution threat. In this subsection, I will first present how the threat of revolution may lead to democratization, specifically because of inequalities. Indeed, inequalities drive social unrest which might force a society to democratize.

The second subsection presents how inequalities, among others, affect the endogenous evolution of democratic constitutions.

2.2.1. THE CASE WHERE THERE IS A THREAT OF A REVOLUTION

I first present the model of Acemoglu and Robinson (2001), which emphasizes the role of social unrest, specifically the threat of a revolution, as a factor in the transition to democracy. They argue that when the poor are excluded from political power, they set a revolutionary threat which is likely to lead to a transition to democracy.

Then, I present another model of the same authors. It is related to the first model, but on their second paper, the focus is on industrialization. Indeed, Acemoglu and Robinson (2002) show how industrialization concentrates poor individuals in urban centers, resulting in an increased political unrest and threat of revolution.

a. *The paper by Acemoglu and Robinson (2001)*

In their first model, Acemoglu and Robinson (2001) analyze the question of the conditions that determine political institutions. They emphasize the fact that the rich

will most likely be against a democracy while the poor will be pro-democratic. This emanates from the fact that the poor have the opportunity to impose higher taxes on the rich in a democratic society. In nondemocratic societies, the poor are excluded from political power, but they set a revolutionary threat because they want more redistribution. The rich elite tries to avoid a revolution by redistributing income to the poor, because a revolution is costly. However, if redistribution is not a commitment credible enough to future income distribution, the elite will be forced to extend the franchise and will therefore change the society into a democracy (Acemoglu and Robinson, 2001, p.939).

The basic framework

Acemoglu and Robinson (2001) consider a society with a share λ of poor agents and the remaining $1 - \lambda$ are rich agents (the elite). If the regime is democratic, the tax rate is set by the median voter, who is a poor individual. In a nondemocracy, the rich elite sets the tax rate, but the poor can attempt a revolution.

There is only one consumption good y and a unique asset h, which is a combination of human capital, physical capital and land. Initially, at time $t = 0$, poor agents have capital h_0^p and agents of the elite have $h^r > h^p$. A_t represents aggregate productivity of the economy and it can take the value $A^h = 1$ with probability $1 - s$ or $A^l = a$ with probability s. It is assumed that $A^l = a < 1$ is a period of recession, and that they are rare so that $s < {}^1/_2$. Thus, $A_t = A^h$ is a "normal" time.

To set up inequalities, assume that the elite have capital $h^r = (1 - \theta)h/(1 - \lambda)$ and the poor have $h^p = \theta h/\lambda$, where $\lambda > \theta > 0$, meaning that a low level of θ corresponds to higher inequalities. If one assumes that the society is a non-democracy at first, poor agents cannot take part in the political process. However, they can attempt a revolution at any time $t \geq 1$, which is believed to always succeed. The poor expropriate a fraction $\pi - \theta$ of the asset of the economy, and a share $1 - \mu > 0$ of the income is destroyed during the process of a revolution.

Assume further that as a result of a revolution, the rich lose everything, meaning they will always want to prevent it. Thus, if the value of μ is low, a revolution will be costly and if the value of π is low, the gains from a revolution will be small.

However, the elite has no special power in a democracy, but they can attempt a coup. The coup is assumed to always succeed, and after the coup the elite are again in control of political power. A share $1 - \phi$ of all agent's income is destroyed in the process (Acemoglu and Robinson, 2001, pp.940-942).

The Set of Strategies of the agents

In each period of the game, different events happen:

1. The state $A_t \in \{A^h, A^l\}$ is known, so it is clear if we are in a period of recession or a "normal" time.

2. If a revolution has occurred in any preceding period, the poor get their share of the income, there is consumption and the period ends.

3. The group in power sets the tax rate τ_t. If the society is a democracy, the poor choose the tax rate; in a non-democracy the rich choose the rate.

4. The rich decide whether to extend the franchise (in a non-democracy) or whether to mount a coup (in a democracy). If the franchise is extended or if a coup takes place, the party coming to power will either choose to keep the tax τ_t of stage 3 or to set a new rate.

5. In a non-democracy, the poor choose whether to start a revolution or not. If a revolution occurs, they share the surviving output of the economy. Otherwise, the tax rate decided from stage 3 or 4 remains.

6. Consumption takes place and the period ends.

The economy is characterized by a multi-stage game between the elite, treated as one player and the poor, also considered as one player[2]. As solution concept, the authors use Markov perfect equilibrium, in which strategies only depend on the current state of the world and the previous actions taken in the same period. This state S can be one of $(A, D), (A, E)$, or (A, R). E stands for a nondemocratic regime where the elite is in power, D is for a democracy and R for revolution. The strategy of the elite is designated by $\sigma^r(S|\tau^p)$. It depends on the State S and the tax rate chosen by the poor, τ^p when $S = (A, D)$. The actions of the elite are determined by this strategy, and they are denoted by $\{\gamma, \zeta, \tau^r\}$. The first term, γ denotes the

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[2] To simplify, all poor agents are taken as identical, and all members of the elite are also identical.

extension of the franchise. Only in the state (A, E) can the elite extend the voting franchise, $\gamma = 1$ means the franchise is extended and $\gamma = 0$ means no extension of the franchise. The second term, ζ is the decision to attempt a coup, which can only arise in the state (A, D). $\zeta = 1$ is the decision to attempt a coup and $\zeta = 0$ means no coup. The last term τ^r is the tax rate set by the elite. They can choose this tax rate when $S = (A, E)$ and $\gamma = 0$ or when $S = (A, D)$ and $\zeta = 1$.

The strategy that the poor use is $\sigma^p(S|\gamma, \tau^r)$, it is a function of the state S and the franchise extension and tax rate decision of the elite when $S = (A, E)$. Their action is determined by their strategy which is the following: $\{\rho, \tau^p\}$. The decision to undertake a revolution is denoted with ρ, $\rho = 1$ being equivalent to the revolution and $\rho = 1$ no revolution. The second term, τ^p is the tax rate set by the poor, when $S = (A, D)$. Thus, starting from (A, E), if there is a revolution, the state becomes (A, R). Without a revolution, if $\gamma = 0$, the state remains (A, E) and if $\gamma = 1$, it becomes a democracy (A, D). Starting from (A, D) and if there is a coup, the state switches to (A, E). Agents maximize their total future welfare, conditional on the strategy and actions by both players. A pure strategy Markov perfect equilibrium is a strategy pair $\{\hat{\sigma}^r(S \mid \tau^p), \hat{\sigma}^p(S \mid \tau^r)\}$ so that for all possible states S, $\hat{\sigma}^p$ and $\hat{\sigma}^r$ are the best responses given the other group's strategy. In other words, in the first period, each group has to choose a strategy that will determine their action. To do so, they need to find their optimal tax rate. In the subgame equilibrium, each group maximizes their utility to find this optimal tax rate, given the anticipated strategy taken by the other groups in the next period. Lastly, this optimal tax rate will be used in their choice of strategy (Acemoglu and Robinson, 2001, p.942).

In the subgame, given the anticipated action of the rich, the optimal tax rate for a poor agent τ^m (when there is no threat of a coup) maximizes the individual's consumption. This means:

$$\tau^m = \arg\max_\tau (1 - \tau)A_t h^p + (\tau - c(\tau))A_t h\}, \qquad (2.5)$$

where $(1 - \tau)A_t h^p$ is the after-tax earned income for the poor, and $\left(\tau - c(\tau)\right)A_t h$ the lump-sum transfer T_t that an agent of group i receives from the state. The first-order condition of the problem is:

$$c'(\tau^m) = \frac{\lambda - \theta}{\lambda}, \qquad (2.6)$$

with $c'(\tau^m)$ being the cost of raising the optimal tax rate τ^m of a poor agent, λ the share of poor agents and $\lambda > \theta > 0$, so that τ^m decreases with an increase of θ.

As in the voting model of Meltzer and Richard (1981) described above, the preferred tax rate of the poor increases along with inequalities. In the subgame, given the anticipated action of the rich, the median voter sets a zero tax rate ($\tau^m = 0$) when $\theta = \lambda$ so that $h^r = h^p$. Let $\delta^i(\theta)A_t$ be the amount of redistribution that a person i receives in state A_t when the tax rate is τ^m (Acemoglu and Robinson, 2001, p.943).

Two assumptions are made to simplify the analysis. They will assure that when $A_t = A^h$, neither a coup nor a revolution is beneficial. For a coup not to take place when $A_t = A^h$, the following condition is sufficient:

$$(1 - \beta)(1 - \phi)h^r > -(1 + \beta s(a - 1))\delta^r(\theta), \qquad \text{Assumption 1}$$

where β is the discount factor, $1 - \phi$ the share of the total income lost in the period of a coup, h^r the capital of the elite, s the probability of a recession a and $\delta^r(\theta)$ the net amount of redistribution received by a member of the elite.

This assumption is given by comparing the cost of a coup during normal times for a rich agent ($(1 - \phi)h^r + \delta^r(\theta)$) to the benefice of avoiding taxation in the future (with the net present value of taxation being $-\beta((1 - s) + sa)\delta^r(\theta)/(1 - \beta)$). These costs and benefits are impacted by the taxes in democracy, which are determined by inequalities.

