Coup-proofing, reconstruction, and resource allocation in fragile and post-conflict countries

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Contents

1 Acknowledgements

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2 Abstract

In this thesis, I explore three main questions. How do resource windfalls affect leaders' coup-proofing strategies when facing coup risk? Second, what does determine the sub-national allocation of post-conflict donors' reconstruction aid? Third, under which conditions is aid an effective tool to promote the redevelopment of the manufacturing sector of post-conflict countries?

In the first two chapters, developing an opportunity-willingness framework, I investigate how access to natural resources and unearmarked aid affects leaders' decisions to undertake institutional coup-proofing when facing coup risk. On the empirical side, I also present and discuss a strategy to capture the relation between coup risk, discretionally allocable resources and institutional coup-proofing taking into account the multidirectional dynamics between these dimensions. Results from a cross-section time-series analysis suggest that leaders who have access to funds they can discretionally allocate are less likely than others to undertake institutional coup-proofing efforts when facing coup risk.

In the third chapter I co-authored with dr. Steinwand, we investigate how political support for the former warring factions affected the sub-national allocation of donors' resources across Nepal since the end of the civil war in 2006. Results suggest that the peace agreement that concluded the decade-long conflict was unsuccessful to prevent partisan allocation of aid.

Finally, in the last chapter, I study via a cross-section time series analysis if and to what extent donors' efforts to rebuild the energy infrastructures of post-conflict countries contribute to promoting recipient countries' manufacturing sector. I find that resources targeting the restoration of facilities to produce and distribute energy have a significant and positive impact in spurring the manufacturing sector of countries that experienced a conflict.

Presented findings increase our understanding of the factors affecting civil-military relations and state-budgeting in fragile countries. At the same time, they advance our understanding of how aid shapes post-conflict countries.

3 Introduction

In this thesis, I aim to investigate how resource windfalls influence countries affected by socio-economic instability. In particular, I aim to examine how such resources impact civil-military relations, how they interact with power equilibria between former warring factions, how they shape spoil politics in post-conflict settings and, finally, how they can contribute to making post-conflict economies more resilient to exogenous economic shocks. Two main reasons motivate this research agenda. First, civil-military relations are one of the determinants of military effectiveness (Nielsen, 2002; Biddle and Long, 2004). Considering this, advancing our understanding of what shapes them is consequently central to shed more light on what affects military power and, therefore, gaining insights regarding the extent to which states can dominate their adversaries (Brooks, 2007). Second, advancing our knowledge regarding how resource windfalls interact with power-equilibria in post-conflict countries as well as how they reshape post-conflict economies helps to explain what makes fragile countries more - or less - stable, prone to a renew of conflict outbreaks and inclined to develop accountable governments. In this sense, this thesis intends to contribute to the greater debate regarding state-building in countries with fragile political institutions and economies.

In the first and the second chapters of the thesis, I address the first question looking at how access to discretionally allocable resources shapes civil-military relations in coup-risk-affected countries. Notably, first I investigate the role of discretionally allocable "endogenous resources" i.e natural resource rents. Then I investigate the role of discretionally allocable "exogenous resources" i.e unearmarked foreign aid. In both cases, I focus in particular on the role that discretionally allocable resources and coup risk have on the extent to which rulers undertake institutional coup-proofing measures. In the third chapter, I investigate how power equilibria between former warring factions and other groups shape the relation between conflict, voting patterns, and sub-national allocation of foreign post-conflict reconstruction aid. Notably, I focus on the case of early post-conflict Nepal looking at the Peace Agreement that concluded the ten-years-long civil war that affected the country between 1996 and 2006.

Finally, in the fourth chapter, I explore the conditions under which the allocation of foreign aid to post-conflict countries contributes to redevelop their economies focusing on the impact on the manufacturing sector.

Understanding how and when aid or natural resource revenues fund institutional coup-proofing in coup-risk-affected countries is relevant for different reasons. First, institutional coup-proofing is one of the most common and relevant coup-proofing strategies leaders resort to when facing coup risk (De Bruin, 2018). In this sense, investigating what shapes leaders' decisions regarding the implementation of this strategy contributes to advance our understanding of civil-military relations. Second, because donors' resources are scarce it is fundamentally relevant to understand if, when and to what extent aid flows fund additional development spending and when they merely substitute institutional coup-proofing strategies. Third, as natural resources represent one of the most important sources of revenue for fragile countries[1], understanding when, if and to what extent aid or natural resource revenues contribute to funding institutional coup-proofing allows to better grasp the mechanisms behind state budgeting within these countries. Finally, as in the last 70 years, coup plotters launched 478 coups ≈50% of which have been successful [2] understanding how state-budgets affect coup-proofing strategies indirectly contributes to our understanding of the determinants of regime transitions and leader survival.

At the same time, there are multiple reasons to further investigate what role foreign aid plays in post-conflict countries. First, as on the one hand, foreign aid tends to be very productive (Collier and Hoeffler, 2002), on the other, the vulnerability of post-conflict countries increases the risk of severe consequences in case of wrong policies. Second, understanding how post-conflict power equilibria affect the sub-national allocation of foreign aid is crucial to advance our understanding of how reconstruction programs might create new subnational grievances. A better knowledge of these phenomena is essential to develop strategies that

[1] According to data from the World Bank natural resource revenues accounted for 17% of the GDP of fragile and conflict-affected countries between 1970 and 2016.

[2] According to the Coup d'etat Dataset (2011).

can prevent conflict recurrence. Third, as countries with limited economic diversification and whose economy relies on natural resources are more at risk to suffer from negative economic shocks (Gylfason, 2006; Collier and Goderis, 2008; Mavrotas et al., 2011), studying the effects of aid on the economy's productive sectors contributes indirectly to understanding how to promote and sustain peace in post-conflict fragile countries. Further, as the structure of the economy affects the extent to which leaders have access to discretionally allocable resources, then investigating how to encourage and strengthen productive rather than extractive sectors contributes to understanding how to promote more accountable post-conflict governments.

Regarding the first two chapters, for centuries, the allocation of resources to strategic actors played a crucial role for those willing to seize or retain power. An early interesting example comes from the Roman Empire in 193 a.C. After the praetorian guards had dismissed emperor Pertinax as a retaliation to his refusal to raise their salary, Sulpicianus and Julianus competed against each other to gain the favour of the guards and, thus, conquer the throne. In the words of Cassio Dio "[after the death of Pertinax] just as if it had been in some market or auction-room, both the City and its entire empire were auctioned off. The sellers were the ones who had slain their emperor, and the would-be buyers were Sulpicianus and Julianus, who vied to outbid each other, one from the inside, the other from the outside [the praetorian camp]. They gradually raised their bids up to twenty thousand sesterces per soldier. Some of the soldiers would carry word to Julianus, 'Sulpicianus offers so much; how much more do you make it?' And to Sulpicianus in turn, 'Julianus promises so much; how much do you raise him?' " (Cassius, C.D.D. and Cassius, D, 1914; vol. IX p. 143). Similarly, in more recent times, Qaddafi relied intensely on oil revenues to buy the loyalty of tribal chiefs who were threatening his rule in the aftermath of his coup in 1969 (Quinlivan, 1999) while both the Venezuelan and the Algerian regimes resorted to such revenues to prevent regime change, in 2017[3] and 2011 (Muradova, 2016). Likewise, during his rule, Ali Saleh kept the

[3]Ulmer, Alexandra and Buitrago, Deisy. "Maduro taps major general to lead Venezuela's deteriorating oil industry". Reuters, 26/11/2017, available at: https://www.reuters.com/article/us-venezuela-

support of crucial sheikhs and generals through direct payments to their tribal and military constituencies[4].

Yet, despite the army is an extremely relevant actor for leaders of fragile countries willing to keep the office, the current literature dedicates little attention to explaining the role of discretionally allocable resources in shaping the strategies that leaders resort to stay in office when facing coup risk. For this reason, in the first two chapters of my thesis, I investigate how access to natural resource revenues and unearmarked foreign aid affects leaders' decision to undertake institutional coup-proofing efforts when facing coup risk.

I pose that leaders who have access to resources that they can allocate as they prefer are less likely to undertake institutional coup-proofing efforts when coup risk rises. This is because when coup risk is relatively high, undertaking coup-proofing measures openly against the military - as institutional coup-proofing - might trigger a preventive coup (Koga-Sudduth, 2017). Thus, leaders who have access to discretionally allocable resources prefer to fund other strategies than institutional coup-proofing as they have the right financial resources to do so. In turn, leaders who do not have access to discretionally allocable resources are more likely to resort to this latter strategy as they lack the financial capacity to undertake alternative coup-proofing strategies.

Here, I will refer to institutional coup-proofing as the set of strategies that include: the creation of multiple rival forces inside the army and militias parallel to it, the rotation of command positions, and the purging of rival military officers (Quinlivan, 1999; Belkin and Schofer, 2003; Powell, 2012). It is important to recall that while institutional coup-proofing is one of the most common coup-proofing strategies (De Bruin, 2018), it is not the only one that leaders who face the threat of a coup can resort to. Some examples of these alternative strategies are: pleasing the selectorate with ad hoc fiscal reforms, increase stability, buy-off

politics-pdvsa/maduro-taps-major-general-to-lead-venezuelas-deteriorating-oil-industry-idUSKBN1DQ0R9, accessed April 2019.

[4]US State Dept., 'Will Saleh's successor please stand up?', 17 Sept. 2005. Downloaded from Wikileaks and also available via The Guardian, https://www.theguardian.com/world/us-embassy-cables-documents/40815

challengers or finance repression (Beblawi and Luciani, 1987; Quinlivan, 1999; Ross, 2001; Morrison, 2009).

What motivates the focus on natural resource revenues and foreign aid is the consideration that while rulers have used a great variety of strategies to gain access to discretionary allocable resources[5], more recently natural resource revenues and foreign aid have often proved to be an exceptional source of discretionally allocable resources for rulers. What makes leaders prone to use natural resource revenues to fund their coup-proofing strategies to retain office are two main factors.

First, natural resource revenues provide a source of foreign hard currency that eases the purchase of weapons to arm paramilitaries loyal to the leader and military expenditure to please the military (Perlo-Freeman and Brauner, 2012). Second, they are generally in the complete disposition of leaders and untied from taxpayers' control[6] (Quinlivan, 1999; Girod, 2015; Morrison, 2009; Caselli and Michaelis, 2009).

At the same time, for donors, it is difficult to control how aid-recipient leaders use the funds they receive. This is because aid-recipient countries receive multiple aid flows from multiple sources simultaneously and their domestic revenues – thus their budget - are likely to be non-static and changing in the same period when aid is received (Pack and Pack, 1993; Feyzioglu et al., 1998). Moreover, Manning and Malbrough (2010), underline how in most of the cases differences in the incentive structure, priorities and practices might further decrease donors' ability to coordinate effectively and supervise recipients' expenditure. As a result, it is not surprising that aid-recipient leaders can then often use at least a part of donors' resources to fund their strategies to retain power rather than investing in development programs. For example, Mwenda and Tangri (2005) and Wright (2008) show how aid flows often provided aid-recipient leaders with the opportunity to fund their patronage schemes as well as increase personal wealth, repress and buy off potential opponents.

[5]Already in the XVIII century, Frederick II instituted a "Fund at disposal of the King" to bypass the controls of the Prussian Court of Audit (Barbero, 2017).

[6]The experience of Cameroon's offshore and extra-budgetary fund to manage oil rents is exemplary: between 1977 and 2006 more than 50% of the revenues accrued disappeared (Gauthier and Zeufack, 2011).

An interesting example of how access to natural resources shaped coup-proofing strategies and civil-military relations over time comes from the regime of General Gawon in Nigeria. When he seized power in 1966 the country had already experienced tense civil-military relations and a series of coups and counter-coups. As an attempt to increase his chances to stay in office, Gawon rapidly reorganized the army fragmenting it and redeploying soldiers depending on their ethnicity and region of origin (Barua, 2013). Despite this decision probably contributed to facilitating eastern separatist insurgents (Obasanjo, 1980) fragmenting the army probably contributed to breaking the chain of coups in the early phase of the Nigerian post-colonial era. Yet, when nine years later the risk of a coup in the country rose again as Gawon announced his willingness to not withdraw from power as promised, to increase his chances to stay in office the General resorted to a strategy different from the one he had implemented in 1966. Indeed, just after his announcement, he did not fragment the army but rather implemented a series of generous fiscal reforms targeting crucial Nigerian elites and increasing the salary of civil servants up to 130% while favouring urban communities with ad hoc public investments (Gelb, 1988). What had changed since 1966 was that now Gawon could take advantage of the conspicuous Nigerian oil revenues accrued abroad between 1973 and 1974.

To empirically test my first two hypotheses I resort to two two-stage cross-section time-series analyses. In both the first and second chapter, to capture the number of ground-combat compatible military organizations in a country in a given year I rely on the counterbalancing index (Pilster and Böhmelt, 2011). Higher levels of the index indicate the presence of several equally strong military or paramilitary rival organizations. In this sense, higher levels of the index suggest more intense institutional coup-proofing efforts. At the same time, to measure the level of coup risk I estimate the probability for a country to experience at least one coup attempt in a given year via a logit model of a coup attempt. Finally, to capture the amount of discretionally allocable resources that leaders enjoy, in the first chapter I rely on data

from the World Bank Open dataset[7], while in the second chapter on data from the AidData Core Research Release (Tierney et al., 2011).

With regard to the third and the fourth chapters discussed in this thesis, the effect of resource windfalls in fragile post-conflict countries has long been debated by scholars and practitioners. Indeed while in some cases the efforts of bilateral and multilateral aid allocations led to success stories of post-conflict reconstruction, in others results have been far below expectations. For example, in the decade following the peace onset in Sierra Leone, donors provided the country with 69 US dollars per capita on average per year[8]. In 2012, ten years after the breakout of peace, Sierra Leonean GDP per capita had risen by 30% but the infant mortality rate was still 69% of its 2002 value and the country's dependency on natural resources had increased dramatically[9]. In neighboring Liberia, donors' support in the decade following the Accra Peace Agreement was even double than in Sierra Leone. Nevertheless, in 2014 natural resources revenues still accounted for almost half of the country's economy[10]. At the same time, while after ten years from the peace onset Mozambican reliance on natural resources had decreased by 6 percentage points and the GDP per capita rose by 47%, the infant mortality was still 62% of its 1992 level in face of average support of 69 US dollars per capita per year.

