

ECONOMIC INEQUALITY AND POLITICAL CONFLICT

An empirical study on the impact of income inequality on
political attitudes, violence and stability.

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Abstract

This thesis uses cross-country data to investigate the relationship between economic inequality and political attitudes and conflict. Specifically, it regresses preferences for radical societal change and political violence and instability on income inequality. A 10-percentage point increase in inequality is expected to increase the likelihood of preferring radical societal change by 50.56 percentage points, and the likelihood of political conflict by 1.233 points on a 5-point scale. An inverted-U shape relationship is found between income inequality and both political attitudes and political conflict. An increase in change-preferences increases the likelihood of political conflict in following years. A 10-percentage point increase in desiring change is associated with an increase in the likelihood of violence and instability of 0.663 points on a 5-point scale in the first year, and 0.348, 0.420 and 3.95 in subsequent years. In sum, economic inequality contributes positively, up to a point, to the likelihood of political unrest.

1. Introduction

The American Revolution was based on the contention that ‘all men are created equal’, the slogan of the Chinese Revolution was ‘those who have much give much, those who have little give little’, and the French Revolution called for ‘liberté, égalité, fraternité’. Across the ages and the social sciences, the relationship between inequality and conflict has inspired researchers and philosophers alike. In countless publications, economic inequality is linked to revolution and civil wars. Where Aristotle claimed that ‘inferiors revolt in order that they may be equal and equals that they may be superior’ (translated in Sinclair, 1981, p.106), Marx predicted an uprising of the proletariat (1848), and Sen stated that ‘the relationship between inequality and rebellion is indeed a close one’ (1973, p.1).

This thesis studies the hypothesis that inequality is related to civil disintegration, known as the ‘economic inequality-political conflict nexus’ (Lichbach, 1989). The main research question is *does economic inequality lead to political conflict?* This age-old concern remains relevant. The Global Peace index reports, for the fourth consecutive year, that the global level of peace has deteriorated (2018). Political conflict, civil wars and violence cause physical, mental and material destruction, and economically hurt the development and stability of a society for generations to come (Global Peace Index, 2018). Income inequality has been increasing in nearly all world regions. In extreme situations, aside from ethical fairness arguments, is harmful for individuals and societies (Alvaredo et al, 2018). Wilkinson and Pickett (2010) describe the negative impact it has on individuals, including poorer health, lower levels of trust and education performance. An OECD study states that higher levels of inequality lead to lower rates of economic growth (Cingano, 2014). But does it lead to unrest and instability?

Several mechanisms and theories of how economic inequality impacts political conflict have been brought forth and tested. So far, is no definitive answer on the validity, or even the direction of the relationship. Prominent recent findings include a positive relationship between income inequality and politically-motivated murders (Alesina & Perotti, 1996), and political conflict and humanitarian crises (Nafinger & Auvinen, 2002). Bartusevičius (2013) relates higher inequality to a greater likelihood of rebellions.

To test the inequality hypothesis, this thesis uses regression analysis on cross-country data to study the direction and strength of the relationship. First, *income inequality* is regressed on *political conflict*. Second, this thesis analyses the mechanism of this relationship by regressing *inequality* on political attitudes, followed by the effect of political attitudes on actual conflict. Three data sources are used to gain insight into *income inequality*, *preferences for radical societal change* and *actual observed political violence and instability*. Preferences are obtained from the Integrated Values Survey, which records attitudes and opinions towards politics. The third variable is one of the World Governance Indicators and is an aggregate measure of actual political conflict and violence.

The regression estimates provide evidence that *income inequality* positively contributes to *political conflict*. A positive but diminishing relationship between income inequality and political conflict is found. A 10-percentage point increase in inequality is expected to increase the likelihood of political conflict by 1.233 points on a 5-point scale. After the tipping point at a Gini coefficient valued at 0.237 on a 0-1 scale, increasing inequality reduces the probability of political conflict. This ‘tipping point’ is at the bottom of the sample range, which runs from 0.220 (Finland) to 0.563 (Peru, both in 1996). Second, the mechanism of this relationship is studied by relating *income inequality* to *preferences for change*, and these *preferences* to actual observed *political conflict* in following years. A 10-percentage point increase in inequality is expected to increase the likelihood of preferring radical societal change by 50.56 percentage points and reduce this likelihood after the tipping point at a Gini coefficient of 0.306. This is just below the sample average Gini of 0.343. Preferences for change increase the likelihood of political conflict in the following years. A 10-percentage points increase in the probability of a society preferring radical change is associated with an increase in the likelihood of political conflict of 0.666 points on a 5-point scale in the first year, and 0.348, 0.420 and 0.395 in subsequent years.

This thesis contributes to the field by mapping the inequality hypothesis within a broad perspective, combining context, previous studies and empirical findings using the most recent data available. To the extent of the writer’s knowledge, the combination of data sources used here, with income inequality figures of 42 countries, spanning 18 years, has not been done. Ultimately, it aims to provide objective and research-based material to discuss the impact of income inequality on society.

The structure of this thesis is as follows. Theoretical background and previous findings are presented in section 2, followed by the resulting theoretical framework in section 3. The relationship between *income inequality* and *political conflict* is analyzed in section 4, including data and variable description, framework and empirical strategy and estimation results. Section 5 provides the data, empirical strategy and results for testing the mechanism of impact through *preferences for change*. All results are discussed in section 6. Section 7 concludes this thesis.

2. Literature review

This section summarizes the literature on the inequality hypothesis. To do so, it describes the concepts individually before reviewing the relationship between them. Definitions of terms and concepts are presented in appendix 1.

2.1. Economic inequality

Since people have had wealth, the distribution of, and access to it have been topics of contention for philosophers and policy advisors. Although recent history has known incredible academic and economic development and reductions in absolute poverty, the distribution of wealth is a pressing matter. According to the World Inequality Lab (Alvaredo et al, 2018), income inequality has increased substantially in nearly all world regions in recent decades.

For the purpose of this thesis, economic inequality is defined as *relative deprivation*. This definition is chosen because it gains clarity through contradiction; *absolute deprivation* describes a state of not having enough. Relative deprivation, then, is not having enough in comparison to the society one is a member of.

Wilkinson and Pickett (2010) connect increased inequality to social problems, including violence, higher rates of imprisonment and lower health. They, as well as Kerr (2014), find patterns of reduced economic and social mobility when inequality rises, suggesting a ‘vicious circle’ effect. Ideological and ethical arguments for a fairer distribution have, especially in recent years, been supplemented with research finding that associate a more equal distribution to higher economic growth. Easterly (2007, p.2) claims that there is a ‘long-run negative association between growth

(of which income is of course the cumulative sum) and inequality'. Milanovic (2016) finds that lower social and political tension leads to greater economic growth. Barro (2000, p.7) argues that redistribution can have a positive effect on growth if greater equality reduces crime rates and riots - even in a dictatorship, self-interested leaders would favor redistribution measures if that means a decrease in 'the tendency for social unrest and political instability'.

Most literature on economic inequality uses the Gini coefficient to represent the equality of wealth distribution in a country (World Bank, 2017). The Gini coefficient is based on income levels, on household or personal level. This limits its validity as a reflection of relative deprivation, because it does not include factors such as land ownership, (inherited) wealth, or inequality in opportunities. The limitations of this measure will be discussed in section 6.

Understanding the Gini coefficient is facilitated through the Lorenz curve in figure 1. If the total income in a society is distributed exactly equally, the cumulative percentage of income and cumulative percentage of members in a society will always equal each other. Plotted, they create a straight 45° 'line of equality'. Unequally divided income bends this cumulative income-to-households line and creates the 'Lorenz curve'; a smaller percentage of society earns a higher percentage of the total income (Lorenz, 1905). A deeper curve indicates a more unequal society. The Gini coefficient is equal to the area between the Lorenz Curve and the line of equality (A), divided by the area ($A+B$) (Gini, 1912). A higher value represents a society where incomes are more unequally distributed. Thus, a country with a completely equal or completely unequal income distribution has a Gini coefficient of 0 or 1, respectively.

2.2. Political conflict

Avoiding riots, demonstrations and terrorism against the state could reasonably be called the number one aim of any government, because conflict threatens the power base. Apart from the risk of being overthrown, intra-state conflict is also very expensive and reduces economic growth (Global Peace Index, 2018). It is perhaps no wonder fictional dystopian governments use Big Brother and 'soma' to ensure civil obedience.¹

¹ Big Brother is the state watching everything and everyone in Orwell's *1984*, and 'soma' is the happiness drug used in Huxley's *Brave New World*. Both are well known dystopian literature books.

It can of course be beneficial to have differences of opinion, calls for change and protests, as they can lead to improvements in policy. Gurr (1970) states that if protest is a reaction to, for example, an unacceptable situation or the presence of a repressive regime, collective violence can be for ‘the greater good’. However, a constructive push for improvement can lead to political instability, terrorism, conflict and violence that harms people, their livelihoods and future prospects. Perotti (1996) outlines the negative effect of political conflict on productivity through the disruption in market activities and labor relationships. There are many ways to quantify conflict aimed at a regime, and entire fields of study that attempt to define the distinction between civil disobedience that results in political improvements versus harm to society, and map global changes in these variables. Political instability can refer to government-caused instability, such as purges, constitutional crises or general regime-related changes, or to civil society-induced instability (Alesina & Perotti, 1996). This thesis focuses on the latter source of political conflict, civil society-induced instability, and attempts to relate it to economic inequality.

This thesis follows the definition for *political conflict* as used by the World Governance Indicators (WGI) project. Thus, political conflict in the context of this analysis is referred to as ‘political instability and/or politically-motivated violence’, including the risk of protests and riots, terrorism, interstate- and civil war (Kaufman et al., 2009). It does not claim that revolutions are a positive *or* negative outcome, per se, but does follow the reasoning that political stability facilitates economic growth and that stability is a political goal in and of itself (Cramer, 2005).

2.3. The inequality hypothesis

Some of the greatest philosophers in history, including Aristotle, Plato and de Toqueville, maintained that extreme inequality is a fundamental cause of revolutions and civil wars (Lichbach, 1989). Karl Marx believed that a (further) concentration of capital would motivate a class struggle, leading to a utopian society where every man is equal. It is an almost universal assumption that an unequal distribution of wealth will provoke violence (Cramer, 2005). This causal relationship is known as the ‘inequality hypothesis’.

In essence, the inequality hypothesis predicts that in a society with an unequal distribution of wealth, eventually the poor will revolt to take from the rich. Lichbach (1989, p.433) states that, having reviewed the literature compiled up to then, ‘the general association of inequality with

conflict thus appears inevitable and immutable.’ He summarizes and reasons that higher inequality causes (i) envious poor, who feel like they have nothing to lose and resort to force to achieve distributive demands; (ii) greedy rich, who have much to lose, and are willing to use force to avoid redistribution, and (iii) a smaller middle class, which would generally respect property rights. Thus, higher levels of inequality increases the motive and the pool of potential ‘conflict participants’, but also reduces the likelihood of success (Lichbach, 1989). Dahl (1966) suggest a causal chain in three stages; (i) discontent is generated, (ii) discontent is politicized, and (iii) it is actualized in political conflict.

