

Pork & Typhoons: The Influence of Political Connections on Disaster Response

ABSTRACT

To what extent do political connections between politicians influence disaster response? To address this question, we produce a baseline estimate for post-disaster need by calculating a storm exposure measure for every municipality in the Philippines from 2001-2010. Then, controlling for storm exposure, we analyze the effect of political connections on reconstruction fund distribution from House legislators to municipal mayors. Our analysis shows that political connections, especially clan ties, increase reconstruction funds allocated to a given municipality. These results suggest that a more needs-based disaster response may require placing a limit on political discretion in the disbursement of post-disaster funds.

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Typhoon Haiyan recently swept across the Philippines, leaving a path of devastation in its wake. Similar to all governments in the aftermath of such disasters, the government of the Philippines mobilized resources to provide assistance to affected areas. Yet, a growing body of research questions the extent to which political calculations (as opposed to need) motivates this type of government response.¹ In this chapter, we analyze the extent to which certain political calculations (specifically, connections between politicians) direct public goods provisions following natural disasters in one of the most disaster-prone countries in the world: the Philippines.

We focus our analysis on disaster response in the wake of typhoons and tropical storms. Using a unique dataset and novel methodological approach, we produce estimates of the extent of typhoon exposure across municipalities in the Philippines and then examine whether disaster assistance corresponds to the level of damage. Our emphasis is on a particular form of disaster assistance—discretionary congressional funds for the reconstruction of public infrastructure. We find that the extent of storm damage in a given municipality affects the amount of reconstruction funds allocated there. However, we also find that, even when controlling for the measure of typhoon exposure, political ties between members of Congress and local mayors, specifically a match in their party affiliation or their clan affiliation, increase the level of reconstruction funds allocated to that municipality. Finally, clan ties have a much larger effect on the distribution of per capita reconstruction funds than party ties.

This chapter makes two contributions. First, we develop a novel and replicable methodological approach (storm exposure) to produce baseline estimates of the extent of disaster affectedness, which proxy the need for government resources in a given area. One of the most difficult tasks for policymakers and researchers alike is to estimate the extent to which efficiency considerations, as opposed to political calculations, play a role in distributive decisions (Golden and Min 2013). Our method helps to overcome this challenge by producing estimates of storm exposure that serve as a baseline for comparing need-based versus politically motivated distribution decisions.

Second, we add to the broad literature on distributive politics by providing empirical evidence that even the very particular type of spending intended for disaster relief, when exposed to politicians' discretion, becomes subject to political calculations. In particular, we find that legislators direct repair and reconstruction funds in the wake of typhoons in favor of politically aligned local politicians. Thus, political connections between politicians at different levels of government (and not just partisan ties between politicians and voters) influence government disaster response efforts. Our work contributes to the growing body of evidence in the empirical literature on how partisanship impacts the distribution of government resources (Arulampalam et al. 2009; Brollo and Nannicini 2010; Burden, Berry and Howell 2010; Larcinese, Snyder and Testa 2006; Solé-Ollé and Sorribas-Navarro 2008; Besley, Pande and Roa, forthcoming) and adds to recent scholarship on the influence of political calculations in disaster relief (May 1985; Platt 1999; Garrett and Sobel 2003; Salkow and Chakraborty 2009; Aldrich 2010; Hyndman 2011; Reeves 2011). Finally, by showing that clan ties direct disaster reconstruction funding in the Philippines over and above the effect of party-based alliances, our results provide further evidence that ethnic, tribal, or clan ties may dominate distribution decisions in countries with weak party systems (Blaydes 2011; Kasara 2007; Kitschelt and Wilkinson 2007; Posner 2004; Stasavage 2005; Wantchekon 2003).

The chapter proceeds as follows. In the next section, we review the literature on distributive politics, highlighting the role of political connections in explaining patterns of allocation. Then, we develop our theory and outline several hypotheses about how political connections might affect the provision of disaster assistance in the Philippines. We describe our data and methodology and present our results in the following two sections. The final section concludes.

Partisanship and Distributive Politics in the Philippines

There is a large and well-developed literature that draws connections between political parties, partisanship and distributive politics. For example, the existing literature on constituency targeting—whether it argues for swing, core or mixed targeting—argues that the partisan identity or tendency of voters or groups of voters helps shape the distribution of government goods and services (Ansolabehere and Snyder 2006; Cox and McCubbins 1986; Dunning and Stokes 2010; Hiskey 1999; McGillivray 2004; Pérez Yarahuan 2006; Stokes 2005; Stokes et al. 2013). This is true even where parties are relatively weak and party discipline is low (e.g. in the case of the weak-party majoritarian system example of the US).

