The Politics of Redistribution:

Beliefs, Institutions and Evidence from 63 countries

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Abstract

What determines the politics of redistribution? The political economy literature suggests that redistributive policies are subject to political institutions such as electoral rules, political competition as well as the degree of fiscal and political decentralization. Others suggest that government welfare spending is correlated with subjective beliefs. In this paper, we test the hypothesis that government health expenditure - a proxy for redistributive policies - vary with the median voter's belief about fairness. Based on data from 63 countries, we find that a stronger belief about fairness has a strong, positive, robust and significant impact on government health expenditure, controlling for political institutions. We speculate that variances in government health expenditure may be the result of different political equilibria, which in turn may be due to different beliefs.

Keywords: Health expenditure, Belief, Median Voter, Political Institution, Redistribution

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What determines the politics of redistribution? The political economics literature suggests that redistributive policies are subject to political institutions such as the electoral rules, political competition as well as the degree of fiscal and political decentralization (e.g. Persson and Tabellini 2000). For example, presidential regimes and majoritarian electoral system are expected to have a lower spending on redistributive policies compared to proportional representation system (Persson and Tabellini 2003). Also, the executive branch of government with egalitarian ideologies is likely to spend more on redistributive policies (Navarro, et al. 2006). The other strand of literature in social economics suggests that government redistributive spending is determined by the voters' belief about fairness, which itself is determined endogenously by voters' experiences or motivation (Alesina, Glaeser, and Sacerdote 2001, Alesina and Angeletos 2005, Benabou and Tirole 2006).

In general, government redistributive spending fulfils two major functions: equality and social insurance (Iverson and Soskice 2001, Moene and Wallerstein 2001). Government health expenditure, serving both of these functions, is an extremely important dimension of government redistributive expenditure. In this paper, we bring together for the first time the literature on beliefs about fairness, political institutions and government health expenditure. Second, compared with the current literature which is limited to OECD countries, we employ a much larger sample of 63 countries including both developed and developing economies. Finally, compared with the current literature, we use a more comprehensive data set of political institutions such as the type of the political system, degree of political competition, the extent of fiscal and political decentralization, government's ideology, etc.

In particular, we explore the effects of the median voter's belief about fairness on redistributive policies such as government health expenditure, controlling for political institutions. We hypothesize that government health expenditure vary with the median voter's belief about fairness. Our findings suggest that a strong belief about fairness has a statistically strong, positive, robust and significant effect on government spending on health, controlling for the effects of political institutions. We also find that government health expenditure, compared to other redistributive expenditures such as government education expenditure, is more likely to be employed by politicians as a response to accommodate the median voter's belief about fairness.

The rest of the paper is arranged as follows. In the next two sections, we discuss the theoretical background of our hypothesis and review the related literature. Then, we discuss the mechanism how the median voter's belief about fairness can have an impact on government health expenditure. Data and methodology employed by this study are presented in the following section. We then show the results of benchmark regression about government health expenditure and comparisons with the cases of private health expenditure and government education expenditure. After the section of robustness checks, we conclude the paper.

Political institutions and redistributive politics

Political economics literature suggests that political institutions are central to redistributive policies. Indeed, the literature has postulated a variety of political variables associated with health expenditure, policies and outcomes. These include the system of government and political traditions, government ideology, political

commitment, decentralization, public participation, policy design, fiscal decentralization, party competition, political timing and coalitions, and regulatory capture, among others (Marmor 1983; Miller 2005; Navarro et al. 2006; Reich 1996).

A country's political system has significant effects on government redistributive expenditure. For example, lower health expenditure per capita is associated with parliamentary systems (Immergut 1992). However, in countries with fiscal decentralization, parliamentary systems have a positive and highly significant effect on health expenditure. From the literature of comparative political economy, government expenditure in a country under parliamentary system is higher, compared with a presidential system because of the costs associated with organizing and maintaining a ruling coalition (Persson and Tabellini 2003).

Studies have shown that the degrees of electoral competition in the legislative and executive branches of government, not surprisingly, have positive and statistically significant effect on redistributive policies and outcomes (e.g. Persson and Tabellini 2003). The literature on the political economy of fiscal policy suggests that in countries with competitive electoral systems, politicians find it difficult to make credible promises about service provision such as health care because it is difficult for voters to assess improvements and to hold politicians accountable (Keefer and Khemani 2003).

The impacts of decentralization on provision of public services and outcomes are mixed and subject to on-going debates. On one hand, Robalino, Picazo and Voetberg (2011), using panel data of rich and poor countries, argue that fiscal decentralization has positive impacts on health policies and outcomes. In contrast, Bossert and Beauvais (2002), using three case studies, argue otherwise.

Amounts of government redistributive expenditure may also vary with the regime types (i.e. democratic vs. nondemocratic). Compared to democratic regimes, nondemocratic regimes may spend less for redistribution since they have to accommodate special interests groups rather than voters in general (Mares and Carnes 2009).

Belief and redistributive policies

The importance of beliefs in economic development is well argued. As North (1993) states, "history demonstrates that ideas, ideologies, myths, dogmas, and prejudices matter and an understanding of the way they evolve is necessary for further progress in developing a framework to understand societal change." Furthermore, Alesina and La Ferrara (2005) argue "that subjective beliefs about future prospects are associated with preferences for redistribution". Alesina, Glaeser, and Sacerdote (2001) also show "that much of the difference between the American and European welfare states can be explained by differences in subjective beliefs".

Following Alesina and Giuliano (2010), we define the belief about fairness in terms of the degree to which voters believe that success is due to luck or connection rather than effort. Success is regarded as fair if achieved through one's effort and not through luck or connection. According to the literature, there are two possible mechanisms through which different beliefs about fairness result in different preferences for redistribution.