MacCulloch (2005) simplifies this into two steps; (i) inequality causes individuals to want a revolution, and (ii) those individuals engage in politically-motivated violence. To take the first step, civilians start out unhappy with inequality and the regime, and rationally weigh opportunity costs, revolution costs and potential returns to choose (not) to revolt. The probability of choosing to revolt is expected to increase with inequality, as the ‘neutral’ middle class fades and more poor people desire change. However, as is especially evident in lobbying practices in the US, the elite are able to influence the preferences and focus of society. Conversion of a desire for change and political conflict occurs only if people think they will gain from the actions. Thus, if the expected utility of a revolution, discounted by the probability of success, is greater than that of the utility gained in the status quo. Actual protest behavior, the second step, then depends on *resource mobilization* and *regime repressiveness*; “whenever high levels of inequality is accompanied by a repressive military, tastes for revolt may not be manifested in terms of observable rebellions” (MacCulloch, 2005, p.95).

There are myriad theories on what triggers the poor to revolt against the rich, or what pushes one from feeling disadvantaged to committing terrorist actions. MacCulloch’s model follows rational-actor (‘greed’) motivation theory. This is contrasted by the grievance motivation, where the preference for revolution comes from resolving an unfair situation, rather than increasing personal wealth. Other mechanisms distinguish between inherency (violence is always there) and contingency (violent event is a rare accident) or ideas, behavior and relations (violence based on values, innate aggression or comparison, respectively). The neoclassical economics framework, additionally, includes endogenous growth theory (inequality; market and policy distortions; disincentive to invest; political conflict) and economic theory of conflict (rational decision to be

violent, depending on expected gains and opportunity costs) (Cramer, 2005). For the purpose of this thesis, no distinction is made between the possible motivation experienced by an individual.

2.3.1. Limitations

Income inequality does not necessitate conflict. Montaigne, in 1552, asked a small group of Indians from Brazil what they found most remarkable about their visit to France. They

“had noticed among us some men gorged to the full with things of every sort while their other halves were beggars at their doors, emaciating with hunger and poverty. They found it strange that these poverty-stricken halves [sic] should suffer such injustice, and that they did not take the others by the throat or set fire to their houses.” (Montaigne, 1981, p.119)

Culture, history, attitudes and power dynamics caused mid-20th century France to be unequal, but stable. The same level of inequality would have caused a violent riot in the small indigenous community. Vice versa, history contains moments of great political violence without economic inequality: Violence is prevalent in human history (Cramer, 2005). This fits with the ‘contingency approach’, which suggests that violence is produced by a combination of factors, heavily influenced by contingency, or accidents (Cramer, 2005).

Political science provides a number of reasons why the inequality hypothesis might not hold. Guiso et al. (2017) find that greater income insecurity leads to lower levels of political engagement - individuals ‘switch off’ if they worry about their future personal income. Piketty (2018) reviews the most current impact of inequality in Europe and argues that the development of elite-left and elite-right movements similarly causes the lower classes to become disengaged.

Finally, Midlarsky (1988) argues that the causal chain resulting in political conflict does not *start with* economic inequality. Instead, he argues that the process that produces inequality also generates patterns of polarization and identification with the ruler and the ruled, leading to ‘mobilization potential’ and ‘revolutionary ethos’ in the ruled. Hence, economists should perhaps not study the impact of economic inequality, but the impact of the *sources* of it. These would include the mechanisms and institutions that allow wealth to concentrate, ranging from technological development to savings rates.

2.3.2. Previous findings

Many empirical and qualitative studies of the inequality-conflict relationship are found, using various definitions of both factors. Muller and Seligson (1987) compare the effect of land- and income inequality in a cross-national sample and conclude that income inequality is a strong predictor of political conflict. Alesina and Perotti (1996) study the impact of income inequality on political instability and find that the annual number of political murders increases with inequality. However, in the same year, Collier and Hoeffler (1996) find evidence of an *inverse* relationship; ‘greater inequality significantly reduces the risk and duration of war’ (p.7). They argue that this is because the concentration of wealth reduces the probability of a successful rebellion.

More recently, Nafziger and Auvinen (2002, p.155) regression results ‘indicate that high income inequality (measured by a Gini coefficient) is associated with political conflict and complex humanitarian emergencies’. They also warn of reverse causality, where ‘political decay’ may increase economic inequality. Finally, Bartusevičius (2013), looking at the economic factors of 77 rebellions, finds that inequality, rather than absolute levels of income, significantly increases the likelihood of rebellion onset.

There is, to date, no consensus on the direction of the change in the relationship over different levels of economic inequality, second derivative, F'' . Lichbach (1989) reasons that one might expect $F' > 0$ and $F'' > 0$, because the motivation of the poor and the reduction of the neutral middle class both increase with inequality. However, high inequality may decrease political instability due to repression by a powerful elite, resulting in an inverted U-shape ($F' > 0$, $F'' < 0$). This is also known as the ‘repressiveness hypothesis’ (Muller, 1985). Given the arguments in the literature, and the decision-making model that takes regime repressiveness into account, the latter shape is expected. As a society becomes more unequal, the elite is expected to safeguard its position and reduce the probability of a successful revolution.

3. Theoretical framework

The definitions and previous findings on the income hypothesis reviewed above can be stated as

$$\text{Political conflict}_{ct} = a + B1 \text{Economic Inequality}_{ct-1} + \text{year}_t + \text{country}_c + \text{governance controls}_{ct} + e_{ct}$$

Where *Political Conflict* is a measure of political conflict, *Economic Inequality* the distribution of wealth in a country and year. The inequality measure is lagged by one year to study its effect. The regression function includes year- and country fixed effects as well as governance controls. The constant is a and the error term is e .

For the general relationship, the main research question is: *does economic inequality increase political conflict?* This is tested in section 4. In section 5, this thesis explores the mechanism of this relationship by empirically testing MacCulloch's (2005) two-step mechanism; *Does inequality affect preferences for radical change, and do these preferences lead to actual political conflict?*

A positive, $F' > 0$, relationship is expected, with a negative second derivative, $F'' < 0$. As the null hypothesis, income inequality may have no functional relationship with political conflict, $F' = 0$. What appeared to be a relationship to the philosophers, economists and sociologists above may be due to other factors, which will be discussed in section 6.

Model selection

The relationship between economic inequality and political conflict is estimated using the pooled cross sections method with repeated samples, where the estimated coefficient reflects the impact of an increase in income inequality on the dependent variable in the following year. Year and country dummies are added to control for unobserved heterogeneity. In the model specification, these are referred to as the 'fixed effects' of each year and country. As argued in section 2.3, this thesis tests for a relationship in the quadratic form. Linear form output is provided in appendix 8.

The Breusch-Pagan test is performed on the linear form, and its null hypothesis of constant variance is rejected at the one per cent significance level. This indicates that residuals, the error

terms, are heteroscedastic, which causes a bias in the estimators unless robust standard errors are computed. All regressions are therefore run with robust standard errors.

Two attempts are made to reduce heterogeneity. First, by creating country specific time trends, and including them in the linear and the quadratic regression. This did not alter the estimated coefficients for the effect of income inequality, and the trend coefficient is not statistically significant when regressed on preferences for radical change. Regression results including the time trend are provided in appendix 6. Additionally, a second lag (note: the Gini coefficient is already lagged by one year) is included to create a distributed lag model. The direction and relative sizes of the effects of inequality on remain the same, but the size of the coefficient becomes unlikely, as can be seen in appendix 6.

When analyzing the binary dependent variable *preferences for radical societal change*, the Probit model could be used to generate predicted values. The aim of this thesis is to study the direction and strength of the potential relationship, and the direction of the second derivative, so the Probit model is not the most suitable. Probit regression results are provided in appendix 7 for comparison with future studies but will not be analyzed for the purpose of this thesis.

Control variables

Multiple regression analysis allows for isolating the effect of inequality while holding constant the effect of other variables on political conflict. This paper deviates from many previous studies on the topic by avoiding ‘bad controls’. Where a good control takes care of ‘omitted variable bias’ - a relationship between the main explanatory variable (*economic inequality*) and the error term (e) - a ‘bad control’ is partly determined by the main explanatory variable (Angrist & Pischke, 2008). Most studies, including MacCulloch (2005), use GDP and economic growth figures. However, many studies, such as the infamous Kuznet’s Curve (1955), have shown conclusive evidence that these two variables are related.

To complement the country fixed effects, this study includes four of the five remaining WGI indicators as ‘government polity’ control variables. Voice and Accountability, Regulatory Quality, Rule of Law, and Government Effectiveness hold constant government quality factors that might otherwise correlate *economic inequality* and the error term. The indicator for Corruption Control

is most likely a ‘bad control’, as it includes inequality: It “captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.” (Kaufman et al., 2009)

To allow for an interpretation of the impact of each control variable, results of the regression analysis will be provided in nine (9) model specifications, adding one control variable per model.

4. Income inequality and political conflict

This section studies the inequality hypothesis in its general form – does economic inequality affect the probability of political conflict? Economic inequality is proxied by income inequality and political conflict by political violence and instability. These variables are defined and described first, followed by the empirical strategy and estimation results. Section 6 discusses these results.

4.1. Data and variables

Economic inequality is proxied by the Gini coefficient, which is sourced from the World Bank and the United Nations. Political conflict is represented by the WGI indicator, an aggregate measure of actual observed political violence and instability. Both variables are detailed below. In order to minimize duplication, table 1 and 2 respectively provide details and summary statistics of these two variables as well as the survey responses described and analyzed in section 5 below.

In total, 42 countries are considered, with data ranging from 1996 to 2014. The selection of countries is based upon data availability, including all countries for which meaningful analysis can be performed. this time period, there are 147,325 survey observations, 774 political conflict indicators, and 866 Gini coefficients. Figure 2 shows a map of the countries included.

The relationship between income inequality and political violence and instability is shown by the scatterplot in figure 3. The correlation coefficient, slope of the line of best fit, is 0.481.

4.1.1. Income inequality

To test the effect of income inequality on political attitudes, a reliable and detailed source of income inequality measures is required. The Gini coefficient, as explained in section 2.1, is the most widely used and most comprehensive indicator of income inequality. Unfortunately, the availability of these coefficients is low for many of the countries covered by the WVS, EVS and WGI reports. For the 42 remaining countries, Gini coefficients were sourced from the World Bank and the United Nations University-WIDER's World Income Inequality Database (WIID). The latter is a secondary database, collecting and providing online access to income inequality statistics. The average Gini coefficient for the entire sample is 0.343, and coefficients range from 0.220 to 0.563 within the sample period. The Gini coefficient averaged over the sample period for each country is provided in appendix 4. A higher Gini coefficient indicates greater inequality. In line with expectations, income inequality is relatively low in Scandinavian countries. Denmark, for example, has a Gini coefficient average over the period 1996-2014 of 0.247. For Mexico and Peru, the average Gini coefficient is roughly double, at 0.481 and 0.497 respectively.

Selecting the secondary sources and adding up three lags is performed in line with Kerr's (2014) methodology, where preference is given to household-level calculations on disposable income. Additionally, the rating by UN-WIDER is consulted and highly deviating values are not included. Issues and limitations concerning this data source are discussed in section 6.