While various studies have explored what can explain this variation looking at how foreign aid affects different social, economic, and political dimensions (Licht, 2010; Wright, 2009; Asteriou, 2009; Irandoust et al., 2005; Heckelman and Knack, 2009; Schmidt-Hebbel, 2007; David et al. 2011; Demekas et al. 2002; Garriga and Phillips, 2014; Collier and Hoeffler, 2002 a; Collier et al. 2003; Suhrke et al., 2005; Nunnenkamp, 2016; Grossman, 1992; Collier and Hoeffler, 2002 b; Nielsen et al., 2011), findings have been mixed. For example, while some researchers point at the positive impact of aid (Hansen and Trap, 2000; Arndt et al.,

[7]Total natural resources rents (% of GDP); https://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS

[8]Data from AidData (Tierney et al., 2011)

[9]According to the World Bank, while natural revenues constituted only 8% of the Sierra Leonean GDP in 2002 this percentage rose to 23% in 2012.

[10]In 2013 natural resource revenues accounted for 49% of the GDP while in 2003 it was 37%.

2010), Burnside and Dollar (2002) claim that this is conditional to the policies that recipient countries implement while Rajan and Subramanian (2011) pose that aid decreases the growth performances of the manufacturing sector.

To contribute to advance this debate and explore what determines the impact of foreign aid allocations in fragile and post-conflict countries, in the second part of my thesis I investigate first, if and to what extent post-conflict power equilibria between former warring factions affect the subnational allocation of donors' resources. Second, I look at the effect of foreign aid targeting energy infrastructures.

Notably, in the third chapter co-authored with dr. Steinwand, we look at the aid redistribution effects of the Comprehensive Peace Agreement that ended the Nepalese civil war in 2006. We argue that while the agreement enfranchised groups that fought during the civil war and supported the peace agreement, those groups that did not take a side were penalized after the peace onset and received less developmental aid regardless of the socio-economic needs. We pose that this is because groups that did not take side during the conflict were under-represented during the negotiations and were not able to threaten future conflict. For this reason, the groups who fought during the war had the opportunity to usurp political and economic benefits that previously accrued to non-combatant parties, and add them to the pie over which they bargained.

Finally, in the last chapter, I examine if and to what extent rebuilding energy infrastructure in post-conflict countries has a positive impact on restoring the manufacturing sector of recipient countries - and, thus, decreasing their reliance on natural resource extraction. In particular, I argue that when donors allocate resources to rebuild the energy infrastructure of post-conflict countries they contribute to reduce the production costs and increase the expected profits for the manufacturing sector thus supporting its growth.

To investigate aid allocation in post-conflict Nepal we bring together data on aid allocations (AidData. 2016), fighting activity (Sundberg and Melander, 2013; Croicu, Mihai and Sundberg, 2017; Joshi Madhav, and Subodh, 2015) elections results (Election Commission

of Nepal) and census data (Open Nepal data hub). At the same time, in the last chapter of the thesis, the AidData Core Research Release is the backbone for my analysis on the impact of aid flows targeting energy infrastructures in post-conflict countries. Indeed, the dataset allows identifying different aid flows by their destination thanks to a detailed set of codes. At the same time, to define post-conflict countries I rely on the UCDP Conflict Termination Dataset (Kreutz, 2010) while, to capture changes in the relative relevance of the manufacturing sector in aid-recipient economies I look at the value-added from the manufacturing sector as a percentage of the GDP using data from the World Bank Open dataset[11].

As discussed, the thesis is divided into four chapters. Each of them starts with an introduction and continues reviewing the most relevant literature, presenting the main hypothesis and methods and closing with conclusions and appendixes. The first two chapters include two short case studies on the relation between discretionally allocable resources and institutional coup-proofing in Nigeria and Bangladesh. Finally, the conclusions of the thesis provide a last overview of results summarizing the main findings, discussing their implications and offering suggestions on avenues for future research.

[11]https://data.worldbank.org/indicator/NV.IND.MANF.ZS

4 Chapter 1 - Institutional coup-proofing and endogenous resources: the case of natural resource revenues

4.1 Abstract

In this paper, I propose a new theory to explain when and to what extent leaders resort to institutional coup-proofing. By developing an opportunity-willingness framework, I argue that access to natural resources increases leaders' willingness to undertake institutional coup-proofing efforts when coup risk is low while it decreases the leader's likelihood to undertake such efforts when coup risk rises. This is because when coup risk is high - thus implementing institutional coup-proofing might trigger a preventive coup - leaders who have access to funds that they can allocate discretionally prefer to invest in other coup-proofing strategies than institutional coup-proofing. In turn, when coup risk is low, leaders who can allocate resources discretionally are likely to implement institutional coup-proofing as a preventive strategy and rely on other strategies than institutional coup-proofing when coup risk rises. On the empirical side, I resort to a cross-section time-series multivariate two-stage least squares analysis covering 107 countries between 1970 and 2013 to disentangle the three-way relationship between coup risk, natural resource revenues and coup risk. Findings support my hypothesis and are robust to different model specifications contributing to shed more light on the relation between coup risk, natural resources and institutional coup-proofing.

4.2 Introduction

Scholars have long investigated *how* natural resources contribute to funding leaders' coup-proofing strategies. Yet, current literature does not investigate *when* access to natural resources provides leaders with valid alternatives to institutional coup-proofing. In this paper, I develop an opportunity-willingness theoretical framework to investigate this aspect of civil-military relations and pose that access to natural resource revenues has a positive impact

on the extent to which leaders undertake institutional coup-proofing only when coup risk is relatively low. In turn, as coup risk rises, leaders who have access to natural resource revenues are less likely to resort to institutional coup-proofing than other leaders. On the empirical side, I propose an instrumental variable approach to examine how access to natural resource revenues influences the implementation of institutional coup-proofing strategies taking into account the feedback loop between coup risk, extraction of natural resources and the undertaking of coup-proofing efforts.

Hereinafter I will refer to institutional coup-proofing as the set of strategies that include: the creation of multiple rival forces inside the army and militias parallel to it, the rotation of command positions and the purging of rival military officers (Quinlivan, 1999; Belkin and Schofer, 2003; Powell, 2012). Notably, despite this is one of the most common coup-proofing strategies leaders resort to (De Bruin, 2018), there is a wide variation with regard to what extent leaders resort to it.

For example, after surviving a coup-attempt in 2012, Sudanese President Omar al-Bashir reduced his efforts to counterbalance the army, while neither General Ibrahim Baré Maïnassara nor his successor Daouda Malam Wanké undertook this move after the coups that brought them to power in 1996 and 1999. In turn, during the three years following the overthrowing of Chatichai Choonhavan, the number of Thai ground-combat compatible military organizations rose by 0.7 units suggesting an intensification of institutional coup-proofing efforts[12].

So far, studies have explained this variation considering dimensions as the relative level of coup risk or the political regime of countries (Böhmelt and Pilster, 2012; Koga-Sudduth, 2017). In this paper, I intend to advance our understanding of civil-military relations by studying when leaders decide to face coup risk resorting to institutional coup-proofing and when using natural resources to fund alternative strategies. In my framework, coup risk affects leaders' willingness to implement coup-proofing strategies and access to natural re-

[12]Data from the Counterbalancing / Coup-Proofing Data (Pilster and Böhmelt, 2011; 2012)

sources provides them with the opportunity to implement coup-proofing strategies other than institutional coup-proofing.

I assume that the goal of incumbent leaders is to retain power and that they chose their survival strategies depending on the resources they have and the threat they face (Bueno de Mesquita et al., 2002; 2017). To face coup risk, leaders can resort to natural resource revenues to buy-off rivals in the military and strengthen their own legitimacy (Beblawi and Luciani, 1987; Albrecht and Eibl, 2018) or they can implement institutional coup-proofing. These strategies have different costs and risks associated and I argue that the decision regarding which strategy to undertake ultimately depends on leaders' capacity and willingness to face such costs.

As the military desire to preserve autonomy and safeguard corporate interests, they might perceive leaders' implementation of institutional coup-proofing measures as dangerous, unwanted and disagreeable interference (Thompson, 1973; Finer, 2002). In this sense, the implementation of such measures might increase the risk of a preventive coup. Some examples come from Algeria and Ghana where leaders' attempts to fragment the army contributed to triggering the 1966 and 1965 coups (Zartman, 1970; Adekson, 1976). Moreover, fragmenting the army into multiple units reduces its capacity to fight effectively interstate and intrastate wars like the Libyan 1987 intervention in Chad and the Libyan 2011 counterinsurgency campaign suggest (Pollack, 2004; Böhmelt and Pilster, 2011; Gaub, 2013). Nonetheless, buying-off rivals in the military and pleasing the selectorate to prevent coup-plotters from increasing their support among it requires access to honeypots of resources that leaders can allocate discretionally.

I pose that leaders who have access to natural resource revenues resort to institutional coup-proofing only as a preventive measure when they believe they do not risk triggering a preventive coup - i.e when coup risk is low. In turn, when coup risk rises these leaders prefer to use natural resource revenues to secure their position buying-off rivals and pleasing the selectorate or, in the most extreme cases, securing wealth abroad. This is because when

coup risk is high, implementing a coup-proofing strategy that is openly against the interests of the military - as institutional coup-proofing - might trigger a preventive coup. Contrarily, leaders who do not enjoy access to such revenues have only institutional coup-proofing as a measure to face coup-plotters when coup risk rises. In this sense, they are expected to react to rising levels of coup risk increasing institutional coup-proofing efforts as they do not have other options.

To test my hypothesis, I resort to a cross-section time-series two-stages least-squares analysis including 107 countries over 43 years. Moreover, to corroborate my results, I propose as a short case study an overview of coup-proofing strategies in Nigeria before and after the oil-boom in the mid-1970s.

The paper develops as follows: first, I present the strategies leaders can resort to face coup-plotters and the role of natural resource revenues in implementing them. Second, I explain how access to natural resource revenues drives leaders' decisions to implement or not institutional coup-proofing when coup risk rises. Then I present methods, results and the short case study on Nigeria. Conclusion and appendix conclude the chapter.

4.3 Coup-proofing strategies

To face coup risk, leaders can reduce the willingness of the military to intervene. To achieve this goal they can increase the expected cost associated to stage a coup as well as the value of maintaining the status quo (de Mesquita and Smith, 2017). To this end, leaders can increase the provision of private goods to crucial supporters among the military or increase the number of resources allocated to the military sector[13] (Powell et al., 2018; Albrecht and Eibl, 2018). At the same time, leaders can strengthen their legitimacy, and ensure

[13]For example, Girod (2015) recalls how during the 2001 elections Soloman Islander leaders targeted with 5.4 million of US dollars politicians, rebels and police members that had organized a coup attempt the previous year. Likewiese, Chambers (2015) describes how the Cambodian Prime Minister Hun Sen ensured civilian control of the military and police driving the military into a managed dependence through a mixture of fear and rewards. In the words of Prof. Pou Souvachana reported by Chambers, [the prime minister] "takes good care of his military cronies, rewarding those who work with him. He rarely changes ministers and other personnel while regularly increasing the number of stars for his generals. This is why Cambodia has perhaps the most generals of any country in the world." (Chambers, 2015; p.190)

the support of the selectorate to decrease the military's capacity to intervene. Indeed, the armed forces' chances to stage a successful coup and maintain a newly-established military government are highly dependent on popular acquiescence and support[14] (Roberts, 1975).

Alternatively, leaders can reduce the military's capacity to strike. For this purpose they can resort to institutional coup-proofing and create multiple rival forces inside the army and militias parallel to it, rotating command positions and purging rival military officers (Quinlivan, 1999; Belkin and Schofer, 2003; Powell, 2012). The creation of different security forces with their chains of command and the rotation of command positions increase the obstacles to the communication thus making for coup-plotters more difficult to coordinate (Quinlivan, 1999). Coordination is vital for coup-plotters who, to launch a successful attack, have to timely and rapidly take control of the centers of power and broadcast stations (Luttwak, 2016). Coordination is essential as well when coup-plotters have to consolidate their achievements and signal to any potential actor willing to react that the coup has already succeeded. If coup-plotters fail to do so, actors willing to counter the coup may strike back while some of the actors backing the coup may defect[15] (Luttwak, 2016; De Bruin, 2018).

Moreover, the creation of different security forces parallel to the army increases the number of armed actors willing to preserve the status quo (Böhmelt and Pilster, 2015). Indeed, when leaders threatened by coup risk create new security forces and appoint loyalist officers as commanders (Horowitz, 1985; Harkness, 2016) they ensure that the goal of these

[14]The course of events of the Soviet 1991 coup-attempt remark how difficult is for coup-plotters to be successful when they face a valid civil resistance. Between August 19th and 22nd large citizens' demonstrations successfully persuaded soldiers that their leaders were far from being in control of the country and convinced them to defect. Taxi and truck divers organized patrols to obstruct armored units' deployment and oppose coup-plotters' movements while civilians even managed to appropriate tanks for their purposes (Varney and Martin, 2000). At the same time, neglecting and ignoring civilian relevant actors might well facilitate the military's intervention. For example, alienation and antagonization of Thai middle class and other elite groups were relevant factors that drove the coup against Thaksin Shinawatra in 2006 (Prasirtsuk, 2007).

[15]In this regard, an important instance comes from the Soviet 1991 coup-attempt. During the days of the coup, the junta was not able to firmly communicate to be in control of the Union. Printers refused to publish junta-endorsed papers and journalists circumvented restrictions on television to broadcast Yeltsin's declarations. At the same time, Izvestia's journalists and printing workers managed to publish the newspaper including Yeltsin's anti-coup statements while journalists from suspended radical newspapers organized underground operations to print and distribute anti-Junta publications. In parallel, the radio station Moscow Echo kept on broadcasting Yeltsin's appeals to oppose the coup. As a result, fierce civil resistance rose and many officers in the military refused to support the coup (Varney and Martin, 2000).

units is to protect their leadership. The result is that in case of a coup, units loyal to the leader will have strong incentives to fight coup-plotters as they are aware that the risk of being dismantled by the new regime is very high (De Bruin, 2018).

Yet, as Böhmelt and Pilster (2015) point out, there is no linear relationship between counterbalancing efforts and decreasing military capacity to stage a coup. In fact, the authors show that counterbalancing efforts are most effective when in a country are present about two equally strong military organizations and through Decaio (1990) recall how the excessive fragmentation of Ugandan armed forces in 1971 obstructed the resistance to the coup.

Finally, if leaders believe they do not have enough resources to oppose coup-plotters, they can send rents abroad and simply flee the country (Wright, 2008). In this sense, peculiar but telling is the case of Robert Mugabe who in the last years of his regime used to travel with a suitcase with "coup money" in case he was ousted while abroad[16].