The first is through the market mechanism in which one's efforts are compensated by market rate of return when success is achieved by one's effort rather than luck or connection. Empirical studies such as Fong (2001) as well as Alesina and

La Ferrara (2005) find that if people believe that success is the result of hard work, they would be more averse to redistribution. Conversely, if one perceives that outcomes from the market mechanism are not fair in which luck or connection determine who are rewarded, we expect voters to prefer the government to intervene by spending more on redistributive policies.

The second mechanism stems from the belief that if success is less likely to depend on effort, and that it is largely the result of luck or connection, then voters are likely to demand a wider coverage of social insurance (Iverson and Soskice 2001, Moene and Wallerstein 2001), which is associated with their preference for redistribution.

We have explained thus far two possible mechanisms through which voters' beliefs about fairness are closely associated with their preferences for redistribution. But what do we know about the factors that might help explain variations in beliefs about fairness? Here, we briefly discuss two factors commonly discussed in the literature: motivation and experience. On one end of the literature, beliefs can be changed as a result of an agent's motivation (Benabou and Tirole 2006, Minozzi 2013). For example, Minozzi (2013) provides an endogenous model of political beliefs in which players are motivated to maximize a utility function that represents preferences over outcomes and the anticipatory experience of uncertainty.

In contrast to the motivation literature, Piketty (1995) and Alesina and Angeletos (2005) argue that belief is an outcome due to the experiences of individuals. For instance, Alesina and Angeletos (2005) suggest that the median voter's belief about fairness leads to multiple equilibria in the level of taxation and redistribution. In their model, the equilibrium tax rate depends on the median voter's belief about

fairness of market outcomes and causes of income inequality. The implication of the model is that the demand for government redistributive expenditure will be higher if the median voter believes – based on his experience - that rich people became rich because of luck or connections rather than effort and talent. Consequently, given the belief about fairness, the tax rate will be higher in such a society. A citizen anticipates this higher tax rate and his efforts (work ethics) in turn will be lower given a higher tax rate that will be expropriated by the government. This lower level of efforts justifies his belief about fairness. In short, different beliefs of the median voters can happen due to self-fulfilling expectations.

The Mechanism

In this section, we propose a mechanism to show how the median voter's belief about fairness, political institutions and government redistributive spending, are linked with each other. We illustrate this mechanism in Figure 1. First, outcomes of redistributive policies are subject to various political institutions (i.e. arrow 1). Second, the median voter's belief about fairness may have an indirect effect on government's redistributive policies via political institutions (i.e. arrow 2). Different median voters' beliefs may change the political structure such as the political competitiveness as well as the political ideology of the incumbent party. For example, if the median voter prefers low redistribution and low tax, the election would be less competitive if only the right wing party proposes low tax rate and low redistribution and other parties propose high tax rate and high redistribution. However, the elections will be more competitive if the median voter's prefer a tax rate locating between the level proposed by left wing and right wing party.

<Insert Figure 1 about here>

Third, anticipating the median voters' belief about fairness, forward looking politicians choose redistributive policies (i.e. arrow 3). This avenue of causal relation is what the median voter theorem literature has proposed: redistributive policies have to meet the expectation of the median voter's preference in equilibrium independent from the effects of political institutions. For example, according to Morgan (2013), although Germany, Netherlands and the United Kingdom have very different electoral system, government ideology and degree of fiscal decentralization, they all experienced a very similar sequence of political and policy changes in terms of work-family policies such as lengthening parental and maternity leave. Morgan (2013) attributes this to the significance of working women in these countries as voting constituencies. This is an example to illustrate that the changing preference of the median voters (e.g. with the growing significance of working women) has a direct impact on redistributive policy, despite variations in political institutions.

For nondemocratic regimes, while redistributive government expenditure is more likely to be targeted for special interests to maintain social stability and prevent rebellion, the governments may still want to spend government budget for redistribution to accommodate masses' belief (Acemoglu and Robinson 2006). In this case, the median voter's belief about fairness may be interpreted as a proxy measurement for masses' belief about fairness.

In this paper, we examine the significance of "arrow 3" in Figure 1 regarding the effect of the belief about fairness on redistributive policies. Note here that the mechanism in this paper does not suffer from "the individualistic fallacy" (Przeworski and Teune 1970), which refers to the case imputing the macro system with the

aggregate belief of individual members. According to the mechanism in this paper, the government redistributive expenditure is associated with individual level beliefs via the political process in which the median voter's preference is pivotal. In other words, we do not draw macro level conclusions directly from individual level findings. Instead, the individual level belief is translated into the macro-level variable such as government redistributive spending only via the political process (i.e. via the median voter theorem).

Among government redistributive expenditures, we are interested in government health expenditure in particular. In general, government redistributive spending can serve two functions: equality and social insurance (Iverson and Soskice 2001, Moene and Wallerstein 2001) and government health expenditure can fulfill both functions. In this case, government health expenditure, compared to other redistributive spending such as government education expenditure, is more likely to be chosen by politicians to accommodate the median voter's beliefs.

Data & Methodology

Data for the belief about fairness are taken from the World Value Survey while data for political institutions are taken from Keefer et al. (2010). Health expenditure and GDP data are obtained from the World Bank. Data for Gini coefficient and the share of people with age 65 years or older in the total population are collected from World Bank Database as well as the CIA World Factbook. We

collect government expenditure as a share of GDP from Index of Economic Freedom compiled by the Heritage Foundation[1].

Data for political institutions include indexes for different political systems, degree of political competition, ideology of executive branch of the government and degree of fiscal decentralization. For the belief data, we pool three waves of World Values Survey (WVS) between 1989 and 2008. After combining these two data sources, we have 63 country-level observations in total (vs. 29 countries in the Alesina and Angeletos (2005) study, most of which are OECD countries). These 63 countries account for 79% of the total world population and over 86% of the total world GDP in 2010. The names of these countries are listed in Table 1.