Starting in the state (A_t, E), the poor undertaking a revolution would obtain:

$$V^P(A_t, R) = \frac{\pi \mu A_t h}{\lambda} + \beta W^P(R), \tag{2.7}$$

with $\frac{\pi \mu A_t h}{\lambda}$ being the period return of each agent and $W^P(R) = \frac{(sa+1-s)\pi h}{(1-\beta)\lambda}$ the expected net present value of a poor after a revolution. Equation (2.7) follows because the poor receive only a share $\pi \mu$ of the assets of the economy h during a revolution and obtain $W^P(R)$ after.

On the other hand, starting in the same state but without a revolution, they would obtain the following utility:

$$\hat{V}^P(A_t, E) = A_t h^p + \beta \frac{((1-s) + sa)h^p}{1 - \beta}, \tag{2.8}$$

with all variables defined as before.

This situation appears so because without taxation, the poor receive h^p in period t and ah^p in all future recession periods. Equation (2.8) is the lower bound on the utility of poor individuals. Hence, $\hat{V}^P(A^h, E) > V^P(A^h, R)$ is a sufficient condition for the poor not to undertake a revolution in the state (A^h, E); it is guaranteed by:

$$\mu < \frac{(\pi - \theta)\beta s(1 - a) + \theta - \beta\pi}{(1 - \beta)\pi}. \qquad \text{Assumption 2}$$

This will imply that the elite will choose no redistribution when in power, when the state is $A_t = A^h$.

The median voter in a democracy is a poor agent, thus the tax rate is τ^m because, by assumption, there is no attempt of a coup in normal times. Agents get h^i from his capital and $\delta^i(\theta)$ from the government.

I will not develop the possibility of the elite mounting a coup in this paper, but we can note that intuitively, more inequalities in a society means more redistribution, although this is less significant for the elite who will be more tempted to mount a coup.

What is more interesting is the motivation of the poor to attempt a revolution in a non-democracy. As previously assumed, a revolution that is not binding at $A_t =$

A^h might be binding at $A_t = A^l$. Hence, the elite can choose redistribution in order to prevent revolution. However, the elite does not commit to future redistribution unless a revolution threat also exists in the future. The revolution constraint for the poor is the following:

$$W^p(R) - W^p(E) \leq \frac{a(h^p + \eta^p(\theta, \tau^e) - \mu\pi h)}{\beta}, \tag{2.9}$$

with $W^p(R) - W^p(E)$ being the difference between the utility for the poor after a revolution and their utility for living in a nondemocracy, $a(h^p + \eta^p(\theta, \tau^e)$ the total income received by the poor (the income from their earnings $(1 - \tau^e)ah^p$ plus the transfer $T_t^e = (\tau^e - c(\tau^e))ah$) and the remaining variables defined above.

The elite will set a tax rate τ^e as high as necessary to convince the poor not to attempt a revolution. However, there is a critical value of μ, designated by $\bar{\mu}(\theta, a, s)$, so that for every value of μ higher than that, no amount of redistribution can prevent a revolution to happen. The critical value is:

$$\bar{\mu}(\theta, a, s) = \frac{(1 - \beta + s\beta)a\left(h^p + \delta^p(\theta)\right) - (as + 1 - s)\beta\pi h + \beta(1 - s)h^p}{(1 - \beta)a\pi h}. \tag{2.10}$$

When $\mu < \bar{\mu}(\theta, a, s)$, the elite can prevent the poor from attempting a revolution, meaning the society will remain nondemocratic. Indeed, given the amount of inequalities and the value of s, a revolution is relatively costly, and redistribution can prevent revolution.

Otherwise, for $\mu > \bar{\mu}(\theta, a, s)$, a political change to democracy is the only solution for the elite. The following equilibrium (whether the democracy will be fully consolidated or not) will depend on the cost of a coup from the elite[3]. Higher inequalities are more likely to result in a revolution because $\partial\bar{\mu}(\theta, a, s)/\partial a > 0$, so that the poor are in a more advantageous position in a democracy (Acemoglu and Robinson, 2001, p.946).

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[3] This will not be discussed in this paper. For further information, refer to Acemoglu and Robinson (2001).

From this analysis, a conclusion can be drawn regarding the relationship between inequalities and political regimes. A reduction of θ means the share of the income lost during the revolution $\bar{\mu}(\theta, a, s)$ and thus the cost of a coup also decreases. A higher level of inequalities therefore leads to a higher probability of a revolution or a coup. In other words, the political regime is more likely to change with high level of inequalities (Acemoglu and Robinson, 2001).

b. The paper by Acemoglu and Robinson (2002)

In their second model, Acemoglu and Robinson (2002) take industrialization into account in the rise of inequalities. Both this model and the previous one have a related pattern. In the previous model, they argue that in a non-democracy, the poor set a revolutionary threat since they are excluded from the political power and they want to contest this. In this model, Acemoglu and Robinson (2002) confirm this theory, but they further argue through political economy theory of the Kuznets curve. They claim that the relationship between income per capita and inequality is driven by political changes. Consecutively, these political reforms are caused by the increase of social tension that comes from rising inequality. Most policies favored the elite and little redistribution was done to the masses before the nineteenth century in European countries. This leads to the mobilization of the poor and an increase of social unrest, eventually resulting in a forced radical reform by the elite (Acemoglu and Robinson, 2002).

The basic framework

As seen in their previous model, Acemoglu and Robinson (2002) consider a society with a share λ of poor individuals (denoted as p), and the remaining $1 - \lambda$ is the rich elite (denoted as r). There is a unique consumption good y and a unique asset h, being a combination of human and physical capital. At time $t = 0$, each poor agent has a capital h_0^p and each member of the elite has $h_0^r > h_0^p \geq 1$. To create the final good, two methods exist: a market technology $Y_t^m = AH_t^m$ and an informal sector technology, $Y_t^h = BH_t^h$ where H_t^m resp. H_t^h are the amount of capital devoted to market technology resp. to the informal sector.

Acemoglu and Robinson (2002) assume that all agents have identical utility, characterized with their own consumption and educational bequests:

$$u^i\left(c_t^i, e_{t+1}^i\right) = \begin{cases} \left(c_t^i\right)^{1-\gamma}\left(e_{t+1}^i\right)^\gamma & if\ e_{t+1}^i > 1 \\ \left(c_t^i\right)^{1-\gamma} & if\ e_{t+1}^i \le 1 \end{cases} \qquad (2.11)$$

with $i = r, p$, $\gamma \in (0,1)$, c_t^i the consumption of a member of group i alive in period t and e_{t+1}^i the investment in the offspring's education.

The offspring's human capital is given by:

$$h_{t+1}^i = max\left\{1;\ Z e_{t+1}^i{}^\beta\right\}, \qquad (2.12)$$

with $Z > 1$ and $\beta < 1$, so that accumulation is not infinite.

Post-tax income is $\hat{y}_t^i \equiv (1 - \tau_t)Ah_t^i + T_t$ for $i = p, r$ with τ_t the tax rate on income and $T_t \ge 0$ the transfer to agent from the state. At the beginning, the elite is in power and therefore has to decide in each period if they extend the voting franchise. If they do, the society develops into a democracy. Poor agents cannot take part in the political process and only after the decision of the elite can poor agents choose to attempt a revolution, which is assumed to always succeed. As seen in the previous section, revolution leads to redistribution from the rich to the poor, but it should be underlined that a share $1 - \mu$ of the capital stock is lost in the process. If a revolution arises at a time t, each poor agent gets a per-period return of $\mu AH_t/\lambda$ in all future periods and the total income in the economy is μAH_t shared between λ agents. If μ is small, a revolution is too costly and therefore not likely. As taxes are set after the decision of a revolution, poor agents will not engage themselves to redistribute from the elite credible. The only commitment is thus the extension of the franchise, which gives political power to the poor (Acemoglu and Robinson, 2002, pp.189-190).

From the utility in equation (2.11), the authors make the assumption:

$$\gamma A < 1\ and\ (\gamma B)^\beta Z > 1. \qquad Assumption\ 1$$

The first part suggests that with no taxation, an individual with the minimum level of human capital leaves no education to their offspring; the second part insures that when there is an accumulation of human capital, a steady-state level of human capital $h_{ss} > 1$ can be attained.

All the analyses start with the following initial condition:

$$h_{ss}^r > h_0^r > (\gamma A)^{-1}, \tag{2.13}$$

with h_{ss}^r being the steady-state value of the rich's human capital. $h_{ss}^r > h_0^r$ assures that we begin with less than steady-state human capital, so that there will be growth. It also assures that rich agents can leave positive endowment to their offspring. The poor are not able to do so, because their income in below the minimum necessary to leave anything to their offspring (Acemoglu and Robinson, 2002, pp.191-192).

If a revolution becomes a real threat, the only credible promise is the extension of the franchise to the poor. The revolution constraint arises from comparing what poor individuals would get under the elite rule to what they would get after a revolution:

$$\frac{h_t^r}{h_t^p} \leq \frac{\lambda(1-\mu)}{\mu(1-\lambda)}. \tag{2.14}$$

If this equation can be considered as true, no revolution will arise at time t. A revolution is more likely to arise when inequalities are high, so when the gap between h_t^r and h_t^p is large. The threat of a revolution also becomes more serious the lower λ is. Indeed, the goal of a revolution is to absorb the wealth of the rich; therefore, when there are fewer rich individuals, the outcome of the revolution is less interesting. (Acemoglu and Robinson, 2002, pp.194-195).

