LUND UNIVERSITY
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Master in Economic Development and Growth

From kings and dictators to liberal democracies
How political regimes affect income inequality

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Abstract: This study looks at how political regimes affect income inequality. Levels of inequality differ a lot between countries but tend to be very stable over time in a country. This is in line with explanations of inequality that focus on structural factors, of which political regimes could be one. The model used in this study is based on the selectorate theory, which states that the size of the group that is necessary to keep a leader or government in power affects the decision making process via political constraints. This group is called the winning coalition and in democracies this group consist of the voters necessary to win. In authoritarian regimes, however, this group is smaller and includes e.g. military leaders that have the power to keep a leader in office. To test the relationship between political regimes and income inequality a sample of more than a 100 countries over the period 1960-2015 is used. Moreover, the impact of the presence of natural resources and foreign aid on this relationship is studied. The findings support the conclusion that political regimes are an important factor in explaining income inequality. For the influence of natural resources and foreign aid no supporting evidence was found. Overall, the selectorate theory can add important insights on how political factors affect inequality by providing a strong theoretical foundation. However, higher quality data is necessary to fully test the predictions empirically.

Key words: Income inequality ; selectorate theory; political regimes; winning coalition

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Chapter 1: Introduction

Politics, economics, and development are inextricably linked. Strong leaders and governments have an origin as the entity that monopolizes power (Olson, 1993). In contrast to a state of violent anarchy, a minimal degree of public order is in everyone's self-interest. It is common that this power is used to redistribute wealth not to create it, to create wealth those who specialize in force must refrain from violence and delegate authority to those who can use it productively (Bates, 2009, p. 10). This also means that in origin most governments are under the leadership of a strong autocratic ruler or group of rulers. A ruler will tax his subjects' income as much as possible without disincentivising further income generation. Part of this tax can be used to increase productivity, but not too much as it directly decreases the rulers net surplus (Olson, 1993). This fickle balance is not conducive to long term development. What is needed for long term development are the right institutions such as property and contract rights, which are as much political as economical and often develop in conjunction with democracy. To understand economic (development) performance, there is then a need to understand the politics that shapes this performance (Beuran, et al., 2011). Political economy attempts to understand how political constraints lead to policies which might not be optimal from a pure economic perspective.

In this thesis a political economy perspective is used to study one tenet of economic development: income inequality. Understanding under what circumstances inequality is created and persists overt time is important as inequality affects many other parts of society and the economy such as growth, poverty, and social unrest. Economic factors are important to understand inequality but political and social factors are just as important or even more so (Kemp-Benedict, 2010).

The main political factor of interest here is the type of political regime or form of government. This isn't by far the first study on this subject but most of the research on the relationship between political regimes and inequality has so far focused on democracy, and on how lower inequality is one of the positive development democratization brings. However, the democracy variable used is mostly a simple binary one, where all democratic and non-democratic countries are grouped together which makes intra-group distinctions hard to make. All authoritarian regimes are also grouped together while these may have very different political constraints and ideologies which could influence the outcome. Another big limitation of this approach is that it is often unclear through which mechanism democracy brings lower inequality.

There already exist many political economy theories and perspectives that can be used as a guideline, but in this thesis the selectorate theory is used. This theory looks at how the size of the group that chooses a leader affects the political constraints and thereby the policies on e.g. public goods provision (Morrow, et al., 2008). The selectorate (S) is the set of people in a polity that can take part in choosing the leader, and the winning coalition (W) is the number of people from the selectorate whose support the leader needs to get and stay in power. Different types of regimes can be quantified as a specific combination of W and S. In the

selectorate theory these two simple variables capture the most important aspects of 'democracy', as the political constraints that follow from these two variables shape the incentives of the leader and thereby his or her policies.

Leaders will make choices that first maximize their probability to stay in power and secondly to accrue as much personal wealth as possible (de Mesquita, et al., 2003, p. 21). If the winning coalition is small than the leader has an incentive to pay his supporting group in private benefits, whereas if the coalition is large then rewarding them is easier via the route of public goods. The winning coalition can be very different between countries, the group whose support the leader needs can be a handful of people in key places or could be one distinct group within society. The selectorate theory cannot only help explain a wide variety of outcomes within a country, but can also be used to explain how international factors such as wars (de Mesquita, et al., 1992) affect domestic policies.

Using the selectorate theory as a foundation, the goal of this study is to better understand the relationship between political regimes and income inequality. More specifically the research question can be stated as:

How do different political regimes affect a country's income distribution?

The question fits well in the recently growing interest in income inequality. In contrast to other subjects, income inequality is definitely not only an academic subject. Rising inequality in many developed countries has brought this topic the foreground of discussion, and has already led to some social unrest in the form of protest groups. Research on the determinants and consequences of inequality can help to better understand inequality and also feeds into possible ways to counter it.

Although the selectorate theory has not been widely used to study inequality, this is not the first study to do so. Kemp-Benedict (2010; 2011) already has found some evidence that this theory can be useful in trying to explain income inequality. This study has some important differences with these earlier studies. The first is that the period under study is twice as long. Secondly, the number of countries in the sample used is a few times larger. A final difference is the database on income inequality that is used.

The first contribution of this study then is to corroborate and possible nuance earlier research by testing a similar hypothesis with a larger sample. A second contribution is the testing of two new hypotheses that have not been tested before. These hypotheses look into how natural resources and foreign aid influence the relationship between political regimes and income inequality. A last contribution is methodological, next to using the specification of the selectorate theory two alternative ways of measuring and modelling political regimes are tested.

The thesis is divided into five chapters. Chapter two introduces the relevant theories and previous research. The theoretical model is also explained in chapter 2. In chapter 3 the methodology and data that are used in this study are described. Then a chapter with the results and discussion follows. The final chapter will conclude and answer the research question.

Chapter 2: Literature review & theoretical model

The first part of this chapter is a literature review of the relevant previous research into the topics related to the research question. The second part of the chapter delineates a theoretical model and hypotheses that are used in answering the research question

2.1 Literature review

The literature review is divided into four parts, the first part is on previous research on political regimes and the selectorate theory more specifically. The next part then is about how these findings fit into the literature on the determinants of inequality. This is followed by an overview on earlier research on how politics and inequality are linked. The final part outlines how 'free resources' affect a regime and its decision making.

2.1.1 Political regimes & the selectorate theory

In classifying political regimes studies often place regimes on a continuum where on one end democracy reside and on the other end autocracy, or even less useful democracy is just a binary variable (Galbraith, 2011). This is a big oversimplification for both democracies and autocracies alike, e.g. although all non-democracies lack free and fair elections they are otherwise a tremendously diverse group (von Stein, 2017). Lately more classifications and theories have been put forth to be able to better distinguish between different regimes. One of those, and the basis for this study, is the selectorate theory first introduced by de Mesquita et al (2003). This theory focuses on how the size of the group that elects the leader affects decision making. Most predictions and estimations in this theory depend on two theoretically easy (but often empirically hard to measure) variables, the size of the selectorate (S) and the size of the winning coalition (W). This means that the theory loses some detail and precision but it offers the possibility to explain a rich variety of political phenomena in a simple theoretical structure (de Mesquita, et al., 2003, p. 42). Furthermore, it is possible to map all different nominal types of regimes in a continuous manner using the selectorate and the winning coalition, as shown in figure 1.

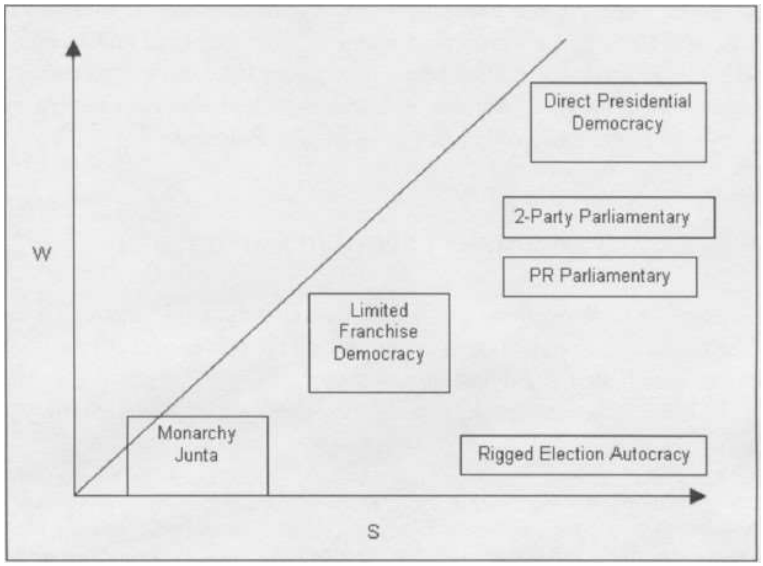

Figure 1: Mapping of different regimes on the basis of W and S, (de Mesquita, 2007, p. 206)

The selectorate is characterized as those people who have a say in the selection of a leader, but more importantly they have a chance of gaining access to the winning coalition. Often, therefore, members of the selectorate share many characteristics, which differ per country. The winning coalition is defined as, "a subset of the selectorate of sufficient size such that the subset's support endows the leadership with political power over the remainder of the selectorate as well as over the disenfranchised members of the society" (de Mesquita, et al., 2003, p. 51). How big this group is differs per political system, e.g. in a pure democracy the winning coalition is about 50% of the selectorate whereas in an extreme dictatorship it might be only a 100 people. In many autocracies the winning coalition includes people with the power to keep the leader in office such the military and police (Knack, 2005). An important assumption in this theory is that a leader will maximize his probability of staying in power, and conditional on that he will maximize his personal wealth. The main lever through which this is achieved is the provision of goods. Every regime provides a combination of public goods that everybody can use and private goods for their supports. Relying on support from a smaller coalition makes it more feasible and efficient for a leader to provide private good transfers to a narrow group of supporters (Ward, et al., 2014; Cao & Ward, 2015). In contrast, leaders in democracies are very constrained by their large winning coalitions, if the resources available to the leader need to be divided over half the population as private rewards everyone will be unhappy, it is therefore in a democratic leader's best interest to provide public goods. In the theory it is of secondary interest to the leader that this might also lead to the best economic outcomes in the long run. The incentives of rulers in democracies are aligned with large parts of the population in contrast to dictatorships. A dictator's incentives are aligned with only a very small part of the population. This gives some indication as to why democracies are often better places to live in. What is left after spending on public goods and private benefits for supporters is the leader's own discretionary funds.