< Insert Table 1 here>

The independent variable in our paper – the belief about fairness - is measured by the mean value of responses for each country for the following two identical but opposite statements in the WVS. Responses are coded on a scale between 1 and 10, with 10 indicating the strongest belief in luck and connections as determinants of success.

Statement 1: *In the long run, hard work usually brings a better life.*

Statement 2: *Hard work doesn't generally bring success—it is more a matter of luck and connections.*

Reponses to above WVS statements are used to show the association between the belief about fairness and social spending in the earlier literature (e.g. Alesina and Angeletos 2005 and Alesina, Glaeser, and Sacerdote 2001). In this paper, we use

[1] In the World Bank database, data for general government expenditure is not available. The government expenditure as a share of GDP data is compiled from general government expenditure across countries between 2009 and 2012 by Heritage Foundation.

cross-sectional Ordinary Least Squares (OLS) regression to find the association between the median voter's belief about fairness and government health expenditure in particular. The median voter's belief about fairness may have either a direct impact on the government's redistributive policies via voting or have indirect impact via the effects of political institutions.

How to identify the causal effect of the median voter's belief about fairness on government health expenditure is the key methodological concern for our study. We are faced with three major methodological issues to identify this causal relation. First, the reverse causality problem may arise given the possibility that direction of causation may be from redistributive policy to the median voter's belief (i.e. a redistributive government fosters an entitlement belief among voters). For example, Lindbeck and Nyberg (2006) argue that redistributive policies weaken the work norms of people in welfare states. In addition, there is another possibility of reverse causality. Variances of health conditions (i.e. demand of healthcare), which are associated with different amounts of government health expenditures, may lead to different preference for redistribution.

We address the issue of reverse causality in two ways. First, we use predetermined values for control and independent variables in our regression analysis to address the concern of reverse causality. In other words, given the timing of dependent variables, we choose values of the control and independent variables of the earlier period. Second, we compare our benchmark regression results with results of models regressing private health expenditure as a share of GDP on beliefs. Here, private health expenditure's share in GDP is considered to be a proxy measurement indicating demand for healthcare. If private health expenditure's share in GDP is not correlated with the median voter's beliefs on redistribution, we can exclude the

possibility that different level of demand of healthcare leads to different beliefs about fairness.

Second, omitted variable bias is another concern. Types of political regimes and types of health financing institutions are not included in the data analysis. Types of political regimes matter since authoritarian regimes may respond to elites' belief rather than voters' belief. We address the issue for the types of political regimes by using Polity IV index in the robustness check section. Regarding to the types of health financing institutions, government health expenditure can be a function of different institutions used to organize health systems such as national health system (e.g. in UK or Italy), social insurance system (e.g. in Germany or Japan), or private insurance oriented health financing system (e.g. in Netherland). However, data for different institutions of health financing is not available for this research.

Third, measurement error is another concern. The mean values of responses to the statements in the WVS for a given country are nevertheless time variant and the responses collected in the earlier waves may not be a good proxy for the median voter's belief in later period. In the robustness check section, we address this issue by using the latest wave instead of all waves of responses in the WVS as the measurement for the belief about fairness.

We acknowledge that a cross-sectional study such as this study may not be able to fully identify the causal relation between the median voter's belief and public expenditure outcomes. Both reverse causality and omitted variable bias issues can be raised in this context. Such causal relation between government health expenditure and the belief about fairness can only be identified from both time series variation and cross sectional variations, which will be left to future research. However, we believe

that identifying the correlation between the median voter's belief and redistributive policies is a significant first step in bringing together two strands in the literature (i.e. the role of political institutions, the role of the median voter's belief and their effects on government redistributive expenditure).

Variable Definition and Coding

Our variables consist of 1) outcome variables (government health expenditure as a share of GDP and total expenditure); 2) ideology variable: the median voter's belief about fairness; 3) political institution variables including type of political system, government ideology, extent of electoral competition for executive and executive positions, and fiscal and political decentralization, etc.; 4) control variables including GDP per capita, Gini coefficient and share of people aged 65 and over in total population.

There are a few reasons why we include these control variables. First, government spending for redistributive policies depends on its fiscal capacity to redistribute which in turn depends on a country's income level (i.e. GDP per capita) via taxation. Also people in countries with different income levels may have different demand for healthcare. GDP per capita then is a proxy measurement for both fiscal capacity and demand for healthcare in a country.

Second, Gini coefficient is included since the level of redistribution is expected to be positively associated with the degree of inequality, i.e. theoretically we expect higher redistributive spending in countries with higher income inequalities (see Meltzer and Richard 1981). Third, the share of people aged 65 years old and over is a proxy variable to show the demand of health service since it is estimated that health

expenditure for people over 65 years old usually is three to five times to that of other age groups in OECD countries (Casey *et al*, 2003).

Values of all dependent variables are calculated based on 2010 data. For control and independent variables including ideology and political institution variables, as we mentioned earlier, we use values before 2010 such that they can be treated as predetermined when the values of the outcome variables are generated.

< Insert Table 2 here>

Table 2 above summarizes the list of variables, their definition and coding. Note here that the two variables measuring the degree of competitiveness in the executive and legislative branch of government (i.e. *liec* and *eiec*) are also two very important dimensions to distinguish democratic and nondemocratic regimes (Svolik 2012: chapter 2). For example, 67% and 68% of nondemocratic regimes score no more than 3 out of 7 for variables *liec* and *eiec* in over 4,900 observations between 1946 and 2008 (Svolik 2012: 36-7). In other words, the regime types (democratic and nondemocratic) are being taken into account for regression exercises in this paper by adding these two variables. Also, in the robustness check section, we use the definition in Policy IV index to exclude the observations of authoritarian regime to check the validity of our results.