When only the rich accumulate, inequalities increase. If (2.14) is not binding at the point of steady-state (when inequalities are maximum), it will never be. Hence, we have the following condition:

$$h_{ss} > \frac{\lambda(1-\mu)}{\mu(1-\lambda)}. \qquad \text{Condition 1}$$

As the rich accumulate and if this condition holds, the threat of a revolution will eventually become persuasive and the elite will be forced to extend the franchise. Otherwise, the revolution constraint can be ignored, because it will never bind. Thus, the economy remains autocratic with high inequalities. This might be the case if there is no well-developed civil society, making it more challenging for the poor to organize and involving a small μ (Acemoglu and Robinson, 2002, pp.195-196).

When all agents accumulate, inequalities are decreasing and are also the highest at point $t = 0$, the following condition appears:

$$\frac{h_0^r}{h_0^p} < \frac{\lambda(1-\mu)}{\mu(1-\lambda)}. \qquad \text{Condition 2}$$

If Condition 2 is true, there will be no revolutionary threat at time $t = 0$ and neither after, as inequalities will be reduced (Acemoglu and Robinson, 2002, p.196).

To sum up, both this model and the previous one reach a similar conclusion. A high level of inequalities makes the probability of a revolution more likely in the two models because the poor are excluded from the political power and they want to contest this. In this model, Acemoglu and Robinson (2002) take into account development and industrialization as arguments of an increase in inequalities through social unrest; however, the crucial factors in the relationship between inequality and development are still political factors. The previous model only focuses on the social unrest-democratization relationship. Both models assumed that a revolution will always succeed, and if the poor do not have to confront issues such as an undeveloped society, the elite will be forced to democratize. Therefore, inequalities are positively correlated with a democratization in these two models.

2.2.2. THE CASE WHERE INTRINSICALLY GOOD CHARACTERISTICS LEAD TO A DEMOCRATIC SOCIETY

In this subsection, I will investigate the way a democratic society is affected by intrinsically good economic characteristics. The previous section argues that the elite initiates democratization because of the threat of conflict. This subsection presents the paper of Cervellati et al. (2005), which tries to provide a unified dynamic theory of both these arguments. They present a model of economic inequality and economic development both as a cause and a consequence of political changes (Cervellati et al., 2005, pp.1354-1356)

Cervellati et al. (2005) emphasize the role of economic inequality and long-term development as a determinant of institutional and political changes. They focus particularly on the emergence of a social contract. They argue that both inequalities and development are the main determinants of the implemented regime. If the society is characterized by a low level of development and an elite is sufficiently richer than the poor agent, so that the engagement to a state of law is credible, then, the society is likely to become - and remain - an oligarchy. This equilibrium arises when neither the rich nor the poor have the incentive to deviate and get implicated in an open conflict. Unlike previous studies, here all groups prefer the oligarchic regime to a democratic one, as the latter would trigger a costly social conflict. On the other hand, if the income is more equally redistributed and the level of development is relatively high, a democracy is more likely to emerge. This is the case because democratization, under the pressure of the poor (as in Acemoglu and Robinson, 2001; 2002), becomes less costly for the elite than avoiding redistribution. For the poor, avoiding conflict is too wasteful in comparison to the expected gains from expropriating the rich. For intermediate levels of inequalities, a social contract does not emerge unless conflicts are wasteful. The equilibrium is a "state of Nature" and is characterized by extensive conflict. Indeed, the cost of redistribution related to a democracy is too significant for the elite and getting involved in a conflict seems to be the best option for both the rich and the poor.

This is the case for defensive reasons for the first group and to expropriate from the rich for the second one (Cervellati et al., 2005, p.1355-1356).

The basic framework

Cervellati et al. (2005), to simplify, differentiate two political systems by their degree of enfranchisement. In a democracy, all agents can take part in the process of political decision-making while in an oligarchy, only the elite has this right. They further differentiate between a *state of nature* and a *state of law*[4]. The first one is characterized by the absence of a social contract. A *state of law* is a universally accepted social contract, meaning that all social interactions are governed by rules that all agents know and accept (Cervellati et al., 2005, p.1359).

The authors base their theory on the hypothesis of an economy populated with overlapping generations t of individuals. The population is divided into well-defined groups, the elite E, which is a fraction $\gamma < 1/2$ of the population, and the people P, which is the remaining fraction $1 - \gamma$ of the population. Members of the elite are endowed with natural resources, signifying their individual income is higher than the one of the people, $y_t^E > y_t^P$.

Each group deals with an allocative problem about how to best use their income and decides to "arm" and engage in a conflict or "not arm". This leads to a conflict of interest; the strategic form of the conflict game played between the different group is presented in Figure 1. Whenever one group chooses to arm, a wasteful conflict arises where a share $(1 - g)$ of total available income is lost. If both groups enter a conflict, both groups burn a fraction g of their own income y_t^E resp. y_t^P for the elite resp. the people. This is reflected in the top-left panel. If only one group decides to arm, a transfer of income arises from the non-armed to the armed group; this is depicted in the top-right and the lower left panel. When the elite arm, they get $y_t \frac{g}{\gamma}$ and the people, as they do not arm, get nothing. In the same way, when the people arm, they get $y_t \frac{g}{1-\gamma}$ and the elite get nothing. If both groups renounce to arm, conflict is prevented, no income wasted, and the two groups can implement a

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[4] This follows the views of Thomas Hobbes (1651) and Jean-Jacques Rousseau (1755).

state of law and follow a social contract. They both get the income they had before, $\tilde{y}_t^E$ for the elite resp. $\tilde{y}_t^P$ for the people. This is the situation presented in the lower right panel (Cervellati et al., 2005, p.1360-1361).

Figure 1. The conflict game

People *Elite*	Arm	Not Arm
Arm	$gy_t^E, \quad gy_t^P$	$y_t \dfrac{g}{\gamma}, \quad 0$
Not Arm	$0, \quad y_t \dfrac{g}{1-\gamma}$	$\tilde{y}_t^E, \quad \check{y}_t^P$

Source: personal elaboration based on Cervellati et al., 2005

with E being the elite, which is a fraction $\gamma < 1/2$ of the population, P being the people, which is the remaining fraction $1 - \gamma$ of the population, y_t being the individual income at a time t and g being the cost of the conflict.

Politico-economic Equilibrium

A political environment will arise endogenously as equilibrium. If the society starts as an oligarchy, and at least one group does not have any significant reason to obey the social contract and therefore decides to invest in arming, a state of nature arises in equilibrium. This will be the case if the per capita income that the elite can get by arming, $\frac{y}{\gamma}g$, is larger than their initial income y^E. This happens if and only if:

$$\frac{y}{\gamma}g > y^E, \tag{2.15}$$

with y individual income, γ the fraction of the population constituting the elite (denoted by E) and g the cost of the conflict.

Indeed, if this group decides to arm, all income in the economy will be appropriated by them. However, if the cost of a conflict is larger than the benefit the elite would obtain,

$$\frac{y}{\gamma}g < y^E,$$ (2.16)

the politico-economic equilibrium is an oligarchy. The elite get a higher income y^E without arming than they could get with a conflict, $\frac{y}{\gamma}g$. The people rationally assume that if they choose to arm, the elite will do the same, leading to a wasteful conflict. Therefore, they prefer choosing an oligarchic regime because through the implementation of a democracy, an equilibrium with state of nature will inevitably be implemented. Indeed, if the cost of the conflict is inferior to the cost of the redistribution, the elite will prefer the conflict. However, under an oligarchy, no arming is possible because people hand the power to the elite. Condition (2.16) is more likely to be fulfilled the richer the elite is in comparison to the people. In other words, the more unequal the society is, the less the elite must gain from arming so that the regime will remain oligarchic (Cervellati et al., 2005, pp.1367-1369).

When a society starts as a democracy, the state of nature arises if the people can get a larger income by arming than by complying to the social contract. Analogously to (2.15), from the payoffs of the conflict game presented in Figure 1, it must hold that:

$$\frac{y}{1-\gamma}g > y,$$ (2.17)

with the left member being the income agent obtain by arming and the right member the income agent obtain by complying to the social contract.

A democratic equilibrium is feasible if the people have incentives not to arm. Symmetrically to (2.17), and comparing the payoffs from Figure 1, it is the case if:

$$y\frac{g}{(1-\gamma)} < y.$$ (2.18)

The agents get higher income (y, the right member) than the one they would get with a conflict ($y\frac{g}{(1-\gamma)}$, the right member). This equilibrium will only arise if the elite also obeys the system and does not break the social contract. This will be the case if the cost of a conflict is higher than the cost of redistribution. This situation is more likely to happen if inequalities are low, otherwise the cost of the taxation is higher than the cost of arming to avoid taxation (Cervellati et al., 2005, p.1370).

To conclude, the economy is defined by a specific level of inequality λ for each generation t. Given the conditions presented above, only one equilibrium will emerge for any given level of inequality λ_t. To sum up, the equilibrium is an oligarchy for $\lambda_t^E > \lambda_{SN}$, it is state of nature for $\lambda_t^E \in (\lambda_D, \lambda_{SN})$, and it is a democracy for $\lambda_t^E < \lambda_D$. This conclusion is different from the previous one, as in this model, a high level of inequality allows an efficient oligarchy to emerge within equilibrium. Indeed, in this environment, all groups choose to leave political power to the rich elite, because a democracy would lead to a wasteful conflict. A democratic society can emerge only if inequalities are relatively small. Overall, the model of this paper delivers new results, with the reduction in inequality being correlated with democratization (Cervellati et al., 2005).