Few dictators voluntarily reform their countries to democracies, whereas many democratically elected leaders convert their countries to dictatorships (de Mesquita & Smith, 2009). In larger coalition systems, the incumbent cannot expropriate many resources and therefore has an incentive to try to make a smaller coalition system. However, coalition members often do not support such purges, as the loss of not being in the new coalition is larger than the 'incremental gain' from increased private rewards. Moreover, at a certain winning coalition size the private rewards become less important with respect to the overall public goods provision and the coalition members then have an incentive to increase the coalition size further. This happens because public good provision often increases the total size of the 'pie', by investing in e.g. infrastructure and education, which is in contrast to the situation where most of the money is spend on private benefits for the leader's supporters.

Not only the absolute size of the winning coalition is of importance but so is the relative size: W/S. This ratio is called the loyalty norm. Given a small coalition, the larger the selectorate the more discretionary resources the regime has. As the ratio W/S gets smaller, the probability that someone in the selectorate enters the winning coalition is small, the leader therefore has to pay less for their 'loyalty'. This can be seen in a comparison between a monarchy and a rigged election system, in the former W is small but so is S which means that the leader's

supporters need to be paid lavishly. In the latter case W is also small but S is large which means that the leader's supporters know that they are easily replaceable.

Building on top of this basic framework, de Mesquita & Smith (2009) examine how leaders respond to revolutionary threats. When faced with a threat a ruler has two broad options, one is to supress public goods (e.g. freedom of assembly) to hinder the revolution and the other is to give in and increase the provision of public goods. These authors argue that the decision is significantly influenced by the sources of government revenue. Governments that have sources of revenues that require minimal labor input such as natural resources and foreign aid (often called 'free resources' in the literature) choose the increased authoritarian path. Whilst those that depend on taxation and don't have access to unearned income increase the provision of public goods. These choices are linked to the role that public goods play in an economy. Public goods increase economic productivity as healthy and more educated people are more productive. Subsequently, this higher productivity means that possible government revenue increases with taxation. This indicates the reason why regimes without free resources are less likely to supress, because this will decrease their income and with that their probability of survival. De Mesquita & Smith (2009) argue that when there is a revolutionary threat, free resources reduce future core public goods in small winning coalition systems but have no effect in large coalition systems. Similarly, aid in smaller coalition systems on average retards democratization by making regime survival more likely. It supports democratization when leaders face a revolutionary threat conditional on already having an initial substantial coalition size. Increasing the coalition size is often the best way for a country to develop and foreign aid often impedes with that objective. Once a leader gives in to a revolutionary threat, the increase in public goods makes future threats more likely and leaders might find it increasingly difficult to suppress public goods (Smith, 2008). A more detailed look into the sources of government revenue is given in section 2.1.4.

A very interesting test of the selectorate theory comes from Leopold II, who is one of the only people to have ruled two different countries and in his case at the same time. In Belgium he was a very progressive monarch who helped improve living conditions for his citizens. This is in stark contrast to his rule of Congo which was marked by brutal tyranny and violence (de Mesquita, 2007). The selectorate theory's focus on political institutions and constraints can better explain these outcomes than theories that stress the 'personality' of a ruler. In Congo Leopold II was not constrained by any institutions and he could set up a regime so violent and extractive that it still influences the country today. Moreover, predictions from the theory can also be used on scales smaller than the country level. Just as the variation in coalitions between countries is big, so is the variation between provinces or even electoral districts. Using district level data for Tanzania, de Mesquita & Smith (2017) find that districts with smaller wining coalition emphasize the provision of private goods such as vouchers in contrast to large wining coalition districts which focus more on public goods such as better health care access. This lends support to the claim that the selectorate theory can distinguish subtle differences across regimes without using imprecise labels, but this is conditional on strong data being available.

As with any theory there also exist some criticisms. One criticism comes from Clark & Stone (2006), who disagree with many of the earlier estimations in de Mesquita et al (2003). Their issue was how democracy was controlled for in these estimations, in Clark & Stone (2006) not all findings hold when retested with different control variables. In response to this critique Morrow et al (2008) retest their initial analyses taking into account this criticism. Although they accept the criticisms, they come to the same conclusion as in the first study that the size of the winning coalition is significant for 28 out 31 different public and private goods they test. The difference in results with Clark & Stone (2006) is due to that those authors include both W and democracy and that confounds rather than separates the effects of winning coalition from other features of democracy. Knack (2005) makes the point that the selectorate theory neglects the feedback from improved performance to survival. And in neglecting time horizons they offer an inadequate explanation for the big variation in economic performance of autocracies, some of which have had episodes of fast growth. Similarly, Hanson & Gallagher (2012) criticizes the selectorate theory for its inability to fully account for the success for export-led growth success in East Asia. In another study Gallagher & Hanson (2013) make a similar argument about very resilient (former) communist authoritarian states. These criticisms are valid but of limited importance in this study.

Recently, some studies have used a modified version of the selectorate theory whereby a nominal classification system for regimes is used. This classification is based on the dataset on authoritarian regimes by Geddes et al (2014). This dataset was created to better study regime transitions. When an autocratic leader loses power, three different transitions are possible. First, the country can democratize. Secondly, someone in the regime can take over and the regime persists. Lastly, a new autocratic regime takes over from the old one. Much literature focuses on the first transition, but this happens infrequently in only about 25% of leadership changes. Cao & Ward (2015) link this remarkable continuity of regimes to new rulers having similar goals and 'inheriting' policies due to the path dependency in political institutions (the rules of the game). An exception to this are personalistic authoritarian regimes, were a change in leader often means a change in regime.

Geddes' definition of a regime is: "Regimes are defined as basic informal and formal rules that determine what interests are represented in the authoritarian leadership group and whether these interests can constrain the dictator". Informal rules are important as often the de facto rules are hidden behind democratic looking institutions. The way they code different regimes has a clear link to the selectorate theory and it therefore makes sense that some authors use these classifications. Geddes et al (2014) look at the leadership group to better predict behaviour, and it is a small group that actually makes the most important decisions (similar to the winning coalition). Chang & Golden (2010) for example use this classification to investigate the determinants of corruption in authoritarian regimes.

Winning coalition sizes are similar across all types of authoritarian regimes, but the selectorate can be ordered as follows from lower to higher selectorate sizes: Military regimes – monarchies – single party – personalistic regimes. The loyalty norm (W/S) then has the reverse order. Chang & Golden (2010) found that some types of dictatorial regimes have a much higher propensity to extract rents and also have higher corruption. For example

personalistic regimes are more likely to be corrupt than single-party or military regimes. This could also be an explanation of why Africa is so corrupt. The regimes that were set up there after independence are mostly personalistic authoritarian regimes.

Other studies on authoritarian regimes that deserve a mention are Boix & Svolik (2013), who look at why some dictatorships establish institutions that constrain the leader, and argue that institutions that facilitate power-sharing can alleviate commitment and monitoring problems between the leader and his supporting coalition. Such power-sharing is not possible when the distribution of power shifts in favour of the leader (supporting coalition's rebellion becomes less credible). Furthermore, such sharing is less likely in economies which are easily controlled and exploited such as those with relative abundance of natural resources where a leader has a lot of executive discretion. Knutsen & Rasmussen (2014) also find that autocracies implement social welfare policies as a credible commitment to future redistribution, and to maximize their survival. Empirically they find that welfare programmes tend to be less universal, which is in line with making only the necessary part of the population happy. E.g. pension systems are easier to target than pure public goods. Lastly, they also find evidence that welfare programs differ between different types of regimes, with monarchies and military regimes being least likely to implement them. In line with the selectorate theory, autocracies underprovide (or have incentives to underprovide) public goods as these are only cost effective for large coalition countries.

Finally, Miquel (2007) shows that under specific circumstances with weak political institutions and ethnic (or clearly distinguishable) groups. Leaders, even if they are quite weak, can extract enormous personal rents form power. A leader extracts a lot from his own ethnic supporters, and even more from other ethnicities, and this can be an equilibrium. Miquel (2007) calls the mechanism the politics of fear, where supporters keep supporting the leader although he extracts a lot from them in fear of what a leader from a different ethnic group would do. Furthermore, in contrast to democracies, leadership transitions are often chaotic when institutions are weak and this uncertainty increase the incentive to keep supporting a leader. The next section will set out how the findings above fit in with earlier research on the determinants of income inequality.

2.1.2 Determinants of inequality

Inequality has been a fruitful avenue for research, of special interest for this study are the more structural/historical determinants. In an important study Li et al (1998) show that inequality within countries changes little over time, and that intertemporal changes are small relative to the differences in inequality across countries. Angeles (2007) sets out and finds supporting evidence for colonialism being a major explanation behind income inequality differences between countries. His argument is that colonies where European settlers became the majority of the population do not suffer from high income inequality in contrast to those where the settlers were a minority and these initial differences in income inequality seem to be highly persistent over time. There is a clear link to the study by Acemoglu et al (2001), where they study settler mortality which is highly correlated with settler patterns as mortality

indicates the feasibility of European settlement. Acemoglu et al (2001) do not specifically look at inequality but a more general economic backwardness. The mechanism through which this happens is the difference in the type of institutions that were erected in colonies with different settlement types. Colonies were Europeans were a majority developed relatively good institutions, whereas those with a European minority developed more extractive institutions. Countries with better institutions will over time invest more in capital and are thereby more likely to achieve a greater level of income (Acemoglu, et al., 2001). These studies have a clear link to selectorate theory. Colonies that attracted only few settlers had few constraints and could therefore set up small coalition systems. In contrast colonies with many settlers were more democratic and also comparatively had larger coalition systems. This led to different policies and institutions. In the small coalition colonies the institutions were extractive, whereas in the larger coalition colonies good institutions where set up that promote economic development and productivity. These differences in institutions is what causes the long run differences in inequality according the studies mentioned above. This effect is also compounded by the fact that many colonies with few settlers had abundant resources. These early policies and institutions have proven to be very persistent and difficult to overcome and have been a drag on development. Similarly, Uslaner & Rothstein (2016) found that corruption is also deeply rooted in these underlying social, historical and political structures of states.