Other work focuses on the connection between party/party system characteristics and the prevalence of particularism and clientelism (Kitschelt 2000; Tabellini 2004). Keefer and Khemani (2009), for example, demonstrate that strong links between voters and political parties curb incentives for legislators to provide pork to their constituents. By contrast, where ties between voters and candidates are of an ethnic, tribal or clan variety, politicians have strong incentives to selectively target resources to their respective constituencies (Keefer and Khemani 2009; Kitschelt 2000; Pande 2003).² Recent work has focused on distributive politics in developing democracies where party ties may be weak relative to ethnic, tribal, or clan ties (Blaydes 2011; Kasara 2007; Kitschelt and Wilkinson 2007; Posner 2004; Stasavage 2005; Wantchekon 2003). Who do politicians target where parties are not good cues for either voters or candidates and where, as a result, it is nearly impossible to differentiate between a party's core and marginal supporters? In this context, voters with weak party affinities are more likely to attribute the benefits of redistribution to individual politicians than to political parties that remain, for most voters, ephemeral abstractions. Hence, individual politicians are unlikely to redistribute public funds based solely on the partisan identities of voters.

This does not mean, however, that parties are superfluous in such democracies. In weakly-institutionalized systems, parties often serve as umbrellas for networks of other, more important power relationships. Particularly important is the relationship between upper-level politicians who wield the redistribution power via their access to the national budget and local leaders who control the power of mobilization via their dense social networks at the grassroots level.³ Parties may exist on an ad hoc basis precisely because those who hold the power to distribute resources need to strike bargains with those who have the power to mobilize electoral support in a classic exchange of distributive benefits for votes (Hicken 2011). Indeed, the political organization that could sustain such political exchange need not be the party; it may very well be the personal ties among politicians such as ethnic affinities, tribal background, or clan affiliations.

Such characterizations of political exchange in the context of democracies with weakly-institutionalized party systems suggest a prediction about how distribution might unfold: upper-level politicians who have the power to redistribute will favor politically aligned local leaders. Broadly speaking, in the absence of stable party systems and an electorate with strong partisan affinities, the political calculations that direct spending and public goods provision are a function of the political organization (in this case, the ties between upper-level and local politicians) that sustains the exchange of redistributive benefits for electoral support.

This logic builds on a growing number of studies that demonstrate the importance of nonpartisan political connections in predicting the distribution of public goods and services. For example, Caeyers and Dercon (2012) find that Ethiopian households with close connections to local public officials are more likely to receive food aid than those households without such connections. Besley, Pande and Rao (forthcoming) show that political connections shape the distribution of local public goods to Indian villages. These and similar studies tend to focus on the link between local politicians/officials and local recipients of benefits, whether individuals or villages. In contrast, we focus on how non-partisan political connections between national and local politicians can shape the distribution of resources.

The Philippines offers an ideal environment in which to assess the relative effects of party and clan ties. The Philippines has one of the oldest democracies in Asia, but also one of the weakest, underdeveloped party systems in the region. Philippine parties are highly factionalized and undisciplined. Party switching has been a recurring phenomenon in the Philippines, with about 40% of incumbent congresspersons switching their party affiliation from one election to the next since the beginning of its democratic period in 1946 (Kasuya 2009). Moreover, party labels carry little weight for either voters or candidates, as evidenced by the high level of electoral volatility from election to election. In the words of one scholar: "Far from being stable, programmatic organizations, the country's main political parties are nebulous entities that can be set up, merged with others, split, resurrected, regurgitated, reconstituted, renamed, repackaged, recycled or flushed down the toilet anytime" (Quimpo 2005).

In contrast to the unstable party system, a defining and enduring feature of political life in the Philippines are political clans. Political clans have historically dominated national and local politics and clan ties continue to shape modern Filipino politics and business (Coronel et al. 2007; Cullinane 2003; Gutierrez 1992; Hutchcroft 1998; Querubin 2010a; Querubin 2010b; Sidel 1999; Simbulan 2005). In fact, family relationships and rivalries generally have proved more robust than partisan differences. Descriptions about the influence of clan politics on public policy

abound.⁴ In a recent study, for example, Labonne and Fafchamps (n.d.) find that those with connections to current local office-holders are more likely to land well-paid government jobs.

However, estimating the causal effect of clan-based alliances on distribution is challenging because it is difficult to derive plausible exogenous variations in clan-based political alliances. It is possible that the very factors that explain why clan politics are strong in some areas also account for distributional patterns. Put differently, clan alliances may be endogenous to distributional patterns. We attempt to address this issue by focusing on the geographical allocation of disaster reconstruction funds. Because our measure of typhoon exposure is exogenous to clan politics or prior distributions of government resources, controlling for the same variable can account for an important time-varying factor that confounds the relationship between clan ties and distribution. This should bring us closer to plausible causal estimates of the effect of clan ties on distribution.

In the next section, we describe our strategy for using storm damage to produce a baseline against which we can measure politically-motivated distribution.

