

Being a Good Samaritan or just a politician? Empirical evidence of disaster assistance

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Abstract

This study explores whether the public spending provided in response to a natural disaster is influenced by the political ideology of the incumbent government. We use a global panel of about 90 democratic countries. Political parties have different preferences regarding policies that redistribute income within a country after a natural disaster. The estimates of a dynamic panel model clearly indicate that left-wing governments allocate about 2.5 percentage-points more public support per capita in the aftermath of a disaster than right-wing cabinets do. Besides, cabinets that consist of at least one nationalistic political party provide about 0.9 percentage-points more disaster assistance than other coalitions. One explanation is that natural disasters may reinforce the feelings of voters related to the national identity and domestic solidarity. Finally, it turns out that ideology cycles happen more frequently in political systems with direct elections as it is easier to target affected voters in these systems.

Keywords: Government ideology; Public spending; Natural disasters.

JEL code: E62, H5, Q54

1. Introduction

Although natural disasters happen beyond government control, the responses to these events are in the hands of elected officials. The need for rapid and coordinated action combined with economies of scale and the public good character of immediate disaster assistance increases the scope for government intervention. According to the theory of retrospective voting, the electorate will hold politicians responsible for the humanitarian and economic losses caused by a natural catastrophe. However, at the same time, voters reward government officials when they react quite promptly by taking decisive actions in the aftermath that will improve recovery (e.g., Healy and Malhotra, 2009; 2010; Reeves, 2011; Garrett and Sobel, 2003; Gasper and Reeves, 2011). Natural disasters might therefore create a window of opportunity that can be used for political motives as political parties like to gratify the needs of their particular constituencies. For instance, Garrett and Sobel (2003) find strong evidence that those US states politically important to the president have higher rates of disaster declaration or receive more assistance.

Based on the so-called partisan cycle theory, one might expect that left-wing governments provide more support than right-wing cabinets in the period following a disaster as their constituency consists for a large part of low-income voters that are often more vulnerable to natural disasters. This is of particular importance for developing countries where the poor population is often uninsured and priced out of safer areas. In the absence of any support, these voters are likely to be trapped in poverty. In turn, right-wing parties have their main electorate in the rich part of the population or in the elite. These voters live usually in more disaster resilient or protected areas. Thus, right-wing governments are less inclined to provide additional support after a natural disaster as their constituency needs less help. Besides, right-wing parties attach less political weight to fighting poverty or inequality, but more so to a small government debt and low inflation rate. The partisan impact of natural disasters is well known in anecdotes, but surprisingly there exists only little quantitative evidence¹. Even more important, the limited literature on this issue is far from conclusive. While some studies argue that there is a clear partisan bias present in public disaster policies, others find no evidence that ideological preferences are able to explain observed differences in the provision of disaster support (e.g., Sylves and Buzas, 2007; Malhotra and Kuo, 2008, 2009; Garrett, et al., 2006; Chang and Zilbermann, 2013; Kauder and Potrafke, 2015).

The main contribution of this study is twofold. First, it explores whether, and if so to which extent, government ideology affects the additional public spending provided in response to a natural disaster using a large global panel. Up so far most previous empirical evidence is based on local or regional data foremost from the United States. Second, we try to explain the mechanisms underlying the main results and relate them to elements of the political system in place (e.g., electoral rules,

¹ See Skidmore (2012) for a nice overview of the anecdotic evidence for the US in this domain.

different forms of government, upcoming elections). These factors affect the provision of public goods as they shape the political incentives faced by the incumbent.

For this purpose, a dynamic panel model is estimated including about 90 democratic countries between 1985 and 2013. Several exogenous measures capturing the frequency and intensity of natural disasters are constructed. The main findings reported in this study provide clear evidence that left-wing governments supply more public support per capita in the aftermath of a disaster than right-wing cabinets do. However, a large part of this finding is explained by several political factors. First, government ideology has a stronger effect when elections are upcoming. So, while left-wing cabinets in normal times already provide more disaster support than right-wing governments do, they spend even more in the (pre-)election period. Second, the partisan effect is stronger under majoritarian and presidential systems than under proportional or parliamentary systems. The interpretation of this finding is that the former systems give the incumbent a strong incentive to target transfers to particular interest groups such as affected voters. Finally, it turns out that governments that consist of at least one nationalistic party provide more public support after geo-meteorological disaster than other cabinets. In turn, coalitions with a large share of their electoral support in rural areas give more assistance after a flood or drought.

The remainder of the paper is structured as follows. Section 2 discusses in more detail how the contribution of this research is related to previous studies on ideology cycles in public disaster support. Section 3 describes the data and methodology used. Section 4 presents the results for the influence of government ideology cycles on public natural disaster support, while the final section offers the conclusions.

2. Literature review

The strand of the political economy literature on which this study mainly builds is the partisan theory. This theory focuses on different spending priorities of left- and right-wing political parties. These differences are based on the political ideology of the government and in line with the interests of the constituencies of the political parties (Hibbs, 1992, 1987; Alesina et al., 1997; Franzese, 2002). The partisan theory, in a nutshell, predicts that left-wing governments implement more expansionary fiscal policies to redistribute income more equally and fight poverty and unemployment as a great deal of their electoral support is given by the working class and low-income voters². In contrast, right-wing governments bolster more the interests of capital owners by believing strongly in *laissez faire* and are more concerned with reducing the inflation rate as this will worsen the international competitiveness of domestic firms. The partisan theory is in line with core voter model arguing that parties target their stable voter base for electoral support.

² See Potrafke (2016) for an extensive survey on the empirical literature on the partisan cycle.