2.1.3 Links between politics and inequality

This section will focus more on how politics and political mechanisms affect inequality. Much of the literature on the relationship between politics and inequality has focused on democracy and inequality. Democracy is seen as a harbinger of many social benefits, of which lower income equality is one (Ahmad, 2017). Several mechanisms through which this can happen are outlined in the literature. The first of these is the median voter theorem were more redistribution is demanded when median income is lower than mean income. If the median voter theorem holds true than inequality is predicted to be lower in democracies than in autocracies. Another mechanism is via political participation which is cheaper in democracies leading to strong unions, parties and interest groups representing low and middle classes. These would push for policies that reduce wage dispersion. The last mechanism is that of political competition, in competitive election leaders would compete for support from lower classes and promise/implement policies that benefits them such as better education and healthcare. However, there are also mechanisms that can lead to higher inequality in democracies. Democracies are characterized by more open economies that come with inequality increasing market opportunities. These are strongly linked to the famous Kuznets curve (Kuznets, 1955), which says that with rising income, income inequality will first increase and then later decrease leading to an inverted U-curve.

Both the study by Alesina & Rodrik (1994) and by Persson & Tabellini (1994) examine the relation between income distribution and economic growth in democracies. Interestingly, both studies use only purely economic variables but their theoretical framework has a political

causal chain in the form of the median voter theorem. Both find that inequality is negatively related to growth in democracies. The bigger the wedge between the median and mean income the higher distributive conflict is and the more likely redistribution becomes. Both studies argue that redistribution introduces distortions into the economy that lower growth. Benabou (2000) has given this approach a sounder empirical and theoretical basis. He showed that the existing paradox that democracies with higher inequality redistribute less and not more can be explained by identifying two divergent steady state outcomes. Both high inequality and low distribution and low inequality and high distribution are steady states. These two outcomes resemble the political and distributional environments of the US and Europe. Which of the two steady states would grow faster depends on the balance between the tax distortions (less effort) and the greater productivity of investment resources due to e.g. education.

However, the studies above are on developed democracies, Leon (2014) shows that these median voter frameworks often do not hold in neoliberal episodes in Latin America, where high inequality then leads to less and not more redistribution. The strategic motive for this is that taking money away from a group now reduces the ability of that group to oppose in the future. Leon (2014) see this process as explaining why many Latin American countries jump between very destructive extremes of left wing populism and neoliberalism. Others studies also look more from a strategic perspective of the elites, which are linked to the selectorate theory in that the elites or rulers make decisions that maximize their outcomes. Western developed countries had unprecedented distributive programs in the nineteenth century after voting rights were extended, Acemoglu & Robinson (2000) argue that this was due to a response of the political elite who feared revolution and social unrest. A policy of promising future redistribution would, in contrast to democratization, not have been credible. Income inequality increases slowly over time, until it reaches a point where the threat of revolution is real. Only then will the equation that maximizes their probability of staying in power shift towards more democratization.

More generally, elites have to balance their power and economic gains, Bourguignon & Verdier (2000) shows how it can be in the elite's best interest to extend the franchise or invest in universal education. The subsequent economic development brings large economic gains, but the downside is less power as democracy is progressively introduced (Mejía & Posaad, 2007). When the path of redistribution is taken, this often happens very inefficiently (Acemoglu & Robinson, 2001). These authors suggest that inefficient redistribution helps sustain some of the political power by targeting specific groups (tribes or sectors). Verardi (2005) shows that inequality decreases when the proportionality of an electoral system increases. Moreover, more electoral competition leads to more transparency which further increase the probability of a system getting more democratic (Hollyer, et al., 2011).

Dodlova & Giolbas (2015) add to this literature by making a clear distinction between social programs in democracies and autocracies. Using data on social programmes they find that democracy increases redistribution and that rising inequality makes more redistribution likely. These findings are in line with the median voter theorem. However, for autocracies the median voter does not decide on policy and the relation between inequality and redistribution

is ambiguous. The elite will only redistribute when it is in their interest, or when it helps them to stay in power. The model confirms that the probability of transfer programs being adopted is higher in democracies than in autocracies. In the latter inequality drives such programs only when there is a revolutionary threat.

2.1.4 Free resources

The importance of different sources of government revenue has already come up multiple times, and this section looks more closely at two of them. These two revenue sources are natural resources and foreign aid, often called free resources in the literature because they come with none of the constraints that taxation of one's citizens brings.

Both resource rich and poor governments search for revenues but do so in different ways. In resource rich countries revenue come from extraction, whereas in resource poor nations it has to come from the creation of wealth (Bates, 2009, p. 90). Although other factors are important, the way resources shape government behaviour can help explain the difference between strong economic organizations in resource poor Asia compared with predatory behaviour in resource rich Africa. The extracting and rent seeking economic and political factors that lead to poor performance is the resource curse (Sachs & Warner, 1995). Anthonsen et al (2012) study the political effects of natural resources on quality of government. They find for a sample of 139 states that oil and gas rent dependency has strong negative effects on all their quality of government indicators. Their main reason for this is that elites in natural resource rich countries have little incentives to develop good bureaucracies and other institutions. "Because money from natural resources extraction comes with absolutely no political conditions" (Anthonsen, et al., 2012). Natural resource rents are very different from other types of income for governments such as taxes. Firstly, these activities involve very few workers as extraction is not labor intensive. Secondly, the prospects for profits are huge and linked to this there are less demands from citizens in return for this money such as is the case with taxes. In extreme cases, rulers do not depend on the consent of citizens and do not face institutional constraints as the rents allows for buying necessary support. Also it is possible to hire international companies to do the extraction and keep the local populace out of it entirely. In their study democracy is also a very important variable as the fungibility of resource income becomes a lot smaller with developed democracies which already have better institutional quality and governance. Jensen & Wantchekon (2004) find that for Africa natural resources are not only linked to more inequality, lower democracy levels but also to democratic government breakdown and the endurance of authoritarian ones.

The literature on foreign aid and aid effectiveness is also immense. Some studies have found that aid has beneficial effects on poverty and democracy, but many others find that aid is associated with eroding institutional quality, corruption, and rent seeking (Askarov & Doucouliagos, 2015). The selectorate theory easily falls in the latter camp with a cynical view on foreign aid. From the perspective of an autocrat keeping the majority of his population poor whilst enriching himself makes perfect sense, so aid cannot alleviate poverty unless it has strict conditions regarding institutional reform (de Mesquita & Root, 2002).

Furthermore, foreign aid has similar consequences as natural resources as both often come without constraints. In small coalition systems these revenue sources shift the nature of political competition and have multiple consequences. First, most of free resource are captured by the leader, which makes aid very inefficient in the best of times. Secondly, free resources decrease the need for tax revenues, which means that a leader has to spend less on public goods that encourage economic activity (de Mesquita & Smith, 2009). Thirdly, as seen before free resource increase the incentive for revolutions which due to less tax dependency will be likely countered with a contraction of public goods leading to less freedom and democratization. "Although foreign aid provides leaders with the resources to promote social welfare, it provides them with the political incentive to do just the opposite" (de Mesquita & Smith, 2009).

These authors in another study also provide an interesting way of looking at aid that is different from the normal reason given for aid. De Mesquita & Smith (2009) set up a model where aid is 'traded' for policy concessions in the recipient country. This relationship is influenced by the leader's support coalition and government revenues. They find that aid is beneficial for the leaders of both countries and the donor's people but not for the recipient's citizens. The recipient's citizens are harmed in two ways. First they get policies which they would rather not have (the concessions). Secondly, aid increases the funds of the ruler and thereby his survival chances, which helps the autocrat to pursue unpopular policies in the future. Buying policy concessions becomes more expensive when the recipient country is richer, and as the supporting coalition increases as more people need to be 'bought off'. This is modelled this way as the policy concessions are seen as unpopular in the recipient country, aid increases the available funds but also the cost on the supporters. Empirically they find that aid goes from rich countries with large coalition to small relatively poor coalition counties, which makes sense as these concessions are cheapest. However, they find no clear evidence that aid is motivated by humanitarian motivations, the neediest do not receive the most aid. The authors recognize that proper policies together with aid could lead to better economic performance, but economic considerations seem to matter very little in allocation. An interesting example of buying concessions is by Japan. Japan is one of the few countries that was against the moratorium on whale hunting instituted by the International Whaling Commission (IWC). Japan uses aid to buy votes on the IWC, and has been rewarded with growing support for the resumption of whale hunting. The most interesting part is that some of the members that are for hunting are aid-receiving landlocked countries such Laos, Mali, Mongolia (de Mesquita & Smith, 2011, p. 176).

2.2 Theoretical model

Formed by the findings from the literature, figure 2 shows the theoretical model that will be used. Not all of the links between the different factors that are shown are pertinent for the question at hand.