Using Natural Disasters as a Distributive Baseline

Stories and scandals abound regarding the particularization of the public purse.⁵ However, moving beyond anecdote and allegation has been challenging for researchers. How do we estimate the extent to which political calculations play a role in the distribution of public goods? Very rarely do we have good records of policy deliberations and so we are unable to observe what arguments were put forward in favor of a particular distributive solution versus another. Furthermore, even where such records are available, they rarely present a clear picture. Politicians will cite many legitimate reasons for why a particular good or service should be allocated to their constituents—e.g. helping the poor, promoting investment—but seldom are they explicit about the political motivations behind their proposals. (At the same time, they are eager to claim credit for any goods and services the government provides). But, if we assume that almost all politicians are at least partially motivated by a desire for reelection (or, as is often the case in the Philippines, for the election of their family members),⁶ then we begin to see the possibility of pork everywhere. And, in fact, one constituency's wasteful pork barrel project is often another's much needed public goods investment.

What we often lack is a clear, objective counterfactual—a baseline we can use to gauge how far a given policy departs from some sort of non-political, technocratic ideal (Golden and Min 2013). Damage from natural disasters provides a reference point for this comparison by introducing a shock into the system. While not completely random (typhoons are more of a concern for the Philippines than for Poland), the precise number, timing, scale, and location of natural disasters are impossible to determine very far in advance. Furthermore, large-scale disasters affect a large number of locales and some locales more than others. (Locations at the epicenter of an earthquake, for example, will experience more damage than those further away). The fact that natural disasters cannot be fully anticipated means that governments will almost always need to respond to those disasters with supplemental relief and reconstruction funds targeted to disaster areas, giving researchers an opportunity to observe how such funds are distributed. Where we have information about the extent of damage across locales, it is possible to estimate how relief funds should be distributed if need-based technocratic criteria were the primary driver, and then observe how far from that baseline governments stray.

Analyzing the political economy of disaster response is a growing trend. Researchers have explored both political motivations for disaster relief (May 1985; Platt 1999; Garrett and Sobel 2003; Salkow and Chakraborty 2009; Aldrich 2010; and Reeves 2011) and the political outcomes of providing these resources (Healy and Malhotra 2009; Cole, Healy, and Werker 2012; Gasper and Reeves 2011; Chen 2013). Most of this research, however, focuses on the U.S. context⁷ and considers political calculations based on politician-voter dynamics. Our paper contributes to this literature by evaluating how political connections between politicians influence a government's disaster response efforts.

We focus our analysis on the Philippines where large-scale natural disasters are, unfortunately, commonplace. Each year, the country experiences an average of U.S. \$17-19 billion in economic losses due to natural disasters (Dumitru 2009). This equates to just under 10% of the Philippines' GDP. Local and national government funds dedicated exclusively to disaster assistance total around \$14 billion annually. Typhoons and tropical storms are a particular concern. On average, twenty typhoons and tropical storms strike the Philippines each year, affecting nearly every

part of the country (see Figure 1). While disastrous for Filipinos, the frequency and distribution of storm activity and the scope of affected municipalities provide us with a rich source of data from which to test hypotheses about the influence of political connections on disaster response.

[Figure 1 about here.]

The Politics of Disaster Assistance

A politician in the Philippines (or elsewhere) with the power to allocate a certain amount of disaster assistance in her district will likely consider several factors. One consideration is presumably the comparative level of need (or the extent to which a particular area has been devastated relative to other areas). This leads to our first hypothesis:

H1: The amount of per capita reconstruction funds distributed to a given area is positively related to the extent of storm damage in that area.

While we expect that damage assessments will help drive allocations decisions, we also expect political considerations to have an effect on those decisions. Politicians interested in reelection should use disasters, and their control of reconstruction funds, in ways that help improve their chances of remaining in office. This might include relatively innocuous activities like plastering the politician's name or picture on relief supplies handed out to disaster victims, or outright corruption—e.g. diverting disaster funds into personal or campaign coffers.

We are particularly interested in whether political ties affect the flow of reconstruction funds and, if so, which kinds of relationships exert the most influence over distribution decisions. In a post-disaster situation, politicians are faced with the task of dividing their scarce resources between several damaged areas. Given two areas that are the same in every way—same level of damage, same population, same amount of economic activity, etc.—except that one area is controlled by a political ally, while the other is not, we hypothesize that politicians will favor the area controlled by the ally. The Philippines is replete with anecdotal examples of non-disaster-related distribution decisions being based on such alliances. For example, the desire to put oneself in a position to receive presidential pork produces massive switching to the president's party by members of Congress, governors and mayors after each election (Banlaoi and Carlos 1996; Hicken 2009). Furthermore, members of Congress and local government officials regularly make the distribution of government goods and services contingent on the recipient's political support (Cruz and Chua 2004). We expect to see a similar pattern in the distribution of disaster assistance, hence the next hypothesis:

H2a: All else equal, areas controlled by political allies should receive more per capita reconstruction funds than other areas.