4.1.2. World Governance Indicators project

The Worldwide Governance Indicators (WGI) project started in 1996 and covers 200 countries and territories. The six indicators of governance are created and updated by Kaufmann, Kraay and Mastruzzi for the World Bank, and are based on over 30 data sources; "subjective or perceptions-based measures of governance, taken from surveys of households and firms as well as expert assessments produced by various organizations" (Kaufmann et al., 2011, p.239). The most recent version was updated in 2016 and is based on figures from up to 2014.²

For the purpose of this research, the dimension 'Political Stability and Absence of Violence/Terrorism' is used to reflect levels of political conflict. This aggregate measure indicates

² The first version was published online in 2006. The second in 2011. This thesis used indicators from the third version, shared online in 2016. The fourth update is expected to be published by the end of this year.

the “likelihood that the government will be destabilized by unconstitutional or violent means, including terrorism” (Kaufmann et al., 2011, p.4). From the 32 data sources used, reports of, for example, ‘armed conflict’, ‘violent demonstrations’ and ‘terrorism to advance a political cause’ are recoded and weighed. Weights are based on validity and reliability of each source. The value given to each country and year runs from roughly -2.5 to 2.5 and is based on the ranking of that country and year relative to other countries.

The sample ranges from -1.76 to 2.81, with off-the-charts values belonging to Pakistan from 2008 to 2013. In 2007, ex-premier Bhutto was assassinated during the election period, unfolding a series of political developments that led to the ‘Taliban movement of Pakistan’, which rebelled against the regime, the army and NATO-forces. The situation stabilized somewhat after the general election in 2013 (for example, Abbas, 2015).

Four out of the five remaining dimensions are used as governance control variables. All dimensions have been ‘flipped’ to allow for easier interpretation - higher values indicate greater political conflict or worse governance.³ A short description of each dimension (with original direction) is provided in table 3, more information on this measure is provided in appendix 3.

4.2. Framework and empirical strategy

The inequality hypothesis, following section 3, is tested using the following specification;

$$\begin{aligned} Political\ conflict_{ct} = & a + B1\ Gini_{ct-1} + B2\ Gini_{ct-1} * Gini_{ct-1} + year_t + country_c \\ & + Governance\ controls_{ct} + e_{ct} \end{aligned}$$

Where *Political conflict_{ct}* is the WGI indicator for political violence and instability, and *Gini_{ct-1}* the measure of economic inequality with estimated coefficients *B1* and *B2*. Year and country fixed effects and governance control variables are added in nine steps to help isolate the effect of *income inequality* on *political conflict*. *a* is the constant, *e_{ct}* is the error term and robust standard errors correct for heteroskedasticity.

Political conflict is an indicator that runs from roughly -2.5 to 2.5, and its value represents an aggregate measure of real instability and violence. A higher value indicates greater political

³ This is done by multiplying the original value with (-1).

conflict. The null hypothesis is rejected if there is a positive relationship between political conflict and income inequality, with $F' > 0$ and $F'' < 0$, an inverted U-shape, is established. To allow for comparison with other studies on the topic, the linear relationship - with $BI\ Gini_{ct-1}$ only - is also estimated and reported in appendix 7.

4.3. Estimated results

Main findings

The results are shown in table 4. Economic inequality seems to increase, $F' = 1.563$, the probability of political conflict, but this effect decreases as inequality increases, $F'' = -3.302$. For a 0.1 point increase in the Gini coefficient of 0 to 0.1, the likelihood of political violence and instability is expected to increase by $0.1 * 1.563 = 0.1563$, decrease by $(0.1 * 0.1) * 3.302 = 0.03302$, and thus increase by 0.123 points. This effect is significant at the one per cent level.

The quadratic form indicates that the positive relationship between economic inequality and conflict changes as inequality increases. The tipping point of this quadratic relationship is at $1.563 / (3.302 * 2) = 0.237$, which is just above the sample minimum (0.220) and well below the sample average Gini coefficient (0.343). Within *most of* the sample, therefore, an increase in income inequality is expected to *reduce* political conflict. Although statistically the null hypothesis can be rejected, on a more meaningful level income inequality does not seem to increase political conflict.

As can be seen in table 4, the impact of income inequality on political conflict diminishes with the addition of country and year fixed effects. All governance indicators individually have a significant positive effect on political conflict. If, for example, a country is deemed to have worse *government effectiveness* by 1 point, it is expected that *political conflict* increases by 0.430 points. This effect is statistically significant at one per cent. When all fixed effect and governance controls are added together, *regulatory quality* is expected to have a small but significant negative effect on *political conflict*.

Robustness check

A second measure of income inequality is used to test for robustness of results. The findings can be said to be robust if the same conclusion can be drawn when using a different measure for economic inequality. The second most available proxy for economic inequality is the 90-10 measure; the share of income earned by the top 10% of a country. If inequality increases, this share becomes greater. The Pearson correlation coefficient between the income share of the 10% and the Gini coefficient is 0.956. The income share data is sourced from the World Inequality Database (WID.world) and converted into a dataset with the same 42 countries. There are 401 observations, when adding up to 3 lags as with the Gini coefficient above.⁴ The measure, like the Gini coefficient, runs from 0-1. The sample ranges from 0.201 to 0.449, with an average share of 0.277. The Gini coefficient, with twice as many observations, is the preferred measure. The robustness of the findings for preferences provides confidence in this analysis, and the results regarding *political conflict* will be analyzed with great care.

The robustness check is performed on the relationship of *income inequality* with *political conflict*, as well as with *preferences for radical societal change*. Both are reported here to minimize duplication. For the first, the results are somewhat robust. Regressing on the income share produces positive coefficients for the share of incomes in the linear and the quadratic specification, of respectively 5.713 and 5.717, both statistically significant at the one per cent level. Thus, increasing the share of the richest by 10-percentage points is expected to increase the probability of political conflict by roughly 0.5 points on a 5-point scale. The squared income share term, measuring the change in the effect of inequality, is small and statistically not significant. Thus, using income share earned by the top 10%, the hypothesis for a positive relationship can be rejected, but with $F' > 0$ and $F'' = 0$. Regressing the 90-10 measure on *preferences for change* results in extremely large coefficients, likely due to the smaller sample. The result is robust. Using the full quadratic specification (model (9)), the coefficients for income share and squared income share are, respectively, 81.835 and -151.380, indicating a turning point at an income share of 27.9%.⁵ All effects are significant at the one per cent level and shown in appendix 5.

⁴ This is done to minimize 'gaps' in the data, in faith that income inequality on a national level changes slowly.

⁵ As with the Gini coefficient, this tipping point is within the sample. To illustrate: the 10% richest Americans have a reported income share of 30.6%. For the Netherlands, this figure is 23.9%

Model check

In an attempt to reduce heterogeneity and test for the most suitable specification of the relationship, regressions with further lagged Gini coefficients are performed. The estimated coefficients of the effect of income inequality, over up to 3 years back, on *preferences* and *conflict* are presented in table 5. Although the size of the coefficients changes, the relationship between the variables in general does not. The model with one lag of the income inequality explanatory variable is preferred.

5. Mapping the inequality-conflict pathway

This section analyses the mechanism of the inequality-conflict relationship. In the first step of MacCulloch's (2005) model, economic inequality increases the probability of people desiring radical societal change, their 'taste for revolution'. In the second, those who prefer change decide to act in a violent matter or not. This section empirically analyses these steps in subsections 5.1 and 5.2, respectively.

5.1. Income inequality and preferences for radical change

To consider the first step, generating desire for radical change, a new dataset is employed. This is described below, followed by the empirical framework and results that are discussed in section 6.

5.1.1. Data and variables

Preference for change is a measure derived from the Integrated Values Survey. The sample average is 10.6%; on average, roughly a tenth of survey respondents desire radical societal change. Tables 1 and 2 respectively present the variable descriptions and summary statistics.

Figure 4a shows the relationship between income inequality and preference for radical societal change. As can be seen in the scatterplot, there are three outliers. In Vietnam especially, the desire for radical change is much higher than the average preference at that level of income inequality. Figure 4b excludes Vietnam, which does not alter the direction of the relationship. The correlation coefficient between income inequality and preferences, slope of the line, is 0.227.

Integrated values survey

Integrated Values Survey (IVS) is the product of combining the World Values Survey (WVS) and the European Values Survey (EVS). The questions are focused on values regarding work, marriage and education, for example, but also attitudes towards the government. At the time of writing, the WVS consists of six waves conducted in 101 countries, the EVS of 4 waves and 48 countries. The total survey counts 113 countries and 1,427 variables, ranging from 1981 to 2014 (EVS, 2015; WVS, 2015).

One question reports the demand for ‘radical societal change’. This question asks respondents “What is your basic attitude to society; valiantly defend the status quo (1), gradual improvement by reforms (2) or a radical change is needed (3)” (WVS, 2015). Unfortunately, this question is not asked very consistently. Having removed the ‘not asked’ and ‘don’t know’ observations and limiting to countries for which the other two sources also have availability, 147,325 responses remain. Additional survey responses are used in the data verification and discussion sections. Appendix 2 includes full formulation of all survey questions used for the purpose of this study.

Following MacCulloch (2005), responses to this survey question are recoded into a binary dummy variable, where response (3) indicates a preference for radical change (yes: 1), and responses (1) and (2) do not (no: 0). This variable is obviously an imperfect proxy for wanting a revolution, but to the extent of the writer’s knowledge, a more suitable is not available for this number of countries. Limitations of this dataset are discussed in section 6.

5.1.2. Framework and empirical strategy

This section studies whether economic inequality increases a society’s desire for radical change. The null hypothesis states that there is no relationship between the two variables. The hypothesis is tested using the following specification;

$$\begin{aligned} Preferences_{ct} = & a + B1 Gini_{ct-1} + B2 Gini_{ct-1} * Gini_{ct-1} + year_t + country_c \\ & + Governance\ controls_{ct} + e_{ct} \end{aligned}$$

Where the *Gini coefficient* proxies for inequality in the previous year and is the main explanatory variable. *Preferences for radical change_{ct}* is the country and year average of a binary variable.

This variable has been created and given the value one (1) if a respondent feels a ‘radical change is needed’, and zero (0) otherwise. As an average, it indicated the probability that society as a whole (in a country and year) desires radical societal change. Fixed effects and governance control variables, the constant and error term are as defined above, and robust standard errors are computed to allow for heteroscedastic errors.

As a higher value reflects a greater likelihood of a revolution, the null hypothesis is rejected if a positive effect of income inequality on change-preferences is found, with a positive coefficient $B1$, $F' > 0$, and a negative $B2$, $F'' < 0$. The relationship is expected to be positive but diminishing in inequality for similar reasons as above: Increased inequality motivates the relatively disadvantaged to desire redistribution of wealth, but at high levels of inequality, elites have power to coerce and suppress these preferences. To allow for comparison with other studies’ findings, the linear relationship - with $B1$ $Gini_{ct-1}$ only - will be estimated and reported in appendix 7.