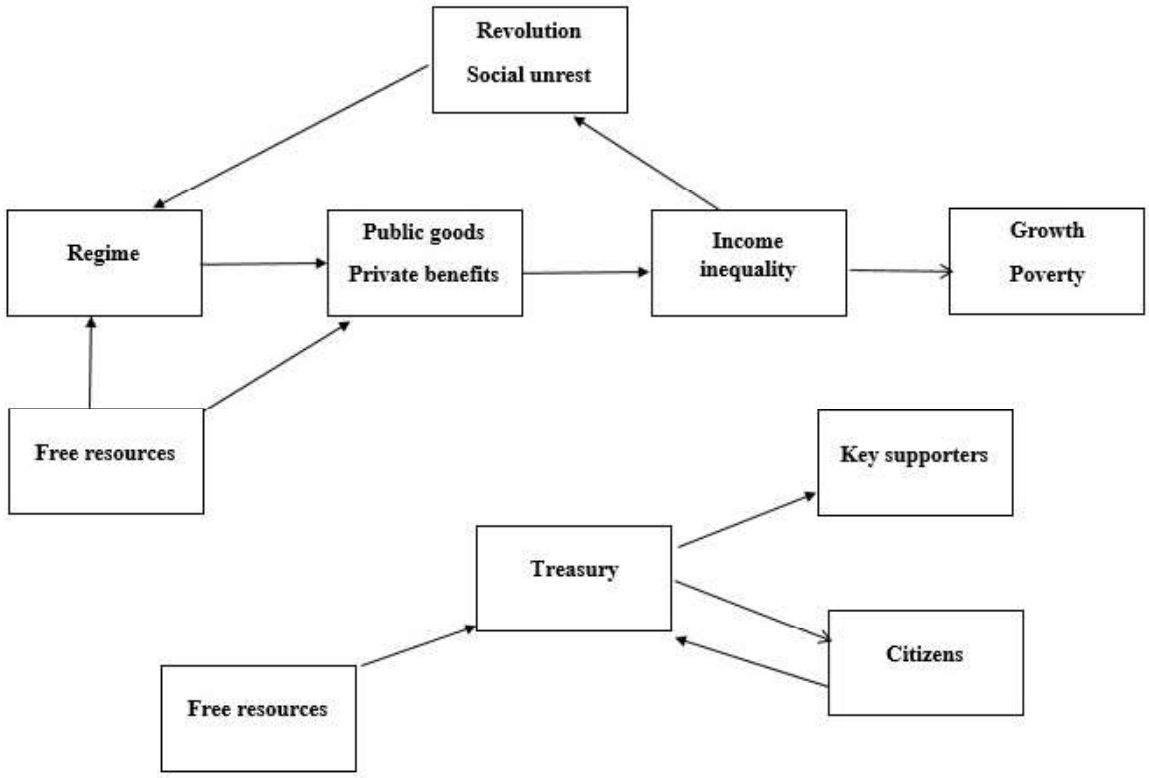

Figure 2: Theoretical model

The most important link in the model is the that between political regime and income inequality. As the interest is in the ultimate cause of income inequality (the political regime) the proximate cause of the regime policies that are in between the regime and income inequality are themselves of a lesser interest. The specific combination of public goods and private benefits includes policies on education and infrastructure, taxation, but also the level of corruption that a regime allows. It might sound strange to look at corruption as a policy choice, but from the perspective of an autocratic leader corruption doesn't have to be something bad. By authorizing his or her supporters to reward themselves directly by e.g. taking bribes for the citizenry an autocrat can avoid the difficulties of gathering and redistributing wealth to his or her supporters (de Mesquita & Smith, 2011, p. 88).

An important point to address here is the possibility of reverse causality. Some studies use income inequality as an determinant of democracy and thereby of political regimes. In figure 2 this is shown via the most used mechanism in the literature, that of revolution or social unrest. A couple of reasons, however, support the view that causality runs from regimes to

inequality, and that in answering the research question reverse causality is not a very big problem. First, almost all states started out as autocratic and only in recent history have some seen a dramatic shift towards democracy. Williamson (2015) argues that before that shift western European states differed little from Latin American ones with both having high inequality. The reason that he gives for Latin America now have higher inequality is the missed opportunity of the great levelling that happened in Europe.

The second reason has to do with the mechanisms through which inequality would influence political regimes. In most arguments this happens via a distributional conflict route, by either revolution or social unrest that makes elites/rulers give in demands of citizen. However, this argument seems to hold a lot better in countries that are already democratic and where rulers are accountable to the citizenry. An authoritarian regime can be very stable with high inequality and/or high poverty rates because the ruler is not accountable to the citizenry but to his key supporters. From the view of the selectorate theory high inequality is not the reason a revolution succeeds, this only happens when the regime is out of money to protect itself. This can be seen in the bottom part of the model, the money the regime has (treasury) can go to the key supporters or to the citizens via public goods. Public goods lead back to the treasury via taxation, where private rewards do not. Revenue from free resources flows into the treasury with no strings attached. So as long as e.g. the military is happy enough to crush any opposition a revolution will fail not matter the level of inequality. This is quite in line with the evidence shown in the literature review that a regime transition is unlikely to lead to democracy.

In the model there is also a link from income inequality to other economic factors such as growth and poverty. This relationship works both ways, here we only take into account the effects of income. Another link is the effect that free resources have on both the ultimate and the proximate causes of income inequality. On the ultimate cause free resources lead to more stable and longer lasting regimes who can spend more on private benefits as economies depended on free resources are more easily controllable leading to more executive direction. The effect on the proximate cause, still kind of goes via the regime, and that is that due to having this source of government revenue less investment in the economy have to be made.

From this model a couple of hypotheses follow that can be used to inform the answer to the research question. The first concerns the effect of political regimes on income inequality. The model above informs this hypothesis by showing how rulers and what policies they implemented are steered by the political constraints and that these policies have an important effect on income inequality.

Hypothesis 1: Countries with smaller winning coalition have higher income inequality

This hypothesis is similar to the one tested by Kemp-Benedict (2010; 2011). Testing this hypothesis is both to replicate, and nuance where necessary, the results of Kemp-Benedict as well as the most important test of our research question. As can be seem from the formulation from the hypothesis, the focus is on the winning coalition and not the loyalty norm (W/S). That is because the size of the winning coalition gives the political constraints. The loyalty norm has some influence on the size of the private benefits that need to be payed, but is more

important in question concerning the longevity of the regime and does not seem to effect a country's income distribution much.

Two other hypotheses have to do with how free resources affect the relationship between political regimes and income inequality. These are:

Hypothesis 2: Natural resource dependency is associated with higher inequality in small winning coalition countries.

Hypothesis 3: Aid dependency is associated with higher inequality in small winning coalition countries.

According to the theory and our model, both natural resource rents and foreign aid have the possibility to affect the relationship between political regimes and income inequality. Leaders in more democratic countries are more accountable which means that free resources are less likely to lead to bad incentives. Leaders of countries with higher dependencies have incentives that become less aligned with that of the citizenry. The next chapter will describe the method and data that are used to answer these hypotheses.

Chapter 3: Methodology, Data & Descriptive statistics

This chapter consist of four parts. The first part introduces the methodology with which the hypotheses will be tested and explains why this methodology is used. The second part looks at the data that are used in the estimations. Section three looks at both the limitations in the methodology and data that are present and should be taken into account. The last section of this chapter is concerned with the descriptive statistics of the sample.

3.1 Methodology

In testing the hypotheses we follow the standard approach in the literature by using a pooled regression model (Verardi, 2005; Kemp-Benedict, 2010; 2011). A pooled model is one where individuals are simply pooled together with no provision for individual or time differences (Adkins & Hill, 2011, pp. 444 - 446). Other estimation options for dealing with panel structure data do not fit well with the data and the question at hand. The main explanatory variable changes very little over time and other structural variables do not change at all, making a fixed effect regression not suitable (Verardi, 2005). Furthermore, a random effects estimator is also not suitable since the data are on country level and that makes it difficult to believe in a strict independence between exogenous variables and the permanent component of the error term. A basic pooled model can be specified as follows (Hill, et al., 2011, p. 540):

$$\boldsymbol{Y_{it} = \mu_t + \beta x_{it} + \gamma Z_i + \epsilon_{it}}$$

Where Y is the dependent variable. The first term being an intercept. X stands for those independent variables whose value can vary across time, e.g. GDP. Z is for the independent variables whose value does not change over time such region and ethnicity. These time-invariant values measure stable characteristics. The last term is the error term. The beta and gamma have no subscript, as they are assumed to be constant for all individuals in all time periods.

Applying pooled least squares without taking the panel nature of the data can be restrictive. Most importantly, the assumption that that errors are uncorrelated is unrealistic. As the sample has multiple observations per country, it is likely that the error term of a country has some components present in each time period. These can be unobservable differences that are not accounted for by the explanatory variables. This means that there is an intercorrelation within the 'cluster' of observations for a country (Adkins & Hill, 2011). Therefore, the assumption of zero error correlation over time for a country is relaxed, so that the error variance can be different in different time periods, but is constant over individuals. Relaxing this assumption also relaxes the homoskedasticity assumption. However, using pooled least squares in the presence of heteroskedasticity and correlation means that robust-clustered standard errors should be used to correctly test hypotheses.

Another estimation approach that is common in many political economy studies is the generalized least squares estimation. In an important study Beck & Katz (1995) examine estimation issues with panel models, and argue for using OLS with panel-corrected standard

errors instead of feasible generalized least squares (FGLS). It is 'feasible' because most studies use an estimate of the error process, avoiding the GLS assumption that the error process is known (Beck & Katz, 1995). They show that not only are panel-corrected standard errors very accurate, OLS estimates themselves are not much inferior to FGLS parameter estimates.

The estimation equation that is used is:

$$\boldsymbol{Gini_{it} = \beta_1 + \beta_2 Regime_{it} + \beta_3 Income_{it} + \beta_4 X_{it} + \beta_5 Z_i + \beta_6\, Free\ resource * Regime_{it} + \varepsilon_{it}}$$

Where the dependent variable is the Gini coefficient of disposable income in country *i* and time *t*. Regime is our main variable of interest and can take the form of winning coalition, the electoral democracy index or Geddes' nominal regime classification. Income consist of the log of GDP and GDP squared. X includes independent variable that change over time, these are the human capital index, trade, natural resource rents as a percentage of GDP, and foreign aid as a percentage of GDP. Z includes independent variable that are time invariant such as the region dummies and the ethnolinguistic fractionalization index. Beta six is the coefficient for the interaction between the regime variable and the free resource variable to test the second and third hypothesis. All regression include cluster standards errors at the country level.