More specifically, we are interested in exploring two kinds of alliances. First, do party ties play a role in allocation decisions? If party ties play a role, then those areas where a congressperson and mayor share partisan ties should receive disproportionate attention in the wake of a disaster.⁸

H2b: All else equal, areas controlled by partisan allies should receive more per capita reconstruction funds than other areas.

In addition to partisan ties, we are interested in whether family or clan relationships will play a role in distribution decisions.⁹ Furthermore, our expectation is that clan ties trump party ties when it comes to the politics of disaster aid. This leads us to our next two hypotheses:

H2c: All else equal, areas controlled by members of the same clan should receive more per capita reconstruction funds than other areas.

H3: All else equal, clan ties should be a stronger predictor of distributed per capita reconstruction funds than partisan ties.

Data and Methods

We now turn to the task of determining the extent to which political calculations direct the redistribution of disaster reconstruction funds. Specifically, we test the hypothesis that the allocation of reconstruction funds across Philippine municipalities is a function not only of typhoon exposure (the amount of damage) but also of political ties between members of Congress and municipal mayors. Our main econometric specification is as follows:

$$\text{reconstruction}_{jt} = \beta_0 + \beta_1 \text{typhoon}_{jt} + \beta_2 \text{party}_{jt} + X_{jt}'\Gamma + \text{district_FE} + \text{election_year_FE} + \varepsilon_{jt}$$

where $\text{reconstruction}_{jt}$ is the per capita reconstruction funds allocated by a given congressperson to municipality j in year t , typhoon_{jt} is a measure of typhoon exposure of municipality j in year t , party_{jt} is a dummy variable indicating 1 if the congressperson and mayor are from the same party and 0 otherwise, and clan_{jt} is a dummy variable indicating 1 if the congressperson and mayor are from the same clan and 0 otherwise.

We also include several control variables (X_{jt}), which include a municipality's per capita Internal Revenue Allotment (IRA) in year t , an indicator for being a rural or a partially urban municipality, and log of land area. Finally, we control for district fixed effects as well as election year fixed effects. To ensure asymptotic consistency of the estimated standard errors, clustering is done at the municipal level.

Dependent Variable

Our main dependent variable is the per capita amount of annual congressional pork allocation that is spent on repairs and reconstruction of local infrastructures in a given municipality.¹⁰ Each year, members of Congress receive lump sum allocations from the General Appropriations Act (GAA) known as the Department of Public Works and Highways - Congressional Allocations (DPWH-CA). Between 2001-2010, the total amount of annual DPWH-CA ranged between PHP 6.7-23.2 billion (roughly USD 156-540 million), which accounted for about 4% to 12% of the total national discretionary budget (i.e. total budget net of personal services, interest payments, and allotments to local government units). Within the same period, each district congressperson received annual DPWH-CA that ranged from PHP 2-50 million (USD 47,000-1.2 million).

These congressional allocations are not all spent on disaster-related repairs. The funds are also used for the construction and routine maintenance of public infrastructures such as schools, roads and bridges, and irrigation systems. However, on average, 64% of these allocations were spent on repairs and reconstruction and, in our analysis, we isolate and focus only on the portion of DPWH-CA that was spent on repairs and reconstruction.¹¹ Looking at congressional pork that is spent on reconstruction funds has a number of advantages. To begin with, DPWH-CA has an “equal sharing” provision wherein every district congressperson, regardless of political affiliations, receives the same allocation as his or her colleagues in Congress every budget year.¹² Hence, we are able to observe the individual behavior of congresspersons within their districts, regardless of political affiliation or seniority. In contrast, calamity funds that are released during or immediately after a typhoon are not very well documented and could easily be the end result of (possibly conflicting) political calculations by politicians at different levels of government.

Another advantage is that even though all releases are made through the DPWH, which also administers the projects, congresspersons have the “power of the purse”, that is, the authority to identify specific projects for a given location and to release the funds for that project. As a result, the process of releasing these funds is transparent in that we can identify the amount released to the local government unit.¹³

Focusing on congressional allocations for repair and reconstruction does have some unavoidable disadvantages. One is that we do not account for calamity funds that are under the discretion of the President in our analysis.¹⁴ A second disadvantage is that we are unable to establish whether the funds distributed to each municipality were actually spent on the project or pocketed by the local government officials. However, the likelihood that local officials misappropriate congressional funds or that political calculations play a role in the allocation of Presidential discretionary funds¹⁵ implies that we may only be estimating a lower bound of how partisanship moderates the responsiveness of public goods provision to typhoon exposure.