When we apply the partisan theory to the issue of public disaster assistance, it is expected that left-wing governments provide more support to prohibit that the inequality in wealth and income rises within a country in the aftermath or that the affected population falls into a poverty trap. Even more so, the vulnerability of the poor population in low-income countries to natural disasters is exorbitant high due to their establishment in less disaster-protected areas, simple accommodation facilities and their strong dependence on agriculture (Freeman et al., 2003). Thus, voter constituencies at the bottom of the income distribution require therefore more ex-post aid. In turn, poor voters traditionally vote more on left-wing parties as they represent their interests better by providing public goods that improve their living conditions such as health care, education and sanitation (e.g., Lipset et al. 1954; Meltzer and Richard, 1981; Brooks and Brady 1999; McCarty, et al., 2006; Gelman, et al., 2005). As a result, left-wing parties have a stronger incentive to provide more ex-post disaster support than right-wing parties. In particular, since poor voters are more responsive to pork-barrels than wealthy voters (e.g., Chen, 2008). However, one can also argue, that excluded groups are often less informed and therefore less likely to participate in elections making that no partisan bias will exist (e.g., Besley and Coate, 2003).

Furthermore, differences in the ideological preferences are not restricted to only the left-right wing discussion. Political parties that are based on particular special interest politics might also be more or less willing to provide additional support based. This willingness depends on the vulnerability of their main consistency. For instance, parties that have large parts of their constituency working in disaster prone industries or living in climate affected regions will have a larger incentive to provide relief ex post compared to other parties.

Several empirical studies, mainly based on regional US data, indeed confirm that government ideology directly or indirectly affects the distribution of disaster relief (e.g., Chen, 2013; Arceneaux and Stein, 2006; Fair et al., 2017). For instance, Sylves and Buzas (2007) find significant evidence that Democratic Party presidents in the US tend to approve a larger percentage of disaster relief requests than Republican Party presidents. However, this conclusion was contested by Wamsley et al. (1996) and Wamsley and Schroeder (1996). Their results mainly indicate that no distinction can be made between Democratic and Republican ways of dealing with disasters in the United States.

Furthermore, the empirical results of Choi (2004) provide evidence that counties in the state of Florida in which a greater percentage of voters supported a Democratic presidential or gubernatorial candidate are less likely to spend more on disaster emergency management. This latter result suggests a reversed partisan cycle and is more in line with the swing voter model arguing that parties target policy benefits to ideologically opposing voters. Furthermore, Revees (2011), Salkowe and

Chakraborty (2009) and Gasper and Reeves (2011a,b) find no relationship between senatorial-presidential party similarity and major disaster declarations, limiting the role for a partisan bias in presidential disaster declaration decision making.

According to Malhotra (2008) party identification and ideological orientations play a major role in shaping attitudes of voters on the officials' roles and responsibilities in the aftermath of a natural disaster. For instance, in the United States, Republicans and conservatives have favored the 'states rights' perspective formulated in the 10th Amendment to the US Constitution, whereas Democrats have generally believed that greater responsibility should be held in the hands of the federal government. Likewise, Malhotra (2008) explores whether the partisan bias affects the attribution of blame of particular officials and the attitudes toward federalism in the aftermath of Hurricane Katrina. Respondents were asked questions such as 'Who should be most responsible for responding to natural disasters?', 'Who should be most responsible for helping to protect citizens from natural disasters before they happen?' or 'Who should be most responsible for helping to protect citizens from natural disasters before they happen?'. Democrats are twice as likely to claim that federal authorities should be responsible, while Republican voters place the responsibility in the hands of state and local authorities. In a follow up, Malhotra and Kuo (2008) find a more nuanced picture and conclude that on first instance party cues cause individuals to blame officials of the opposite party. However, voters make more principle judgments when they are provided with information about officials' actual responsibilities.

There are a number of subsequent studies exploring whether there is an ideology effect of natural disasters in the economic consequences or voter turnout. For instance, Wen and Chang (2015) examine whether natural disaster losses vary under the tenure of a government with a different ideology. They find that right-wing governments experience fewer natural disaster losses measured by the number of people affected or the economic damage created. Moreover, Chen (2013) combined detailed data on FEMA disaster aid spending during the 2004 Florida hurricane season together with individual voter information. He finds that disaster relief spending mobilizes incumbent party turnout but demobilizes the opposing party. To be specific, George W. Bush's vote share in the 2004 presidential election in Republican precincts, but failed to boost Bush's vote share in Democratic precincts.

3. Data and methodology

3.1 Data

One of the main challenges in the literature dealing with natural disasters is the identification strategy of such an event as it is the product of hazard, exposure and vulnerability (Yonson, et al., 2017; Felbermayr and Gröschl, 2014). One can argue that the hazard to a natural event is exogenous, while

the exposure and vulnerability risk is to a large extent endogenous since it depends on choices made by individuals or the government in the past. For instance, governments can manipulate the consequences of a disaster by taking precautionary measures. Traditionally, politicians have short time horizons and tend to avoid thinking about low-probability events since precautionary expenditures generate immediate costs while producing electoral gains only if the hazard risk materializes (Kunreuther and Michel-Kerjan, 2010). To estimate the impact of natural disasters, it is therefore quite important to separate the exposure and vulnerability element from the natural disaster impact and focus exclusively on the hazard part.

In the empirical section later on, we distinguish between four different natural disasters: 1) hydrological disasters; 2) meteorological disasters; 3) geophysical disasters and 4) climatic disasters. The measure on hydrological disasters is based on the number of floods in a country-year reported in the “Global Active Archive of Large Flood Events” dataset. This database records the intensity of the floods occurring worldwide the last three decades. The physical magnitude of a flood is computed as the logarithm of the product of the interval probability in years, duration and the affected area. Second, climatic events are based on the occurrence of droughts. A drought is recognized in a country-year when at least three subsequent months have rainfall below fifty percent of the long-run average monthly mean, or if at least five months within a year have rainfall below fifty percent of the long-run monthly mean. The data on monthly rainfall is taken from the weather station data reported by the National Oceanic and Atmospheric Administration (NOAA). Third, geophysical disasters are captured by the number of earthquakes and volcano eruptions in a particular country-year. To be included in the dataset a geophysical event should meet the following two criteria: (1) creates damage (approximately \$1 million or more) or cause fatalities and (2) the magnitude of the earthquake should be above 6 on the Richter scale or the volcano eruption scores at least 3 on the Volcanic Explosivity Index scale. By imposing these criteria, we partially control for the concern that two episodes may have completely different impact because of their intensity and location. Thus, geo-events that occur in the middle of the desert are not considered as disasters. The data on geophysical disasters is taken from the “Global Significant Earthquake and Volcano Eruption Database” reported by NOAA. Finally, meteorological catastrophes are captured by the occurrence of storms, hurricanes and tornados. A threshold is applied assuming that a storm should at least be at the score one on the Saffir-Simpson Hurricane Wind Scale index which is equivalent to a wind speed of about 119 km/h. Below this threshold it will cause almost no damage. The used measure on meteorological disasters is based on information taken from the “Tropical Cyclone Best Track” dataset supplemented by data from the “Global Surface Summary of the Day” reported by NOAA.