3.2 Data (full data sources can be found in Appendix A)

The dependent variable in the model is the Gini coefficient for disposable income from the Standardized World Income Inequality Database (SWIID) set up by Solt (2016). The SWIID maximizes comparability of available income inequality data for the broadest possible sample of countries and years, by taking a Bayesian approach to standardizing observations that are collected from different sources. However, what makes this dataset unique is that it also takes into account that the first approach does not take away all uncertainty and incomparability, these are reflected in the standards errors in this dataset. The inequality estimates and their associated uncertainty are represented by 100 draws from the posterior distribution: for any given observation, the differences across these imputations capture the uncertainty in the estimate. This also means that in estimating the model multiple imputation is to be used. The broad global coverage and comparability over countries make this dataset well suited for empirical work (Kotschy & Sunde, 2017; Ahmad, 2017; Dodlova & Giolbas, 2015). SWIID among other datasets, such as the WIID and World Bank's all the Ginis database meet the criteria for high quality data on income distributions (Neves, et al., 2016). Between those SWIID has the broadest coverage.

The first explanatory variable is the winning coalition (W) from the selectorate theory. W is a composite index based on four variables from Polity IV. These are regime type (regtype), competitiveness of executive recruitment (xrcomp), openness of executive recruitment (xropen), and competitiveness of participation (parcomp). The score is normalized to fall between 0 and 1, where higher scores mean larger winning coalitions. Some argue that the progression to larger scores should not be seen as linearly but best thought of as a logarithmic scale that estimates the order of magnitude of the winning coalition (de Mesquita & Downs,

2006). A big downside is the crudeness with which the winning coalition is measured, and this could have consequences for the results.

Autocratic states all have relatively small winning coalitions, but the selectorate size (S) can differ greatly between different types of regimes. S is based on the mode of legislative selection which has three option: no legislature exists, non-elective legislature, and elective legislator. These have the values 0, 1, and 2 and for S these are normalized to 1 (Cheibub, et al., 2010).

Next to classifying regimes by W and S, other classification have been used in the literature. Here we use two of those alternatives, the first is the classification by Geddes et al (2014). Some argue that this leads to more easily interpretable regime measures which are still consistent with the selectorate theory (Chang & Golden, 2010). The default here is democracy and the different authoritarian regimes are measured by dummies. These are monarchy, military regimes, single-party rule and personalistic regimes.

The second alternative is the electoral democracy index from the Variety of Democracy Project. This measure takes into account measures of freedom of association, clean elections, freedom of expression, how official are elected, and suffrage. It measure to what extend the ideal of electoral democracy is achieved in its fullest sense (Coppedge, 2017). This measure is continuous and does not suffer from lumping together all different types of authoritarian regimes as do other democracy measures. This measure is also not too different from the winning coalition in the sense that it measures to what extent leaders are and have to be responsive to their citizens through electoral competition. Von Stein (2017) argues that this index is also adept at distinguishing between semi-autocratic and semi-democratic regimes. It has the advantage over W that it is more finely measured.

To test the other two hypotheses data on natural resources and foreign aid is needed. We use these both as a share of GDP, from the World Bank development indicators. In this Anthonsen et al (2012) are followed, who use resource rents as a share of GDP instead of rents per capita because the main mechanism is financial dependency of the government on unconditional income. The countries with the same amount of rents can have very different dependencies on this rent. The same argument can be made for foreign aid. To allow for the deleterious effect of free resources, which are hypothesized to be stronger in small coalition settings, we can include interactions between the free resource measures and the preferred variable for regimes. Next to the dependency on free resources, per capita dollars from these sources will be used as an alternative.

The control variables that are included in the regression will be described below. As time invariant controls we include regional dummies and the ethnolinguistic fractionalization index (in 1985), hereafter called ELF. The regional dummies capture different aspects that are relevant according to the literature such as colonial roots and former communist regimes which Angeles (2007) found to be strong predictors of inequality. As time-varying controls we include GDP and GDP squared, due to different theories pointing to non-linear relationship to inequality (Kuznets, 1955; Ahmad, 2017). The human capital index from the Penn world table is included to account for education and investment in human capital. Higher levels of education have been

found to lead to greater levels of equality for countries and lower levels of corruption. More educated people are more likely to complain about corruption, even in authoritarian regimes (Uslaner & Rothstein, 2016; Verardi, 2005). Lastly, we include a measure for trade and globalization. That is the sum of export and imports as a percentage of GDP, which is also from the Penn world table. The effect of this variable is uncertain as the literature points to different mechanisms. Trade openness can be an effective policy for reducing inequality in low income countries, if gains are redistributed (Dong, 2014). Lin & Fu (2016) find that trade decreases inequality in autocracies, but increases in democracies. And Galbraith (2011) argues that globalization is one of the main forces driving inequality in the world today.

3.3 Limitations

As with any empirical study there are limitations to the methodology and data used. The main limitations in this study have to do with the data, especially the fact that the most important variables are proxies rather than exact measures of the theory. Another limitation could be the limited estimation options available given the structure of the data and question.

As mentioned before the selectorate theory is theoretical quite strong but it suffers from some measurement problems. The winning coalition is measured as a composite index of four different variables. However, this obviously is a proxy and not a direct measurement of the size of the winning coalition. And although it is at this point the best proxy, according to the original researchers, the question remains how good a proxy it is. The measurement of the selectorate size is even more problematic, the value of the proxy can only take 3 values. Furthermore, as will be shown later in the descriptive statistics the selectorate size in our sample has very limited variability between countries which is unlikely to be the case of the true selectorate size. The alternative measure for political regimes, the electoral democracy index, which is also a composite index has a similar question of validity as a proxy. However, in contrast to the winning coalition this variable has a wider variability and is more continuously measured.

The measurement of inequality could be another limitation. Although the inequality database used uses the highest quality data and also accounts for data uncertainty better than any other by using multiple imputation, it is likely that the data is more trustworthy for democracies. Especially in small winning coalition countries the private benefits that the small group of key supporters gets is unlikely to be taken into account in these statistics which are often self-reported.

A similar argument can also be made for the measurement of free resources. Natural resources and foreign aid as a percentage of GDP have to proxy for the more complex discretionary funds that are available to the regime/leader. Next to the unknown costs of buying loyalty from the coalition, it is very hard to know what resources are available. This problem is exacerbated by measurement problems being largest in low winning coalition countries. An enlightening example is Myanmar/Burma, which is blessed with an abundance of natural resources but where national statistics are not very reliable. The reliability is retarded in different ways. The first is understating the volume, e.g. in 2001 China reported that it had

imported 514000 cubic meters of hardwood while Burma only recorded the export of 3240 cubic meters. Myanmar main resource is natural gas though, but most of the money made by exporting natural gas never finds its way in the government's accounts. This happens because the real exchange rate of Kyak to Dollar is 200 times that of the official exchange rate, which means the regime can deposit all gas export earnings in government accounts at the official rate and keep 99.5% of the money (de Mesquita & Smith, 2011, pp. 211-212).

3.4 Descriptive statistics

Below some descriptive statistics relevant to the study are discussed. Figure 3 shows the number of observations per year. The dataset is from 1960 to 2015, however, most of the observations are from a shorter period of time. This also means that the dataset is unbalanced, with some countries only having ten observations and some others for every year. The reason for using an unbalanced panel is that this allows us to study the question over a larger sample which will gives more variability between countries.

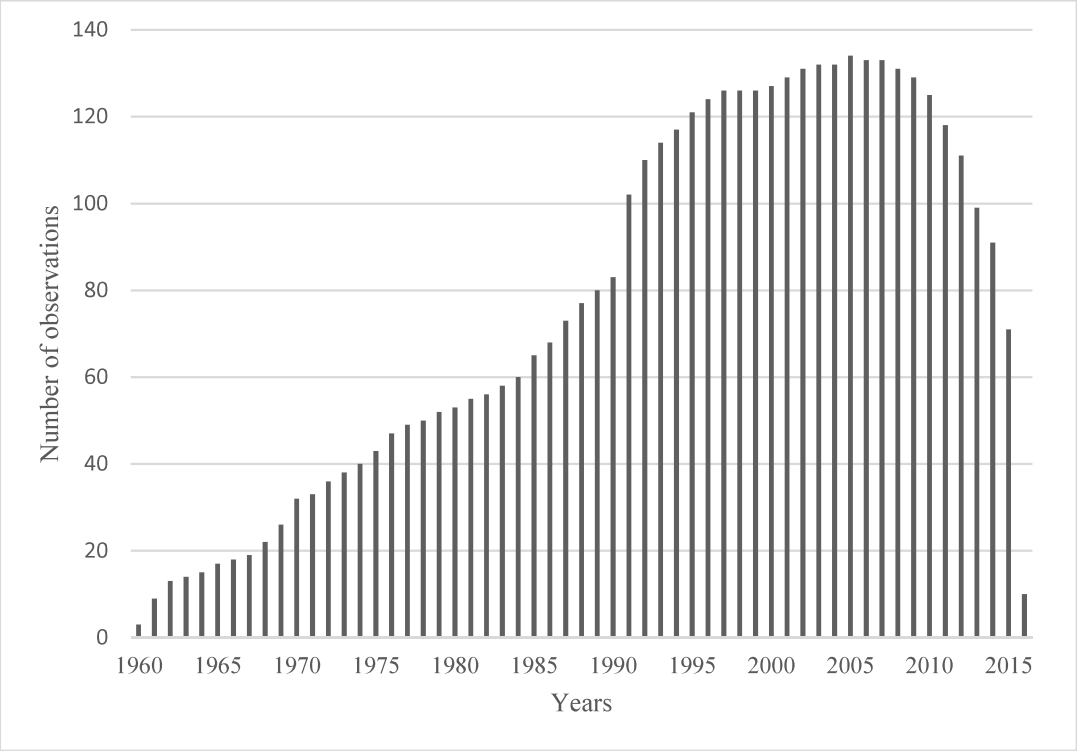

Figure 3: Number of observations per year

Table 1 shows the summary statistics for the variables that are used. The dummy variables for different regime types and regions are not included. A couple of observations stand out, firstly most variables have a comparable amount of observations. An exception to this is the selectorate size, which is due to it being composed on the basis of a dataset that has not been expanded lately. Another problem that arises with the selectorate size is that the mean is very close to the maximum, which indicates that there is very limited variability in the sample.