In this paper, we limit our data sample to those countries in which political leaders have finite terms of office for two reasons. First, in countries with term limits, politicians are more or less accountable for their policies and are therefore expected to be responsive to the median voter's preferences compared to those with no term limits. How politicians respond to the median voter's preference is exactly the research

question that we are interested. Second, we only have two countries in our current dataset in which political leaders do not have finite terms.

Hypothesis

Based on the preceding review of the literature and the theory that have been postulated, we test the following hypothesis on the relationship between belief about fairness and redistributive health policy:

> *The less the median voter believes that success is the result of hard work, the more likely that government will spend a higher percentage of GDP and government expenditure on health expenditure, controlling for the effects of political institutions.*

Results

Table 3 summarizes our descriptive statistics. The variances are relatively large across countries for the belief about fairness and government health expenditure as a share of fiscal expenditure and GDP. The maximum value of belief on the connection and luck matter is over 6 while the minimum value is about 2.3. Also the health expenditure as a share of fiscal expenditure varies from 3.5% to over 20%.

Table 4 shows the correlation among independent variables. It suggests that multicollinearity is not a big concern since most correlation coefficients are lower than 0.6. We also calculate the variance inflation factors (VIF) for each variable and the highest value of VIF is only 3.94, which is much lower than the widely-used threshold value 10. This value suggests that multicollinearity is not a big concern.

< Insert Table 3 and 4 here>

Our benchmark OLS regression results are summarized in Tables 5 and 6 below. We find that a stronger belief about fairness indeed is associated with higher government health expenditure as a share of GDP as well as government expenditure, conditional on political institutions such as types of political system, fiscal decentralization, ideology of incumbent government and the extent of electoral competition. Table 5 shows the results of our regressions when the dependent variable is the government health expenditure as a share of GDP.

< Insert Table 5 here>

Model (1) in table 5 shows that the coefficient of the median voter's belief about fairness is positive and statistically significant, controlling for GDP per capita, age65 and Gini coefficient. The signs for control variables GDP per capita, age65 as well as Gini coefficient are consistent with the result in Alesina and Angeletos (2005) while Gini coefficient is statistically significant in Model (1). Model (2) shows that the coefficient of political system is positive but not statistically significant. However, the effect of political competition is mixed given the sign of competition for legislative positions are negative and the sign of competition for executive positions is positive.

Model (3) and (4) in table 5 include both political institution variables and the median voter's belief about fairness as regressors. In model (4), we add the variable "execrlc " (i.e. ideology of government). We find that the coefficient of the median voter's belief about fairness is statistically significant in both models, consistent with our theoretical expectations. The coefficient of political system is significant in model (3) and (4), which implies that in the parliamentary system, the government is more

likely to spend more on health care compared to the case under the presidential system. Coefficients for political competition indexes are likewise statistically significant.

Model (5) adds the fiscal decentralization variable as well as the interaction terms between fiscal and political decentralization as regressors. These variables are added to control the effect of fiscal decentralization and how it varies with political decentralization. We find that the coefficients on belief about fairness as well as political institutions are statistically significant.

From model (3), (4) and (5) in table 5, one standard deviation on belief about fairness above its mean is associated with an increase of government health expenditure by 0.44 to 0.88 percent of GDP. The coefficient of age65 is positively significant in all models except model (5). It suggests that a one percent increase in people aged 65 years and older as a share of total population is associated with about a 0.1 percent more of GDP spent on health care by the government. This is consistent with expectation because the elderly population accounts for a substantial share of public health expenditure. GDP per capita is significantly and positively correlated with the government health expenditure's share of GDP for all models.

The capacity for redistributive policies, of course, depends on fiscal capacity. Government health expenditure is subject to state's fiscal capacity when politicians are willing to spend more on health. Taking into account government's fiscal capacity, all models in table 6 use the government health expenditure as a share of total government fiscal expenditure. Regressors remain the same as the models in table 5. Models in table 6 show a similar pattern as models in table 5 and the results are even more robust. The coefficient of the median voter's belief about fairness is statistically

significant in all models. These results imply that the government health expenditure is more likely to be adjusted by politicians as a response to accommodate the median voter' belief about fairness, compared to other government expenditures.

< Insert Table 6 here>

From model (3), (4) and (5) in table 6, one standard deviation of the belief about fairness above its mean is associated with an increase of government health expenditure by about from 1.32 to 2.20 percent of total government expenditure. The coefficient of political system is significant in all models. This is consistent with the literature that the forms of government such as parliamentary or presidential system matter for the size of government. Political competition for legislative positions has a significant negative effect on government health expenditure as share of government expenditure while the competition at the executive branch is no longer statistically significant. This result suggests that less competition in the legislative branch may give the government more discretion for spending on the redistributive policies. The coefficients of variables of political and fiscal decentralization as well as ideology of government are not statistically significant.

Interestingly, the coefficient of the share of people over 65 years old in total population is not statistically significant in all models except model (2) in table 6. It may be that both government expenditure in general and government health expenditure in particular increase with the share of elderly people. Total government expenditure may also increase with the share of elderly people in total population though other avenues (e.g. pension outlay accounts for considerable part of government expenditure and increasing share of elderly people may lead to increasing government expenditure on pensions). In this case, the share of elderly people may

not have significant impact on the share of health expenditure in total government expenditure given that both numerator (i.e. government health expenditure) and denominator (i.e. total government expenditure) increase with the share of elderly population.