3. RELATIONSHIP BETWEEN POLITICAL REGIMES AND INEQUALITIES: EMPIRICAL CONSIDERATIONS

This part reviews different papers presenting the empirical evidence of the relationship between political regimes and inequalities. First, I will look at studies about the effects of political regimes on inequalities and later on studies about the effects of inequalities on political regimes.

3.1. EMPIRICAL STUDIES ABOUT THE EFFECTS OF POLITICAL REGIMES ON INEQUALITIES

This section presents some empirical evidence of the effects of political regimes on inequalities. It is demonstrated that a consensus about the results is not found. Indeed, some authors find an egalitarian impact of democracy while others are doubtful about this effect. These sceptical authors argue that evidence is ambiguous and not robust. I will review the papers chronologically, firstly analysing older models, which measure a correlation, then more recent ones which are sceptical about this correlation. Results are expected to be different, as data should be more recent in the second group of models, and the method used might diverge between old and more recent models. Indeed, the latter takes endogeneity into account and control for different variables.

3.1.1. SEMINAL PAPERS

The review starts with a paper of Jackman (1974). Jackman (1974) tries to determine the validity of the argument that a democracy has contribute to more egalitarian systems. He also analyses whether the effect is linear or curvilinear. The dependent variable is social equality, which is defined by three variables. *Social insurance Program Experience (SIPE)* is the measure of the efforts from the state

to redistribute revenue in a more egalitarian way. Therefore, we expect it to negatively impact inequality. Each country is scored depending on the number of social security programs and the number of years between 1934-1960 for which these programs have been in effect. *The Schutz Coefficient of Income Equality* is established on changes in the amount of inequalities in income. The data used is a substitute measure of information collected at the individual level proposed by Kuznets (1957). They illustrate the extent of intersectoral income inequalities in a national economy; these inequalities are characterized in terms of how much they differ from a totally egalitarian distribution. The coefficient presented by Schutz (1951) is used to summarize the distribution. It calculates, on a Lorenz curve[5], the difference between the observed slope and the line of perfect equality. Values have however been reversed ($100 - x_i$) so that a higher value of the Schutz coefficient means a greater degree of equality; thus, making us expect a negative relationship between the Schutz coefficient and inequality. *The Social Welfare Index* is a function of four components: physicians per million inhabitants, infant live births per thousand births, caloric consumption per capita per day and protein consumption per capita per day. The argument for the choice of this variable is that those elements relate more directly on distributions. Indeed, the elite is limited on the extent to which they can monopolize consumption of these assets. Hence, a higher score on this index is assumed to be negatively correlated with inequalities (Jackman, 1974, pp.32-34).

Jackman (1974) first inspects the form of the impact of the level of economic development on the different measures of social equality. He tests the adequacy of the linear and curvilinear hypotheses. The difference between the two hypotheses is that the curvilinear hypothesis is a type of relationship in which the variable increases. So does the other hypothesis, but after a certain level of economic development, the second variable starts decreasing as the first one continues to increase (Jackman, 1974, pp.34-35).

The models are estimated separately for the three dependent variables presented before (Social Insurance Program Experience, Schutz Coefficient of income

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[5] The Lorenz curve plots, in the case of income inequalities, the share of income that every percentage of the population has; and compares this curve with the line of perfect equality (Jackman, 1974, p.34).

equality and Social Welfare Index). The linear model shows significant parameter estimates for the three variables, but the curvilinear model gives an even higher fit for all variables. Indeed, the amount of explained variance increases considerably with the curvilinear model (for the SIPE variables for instance, R^2 is 0.355 for the linear model and 0.545 for the curvilinear model[6]); the linear hypothesis is therefore rejected (Jackman, 1974, pp.35-37).

Considering these results, Jackman (1974) then addresses the model of developmental effects in relationship with the impact of democracy on inequalities. Democratic performance variable emphasizes electoral participation, political competition, and access to information. These results support the argument that a political effect on inequalities is spurious. Indeed, the parameter estimate for democracy is smaller than its standard error of estimate, for all three variables. This adds assertion to the conclusion that a connection between democracy and inequalities only results from the impact of economic development on both variables (Jackman, 1974, pp.37-38).

To conclude, Jackman found a positive and strong effect of economic development on the three variables, the Social Insurance Program Experience, the Schutz Coefficient and the Social Welfare Index. The effect is curvilinear, which means that a higher level of economic development has a positive impact on social equality until it reaches a peak that provokes a gradual weakening of the effects. Jackman's second finding is that democratic performance does not have any effect on any dependent variables, including income equality. Indeed, once economic development is taken into account, the effects of democratic performance on material equality are spurious. (Jackman, 1974, pp.41-43).

The paper of Stack (1980), presents and tests aspects of three notable theoretical alternative models to the economic development model of income inequality presented by Kuznet (1955)[7]: first, the political model which sees political democracy as the most important variable in the reduction of inequalities[8]; second,

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[6] R^2 represents the proportion of the variance that is explained by the independent variable.
[7] Kuznet argues that the level of income inequality is largely explained by variables associated with the level of industrialization (Kuznet, 1963)
[8] E.g. Hewitt 1977

the world-economy model which thinks it is the strategic position of a nation in the world economy[9]. Finally, there are other socioeconomic factors that could be developed into new models or incorporated into existing models. In the latter, these variables can be used to explain secondary variation or to study income inequality in new models[10]. Stack (1980) tests elements of the three alternatives to the economic development model of income stratification. This is a tentative evaluation of each of these three models. Stack's purpose is to use economic development as a control variable in the inequality-democracy relationship, to assess if politics has an effect on income inequality while being independent of the level of development (Stack, 1980, pp.273-277).

Stack's model (1980) uses the level of inequalities, measured with the Gini coefficient as the dependent variable. GDP per capita is used for the measure of the level of economic development, and the democratic performance index developed by Jackman[11] is used for the degree of political democracy. The index includes political participation, competitiveness of voting, electoral irregularity, and the degree of freedom of the press; all the data refers to the year 1960. Each element is ranked from 0 to 100 and the final index is the average of the four numbers. Exports as a proportion of GDP are the measure used for the degree of a nation's dependence on the world market, and the number of individuals in the military per 1000 working age population is the index of military organization for the year 1965. The degree of dependence on the world market can reduce efforts to limit democracy. Moreover, military organization tends to affect, among others, the level of stratification in society. Stack (1980) uses a sample of only 37 countries because information on the five variables were available only for those countries (Stack, 1980, pp.279-281).

Stack (1980) first only assesses the correlation of all coefficients with income inequality without controlling the other variables. He finds that all variables are statistically significant and have the expected sign. The one with the strongest zero order relationship with inequality is the index of democratic performance (r = -0.42). Military participation is negatively and significantly related to inequality.

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[9] E.g. Rubinson 1976
[10] E.g. Lenski, 1971
[11] Jackman, R. (1974) Politics and Social Equality

This is expected because, according to Andreski (1954), the nature of military organization seems to have an effect on many parts of a society. For instance, if the military ratio is high, the elite is more inclined to make compromises. It includes redistributing income to the non-elite since they want to insure the motive of combat forces and the loyalty of the troops and their family. The coefficient for the index of dependence on world economy is expected to be positively correlated with inequality. Indeed, the more a country is dependent on the world market, the less it has control over the production methods and the more it is vulnerable to the international price structure; this will hinder the efforts to reduce inequalities. However, when only assessing the correlation between the index of dependence on world economy and inequality, the coefficient is not significant (Stack, 1980, pp.281-282).

Stack (1980) then conducts a regression analysis to test potential spurious relationships. Military participation ratio has the same negative effect as before. After the verification of economic development and other variables, the index of dependence on world economy then has a significant effect on inequality. The coefficient for democratic performance is statistically significant and has the same sign as before, which means that after controlling the level of development and other variables, democracy has a negative effect on inequalities. To summarize, the level of political democracy is the single most important variable of income inequalities. However, this conclusion can be questioned and should be carefully considered, given the small sample size and other factors (Stack, 1980, pp.283-285).

3.1.2. MORE RECENT STUDIES

More recently, authors have questioned this correlation. More recent findings will try a reassessment of the relationship between a political regime and inequalities with better measures and a larger or more recent sample of data.

Burkhart (1997) attempts to use what he thinks are better measures and a larger sample with more recent data to analyze the relationship. He tests for a parabolic inverted U-curve between democracy and inequalities. The theory states that, at first, inequalities rise with the increase of democracy, but after a certain threshold,

inequality decreases (Burkhart, 1997, p.151). The author probes the socioeconomic development as a variable likely to have an independent influence, but also for population structure and whether the county is communist or not. Socioeconomic developments are expected to have a positive effect on democracy and a positive inverted U-shaped relationship on inequalities. I anticipate population structure to negatively influence income distribution because a younger population receives less income, hence increasing income inequality. Lastly, as communist countries' goal is to distribute the wealth, they should be more equal (Burkhart, 1997, pp.148-151).

Burkhart (1997) uses data of income distribution from Hoover (1989) for the years 1983 and 1978 and from the World Bank (1993) for the years 1983 and 1988. The measure for democracy is the Freedom House measure: a country is considered a democracy if the Freedom House codes it as "Free" or "Partially Free". Burkhart uses a two-stage least-squares regression procedure (2SLS) to estimate both equations simultaneously (democracy-income distribution and income distribution-democracy). This procedure first implies constructing instruments for all the endogenous variables. In the second stage, these instruments will be used as a replacement for the endogenous variables; the second stage is the OLS estimation of the whole equations (Burkhart, 1997, pp.153-158).