5.1.3. Estimated results

Main results

Results are presented in table 6. Based on this, the null hypothesis of no relationship between inequality and preferences for change can be rejected at the one per cent level. In the full model (9), the first increase in income inequality increases preference for change, but after the tipping point, preferences for change fall with inequality. If the Gini coefficient were to increase by 10-percentage points from 0 to 0.1, preferences for radical societal change are expected to increase by $(0.1) * 5.430 = 0.543$, or, because this is a binary variable, by 54.3 percent, and decrease it by $(0.1) * (0.1) * 8.869 = 0.08869$ or 8.869 percent, and thus increase by 45.431 percentage points. This effect is significant at the one percent level.

With a positive first, and negative second derivative, there is a tipping point. In model (9), this lies at $5.43 / (8.869 * 2) = 0.306$.⁶ Thus, starting from a Gini coefficient of above 0.306 (just below the average, 0.343), increasing inequality starts decreasing society’s desire for radical change.

⁶ The tipping point is found by taking the first derivative of the quadratic equation and setting this equal to zero.

Interestingly, the relationship between government policy indicator *voice and accountability* and dependent variable *preferences for change* is negative in both the linear and the quadratic form. This implies that as citizen's ability to voice their concerns increases, desire for radical change decreases. As the policy indicator is flipped to reflect a worse situation at higher values, this relationship is counterintuitive. One expects a lower level of democracy and lower freedom of expression to increase preferences for change.

Data validity test

Following MacCulloch (2005), it is tested whether revolutionary preferences are not symptomatic of a general attitude or feeling of frustration. If so, higher likelihood of desiring radical change in a society may be the result of a general pessimism and lack of trust, rather than a motivation to upset the status quo. If so, it cannot help understanding the relationship between economic inequality and political conflict.

This issue is addressed by correlating preferences for revolution with responses to survey questions that a pessimist would also rate high on. These are questions on the manner in which the country is run (for a small elite or the general population, and whether corruption is a large issue), attitude towards authority ('would it be bad if *more* people would respect authorities?') and the respondent's general outlook on the future.⁷ Results are shown in table 7.

All Pearson correlation coefficients with 'revolution', *except* 'run for the few', are statistically significant at the one per cent level. There are negligible correlations between the dummy for preference for revolution and the dummies for the other concerns. The small correlation values indicate that there is *not* a general pessimism; those that believe the future is bleak, for example, are not the same respondents as those who prefer a radical change. "The country is run by a few big interests looking out for themselves" *is* positively correlated with "corruption is prevalent" (0.232), for example, but these feelings do not seem to go hand-in-hand with a desire for radical change. This is in line with MacCulloch's findings and validates the use of this survey question: Respondents that desire a radical change are not 'simply pessimists' but may desire this change because of income inequality.

⁷ Full formulation and recoding steps are provided in appendix 2.

5.2. From desire to action

The third and final question this thesis attempts to answer is whether a higher percentage of individuals desiring radical change can be said to lead to a greater likelihood of *actual* political conflict. Analyzing this mechanism helps understand the occurrence of political conflict and provides valuable insight to policy makers aiming to reduce political violence, terrorism and instability.

The relationship between preferences for change and the decision to participate in political conflict is analyzed in three parts. First, a correlational study shows whether higher levels of this preference coincide with higher levels of reported participation in politically-motivated actions. Thereafter, preferences and attitudes towards society derived from the survey responses is correlated with political violence and instability in the same period. Finally, the effect of a higher likelihood of preferring radical change on political conflict in following years is tested using regression analysis. The null hypothesis is rejected if a positive relationship between demand for change and violent behavior can be established. To avoid duplication, the empirical strategy is immediately followed by the estimated results for that part. All results are discussed in section 6.

5.2.1. Preferences for change and political actions

The Integrated Values Survey includes the question ‘which of these political actions have you recently participated in?’ The political actions listed are: *signing a petition, joining a boycott or strike, demonstrating, occupying a factory or building, damaging property and committing violent acts*. Full formulations, summary statistics and coding of all survey questions used are described in appendix 2. Binary dummies averaged per country and year are created for each political action participated in, where a higher value indicates a greater likelihood of participation. To assess whether a preference for radical change translates into actual politically-motivated acts, individual preferences are correlated with participation in political actions. A higher Pearson correlation coefficient indicates that a society with a desire for radical change is more likely to also have participated in those actions.

Estimated results

Correlation coefficients are shown in table 8. All Pearson correlation coefficients are significant at the one per cent level. The sizes of the coefficients for *preference for change* and the political actions are small. This hints at the difficulty of this problem, as discussed in section 2.3 - just because a respondent *wants* a revolution, does not mean he or she will be willing and able act upon this wish. The strongest correlation for *preferences* is with *participated in personal violence as a political action*. This suggests a positive relationship between preferences for, and participation in actual revolutionary behavior, but the coefficient (0.131) is small. The limited size of the coefficient means we cannot explain step (2) in the economic inequality-political conflict relationship, going from a sense of frustration to action, using these variables.

The correlations between the participation variables themselves are notably higher, suggesting that a respondent participating in one politically motivated action, such as a demonstration, is much more likely to also sign a petition (0.343) and join a boycott (0.353). The relationship between signing a petition and preference for radical change is small but negative (-0.015). This could indicate that a civilian participating in the least violent form of protest (signing a petition) would be less likely to support radical societal change.

5.2.2. Survey responses and governance indicators

The survey also asks respondents whether they feel that ‘corruption is prevalent’, on a scale of 1 to 4, and that ‘the country is run by a few big interests looking out for themselves’, yes or no. The survey responses for *preference for change*, *perceived corruption* and *run for the few* are correlated with the WGI indicators for *political violence*, *corruption*, *government effectiveness*, *confidence in the rule of law*, *regulatory quality* and *voice and accountability*. A higher Pearson correlation value indicates a closer relationship between movements in perceptions and the aggregate measures of governance quality. This validates the survey responses as indicators of regime quality, as well as a predictor of political conflict.

Estimated results

As shown in table 9, there is a moderate positive relationship (0.480) between *political conflict* and *preference for radical societal change*. This is the also the highest correlation coefficient for

preferences, indicating that as preference for revolt increases, the likelihood of political violence and instability is expected to increase.

Unsurprisingly, there is a very strong positive relationship between the six WGI variables. Notable is also the 0.909 coefficient for the survey response *corruption is prevalent* and actual observed *corruption control*, showing that respondents' feeling about corruption is nearly always backed up by WGI research. All Pearson correlation coefficients are statistically significant at the one per cent level.

5.2.3. Regressing political conflict on preferences

Simple OLS regression analysis provides insight into a potential causal relationship between the preference for revolution and observed actual violence in following years. Simple OLS is chosen here to help identify the direction and strength of the relationship, and can be formulated as;

$$\text{Political conflict}_{ct+s} = a + BI \text{ Preference for change}_{ct} + e_{ct}$$

Where $s = 0, 1, 2, 3$ for leads of zero, one, two and three years, a is the constant and e_{ct} the error term, computed with robust standard errors. *Political conflict* ranges from roughly -2.5 to 2.5, with 0 being the average rank, and the dummy variable taste for preferences holds either value zero or one and is averaged over the year. Following the theory, a preference for radical change is expected to show higher probability of political conflict: a positive BI effect for *Preference for change*_{ct} on *Political conflict*_{ct+s} is expected.

Estimated results

The estimated coefficient BI for s values zero, one, two and three are found in table 10. A 10-percentage point increase (0.1) in the probability of an individual preferring radical change increases the likelihood of political conflict by, in chronological order, 0.663, 0.348, 0.420 and 0.395 points in subsequent years. The effect is statistically significant at the one per cent level for each year.

Comparing two countries where, *ceteris paribus*, in one country *no one* desires a radical change and in the other *everyone* prefers a it, the latter country is expected to have an extreme amount of

political conflict; 6.63 points on the indicator's scale will cause the political violence and instability measure to go 'off-the-charts, much like Pakistan during Taliban terrorism. In subsequent years, the probability of political conflict subsides if society's preferences change. If society continues to prefer radical societal change, the probability of political conflict is expected to rise with it.

6. Discussion

This section discusses the results found above, as well as limitations and possible future applications of this analysis. Section 4 shows evidence of an inverted U-shaped relationship between income inequality and political conflict. The tipping point, where an increase in inequality is expected to lead to a *lower* probability of political violence and instability, is estimated to be at a Gini coefficient value of 0.237. In section 5.1, a similar relationship is found between income inequality and society's preference for radical change. Here, the tipping point is estimated at 0.306. Both are Gini coefficients, albeit relatively low, within the sample of 42 countries studied. The coefficients are shown in table 11. Section 5.2 uses correlational and regression analysis to show that preferences for radical change are positively related to the probability of politically-motivated violence in the future.

6.1. Data limitations

A general issue regarding the data used is whether it helps answer the research question. The research question 'does economic inequality increase political conflict' combines two complex concepts. Three different data sources provide insight but are imperfect reflections of these concepts. Of the three variables, the Gini coefficient is most problematic. Economic inequality is not simply inequality in incomes. Instead, it includes land ownership, capital savings, distributional institutions, job security and equality of opportunities. Especially the last two intersect with issues of race, heritage and gender, which further complicates the concept of economic inequality.

Like all empirical studies, the data analysis is limited by three core issues; omitted variable bias, reverse causality and measurement bias (for example, Angrist & Pischke, 2013). Omitted variables

are factors that impact the inequality-conflict relationship but are not included in the model. This causes covariance between the error term and income inequality, thus making the estimated coefficients $B1$ and $B2$ biased. Because both *economic inequality* and *political conflict* are both complex macroeconomic concepts, this list is practically endless. A few important potential factors, and how they would create a bias, are listed below.

Firstly, whether inequality leads to a society preferring change is influenced by society's beliefs about (un)fairness; whether inequality is justified and/or accepted determines whether one would want to revolt against it. Gurr and Duval (1973) create a model explaining political conflict with *inequality*, the *balance of power* and *justification*, giving equal importance to each explanatory variable. Kerr (2014), however, finds that increased inequality changes the attitudes towards, and perception of inequality in a 'vicious circle'. This indicates that society's attitude to inequality might be a 'bad control' but, 'inequality itself, and even perceived relative deprivation, will not cause violence without other meditating factors, notably justification.' (Cramer, 2005, p.6).

Secondly, and concerning the second step in the model, an individual who desires radical change may not express this in anger towards the government, but towards the elite. The Montaigne quote in section 2.3 also shows that a perhaps more natural way to resolve distributional issues is to take from the rich. The WGI indicators refer to governance quality only, not violence aimed at other citizens. Abbink et al. (2011) find that inequality leads to inter-group conflict, so including inter-group conflict in the model may remove a positive bias. Without behavioral economics and more detailed individual-level data, it may not be possible to find the pathways that explain how and when a desire for change is acted upon in a violent way, and whether this violence is aimed towards the regime or an elite. Utility maximization based on income, inequality and probability of success gives valuable insights, but will never be able to represent the complexity of each situation, each decision of each individual.

The third potential omitted variable to note is *economic development*. This is also expected to be a bad control, and therefore not included in the specification. Although its importance is difficult to deny, the direction of the bias is unclear. Higher levels of development can lead to overall happier societies with a lower sense of emergency. However, utility maximization might favor Revolt if the potential rewards are higher.