4.4 Coup risk and coup-proofing: the role of natural resources

Natural resources play an important role in the relationship between institutional coup-proofing and coup risk. Coup risk affects the extent to which such revenues constitute the backbone of state finance and is likely to increase countries' natural resource dependency. This is because, first, the decline of socio-political stability is likely to hit less harshly the resource extracting sector than others as this sector has limited linkages with the rest of the economy and can not be relocated (Brunnschweiler and Bulte, 2009; Mitchell and Thies, 2012). Second, instability encourages the incumbent faction in power to over-extract natural resources to stock revenues before they could be lost because of regime change and to buy-off opponents (Robinson et al. 2006; Fjelde, 2009; Collier, 2010). Yet, at the same time, natural resource revenues that coup-plotters can loot if successful might increase the risk of a coup (Acemoğlu et al., 2008).

On top of this, simultaneously, leaders often resort to natural resources revenues to coun-

[16]How to hide a billion dollars, The Economist, October 10^{th} 2019 edition

terbalance the army, please the selectorate, increase stability, buy-off political consensus and finance repression (Beblawi and Luciani, 1987; Quinlivan, 1999; Ross, 2001; Morrison, 2009). A recent instance comes from Venezuela where the appointment of a National Guard Major General as leader of the Venezuelan state oil company PDVSA in November 2017 followed a period of protest threatening Maduro's regime[17]. Other instances come from Libya - where Qaddafi resorted to oil revenues to buy the loyalty of tribal chiefs who were threatening his rule[18] and Algeria - where during the protests of 2011, the Algerian government used oil revenues to finance interest-free loans and the creation of 70.000 workplaces for young people (Muradova, 2016). Likewise, during the 1970s, 1980s and 1990s President Ngouabi - who had taken the power in 1969 and faced a coup attempt in 1972 - and President Sassou-Nguesso resorted to oil revenues to patronize relevant parts of the selectorate and fund the constitution of presidential guards and paramilitary forces loyal to them (Clark, 1997). Eventually, Skocpol (1982), Quinlivan (1999), Sandbakken (2006) and Collier (2011) link the funding of coup-proofing strategies, patronage schemes and security apparatus in Iraq, Iran, Algeria, Nigeria and the Arab countries of the Persian Gulf to their vast petrol revenues.

Two main reasons explain the link between natural resources and coup-proofing strategies. First, they are generally in the complete disposition of leaders since, unlike foreign aid or taxes, natural revenues are usually untied from donors' or taxpayers' control[19] (Quinlivan, 1999; Girod, 2015; Morrison, 2009; Caselli and Michaelis, 2009). Second, natural resources revenues provide a source of foreign hard currency that eases military expenditure (Perlo-Freeman and Brauner, 2012).

[17]Ulmer, Alexandra and Buitrago, Deisy. "Maduro taps major general to lead Venezuela's deteriorating oil industry". Reuters, 26/11/2017, available at: https://www.reuters.com/article/us-venezuela-politics-pdvsa/maduro-taps-major-general-to-lead-venezuelas-deteriorating-oil-industry-idUSKBN1DQ0R9, accessed April 2019.

[18]Ross, M.L., 2011. Will oil drown the Arab Spring: Democracy and the resource curse. Foreign Aff., 90, p.4.

[19]In this sense, the case of Cameroon's offshore and extra-budgetary fund to manage oil rents is exemplar as between 1977 and 2006 more than 50% of the oil revenues accrued by the government disappeared from the fund (Gauthier and Zeufack, 2011). Similarly, "under Saddam, more than half of Iraq's national budget was funneled through the Iraq National Oil Company, the finances of which were never disclosed." (Ross, M.L., 2011. Will oil drown the Arab Spring: Democracy and the resource curse. Foreign Aff., 90, p.4.)

4.5 Facing coup risk: institutional coup-proofing or not?

To develop my theoretical framework, first, I assume that leaders are rational, survival seeking and that they chose their survival strategies depending on the resources they have and the threat they face (Bueno de Mesquita et al., 2002; 2017). Notably, to retain power when facing coup risk leaders can decide to implement institutional coup-proofing or rely on the other strategies above presented. Second, I assume that when coup risk is low, leaders find the benefits of implementing institutional coup-proofing greater than the risk of triggering a preventive coup (Koga-Sudduth, 2017).

I pose that, when coup risk is low leaders might decide to implement institutional coup-proofing strategies as a preventive measure taking advantage of the low risk of triggering a preventive coup. Notably, leaders who have access to natural resource revenues, are more likely than other leaders to do so. This is because for leaders who face strict budget constraints, the cost of diverting national resources to fund preventive institutional coup-proofing efforts might not offset the benefits of implementing such a measure. In other words, when coup risk is not alarming, implementing preventive institutional coup-proofing might simply not be a priority for leaders who do not have access to large honeypots of resources that they can allocate as they desire. In turn, the more leaders enjoy access to discretionally allocable resources, the less it is - politically and financially - relatively costly for them diverting funds to undertake preventive institutional coup-proofing.

Yet, rising coup risk binds leaders to take action. In this scenario, leaders who enjoy access to discretionally allocable resources, are likely to prefer to implement other coup-proofing strategies than institutional coup-proofing as they have to discount the utility of institutional coup-proofing by the risk of triggering a preventive coup. In turn, leaders who lack access to natural resource revenues that they can allocate discretionally are likely to face rising coup risk implementing institutional coup-proofing because of lack of alternatives.

In sum, and more formally:

Hypothesis 1: *Access to natural resources revenues decreases (increases) leaders' likelihood*

to undertake institutional coup-proofing activities when coup risk rises (decreases).

4.6 Methods

To disentangle the relationship between coup risk, natural resource revenues and coup-proofing I resort to a two-step strategy. First, I predict the risk for a country to experience a coup estimating with an instrumental variable approach a logistic model of coup-attempt. Second, I estimate the effect of coup risk and natural resource revenues on institutional coup-proofing through a multivariate time-series cross-section two-stage least squares analysis covering 107 countries between 1970 and 2013. Table 1A in the appendix presents descriptive statistics of the dataset.

The independent variable for my logit model of coup-attempt assumes value 1 if in a given year a country experienced at least one coup-attempt and 0 otherwise according to the Coup d'etat Dataset (Powell and Thyne, 2011). Resorting to an instrumental variable approach is fundamental to avoid biased predicted probabilities due to fitting the model without considering the endogeneity of relevant regressors as GDP or military expenditure. For this reason, using a control function approach I fit my probit model using a set of historical, meteorological and geographical variables as excluded instruments for the endogenous regressors GDP growth, foreign direct investments, military expenditure and its inter-year chance. At the same time, I add as exogenous regressors and included instruments year fixed effects, two dummy variables accounting for the country being an autocracy or a military regime, the number of coup-attempts that occurred in the last five years and its squared term. I discuss in detail the full model in the appendix where Table 2A presents model estimates.

To capture the impact of natural revenues, coup risk and their interaction on institutional coup-proofing efforts, it is fundamental resorting to a two-stage least-squares analysis. Failing to account for the feedback loop between institutional coup-proofing, coup risk and natural resources would result in biased estimates. As discussed, coup risk affects leaders' incentives

to implement institutional coup-proofing and, simultaneously, institutional coup-proofing influences coup-plotters' willingness and capacity to stage a coup. On top of this, coup risk affects the extent to which natural resources constitute the backbone of state finances, as well as this affects leaders' decisions regarding if and to what extent implementing institutional coup-proofing. Finally, natural resource abundance influences coup risk.

The following equation describes the second stage of my two-stages least-squares analysis:

$$CBI_{t,j} = \beta_0 + \beta_1 CoupRisk_{t,j} + \beta_2 Nat.Rev._{t,j} + \beta_3 Nat.Rev._{t,j} * CoupRisk_{t,j} + \beta_4 \boldsymbol{X}_{t,j} + \epsilon_{t,j} \quad (1)$$

My independent variable is the counterbalancing index (from now on *CBI*) from the Counterbalancing/Coup-Proofing Dataset[20] (Pilster and Böhmelt, 2011; 2012). This variable captures the number of ground-combat compatible military organizations in a country in a given year. Thus, for instance, when the index equals 2 it indicates the presence of two equally strong rival military units.

The value of the *CBI* in the year t for the country j is equal to:

$$CBI_{j,t} = \frac{1}{\sum_i S_{j,i,t}^2} \quad (2)$$

where $S_{s,i,t}$ is the personnel share of the ground-combat compatible military or paramilitary organizations in the year t for the country j (Pilster and Böhmelt, 2011).

As main independent variables, the model includes *Coup Risk*, *Natural Revenues* and their interaction *Coup Risk*Natural Revenues*. *Coup Risk* is the logarithm of 1 plus the predicted probability of coup-attempt calculated through the logit model discussed above while *Natural Revenues* is the logarithm of 1 plus the percentage of natural resource revenues as a share of the GDP. The data source is the World Bank Open Dataset[21]. I use the logarithm of these variables to reduce the weight of outliers.

[20] https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/JCVR1H
[21] https://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS

As excluded instruments for *Coup Risk*, *Natural Revenues* and their interaction I use the variables *Equator*Oil*, *Equator*^{2}**Oil*, *Oil Revenues*, *Metal Revenues*, *Duration* and *Oil Revenues*Duration*. *Equator* measures the distance from the equator[22] while *Oil* accounts for the yearly price index of petroleum. Data sources for oil prices is Jacks (2019) [23]. Notably, *Equator*Oil* and *Equator*^{2}**Oil* are present in the first stage equation as excluded instruments but not the main effects of these interactions. This is because I run my analysis using country and year fixed effects as included instruments. *Oil Revenues* and *Metal Revenues* are a proxy for the amount of natural resource rents that leaders enjoy. I estimate the former multiplying the oil reserves per square kilometer in 1970 times *Oil*. I estimate the latter multiplying the yearly price index of iron ore[24] times the metal minerals production per capita in 1970[25]. *Duration* is equal to the number of years since the last coup-attempt occurred.

X is a vector of variables serving as included instruments for the first-stage equations and control variables for the second stage equation. As controls for state capacity and size of the military, **X** includes the logarithm of the population, GDP per capita and number of military personnel. To reduce endogeneity concerns, I look at the lagged value of the inter-year change of these variables. Data sources for these variables are the V-Dem dataset and the National Material Capabilities Dataset (Singer, 1998).

To control for regime type, **X** includes two dummy variables accounting for the country being a democracy or a military regime. The former dummy assumes value 1 if the polity2 index score[26] for the country is equal or greater than 5. The source for the index is the PoiltyIV project database (Marshall and Jaggers, 2015). The latter dummy assumes value 1 if in a given year the regime type is coded as "indirect military", "military", "military-personal", "party-military" or "party-military-personal" in the V-Dem dataset. This is to

[22]Following Hall and Jones (1999) I calculate the distance as the absolute value of the latitude divided by 90. The latitude is measured at the geographical centroid of the country.

[23]https://ourworldindata.org/grapher/commodity-price-index-of-cereal-crops-and-petroleum-1850-2015

[24]Data source available at https://ourworldindata.org/grapher/real-commodity-price-index-metals

[25]The V-dem Dataset (Coppedge et al., 2019) provides data for oil reserves and metal minerals production per capita.

[26]The index measures the political regime authority and approximates the level of democratization ranging from -10 (full autocracy) to +10 (full democracy)

take into account for the centrality of the military and for the fact that democratic leaders are less likely than others to undertake institutional coup-proofing (Jenkins and Kposowa, 1992; Pilster, and Böhmelt; 2012).

To control for the impact of ongoing conflict **X** includes a dummy variable assuming value 1 if the country is experiencing an inter or intrastate conflict or not. As counterbalancing efforts decrease military fighting effectiveness and wars affect coup risk (Böhmelt and Pilster, 2015; Piplani and Talmadge, 2016; Bell and Koga-Sudduth, 2017), ongoing conflict might affect leaders willingness to implement institutional coup-proofing efforts. Moreover, **X** includes the ethnic fractionalization index from the Historical Index of Ethnic Fractionalization (HIEF) dataset (Drazanova, 2019) as ethnically diverse societies provide leaders willing to implement institutional coup-proofing with the capacity to set up counterweights to the army leveraging over ethnic differences (Quinlivan, 1999). Finally, to soak up unobserved time-invariant characteristics and time trends **X** includes country and year fixed effects and a dummy variable assuming value 1 if the year is prior to 1991.

4.7 Results

Table 1 presents the estimates for the first and second stages of my main model reporting clustered standard errors on the country level robust to heteroskedasticity and intra-cluster correlation. Model 1, 2 and 3 report estimates for the first stage equations and Model 4 for the second stage. Reported values for the GMM distance test statistic of exogeneity, the Kleibergen-Paap *rk* LM, Kleibergen-Paap *rk* Wald F and Hansen's *j* statistics suggest that *Coup Risk*, *Natural Revenues* and their interaction are indeed endogenous, that the instruments are uncorrelated with the error term and - not only weakly - correlated with the endogenous regressors (Hayashi, 2000; Baum et al., 2007; Staiger and Stock, 1994; Stock and Yogo, 2005). Finally, it is worth to recall that in IV analysis R^2 has no natural interpretation as SSR for IV can be larger than SST (Wooldridge, 2006).