Typhoon Index

Developing a standard baseline measure for determining how disasters affect different areas can be challenging. One measure commonly used to compare disaster levels across areas is the death toll. Poorer nations (and poorer regions in a nation), however, suffer significantly greater death counts than richer ones, which can lead to biased estimates of the intensity of the disaster in a given area (Stromberg 2007). An alternative measure for comparing the impact of a disaster in one locale versus another is to use estimated damages. However, these measures also create biased estimates as wealthier nations may have sturdier buildings and infrastructure, which can limit the damage, but they also can experience significantly higher damage estimates because of the more expensive nature of the buildings and infrastructure affected. To account for these potential biases, some research uses actual weather patterns (rather than human reporting) to estimate the extent of disaster damage (e.g. Yang 2008; Cole, Healy & Werker 2012). Our approach follows in this tradition. We discuss in detail the construction of the typhoon index in the Appendix.

Political Variables and Methodology

Our measure of political ties is broken down into partisan ties and family ties. ‘Partisanship’ is operationalized as the match in party affiliations of the incumbent district congressperson and the incumbent municipal mayor. ‘Family ties’ is the match in clan membership of the same politicians. To determine party affiliations and clan membership, we use electoral data relevant for our period of study from election years 2001, 2004 and 2007, obtained from the Commission on Elections (COMELEC).

Within these election periods, there were 37 unique party affiliations of winning congresspersons and 58 unique party affiliations of winning mayors. Politicians in the Philippines typically run under several party names, either to signify affiliations with a national party and a local party (e.g. DIMASALANG/LAKAS-CMD), or to signify affiliations with an ad hoc pre-election coalition among national parties (e.g. LAKAS-NUCD/UMDP). To determine the partisan ties between a municipal mayor and her respective district congressperson, we create a variable called ‘partisanship’ which takes on a value of 1 if the congressperson’s party affiliation matched with the mayor’s party affiliation and takes on a value of 0, otherwise.

For the second measure of political ties based on clan membership, we create a variable called ‘family ties’ and, following Querubin (2010a), we match not only last-names of the district congressperson and the municipal mayor, but also look at different combinations of last-names, mid-names, and husband’s last-name (in the case of married women). This is done so as not to miss filial affinities through wives and female relatives. In any case, the results in this paper are very similar if family and relatives are only traced using last-names or mid-names.

A natural concern with the above method is that individuals from the same district who share a last-name, mid-name or husband’s last-name may not necessarily be related by blood to each other. While certainly a possibility, Querubin (2010b) explains how this is less of a concern in the Philippines than in other countries because of how family names were historically distributed across different provinces. Specifically, in 1849, during the Spanish era, a different set of surnames was assigned to each town and local officials then assigned a different surname to each family head. Nevertheless, the possibility of measurement error remains. Fortunately, if our method frequently produces Type 1 errors (false positives) then this should bias *against* our finding support for our hypotheses about family ties.

Results

We begin with a simple graphical illustration of our analysis. Figure 2 shows a side-by-side comparison of levels of typhoon exposure (on the left-hand side) and levels of reconstruction fund distribution (on the right-hand side). The comparison shows some areas where high levels of typhoon exposure correspond to high levels of reconstruction fund distribution (especially in the northern part of Luzon). But there are discrepancies throughout the country where large distributions of reconstruction funds flow to areas with low levels of storm exposure (and vice versa). The following statistical analyses provide evidence for the political nature of these discrepancies.

[Figure 2 about here]

Table 1 presents the regression results from the OLS estimation of the model specified above. Results confirm Hypothesis 1 by showing a positive and significant relationship between the typhoon index (the amount of storm damage) and the amount of per capita reconstruction funds provided. An increase from 0 to 1 on the typhoon index results in an increase of approximately 220 pesos per person in reconstruction funds. For a municipality the size of Tacloban (221,174 people), which was one of the areas devastated the most by Typhoon Haiyan recently, an increase in the typhoon index from 0 to 1 would result in an increase in reconstruction funds of approximately PHP 48.66 million (USD 1.16 million).

[Table 1 about here]

Results also show that a party match between the congressperson and the mayor in a given municipality increases the per capita reconstruction funds allocated to that municipality. The coefficient remains positive and statistically significant when controlling for the typhoon index and with the inclusion of additional control variables, providing support for Hypothesis 2b. If a congressperson and mayor are from the same party, a city the size of Tacloban can expect an increase in total reconstruction funds of approximately PHP 2.24 million (USD 53,292).

There is also evidence in support of Hypothesis 2c. A match in the clan name significantly increases the amount of per capita reconstruction funds allocated to a municipality. This effect remains significant when controlling for the typhoon index and additional control variables. For a city the size of Tacloban, the presence of clan ties between the congressperson and the mayor would result in an additional PHP 9.18 million (USD 218,541) in per capita reconstruction funds.