Comparisons with private health expenditure and education expenditure

In the previous section, we show that there are statistically significant correlations between government health spending and the median voter's belief about fairness, which is consistent with our theoretical expectations. In this section, we perform two comparisons with benchmark models to push the benchmark results one step forward.

First, one may argue against our earlier results that the variance in the demand for healthcare may have an effect on the median voter's belief. For example, one who is healthy and thus has lower demand for healthcare is more likely to spend less on health and also is more likely to believe that success is a result of hard work. Hence, the variance of government expenditure may not have been caused by different beliefs but different demand for healthcare. To show that our earlier results are robust to this threat, we replace the dependent variable with the private health expenditure as a share of GDP in all models. If private health expenditure is not correlated with belief, we can infer that health condition is not correlated with beliefs about fairness.

Second, we wonder whether beliefs about fairness are also associated with other government redistributive expenditures. Here, we replace our dependent variable with government education expenditure as a share of government expenditure

to check whether the belief about fairness is associated with government education expenditure. From earlier literature (Alesina, Glaeser, and Sacerdote 2001, Alesina and Angeletos 2005), the median voter's belief about fairness may be correlated with other redistributive social spending also, which may include government income support for individuals such as pension, sickness, unemployment, social assistance as well as social services such as health care and family services such as childcare allowance. Public education expenditure, especially government expenditure on compulsory education, also serves some function of redistribution of for the development of human capital and it is expected to be associated with the median voter's belief about fairness.

We collect government education expenditure in 2010 from the World Bank data sets. We end up with 51 observations in our database. The dependent variable is government education expenditure as a share of government fiscal expenditure. We include both the median voter's belief and indexes of political institutions as our regressors. Further, we replace a control variable, proportion of people in age 65 or older, with the share of under-14 years old in total population in 2010 (variable name: age14) since a large share of public education expenditure is spent on primary and secondary schools.

< Insert Table 7 here>

Table 7 shows that the coefficient of the belief about fairness is not statistically significant for private health expenditure in all models. These results suggest that health condition or demand for health care in a country, for which private health expenditure is a proxy measurement, is not correlated with the median voter's belief about fairness. Therefore, it is unlikely that variance of health conditions or

demand for health results in different beliefs about fairness. From this comparison between the government and private health expenditure, we are able to show the reliability of our benchmark results that government health expenditure is statistically significantly associated with the median voter's belief about fairness.

< Insert Table 8 here>

The regression results for government education expenditure are shown in Table 8 above. We find that for all models, the sign of coefficient of the variable "Belief" is positive. However, in contrast to the case of government health expenditure, the coefficient of the median voter's belief about fairness is not statistically significant for government education expenditure in all models except model (4) in table 8. The coefficient of the share of population aged 14 or younger is statistically significant in all models. This is not surprising because much of government expenditure is mainly targeted for certain age groups in the phase of compulsory education.

Our interpretation of above regression results is as follows. Government health expenditure is associated with both purposes of government redistributive spending: equality for health condition as well as social insurance for health shocks. On the contrast, government education expenditure is redistributive but it does not fulfil the function of social insurance.

Since the median voter's belief about fairness is closely associated with his preference for redistribution, given that government health expenditure serves both equality and social insurance functions of redistribution, politicians are more likely to

adjust government health expenditure rather than government education expenditure to accommodate the median voter's belief.

Robustness Checks

Three robustness checks are conducted. First, we use means of responses the most recent wave rather than all waves of responses to the statements in the WVS, as the proxy measurement for the median voter's belief about fairness. This robustness test is to address the concern that earlier waves of responses may not represent beliefs of the median voter of the current generation. We have 30 observations (countries) with more than one wave of responses. We replace the values of "belief" variable with the means of responses the most recent wave to the statements in the WVS for these 30 observations. We end up with 43 country level observations collected during wave 5 (between 2005 and 2008) and 20 country level observations collected during wave 3 (between 1994 and 1998).

The regression results are reported in table 9, where the dependent variable is government health expenditure as a share of total government expenditure. From table 9, the coefficient of the median voter's belief about fairness is statistically significant while the magnitude of the coefficient is similar to the result reported in table 6. From model (3), (4) and (5) in table 9, one standard deviation of the belief about fairness above its mean is associated with an increase of government health expenditure by 1.22 to 3.02 percent of government expenditure.

< Insert Table 9 here>

Second, politicians in authoritarian regimes may respond to elite's interests rather than the median voter's belief. To exclude the possibility that it is the authoritarian regimes which drive the regression results, we have another robust test by removing 4 observations from the authoritarian regimes. Following the literature, we define authoritarian regimes as countries scoring -6 or below on the Polity IV Index in year 2010[2] (Brancati 2014). The regression results are reported in table 10, where the dependent variable is the government health expenditure as a share of total government expenditure. From table 10, the coefficient of the median voter's belief about fairness is statistically significant in all models while the magnitude of the coefficient is similar to the result reported in table 6.

< Insert Table 10 here>

Third, we use total health expenditure including both private and public health expenditure as the dependent variable in our models. After replacing the dependent variable with total health expenditure, the coefficient of the median voter's belief about fairness is not statistically significant in most of the models. This result is consistent with our proposition that only government health expenditure is associated with the median voter's belief about fairness. The regression outcomes are not reported here and but they are available upon request.

Conclusions

Our findings suggest that there is support for our model and hypothesis that a stronger belief by the median voter about fairness is indeed associated with

[2] Polity IV data can be accessed from http://www.systemicpeace.org/polity/polity4.htm.

redistributive policies, controlling for political institutions. In particular, we find that higher government health expenditure as a proportion of GDP and total government spending is associated with stronger beliefs about fairness controlling for the effects of political institutions such as types of political system, fiscal decentralization, ideology of incumbent government, the extent of electoral competition as well as a country's GDP per capita, Gini coefficient and proportion of population aged 65 and above. Consistent with the literature, we also find that political institutions are associated with government health care expenditure.