Table 1: The impact of coup risk on institutional coup-proofing. *CBI* as independent variable

VARIABLES	(1) Model 1 First Stage Coup Risk	(2) Model 2 First Stage Natural Revenues	(3) Model 3 First Stage Coup Risk*Natural Revenues	(4) Model 4 Second Stage CBI
Coup Risk				0.964***
				(0.333)
Natural Revenues				0.635**
				(0.285)
Coup Risk*Natural Revenues				-0.197*
				(0.115)
Duration	-0.011***	0.001	-0.022***	
	(0.003)	(0.004)	(0.008)	
Duration*Oil Production	-0.004**	0.003*	-0.028***	
	(0.002)	(0.001)	(0.004)	
Oil Revenues	0.243***	-0.015	1.543***	
	(0.065)	(0.074)	(0.204)	
Metal Revenues	-0.000	0.000	0.000	
	(0.000)	(0.000)	(0.000)	
Equator*Oil	0.001	0.006***	0.010***	
	(0.001)	(0.002)	(0.004)	
Equator^2*Oil	-0.001	-0.008***	-0.016***	
	(0.001)	(0.003)	(0.005)	
Δ GDP	-0.172	0.195	-0.452	-0.032
	(0.147)	(0.157)	(0.522)	(0.165)
HIEF index	1.682***	-0.104	3.720***	-0.966
	(0.455)	(0.618)	(1.062)	(0.642)
Population	-0.263*	0.469**	-0.813**	-0.086
	(0.143)	(0.194)	(0.397)	(0.228)
Δ Military Personnel	-0.001**	0.000	-0.001	0.001***
	(0.000)	(0.000)	(0.001)	(0.000)

Continued on next page

Table 1 – continued from previous page

Conflict	0.043	0.073	0.087	0.069
	(0.050)	(0.046)	(0.154)	(0.080)
Democracy	-0.125**	-0.037	-0.098	0.102
	(0.060)	(0.064)	(0.163)	(0.099)
Military	0.886***	-0.060	1.283***	-0.664**
	(0.078)	(0.074)	(0.309)	(0.262)
Cold war	0.632***	0.220	1.049***	-0.541**
	(0.127)	(0.182)	(0.354)	(0.227)
Observations	2,983	2,983	2,983	2,983
Number of ID	107	107	107	107
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES
Adjusted R-squared				-0.429
R-squared by hand				-0.354
F statistic				2.151
p-value of F-statistic				0.000540
F-stat for weak identification				20.94
F-stat for underidentification				16.25
p-value of underidentification				0.00616
Hansen J statistic				4.510
p-value of Hansen J statistic				0.341
GMM distance test statistic of exogeneity				8.327
p-value of GMM distance test statistic				0.0397

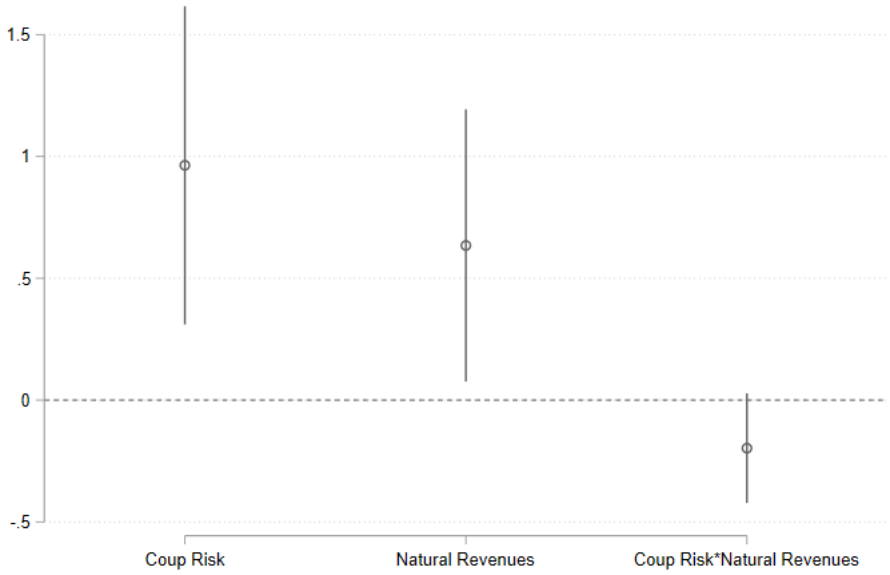
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Looking at estimates for Model 4, *Coup Risk*, is significant at 1% level, *Natural Revenues* at 5% and their interaction at 10%. All of them have the expected signs. Notably, increasing by one standard deviation the variable *Coup Risk* raises the number of rival military organizations in the country by 0.8 units. Likewise, when *Natural Revenues* rises by one standard deviation, the number of rival military organizations grows by 0.67 units. This is in line with the idea that, *ceteris paribus*, leaders who face higher levels of coup risk or have access to larger amounts of natural resource revenues are more likely to implement institutional coup-proofing efforts than others.

To investigate the effects of the interaction *Coup Risk*Natural Revenues*, I calculate the marginal effect of *Coup Risk* over *Natural Revenues* and, symmetrically, the marginal effect of *Natural Revenues* over *Coup Risk*. Table 2 shows the value of the marginal effects of *Coup Risk* at the 1^{st}, 25^{th}, 50^{th}, 75^{th} and 99^{th} percentile of *Natural Revenues*. In parallel, Table 3 reports the values of the marginal effect of *Natural Revenues* at the 1^{st}, 25^{th}, 50^{th}, 75^{th} and 99^{th} percentile of *Coup Risk*.

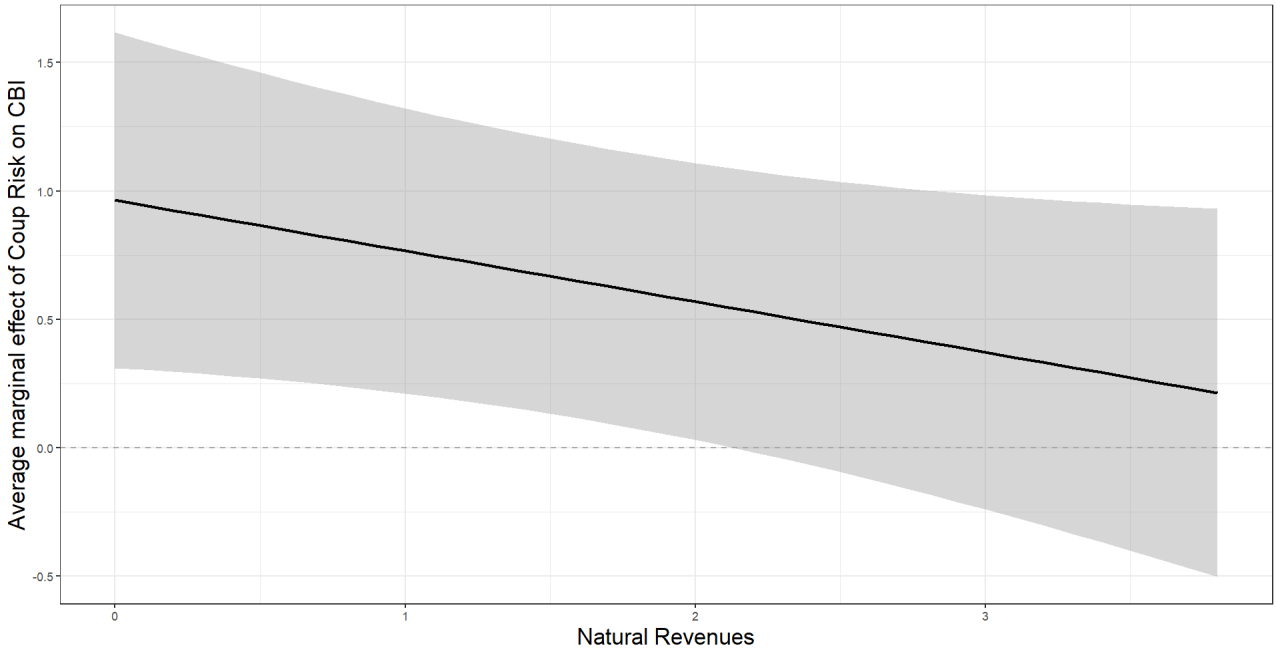
Looking at Table 2, the marginal effect of *Coup Risk* decreases over rising levels of *Natural Revenues* from .964 to .198. Notably, while it significantly different from 0 at 1% level at the 1^{st} percentile of *Natural Revenues*, it is no longer different from 0 at the 99^{th} percentile of the same variable. Likewise, looking at Table 3, the marginal effect of *Natural Revenues* decreases over rising levels of *Coup Risk*. At the 1^{st} percentile of *Coup Risk* it is equal to 0.62 and significant at 5%. At the 99^{th} percentile it is equal to -0.667 and not statistically different from 0. These results are in line with the idea that leaders who have access to natural resources are less likely to implement institutional coup-proofing than leaders who do not have access to these revenues when facing coup risk. Figure 1 plots the point estimates and their 95% confidence intervals for the variables *Coup Risk*, *Natural Revenues* and their interaction. At the same time, Figure 2 and Figure 3 plot, respecively, the average marginal effect of *Coup Risk* over rising values of *Natural Revenues* and the average marginal effect of *Natural Revenues* over rising values of *Coup Risk* and their 95% confidence intervals.

Figure 1: β coefficients of *Coup Risk*, *Natural Revenues* and *Coup Risk*Natural Revenues*. *CBI* as dependent variable.



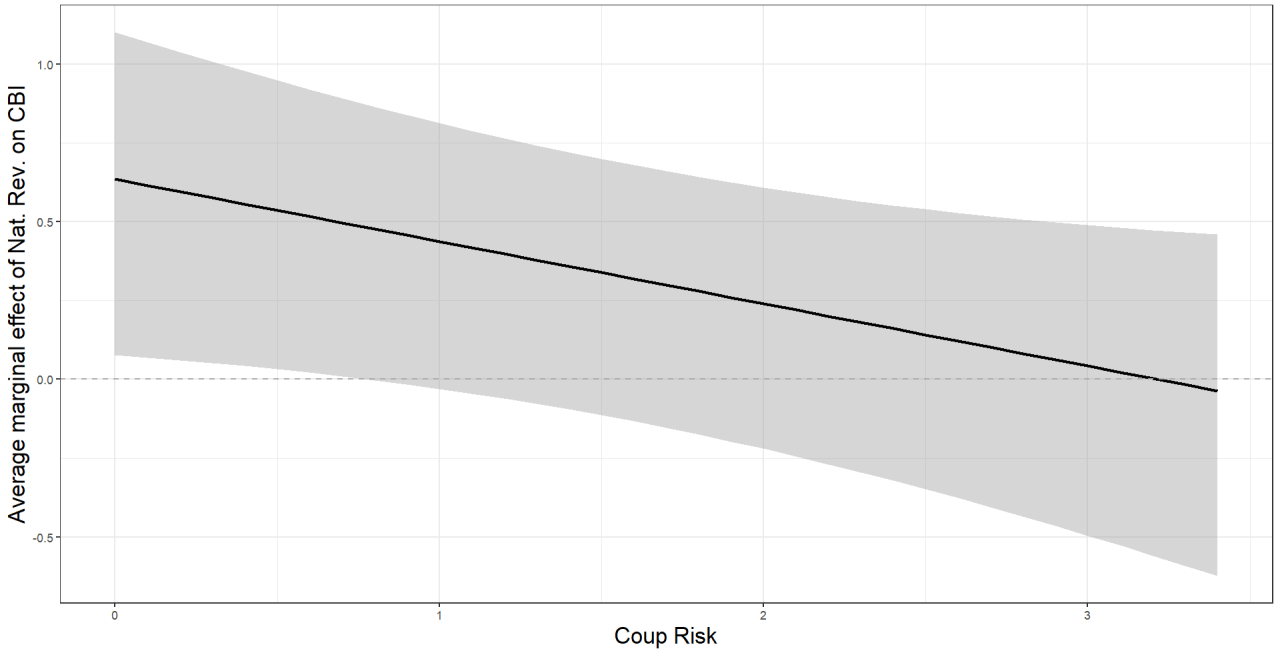
Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

Figure 2: Average marginal effect of *Coup Risk* on *CBI* over *Natural Revenues*.



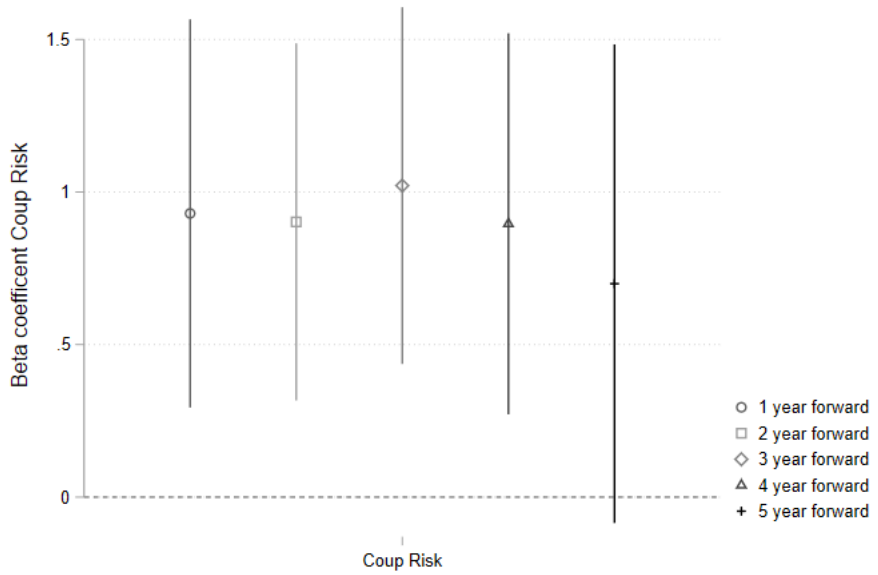
The dark line represents the average marginal effect estimates while the gray area its 95% confidence interval. The dashed horizontal line is set on 0.

Figure 3: Average marginal effect of *Natural Revenues* on *CBI* over *Coup Risk*.



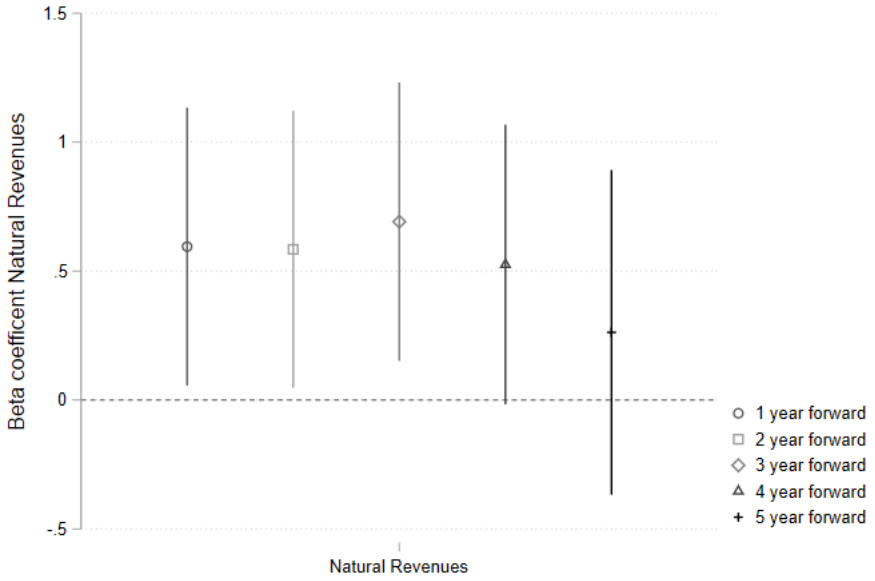
The dark line represents the average marginal effect estimates while the gray area its 95% confidence interval. The dashed horizontal line is set on 0.