For each country-year, a disaster count variable is constructed to determine the impact of natural disasters on public spending. Using a count measure puts equal weight to the disaster events.

This has the advantage of reducing the influence of outlier events at the upper end of the disaster distribution. Besides, a country that is hit more than once by a disaster in the same year will suffer a sharper increase in the public spending than a country which suffers only a single incident. The number of disaster events is normalized by the land area of a country as larger countries have a higher probability of experiencing a natural shock³.

Moreover, to measure the partisan cycles an ideology index based on the methodology proposed by Potrafke (2011) is used. This index places the cabinet on a left-right scale with values running between 1 and 5. The ideology variable takes the value 1 (5) if the share of governing right-wing (left-wing) parties in terms of seats in the cabinet and in parliament is larger than $\frac{2}{3}$, and 2 (4) if it is between $\frac{1}{3}$ and $\frac{2}{3}$. The index is 3 if the share of centre parties is 50 percent, or if the left- and right-wing parties form a coalition government that is not dominated by one side or the other.

In addition, a number of special interest politics dummies are created which take the value one if at least one coalition member is recognized as a political party that is based on special interest politics. Three types of these parties are considered. First, a religious party is recognized when the party program is based on Christian, catholic, Hindu, Islamic or Buddhist principles. Disasters might be viewed as a wrath of God by religious voters that punishes people. Religious parties may provide more support than other parties when they act as a good Samaritan to help voters out of solidarity that suffer from these disasters. Second, a political party is identified as a rural political party when rural issues list a key component of the party's platform or if farmers are a key party constituency. It is widely documented in the literature that natural disasters are in particular a threat to the agricultural sector as the production in this sector depends to a large extent on the climatic and biophysical conditions present (e.g., Benson and Clay, 2003; Fomby et al., 2011; Loayza et al., 2012; Sivakumar et al., 2005; Lobell et al., 2011; Barrios et al., 2010; Rosenzweig et al., 2001, Klomp and Hoogezand, 2018). This gives especially political parties that have their main electoral support in rural areas an incentive to provide additional relief after a natural disaster. Finally, a government is identified as nationalistic when a primary component of the party platform is the creation or defense of a national or ethnic identity. Natural disaster may reinforce feelings of voters related to the national identity and domestic solidarity from which especially nationalistic governments might benefit. The partisan and special interest politics measures are based on data provided by the *Database of Political Institutions* reported by the World Bank (Beck et al., 2001).

³ Otherwise, the disaster measures are correlated with the error term.

3.2 Model

This subsection presents the empirical model used to estimate the relationship between ideological cycles and public natural disaster support. As the partisan cycle theory presumes competitive elections, only country-years with a Polity IV democracy score of at least six are included. This restriction leaves us with about 90 countries. As cross-country data on disaster assistance provided by the national government is lacking for most countries, a more indirect empirical method is applied. In this approach, the change in the total public spending explained by a natural disaster is compared when there is left-wing or right-wing cabinet in office or if a coalition is based on special interest politics. However, due to this indirect method, we should be careful in interpreting our results later on as the likelihood that our results are caused by a measurement error becomes larger. The results should therefore be interpreted as correlation rather than causality.

The following dynamic panel model based on an unbalanced dataset between 1985 and 2013 is estimated.

$$\Delta \ln spending_{it} = \alpha_i + \gamma \ln spending_{it-n} + \beta_k \mathbf{x}_{it-j} + \eta disaster_{it} + \mu \mathbf{pol}_{it} + \varphi(disaster_{it} \times \mathbf{pol}_{it}) + \delta_t + \varepsilon_{it} \quad (1)$$

where $spending_{it}$ represents the total public spending per capita by the central government in country i in year t taken from the IMF Government Financial Statistics. We include the lagged level of public spending to control for autoregressive tendencies. The vector \mathbf{x}_{t-j} contains the (lagged) control variables we consider. To make sure that the right hand side variables are not affected by the natural disasters in the current year, they are included with a lag. The optimal number of lags j for each variable is determined by using the Schwarz Bayesian Information Criterion (SBC). The vector \mathbf{pol}_{it} includes the partisan variable and the three special politics dummies introduced above. The variable $disaster_{it}$ measures the number of disasters taking place in a particular country-year (divided by the country size). The parameter α_i is a country-specific intercept to control for time-invariant unobserved characteristics such as geographical factors. By using country-specific intercepts, the emphasis of the analysis is placed on the identification of the within country variation over time. The parameter δ_t represents the time-fixed effects, while the final term ε_{it} is the error term.

The parameter η provides an estimate of the additional public spending allocated in a response to a natural catastrophe. Governments typically face an increased pressure on public spending as they need to provide emergency assistance and finance the recovery efforts (Lis and Nickel, 2009; Benson and Clay, 2003; Borenzstein et al., 2009; Melecky and Raddatz, 2014; Noy and Nualsri, 2011). To test empirically for the political use of public natural disaster support, several interaction terms be-

tween the natural disaster measure and the government ideology variables are included in the econometric specification. When the additional public spending provided in response to a natural disaster is used for political motives, then φ should statistically be different from zero.