Given the benchmark regression results, we also compare the association between the median voter's belief about fairness and private health expenditure as well as the association between belief and government education expenditure. First, the median voter's belief about fairness is not correlated with private health expenditure as a share of GDP, which implies that the belief about fairness is not a result of health condition or demand for healthcare. Second, government education expenditure as a share of total government expenditure is not associated with the median voter's belief. This result suggests that, compared to government education expenditure, which is also redistributive, government health expenditure is more likely to be used by politicians to accommodate the median voter's belief about fairness.

Regression results of this paper are consistent with our theoretical predictions. Theoretically, redistributive policies are associated with forward looking politicians' strategies, which respond to the median voters' beliefs and preferences. The variances of the share of government health expenditure may be the result of different political equilibria due to variances of the median voters' beliefs, which are the results of different motivations or experiences. In this paper, we have made a preliminary effort

to show that redistributive polices are made by forward looking politicians in response to beliefs about fairness of the median voters, controlling for the effects of political institutions. However, because of data limitations, systematically identifying the causal relation between belief and government health expenditure is left for future research.

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Table 1: List of 63 countries in our sample

	OECD		Non-OECD		
1	Australia	1	Albania	22	India
2	Canada	2	Argentina	23	Indonesia
3	Chile	3	Armenia	24	Iran (Islamic Republic of)
4	Czech Republic	4	Azerbaijan	25	Latvia
5	Estonia	5	Bangladesh	26	Lithuania
6	Finland	6	Belarus	27	Macedonia
7	France	7	Bosnia and Herzegovina	28	Malaysia
8	Germany	8	Brazil	29	Mali
9	Italy	9	Bulgaria	30	Nigeria
10	Japan	10	Burkina Faso	31	Pakistan
11	Mexico	11	China	32	Peru
12	Netherlands	12	Colombia	33	Philippines
13	New Zealand	13	Croatia	34	Republic of Moldova
14	Poland	14	Cyprus	35	Romania
15	Slovakia	15	Dominican Republic	36	Russian Federation
16	Spain	16	Egypt	37	Rwanda
17	Sweden	17	El Salvador	38	South Africa
18	Switzerland	18	Ethiopia	39	Ukraine
19	Turkey	19	Georgia	40	Uruguay
20	United Kingdom	20	Ghana	41	Venezuela
21	United States of America	21	Hungary	42	Zambia

Table 2: Summary of variables and coding

Variables	Coding
Outcome Variable	
Government Health expenditure[3] as a share of GDP	*ratio_health_wealth* (%) in 2010, from the World Bank database
Government Health expenditure as a share of total government expenditure	*ratio_health_fiscal* (%) in 2010, from the World Bank database
Ideology Variables	
Median voter's belief about fairness	*Belief* The value locates between 1 and 10. The higher the value, the more people appreciate the redistribution. This variable is defined by the mean value of answers for the question in the world value survey (pooling three waves between 1989 and 2008). There are 16, 46 and 43 country-level observations in three waves (89-93, 94-98,05-08). There is one wave of responses in 33 countries. There are two and three waves of responses in 19 and 11 countries respectively.
Political Institutions Variables	
Political System	*System* Parliamentary (3), Assembly-elected President (2), Presidential (1)
Political competition	*Liec* Intensity of electoral competition for legislative positions, average of ordinal ranking from 0 (non-existent) to 7 (highly competitive) from 1975 to 2010. See ordinal ranking below Ordinal ranking: No legislature=1; Unelected legislature=2; Elected, 1 candidate=3; 1 party, multiple candidates=4; multiple parties are legal but only one party won seats=5; multiple parties DID win seats but the largest party received more than 75% of the seats=6; largest party got less than 75%=7 *Eiec*

[3] From the definition of the World Bank, government (public) health expenditure includes "recurrent and capital spending from government budgets, external borrowings and grants, and social (or compulsory) health insurance funds".

	Intensity of electoral competition for executive positions, average of ordinal ranking from 0 (non-existent) to 7 (highly competitive) from 1975 to 2010. See ordinal ranking below Ordinal ranking: No executive =1; Unelected executive =2;Elected, 1 candidate=3; 1 party, multiple candidates=4; multiple parties are legal but only one party won the executive position=5; an executive elected in a competition with multiple parties and received more than 75% of the votes=6; the candidate got less than 75%=7
Government's Ideology	*Execrlc* Economic ideology of the executive branch of government. Coded as follows: Left (3); Center (2); Right (1);
Political decentralization	*Pol Decent Muni* Are municipal officials elected? Coded as follows: 0 if neither local executive nor local legislature are locally elected. 1 if the executive is appointed, but the legislature elected. 2 if they are both locally elected. *Pol Decent State* Are state officials elected? Coded as follows: 0 if neither State executive nor State legislature are locally elected. 1 if the executive is appointed, but the legislature elected. 2 if they are both locally elected.
<u>Control Variables</u>	
Gini Coefficient	*Gini* gini coefficient data in 2009[4]
GDP per capita	*GDP per capita* GDP per capita in year 2010
Share of people with age 65 years or older in total population	*Age65* share of people over 65 years old in 2010 (%)

[4] We use 2008 Gini coefficient if the 2009 data is not available.