Figure 4: β coefficients of *Coup Risk CBI* as dependent variable. Additional forwards



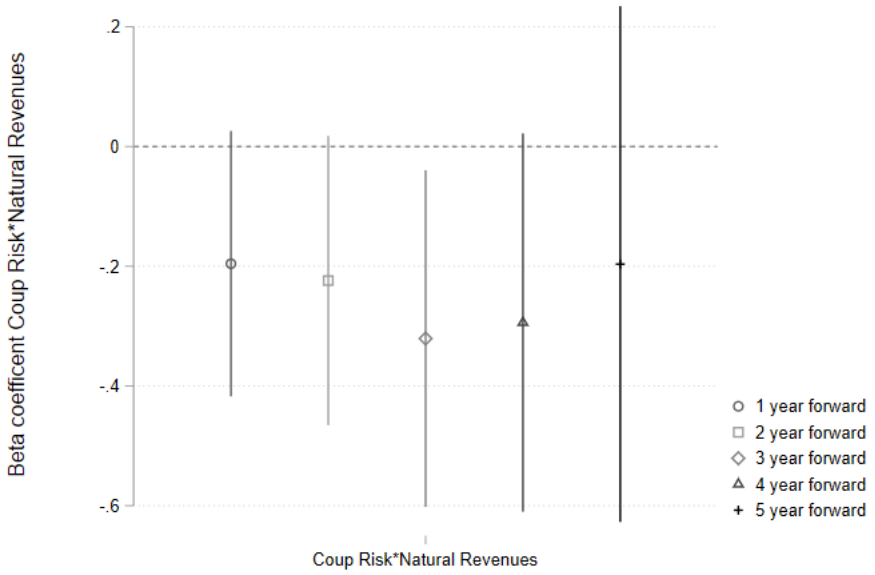
Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

Figure 5: β coefficients of *Natural Revenues CBI* as dependent variable. Additional forwards



Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

Figure 6: β coefficients of *Coup Risk*Natural Revenues CBI* as dependent variable. Additional forwards



Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

Table 2: Marginal effect of *Coup Risk* on *CBI* over rising levels of *Natural Revenues*.

Natural Revenues	δ *CBI* δ *Coup Risk*	95% Lower CI	Upper 95% CI
1st percentile	.962	.310	1.613
25th percentile	.867	.270	1.464
50th percentile	.709	.168	1.249
75th percentile	.530	-.017	1.076
99th percentile	.195	-.537	.927

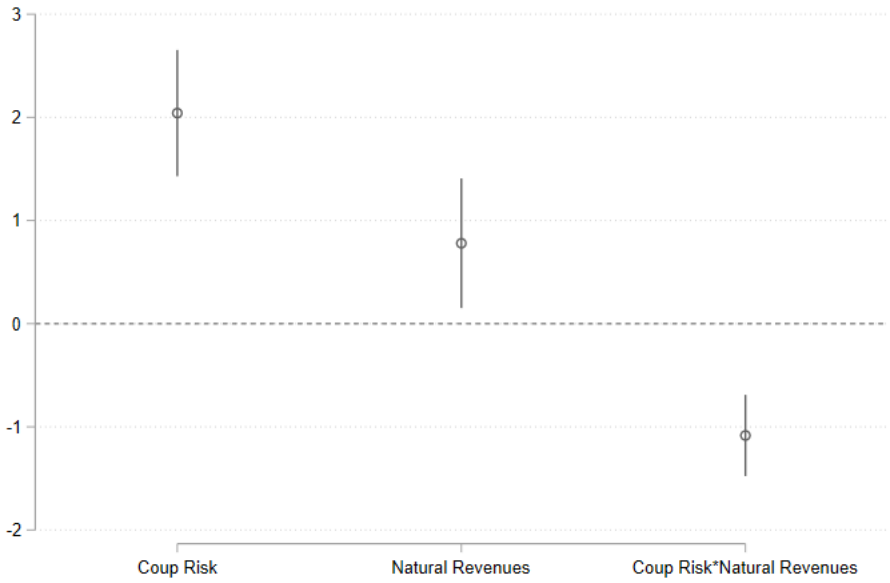
Table 3: Marginal effect of *Natural Revenues* on *CBI* over rising levels of *Coup Risk*.

Coup Risk	δ *CBI* δ *Natural Revenues*	95% Lower CI	Upper 95% CI
1st percentile	.628	.074	1.182
25th percentile	.553	.049	1.057
50th percentile	.462	.003	.921
75th percentile	.337	-.093	.768
99th percentile	-.049	.653	.555

To corroborate these results taking into account temporal lags of the effects of coup risk, I run my model five more times forwarding my dependent variable from 1 to 5 periods. Results from these additional specifications, show that as soon as coup risk rises, leaders who do not have access to natural resource revenues begin to undertake institutional coup-proofing strategies. The effect of coup risk on institutional coup-proofing efforts lasts for roughly four years and then decreases. In turn, leaders who have access to unearmarked resources tend to decrease institutional coup-proofing efforts only after roughly three years since coup risk peaks. Table 3A in the appendix displays full estimates for these additional models and Figures 4,5 and 6 display point estimates and their 95% confidence intervals for the variables *Coup Risk*, *Natural Revenues* and their interaction.

Finally, to further my analysis, I estimate the impact of coup risk and natural revenues on institutional coup-proofing using as dependent variable the dummy *Coup-proofing*. This is a dummy variable assuming value 1 if in the country there are more than 1.5 and less than 2.5 military rival units. Indeed, as Böhmelt and Pilster (2015) note, counterbalancing efforts are most effective in opposing coups when in a country are present about two equally strong military organizations. Results are in line with those above presented. Figure 7 plots point

Figure 7: β coefficients of *Coup Risk*Natural Revenues Coup-proofing* as dependent variable.



Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

estimates and their 95% confidence intervals for the variables *Coup Risk*, *Natural Revenues* and their interaction. Table 4A in the appendix displays full results from this additional model.

4.8 The Nigerian case

The development of civil-military relations in Nigeria between 1966 and 1976 is an interesting instance of the theoretical framework presented. Indeed, the coup-proofing strategies implemented in the country changed markedly after the oil shock Nigeria experienced in the early 1970s when the oil crisis in combination with an increase of Nigerian production capacity, greater public ownership of oil companies, and higher taxes and royalties provided the government with a consistent amount of financial resources (Gelb, 1988).

In January 1966, the country experienced its first coup. Notably, - the suspect of - political interference in the appointment and promotions of officers by the Minister of Defence at the expense of southern Ibo officers was one of the main causes (Luckham, 1974). After

taking the power, Major General Johnson Aguiyi-Ironsi began a substantive centralization process of the civil and the military sectors assigning most of the senior positions in the army to Ibo officers. Such a move rose dissatisfaction both among the civilian bureaucrats and military personnel triggering the second Nigerian coup in July (Luckham, 1974; Fanso, 1979). The successor of Aguiyi-Ironsi, General Gowon, did not repeat the same mistakes of his predecessors. Indeed, besides restoring Nigeria as a federation, he rapidly reorganized the army fragmenting it and redeploying soldiers depending on their ethnicity and region of origin (Barua, 2013). This decision probably contributed to facilitating eastern separatist insurgents (Obasanjo, 1980). Nonetheless, General Gowon had managed to break the chain of coups in the early phase of Nigerian post-colonial era.

General Gowon's coup-proofing strategy was different in 1975. What had changed was that now he could take advantage of the conspicuous Nigerian oil revenues accrued abroad between 1973 and 1974. To reduce the risk of being deposed by a coup after the announcement of his decision to not withdraw from power as promised, he implemented a series of generous fiscal reforms targeting crucial Nigerian elites. With the so called Udoji accords the average salary of civil servants rose by an average of 100% with peaks of 130% and urban communities become the target of a campaign of public investment relying on oil revenues[27](Gelb, 1988). At the same time, the leader did not undertake any effort to counterbalance the Nigerian army.

4.9 Conclusions

In 88 B.C. the Senate of Rome revoked the command of the Mithridian War from Silla shortly after giving it to him. Persuaded to be in the good graces of Minerva, Silla thought it appropriate to express his disappointment by marching on Rome with six legions. For the first time, a Roman army headed towards the city siding with its general against the Senate. Silla defeated his political enemies and probably appreciated the effectiveness of this

[27]In the words of Gelb (1988, p.243) the government "was in hurry to use its oil revenues [...] to avoid being accused of not spending when Nigeria was so poor"

approach to dealing with the Senate as just six years later he resorted to the same mean to oppose a government considered illegitimate[28] (Langhorne et al., 1854). Since then, and not only in Lazio, the rapports between country leaders and the army proved to be tenser than both parties wished in many more occasions as recent developments in Myanmar show. Far from being torpid, leaders developed various strategies to face the risk of being removed by a coup. In this paper, I investigated if, how and to what extent access to natural resources revenues shapes leaders' decision to undertake institutional coup-proofing efforts to keep the office.

By providing an opportunity-willingness theoretical framework, I argue that leaders resort to institutional coup-proofing to face coup risk only when they do not have access to natural resources revenues. Indeed, leaders who enjoy access to discretionally allocable resources prefer to invest in other coup-proofing strategies than institutional coup-proofing as buying off coup-plotters and pleasing the selectorate when coup risk rises. This is because when coup risk is high, undertaking measures that are openly against the interests of the military - as institutional coup-proofing - might trigger a preventive coup. In turn, leaders who do not have access to natural resources revenues are likely to react to rising coup risk resorting to institutional coup-proofing as they do not have enough discretionally allocable resources to buy off coup-plotters and please the selectorate.

To test my theory and disentangle the three-directional relationship between coup risk, institutional coup-proofing and natural resource revenues, I resort to a cross-section time-series multivariate two-stage least-squares analysis covering 107 countries between 1970 and 2013. Empirical findings support the theory and contribute to increasing our understanding of the key factors determining civil-military relations and, to a certain extent, leaders' decisions regarding the allocation of domestic resources.

[28]In this sense, if we consider the government of Marius and Cinna illegal, and Silla's intervention legitimate, then we might consider the actual first Roman coup the one staged 45 years later by Augustus (Canfora, 2004).

4.10 Appendix

Table 1A presents the descriptive statistics of the dataset and Table 2A the estimates for the logit model of coup-attempt.

A first way to understand factors affecting coup risk is differentiating between structural factors and more contingent ones. The former tend to change slowly over time, while the latter are more prone to shift in the short term. The number of past coups and their frequency in the history of the country, the concentration of centres of power, poor long-term economic performances fit the former set of factors while economic shocks, foreign powers with an interest to block or support the coup, and individual officers' grievances fit the latter (Fossum, 1967; Jonson et Al., 1984; Londregan and Poole, 1990; Belkin and Schofer 2003; Powell, 2012; Luttwak 2016; Kim, 2016).

Indeed, coup-plotters justified their intervention mentioning the previous governments' economic mismanagement both in the aftermath of the 1983 Nigerian and the 1982 Bangladeshi coups (Bertocci, 1982; Othman, 1984). At the same time, the British military interventions in East Africa in the late 1960s and the Turkish invasion of Cyprus in 1974 serve as an example of foreign forces interventions to prevent or defeat a coup (Roberts, 1975).

A second way to understand coup risk is to identify factors affecting the military's capacity and willingness to intervene (Finer, 2002; Powell, 2012). Reductions in the military budget threatening the capacity of military elites to maintain their patronage networks or political liberalization are factors influencing military's disposition to intervene (Albrecht and Eibl, 2018). Recent regime change, regime legitimacy and strength of the civil society are factors affecting the military's capacity to launch a coup (Belkin and Schofer 2003; Gassebner et al., 2016).

For example, we can consider the 1971 coup in Uganda as a military's reaction to a government threatening its economic interests and privileges (Lofchie, 1972). At the same time, the loyalty of civil servants and syndicates for the incumbent government played a determining role in the failure of the 1920 German coup (Goodspeed, 1967). This had been

the case as well three years before in Russia when the Soviet Railway Bureau sabotaged the communication, supply provision and movements of Kornilov's units (Chernov, 1936).

For this reason, to model factors affecting military's willingness and opportunity to stage a coup I include as regressors the GDP growth, military expenditure and its inter-year change, the level of foreign direct investments (FDI), a dummy variable accounting for the country being an autocracy[29], a dummy variable accounting for the country being ruled by a military regime, the number of coup-attempts occurred in the last five years and its squared term. In fact, low economic performances and reduced military expenditure might reduce leaders' capacity to face coup-plotters, increase military's willingness to protect their corporate interest and provide them with the legitimacy to intervene. At the same time, accounting for a country's political regime and history of coups works as proxy for the strength of civil society and regime legitimacy.

As the latent variable coup risk is likely to affect both the dependent variable and the independent variables GDP growth, military expenditure and FDI, it is necessary to resort to an instrumental variable approach. Failing to do so would lead to biased model estimates and, thus, biased predicted probability of coup-attempt. For this reason, to estimate my logit model of coup-attempt I resort to a control function estimator. In this sense, first, I estimate the model of endogenous regressors as a function of a set of instruments. Second, I use the errors from this model as an additional regressor in a probit model. As set of excluded instruments I use the percentages of ice-free coast within 100 km, land with tropical climates, desertic surface, fertile soil, an index of terrain ruggedness,[30], the proportional inter-year change of a weighted measure of countries' average monthly precipitation[31] and its lagged value, the lagged value of surface temperature anomaly and its inter-year change[32], and two dummy variables accounting for the country being a former colony and the year being prior

[29]This dummy assumes value 1 if in the given year the country's polity2 score is equal or minor than -5 and 0 otherwise

[30]I code these variables following Nunn and Puga (2012).

[31]Our World in Data: https://ourworldindata.org/grapher/average-monthly-precipitation?tab=chart

[32]Data is based on the HadCRUT analysis from the Climatic Research Unit (University of East Anglia), https://ourworldindata.org/grapher/hadcrut-surface-temperature-anomaly

to 1991. In fact, these variables are proxies for the chances of a country to have access to trade routes, develop its economy, strengthen state capacity and experience conflict (Fearon and Latin, 1999; Gallup et al., 1999; Buhaug and Gates, 2002; Miguel et al. 2004; Buhaug and Lujala, 2005; Disdier and Head, 2008; Feyrer. 2009; Hendrix, 2011; Dell et al., 2012).