Further, the coefficient on clan ties is nearly 4 times the size of the coefficient on party ties, and this difference remains statistically significant at the 5% level across all specifications, providing support for Hypothesis 3. This result is consistent with the findings elsewhere in the literature on the importance of non-partisan linkages (e.g. ethnic or tribal ties) for allocation decisions in countries with weak party systems (Eifert, Miguel and Posner 2010). Where party affiliations are weak and ephemeral, politicians can and do make use of alternative networks to guide the distribution of government goods and services. Family ties are among the least risky and most effective institutions through which the political exchange of distributive benefits for electoral support is possible, so it should not be surprising that dynastic politics, rather than party politics, is pervasive in many countries.

It is important to note, however, that party ties still have a significant effect in our fully specified model, which controls for clan ties. Thus, even in the Philippine context where party affiliation is fluid, parties still matter in the distribution of reconstruction funds. Parties (like clan ties) provide another opportunity for upper-level politicians to identify lower-level allies with whom they can engage in exchanging funds for the mobilization of voter support.

Conclusion

Our goal in this chapter has been to explore the extent to which political calculations shape public goods provision following natural disasters in the Philippines. The chapter makes three contributions. First, it develops a novel methodological approach using storm track damage estimates to produce an apolitical baseline estimate of need for government resources in a given area. This method produces baseline estimates that can then be compared to actual patterns of distribution. Second, the paper speaks to the broad literature on distributive politics by demonstrating that even in weak party systems, party ties can be an important basis for distributive politics. Finally, we provide systematic empirical evidence that clan-based partisanship is a powerful predictor of distribution. We find that clan ties are a stronger predictor of disaster reconstruction funding in the Philippines than party-based affiliations.

We can identify several avenues for future research. One is to explore the extent to which presidential ties shape disaster reconstruction allocation. A second avenue is to explore in more detail, via case studies, the dynamics and mechanisms involved in reconstruction assistance in select municipalities. Combining the current project with these additional research avenues is key to developing any policy prescriptions that can mitigate the political allocation of reconstruction funds in the aftermath of disasters.

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Endnotes

¹ See, for example, May (1985); Platt (1999); Garrett and Sobel (2003); Salkowe and Chakraborty (2009); Aldrich (2010); Hyndman (2011); and Reeves (2011).

² But, see Kasara (2007) for an example of when ethnic ties result in a reduction in favorable policies.

³ On how mayors are able to mobilize support at the grassroots level in the Philippines, see Agpalo (1972); Hollensteiner (1963); Kawanaka (2002); Villanueva et al. (1966); and Wolters (1984). On more theoretical treatments of how the local politician-voter linkage may be sustained, see Magaloni, Diaz-Cayeros and Estevez (2007); Medina and Stokes (2007); Robinson and Verdier (2002); and Stokes et al. (2013).

⁴ For several examples, see Gutierrez et al. (1992).

⁵ For a recent example in the Philippines, see: <http://world.time.com/2013/09/11/philippinespork-barrel-graft-probe-has-lawmakers-squealing/>

⁶ Many offices in the Philippines are term-limited. Given this constraint, a common tactic is to attempt to pass offices from incumbents to other family members (e.g. spouses, children, siblings).

⁷ See Aldrich (2010) and Cole, Healy, and Werker (2012) for examples of political calculations in disaster relief spending in India

⁸ In future work, we plan to look at ties to the president as well. Recent scandals suggest that the allocation of calamity funds by the president is also a politicized process (See "SONA Failed to Chart Course, says minority." Business World, 27 July 2010). In his 2010 state of the nation address, President Aquino noted that the province of Pampanga – the second district of which outgoing President Arroyo now represents in Congress - received a large portion of the budget designated for national calamities, with the majority for that province (105 million pesos of the 108 million pesos) going to her district. He also noted that province Pangasinan only received 5 million pesos, even after being ravaged by typhoon Cosme in 2008.

⁹ We are assuming here that party and clan ties are useful proxies for political alliances. However, there are certainly examples of competition and outright feuding between members of the same party or clan. Such feuds should bias against our hypotheses, making it less likely that clan and party ties are significant predictors of reconstruction flows. The fact that we still observe support for our hypotheses, even with intra-clan and intra-party feuds introducing noise into the data, is reassuring.

¹⁰ We include years for which disaggregated data are available: 2001, 2003, 2004, 2005, 2009, and 2010. Data for years 2003, 2004, 2005, 2009, and 2010 comes from the Department of Budget and Management website (<http://www.dbm.gov.ph/>). Data for year 2001 comes from the Philippine Center for Investigative Journalism, which archived this previously published data that is no longer available online.

¹¹ We run the same analysis using DPWH-CA spent on construction of new infrastructure and we do not find any effect of typhoon exposure.