Table 3: Descriptive statistics

Variable	obs	Mean	Std. Dev.	Min	Max
ratio_health_fiscal (%)	63	12.537	4.631	3.510	20.635
ratio_health_wealth (%)	63	4.592	2.350	0.777	10.338
Belief	63	4.375	0.827	2.367	6.038
system	63	1.984	0.959	1	3
liec	63	6.238	1.118	3	7
eiec	63	6.063	1.243	3	7
fiscal_decent	61	0.607	0.493	0	1
poldecent_muni	51	1.588	0.638	0	2
poldecent_state	53	1.185	0.779	0	2
execrlc	30	2.267	0.868	1	3
gini	63	0.377	0.089	0.23	0.631
gdp_per_capita (US$ 10,000)	63	1.502	1.684	0.032	7.057
age65 (%)	63	10.825	5.564	2	23
ratio_education_fiscal[5](%)	51	14.013	3.547	8.478	25.198
age14(%)	51	22.709	9.329	13.358	47.156

[5] ratio_education_fiscal is defined as the ratio between government education expenditure and government fiscal expenditure.

Table 4: Correlation Matrix and VIF

	Belief	**system**	**liec**	**eiec**	**gini**	**gdp_per_capita**	**age65**
belief	1						
system	-0.0447	1					
liec	0.2058	0.2746	1				
eiec	0.1792	0.2581	0.8484	1			
gini	-0.0295	-0.5174	-0.1538	-0.1353	1		
gdp_per_capita	0.2274	0.4653	0.4696	0.4945	-0.3354	1	
age65	0.4114	0.5014	0.5075	0.5335	-0.5207	0.638	1

Variable	**VIF**	**1/VIF**
eiec	3.94	0.253818
liec	3.67	0.272571
age65	3.07	0.326225
gdp_per_capita	1.89	0.528962
system	1.72	0.579804
gini	1.67	0.598224
belief	1.39	0.71937
Mean VIF	2.48	

Table 5: Dependent variable: Government Health Expenditure as a share of GDP

	(1)	(2)	(3)	(4)	(5)
Belief	0.369*		0.527**	1.070***	0.512*
	(0.218)		(0.214)	(0.280)	(0.286)
gdp_per_capita	0.773***	0.735***	0.727***	0.462*	0.723**
	(0.175)	(0.186)	(0.196)	(0.263)	(0.286)
gini	3.392*	5.620**	4.777**	1.927	3.646
	(1.912)	(2.168)	(2.091)	(3.164)	(2.315)
age65	0.156***	0.188***	0.135**	0.113*	0.120
	(0.0523)	(0.0454)	(0.0520)	(0.0561)	(0.0772)
system		0.345	0.477**	0.731**	0.467*
		(0.215)	(0.235)	(0.351)	(0.262)
liec		-0.551***	-0.604***	-0.335**	-0.449**
		(0.205)	(0.182)	(0.128)	(0.191)
eiec		0.360**	0.435**	0.287	0.453**
		(0.167)	(0.163)	(0.174)	(0.176)
execrlc				-0.0374	
				(0.244)	
fiscal_decent					-0.738
					(1.180)
fiscal_decent* Pol Decent State					-0.395
					(0.332)
fiscal_decent* Pol Decent Muni					0.762
					(0.674)
constant	-1.147	-0.0945	-1.884	-4.221	-2.227
	(0.965)	(1.340)	(1.417)	(2.573)	(1.719)
N	63	63	63	30	46
adj. R^2	0.691	0.699	0.721	0.713	0.752

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Dependent variable: Government Health Expenditure as a share of total government expenditure

	(1)	(2)	(3)	(4)	(5)
Belief	1.202*		1.584***	2.682***	1.531**
	(0.634)		(0.539)	(0.891)	(0.702)
gdp_per_capita	1.555***	1.579***	1.552***	1.251**	1.650***
	(0.261)	(0.274)	(0.302)	(0.544)	(0.452)
gini	15.10**	23.62***	21.09***	11.48	18.79***
	(6.096)	(6.070)	(5.555)	(9.829)	(6.657)
age65	0.0957	0.272**	0.115	0.0407	0.0120
	(0.140)	(0.112)	(0.130)	(0.168)	(0.164)
system		0.980*	1.376**	2.048*	1.499**
		(0.524)	(0.570)	(1.067)	(0.654)
liec		-1.788***	-1.947***	-1.608***	-1.821***
		(0.604)	(0.485)	(0.480)	(0.622)
eiec		0.511	0.735	0.522	0.988*
		(0.474)	(0.440)	(0.542)	(0.530)
execrlc				-0.155	
				(0.739)	
fiscal_decent					-1.515
					(3.023)
fiscal_decent* Pol Decent State					0.147
					(1.203)
fiscal_decent* Pol Decent Muni					0.490
					(1.755)
constant	-1.781	4.430	-0.944	-3.420	-1.114
	(3.232)	(4.105)	(4.185)	(8.677)	(4.922)
N	63	63	63	30	46
adj. R^2	0.437	0.489	0.545	0.510	0.523

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Dependent Variable: Private Health Expenditure as a share of GDP

	(1)	(2)	(3)	(4)	(5)
Belief	-0.0269		-0.182	-0.162	-0.128
	(0.233)		(0.301)	(0.450)	(0.334)
gdp_per_capita	0.127	0.200	0.203	0.237	0.336
	(0.197)	(0.206)	(0.204)	(0.183)	(0.228)
gini	4.268	2.202	2.493	0.240	3.458
	(2.686)	(2.114)	(2.326)	(3.255)	(2.437)
age65	-0.0175	-0.00542	0.0127	-0.0160	-0.0405
	(0.0524)	(0.0478)	(0.0619)	(0.103)	(0.0635)
system		-0.531**	-0.576*	-0.644**	-0.392
		(0.261)	(0.302)	(0.280)	(0.381)
liec		0.0201	0.0384	0.270	-0.100
		(0.338)	(0.366)	(0.459)	(0.294)
eiec		-0.0114	-0.0370	-0.195	-0.00369
		(0.322)	(0.349)	(0.415)	(0.264)
execrlc				-0.362	
				(0.352)	
fiscal_decent					-0.371
					(0.781)
fiscal_decent* Pol Decent State					0.408
					(0.288)
fiscal_decent* Pol Decent Muni					-0.0950
					(0.423)
constant	1.417	2.832**	3.450**	4.724*	3.369
	(0.908)	(1.229)	(1.499)	(2.407)	(2.054)
N	63	63	63	30	46
R^2	0.078	0.156	0.164	0.213	0.310