The role of *political dynamics* is the fourth omitted factor. Although this is mostly remedied through country fixed effects and the governance quality controls, society's political preferences and attitudes are related to both *economic inequality* and *political conflict*. Using the survey question 'where do you place yourself on the political scale, from (1) extreme left to (10) extreme right?' it can be shown that the spread (standard deviation) in political preferences increases with inequality. The Pearson correlation coefficient of income inequality and the standard deviation of responses is 0.358. This affects the inequality-conflict relationship because, as shown by Layman and Carsey (2002) more polarized groups are less likely to gain mass mobilization. Increased inequality thus might reduce the likelihood of political conflict through.

Finally, and perhaps most importantly, is the *historical context*. As mentioned above, Pakistan and Vietnam jump out from the sample, but each country has a unique history that impacts the inequality-conflict relationship. Where Pakistan suffered from turmoil caused by the Pakistani Taliban, the Vietnamese regime has been unstable for decades. After WWII, France tried to re-establish colonial rule, but was defeated in the 1st Indochina War (1945-54). Then, North and South Vietnam split, with the Soviets supporting the North, and the UN and the USA the South. The Vietnam War lasted until 1975, but in its aftermath, Vietnam suffered isolation and repression as well as an international relations crisis with Cambodia and China. In 1986, the regime moved from a planned economy to a market oriented one. Since the mid-1980's Vietnam's economy has grown substantially, but politically, the regime is weakened by official corruption and a widening gap between the urban rich and the rural poor (Elliot, 2010). These factors, amongst many others, help understand the high preference for change (0.538) within the sample period.

Acemoglu and Robinson (2012) apply path dependency to explain "Why nations fail"; the current state is a product of past effects that 'lock in' a certain path. Similarly, "Why nations revolt" is based on practically infinite factors in a complex system. Successful versus failed revolution attempts in the past, for example, impact the perceived probability of success, which in turn influences the choice to act on a wish for radical change, but may also influence inequality. This highlights potential reverse causality. Violent political conflict can lead to an *increase* in inequality (Cramer, 2005). A failed revolution, or a revolution that creates a new elite, can increase inequality. This could, in turn, lead to higher levels of revolutionary preferences and political instability and violence.

Finally, bias can originate from measurement issues. The Integrated Values Survey suffers from the limitations and biases common to all surveys. Self-reporting on feelings and attitudes includes problems such as pleasing the surveyor or fearing judgement or retribution. Measurement errors are possible through mislabeling responses. Additionally, many of the variables that could shed a light on the inequality-conflict relationship have barely any observations because they are not recorded consistently. For example, the question “recently, how often have you performed these political actions?” would have been a valuable dependent variable in this study. However, the number of observations, 13,388, is too low allow to empirical analysis of the relationship between self-reported political violence and income inequality. Similarly, the question ‘how satisfied are you with the current regime’ would be an interesting variable but also does not include a sufficient number of observations. Further research could use the specifications with updated IVS waves if these questions are answered more regularly in the future. It could especially shed a light on the first step of the decision-making model - what factors motivate an individual to participate in violent politically-motivated actions.

Finally, even if we accept that the Gini coefficient is a perfect proxy for economic inequality, the record of Gini coefficients available are not. As described in section 4.1.1, this thesis used lags and secondary sources to attempt to ‘fill out’ the database. However, many gaps still remain. This method of sourcing the main explanatory variable is clearly not perfect, and the mix of sources likely increases movement in income inequality not actually observed in the ‘real world’. Adding lags decreases movement and is done in faith that distribution in a society does not change fast. Country fixed effects are used in the specifications to control for much of the remaining differences, but the poor availability of the most common measure of inequality is a serious concern. With better and more consistent data available in the future, researchers could replicate this study with more confidence.

Regarding the Gini coefficient *and* the IVS responses, there is bias from selecting countries based on data availability. The data analysis would also be enriched by expanding the time range but doing so would create a disconnect between their range and that of the WGI indicators. Generally speaking, more stable and economically developed countries have a higher coverage; Sigelman and Simpson (1977) even suggest using data availability as a measure of ‘societal modernity’.

6.2. Limitations of model and methodology choices

Aggregating data over the whole country

Taking country and year averages of preference for change removes individual heterogeneity. However, there are some interesting within-society differences in attitudes. Tables containing all statistical output referred to in this subsection are provided in appendix 9.

Males are more likely to prefer radical societal change than females; 11.7% of males desire change, compared to 9.6% of women. Married respondents are slightly less likely, at 10.3%, than unmarried respondents with a 11.1% probability of preferring radical change. Unmarried men are the most likely to prefer revolution. Assessing the political preferences and attitudes of individuals per income level also yields interesting results. The IVS asks respondents to self-select in which decile of the income distribution they are, with level 10 being the richest 10% of that country, and 1 the poorest 10%. The preference for revolution does not vary much for deciles 1 through 6 but drops by almost half for the respondents identifying as the richest. Education levels are, of course, related to income levels, so finding a similar pattern here, is unsurprising.

Removing these nuances from the data analysis by taking the average value for each country not only removes interesting information, but also the ability to compare the inequality-conflict relationship conditional on different variables. Computing the quadratic full model (9) at the individual level, first on the complete sample and then per gender, results in different coefficients and tipping points per gender. The effect of an increase in income inequality on preference for radical change is higher for females (6.59) compared to males (5.21), but the tipping point is slightly lower for females (Gini coefficients 0.332 versus 0.353). Effects are significant at the one per cent level.

These distinctions are important if policy makers wish to reduce (or increase) the probability of society choosing to revolt. The Vietnamese government, for example, can target low income, low education, unmarried males in order to reduce the over-50 percent average preference for radical societal change.

Using data aggregated over a whole year

A recent study of protests in China shows that protests follow an annual cycle that peaks around Chinese New Year (Göbel, 2017). Additionally, using year-based averages makes it impossible to tell whether there was a very large incident, or a series of small ones. It would add another layer of depth and variety to be able to study the relationship between seasonal fluctuations in income inequality and political conflict.

Taking 42 countries together

Finally, a discussion of the model computed must address limitations of using cross-country data for this analysis. Grouping together a wide variety of countries, spread across the world and a spectrum of economic development allows for making general predictions of the average direction of impact inequality has on political conflict, but removes the opportunity of studying this relationship in the historical and cultural context of each country. An effort to include this context is made, but it is beyond the ability of the data used here, and the scope of this thesis to interpret the relationship for each country separately. To overcome this issue, future research could perform a case study or focus on a small selection of countries with more in-depth data.

7. Conclusion

Although technological, medical and economic developments are improving the world in many ways, economic inequality is rising, and the global level of peace is deteriorating. Many great thinkers believe there is a relationship between the two; that income inequality increases political conflict. This study adds to the literature on the Economic Inequality-Political Conflict relationship by carefully reviewing the theoretical framework and using new data and insights to test it, combining concepts from economics, political science and philosophy. The theories in which economic inequality might increase political conflict are summarized into a two-step model. First, economic inequality creates the motivation to revolt, and second, this motivation is converted into revolutionary behavior. The decision to act depends on the expected utility gain from doing so, which in turn depends on income, level inequality and the probability of success.

The data analysis includes the latest wave of survey responses and income inequality, as well as a measure that has not before been applied to this theory, an aggregate indicator of actual political violence and instability. This thesis uses the Gini coefficient as a proxy for economic inequality. The survey responses on political attitudes are extracted from the Integrated Values Survey, which reports individuals' values, attitudes and beliefs. The indicator of actual political instability and violence (shortened to political conflict), is created and updated by the World Governance Indicators project and is composed of 32 sources that report on incidences such as protests and violent civilian-regime clashes.

This thesis provides valuable input to the age-old concern *does economic inequality increase political conflict?* In tying together the results from the three-part analysis, this study finds that higher levels of economic inequality *increase* the probability of political conflict. This is shown directly, as well as through an increase in preferences for change, which is shown to increase actual political conflict.

There is a tipping point after which an increase in economic inequality *decreases* both the *preference for change* and *political violence and instability*. For revolutionary preferences, this tipping point is at a Gini coefficient value of 0.306, for political conflict at 0.237. Both are below the sample average Gini coefficient (0.343) but above the sample minimum (0.220). This tipping point could be explained through political power of the elite. Using the decision-making model outlined in section 2.3, the probability of a successful revolution is expected to decrease if the elite gain means of repression. In a more current theoretical framework, a more powerful (private) elite exercises a greater power on political agendas to maintain the status quo, rather than to redistribute. Epp and Borghetto (2018) support this theory with empirical evidence. In studying the political agendas of 9 European countries, they find a 'negative agenda power' of the rich; rising inequality is associated with a greater focus on 'social order', such as crime and immigration, and less on economic justice (Epp & Borghetto, 2018). Thus, beyond the tipping point, the chances of success become smaller and attention is directed elsewhere.

The use of the actual conflict indicator to test the second step of the inequality-conflict relationship is an important contribution to the field, and may guide future research to use real-world data, rather than abstractions from it. As discussed above, future research might use the framework

presented and apply it on one, or a handful of countries, giving more detailed attention to historical and cultural context.

The finding that income inequality is positively related to political unrest has important implications for civilians and politicians alike. Although the existence of, and level of the tipping point will depend on the context, inequality's link to political conflict provides motivation for policy makers to lift redistribution efforts higher up on the political agenda.

8. References

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9. Figures

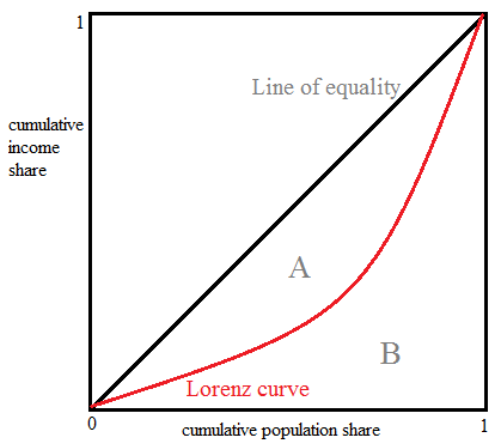


Figure 1. Lorenz curve

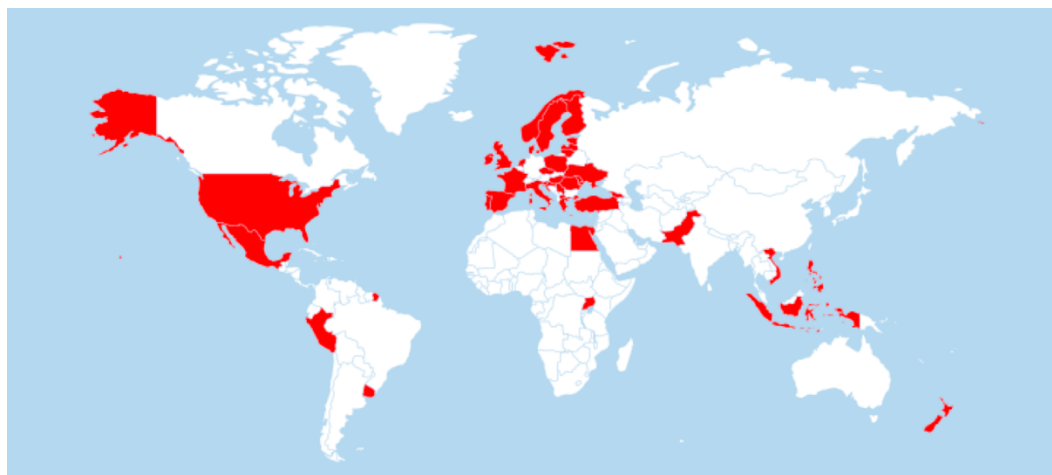


Figure 2. Map of the 42 countries in sample.