The vector of control variables is largely based on previous empirical studies explaining the existence of political cycles (e.g., Shi and Svensson, 2006; Klomp and De Haan, 2013; Brender and Drazen, 2005). These variables are required to capture the role of structural policies, and the economic conditions and help to avoid an omitted variable bias (Table A2 in the Appendix offers a description and provides the sources used. The following control variables are considered: real GDP per capita (in logarithm), growth rate of real GDP, foreign aid (as a share of GDP), population growth, inflation rate, age-dependency ratio, coalition dummy, political constraints index (Henisz, 2004), monetary union dummy and an election year dummy. One concern is that a number of the suggested control variables are endogenously determined. When we fail to explicitly control for this issue, the results might be spurious. To address the potential endogeneity problem formally, we apply the two-step system-GMM estimator developed in Arellano and Bover (1995) and Blundell and Bond (1998). In essence, it estimates in a system the regression equations in differences and levels, each with its specific set of instruments. Relative to conventional instrumental variable methods, it improves substantially on the weak instruments problem through more formal checks of the validity of the instruments and provides for potentially improved efficiency⁴.

4. Empirical results

4.1 Baseline results

In Table 2 the main results on the impact of ideology cycles on public disaster support are reported. To obtain robust standard errors, we used the bootstrap procedure (with 1,000 replicators) and cluster the standard errors on country level. This procedure reduces the likelihood that the results are driven by small countries that have an extreme high frequency of natural disasters. The Sargan test provides no evidence of misspecification, while the serial correlation tests point to first- but no second-order autocorrelation of the residuals, which is in accordance with the assumptions underlying the selection of instruments.

⁴ We deal with the bias that arises from the presence of a lagged endogenous variable on the right-hand-side of the equation using a two-step GMM (Nickell, 1981). In addition, the bias should be already small on forehand since we use panel data with a long time dimension (Judson and Owen, 1999). Specifically, we use the GMM estimator implemented by Roodman (2006) in Stata, including Windmeijer's (2005) finite sample correction.

The reported coefficients on the natural disaster variables and their interaction terms are scaled by the median country size in the used sample to make the interpretation easier⁵. Based on the regression results shown in column (1) a number of conclusions can be drawn. First, one additional natural disaster raises the public spending by the central government significantly by about one percentage-point. This supports the empirical evidence from Lis and Nickel (2009), Melecky and Raddatz (2014) and Noy and Nualsri (2011) arguing that the public spending jumps immediately following a natural disaster to provide emergency relief and to start the reconstruction of the destroyed public infrastructure. Second, the results provide no evidence of a general partisan cycle in public spending as there is no structural difference in the total amount of public spending per capita between left and right-wing cabinets. One explanation is that because the various spending categories are so diverse, ideological cycles might only exist in specific spending categories, leaving aggregate spending unaffected. This could especially be true for spending categories that are most visible for voters and can easily be targeted to specific constituencies. Finally, the interaction variable between the government ideology measure and the total number of natural disasters (divided by country size in square kilometers) is statistically significant at the common confidence levels. This latter finding demonstrates that left-wing governments provide more public support than right-wing governments in the period immediately following a disaster. To be specific, full left-wing governments spend about 2.5 percentage-points more on disaster support or assistance compared to a complete right-wing cabinet⁶. One explanation, as already highlighted above, is that the constituency of left-wing parties is more frequently affected by natural disasters since they live in the cheaper and less disaster protected areas, especially in developing countries. This gives left-wing political parties in particular an incentive to increase the public spending in a response to a natural disaster as they may have to lose more electoral support when not acting promptly. Alternatively, according to Wen and Chang (2016) right-wing governments are associated with more natural disaster prevention and protection measures (e.g., enforce zoning and building codes and construction regulation, early warning systems and other measures to insure against and prepare for disastrous events) reducing the need for ex post disaster relief.

Furthermore, in column (2) the special interest politics dummies and their related interactions with the normalized number of disasters are also included in the econometric specification. The findings indicate that cabinets that consist of at least one nationalistic political party provide more support than other coalitions⁷. This latter finding provides some evidence that dealing with the consequences

⁵ The average country size in the sample used is about 600.000 square kilometers.

⁶ Calculated based on the results presented in column (1) of Table 1: $(5 - 1) \times 0.0062 = 0.0248$

⁷ It is also tested whether there exists a statistical significant interaction between the ideology measure and the interest politics dummies. However, none of the interactions turn out to be significant. Detailed results are available upon request.

of natural disasters might be perceived as a patriotic event that intensifies or strengthens the country identity of voters.

To explore whether the impact of government ideology relies on the number of disasters occurring within a country-year, we use the method suggested by Brambor et al. (2006). For this purpose, we plot the marginal effect of our government ideology measures on the total public spending conditional on the number of disasters striking a country within a year. The 95 percent confidence intervals around the marginal effect line allow us to determine when government ideology has a statistically significant effect on total public spending. There is a statistically significant effect when the upper and lower bounds of the confidence interval are both above (or below) zero. The results in Figure 1 clearly demonstrate that the impact of the partisan cycle and nationalistic governments declines when more disasters occur. In turn, we still do not find any evidence that rural or religious coalitions provide additional disaster support regardless the number of events.

<<< Insert Table 1 about here >>>

<<< Insert Figure 1 about here >>>

Meanwhile, it is widely documented that the impact of natural disasters tends to be higher when the degree of economic development is rather low (Freeman et al., 2003; Borensztein et al., 2009). According to EM-DAT (2015) up to 80 percent of the total damages from natural disasters are concentrated in low-income countries. This figure can be explained by a combination of three features that are the most present in developing countries: a higher physical exposure in many areas (e.g., proximity to temperature thresholds), a higher economic vulnerability to climate events (e.g., heavier reliance on agriculture) and a lower adaptive capacity (e.g., a lower ability to deal with climate stress). In contrast, richer countries can protect themselves better in the pre-disaster period which may reduce the damage created by a natural disaster. Thus, the opportunity to use public disaster relief for partisan motives might be higher in developing countries.