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Dependent Variable: Government Education Expenditure as a share of total government expenditure

	(1)	(2)	(3)	(4)	(5)
Belief	0.275		0.313	2.022*	0.209
	(0.500)		(0.601)	(1.097)	(0.670)
gdp_per_capita	-0.0482	-0.0291	-0.0593	0.384	0.414
	(0.284)	(0.357)	(0.360)	(0.477)	(0.327)
gini	2.511	5.124	4.720	-1.947	1.441
	(7.076)	(6.747)	(6.852)	(9.118)	(6.996)
age14	0.176**	0.147**	0.156**	0.363***	0.202**
	(0.0748)	(0.0715)	(0.0753)	(0.105)	(0.0838)
system		0.229	0.286	0.419	-0.257
		(0.733)	(0.774)	(1.318)	(0.751)
liec		-0.908	-0.907	-0.647	-0.823
		(0.867)	(0.890)	(0.580)	(0.736)
eiec		0.505	0.518	-0.452	-0.268
		(0.821)	(0.858)	(0.632)	(0.544)
execrlc				0.340	
				(0.850)	
fiscal_decent					0.466
					(2.451)
fiscal_decent* Pol Decent State					1.008
					(0.868)
fiscal_decent* Pol Decent Muni					-0.731
					(1.499)
constant	7.950***	10.99**	9.406	2.059	13.52**
	(2.815)	(5.274)	(6.242)	(8.720)	(5.390)
N	51	51	51	25	39
adj. R^2	0.180	0.169	0.155	0.377	0.245

Note: the data of government education expenditure and age14 are collected from the World Bank. Age14 refers to the share of people with age 14 or younger in total population in 2010.

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Dependent variable: Government Health Expenditure as a share of total government expenditure

	(1)	(2)	(3)	(4)	(5)
Belief[6]	1.155*		1.472***	3.648***	1.581**
	(0.609)		(0.517)	(0.916)	(0.699)
gdp_per_capita	1.555***	1.579***	1.562***	1.254**	1.580***
	(0.265)	(0.274)	(0.308)	(0.591)	(0.475)
gini	15.18**	23.62***	21.23***	12.11	17.84**
	(6.102)	(6.070)	(5.607)	(8.815)	(6.827)
age65	0.0958	0.272**	0.123	-0.0710	0.0148
	(0.142)	(0.112)	(0.135)	(0.153)	(0.173)
system		0.980*	1.331**	2.044**	1.406**
		(0.524)	(0.562)	(0.970)	(0.652)
liec		-1.788***	-1.877***	-1.523***	-1.763***
		(0.604)	(0.463)	(0.409)	(0.584)
eiec		0.511	0.652	0.280	0.963*
		(0.474)	(0.431)	(0.536)	(0.528)
execrlc				-0.463	
				(0.644)	
fiscal_decent					-1.937
					(2.995)
poli_fiscal_state					0.452
					(1.193)
poli_fiscal_muni					0.566
					(1.752)
constant	-1.623	4.430	-0.490	-5.509	-0.986
	(3.048)	(4.105)	(3.913)	(7.973)	(4.659)
N	63	63	63	30	46
adj. R^2	0.435	0.489	0.537	0.570	0.522

Standard errors in parentheses
* p<.1, ** p<0.05, *** p<0.01

[6] In this table, the variable "Belief" is measure by the most recent wave of responses to the statements in WVS.

Table 10: Dependent variable: Government Health Expenditure as a share of total government expenditure (excluding observations from authoritarian regimes[7])

	(1)	(2)	(3)	(4)	(5)
Belief	1.202*		1.656***	2.651**	1.672**
	(0.634)		(0.557)	(0.936)	(0.773)
gdp_per_capita	1.555***	1.574***	1.533***	1.218**	1.553***
	(0.261)	(0.277)	(0.308)	(0.529)	(0.449)
gini	15.10**	23.19***	20.80***	12.37	17.52**
	(6.096)	(6.367)	(5.820)	(10.76)	(6.864)
age65	0.0957	0.288**	0.120	0.0757	0.0129
	(0.140)	(0.114)	(0.136)	(0.179)	(0.176)
system		0.917	1.376**	2.120*	1.483*
		(0.557)	(0.616)	(1.154)	(0.762)
liec		-1.953***	-2.087***	-1.897**	-2.040**
		(0.715)	(0.537)	(0.786)	(0.870)
eiec		0.467	0.759*	0.475	1.144*
		(0.502)	(0.451)	(0.528)	(0.569)
execrlc				-0.0767	
				(0.825)	
fiscal_decent					-1.819
					(3.494)
poli_fiscal_state					0.352
					(1.268)
poli_fiscal_muni					0.640
					(1.960)
constant	-1.781	6.002	-0.369	-2.025	-0.728
	(3.232)	(4.735)	(4.954)	(10.74)	(6.548)
N	63	59	59	28	42
adj. R^2	0.437	0.473	0.535	0.505	0.495

[7] Authoritarian regimes are defined as countries scoring -6 or below in 2010 on the Polity IV Index (Brancati 2013). These regimes include Azerbaijan, Belarus, China and Iran.

Figure 1: The Model of Political Institutions, Beliefs and Redistributive Policies