Table 1A: Summary statistics

	Mean	Median	Std.Dev.	Min	Max	Obs
CBI	1.67		0.65	1.00	4.58	2983
Coup Proofing	0.40		0.49	0.00	1.00	2983
Coup Risk	1.07		0.83	0.00	4.04	2983
Natural Revenues	1.44		1.06	0.00	4.43	2983
Coup Risk*Natural Revenues	1.78		2.05	0.00	12.53	2983
Δ GDP	0.02		0.07	-0.58	0.85	2983
HIEF index	0.43		0.28	0.00	0.89	2983
Population	16.29		1.31	12.43	21.03	2983
Δ Military Personnel	-0.79		30.74	-1100.00	410.00	2983
Conflict	0.20		0.40	0.00	1.00	2983
Democracy	0.58		0.49	0.00	1.00	2983
Military	0.12		0.33	0.00	1.00	2983
Cold war	0.45		0.50	0.00	1.00	2983
Duration	26.14		18.32	0.00	64.00	2983
Duration*Oil Production	0.54		5.90	0.00	130.31	2983
Oil Revenues	0.02		0.16	0.00	2.57	2983
Metal Revenues	7461.59		18886.31	0.00	245525.55	2983
Equator*Oil	97.65		81.87	0.34	410.58	2983
Equator^2*Oil	40.21		49.03	0.00	274.33	2983
Precipitation	8.45		6.00	0.04	35.22	2983
Coup	0.04		0.19	0.00	1.00	2983
Autocracy	0.26		0.44	0.00	1.00	2983
Military	0.12		0.33	0.00	1.00	2983
Past coups	0.24		0.73	0.00	9.00	2983
GDP growth	0.02		0.07	-0.44	1.34	2983
Military_Expenditure	3.01		4.07	0.00	117.35	2983
FDI	2.40		6.33	-43.46	198.07	2983
Year	1993.26		11.93	1970.00	2013.00	2983
Coast	40.91		37.80	0.00	100.00	2983
Soil	36.37		21.39	0.00	88.65	2983
Tropical	34.18		41.69	0.00	100.00	2983
Ruggedness	1.25		1.09	0.04	6.20	2983
Desert	4.12		11.06	0.00	77.28	2983
Colonized	0.76		0.43	0.00	1.00	2983
Δ Precipitation	0.03		0.27	-0.86	4.11	2983
Δ Precipitation	0.03		0.27	-0.86	4.11	2983
Cold war	0.45		0.50	0.00	1.00	2983
Δ Temperature	0.02		0.53	-2.74	2.42	2983
Temperature	0.31		0.54	-1.83	2.99	2983

Table 2A: Logit model of coup attempt.

VARIABLES	(1) Model 1A Second Stage Coup	(2) Model 1A First Stage GDP growth	(3) Model 1A First Stage Military Expenditure	(4) Model 1A First Stage Δ Military Expenditure	(5) Model 1A First Stage FDI
Autocracy	-0.026	-0.003	1.543***	-0.026	-0.250
	(0.094)	(0.004)	(0.597)	(0.107)	(0.489)
Military	0.139**	0.007*	-0.620	-0.063	-0.436
	(0.069)	(0.004)	(0.497)	(0.054)	(0.322)
Past coups	0.049	-0.005	-0.026	0.045	0.216
	(0.085)	(0.004)	(0.246)	(0.050)	(0.373)
Past coups^2	-0.008	0.000	-0.012	-0.012	-0.040
	(0.013)	(0.001)	(0.041)	(0.009)	(0.057)
Coast		0.000	0.014**	0.000	0.002
		(0.000)	(0.006)	(0.001)	(0.006)
Soil		0.000	-0.039***	-0.001	-0.007
		(0.000)	(0.012)	(0.001)	(0.012)
Tropical		-0.000	-0.019***	0.001	-0.007
		(0.000)	(0.005)	(0.001)	(0.007)
Ruggedness		-0.000	0.007	0.013	-0.186
		(0.001)	(0.119)	(0.022)	(0.196)
Desert		-0.000	0.005	-0.000	-0.027
		(0.000)	(0.026)	(0.002)	(0.024)
Colonized		-0.004*	-0.093	0.018	0.720
		(0.002)	(0.779)	(0.041)	(0.537)
Δ Precipitation		0.003	1.765*	0.751	0.709
		(0.011)	(0.977)	(0.593)	(0.574)
Δ Precipitation		0.002	1.242**	-0.406	0.504
		(0.008)	(0.609)	(0.310)	(0.745)

Continued on next page

Table 2A – continued from previous page

Cold war		0.008	0.529	0.115	-2.644***
		(0.011)	(0.716)	(0.229)	(0.721)
Δ Temperature		0.001	-0.265**	0.088	0.166
		(0.002)	(0.135)	(0.113)	(0.310)
Temperature		0.001	-0.572**	0.072	0.024
		(0.002)	(0.274)	(0.072)	(0.375)
GDP growth	-12.595***				
	(2.329)				
Military Expenditure	-0.006				
	(0.023)				
Δ Military Expenditure	0.079				
	(0.218)				
FDI	-0.041				
	(0.050)				
athrho2_1					1.621**
					(0.734)
athrho3_1					-0.095
					(0.116)
athrho4_1					-0.434
					(0.356)
athrho5_1					0.356
					(0.407)
athrho3_2					-0.044*
					(0.025)
athrho4_2					-0.321**
					(0.146)
athrho5_2					0.052***
					(0.018)
athrho4_3					0.328***

Continued on next page

Table 2A – continued from previous page

						(0.096)
athrho5_3						-0.029**
						(0.014)
athrho5_4						0.009
						(0.009)
lnsigma2						-2.644***
						(0.076)
lnsigma3						1.190***
						(0.193)
lnsigma4						0.753*
						(0.397)
lnsigma5						2.002***
						(0.216)
Constant	0.032	0.024***	4.029***	-0.106	4.025***	
	(0.302)	(0.007)	(0.941)	(0.138)	(0.989)	
Observations	3,747	3,747	3,747	3,747	3,747	3,747
Cluster SE	YES	YES	YES	YES	YES	YES
AUROC	0.853	0.853	0.853	0.853	0.853	0.853

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

Table 3A presents results from my additional specifications. In particular, Model 2A, 3A, 4A, 5A and 6A presents, respectively, estimates from my model when I forward my independent variable from 1 to 5 periods. Finally, Model 7A in Table 4A presents results from my supplementary analysis where I use as dependent variable *Coup-proofing*. To take into account for the reverse causality effects described in the method section, to estimate the effect of *Coup Risk*, *Natural Revenues* and their interaction I resort to a control function estimator. The excluded instruments used in the first stage are the same employed for the main analysis.

Table 3A: The impact of coup risk on institutional coup-proofing. *CBI* as independent variable. Additional time lags

VARIABLES	(1) Model 2A Second Stage CBI F.1	(2) Model 3A Second Stage CBI F.2	(3) Model 4A Second Stage CBI F.3	(4) Model 5A Second Stage CBI F.4	(5) Model 6A Second Stage CBI F.5
Coup Risk	0.930***	0.902***	1.021***	0.896***	0.700*
	(0.325)	(0.299)	(0.298)	(0.319)	(0.400)
Natural Revenues	0.595**	0.584**	0.692**	0.525*	0.262
	(0.275)	(0.274)	(0.275)	(0.277)	(0.321)
Coup Risk*Natural Revenues	-0.196*	-0.224*	-0.321**	-0.294*	-0.196
	(0.113)	(0.123)	(0.144)	(0.161)	(0.220)
Δ GDP	-0.030	0.040	-0.047	0.005	0.079
	(0.154)	(0.167)	(0.185)	(0.160)	(0.173)
HIEF index	-0.951	-0.675	-0.389	-0.023	0.154
	(0.669)	(0.704)	(0.710)	(0.670)	(0.700)
Population	-0.051	-0.005	-0.081	-0.025	0.112
	(0.224)	(0.231)	(0.237)	(0.227)	(0.233)
Δ Military Personnel	0.001**	0.001	0.000	0.000	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Conflict	0.098	0.080	0.062	0.063	0.083
	(0.081)	(0.079)	(0.085)	(0.083)	(0.086)
Democracy	0.066	0.060	0.056	0.046	0.017
	(0.101)	(0.096)	(0.092)	(0.089)	(0.095)
Military	-0.669***	-0.613**	-0.585**	-0.517**	-0.479**
	(0.256)	(0.245)	(0.234)	(0.223)	(0.227)
Cold war	-0.519**	-0.403*	-0.363	-0.278	-0.117
	(0.241)	(0.242)	(0.231)	(0.215)	(0.142)
Observations	2,999	3,017	3,031	3,042	2,951
Number of ID	107	107	107	107	107
Adjusted R-squared	-0.368	-0.280	-0.363	-0.263	-0.177

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Table 3A – continued from previous page

Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES	YES
R-squared by hand	-0.297	-0.214	-0.293	-0.198	-0.116
F statistic	2.469	2.244	2.952	2.261	2.986
p-value of F-statistic	5.49e-05	0.000277	1.70e-06	0.000244	1.49e-06
F-stat for weak identification	21.43	26.04	25.16	29.49	16.69
F-stat for underidentification	15.70	15.92	14.28	15.92	23.37
p-value of underidentification	0.00776	0.00708	0.0139	0.00708	0.000287
Hansen J statistic	3.002	3.146	3.484	3.757	4.794
p-value of Hansen J statistic	0.557	0.534	0.480	0.440	0.309
GMM distance test statistic of exogeneity	8.821	6.473	4.748	3.817	1.882
p-value of GMM distance test statistic	0.0318	0.0907	0.191	0.282	0.597

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4A: The impact of coup risk on institutional coup-proofing. *Coup-proofing* as independent variable.

VARIABLES	(1) Model 7A Second Stage Coup-proofing	(2) Model 7A First Stage Coup Risk	(3) Model 7A First Stage Natural Revenues	(4) Model 7A First Stage Coup Risk*Natural Revenues
Δ GDP	-0.244	-0.536***	0.113	-1.486**
	(0.473)	(0.175)	(0.251)	(0.631)
HIEF index	0.244	0.305***	0.657**	1.317***
	(0.375)	(0.112)	(0.258)	(0.443)
Population	0.044	0.015	-0.010	0.021
	(0.063)	(0.020)	(0.052)	(0.079)
Δ Military Personnel	0.000	-0.000	0.000	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)
Conflict	-0.081	-0.064	-0.096	-0.260
	(0.165)	(0.053)	(0.119)	(0.214)
Democracy	-0.297	-0.194***	-0.859***	-0.989***
	(0.257)	(0.065)	(0.144)	(0.176)
Military	-0.311	0.897***	-0.007	1.548***
	(0.350)	(0.085)	(0.186)	(0.387)
Cold war	-1.238***	0.056	-2.084***	-2.506***
	(0.435)	(0.136)	(0.279)	(0.469)
Duration		-0.014***	-0.001	-0.023***
		(0.002)	(0.004)	(0.005)
Duration*Oil Production		-0.000	-0.009	-0.030***
		(0.003)	(0.007)	(0.006)
Oil Revenues		-0.138	1.323***	1.122***
		(0.144)	(0.340)	(0.345)
Metal Revenues		0.000	0.000***	0.000**
		(0.000)	(0.000)	(0.000)
Equator*Oil		-0.005***	-0.012***	-0.025***
		(0.001)	(0.004)	(0.005)

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Table 4A – continued from previous page

Equator^2*Oil		0.005**	0.013**	0.029***	
		(0.002)	(0.005)	(0.007)	
Precipitation,		0.013**	-0.024*	-0.011	
		(0.006)	(0.012)	(0.018)	
Coup Risk	2.042***				
	(0.312)				
Natural Revenues	0.779**				
	(0.321)				
Coup Risk*Natural Revenues	-1.084***				
	(0.201)				
athrho2_1					-0.051
					(0.140)
athrho3_1					0.183
					(0.178)
athrho4_1					0.541***
					(0.183)
athrho3_2					0.026
					(0.062)
athrho4_2					0.766***
					(0.061)
athrho4_3					0.582***
					(0.075)
lnsigma2					-0.743***
					(0.043)
lnsigma3					-0.284***
					(0.053)
lnsigma4					0.316***
					(0.066)
Constant	-1.742	1.157***	3.515***	4.044***	
	(1.181)	(0.373)	(0.887)	(1.355)	

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Table 4A – continued from previous page

Observations	2,983	2,983	2,983	2,983	2,983
Year FE	YES	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES	YES
AUROC	0.688	0.688	0.688	0.688	0.688

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

5 Chapter 2 - Institutional coup-proofing and exogenous resources: the case of discretionally allocable foreign aid

5.1 Abstract

Coup risk presents a fierce threat to incumbent leaders. To face it, they can implement policies to please the selectorate, buy-off rivals in the military, ensuring personal wealth or resort to institutional coup-proofing. I claim that to understand when leaders decide to undertake the latter rather than other coup-proofing strategies it is necessary to consider the costs associated with the various coup-proofing strategies, the relative level of coup risk leaders face and the resources to which they have access to. In particular, I pose that leaders of aid-recipient countries who do not have access to unearmarked resources are more likely than others to undertake institutional coup-proofing and forgo other strategies to oppose coup-plotters. This is because, despite the costs of institutional coup-proofing in terms of preventive-coup risk and military effectiveness on the battlefield, they do not have the means to implement other coup-proofing strategies that require access to discretionally allocable funds. To test my hypothesis, I resort to a cross-section time-series multivariate two-stage least squares analysis covering 122 countries between 1970 and 2013. Findings support the hypothesis and are robust to different model specifications contributing to shed more light on the relation between coup risk, resources and institutional coup-proofing.

5.2 Introduction

Following the arrest of his predecessor Francisco Madero on 19th February 1913, Pedro Lascuráin Paredes assumed office as President of Mexico. He kept the office for 28 minutes, then General Huerta seized power completing the coup culminated the day before (Braddy,

1969). The experience of Paredes is probably borderline. Yet, it is a striking example of the threat that coups pose to incumbent leaders.

In the last 70 years, coup plotters launched 478 coups ≈50% of which have been successful [33]. To contrast them, leaders developed different strategies. Institutional coup-proofing - the creation of multiple rival forces inside the army and militias parallel to it, rotation of command positions and the purging of rival military officers (Belkin and Schofer, 2003; Powell, 2012) - is one of the most common (De Bruin, 2018). Nevertheless, there is a wide variation in the extent to which leaders resort to it. In 2006, after surviving the fourth coup attempt in his career as president of Chad, Idriss Déby re-organized the army decreasing its strength vis-à-vis the pro-government paramilitary groups (ISS, 2008). This was not the case in Guatemala where, after the coups attempts of 1988 and 1989, President Vinicio Cerezo decreased the number of paramilitary units by 125.000 men while increasing the number of army reservist by 30.000 units (Paxton, 1989; 1990).

So far, political regime and level of coup risk have been considered major factors influencing the implementation of institutional coup-proofing (Böhmelt and Pilster, 2012; Koga-Sudduth, 2017). Yet, despite Bueno de Mesquita and Smith (2010) show that leaders develop their survival strategies depending both on the challenges they face and the resources they have, to date no studies have empirically examined the nexus between the type of revenues leaders enjoy and institutional coup-proofing. This paper addresses this gap examining if and to what extent the allocation of unearmarked aid affects the implementation of institutional coup-proofing. I pose that leaders who lack access to unearmarked resources that they can allocate discretionally - namely financial support to the general budget of the state - are more likely than others to face coup risk resorting to institutional coup-proofing.