¹² When and whether the allocation gets released or not, however, also depends on the approval of the President.

¹³ Whether all funds released were actually spent on the project or pocketed as rents by the congressperson or the mayors or the DPWH bureaucrats is another matter.

¹⁴ Unfortunately, detailed data on calamity fund distribution are not available.

¹⁵ For instance, former President Gloria Arroyo is charged with plunder in the alleged misuse of the PHP 900 million Malampaya Fund that was meant for disaster rehabilitation and reconstruction in the wake of super typhoons "Ondoy" and "Pepeng" in 2009.

Tables

Table 1. Typhoon affectedness, party match, family match, and their effects on per capita reconstruction funds

Dependent Variables	Independent Variable: Per Capita Reconstruction Funds					
	(1)	(2)	(3)	(4)	(5)	
Typhoon Index	$\beta_1 =$	368.7*** (101.6)	367.5*** (105.9)	191.9*** (53.6)	180.8*** (53.0)	220.6*** (62.5)
Party Match	$\beta_2 =$		9.5* (5.7)	10.8** (4.36)	10.8** (4.4)	10.5** (4.3)
Family Match	$\beta_3 =$		49.9*** (14.6)	39.8*** (12.0)	39.8*** (12.0)	41.5*** (12.1)
District Fixed Effects		No	No	Yes	Yes	Yes
Election Year Fixed Effects		No	No	No	Yes	Yes
Controls		No	No	No	No	Yes
Constant		64.7*** (2.2)	58.9*** (3.1)	61.9*** (2.5)	58.9*** (2.8)	108.1*** (29.2)
R-Squared		7,901	7,462	7,462	7,462	7,238
Observations		0.011	0.014	0.288	0.288	0.294
Testing Hypothesis 3: $\beta_2 = \beta_3$ (<i>p-values</i>)			(0.0111)	(0.0347)	(0.0343)	(0.0243)

Notes: All results are based on Ordinary Least Squares estimations. Dependent variable: Per Capita Reconstruction Funds distributed by a congressperson to municipality j within his district at year t . Independent variable: Typhoon Index is a measure of typhoon affectedness of municipality j in year t ; Party Match and Family Match are indicators for the match in partisanship or clan affiliation between the congressperson and the municipal mayor. Control variables include per capita Internal Revenue Allotment (IRA), indicators for rural and partially urban classifications, and log of land area (in hectares). Robust (Huber/White) standard errors in parentheses, clustered at the municipality level. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Figures

Figure 1. The number of typhoons and tropical storms per municipality (averaged across years 2001-2010). The darkest areas experienced 26 storms during this period while the lightest areas experienced zero.