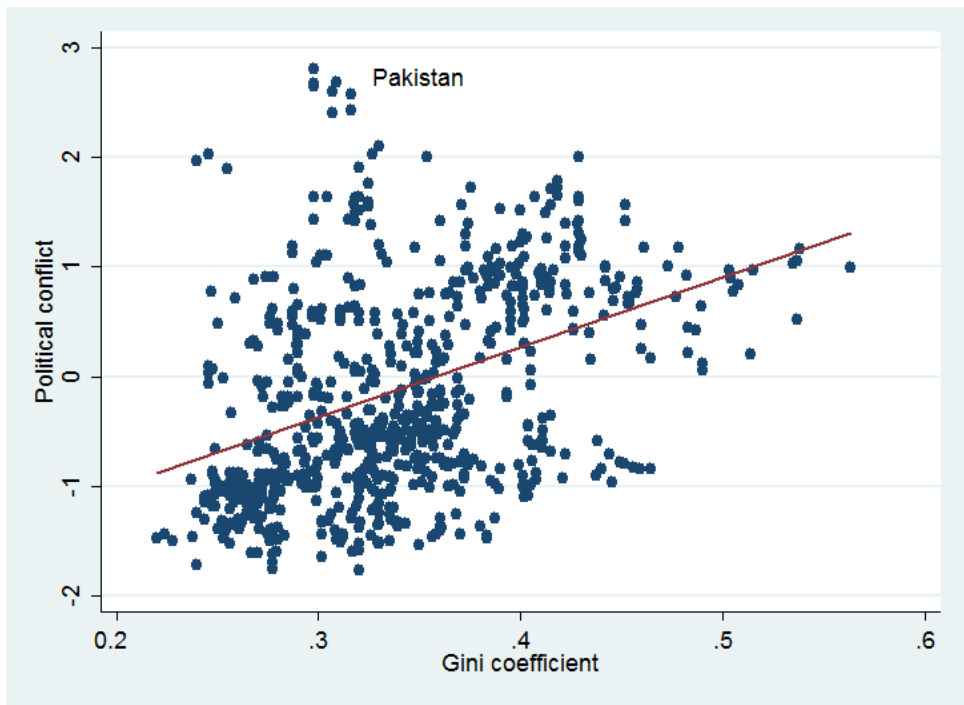


Figure 3. Scatterplot of political conflict and income inequality

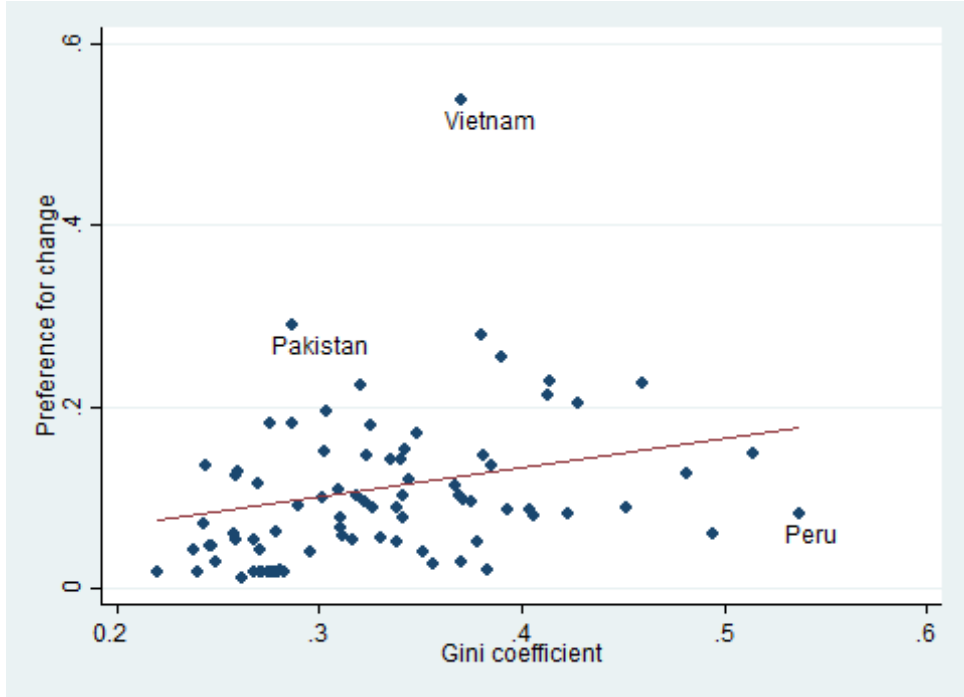


Figure 4a. Scatterplot of preference for radical change and income inequality

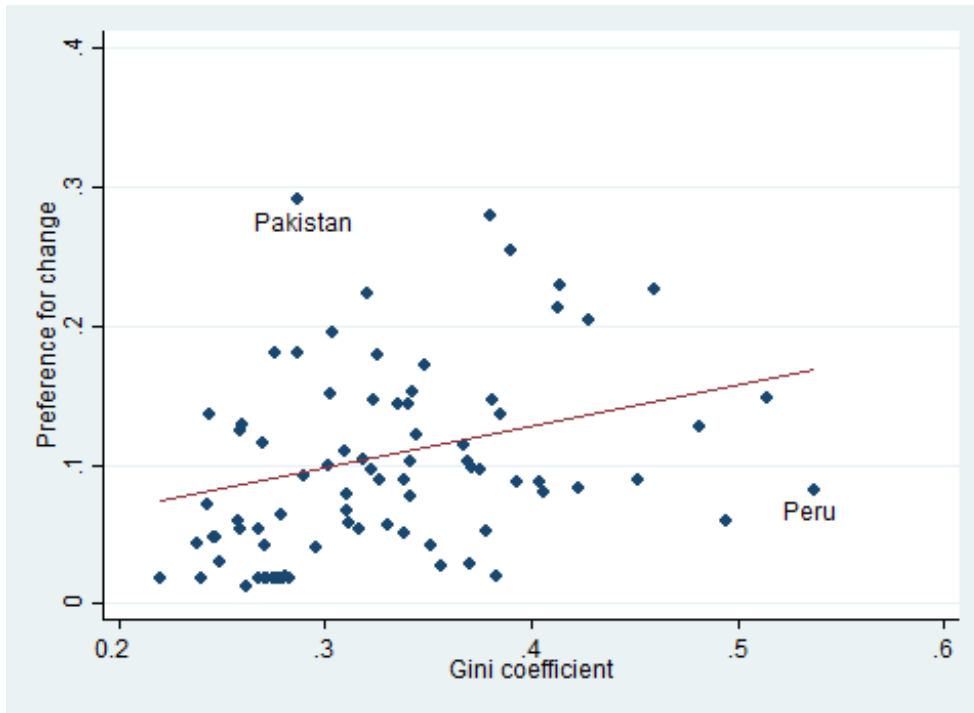


Figure 4b. Scatterplot of change preferences and income inequality, excluding Vietnam

10. Tables

Table 1. Variable descriptions

Variable	Description
Countries	Croatia, Czech Republic, Denmark, Egypt, Arab Rep., Estonia, Finland, France, Georgia, Greece, Hungary, Indonesia, Ireland, Italy, Kyrgyz Republic, Latvia, Lithuania, Luxembourg, Macedonia, Mexico, Moldova, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay and Vietnam
Gini coefficient (0 - 1)	Measure of income inequality (0: completely equal, 1: completely unequal)
Preference for change (0 - 1)	Respondent feels ' <i>a radical change is needed</i> ' in society (1: yes, 0: no)
Political conflict (-2.5 - 2.5)	Aggregate indicator of governance, with a higher score indicating more <i>political instability and violence</i> (0: average rank, minimum: -2.5, maximum: 2.5)

Note: Ranges of variables are given in brackets.

Table 2. Summary statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Countries	42				
Gini coefficient	866	0.342	0.066	0.22	0.563
Preference for change	147,325	10.6%	0.308	0	1
Political conflict	774	-0.185	0.957	-1.760	2.810

Note: Political conflict maximum is out of the theoretical range due to Pakistan's terrorism (2008-2013). The average is below the theoretical WGI average (0) due to sample selection.

Table 3. Description of World Governance Indicators

Governance indicator	Description
Political Stability and Absence of Violence/Terrorism	The likelihood that the government will be destabilized by unconstitutional or violent means, including terrorism
Voice and Accountability	The extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media
Government Effectiveness	The quality of public services, the capacity of the civil service and its independence from political pressures; and the quality of policy formulation
Regulatory Quality	The ability of the government to provide sound policies and regulations that enable and promote private sector development
Rule of Law	The extent to which agents have confidence in and abide by the rules of society, including the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence
Control of Corruption	The extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests

Notes: Table adapted from Kaufman et al. (2011).

All indicators run from -2.5 to 2.5, where the value is based on a country's ranking on 32 sources.

Table 4. Quadratic regression estimates impact of income inequality on political conflict

Political violence	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	18.062*** (0.201)	16.418*** (0.206)	2.762*** (0.143)	-0.857*** (0.119)	1.405*** (0.104)	1.151*** (0.152)	0.935*** (0.132)	-1.377*** (0.107)	1.563*** (0.109)
Gini ^2	-16.049*** (0.267)	-13.902*** (0.279)	-5.438*** (0.204)	-0.817*** (0.176)	-4.143*** (0.158)	-3.047*** (0.226)	-2.231*** (0.197)	1.279*** (0.159)	-3.302*** (0.164)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.432*** (0.003)				0.303*** (0.002)
Government effectiveness						0.430*** (0.003)			0.200*** (0.004)
Regulatory quality							0.393*** (0.003)		-0.032*** (0.005)
Rule of law								0.582*** (0.004)	0.278*** (0.007)
Average	-0.089								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.

Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table 5. Longitudinal study on the effect of inequality using further lags

Economic inequality and:	Political conflict	Preference for change
<i>Linear</i>		
Gini t-1	-1.243***	5.943***
Gini t-2	0.261***	-8.869***
Gini t-3	-1.649***	-0.049***
<i>Quadratic</i>		
Gini t-1	16.755***	25.355***
Square Gini t-1	-24.304***	-31.949***
Gini t-2	-0.884***	-4.693***
Gini t-3	-0.967***	0.690***
Tipping point	0.359	0.397

Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

The tipping point is found by taking the first derivative ($B1-2*B2*Gini=0$) and solving for Gini.