A second observation is that for many variables the observations stretch across the whole spectrum. The ethnolinguistic fractionalization index spans from those close to zero to those close to one. Similarly, W and the electoral democracy index, the measures for political regimes, also show great variation. Another comparison that can be made between these two variables is that the electoral democracy index's mean is a lot lower than that of W. One reason why the mean of W could be so high is that many developed countries that have scores of 1 have more observations over the sample period. However, it could also be due to the crudeness of the measure. For some countries the score of W is higher than one would expect. As an example the latest observation for Zimbabwe (in 2011), a country that does not have a reputation for democracy has a winning coalition score of 0.75. The electoral democracy index with a more fine grained measurement seems to be closer to reality with a score of around 0.28.

Table 1: Summary statistics

Variable	*Number of observations*	*Mean*	*Std. Dev.*	*Min*	*Max*
Winning coalition	4306	0,6928704	0,2701555	0	1
Selectorate size	3515	0,9415363	0,2207477	0	1
W/S	3354	0,715489	0,2556798	0	1,5
Electoral democracy	4262	0,5540329	0,2732328	0,0226257	0,9470936
Log(GDP)	4215	8,940669	1,153544	6,021233	11,97672
Log(GDP)²	4215	81,2659	20,38295	36,25525	143,4418
ELF	4292	0,4472607	0,2725912	0,003	0,922
Trade (% of GDP)	4215	47,69653	46,40822	0,0140515	609,0619
Human capital index	4019	2,299174	0,7132837	1,045362	3,734285
Natural resources (%of GDP)	4064	5,885423	8,894253	0	80,9206
Foreign Aid (% of GDP)	4157	0,1985571	0,459106	-0,0782577	7,304105
Natural resources per capita	3994	646,8906	2693,067	0	45190,92
Foreign Aid per capita	4157	4,852738	8,39112	-8,753	113,3136
Gini	4306	0,3811549	0,0861922	0,190322	0,6105847

Due to the manner in which the SWIID accounts for uncertainty in the Gini coefficients with multiple imputation, that variable cannot be shown in these summary statistics. However, the average Gini coefficient is included which is just the average over the 100 imputation per country per year. This measure again shows great variation with a minimum of 19 and a maximum of 61.

Table 2 shows the correlations between the variables used. The most important observation from these correlations is the winning coalition and the electoral democracy index are highly correlated, which gives support to the view that what they measure has a lot of overlap. Also, the measure for human capital is quite correlated with many other variables. This all seems to be due to developed countries have more human capital, but also being richer, having bigger winning coalitions, and less dependency on natural resources and aid. A last observation from table 2 is that the two different measurements of natural resources and foreign aid are

mostly not very highly correlated, supporting the idea that dependency and per capita measure very different aspects.

Table 2: Correlation table

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	**Winning Coalition**	1													
2	**Selectorate size**	0,2225	1												
3	**W/S**	0,981	0,0648	1											
4	**Electoral democracy**	0,8085	0,1844	0,7847	1										
5	**Log(GDP)**	0,5489	0,0832	0,5368	0,5952	1									
6	**Log(GDP)²**	0,5569	0,061	0,5475	0,602	0,9973	1								
7	**ELF**	-0,2352	-0,0604	-0,2252	-0,278	-0,4613	-0,4575	1							
8	**Trade (% of GDP)**	0,2672	0,0251	0,2651	0,227	0,4985	0,5116	-0,1967	1						
9	**Human capital index**	0,5929	0,0733	0,5882	0,6589	0,7594	0,7612	-0,428	0,3403	1					
10	**Natural resources (% of GDP)**	-0,3271	-0,1624	-0,311	-0,3598	-0,2676	-0,2566	0,2893	-0,1055	-0,3516	1				
11	**Foreign Aid (% of GDP)**	-0,22	-0,0556	-0,2148	-0,2584	-0,5523	-0,5284	0,2468	-0,2423	-0,4471	0,2128	1			
12	**Natural resources per capita**	-0,1026	-0,4162	-0,0482	-0,1087	0,2308	0,2538	0,0728	0,0709	0,0317	0,3635	-0,0627	1		
13	**Foreign Aid per capita**	-0,2768	0,0104	-0,2814	-0,2854	-0,382	-0,3851	0,1073	-0,2543	-0,3592	0,1913	0,725	-0,0364	1	
14	**Gini**	-0,3732	-0,0219	-0,3668	-0,4361	-0,413	-0,4406	0,4175	-0,2775	-0,5169	0,1431	0,0346	0,0147	0,1183	1

Chapter 4: Empirical analysis

In this section the empirical results will be shown and discussed. To test the first hypothesis three similar estimations are run. The difference between these estimations is the political regime variable that is used. The rest of the estimation is the same, unless otherwise indicated. The first estimation uses the winning coalition (W) as the regime measure, the second uses the Electoral Democracy Index, and the last use both W and the dummies for the different types of authoritarian regimes. The dummies, according to the literature, measure a similar thing to the loyalty norm (W/S). However, in the first estimation we do not include either S or the loyalty norm W/S. The reason for doing so is closely related to the earlier observation that there is almost no variability in S. This was also reflected in both variables never entering a regression significantly. Furthermore, due to data limitations including either S or W/S leads to a big loss of observations, therefore all estimation shown in this chapter exclude them. In line with the findings of the methodological section, all models have clustered errors at the country level (the region level was also tested but made no difference) to control for heteroskedasticity and spatial autocorrelation.

In table 3 the results for estimation with the winning coalition are shown. The first column only includes W and this variable has the correct negative sign and is highly significant. The negative sign indicates that countries with higher winning coalitions (more democratic), are associated with lower levels of inequality. The difference between a complete autocracy (W=0) and democracy (W=1) is almost 11 points in the Gini coefficient. The second column then adds income in the form of log of GDP and GDP squared. Both are included to account for the Kuznets curve. The first is positive and significant and the latter is negative and significant, the signs of these coefficients are in line with the Kuznets curve. Moreover, W has lost its significance while retaining the correct sign.

The third column adds the structural and time-invariant variables, these include the dummies for the different regions and the ethnolinguistic fractionalization index. Most coefficients are substantial and highly significant, which is in line with many earlier findings stressing the importance of structural variables. The signs and significance of the region dummies depend on which region is taken as the reference region. In all specification here the OECD countries are used as the reference region. This explains why all coefficients are positive and why the dummies for Eastern Europe and East Asia are insignificant. The OECD countries have the lowest income inequality, followed by these two regions. Moreover, the results are in line with many findings of higher inequality in Africa and Latin America.

The model in the third column is also the model that is closest to that of Kemp-Benedict (2010; 2011). The results though differ a lot, the coefficient on W in his studies is a lot larger (-0.0674). There could be multiple reasons for this. First, he uses a different database on inequality. Secondly, there are some small differences between the models as he includes a variable that is not available for the whole sample used here. Thirdly and most importantly, he uses a smaller sample of countries. To test that the last factor drives the differences in results, we cut our sample to the same time period (1970 – 1990), and use the same countries as far as

possible. This is made harder by the fact that his studies do not give a clear overview of the countries used, but using the countries that could be identified we get a similar number of observations (352 vs 307). Running the model in column 3 on this smaller sample leads to W having a coefficient of -0.87 with a 1 percent significance, an even larger effect than he found. Furthermore, for this limited sample the R-square for our model is 0.89 compared to his 0.63. The plausible reason why this sample leads to different results is the inclusion of certain countries. Overall his sample includes more developed western countries (mean W at 0.78 is also a lot higher than in our sample) and a few very unequal Latin American and African countries, which could drive the results.

Table 3: Estimation results 1

VARIABLES	(1) Gini	(2) Gini	(3) Gini	(4) Gini
Winning coalition (W)	-0.1086***	-0.0484	-0.0100	-0.0115
	(0.0212)	(0.0306)	(0.0199)	(0.0206)
Log(GDP)		0.279***	0.172**	0.115
		(0.0958)	(0.0695)	(0.0726)
Log(GDP)²		-0.0171***	-0.00956**	-0.00661
		(0.00565)	(0.00386)	(0.00410)
ELF			0.0438**	0.0385*
			(0.0206)	(0.0205)
Latin America			0.150***	0.151***
			(0.0184)	(0.0188)
Middle East			0.0909***	0.0934***
			(0.0219)	(0.0248)
Eastern Europe			0.00949	0.0155
			(0.0171)	(0.0194)
Africa			0.111***	0.111***
			(0.0286)	(0.0310)
South Asia			0.117***	0.120***
			(0.0223)	(0.0231)
East Asia			0.0468	0.0530
			(0.0298)	(0.0325)
Islands			0.162***	0.163***
			(0.0477)	(0.0457)
Human Capital Index				-0.00193
				(0.0122)
Natural resources (% of GDP)				-0.000409
				(0.000477)
Foreign Aid (% of GDP)				-0.0204**
				(0.00949)
Trade (% of GDP)				-1.98e-05
				(0.000112)
Constant	0.456***	-0.686*	-0.472	-0.185
	(0.0154)	(0.409)	(0.311)	(0.324)
Observations	4,306	4,215	4,202	3,763
Clustered SE	YES	YES	YES	YES
R2	0.111	0.250	0.582	0.592
R2 adjusted	0.111	0.249	0.581	0.590

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Column 4 then includes two more controls, trade and the human capital index, both of which are not significant. Also the measures of natural resources and aid as a percentage of GDP are included, of which aid is significant. Including these variables leads to a lower amount of

observations, this is because the World Bank does not have data on these before 1970. Overall, including these four variables leads to a very limited increase in explanatory power.