The results he gets is that from 1973 to 1988, democracy and its square (to control for the U-shaped relationship) have an inverted U-curve effect on income distribution. At a low level, democracy leans toward an increasing inequality; this propensity tends to weaken as the democracy score increases and after a certain point, income inequality rises. Socioeconomic development also has an inverted U-curve relationship to income inequality, although the effect is rather weak. Communist countries seem to be more equal [12] and countries with a young population have more inequalities (Burkhart, 1997, pp.158-160).

In conclusion, Burkhart's study did find a relationship between democracy and inequalities, but it is, however, not linear. This suggests that democratization is worthy, even if at first this will increase income inequality (Burkhart, 1997, pp.160-161).

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[12] This conclusion should be treated with caution regarding the small number of communist countries in the data set (N=3).

Lee (2005) states that the majority of previous studies ignores the impact that the state might have on distributional outcomes through its interaction with organized societal forces (Lee, 2005, p.159). Several previous studies suppose that democracy directly influences inequalities, without considering the state's role in resource allocation. Lee (2005) discusses the argument that inequalities might increase with the growth of public sector size because of the state-elites' focus on economic development rather than improvement of equality within society. He also argues that after a certain threshold, the increase of public sector size will be linked to a decrease in income inequalities. This might be explained by the fact that the elite in power will start acknowledging the growing social welfare demands of interest groups. These discussions lead to a major hypothesis that he will empirically test: "Public sector development has a positive effect on income inequality in nondemocracies or limited democracies, but it has a negative effect on income inequality in institutionalized democracy" (Lee, 2005, p.163). Put differently, he argues that democracy has an influence on income inequality through the effects of public sector size. He tests for the interaction term (institutionalized democracy x public sector size) to assess if democracy has a conditional effect which would switch the relationship of public sector size to inequality from positive to negative (Lee, 2005, pp.159-172).

Therefore, Lee (2005) presents a model of the state, democracy and income inequality, where he verifies the suggestion of an inverted-U-shaped curvilinear relationship between public sector size and inequalities. He also analyses how democracy gives reformist elites better chances to get their preferred redistribution. Linking these ideas, he found that in non-democracies, a larger government size will increase inequalities. On the other hand, in institutionalized democracies, inequalities decrease with an increase of public sector size (Lee, 2005, pp.159-161).

For the analysis, Lee (2005) uses the Gini for a measure of inequalities as a dependent variable. The problem is that different measurements of the Gini exist; to counteract this potential bias, three dummy variables are included in the analyses: whether the Gini is based on income or expenditure, on households or individuals,

and on gross or net income. The data are for the years 1970 to 1994, they include 341 observations of 64 countries (Lee, 2005, pp.164-165).

He uses four groups of main independent variables. *Internal development models* include Nielsen's (1994) different measures as the main explanatory factors: sector dualism, the share of the labour force in agriculture, the natural rate of population and the secondary school enrolment ratio. The demographic transition is expected to increase inequality, as a large young group tends to impoverish lower-income households. The expansion of education should decrease income inequality, as skill deepening leads to lower wage differentials. *Dependence* is a measure of foreign capital stock divided by GDP and foreign capital stock per capita. According to Alderson and Nielsen (1999), foreign capital is expected to increase income inequality. *Size of the public sector* describes the percentage of the government resources in a national economy, determined by the current tax revenue of the central government as a share of GDP. The size of the public sector more directly displays taxation and resource allocation process performed by the state. It estimates the share of government activities but also indicates the changes in the allocation process, which are conditioned on the state-elites' policy orientation. A larger public sector size is expected to worsen inequalities as a result of reasons explained above. *Institutionalization of democracy* is added to show the dependant role of democracy in the relationship between public sector size and inequalities. For the measure of democracy, Lee (2005) uses the paper of Marshall and Jagger (2000), which includes three elements. It consists of the presence of institutions and procedures which could express the preferences of citizens, the existence of institutionalized constraints on the exercise of power by the executive and the guarantee of civil liberties. This paper points out the effects of democracy, which reverses the positive relationship between public sector size and inequality (Lee, 2005, pp.165-167).

The data set consists of a cross-national panel of 64 countries over 25 years. Because multiple time points are observed for each country, an ordinary least squares (OLS) is not appropriate. Indeed, data may be correlated with each other because unmeasured time-invariant factors will be moved into the error term, creating heterogeneity bias. Lee (2005) uses a random-effects model (REM),

known to correct the unobserved time-invariant effects. The equation is the following:

$$Y_{ij} = \alpha_0 + \sum (\beta_k * X_{kij}) + \alpha_i + \varepsilon_{ij} \qquad (3.1)$$

$$E[\varepsilon_{it}] = 0 \ and \ Var[\varepsilon_{it}] = \sigma_\varepsilon^2$$

Where i=1,2,…,N & j=1,2,…,T$_i$)

with i for the countries, j the year, N the number of countries and T the uneven number of observations over time in country i. α_i is the random-effect error term defining unobserved time-invariant factors (Lee, 2005, pp.167-169).

The results are consistent with the hypothesis and robust even with other control variables. To test for a potential non-linear relationship, Lee (2005) adds a variable of government tax revenue and its square. The results show an inverted-U-shaped relationship between public sector size and inequality, where inequality increases at first with the expansion of public sector size and decreases after a certain threshold. This stresses the role of progressive tax and transfer policies in the reduction of inequality. However, the significance of the coefficient for the share of labour force in agriculture became nonsignificant and the one for the size of sector dualism decreased, which might suggest that the intervention from the state also affects inequalities indirectly through uneven redistribution to different sectors and not only directly through taxation and income transfers. Then, to test the robustness of the inverted-U-shaped relationship, Lee (2005) adds in different models GDP per capita and its square, foreign direct investment stock per capita and its square, a variable for the world system position, and regional dummies. All models are compatible with the claim that income inequality has an inverted U-shaped relationship with the size of the government (Lee, 2005, pp.169-171).

Lee (2005) further tests the relationship between the continuous measure of democracy and income inequality; the function of democracy is not statistically significant, meaning it is consistent with the assumption that democracy alone cannot directly affect redistribution and that inequalities might decrease only when

democracy is fully institutionalized[13]. The next model confirms the effects of institutionalized democracy that converts the positive relationship between public sector size and inequality to a negative one. The interaction term between institutionalized democracy and the public sector size has a negative sign while public sector size is positive. This means that in a limited democracy (or an autocracy), an increase of 1 point in the size of government moderately increases the inequalities (measured as the Gini coefficient) of 0.244 points. However, in fully institutionalized democracy, the same increase in government size leads to a slight decrease of 0.08 points (0.244-0.324) in inequality. When Lee (2005) adds the polynomial function of GDP per capita, it confirms the results found in the previous model (Lee, 2005, pp.171-175).

In conclusion, the role of the state is crucial to understand the direction of inequalities. Indeed, Lee (2005) found that the state-elites, as government grows, allocate limited resources only to certain sectors, which increase income inequalities between social groups. Only after a certain threshold does public sector size bring less inequalities. In addition to this, the author identifies the conditional impact of institutionalized democracy, which will shift the effects of government size on inequality from positive to negative. Lee's (2005) greatest contribution is to show that even if previous studies could not find an agreement on the results in the relationship between democracy and inequalities, no conclusion is entirely wrong nor right. Once government size is added to the model, democracy only has an effect on inequalities because it converts state-elites' policy orientation from growth to equity (Lee, 2005, pp.175-176).

Lastly, Acemoglu et al. (2014) attempted again to assess the relationship between democracy and inequality while also taking redistribution into account. In addition to the last article by Lee (2005), their contribution is to add country fixed effects and time effect in a canonical panel data. Fixed effect will remove confounding component, which will allow to better interpret the results. For instance, many unobservable elements, that distinguish democracies to non-

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[13] A democracy is fully institutionalized when institutions structures are consolidated (Lee, 2005, p.162).

democracies, might also affect inequality and taxation. (Acemoglu et al., 2014, pp.1909-1911).

They construct a yearly and a 5-year panel with observations for 184 countries between 1960 and 2010. Their measure for democracy combines information from Freedom House presented above and Polity IV. National income statistics are taken from the World Bank economic indicators. They use taxes to GDP and revenues to GDP ratios, secondary-schooling enrolment, agricultural shares of employment and GDP. For the inequality measures, they use the Standardized World Inequality Indicators Database. It is a panel of Gini coefficient, standardized across different sources and measures (Acemoglu et al., 2014, pp.1914-1916).

The authors argue that most of the previous literature did use an OLS regression with $\rho = 0$ to estimate an equation with panel data. However, in the case of $\rho = 1$, this suggestion might lead to a biased estimator and this will not allow to determine the long-run effects of democracy. Therefore, they use a standard generalized method of moments (GMM) estimator for this study. To assess the validity of the results of these estimates, the authors also report OLS estimates of their equation, showing that the results are indeed robust to any value of ρ between 0 and 1 (Acemoglu et al., 2014, pp.1911-1913).