To explore in more detail whether the impact of election cycles in public spending after a natural disaster relies on the degree of economic development, we split our sample into OECD and non-OECD countries and re-estimate the model for the respective samples. In columns (3) and (4) of Table 1, we report our findings of this analysis. The results generally indicate that partisan cycles induced by natural disasters are larger in the sample of non-OECD countries. Finally, as a robustness test, we have re-estimated our model using the OLS-FE estimator. The findings in Table A3 in the appendix are almost identical to the system-GMM results. Thus, our results are not driven by the choice of estimator.

4.2 Disaster differences and political mechanisms

The results found so far show that that left-wing and nationalistic cabinets give more support than other cabinets. However, the disaster measure used up so far embeds different types of disasters. The opportunity to use government ideology to gratify the needs of their specific constituencies might differ among disasters. For instance, the economic effect of geophysical and meteorological disasters run for a large part through the destruction of physical capital in the industry sector. In turn, droughts and floods tend to have a larger effect on the agricultural sector (Klomp, 2016). Broadly speaking, disasters differ in at least seven respects as indicated in Table 2 (e.g., frequency, duration, scope, predictability, preparation, affected population and physical damage created) (Klomp, 2016). In column (1) of Table 3 the complete set of disasters is split into four more homogenous groups: hydrological, meteorological, geophysical and climatic disasters. As some natural disasters such as storms and floods often occur in tandem, simultaneous inclusion allows isolation of the effects of each disaster (Loayza, et al., 2012; Klomp, 2016).

The results indicate that the magnitude and even the direction differs significantly between the various disasters. First, left-wing cabinets provide more support after a hydrological or meteorological disaster. One explanation is that the poor suffer the most from these disasters as they live in the most disaster prone areas and unsafe housing. This makes the political response to these disasters more relevant for left-wing parties as their main constituency is harmed disproportionately. Second, the most severe impact of geophysical disasters runs through the destruction of the physical capital stock in the industrial sector. However, capital owners mainly vote for right-wing political parties as predicted by the partisan theory. This makes that right-wing governments are more inclined to support the industrial sector. Finally, the effect of climatic disasters is statistically insignificant. This latter finding can be explained by the presence of various effects that run in opposite directions. On the one hand, since climatic disasters are often regional or even national disasters, it will affect large shares of the poor population. However, on the other hand, climatic disasters only create little physical damage per affected person. Besides, the impact of climatic disasters mainly runs through a fall in the agricultural production. The evidence of Olper (2007), Klomp and De Haan (2013) and Swinnen (2010) generally indicate that right-wing governments provide more support to the agricultural sector than left-wing governments. Also from a voters perspective there is substantive evidence that farmers vote for right-wing parties (see Lewis-Beck, 1977). Thus, the results found in this study indicate that these effects apparently cancel each other out. Finally, the results indicate that nationalistic governments provide more public spending directly after a geo-meteorological disaster, while coalitions with a large share of their support in rural areas give more assistance after a flood or drought.

<<< *Insert Table 2 about here* >>>

<<< *Insert Table 3 about here* >>>

The possibility to use a rent seeking strategy by the incumbent in times of a natural catastrophe might also rely to some extent on a number of characteristics related to the political system of a country. In the remaining of this section, we try to reveal these mechanisms underlying the occurrence of ideological cycles in public disaster support. In more detail, the following model is estimated.

$$\begin{aligned} \Delta \ln spending_{it} = & \alpha_i + \gamma \ln spending_{it-j} + \beta_k \mathbf{x}_{it-j} + \lambda_m \mathbf{z}_{it}^m + \eta disaster_{it} + \mu \mathbf{pol}_{it} + \kappa (\mathbf{z}_{it}^m \times disaster_{it}) \\ & + \phi (\mathbf{z}_{it}^m \times \mathbf{pol}_{it}) + \varphi (disaster_{it} \times \mathbf{pol}_{it}) + \theta (\mathbf{z}_{it}^m \times disaster_{it} \times \mathbf{pol}_{it}) + \delta_t + \varepsilon_{it} \end{aligned} \quad (2)$$

Where \mathbf{z}^m is a vector containing the m conditional factors represented by a series of dummies. The other variables have the same meaning as in equation (1). Since it is hard to interpret the economic significance based on these outcomes, the conditional effect of the mediating factor on the effect of natural disasters is analysed using the linear combinations of estimators for the different samples. This enhances the interpretation and comparison of the results. First, the partisan bias may become more visible during election periods. Voters are myopic and evaluate only the recent past when casting their votes, this gives incumbents powerful incentives to affect voters' behavior in the aftermath of a natural catastrophe especially when elections are at hand (Klomp, 2016). To explore this issue some further, a three-way interaction is created with an dummy taking the value one indicating whether a particular country-year is recognized as an election year. From the results in column (1) and (2) in Table 4 it follows that ideological cycles occur more frequently when elections are upcoming. So, while left-wing cabinets in normal times already spend more on public disaster support than right-wing governments, they spend even more in the pre-election period. The result supports the evidence of Garrett and Sobel (2003) arguing that the mean rate of disaster declaration during an election year was higher for the Clinton than for Bush administration.

Second, there are major differences between electoral systems (majoritarian vs. proportional elections) and between political systems (parliamentary vs. presidential systems) in the provision of public goods (Persson and Tabellini, 2000; 2003; Grossman and Helpman, 2005). In a majoritarian system an electoral district is generally small and the politician who wins the majority of the votes represents this district in parliament. Such a system gives politicians a strong incentive to target policies towards a particular constituency. In proportional systems, public policies are arguably more directed towards spending programs benefiting large groups in the population (e.g., Persson and Tabellini, 1999; Lizzeri and Persico, 2001; Milesi-Ferretti et al., 2002).