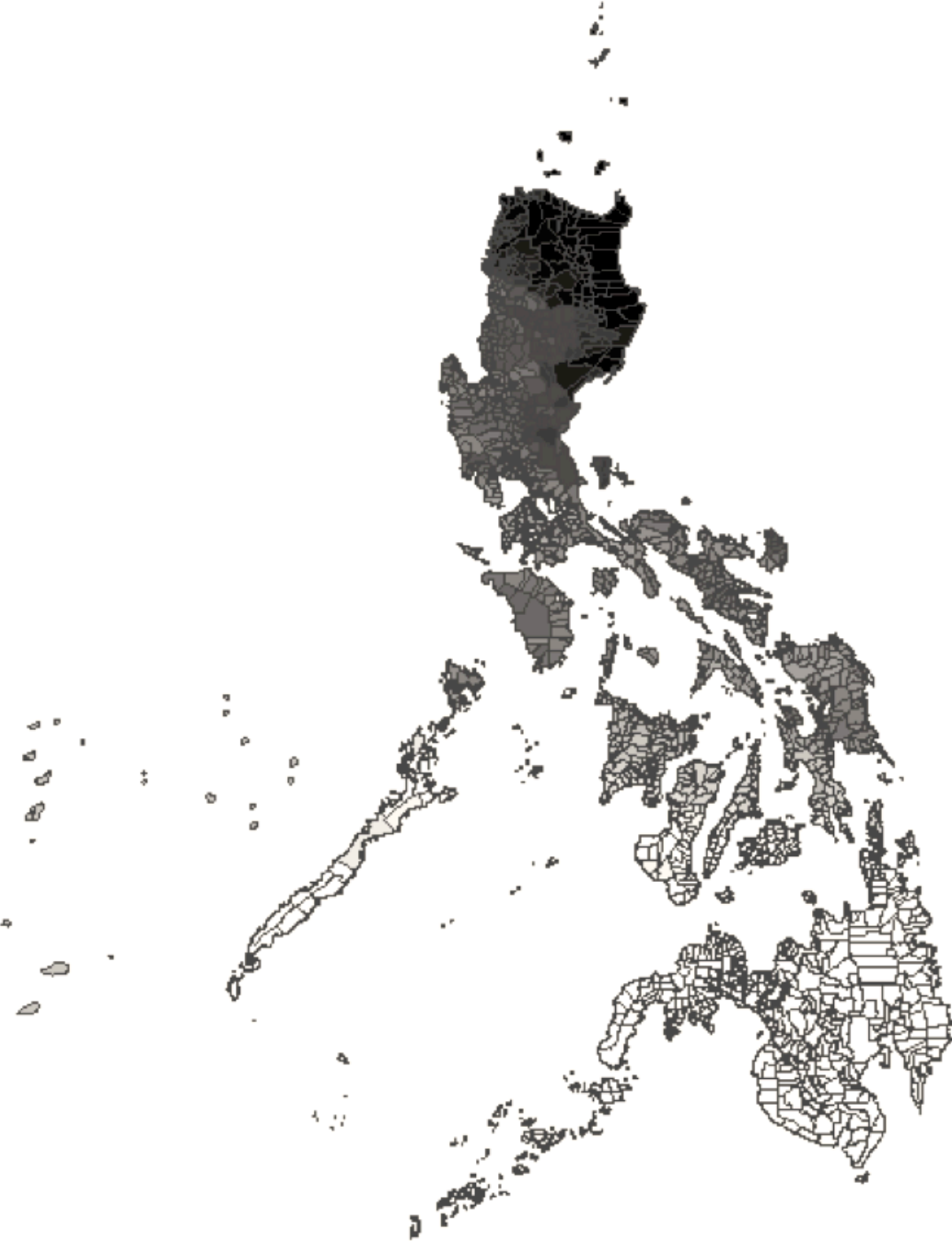


Figure 2. Storm exposure in 2009 (left) and the distribution of reconstruction funds (right). Darker areas represent greater exposure and more funds, respectively.



Appendix

Construction of the Typhoon Index

To create a baseline for the comparison of storm damage across municipalities, we follow the methodology found in Yang (2008) and develop a typhoon index using data on tropical storms from the Japanese Meteorological Agency.¹ The storm data include best tracks of each storm, with date, time, location (latitude and longitude), windspeed, barometric pressure and type of tropical storm or typhoon. Data are collected along each storm track at 6-hour intervals. Figure 2 provides an example of the best tracks and corresponding data points of the storms that affected the Philippines in 2009.

[Appendix Figure 1 about here]

We use these data to construct a typhoon index at the municipality-year level. The level of storm damage experienced due to a typhoon depends on several storm-related factors, most notably windspeed. Additionally, a typhoon is likely to cause more damage in areas of higher population concentration (with presumably more infrastructure that could be damaged). We use these assumptions to create a typhoon index for municipality j in year t as follows:

$$typhoon_{jt} = \left[\sum_i \sum_s x_{isjt} \right] / N_{jt}$$

The variable x_{isjt} measures the level of exposure for an individual i by storm s in municipality j and year t . The level of exposure is calculated as follows:

$$x_{isjt} = (w_{isjt} - 33)^2 / (w^{MAX} - 33)^2$$

where w_{isjt} is the windspeed to which an individual was exposed (in knots) and w^{MAX} is the maximum windspeed in the data set, which is 125 knots.² Thus, this measure consists of the square of the windspeed above the tropical speed threshold (33 knots) experienced by a given municipality divided by the square of the maximum windspeed above the tropical speed threshold experienced by any municipality in the data set.³ To construct the storm index, individual exposure is summed across all storms in a given year and across all individuals in the municipality, with the result divided by the municipality population, N_{jt} .

The typhoon index is essentially a measure of “intensity-weighted events per capita” (Yang 2008). An index of 1 would occur if all of the residents in a given municipality were exposed to the highest intensity windspeed ($x_{isjt}=1$) once in a given year. To construct the individual-level exposure variable, we use population data at the barangay level.⁴ We use the storm best-track data, a model of windspeed decay given distance from typhoon eyes, and geographic information systems software (ArcGIS 10.0) to estimate the windspeed experienced at each barangay for each separate storm (Dilley et al. 2005). This level of exposure is summed across all storms and population-weighted barangay (as opposed to individuals) by year.

Appendix Endnotes

¹ Although we use a similar methodology to Yang (2008), we adapt his approach to develop sub-national, rather than national, levels of typhoon exposure.

² 1 knot = 1 nautical mile per hour; 1 nautical mile = 1.15 land miles. Also, 33 knots is the minimum threshold for a storm to qualify as a tropical storm.

³ The maximum windspeed in this data set occurred during typhoon Juan in 2010.

⁴ The 1623 municipalities in the Philippines are subdivided into 41,940 barangay.

Appendix Figures

Appendix Figure 1. Storm tracks in the Philippines in 2009.