They found no evidence for a statistically significant impact of democracy on inequality. Some estimates show a negative effect of democracy on the Gini coefficient, but all these results are non-significant at the standard level. They further test, adding control variables, but the inclusion of controls does not change the pattern of the previous results. However, the exclusion of income as a control variable leads to a significant negative effect (although small) on inequality. This might imply that other variables, correlated both with democracy and GDP, influence inequalities. Overall, they find no consistent and robust impact of democracy on inequalities (Acemoglu et al., 2014, pp.1928-1935).

To summarize, this section reviewed some of the empirical literature on whether and how democracy reduces economic inequality. At first glance, it seemed that democracy does have an effect on inequalities. Indeed, a large series of articles, some of which were presented in this thesis, do find a negative relationship between

political regimes and inequality. Other studies include those of Cutright (1967), Hewitt (1977) and Muller (1988). However, it seems like when more, or different data is included in a model, the relationship becomes spurious. Indeed, we got a first suggestion that with more recent studies, which have more recent data and improved empirical techniques, the results on the relationship between democracy and inequalities are not the same. Among sceptical authors which are not presented here, we can cite those who find a curvilinear relationship between democracy and inequality, like Simpson (1990) and Gradstein and Justman (1999). Finally, other studies like the one of Weede (1989), Rodrik (1999) or Albertus and Menaldo (2013) find no significant relationship between democracy and inequality.

3.2. EMPIRICAL STUDIES ABOUT THE EFFECTS OF INEQUALITIES ON POLITICAL REGIMES

Empirical evidence of the causal influence running in the other direction, namely inequalities influencing political regime, are presented in this section. The results are again heterogeneous. Some studies find no significant effect of inequalities on democracies, while others find a positive correlation between change in income and democracy. Like in the previous section, we review studies in a chronological order, as data and method have evolved.

3.2.1. SEMINAL PAPERS

A pioneer paper on the question about the relationship between inequalities and democracy is the one of Rubinson and Quinlan (1977). They address and compare the results of Jackman (1974), presented in the previous section, which find no relationship between democracy and inequalities. Coupled with the results of Cutright (1967) a different conclusion is reached by finding a negative effect of democracy on inequalities. Jackman's index of democracy was already presented before. In comparison, Cutright constructs his index for the year 1945-1954 in the following way: for each year a parliament existed in which the lower chamber involved members of two or more political parties; and the minority parties had at

least 30 percent of the seats, a nation is given two points. The nation got zero point if it had no parliament for the year. An additional point is given if the chief executive was elected with a direct vote (Rubinson and Quinlan, 1977, pp.611-613).

In their article, Rubinson and Quinlan (1977) try to understand these contradictory findings. By doing so, they focus, among others, on the direction of the causal effect. In other words, they are looking at the effect that inequalities might have on democracy. Indeed, observations of inter-country differences in income inequality are mostly related to the relative strength of the middle-class. This suggests that income distribution is mainly a function of the relative power of economic groups in a country; an economically powerful and large middle-class being correlated to the greatest income equality. Therefore, countries are compared by the degree to which the middle-class dominates the society, suggesting inequalities have an impact on democratization because they seem to be an indicator of class structure (Rubinson and Quinlan, 1977, pp.613-615).

Rubinson and Quinlan (1977) test this hypothesis with the following equation:

$$X_1 = a + b_1 Y_1 + b_2 X_2 + e, \tag{3.9}$$

with X_1 Jackman or Cutright democracy index, Y_1 personal income inequality (Gini or 3rd quintile) and X_2 ln kilowatt-hours of energy consumption per capita (KWH). Inequalities are measured by the Gini index, but also with the middle 40-60 percent (the 3rd quintile) because it is an indicator of the economic power of the middle-class. Indeed, it shows the share of income which accumulates to the middle of the income distribution. Inequality measured with the Gini index is expected to be negatively related to the index of democratization; while the 3rd quintile should be positively related to democratization[14]. Indeed, the latter represents the share of income going to the middle-class, so that a large indicator means less inequality while a high level of the Gini index means a high level of inequality (Rubinson and Quinlan, 1977, pp.616-617).

Rubinson and Quinlan (1977) find that an increase of 1 point of the Gini index largely decreases the index of democratization of Jackman of 56.41 points and the

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[14] Paukert, 1973.

index of Cutright of 17.11 points. They also find that the 3rd quintile has a positive, which is a rather small but significant effect on both indexes of democratization, of 2.08 point for Jackman and 0.529 points for Cutright. These conclusions are consistent with our expectations (Rubinson and Quinlan, 1977, p.617).

Nevertheless, the equation is estimated by ordinary least squares (OLS), making it difficult to ascertain the validity of each specification. Hence, the authors then proceed the equation with the instrumental variables method (IV). Two variables are added to the model: Horizontal Power Distribution (POWCON) and government revenue as a share of gross domestic product (GOVREV). This implies that errors are uncorrelated with the independent variables in the equations. The first instrumental variable measures to which extent the different branches of government can exercise their functions or if they are dominated by another branch. It is scored from 0 to 2, with 0 being a more equal power distribution and 2 a more concentrated power distribution. Government revenue as a share of gross domestic product is added because it is supposed to be a measure of state strength, which is one of the most important causes of inter-country variables in inequality (Rubinson and Quinlan, 1977, p.618).

The results are presented in Table 1 for Jackman's index. Column 1 and 3 shows the OLS estimates, and column 3 and 4 presents the IV estimates for comparison. The effects of inequalities on democratization are shown under column 3 and 4.

Table 1. Analysis Using Jackman's Index: Ordinary Least Squares (OLS) and
Instrumental Variables (IV) Regression Estimates

Variables	(1)	(2)	(3)	(4)
	Gini Index		**Jackman**	
	OLS	IV	OLS	IV
POWCON	a	b	-10.145*	-11.07*
			(2.99)	(4.15)
KWH	.0007	.0004	.014	.005
	(.560)	(.279)	(1.04)	(.433)
GOVREV	-0.003	-.006*	a	c
	(.776)	(1.80)		
Gini Index	b	b	-60.741*	-143.35*
			(2.90)	(2.34)
Jackman	-.042*	.017	b	b
	(2.03)	(.450)		
R^2	.205	.117	.503	.706
N=32				
	3rd Quintile		**Jackman**	
	OLS	IV	OLS	IV
POWCON	a	c	-10.817*	-11.84*
			(3.48)	(4.61)
KWH	.002	.007	-.0008	.018
	(.629)	(1.57)	(.060)	(.980)
GOVREV	.074	.220*	a	c
	(.729)	(2.01)		
3rd Quintile	b	b	2.30*	4.03*
			(3.99)	(2.62)
Jackman	.110*	-.082	b	b
	(2.69)	(.703)		
R^2	.389	.112	.588	.765
N=32				

[a] Variable is excluded from this equation

[b] Variable is the dependent variable in this equation

[c] Variable is used as the instrument variable in this equation

t-statistics in parentheses

Source: Personal elaboration based on Rubinson and Quinlan, 1977.

Column 4 of Table 1 demonstrates that an increase of the Gini index of 1 point largely decrease the Jackman's index of 143.35 points (significant with a t-statistic of 2.34). In comparison, the OLS model finds a moderate effect of -60.741 (with a significant t-statistic of 2.90). This shows that the IV estimation increases the size of the negative impact of the Gini on Jackman's index. The same pattern arises using 3rd quintile, as it has a significant effect (t-statistic of 2.63) of 4.03 on Jackman, meaning an increase of the 3rd quintile index of 1 point slightly increases Jackman's index of democracy of 4.03 points. The size of the coefficient is 75 percent greater than the OLS estimate (Rubinson and Quinlan, 1977, pp.618-621).

Rubinson and Quinlan (1977) find the same pattern of results with Cutright's index. An increase of 1 point of the Gini index moderately decreases Cutright's index of 40.74 points (significant with a t-statistic of 2.14). The size of the impact

of the Gini index again increases significantly with the IV equation. The results with 3rd quintile are about the same: it has a small effect of 1.20 on Cutright's index (significant with a t-statistic of 2.27). The size of the effect of inequality on Cutright also increases with IV estimation (Rubinson and Quinlan, 1977, pp.621-623).

In summary, the use of instrumental variables allows for an increase in size, always statistically significant. These results are the same for both index of democratization and for the two different measures of inequality, which supports the hypothesis that inequalities impact democratization (Rubinson and Quinlan, 1977, p.623).

Bollen and Jackman's study (1985) focuses on some problems they found in the previous literature on the subject. They first look at the issue that only Rubinson and Quinlan (1977) estimate a simultaneous-equations model, allowing for inequalities to appear, but also influencing democracy. The remaining papers restrict their attention on the effects of democracy on inequality. Moreover, Bollen and Jackman take into account an inverted U-shaped curve between economic development and inequality. If the development-inequality relationship is spuriously specified, it distorts the estimates for this relationship but also the other estimates, like those for the development-inequality effects. To solve this issue, Bollen and Jackman (1985) propose an analysis that tests for simultaneity and the U-shaped development-inequality relation (Bollen and Jackman, 1985, pp.441-442).

The second problem they address is the measurement problem. A comparability problem emerges when the data does not always refer to individuals as the income-receiving unit; most studies took either the distribution of income across industrial sectors or referring to household, or to individuals. For the democracy measure, it suffers from definitional and measurement problems. Some previous studies did not distinguish between political democracy and social democracy, between political stability and political democracy or between democracy and electoral participation. Although these measures might be correlated, they are distinct and should be separately controlled. Bollen and Jackman (1985) therefore use measure of inequality reflecting household/individual income and democracy data that is not

influenced by stability and turnout. The last issue is that these studies use different samples, challenging the comparison of the results. Bollen and Jackman (1985) use a reasonably large sample with less developed countries (Bollen and Jackman, 1985, pp.441-442).