Table 4: Estimation results 2

VARIABLES	(1) Gini	(2) Gini	(3) Gini	(4) Gini
Electoral Democracy index	-0.125***	-0.0700**	-0.0531**	-0.0720***
	(0.0211)	(0.0323)	(0.0210)	(0.0238)
Log(GDP)		0.274***	0.177***	0.126**
		(0.0894)	(0.0636)	(0.0639)
Log(GDP)^2		-0.0167***	-0.00958***	-0.00709**
		(0.00530)	(0.00348)	(0.00353)
ELF			0.0436**	0.0403**
			(0.0200)	(0.0197)
Latin America			0.143***	0.146***
			(0.0167)	(0.0173)
Middle East			0.0725***	0.0758***
			(0.0194)	(0.0228)
Eastern Europe			0.000337	0.00411
			(0.0155)	(0.0175)
Africa			0.102***	0.105***
			(0.0278)	(0.0302)
South Asia			0.104***	0.104***
			(0.0212)	(0.0219)
East Asia			0.0324	0.0328
			(0.0255)	(0.0274)
Islands			0.158***	0.162***
			(0.0468)	(0.0437)
Human Capital Index				0.00717
				(0.0115)
Natural resources (% of GDP)				-0.000760
				(0.000461)
Foreign Aid (% of GDP)				-0.0163*
				(0.00938)
Trade				-1.80e-05
				(9.95e-05)
Constant	0.451***	-0.674*	-0.475	-0.225
	(0.0127)	(0.379)	(0.291)	(0.292)
Observations	4,262	4,173	4,160	3,721
Clustered SE	YES	YES	YES	YES
R2	0.150	0.270	0.601	0.619
R2 adjusted	0.150	0.269	0.600	0.618

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 shows the results with estimation results of basically the same regression only this time with the electoral democracy index as the political regime variable. In contrast to W, this variable is significant in all regressions and also has a substantially larger coefficient. In the full model, column 4, going from lowest to highest scores on democracy is associated with a 7 point lower Gini coefficient. Overall, the electoral democracy index seems to have more explaining power than W. This is not totally unexpected as it was shown that the electoral democracy index seems to have more variability and more sensical values. The results for income and the structural variables are still significant and important.

Table 5 then shows the results for the estimation with the last set of political regime variables. In this estimation dummies for four different types of authoritarian regime are added to regression. These are party based authoritarian regimes, personalistic regimes, military regimes, and monarchies. For legibility the result from the regional dummies are omitted, they showed very similar results to those in table 3 and 4. The only nominal regime type that is significant is the dummy for party based regime. This is one of the regime types associated with a higher loyalty norm. However, most results are not significant and the coefficients for all four are not very substantial. Including these dummies seems to lead to only a small improvement in the model. The limited number of observations for certain regime types could also mean that one or a few countries could drive the results.

Table 5: Estimation results 3

VARIABLES	(1) Gini	(2) Gini	(3) Gini	(4) Gini
Winning coalition (W)	-0.124***	-0.0681*	-0.0179	-0.0179
	(0.0241)	(0.0400)	(0.0227)	(0.0247)
Party	0.0207	0.00906	0.0198*	0.0305***
	(0.0150)	(0.0148)	(0.0103)	(0.0112)
Personal	-0.0307**	-0.0413**	-0.00388	0.00300
	(0.0150)	(0.0169)	(0.0136)	(0.0145)
Military	-0.0323	-0.0291	-0.0218	-0.0194
	(0.0238)	(0.0279)	(0.0167)	(0.0173)
Monarchy	0.0270	0.0266	0.0431	0.0438
	(0.0428)	(0.0446)	(0.0416)	(0.0425)
Log(GDP)		0.264***	0.153**	0.0863
		(0.0904)	(0.0671)	(0.0692)
Log(GDP)²		-0.0163***	-0.00852**	-0.00507
		(0.00533)	(0.00374)	(0.00393)
ELF			0.0458**	0.0404**
			(0.0196)	(0.0194)
Human Capital Index				0.00277
				(0.0121)
Natural resources (% of GDP)				-0.000449
				(0.000437)
Foreign Aid (% of GDP)				-0.0227**
				(0.0101)
Trade				-5.98e-05
				(0.000103)
Constant	0.468***	-0.600	-0.372	-0.0562
	(0.0191)	(0.395)	(0.301)	(0.310)
Observations	4,306	4,215	4,202	3,763
Clustered SE	YES	YES	YES	YES
Region dummies	YES	YES	YES	YES
R2	0.143	0.279	0.598	0.613
R2 adjusted	0.142	0.278	0.596	0.611

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In the first three specifications both natural resources and foreign aid as a percentage of GDP were included. Both entered the regression with a negative coefficient, and foreign aid was somewhat significant. However, to fully test the second and third hypothesis interactions between these variables and the political regime variables need to be included. The results for these regressions are shown in table 6. The first and second column have the winning coalition as regime variable, whereas the third and fourth column have the electoral democracy index as regime variable. The difference between the two regressions with the

same regime variable is that in the first natural resources and foreign aid as a percentage of GDP are used. Whereas in the second dollars per capita are used for both. Although the interactions with the electoral democracy index use just the variable, for the winning coalition a dummy for countries with low W scores is used (W<=0.5).

Table 6: Estimation results 4

Variables	(1)	(2)	(3)	(4)
Dep. Var: Gini coefficient	W	W	ED	ED
Regime	-0.0228	-0.0105	-0.0781***	-0.0715**
	(0.0255)	(0.0239)	(0.0295)	(0.0283)
Log(GDP)	0.119	0.243***	0.129**	0.216***
	(0.0739)	(0.0734)	(0.0620)	(0.0716)
Log(GDP)²	-0.00678	-0.0143***	-0.00727**	-0.0124***
	(0.00415)	(0.00426)	(0.00339)	(0.00417)
Natural resource (% of GDP)	-0.000241		-0.000364	
	(0.000674)		(0.000846)	
Foreign Aid (% of GDP)	-0.0144		-0.0385**	
	(0.00943)		(0.0168)	
Foreign Aid * Regime	-0.0159		0.0581*	
	(0.0113)		(0.0337)	
Natural resources * Regime	-0.000321		-0.00100	
	(0.000773)		(0.00185)	
Natural resources per capita		3.68e-06		3.12e-06*
		(4.21e-06)		(1.72e-06)
Foreign Aid per capita		-0.000271		-0.00123
		(0.000536)		(0.00107)
Natural resource pc * Regime		7.11e-07		-5.12e-06
		(3.96e-06)		(3.99e-06)
Foreign Aid pc * Regime		-0.000535		0.00194
		(0.000802)		(0.00203)
Constant	-0.191	-0.713**	-0.232	-0.598*
	(0.328)	(0.317)	(0.285)	(0.313)
Observations	3,763	3,763	3,721	3,721
Clustered SE	YES	YES	YES	YES
Region dummies	YES	YES	YES	YES
R2	0.594	0.595	0.622	0.618
R2 adjusted	0.593	0.593	0.620	0.616

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
The results for ELF, trade and the human capital index are not shown

The results in column 1 have no significance for both the single variables and the interaction with free resources. In column three for the same regression but with the electoral democracy index as the political regime variable both the variable for foreign aid and the interaction with the regime are somewhat significant. These results however are not in line with the hypothesis. The single variable has a negative coefficient meaning that higher values of aid are associated with lower inequality levels. Similarly, the interaction has a positive sign indicating that foreign aid is associated with higher inequality in more democratic countries. The natural resources variables are not significant.

Column 2 and 4 then show the results for the regression with per capita values instead of percentages of GDP. Again for the regression with the winning coalition, no significant results are found. The results for natural resources in column 4 have the correct signs but the

interaction is not significant and the single variable barely so. Table 7, in appendix B, shows the results for the interactions between the different nominal classification and both the free resources as percentages of GDP and per capita. Most interactions are insignificant and those that are significant have the opposite sign that the hypotheses stated.

Overall the results leads to a rejection of the second and third hypotheses. Both natural resources and foreign aid seem to add little to the model and their interactions show no evidence for these forces being associated with higher income inequality in countries with smaller winning coalitions. There is evidence though in support for the first hypothesis. Although the preferred measure in the selectorate theory W scores less well than the alternative electoral democracy index. If we take the latter than in the full specification going from most undemocratic to most democratic or from lowest to highest winning coalition is associated with a drop of more than 7 points in Gini coefficient. This is a very substantial effect. The addition of dummies for different authoritarian regime is small, although some have significant coefficients, they do not make a substantial difference. This could be in line with the main mechanism going through a small winning coalition, and the difference between different regimes mattering less for income inequality. The results are further discussed in the next section. The results above are robust to inclusion of time dummies and different lag structures of the independent variables. Furthermore, the same analysis with feasible generalized least squares estimation leads to similar results and no difference in inferences. These results are, therefore, not shown.

4.1 Discussion

One of the reasons why few consistent results for natural resources and aid dependency are found could be due to the importance of these variables for countries in the sample. A couple of countries have a very high dependency on natural resources, e.g. Turkmenistan, Nigeria, Angola, Iran, Congo, Liberia, and Mauritania have observations of above 50%. However, away from these extremes dependency drops of quickly. 7% of the sample has >20% dependency, 18% of the sample has >10%, but on the other hand 36% of the sample has <1%. Furthermore, the countries that score high on natural resource dependency are quite poor, and do not seem to fall in the highest echelons income inequality wise. The countries in the sample with the highest inequality are mostly in Africa and Latin America (Namibia, South Africa, Botswana, Peru) and except South Africa these countries have lower dependency rates. In testing the hypothesis on natural resources we also used natural resource rents per capita, which quite distinctly measures something else than natural resources as a percentage of GDP. Firstly, the countries that score high on this measure are a lot richer such as Chile, Venezuela, Norway, but especially Qatar is a major outlier. Secondly, some quite poor countries such as Burundi in 2000 had a dependency of 15% but this translates into only 60 dollars per capita. Which of the two is the more relevant measure is not quite clear. The dependency ratio captures better the need of the state to improve productivity or not. Whereas measuring in as dollars per capita could give a better indication (especially in richer autocracy) how much fungible money the leader can spend.

Foreign aid seems the be less 'important' overall than natural resources for government revenue. The highest value of aid dependency is only 7% of GDP (Congo, 2006). Some other countries with higher values are India, Bangladesh, and Egypt. However, only 4% of the sample has a dependency of more than 1%. The same goes for aid per capita, with only one country having more than $100 dollar a year (Nigeria, 2006). And only 14% of the sample has observations of more than $10 per capita. Interestingly, most high observations come from Egypt, which is in line with some studies that show that Egypt is a country that has actively traded policy concessions for foreign aid, especially on the issue of relations with Israel.