Likewise, the difference between parliamentary and presidential systems may play a role. Presidential systems are characterized by separate and direct elections for both the executive and the

legislature. In parliamentary systems, the executive is indirectly formed through the legislature. In the latter systems bargaining between different legislative coalitions is disciplined by the threat of a government crisis. As such, a crisis would result in the loss of valuable agenda-setting powers for the government coalition, party discipline and stable legislative coalitions are promoted. As a result, parliamentary governments have larger broad programs at the expense of targeted programs compared to presidential regimes (Persson and Tabellini, 2001). In presidential systems the executive cannot be brought down by the legislature, but it is directly accountable to the voters. Thus, legislators have weaker incentives to stick together and to vote according to party or coalition lines. Therefore, in a presidential regime, the president is better able to target particular constituencies especially if they are well organized. Disaster relief mainly takes the form of a local public good as the affected population lives mostly grouped together in specific geographical areas. Thus, it is expected that left-wing parties provide more support in presidential and majoritarian systems than in parliamentary and proportional systems as it is easier to target the affected voters in these former systems. The results reported in columns (3)-(6) of Table 4 confirm these hypotheses.

<<< *Insert Table 4 about here* >>>

5. Conclusions

Although natural disasters happen beyond government control, the responses to these events are in the hands of elected officials. The need for rapid and coordinated action combined with economies of scale and the public good character of immediate disaster relief increases the scope for government intervention. According to the theory of retrospective voting, the electorate will hold politicians responsible for the humanitarian and economic losses. Natural disasters might therefore create a window of opportunity that can be used for political motives as political parties like to gratify the needs of their particular constituencies. Based on the so-called partisan cycle theory one may expect that left-wing governments provide more support than right-wing cabinets in the period following a disaster as their constituency consists for a large part of low-income voters that is often more vulnerable to natural disasters and therefore need more assistance. In the absence of any support, these poor voters might be trapped in poverty. In turn, right-wing voters are often located in the rich part of the population or in the elite. These voters live usually in more disaster protected areas. Thus, right-wing governments might provide less aid compared to left-wing parties after a natural disaster as it attaches less political weight to fighting poverty or inequality.

The main contribution of this study is twofold. First, it explores whether and if so to which extent ideological cycles affect the additional public spending provided immediately after a natural disaster using a large global panel. Second, this study tries to reveal the mechanisms underlying the

results and relate them to elements of the political system in place. The main findings of this study provide clear evidence that left-wing governments supply more public support per capita in the aftermath of a major disaster than right-wing cabinets do. However, a large part of this finding is explained by several political factors. First, government ideology has a stronger effect when elections are upcoming. Second, the partisan effect is stronger under majoritarian and presidential systems than under proportional or parliamentary systems as it is easier to target transfers to affected voters in the former systems. Finally, it turns out that cabinets that consist at least out of one nationalistic party provide more public spending directly after geo-meteorological disaster, while coalitions with a large share of their electoral support in rural areas give more assistance after a flood or drought.

One possible way to reduce the political use of natural disaster relief is by establishing a public catastrophic fund managed by politically independent and non-elected officials. This fund should be set up in the pre-disaster period and receive tax revenues in the period preceding the disaster. The main advantage of such fund is twofold. First, it is easier absorb the negative shocks when they happen without creating any fiscal pressure. Second, there is no political influence which reduces the likelihood of rent seeking by elected officials in the aftermath of a disaster.

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Table 1: Natural disaster support and partisan cycles

	Dependent variable: $\Delta \ln$ Central government spending per capita			
	All countries		OECD	non-OECD
	(1)	(2)	(3)	(4)
Natural disasters	0.010 *	0.010 *	0.006 *	0.015 **
	(0.005)	(0.005)	(0.004)	(0.007)
Ideology	0.018	0.018	0.019	0.021
	(0.014)	(0.023)	(0.035)	(0.034)
Religious political party		0.024	0.020	0.028
		(0.026)	(0.022)	(0.045)
Nationalistic political party		0.037	0.035	0.041
		(0.028)	(0.033)	(0.034)
Rural political party		0.009	0.010	0.011
		(0.007)	(0.009)	(0.016)
Natural disasters \times Ideology	0.006 **	0.005 *	0.003 **	0.006 **
	(0.002)	(0.003)	(0.001)	(0.002)
Natural disasters \times Religious political party		0.007	0.006	0.006
		(0.012)	(0.006)	(0.009)
Natural disasters \times Nationalistic political party		0.009 **	0.006	0.010 *
		(0.004)	(0.008)	(0.006)
Natural disasters \times Rural political party		0.003 *	0.002 *	0.004 *
		(0.002)	(0.001)	(0.002)
Controls	YES	YES	YES	YES
Observations	1888	1534	692	842
Countries	84	75	33	42
Sargan test (p-value)	0.457	0.674	0.699	0.692
Arellano-Bond AR(2) (p-value)	0.609	0.833	0.709	0.687

Note: **/* Indicating significance levels of respectively 5 and 10 percent. Bootstrapped standard errors are shown between brackets.