To estimate the relation between democracy and inequality, Bollen and Jackman (1985) propose a two-stage least-square (2SLS) and a new weighted 2SLS procedure. They define a simultaneous-equations model with a sufficient number of exogenous variables to meet the conditions for identification. They further control for factors that might alter the democracy-inequality relationship (Bollen and Jackman, 1985, p.442).

In the income inequality equation, the first variable is political democracy. Inequalities are specified as a curvilinear function of the level of economic development, represented as a quadratic curve. A second variable is taken from the world-system view. This perspective argues that states are included in a wider system: the core, the periphery, and the semi-periphery. These three blocks have asymmetrical relationships between each other, and the core benefits at the expense of the two other blocks. Intranational stratification then tends to increase distributional inequalities in noncore countries. Therefore, I expect this variable to be positively related to inequalities. Bollen and Jackman (1985) use a qualitative classification to discern the core, the periphery and semi-periphery. They do so because according to the world-system theory, inequality should be more pronounced outside the core. Moreover, they control for characteristics of the population. For instance, high rates of population growth increase income inequality as it expands the proportion of populations in low-income groups. Lastly, they include a qualitative variable to counteract measurement error in the inequality data. Countries are classified according to the type of inequality data recorded (Bollen and Jackman, 1985, pp.442-444).

For the Political-Democracy equation, they include inequality, socioeconomic development, dependency and position in the world system, the share of the population protestant and a measure of colonial experience (Bollen and Jackman, 1985, pp.444-445).

The data is collected for a sample of 60 countries. The income inequality data (INEQ) comes from World Bank sources, with a mean year being 1968. It indicates the percentage of income earned by the wealthiest 20 percent of the population, the 40 following percent and the 40 poorest percent. The type of inequality data (INDIVID) is of the form of the household (single person or multi-person) as the income unit for 42 of 60 countries. For the remaining 18 countries, the inequality data is based on the distribution of income across individuals. The index of political democracy (POLDEM) of Bollen (1980), already presented before, is the measure used for the year 1965. Gross National Product per capita is used as the measure of development (GNP/p). To order the share of the population that is young, they employ the proportion of the population aged between 0 and 14 years old (AGE0-14). The world-system position is reviewed with the classification by Snyder and Kick (1979), who analyze four indicators of international networks and then puts the countries into the core, semi-periphery (SEMPER) and periphery (PER). Lastly, they take the share of the population Protestant in the year 1965 (PROT), and they use a dummy variable coded 1 if the country was a former British colony and 0 otherwise (BRITCOLN) (Bollen and Jackman, 1975, pp.445-446).

The two equations are the following:

$$INEQ = b_0 + b_1 POLDEM + b_2 \ln\left(\frac{GNP}{p}\right) + b_3 \left(\ln(\frac{GNP}{p})\right)^2 + b_4 SEMPER +$$
$$b_5 PER + b_6 INDIVID + b_7 AGE0 - 14 + e_1 \qquad (3.10)$$

$$POLDEM = b_8 + b_9 INEQ + b_{10} \ln\left(\frac{GNP}{p}\right) + b_{11} SEMPER + b_{12} PER +$$
$$b_{13} \ln(PROT) + b_{14} BRTCOLN + e_2 \qquad (3.11)$$

The analysis proceeds in four stages: first, they control for potential outliers that could impact their estimates. No country has been found to change the results when taken out of the sample. The second step is to estimate the model with two-stage least-squares (2SLS). The equation for income inequality contains 2SLS and

W2SLS estimates to correct for heteroscedasticity[15]. The effects of democracy on inequalities is found to be nonsignificant. Plus, the democracy coefficient has the wrong sign, which would mean that a more democratic society leads to more inequalities. Table 2 presents the estimates for the political democracy equation. This equation only contains 2SLS estimates.

Table 2. Two-Stage Least-Squares Estimates for the Political-Democracy Equation (N=60)

Dependent Variable:	Regression Coefficients (standard errors)
POLDEM	2SLS
Regressor	
constant	3.62
	(29.65)
INEQ	2.41
	(2.31)
ln(GNP/p)	9.78
	(4.54)
SEMER	-7.78
	(12.00)
PER	-23.15
	(13.15)
ln(PROT)	4.77
	(2.37)
BRITCOLN	18.26
	(8.34)
R^2 a	0.563

a R^2 computed using 2SLS coefficients to form predicted POLDEM which is correlated with the observed POLDEM

Source: personal elaboration based on Bollen and Jackman, 1985.

It can be emphasized that no significant effect of inequalities on political democracy is found. Moreover, the inequality coefficient is also not composed by the sign we would have expected. For the remaining variables, economic development, the dummy for British-colony and the indicator for Protestantism all have a positive effect on democracy (Bollen and Jackman, 1985, pp.446-448).

After that, they control if collinearity is the problem leading to nonsignificant effect of inequality and democracy on each other's. Both democracy and inequality are endogenous variables and formed as linear association of all the exogenous variables, so that the collinearity they found is expected and do not explain the no significance of both variables (Bollen and Jackman, 1985, pp.448-449).

To conclude, Bollen and Jackman did not find any evidence of a relationship between democracy and inequality, in either way. The inequality equation indicated

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[15] To assess whether to correct for heteroscedasticity or not, Bollen and Jackman used a test proposed by Harvey and Phillips (1981) based on the residuals of the equation estimated with 2SLS.

the importance to contrast different kinds of inequality data. The results from the democracy equation showed the importance of socioeconomic development, along with other cultural and political variables for democratic political institutions (Bollen and Jackman, 1985, pp.450-452).

3.2.2. MORE RECENT STUDIES

In a more recent paper, Muller (1995) tries to explain the contradiction between the theory that argues that the level of economic development is the most important explanatory component of the level of democracy and the empirical evidence which does not support this theory[16]. To do so, he focuses on the relationship between income inequality and the level of democracy, while also controlling for economic development. He uses the hypothesis that income inequality affects the process of democratization; if its impact is negative, it can counteract the positive effect of economic development. Besides, as economic development first negatively influences income inequality, it is a possible explanation on why moderately developed countries experiment a decline in their level of democracy (Muller, 1995, pp.966-967).

Muller (1995) analyses in this paper the relationship between economic development, income inequality and the level of democracy. He uses different variables as before: the gross national product (GDP) as a measure of economic development, the Gini coefficient and the share of personal income received by the richest quintile as a measure of income inequality and the index of liberal democracy created by Bollen (1980)[17]. The sample contains 58 countries and is used to assess the effects of economic development and income inequality in 1970 on change in level of democracy during the period 1965-1980 (Muller, 1995, pp.969-970).

The authors found that all 16 high-income countries also have high democratic scores. Moreover, more than half of them have a relatively low level of income inequality (a Gini smaller or equal 0.35). Only one country has very high-income

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[16] For instance, in Latin America, the level of democracy declines, even in the most economically advanced countries (Muller, 1995, p.967).

[17] The measure rank from authoritarian society (0) to democratic society (100).

inequalities (0.47), all others have intermediate level of inequalities. In the upper-middle-income group, all countries with low level of income inequalities were able to maintain stable democracy, while half of those with middle to high-income inequality saw their levels of democracy declining. Most middle-income countries score with high-income inequality and all of them also experiment decline in their level of democracy. The group of low-income countries includes countries with a stable democracy, with decline in level of democracy and even with increase of level of democracy. Most countries in this group have low to middle levels of inequality (Muller, 1995, pp.970-971).

If the hypothesis that the level of economic development is the determinant variable of democracy, then middle- and upper-middle income countries should have an increase in their democracy score. Nevertheless, 45 percent of low-income countries, 67 percent of the middle-income countries, 40 percent of the upper-middle income countries and 0 percent of high-income countries recorded a decline in the level of democracy. The analysis shows an inverted-U relationship between the two variables: income inequality seems to have a negative effect on democratization, as countries with middle levels of economic development and high levels of income inequality decline in democratization. Indeed, 72 percent of middle-income countries are highly inegalitarian, while the percentage is only 27 percent for low-income countries, 30 percent for upper-middle income countries and 6 percent of high-income countries (Muller, 1995, pp.971-973).

The contribution of Muller's (1995) paper also comes from the fact that he further asks whether income inequality and economic development directly affect changes in the level of democracy. The analysis supports the U-curve relationship theory between economic development and democratization. Muller (1995) further includes income inequality in the model to assess if this variable is the direct cause of decline in the level of democracy for countries with middle level of economic development. The results show that once inequality is taken into account, it has a significant negative effect on democratization, and the U-curve relationship between economic development and democratization becomes spurious. Hence, this U-curve relationship seems to indicate that countries with middle levels of economic development are likely to have higher level of income inequalities. In

summary, income inequality seems to hinder democratization, and this effect explains why countries with middle levels of economic development experience a decrease of democracy. Unlike countries with very low or very high level of development, hey are more likely to see their level of democracy decline as they have higher levels of income inequality, which makes it complicated to maintain a high level of democracy. On the other hand, countries with a low level of development, since they do not have as much inequalities as countries with middle levels of economic development, are more likely to experience a relatively high level of democracy (Muller, 1995, pp.968-975).