The issue of the crudeness with which the winning coalition is measured was already brought up in the data section. However, given the results it seems that the Electoral Democracy Index indeed has more explaining power than W, which is partially due to being a more sensitive and continuous measure. Although the correlation between the two measures is quite high, there are also big differences. As both variables fall between 0 and 1, we can take the difference between these two for every country year observation to see how far the differ at times. On one side of the spectrum W understates that the level of democracy, if we take the Electoral Democracy Index to be true. With the biggest differences being Tunisia (-0.483, 2012); Ghana (-0.482, 2000); and Korea (-0.465, 1987). On the other side of the spectrum W overstates the level of democracy, in the data section the example of Zimbabwe was already given. Another would be the Democratic Republic of Congo that scores a 0.75, but the cases with the biggest differences are Lithuania (0.666, 1991); Nepal (0.62, 1980s); and Malaysia (0.595, 1970-1971). These results support the conclusion that crudeness of the measurement of the winning coalition leads empirical problems.

Chapter 5: Conclusion

With the theoretical and empirical analysis completed the research question first stated in the introduction can be answered. This question was:

How do different political regimes affect a country's income distribution?

In answering this question the selectorate theory was used as the guiding political economy framework. This theory together with the findings from the relevant literature led to the foundations in the theoretical model that was used in the rest of this study. The three testable hypotheses were related to how political regimes affected income inequality and how free resources (natural resources / foreign aid) influenced this relationship.

Whilst the selectorate theory is theoretically strong, it is often hard to test empirically. The main reason for this are the data limitations. For all the main variables proxies have to be used as the 'real' values are unknown. Some proxies definitely seem more reliable than others. Taking these limitations into account a large sample of more than a hundred countries in a unbalanced panel over the period 1960 to 2015 was used for the empirical analysis. In following the literature a pooled regression model was used as the main estimation technique. For the dependent variable, Gini coefficient of disposable income, Solt's (2016) inequality database was used. A big advantage of this dataset, besides its coverage and comparability, is the use of multiple imputation to address the uncertainty in the measurement of inequality in many cases. This means that these observations do not have to be thrown out but will have higher variation.

With the findings in the literature the case can be made that the main mechanism via which political regimes affect a country's income distribution is that of policy decisions on the combination of public goods and private rewards. Whereas no one rules alone, the number of supporters a leader needs has direct consequences on the constraints and incentives faced. The results of the empirical analysis show support for the first hypothesis that income inequality is higher in smaller winning coalition countries. Where these smaller winning coalition countries are proxied for by the different political regime variables. These results can also explain the large benefits that come with democratization. As the size of the winning coalition grows, the allocation shifts more towards public good provision which comes with additional economic benefits of higher productivity.

Although a theoretical case can be made that the presence of natural resources or foreign aid might have deleterious effects on this relationship between regimes and inequality, no supporting empirical evidence was found for the second and third hypotheses concerning these questions. However, the lack of empirical support could well be due to the substantial data limitations concerning these questions. Overall, the findings suggest that the important factor is the size of the winning coalition. Adding the dummies for the different types of regimes, which can account for different selectorate sizes or ideologies between authoritarian regimes, also made little difference.

The testing of the hypotheses concerning the free resources was mentioned as one of two possible contributions to the existing literature that this study could make. Although no empirical support was found, the theoretical argument seems strong enough that empirical findings might follow when stronger data is available. The second contribution has to do with corroborating and were necessary nuancing earlier results, especially the studies by Kemp-Benedict (2010; 2011). In contrast to his studies, the winning coalition variable from the selectorate theory has lower coefficients and less significance in this study. As explained in chapter 4 this is due to the different samples. Next to the importance of the sample used, we corroborate much of the earlier research in the importance of structural variables. In this case the regional dummies and the ethnolinguistic fractionalization index carry much of the model. In contrast to many earlier studies, the findings here give some supporting evidence for the existence of a Kuznets-curve. A reason for this could be the much larger sample used in comparison to others studies, which means that more countries from different income groups are represented.

Taking politics and especially political mechanisms into account can give a deeper and better understanding of economic issues. This is definitely the case for income inequality in which political institutions and constraints seem to play such an important role.

Appendix A: Data sources

Name	Variable	Full definition
Gini coefficient	gini_disp	Estimate of Gini index of inequality in equivalized (square root scale) household disposable (post-tax, post-transfer) income, using Luxembourg Income Study data as the standard. Source: Solt (2016)
Winning coalition	W	W is a composite index based on four variables from Polity IV. These are regime type (regtype), competitiveness of executive recruitment (xrcomp), openness of executive recruitment (xropen), and competitiveness of participation (parcomp). The score is normalized to fall between 0 and 1, where higher scores mean larger winning coalitions. Source: Polity IV
Selectorate size	S	S is based on the mode of legislative selection which has three option: no legislature exists, non-elective legislature, and elective legislator. These have the values 0, 1, and 2 and for S these are normalized to 1 Source: Cheibub et al (2010)
Electoral democracy index	V2x_polyarchy	The index is formed by taking the average of, on the one hand, the weighted average of the indices measuring freedom of association (thick) (v2x_frassoc_thick), clean elections (v2xel_frefair), freedom of expression (v2x_freexp_thick), elected officials (v2x_elecoff), and suffrage (v2x_suffr) and, on the other, the five-way multiplicative interaction between those indices. This is half way between a straight average and strict multiplication, meaning the average of the two. It is thus a compromise between the two most well-known aggregation formulas in the literature, both allowing (partial) "compensation" in one subcomponent for lack of polyarchy in the others, but also punishing countries not strong in one sub-component according to the "weakest link" argument. The aggregation is done at the level of Dahl's sub-components (with the one exception of the non-electoral component). The index is aggregated using this formula: v2x_polyarchy= .5 MPI + 0.5 API = .5(v2x_elecoff* v2xel_frefair *v2x_frassoc_thick *v2x_suffr * v2x_freexp_thick) + .5(1/8 v2x_elecoff + 1/4 v2xel_frefair + 1/4 v2x_frassoc_thick + 1/8 v2x_suffr + 1/4 v2x_freexp_thick) Source: Variety of Democracy Project (Coppedge, 2017)
GDP	rgdpna	Real GDP at constant 2011 national prices (in mil. 2011US$) Source: Penn World Table (Feenstra, et al., 2015)
ELF85	ethnolinguistic fractionalization index	Ethnolinguistic fractionalization index score in 1985 based on the Taylor and Hudson formula. This score uses none of the different ethnic groupings when data on sub-groups are available. Source: Roeder (2001)

Trade	Trade (% of GDP)	Share of merchandise exports at current PPPs (csh_x) + share of merchandise imports at current PPPs (csh_m). Source: Penn World Table (Feenstra, et al., 2015)
Human Capital index	Human capital index	The human capital index is based on years of schooling and returns to education. Source: Penn World Table (Feenstra, et al., 2015)
Population	Pop	Population (in millions) Source: Penn World Table (Feenstra, et al., 2015)
Natural resources (% of GDP)	Total natural resources rents (% of GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Estimates based on sources and methods described in "The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium" (World Bank, 2011). Source: World Bank (2018)
Foreign Aid (% of GDP)	Net official development assistance and official aid received	Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent). Net official aid refers to aid flows (net of repayments) from official donors to countries and territories in part II of the DAC list of recipients: more advanced countries of Central and Eastern Europe, the countries of the former Soviet Union, and certain advanced developing countries and territories. Official aid is provided under terms and conditions similar to those for ODA. Part II of the DAC List was abolished in 2005. The collection of data on official aid and other resource flows to Part II countries ended with 2004 data. Data are in constant 2013 U.S. dollars. Development Assistance Committee of the Organisation for Economic Co-operation and Development, Geographical Distribution of Financial Flows to Developing Countries, Development Co-operation Report, and International Development Statistics database. Data are available online at: www.oecd.org/dac/stats/idsonline Source: World Bank (2018)

Appendix B: Estimation results 5

Variables Dep. Var: Gini coefficient	(5) (% of GDP)	(6) Per capita
Winning coalition (W)	-0.0113	-0.00415
	(0.0246)	(0.0216)
Party	0.0402**	0.0317**
	(0.0165)	(0.0146)
Personal	0.00555	0.0161
	(0.0177)	(0.0173)
Military	-0.00552	0.0148
	(0.0194)	(0.0185)
Monarchy	0.0712	0.132***
	(0.0593)	(0.0440)
Log(GDP)	0.0650	0.223***
	(0.0719)	(0.0710)
Log(GDP)²	-0.00391	-0.0132***
	(0.00408)	(0.00414)
Natural resources	-0.000464	4.50e-06***
	(0.000584)	(1.57e-06)
Foreign Aid	-0.0131	-0.000197
	(0.00950)	(0.000417)
Foreign Aid * Party	-0.0198	-0.000362
	(0.0141)	(0.000773)
Foreign Aid * Personal	-0.0149	-0.00157
	(0.0123)	(0.00117)
Foreign Aid * Military	-0.0279	-0.00190*
	(0.0277)	(0.00106)
Foreign Aid * Monarchy	-0.230	-0.0144***
	(0.188)	(0.00442)
Natural resources * Party	-0.000192	-1.51e-06
	(0.000888)	(7.25e-06)
Natural resources * Personal	0.000271	-1.29e-06
	(0.000801)	(1.28e-05)
Natural resources * Military	-0.000672	-4.32e-05***
	(0.000921)	(1.49e-05)
Natural resources * Monarchy	0.00331	-1.20e-06
	(0.00246)	(8.12e-06)
Constant	0.0347	-0.642**
	(0.322)	(0.308)
Observations	3,763	3,763
Clustered SE	YES	YES
R2	0.623	0.636
R2 adjusted	0.621	0.633

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Next to region dummies, trade and HC results are not shown

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