Table 2: Disaster characteristics

	Geophysical	Meteorological	Hydrological	Climatic
Frequency in the dataset	10%	26%	41%	23%
Duration	Minutes	Hours to days	Weeks to months	Weeks to months
Geographical scope	Local	Local to regional	Regional	Regional
Predictability	-	+/-	+	+
Preparation possibilities	-	-	+	+/-
Population affected	-	+/-	+/-	+
Physical damage	++	+/++	+	-

Table 3: Different types of disasters

	Dependent variable: $\Delta \ln$ Central government spending per capita	
	(1)	(2)
Ideology	0.014 (0.019)	0.013 (0.011)
Hydrological disasters	0.033 * (0.016)	0.023 * (0.012)
Hydrological disasters \times Ideology	0.007 ** (0.003)	0.005 * (0.003)
Meteorological disasters	0.048 ** (0.011)	0.048 ** (0.018)
Meteorological disasters \times Ideology	-0.009 * (0.005)	-0.010 * (0.006)
Geophysical disasters	0.031 ** (0.007)	0.019 ** (0.009)
Geophysical disasters \times Ideology	-0.006 * (0.004)	-0.005 * (0.003)
Climatic disasters	0.006 (0.005)	0.005 (0.003)
Climatic disasters \times Ideology	0.003 (0.003)	0.003 (0.002)
Religious political party		0.021 (0.037)
Hydrological disasters \times Religious political party		0.006 (0.004)
Meteorological disasters \times Religious political party		0.006 (0.011)
Geophysical disasters \times Religious political party		0.005 (0.009)
Climatic disasters \times Religious political party		0.006 (0.005)
Nationalistic political party		0.043 (0.062)
Hydrological disasters \times Nationalistic political party		0.011 (0.010)
Meteorological disasters \times Nationalistic political party		0.011 * (0.006)
Geophysical disasters \times Nationalistic political party		0.006 * (0.003)
Climatic disasters \times Nationalistic political party		0.005 (0.004)
Rural political party		0.007 (0.013)
Hydrological disasters \times Rural political party		0.001 * (0.001)
Meteorological disasters \times Rural political party		0.001 (0.001)
Geophysical disasters \times Rural political party		0.002 (0.002)
Climatic disasters \times Rural political party		0.002 * (0.001)

Controls	YES	YES
Observations	1888	1534
Countries	84	75
Sargan test (p-value)	0.624	0.447
Arellano-Bond AR(2) (p-value)	0.875	0.697

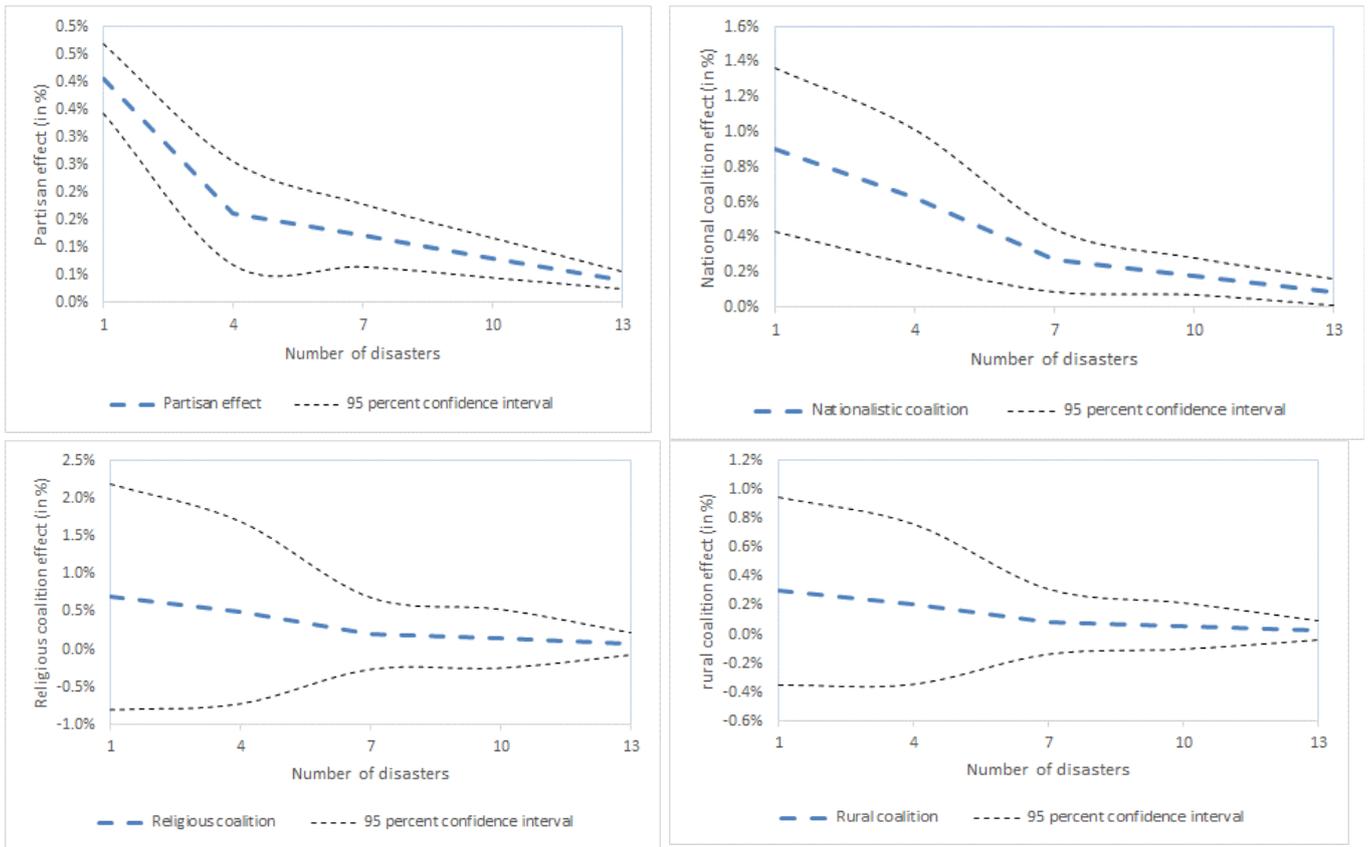
*Note: **/* Indicating significance levels of respectively 5 and 10 percent. Bootstrapped standard errors are shown between brackets.*