To conclude, income inequality is an inverted-U function of the level of economic development. Therefore, countries with intermediate levels of economic development are the most inegalitarian ones. As presented above, those are the more likely to suffer an important decrease in their level of democracy. Moreover, income inequality directly and negatively affects the level of democracy (Muller, 1995, pp.979-981).

Further, some authors shifted their studies from the relationship between wealth and democracy to the relationship between wealth distribution and inequality. Boix (2003), for instance, argues that inequality undermines both democratization and consolidation of democracy. Acemoglu and Robinson (2006) also claim that inequality hinders consolidation, but it relates to democratization through an inverted U-shaped curve. These ideas are developed theoretically but they lack empirical support. Thus, Houle (2009) conducts an empirical test of the relationship between inequality and democracy. It differs from other studies by the method – dynamic probit. This method allows the distinction between the effects of inequality on democracy but also its impact on consolidation of democracy. Houle demonstrates that the relationship between inequality and democracy complements the relationship between wealth and democracy (Houle, 2009, pp.589-590).

Houle (2009) uses the capital shares database of Ortega and Rodriguez (2006) for the measure of inequality. It includes 3500 observations for 116 countries from the years 1960 to 2000. Houle (2009) regrets the fact that previous literature cannot be compared, as the data comes from different sources. This might considerably

impact the inequality measure. Houle (2009) discusses the use of the dataset of Deininger and Squire, broadly used in the studies of income inequality. He says that the sample of observations is biased toward wealthy, democratic countries which have the ability and the will to collect these data. Moreover, Houle (2009) looks at Burkhart's findings (1977), which are reviewed above. Burkhart (1977) finds an inverted U-shaped relationship, but his analysis only includes data of 56 countries, which might not be representative of the population. For instance, few observations are taken from sub-Saharan Africa and particularly the Middle East. Houle (2009) includes more countries from these regions, which tend to have a moderate level of inequality and authoritarian regimes (Houle, 2009, pp. 591-601).

Houle takes regimes types data from the Przeworski et al. (2000) database, for most countries from 1950 to 2002. A country can either be a democracy or an autocracy, and it has to fill in four conditions: the chief executive and the legislature have to be elected by the people, except that the chief executive can be elected directly or indirectly, and the legislature has to be elected directly. More than one party must exist, and at least one alternation in power due to elections must have taken place (Houle, 2009, p.601).

The measure for the independent variable, inequality, is capital share of the value added in the industrial sector, from Ortega and Rodriguez (2006). The database contains 3500 observations for 116 countries, covering the year 1960 to 2000. This measure is chosen by Houle (2009) because low capital shares are correlated with low inequality, as an important part of the value added in production is accumulated by the labor class. It has the advantage that it measures the relative income of the elite, thus focusing on intergroup inequality and not overall inequality. The second advantage is that countries can be compared between each other, as the same definitions and methods of capital shares are used for all countries (Houle, 2009, pp.602-603).

Houle (2009) then verifies the economic performance, measured by the GPD per capita, the growth of the GDP per capita and the structure of the economy, particularly whether the country possesses natural resources. The control for economic performance was already explained above; whether a country has natural resources is measured by a dummy variable for large oil exporters. If a society relies

massively on natural resources, the society is less likely to be democratic as the elites are more vulnerable to taxation. The social and cultural context might also influence democracy; hence the author adds variables measuring the share of the population that are Muslim, Catholic and Protestant. Religion might affect the tolerance of the population toward inequality. Moreover, measures of ethnic and religious fractionalization are included, indicating the likelihood that two randomly selected person belong to different ethnic or religious groups. Indeed, a divided society might be less likely to start and preserve democratic institutions. As for the political variables, a dummy variable for former British colonies and a dummy variable for countries that did not exist in 1975. The former is added because British colonies are said to have inherited institutions more inclined to democracy (La Porta et al., 1998) and the latter because these countries might not have the prerequisites for democracy. The number of transitions from democracy to dictatorship is controlled for, since a country which experienced many coups is more likely to be suffering from more coups in future. Lastly, a dummy variable for a presidential democracy is included, as they are more fragile than other types of democracies; and the share of democracies in the world is also controlled for. All variables are taken from the dataset of Przeworski et al. (2000) (Houle, 2009, pp.603-605).

Houle uses a dynamic probit model, which estimates the probability of countries with a definite regime to change for another regime in the next period. This allows to contrast the effects of different independent variables on democratization. The results of the analysis are the following: in both linear and nonlinear models, lower capital shares are correlated with smaller probability of a transition to democracy, but the relation is not statistically significant. The nonlinear relationship is then controlled, but capital share and squared capital share have the wrong sign although they are not significant, meaning the relationship between inequality and democracy is not an inverted U-shaped. Controlling for region and decade variables does not change the results (Houle, 2009, pp.606-609).

The analysis of the effects of capital shares on the stability of democracy shows that democracies with large capital shares are more likely to break down when the estimate is significant, presuming that inequality harms consolidation. Controlling for region and decade dummy variables decreased lightly the estimates

but they are still significant and important. The results of the control variables are robust across model specifications: Houle (2009) found wealth to not affect the likelihood of being a democracy but to support consolidation; exporting oil do not affect democratization nor consolidation. Ethnic, religious fractionalization and religion do not have any effect on democracy. For political factors, having a past of British colonization does not impact the transition to democracy but does affect consolidation; whether a country existed in 1945 or not does not impact democratization. The number of past regime transitions makes it more likely for a country to become a democracy but not to remain one. Lastly, when there are many democracies, a country is more prone to become and stay a democracy (Houle, 2009, pp.606-615).

To conclude, Houle (2009) found that inequalities have no net effect on democratization; however, they do harm consolidation of democracy. Past studies might have not found these results because of the database or the method used.

To resume this section, the effects of inequalities on democracy is not very clear and further research is needed to analyse if the relationship between inequality and democracy does exist. There is a vast literature on the subject and the results are heterogeneous. Some authors argue that the level of inequality does influence the level of democracy or the process of democratization; however, a positive or negative impact of inequalities on political democracy might be found because of errors in the equation, like measurement errors. We saw that economic development, when considered, might play a crucial role in the connection between inequality and democracy. Besides, making the difference between different kinds of inequality data can also change the results of the relationship.

4. CONCLUSION

In this thesis, I looked at the relationship between political regimes and inequality in a unified theoretical and empirical framework. It is crucial to understand if democracy is efficient in reducing inequality to find out whether it is worth it to initiate the democratization process, and if inequality plays a role in the process of democratization.

Theoretically, I reviewed the expected redistributive effects of democracy thanks to the extension of political power, shifting the median voter to the poorer segments of society and therefore increasing demand for redistribution. However, I presented how captured democracy by an elite might not lead to a reduction in inequality. I suggested models of inefficient states in which the rich elite influences the public bureaucracy or manipulates political outcome. This leads to inefficient state structure and institutions, consequently limiting redistribution and cancelling the political power poorer agents gained through democratization. I also demonstrated how the middle-class might also capture democracy to its advantage, for instance through their benefits from the social security system. On the other hand, authoritarian regimes are better able to protect the interests of the poor and working class, which therefore suggests that more redistribution occurs in an autocratic society than in a democracy. Nevertheless, the elite can pursue policies that benefit them because since there is a lack of a political mechanism holding the elite responsible for the majority. Hence, equality will not be improved in an autocracy, unless democracy poses a revolutionary threat; in this case, redistribution does take place in an autocracy.

For the effects of inequality on political regimes, I cited models emphasizing the role of social unrest as a factor in the transition to democracy. Indeed, when the poor are excluded from political power, they pose a revolutionary threat likely to force the elite to democratize when inequality is high. In addition, the relationship between income per capita and inequality is forced by political changes, caused by the increase of social tensions that come from rising inequality. Besides, good

economic characteristics might lead to the endogenous evolution emergence of a democracy: economic inequality and economic development can be both a cause and a consequence of political changes.

Empirically, I presented evidence of the relationship between political regimes and inequality and did not reach any consensus about the results: some authors find an egalitarian impact of democracy while others are doubtful about this effect. I presented seminal papers which did not find any effect of democracy on inequality once economic development is taken into account; even when different elements of previous models are controlled for. More recent findings found a nonlinear relationship between democracy and inequalities with a larger sample and more recent data. I presented a model which considers the impact that the state might have on distributional outcomes through its interaction with organized societal forces, finding that inequalities will only decrease with an increase of public sector size in institutionalized democracies. Models with country fixed effects and time effects did not find any evidence of a statistically significant impact of democracy on inequality.

I found again heterogenous for the empirical studies about the effects of inequalities on political regimes. The seminal papers identified, with the use of instrumental variable, that inequality does negatively impact democratization. More recent studies controlled for the effects of economic development in the relationship between democracy and inequality and found an inverted-U function of the level of economic development along with a negative direct effect of inequality on democracy. Besides, another study found that inequality has no effect on democratization but on consolidation of democracy.

These patterns suggest that the effects of democracy on redistribution and inequality may be more nuanced than often presumed and highly heterogeneous. Unfortunately, the conclusion is not evident, and we cannot expressly say whether there is a relationship between democracy and inequality. Theoretically, democracy should negatively affect inequality, unless it is captured by a part of the society; and it is not clear the way inequality impacts democracy. Empirically, the results are different depending on the model and the data used. To conclude, the relationship

between democratic institutions and inequality is worth further empirical investigation, for instance with bigger samples and more recent data.

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