Table 6. Quadratic regression estimates impact of income inequality on preference for radical change

Preference for change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	2.060*** (0.023)	1.238*** (0.029)	1.101*** (0.029)	1.892*** (0.053)	3.749*** (0.054)	6.332*** (0.060)	4.850*** (0.060)	4.779*** (0.062)	5.430*** (0.047)
Gini ²	-2.393*** (0.031)	-1.398*** (0.040)	-1.572*** (0.041)	-2.907*** (0.077)	-5.725*** (0.081)	-9.559*** (0.090)	-7.148*** (0.088)	-7.150*** (0.092)	-8.869*** (0.071)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					-0.036*** (0.000)				-0.049*** (0.000)
Government effectiveness						0.059*** (0.001)			-0.065*** (0.001)
Regulatory quality							0.060*** (0.000)		-0.033*** (0.001)
Rule of law								0.055*** (0.001)	-0.030*** (0.001)
Average	0.108								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.

Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table 7. Test for evidence of general pessimism in society

Variable	Preference for change	Run for the few	Corruption	Authority	Bleak future
Country is run for the few	0.025	1			
Corruption is prevalent	0.091	0.232	1		
Should not respect authority	0.028	0.014	-0.084	1	
The future is bleak	0.037	0.135	0.088	0.045	1

Notes: Pearson correlation coefficients estimate the closeness of a relationship between two variables, with 0 being no relation at all, and 1 perfect one-to-one movement in values.

Table 8. Correlation between preferences for change and reported participation in political actions

Variable	Preference for change	Petition	Boycott	Demonstration	Strike	Occupy	Damage	Violence
Signed a petition	-0.015	1						
Joined a boycott	0.030	0.331	1					
Demonstrated	0.027	0.343	0.353	1				
Joined a strike	0.048	0.192	0.247	0.313	1			
Occupied a building	0.046	0.125	0.178	0.210	0.299	1		
Damaged property	0.051	0.052	0.091	0.081	0.144	0.193	1	
Was violent	0.131	0.045	0.107	0.093	0.151	0.198	0.374	1

Notes: Pearson correlation coefficients estimate the closeness of a relationship between two variables, with 0 being no relation at all, and 1 perfect one-to-one movement in values.

Table 9. Correlation between survey responses and governance indicators by country and year

	Preference for change	Run for the few	Corruption prevalent	Political violence	Voice and accountability	Gov't effectiveness	Regulatory quality	Rule of law	Corruption
Country is run for the few	-0.054	1							
Corruption is prevalent	0.416	0.538	1						
Political violence	0.480	0.255	0.696	1					
Voice and accountability	0.380	0.343	0.829	0.787	1				
Government effectiveness	0.441	0.505	0.858	0.746	0.838	1			
Regulatory quality	0.440	0.434	0.826	0.761	0.862	0.934	1		
Rule of law	0.389	0.429	0.880	0.799	0.862	0.951	0.942	1	
Corruption	0.426	0.493	0.909	0.760	0.860	0.956	0.928	0.966	1

Notes: Pearson correlation coefficients estimate the closeness of a relationship between two variables, with 0 being no relation at all, and 1 perfect one-to-one movement in values.

Table 10. Regression estimates of effect preferences on future political conflict

	Political conflict	Political conflict t+1	Political conflict t+2	Political conflict t+3
Preference for change	6.634*** (0.033)	3.484*** (0.035)	4.203*** (0.035)	3.947*** (0.036)

*Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively. Robust standard errors for each estimated coefficient are given in brackets.*

Table 11. Overview of income inequality effect

Economic inequality and...	B1 (F')	B2 (F'')	Tipping point
Political conflict	1.563***	-3.302***	0.237
Preference for change	5.943***	-8.869***	0.306

*Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively. The tipping point is found by taking the first derivative ($B1-2*B2*Gini=0$) and solving for Gini.*

11. Appendix

11.1. Concept definitions

Economic inequality: unequal distribution of economic means, including but not limited to income, wealth, capital, land and opportunities. Working definition built upon ‘relative deprivation’; as compared to other members of society.

Gini coefficient: Measure of inequality based on cumulative frequency distribution of income, ranging from 0 (total equality) to 1 (total inequality).

Income inequality: the differences in income within a society, here proxied by the Gini coefficient. This thesis does not study inequality *between* countries.

Political conflict: politically-motivated violence and ensuing political instability threatening the power base of a regime, such as riots, terrorism and civil war. Analyzed using the WGI indicator ‘political instability and violence’.

Preferences for change: interchangeably called ‘revolutionary preference’ or ‘taste for revolution’, indicating the average IVS survey respondent’s probability of answering “society needs radical change”. MacCulloch (2005) uses this question as a predictor of revolutions. Binary dummy, ranging from 0 (no-one responds that society needs radical change) and 1 (everyone does).

11.2. Integrated Values Survey

World Values Survey data is produced and uploaded by the Institute for Social Research and can be downloaded from www.worldvaluessurvey.org. The European Survey Data is produced by Tilburg University. This dataset can be downloaded from www.europeanvaluesstudy.eu. When merged together, they form the Integrated Values Survey. All data is gathered through face-to-face interviews, and sampling of adult citizens is done through national random as well as quote sampling. Its aim is to “provide insights into the ideas, beliefs, preferences, attitudes, values and opinions of citizens” (EVS, 2015). The main survey question used is ‘revolution’. This, and all other IVS questions used in this thesis, are described below.

Bleak future: “For each of the following pairs of statements, please tell me which one comes closest to your own views: (1) humanity has a bright future, (2) humanity has a bleak future”. Dummy variable equals one (1) if he or she responds, ‘a bleak future’, zero (0) if ‘bright’.

Corruption is prevalent: “How widespread do you think bribe taking and corruption is in this country? (1) almost no public officials are engaged in it, (2) a few public officials are engaged in it (3) most public officials are engaged, or (4) almost all public officials are engaged in it.” Discrete variable running 1-4, using the IVS coding scheme.

Country run for the few: “Generally speaking, would you say that this country if run by a few big interests looking out for themselves, or that is it run for the benefit of all the people? Dummy equals one (1) if the respondent agrees with the first option, zero if the second.

Disrespect authority: “I’m going to read out a list of various changes in our way of life that might take place in the near future. Please tell me, for each one, if it were to happen, whether you think it would be (1) a good thing, or (2) a bad thing – Greater respect for authority”. Dummy equals one (1) if answered ‘a bad thing’, zero (0) if ‘a good thing’.

Education level: Variable with three tiers, created by the IVS to distribute country-specific education levels into comparable groups; lower, middle and higher education.

Income scale: “On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in.”

Marital status: “Are you currently: Married, living together as married, divorced, separated, widowed, or single? Dummy equals one (1) if the respondent is married and zero (0) if otherwise.”

Participated in political activities: Respondents are offered a list with political actions and asked to indicate for each if they have “have done”, “might do” or “would never do” it. List includes signing a petition, joining a boycott or strike, demonstrating, occupying a factory or building, damaging property or committing violent acts. Dummies generated equal one (1) if the respondent has done it and zero (0) otherwise.

Preference for change: “On this card are three basic kinds of attitudes concerning the society we live in. Please choose the one which best describes your own opinion. (1) radical change is needed. (2) gradual improvement by reforms (3) valiantly defend status quo.”

The dummy generated equals one (1) if respondent answered, ‘radical change is needed’, and zero (0) for the other two responses.

11.3. World Governance Indicators

Governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them. They are created and updated by Kaufman, Kraay and Mastruzzi, and publicly available on www.info.worldbank.org/governance/WGI.

The Worldwide Governance Indicators (WGI) project reports aggregate and individual governance indicators for over 200 countries and territories over the period 1996–2014, for six dimensions of governance:

1. **Voice and Accountability:** the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
2. **Political Stability and Absence of Violence/Terrorism:** the likelihood that the government will be destabilized by unconstitutional or violent means, including terrorism.
3. **Government Effectiveness:** the quality of public services, the capacity of the civil service and its independence from political pressures; and the quality of policy formulation.
4. **Regulatory Quality:** the ability of the government to provide sound policies and regulations that enable and promote private sector development.
5. **Rule of Law:** in and abide by the rules of society, including the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence.

6. Control of Corruption: the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests.

For each indicator, the authors have published a methodology description which includes a list of data sources. This data is rescaled and weighted using an ‘Unobserved Components Model’ (UCM), which gives more weight to strongly correlated data sources. This improves the reliability of the indicator, which is then scaled from approximately -2.5 to 2.5 (higher values indicate better governance) and ranked (Kraay et al, 2009). For the purpose of this thesis, all these variables have been ‘flipped’ so that a higher score indicates greater political conflict.

Dimension 2, ‘Political Stability and Absence of Violence/Terrorism’, once flipped, indicates the likelihood of instability and violence. For the purpose of this thesis, this is referred to as ‘political violence’, to contrast with the preference for revolt, which is ‘only’ a feeling or attitude. The sources and variables from each source are listed below, which is based on the online handout (World Governance Indicators, 2017).

Table A.1. Sources used for Political Violence

Source	Variables used
Economist intelligence unit riskware & democracy index	Orderly transfers, armed conflict, violent demonstrations, social unrest, international tensions/terrorist threat
World economic forum global competitiveness report	Cost of terrorism
Cingranelli Richards Human Rights Database and Political terror scale	Political terror scale
iJET Country Security Risk Ratings	Security risk rating
Institutional Profiles Database	Intensity of internal conflicts; ethnic, religious or regional, intensity of violent activities or underground political organizations, intensity of social conflicts
Political Risk Services International Country Risk Guide	Government stability, internal conflict, external conflict, ethnic tensions
Global Insights Business Conditions and Risk Indicators	Protests and riots, terrorism, interstate war, civil war
Institute for Management and Development/ World Competitiveness Yearbook	The risk of political instability is very high
World Justice Project Rule of Law Index	Civil conflict if effectively limited

11.4. Income inequality

Table A.2. Average Gini coefficient for each year, across the time range 1996-2014

Country	Average Gini	Country	Average Gini
Croatia	0.312	Pakistan	0.302
Czech Republic	0.259	Peru	0.497
Denmark	0.247	Philippines	0.437
Estonia	0.34	Poland	0.333
Finland	0.276	Portugal	0.368
France	0.299	Romania	0.298
Georgia	0.379	Russian Federation	0.400
Greece	0.344	Serbia	0.276
Hungary	0.28	Slovak Republic	0.253
Indonesia	0.346	Vietnam	0.363
Ireland	0.329	Slovenia	0.246
Italy	0.345	Spain	0.34
Kyrgyz Republic	0.302	Sweden	0.257
Latvia	0.342	Turkey	0.403
Lithuania	0.333	Uganda	0.452
Luxembourg	0.289	Ukraine	0.314
Mexico	0.481	Macedonia, FYR	0.337
Moldova	0.362	Egypt, Arab Rep.	0.335
Netherlands	0.292	United Kingdom	0.331
New Zealand	0.344	United States	0.406
Norway	0.298	Uruguay	0.429

Notes: Alphabetical order of countries in the sample and the average Gini coefficient for each.