Table 4: Political mechanisms

	Dependent variable: $\Delta \ln$ Central government spending per capita										
	Election year		No election year		Presidential		Parliamentary		Proportional		Majority
	(1)	(2)	(3)	(4)	(5)	(6)					
Natural disasters	0.020 **	0.006 *	0.008 **	0.006 *	0.007 *	0.006 *					
	(0.006)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)					
Ideology	0.015	0.012	0.011 *	0.011	0.012	0.010					
	(0.010)	(0.012)	(0.006)	(0.009)	(0.024)	(0.019)					
Religious political party	0.019	0.028	0.026	0.020	0.027	0.021					
	(0.018)	(0.042)	(0.021)	(0.033)	(0.020)	(0.022)					
Nationalistic political party	0.041	0.036	0.033	0.031	0.035	0.034					
	(0.038)	(0.047)	(0.044)	(0.028)	(0.028)	(0.045)					
Rural political party	0.010	0.010	0.010	0.007	0.008	0.011					
	(0.008)	(0.011)	(0.007)	(0.012)	(0.006)	(0.018)					
Natural disasters \times Ideology	0.021 **	0.004 *	0.021 **	0.006 *	0.004 *	0.015 **					
	(0.007)	(0.002)	(0.010)	(0.003)	(0.002)	(0.005)					
Natural disasters \times Religious political party	0.008	0.007	0.008	0.006	0.006	0.007					
	(0.005)	(0.005)	(0.005)	(0.006)	(0.008)	(0.012)					
Natural disasters \times Nationalistic political party	0.025 **	0.007 *	0.008 *	0.009 *	0.008 *	0.009 *					
	(0.008)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)					
Natural disasters \times Rural political party	0.003	0.003	0.003	0.003	0.003	0.003					
	(0.002)	(0.003)	(0.004)	(0.005)	(0.002)	(0.003)					
Controls	YES		YES		YES		YES				
Sargan test (p-value)	0.425		0.355		0.643						
Arellano-Bond AR(2) (p-value)	0.519		0.438		0.737						

Note: **/* Indicating significance levels of respectively 5 and 10 percent. Bootstrapped standard errors are shown between brackets.

Figure 1: Marginal effect of government ideology on total public spending, conditional on the number of disasters



Appendix

Table A1: Countries included

Albania	El Salvador	Korea, Rep.	Paraguay
Argentina	Fiji	Lebanon	Peru
Australia	Finland	Lesotho	Philippines
Austria	France	Liberia	Portugal
Bangladesh	Gambia, The	Madagascar	Senegal
Belgium	Germany	Malawi	Sierra Leone
Benin	Ghana	Malaysia	Slovak Republic
Bolivia	Greece	Maldives	South Africa
Botswana	Guatemala	Mali	Spain
Brazil	Guinea-Bissau	Mauritius	Sri Lanka
Burundi	Guyana	Mexico	Sudan
Cameroon	Honduras	Mongolia	Sweden
Canada	Hungary	Nepal	Switzerland
Chile	India	Netherlands	Thailand
Colombia	Indonesia	New Zealand	Trinidad and Tobago
Comoros	Ireland	Nicaragua	Turkey
Cyprus	Israel	Niger	United Kingdom
Czech Republic	Italy	Nigeria	United States
Denmark	Jamaica	Norway	Uruguay
Dominican Republic	Japan	Pakistan	Venezuela, RB
Ecuador	Kenya	Panama	Zambia

Table A2: Control variables used

Variable	Description	Source	Mean	Stand. Dev.
Real GDP per capita	Real GDP per capita in 2005 constant US dollars (taken in logarithms).	Penn World Tables (2013)	8.31	1.48
Population growth	Growth rate of the number of inhabitants within a country	Penn World Tables (2013)	1.12	1.11
Growth rate of GDP	Growth rate of real GDP per capita	Penn World Tables (2013)	2.13	5.85
Age-dependency ratio	The ratio of population older than 65 and younger than 15 to the population between 15 and 64	World Bank (2012)	61.08	15.53
Inflation	Calculated as the log of $(1 + \pi)$, where π is the annual price increase calculated using the GDP deflator	Penn World Tables (2013)	1.97	1.50
Foreign aid	Official Development Assistance as a share of GDP (in logarithm)	World Bank (2012)	4.03	8.29
Coalition	Dummy taking the value one when a country is ruled by a multiparty cabinet and zero otherwise.	Beck et al. (2001)	0.49	0.50
Monetary union dummy	Dummy taking the value one when a country is member of monetary union and zero otherwise	www.eu.com	0.07	0.26
Checks and balances	Political constraint index: the number of veto players in the political system	Henisz (2004)	0.36	0.18
Election	Dummy variable taking the value one when there are parliamentary or presidential elections held within a particular year and zero otherwise	Database of Political Institutions (2015)	0.23	0.32

Table A3: Natural disaster support and partisan cycles - OLS-FE

	Dependent variable: $\Delta \ln$ Central government spending per capita			
	All countries		OECD	non-OECD
	(1)	(2)	(3)	(4)
Natural disasters	0.011 *	0.010 *	0.008 *	0.011 **
	(0.006)	(0.006)	(0.004)	(0.003)
Ideology	0.015	0.019	0.013	0.012
	(0.023)	(0.028)	(0.009)	(0.012)
Religious political party		0.023	0.022	0.021
		(0.016)	(0.020)	(0.020)
Nationalistic political party		0.034	0.031	0.030
		(0.038)	(0.055)	(0.031)
Rural political party		0.009	0.009	0.008
		(0.007)	(0.013)	(0.006)
Natural disasters \times Ideology	0.004 **	0.006 *	0.004 **	0.005 **
	(0.001)	(0.003)	(0.001)	(0.002)
Natural disasters \times Religious political party		0.005	0.009	0.006
		(0.005)	(0.014)	(0.008)
Natural disasters \times Nationalistic political party		0.009 **	0.005	0.011 *
		(0.003)	(0.004)	(0.007)
Natural disasters \times Rural political party		0.003 *	0.002 *	0.005 *
		(0.001)	(0.001)	(0.003)
Controls	YES	YES	YES	YES
Observations	1925	1564	706	859
Countries	84	75	33	42

Note: **/* Indicating significance levels of respectively 5 and 10 percent. Bootstrapped standard errors are shown between brackets.