Despite its effectiveness to deter and obstruct coup plotters, institutional coup-proofing has some drawbacks. First, creating ex-novo counterweights to the army may be time-consuming and unsuited for a leader whose grip on the military is deteriorating. Second,

[33] According to the Coup d'etat Dataset (2011).

institutional coup-proofing decreases the military's capacity to face external security threats (Böhmelt and Pilster, 2011). Third, implementing institutional coup-proofing when coup risk is relatively high may trigger a preventive coup (Koga-Sudduth, 2017).

For these reasons, leaders may prefer resorting to other strategies to face coup risk. For example, they might provide private goods to rivals to increase their value of the status quo, implement policies favourable to the selectorate, ensure personal wealth and so forth (Wright, 2008; Gilli and Li, 2015; de Mesquita and Smith, 2017). Yet, these strategies are not cost-free neither. All of them require the availability of funds that leaders can allocate discretionally.

In this sense, I pose that the allocation of unearmarked resources to aid-recipient leaders shapes their decisions regarding to what extent to face coup risk resorting to institutional coup-proofing or other strategies. Indeed, if donors provide leaders with unearmarked and discretionally allocable funds, they might provide recipient leaders with the right resources to face coup risk funding strategies other than institutional coup-proofing and less openly against the interests of the military. In turn, leaders who do not enjoy these resources are more likely to resort to institutional coup-proofing when needed as they have fewer resources to allocate discretionally.

Bringing together literature on foreign aid, leader survival and coup-proofing, this paper contributes to the existing literature in different ways. First, on the theoretical side, it presents a model that takes into account leaders' incentives - coup risk - and opportunities - available resources - to advance our understanding of the conditions under which leaders implement institutional coup-proofing. Second, it contributes to explain how and to what extent foreign aid and donors' practices contribute to the survival of aid-recipient leaders. Third, on the empirical side, it enhances Koga-Sudduth's (2017) seminal work on coup-proofing and coup risk examining this nexus with an instrumental variable approach to control for the bidirectional relationship between these dimensions. Additionally, it suggests a set of geographical, meteorological and historical variables to estimate the probability for

a country to experience a coup avoiding endogenous regressors as the level of trade or the GDP.

To test my theory, I resort to a time-series cross-section two-stage least squares multivariate analysis focusing on 122 countries between 1970 and 2013. In the following sections, first, I describe the determinants of coup risk and the strategies leaders can resort to coping with it. Second, I describe the trade-offs that these strategies pose and how the access to donors' unearmarked resources influences leaders' decisions regarding which strategy to implement. Third, I present methods and results from my empirical analysis. The exemplifying case of Bangladesh, conclusions and appendix conclude the chapter.

5.3 Coup risk determinants and coup-proofing strategies

At first, it is possible to identify two categories of factors determining coup risk: those affecting the military's capacity to stage a coup and those driving the military's willingness to intervene (Finner, 2002; Powell, 2012). Reductions in the military budget threatening the capacity of military elites to maintain their patronage networks, political liberalization, or the presence of resources that coup-plotters can loot if they are successful are factors influencing the disposition of the military to intervene (Acemoğlu et al., 2008; Albrecht and Eibl, 2018). At the same time, recent regime change, the strength of the civil society and the implementation of institutional coup-proofing activities are factors influencing the military's capacity to launch a coup (Belkin and Schofer, 2003; Böhmelt and Pilster, 2015; Gassebner et al., 2016). A second way is to differentiate between structural factors and more contingent ones. The former tend to change slowly over time, the latter are more prone to change in the short term. The legitimacy of the regime, the number of years since the last coup and the frequency of military's interventions in the history of the country, the concentration of centres of power and poor long-term economic performances are structural factors while economic shocks, the absence of a foreign power with interest to block a coup, and individual officers' grievances are contingent ones (Fossum, 1967; Jonson et Al., 1984; Londregan and

Poole, 1990; Finer, 2002; Belkin and Schofer 2003; Powell, 2012; Luttwak 2016; Kim, 2016; Albrecht and Eibl, 2018).

To face coup risk leaders have different opportunities. If they believe they are in the last period of their regime, they can send rents abroad and flee the country (Wright, 2008). Otherwise, then they can undertake strategies targeting the coup-plotters willingness and capacity to stage a coup. To decrease the military's willingness to intervene, leaders can increase the expected cost associated to stage a coup and the value of maintaining the status quo (de Mesquita and Smith, 2017). To achieve this, they can buy-off potential threats to the regime and expand the provision of private goods to crucial supporters among the military[34] (Wintrobe, 1998, de Mesquita and Smith, 2017). Additionally, they can raise the amount of resources allocated to the military sector to please the corporative interests of the military (Powell et al., 2018). For example, Hosni Mubarak resorted consistently to pecuniary and career rewards to keep loyal the higher ranks of the Egyptian military (Bou Nassif, 2013). Likewise, during his rule, Ali Saleh kept the support of crucial sheikhs and generals through direct payments to their tribal and military constituencies[35]. At the same time, leaders can implement policies to please the selectorate and gain legitimacy[36]. Doing so they discourage coup-plotters from staging a coup - as the Spanish generals' decisions to stand down in 1931 and intervene in 1936 suggest -, and decrease coup-plotters' chances of being successful as the coup attempts of 2016 in Turkey and 1936 in Japan demonstrate (Roberts, 1975; Gilli adn Li, 2015; Gilli and Li, 2013; Esen and Gumuscu, 2017; Rozenas and Zeigler, 2019).

An alternative common coup-roofing strategy is institutional coup-proofing. This strategy includes activities aiming at counterbalancing the power of the army and reducing its coordination ability (Belkin and Schofer, 2003; Powell, 2012; Quinlivan, 1999). In partic-

[34]In the words of Girod (2015, p.155) "Handouts can alleviate grievances of potential rivals and allow them to benefit from the status quo, thereby reducing their incentive to initiate a coup."

[35]US State Dept., 'Will Saleh's successor please stand up?', 17 Sept. 2005. Downloaded from Wikileaks and also available via The Guardian, https://www.theguardian.com/world/us-embassy-cables-documents/40815

[36]As Kono and Montiola (2009) note, leaders of aid-recipient countries can mitigate crises distributing accrued state resources to rivals and supporters via non-state institutions under their control.

ular, I refer to institutional coup-proofing as the set of activities that include the creation and the strengthening of security forces parallel to the army as civilian militias, militarized police, presidential and republican guards, the rotation of command positions and the purging of rival military officers. Institutional coup-proofing obstacles coup-plotters via two different mechanisms. First, the creation of different security forces hinders infra-military communication thus making coordination more difficult for coup-plotters (Quinlivan, 1999). Coordination is vital for coup-plotters who, to be successful, need to rapidly take control of the centres of power and broadcast stations and signal that the coup has already succeeded (Luttwak, 2016). If coup-plotters fail to show that they are in full control of the state apparatus, actors willing to counter the coup may strike back while some of those backing the coup may defect (Luttwak, 2016; De Bruin, 2018). Second, the creation of different security forces parallel to the army increases the number of armed actors with incentives different from those of the army (Böhmelt and Pilster, 2015). Notably, when leaders facing coup risk create new security forces and appoint loyalist officers as commanders they ensure that that the goal of these units is to protect their leadership (Horowitz, 1985; Harkness, 2016). Moreover, assigning different tasks to different security forces and setting different payment rates contributes to making the interests of the new units diverge from those of the army (Kabir, 2004; De Bruin, 2018). The result is that units loyal to the leader will have strong incentives to fight the coup-plotters since they are aware that the risk of being dismantled by the new regime is very high (De Bruin, 2018). Notably, Böhmelt and Pilster (2015) show that institutional coup-proofing is most effective when about two equally strong military organizations are present in the country.

Yet, institutional coup-proofing has relevant drawbacks. Attempts to counterbalance the army may trigger preventive coups. In fact, the military's willingness to preserve its autonomy and corporate interests is one of the most widespread and powerful motives of intervention (Thompson, 1973; Finer, 2002). For example, in 1999 the Pakistani army deposed in a coup the then Prime Minister Nawaz Sharif a few hours after he tried to dismiss

the powerful General Pervaiz Musharraf (Koga-Sudduth, 2017). Moreover, institutional coup-proofing decreases the military's capacity to fight interstate and intrastate wars like the Libyan inadequacy to oppose Chadian troops in the 1980s and Libyan insurgents in 2011 shows (Pollack, 2004; Böhmelt and Pilster, 2011; Gaub, 2013). Further, purges of the officer corps and rewarding soldiers on loyalty and ethnic criteria dissuade the acquisition and development of disinterested technical expertise[37] (Biddle and Long, 2004). At the same time, dividing the army into multiple parallel units, rotating senior commanders and preventing different units from training together hampers the army to develop the ability to coordinate effectively on the battlefield (Böhmelt and Pilster, 2011).

5.4 Unearmarked aid and coup-proofing

As discussed, leaders have various strategies to face coup risk. While institutional coup-proofing is the most common, it is not cost-free. First, leaders must discount the benefits from institutional coup-proofing by the risk of triggering a preventive coup. Second, they face a trade-off between obstructing coup-plotters and keep the army effective. In turn, the other strategies discussed - ensuring personal wealth, implementing policies targeting the selectorate, providing private goods to rivals in the military etc. - are less likely to trigger a preventive coup and decrease military effectiveness. Yet, they require leaders to have access to resources that they can allocate discretionally. This latter condition may not be satisfied in aid-recipient developing countries where state revenues are meagre and especially when leaders might not have access to natural resources.

In this sense, donors play a role in determining if and to what extent leaders resort to institutional coup-proofing. If they provide leaders with unearmarked resources, then recipients can allocate such funds discretionally to implement coup-proofing strategies other

[37]The trade-off between effective and loyal officers is undoubtedly a long-standing acknowledged issue. Already in 1560, the Venetian bailo urged the Serenissima senate to appoint officers depending on their merit rather than on their prominence to strengthen the dominions of the republic (Albèri, 1831). One decade later, de Granvelle vocally marked the need to assign the command of the Liga Sancta's galleys not to loyal but rather capable officers to face the Ottoman fleet (Barbero, 2010).

than institutional coup-proofing. In turn, if they do not provide such resources, they decrease leaders' capacity to rely on side-payments to rivals (Wintrobe, 1998; Nielsen et al., 2011) and buying the consensus of the selectorate, thus increasing leaders' willingness to resort to institutional coup-proofing when needed.

To develop my theoretical model, first, I assume that leaders are rational, survival seeking and that they chose their survival strategies depending on the resources they have and the threat they face (Bueno de Mesquita et al., 2002; 2017). Second, that the benefits of institutional coup-proofing offset the risk of triggering a preventive coup. This is because the average leader is likely to react to coup risk implementing institutional coup-proofing *before* the risk of triggering a preventive coup is too high[38]. Finally, I assume that leaders do not risk to lose future aid flows if they use donors' resources to fund coup-proofing strategies. In other words, the risk of losing future aid flows does not affect leaders' decision to divert aid to fund coup-proofing strategies. This assumption lies on two considerations. First, if donors' interest is the survival of the aid-recipient leader, it is unlikely that they might threat to stop aid allocation if it is redirected to fund coup-proofing[39]. Second, even if donors aid allocation is development-driven, they have an exiguous capacity to monitor how aid-recipient leaders allocate unearmarked resources[40]. The reasons are mainly two: first, recipient countries receive multiple aid flows from multiple sources simultaneously; second, domestic revenues of the recipient country – thus its budget - are likely to be non-static and changing in the same period when aid is received (Pack and Pack, 1993; Feyzioglu et al., 1998). On top of this, Manning and Malbrough (2010), underline how differences in the incentive structure, priorities and practices decrease donors' ability to coordinate and supervise recipients' expenditure. Moreover, in some cases the bureaucratic apparatus of aid-

[38]This reasoning is in line with the theoretical argument proposed by Koga-Sudduth (2017) but in contrast with her empirical findings.

[39]As Girod (2015, p.156) poses, "recipient leaders may siphon aid from development projects to coup-proofing with impunity if the donors are more interested in achieving strategic objectives than in fostering development".

[40]In this sense, differencing between strategic and non-strategic aid is superfluous as it is unlikely that donors can detect and punish reallocations of resources.

recipient countries might simply not disclose any reliable information on budget allocations. For example, in the 1980s Mobutu's bureau made no distinction between state funds and personal expenditure of the president (Askin and Collin, 1993).

In fact, different studies examine how aid-recipient leaders strategically use aid to ensure personal wealth, gain the support of the selectorate and please the winning coalition[41]. For example, Ahmed (2012) presents evidence of leaders from Muslim autocracies who increase their survival chances funding patronage with aid while Masaki (2018), Jablonski (2011) and Hodler and Raschky (2010) find that leaders' concerns regarding population support shape aid sub-national allocation more than developmental needs. For instance, during the presidential mandate of Frederick Chiluba (1991 - 2001), Zambia received on average 31 US dollars per capita as unearmarked aid[42]. During his presidency, Chiluba managed to appropriate more than 40 million US dollars of public money to accrue slush funds for private use and fund favored or politically useful actors (Yambayamba, 2007; Transparency International, 2008)[43].

It follows that leaders with no access to donors' unearmarked resources have few options to choose from when facing coup risk. As the provision of private goods to buy-off rivals is expensive, immediate and ongoing (Quinlivan, 1999) and they do not have access to resources they can use discretionally to gain the support of the selectorate, they can only resort to institutional coup-proofing to increase their survival chances. For example, when Nur Muhammad Taraki took power in Afghanistan in the aftermath of the self proclaimed "Saur Revolution" in 1978, he did not have access to any unearmarked resources from donors[44]. Not surprisingly thus, in the following two years he decreased the army by 10.000 units and strengthened the Ministry of the Interior-led *gendarmerie* by 9.000 units (Paxton, 1977;

[41]In this sense, Asongu's (2012) findings on the positive relationship between aid flows and corruption are not surprising.

[42]According to the AidData dataset (Tierney et al., 2011).

[43]In light of this, it is not shocking that Rosenstein-Rodan affirmed that "when the World Bank thinks it is financing an electric power station, it is really financing a brothel" (Jones, 2005, p. 168).

[44]On top of this, according to World Bank estimates, natural resource revenues in Afghanistan accounted for circa only 1% of the GDP and the GDP per capita was 7.7 US dollars.