Table A.3. Additional sources for Gini coefficients

Country	Sources other than the World Bank Database
Croatia	Statistical Yearbook 1998, European Commission 2006, Eurostat
Czech Republic	Transmonee 2004, Transmonee 2011
Denmark	OECD StatExtract
Estonia	Transmonee 2004, Transmonee 2011
Finland	European Commission 2005
France	OECD StatExtract
Greece	European Commission 2005
Hungary	OECD StatExtract
Indonesia	National Socio Economic Survey, Consumption Module
Ireland	European Commission 2005, Eurostat, Eurostat 2016
Italy	European Commission 2005, Luxembourg Income Study (LIS) 2016
Latvia	Transmonee 2004
Lithuania	Transmonee 2011
Luxembourg	European Commission 2005
Netherlands	CSO 2005, European Commission 2005, European Commission 2006
New Zealand	Household Economic Survey, New Zealand 2014, O'Dea 2000, OECD StatExtract
Norway	Statistics Norway 2000, Statistics Norway 2002, Statistics Norway 2004
Portugal	European Commission 2005
Slovenia	Transmonee 2004, Transmonee 2011
Spain	European Commission 2005
Sweden	Luxembourg Income Study (LIS) 2016, Sweden CSO 2004
United Kingdom	European Commission 2005, OECD StatExtract
Uruguay	Socio-Economic Database for Latin America and the Caribbean (SEDLAC) 2016
Vietnam	Asean Statistical Yearbook 2003

Note: Alphabetical order of countries, and the additional sources of Gini coefficients used.

11.5. Robustness checks

The robustness check described in section 3.4 uses the income share earned by the top 10% earners in the country. The average share is 0.227, or 22.7% of national income earned by the top 10%. A higher value indicates greater income inequality. The estimated effect of income share on the preference for change in the linear and the quadratic form is presented in tables A.4 and A.5, respectively. Similarly, estimated effects on political violence are presented in tables A.6 and A.7.

Table A.4. Linear regression estimates impact of income inequality on preference for change

Preference for change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Income share	0.373***	0.196***	-0.052***	-0.733***	-1.094***	-0.428***	-0.238***	-0.275***	1.705***
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.096***				-0.205***
Government effectiveness						0.068***			-0.202***
Regulatory quality							0.056***		0.089***
Rule of law								0.070***	0.259***
Average	0.108								

Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Income share is the share of income earned by the top-10 percent, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table A.5. Quadratic regression estimates impact of income inequality on preference for change

Preference for change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Income share	4.849***	3.955***	-2.523***	3.254***	208.753***	34.634***	-21.670***	89.913***	81.835***
Income share ^2	-7.373***	-6.641***	4.095***	-7.248***	393.740***	65.501***	40.071***	168.379***	151.380***
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.283***				-0.014***
Government effectiveness						0.069***			1.222***
Regulatory quality							0.059***		0.296***
Rule of law								0.081***	0.167***
Average	0.108								

Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Income share is the share of income earned by the top-10 percent, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table A.6. Linear regression estimates impact of income inequality on political conflict

Political conflict	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Income share	9.299***	9.659***	-0.711***	1.726***	0.979***	3.695***	5.692***	4.753***	5.713***
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.314***				0.030***
Government effectiveness						0.641***			-0.102***
Regulatory quality							0.647***		0.476***
Rule of law								0.743***	0.357***
Average	-0.089								

Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Income share is the share of income earned by the top-10 percent, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table A.7. Quadratic regression estimates impact of income inequality on political conflict

Political conflict	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Income share	9.583***	9.855***	-0.685***	1.732***	0.968***	3.700***	5.698***	4.756***	5.717***
Income share ²	-0.477***	-0.342	-0.042	-0.011	0.020	-0.009***	-0.010	-0.006	-0.005
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.314***				0.030***
Government effectiveness						0.641***			-0.102***
Regulatory quality							0.647***		0.476***
Rule of law								0.743***	0.357***
Average	-0.089								

Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Income share is the share of income earned by the top-10 percent, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

11.6. Model checks

Table A.8 shows the results of including a country specific trend variable to the full model, including year- and country fixed effects and governance controls. The trend is the interaction between a general (year) time trend and the country average of the dependent variable. This does not significantly alter the outcomes presented and discussed above, so preference is given to the simpler version of the model which controls for year and country unobserved heterogeneity, as well as governance controls.

Table A.8. Adding country-specific trend (B5)

	Linear		Quadratic			Tipping point
	B1 (F')	B5	B1 (F')	B2 (F'')	B5	
Economic inequality and...						
Political violence	-0.662***	-0.187**	1.563***	-3.302***	-0.175**	0.237
Preference for change	0.193***	-0.039***	5.943***	-8.869***	-0.008	0.335

*Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively. The tipping point is found by taking the first derivative ($B1-2*B2*Gini=0$) and solving for Gini.*

11.7. Probit results

Table A.9. Raw output Probit linear regression impact of inequality on preference for change

Preference for change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	1.560*** (0.081)	1.232*** (0.151)	0.156 (0.303)	-0.516* (0.201)	-0.198 (0.301)	0.176 (0.312)	0.886*** (0.335)	0.333 (0.328)	0.825** (0.345)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					-0.191** (0.046)				-0.229*** (0.051)
Government effectiveness						0.239*** (0.051)			0.121 (0.088)
Regulatory quality							0.401*** (0.055)		0.437*** (0.091)
Rule of law								0.269*** (0.067)	-0.181 (0.142)
Average	0.108								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.

Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table A.10. Raw output Probit quadratic regression impact of inequality on preference for change

Preference for change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	11.256*** (0.701)	7.130*** (0.629)	5.802*** (1.138)	8.648*** (1.669)	21.860*** (4.170)	39.904*** (4.654)	29.333*** (4.192)	26.754*** (4.166)	42.472*** (5.102)
Gini^2	-13.191*** (0.694)	-8.089*** (0.861)	-8.308*** (1.711)	-13.782*** (2.499)	-33.854*** (6.385)	-60.498*** (7.065)	-43.471*** (6.382)	-40.404*** (6.349)	-64.207*** (7.846)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					-0.139*** (0.047)				-0.230** (0.051)
Government effectiveness						0.448*** (0.058)			0.628*** (0.107)
Regulatory quality							0.454*** (0.057)		0.322*** (0.094)
Rule of law								0.322*** (0.068)	-0.513*** (0.128)
Average	0.108								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.
 Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.
 Year and Country are fixed effects.
 Higher values on the WGI variables indicate worse governance quality.
 Standard errors for each estimated coefficient are given in brackets.

Table A.11 Raw output Probit linear regression impact of inequality on political conflict

Political conflict	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	0.321*** (0.003)	0.223*** (0.003)	0.038*** (0.004)	-0.038*** (0.004)	0.019*** (0.004)	0.058*** (0.004)	0.178*** (0.005)	0.101*** (0.004)	0.193*** (0.005)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					-0.043*** (0.000)				-0.048*** (0.000)
Government effectiveness						0.031*** (0.001)			0.006*** (0.001)
Regulatory quality							0.055*** (0.000)		0.053*** (0.001)
Rule of law								0.046*** (0.000)	0.000 (0.001)
Average	0.108								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.
 Robust standard errors for each estimated coefficient are given in brackets.
 Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.
 Year and Country are fixed effects.
 Higher values on the WGI variables indicate worse governance quality.

Table A.12. Raw output Probit quadratic regression impact of inequality on political conflict

Political conflict	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	6.388*** (0.026)	6.391*** (0.026)	-0.994*** (0.022)	-1.403*** (0.024)	-1.363*** (0.020)	-0.889*** (0.020)	-0.560*** (0.022)	-0.525*** (0.026)	-0.662*** (0.022)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.426*** (0.003)				0.278*** (0.002)
Government effectiveness						0.426*** (0.003)			0.151*** (0.004)
Regulatory quality							0.391*** (0.003)		-0.025*** (0.005)
Rule of law								0.580*** (0.004)	0.188*** (0.007)
Average	-0.089								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.

Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

11.8. Linear regression results

Table A.13. Linear form income inequality on preference for change

Preference for change	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	0.321*** (0.003)	0.223*** (0.003)	0.038*** (0.004)	-0.038*** (0.004)	0.019*** (0.004)	0.058*** (0.004)	0.178*** (0.005)	0.101*** (0.004)	0.193*** (0.005)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					-0.043*** (0.000)				-0.048*** (0.000)
Government effectiveness						0.031*** (0.001)			0.006*** (0.001)
Regulatory quality							0.055*** (0.000)		0.053*** (0.001)
Rule of law								0.046*** (0.000)	0.000 (0.001)
Average	0.108								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.

Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

Table A.14. Linear form income inequality on political conflict

Political conflict	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	6.388*** (0.026)	6.391*** (0.026)	-0.994*** (0.022)	-1.403*** (0.024)	-1.363*** (0.020)	-0.889*** (0.020)	-0.560*** (0.022)	-0.525*** (0.026)	-0.662*** (0.022)
Year	N	Y	N	Y	Y	Y	Y	Y	Y
Country	N	N	Y	Y	Y	Y	Y	Y	Y
Voice and accountability					0.426*** (0.003)				0.278*** (0.002)
Government effectiveness						0.426*** (0.003)			0.151*** (0.004)
Regulatory quality							0.391*** (0.003)		-0.025*** (0.005)
Rule of law								0.580*** (0.004)	0.188*** (0.007)
Average	-0.089								

Notes: *, ** and *** represent P-values of less than ten, five and one per cent, respectively.

Robust standard errors for each estimated coefficient are given in brackets.

Gini is the Gini coefficient, ranging from 0-1 with higher values indicating more inequality.

Year and Country are fixed effects.

Higher values on the WGI variables indicate worse governance quality.

11.9. Within-society heterogeneity

Table A.15. Preference for change by gender and marital status

Marital Status	Gender		Total
	Male	Female	
Married	11.1%	9.5%	10.3%
Not married	12.7%	9.8%	11.1%
Total	11.7%	9.6%	

Note: Percentage indicates the probability of each sub-group desiring radical societal change.

Table A.9. Preference for change by income level

Income level	Preference for change		
	Observations	Mean	Std.Dev.
10	4,036	6.2%	0.241
9	4,766	6.5%	0.246
8	6,300	9.7%	0.295
7	8,389	10.5%	0.307
6	10,119	11.7%	0.321
5	13,189	12.5%	0.331
4	13,560	11.4%	0.318
3	13,158	11.7%	0.321
2	10,888	11.4%	0.318
1	7,666	11.8%	0.322

Note: Percentage indicates the probability of individuals on each income level desiring radical societal change. Standard deviations are provided to highlight differences.

Table A.10. Preference for change by education level

Education level	Preference for change		
	Observations	Mean	Std.Dev.
Lower level education	31,428	12.6%	0.332
Middle level education	44,926	11.1%	0.315
Higher level	23,709	9.2%	0.288

Note: Percentage indicates the probability of individuals on each education level desiring radical societal change.

Table A.11. Quadratic form income inequality on preferences, by gender

	Impact of Gini coefficient on Preference for change		
	B1	B2	Tipping point
Male	5.208***	-7.374***	0.353
Female	6.586***	-9.918***	0.332
Complete sample	5.970***	-8.919***	0.335

*Note: *, ** and *** represent P-values of less than ten, five and one per cent, respectively. The tipping point is found by taking the first derivative ($B1-2*B2*Gini=0$) and solving for Gini.*