1980).

In turn, if leaders have access to unearmarked resources that they can allocate discretionally to buy-off rivals and strengthen their legitimacy, then they might substitute institutional coup-proofing efforts with these latter strategies. In this scenario, when leaders face coup risk they do not undertake institutional coup-proofing efforts that can increase the risk of preventive coups and reduce military effectiveness to fight interstate and intrastate conflicts. In turn, they use unearmarked aid resources to increase the value of keeping the status quo for the winning coalition and the selectorate. An example comes from the Solomon Islands that between 2000 and 2001 received on average 63 US dollars per capita for a total of ≈53 million US dollars. Before the 2001 elections, the incumbent leader with the support of the Australian Government provided 5.4 million of US dollars to politicians, rebels and police that had organized a coup attempt the previous year (Girod, 2015).

More formally:

Hypothesis 2: *Limited access to donors' unearmarked resources increases leaders' likelihood to undertake institutional coup-proofing activities when coup risk rises.*

5.5 Methods

To test my hypothesis, I resort to the following strategy: first, I estimate the probability for a country to experience a coup through a logit model of coup attempt. Second, I estimate the effect of coup risk and aid on institutional coup-proofing with a two-stage least squares analysis. To do so, I collect data from 122 countries that according to the AidData dataset received financial and in kind donors' support between 1970 and 2013. The country-year is the unit of analysis and Table 5A in the appendix presents the descriptive statistics of the dataset. The following equation describes the second stage equation of my main model:

$$CBI_{t,j} = \beta_0 + \beta_1 Coup\ Risk_{t,j} + \beta_2 Aid_{t,j} + \beta_3 Aid_{t,j} * Coup\ Risk_{t,j} + \beta_4 \boldsymbol{X}_{t,j} + \epsilon_{t,j} \qquad (3)$$

To capture the process of creating, strengthening and disbanding counterweights to the army I use the counterbalancing index (from now on *CBI*) from the Counterbalancing/Coup-Proofing Dataset[45] (Pilster and Böhmelt, 2011; 2012). As counterweights the index includes all the ground-combat compatible military organizations relying on the "Military Balance" statistics from the International Institute for Strategic Studies and additional secondary sources (Pilster and Böhmelt, 2011). The value of the *CBI* in the year t for the country j is equal to:

$$CBI_{j,t} = \frac{1}{\sum_i S^2_{j,i,t}} \tag{4}$$

where $S_{s,i,t}$ is the personnel share of the ground-combat compatible military or paramilitary organizations in the year t for the country j (Pilster and Böhmelt, 2011). This means, for example, that a value of the index equal to 2 indicates two equally strong military organizations present in a country.

As main independent variables, the model includes *Coup Risk*, *Aid* and their interaction *Coup Risk*Aid*. *Coup Risk* proxies the level of coup risk. I calculate this variable as the logarithm of one plus the probability of coup attempt in the year t for the country j in percentage terms[46].

To predict the probability for a coup to occur I resort to a maximum likelihood estimation of a logistic model for the binary variable *Coup*. This variable assumes value 1 if in a given year the country experienced at least one coup attempt and 0 otherwise as coded in the Coup d'etat Dataset (Powell and Thyne, 2011). As regressors accounting for the willingness and the capacity of coup-plotters to stage a coup, I use a set of geographical, meteorological and historical variables. This is important to avoid biased estimates due to using endogenous regressors such as the level of trade or the GDP per capita. I present the model in the

[45] https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/JCVR1H

[46] Using the logarithm of coup risk estimates reduces the volatility of the measure and the impact of outliers.

appendix where Table 6A displays its estimates[47].

Aid is a dummy variable assuming value 1 if in a given year the four-year moving average of donors' unearmarked commitments per capita is greater than 0.1 US dollars[48]. To identify the amount of unearmarked aid that leaders receive I look at aid flows coded in the AidData Core Release dataset as "General Budget Support". Figure 14 in the appendix shows the distribution of *Coup Risk* over the values of the variable *Aid*. It is worth noting that *Coup Risk* is equally distributed between the two values of the variable.

To capture the effect of *Coup Risk* and *Coup Risk*Aid* on institutional coup-proofing efforts, it is necessary resorting to a two-stage least squares analysis. Indeed as coup risk influences leaders' decisions regarding if and to what extent to undertake institutional coup-proofing, these efforts affect the willingness and capacity of coup plotters to stage a coup, thus coup risk itself. In this sense, directly plugging in the main model the variable *Coup Risk* and its interaction with *Aid* would not take into account the feedback loop between the dependent and independent variable. As excluded instrument for the endogenous regressors *Coup Risk* and *Coup Risk*Aid*, I use the variable *Duration*, its interaction with *Aid* and the meteorological variable *Temperature* (Δ) to account for external shocks[49]. *Duration* is equal to the number of years since the last coup attempt. Δ *Temperature* is the inter-year change of the lagged value of surface temperature anomalies measured in Celsius degrees. For this variable, the data source is the HadCRUT analysis from the Climatic Research Unit (University of East Anglia)[50].

X is a vector of variables serving as included instruments for the first-stage equations and control variables for the second-stage equation. **X** includes the ratio between total commitments per capita and GDP per capita, the logarithm of the population, the lagged inter-year change of the share of natural resources rents over the GDP, the lagged inter-year

[47]The value of the area under the ROC curve greater than 0.8 suggests that the model performs well in measuring the probability of coup attempt (Hosmer, et al., 2013).

[48]Resorting to the four-years moving average is needed as data on donors' commitments are likely to be lumpy and their record on national budgets might not reflect the actual progress of disbursements.

[49]For a brief discussion on the impact of temperatures on economic activity Dell et al. (2012)

[50]https://ourworldindata.org/grapher/hadcrut-surface-temperature-anomaly

change of GDP per capita and number of military personnel. [51]

To control for regime type, **X** includes two dummy variables accounting for the country being a democracy or a military regime. The former dummy assumes value 1 if the polity2 index score[52] for the country is equal or greater than 5. The source for the index is the PoiltyIV project database (Marshall and Jaggers, 2015). The latter dummy assumes value 1 if in a given year the regime type is coded as "indirect military", "military", "military-personal", "party-military" or "party-military-personal" in the V-Dem dataset. *Democracy* takes into account that institutional coup-proofing is both relatively less attractive and necessary in a democratic country (Pilster and Böhmelt, 2012) while *Military* controls for the relevance of the army in the politics (Jenkins and Kposowa, 1992).

To control for the impact of ongoing conflict, **X** includes a dummy variable assuming value 1 if the country is experiencing an inter or intrastate conflict or not. As counterbalancing efforts decrease military fighting effectiveness and wars affect coup risk (Böhmelt and Pilster, 2015; Piplani and Talmadge, 2016; Bell and Koga-Sudduth, 2017), ongoing conflict might affect leaders willingness to implement institutional coup-proofing efforts. Moreover, **X** includes the ethnic fractionalization index from the Historical Index of Ethnic Fractionalization (HIEF) dataset (Drazanova, 2019) as ethnically diverse societies provide leaders willing to implement institutional coup-proofing with the capacity to set up counterweights to the army leveraging over ethnic differences (Quinlivan, 1999). Finally, I include a dummy variable assuming value 1 if the year is prior to 1991 -*Cold War* - and country-year fixed effects to soak up time trends and unobserved invariant effects.

5.6 Results

Table 4 presents the estimates for the first and second stages of my main model and a baseline model reporting clustered standard errors on the country level robust to heteroskedasticity

[51] Data sources are, the AidData Dataset (Tierney et al., 2011), the V-Dem dataset (Coppedge et al., 2019), the World Bank Open Dataset and the National Material Capabilities Dataset (Singer, 1998).

[52] The index measures the political regime authority and approximates the level of democratization ranging from -10 (full autocracy) to +10 (full democracy)

and intra-cluster correlation. Looking at the estimates of the second stage of my main model under Model 5, the GMM distance test statistic of exogeneity suggests that *Coup Risk* and *Coup Risk*Aid* are indeed endogenous, while the values of the Kleibergen-Paap *rk* LM, Kleibergen-Paap *rk* Wald F and Hansen's *j* statistics hint that the instruments are uncorrelated with the error term and - not only weakly - correlated with the endogenous regressors (Hayashi, 2000; Baum et al., 2007; Staiger and Stock, 1994; Stock and Yogo, 2005). Finally, it is worth recalling that in IV analysis R^2 has no natural interpretation as SSR for IV can be larger than SST (Wooldridge, 2006).

Model 1 and Model 2 report, respectively, estimates from the first and the second stage of a baseline model including *Coup Risk* and *Aid* but not *Coup Risk*Aid*. Looking at Model 2, *Coup Risk* has positive sign and is statistically different from 0 only at 10% level while the coefficient of *Aid* has negative sign and is not statistically different from 0. Model 3 and Model 4 report the first stage estimates from my main model, while Model 5 displays the estimates for the second stage equation. Looking at Model 5, *Coup Risk*Aid* has a negative sign, but is significant only at 10% level. In turn, *Aid* changes sign and is still not significant, while *Coup Risk* remains positive and is now significant at 5% level. This suggests that leaders who do not have access to unearmarked aid are likely to react to coup risk *increasing* institutional coup-proofing efforts. When *Coup Risk* rises by one standard deviation, leaders who do not have access to unearmarked resources increase the number of effective ground-combat military organizations by ≈0.39 units. In turn, leaders who have access to unearmarked aid seem to react to coup risk *decreasing* institutional coup-proofing efforts. Indeed, when *Coup Risk* rises by one standard deviation, leaders who enjoy discretionally allocable aid decrease the number of effective ground-combat military organizations by ≈0.11 units. This suggests that leaders might prefer facing coup risk replacing institutional coup-proofing with other strategies when they have financially chances to do so. These findings are in line with the hypothesis i.e that leaders who do not have access to unearmarked aid are more likely to face coup risk implementing institutional coup-proofing strategies than leaders who have access

to such revenues. Figure 8 displays the point estimates and their 95% confidence intervals for the variables *Coup Risk*, and *Coup Risk*Aid*.

Table 4: The impact of coup risk and aid on institutional coup-proofing. *CBI* as independent variable

VARIABLES	(1) Model 1 First Stage Baseline Model Coup Risk	(2) Model 2 Second Stage Baseline Model CBI	(3) Model 3 First Stage Main Model Coup Risk	(4) Model 4 First Stage Main Model Coup Risk*Aid	(5) Model 5 Second Stage Main Model CBI
Coup Risk		0.369*			0.475**
		(0.206)			(0.217)
Aid	-0.048	-0.031	-0.056	1.772***	0.135
	(0.031)	(0.039)	(0.061)	(0.106)	(0.086)
Coup Risk*Aid					-0.138*
					(0.073)
Duration	-0.011***		-0.012***	0.007***	
	(0.003)		(0.003)	(0.002)	
Duration*Aid			0.000	-0.026***	
			(0.002)	(0.003)	
Δ Temperature	-0.086***		-0.086***		
	(0.011)		(0.011)		
Aid over GDP	-1.524*	0.543	-1.518*	-0.208	0.738
	(0.793)	(0.929)	(0.790)	(0.742)	(0.932)
Δ GDP	-0.302*	0.083	-0.302*	-0.035	0.109
	(0.162)	(0.146)	(0.162)	(0.145)	(0.150)
HIEF index	2.111***	-0.954	2.119***	0.173	-1.070
	(0.543)	(0.664)	(0.547)	(0.477)	(0.669)
Population	-0.094	0.160	-0.096	-0.273***	0.111
	(0.150)	(0.177)	(0.148)	(0.104)	(0.182)
Δ Military Personnel	-0.001**	0.001***	-0.000**	-0.000	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Conflict	0.068	0.114*	0.068	0.090**	0.119*
	(0.049)	(0.066)	(0.049)	(0.043)	(0.068)
Democracy	-0.098*	-0.040	-0.098*	-0.075	-0.045

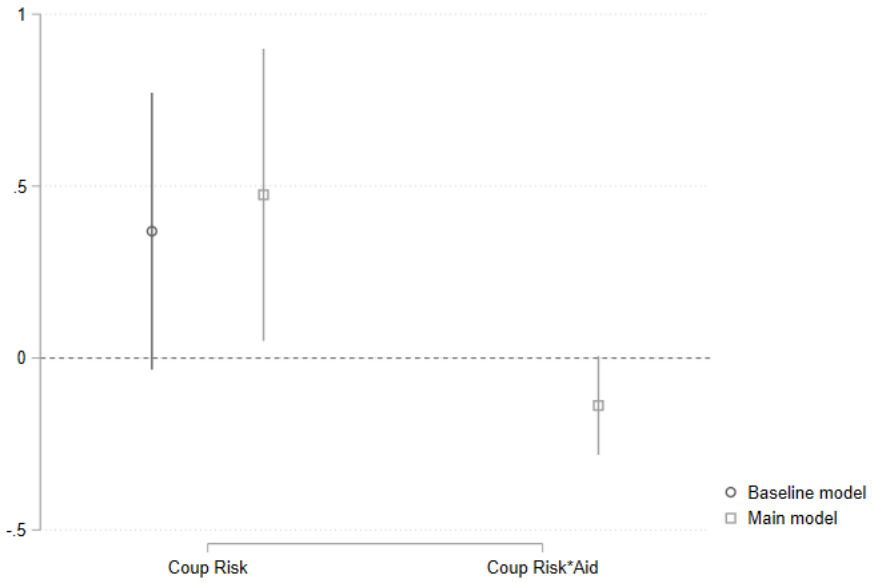
Continued on next page

Table 4 – continued from previous page

	(0.058)	(0.074)	(0.058)	(0.048)	(0.075)
Military	0.854***	-0.440**	0.853***	0.482***	-0.470**
	(0.080)	(0.201)	(0.080)	(0.075)	(0.205)
Cold war	0.690***	-0.389*	0.689***	0.344***	-0.420**
	(0.090)	(0.202)	(0.090)	(0.090)	(0.209)
Δ Natural Revenues	0.037	-0.037	0.037	0.070**	-0.031
	(0.031)	(0.028)	(0.031)	(0.031)	(0.028)
Observations	2,733	2,733	2,733	2,733	2,733
Number of ID	122	122	122	122	122
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES	YES
Adjusted R-squared		-0.077			-0.110
R-squared by hand		-0.00989			-0.0405
F statistic		2.695			2.632
p-value of F-statistic		6.50e-06			9.46e-06
F-stat for weak identification		39.74			25.76
F-stat for underidentification		35.46			35.04
p-value of underidentification LM statistic		1.99e-08			2.46e-08
Hansen J statistic		2.019			2.447
p-value of Hansen J statistic		0.155			0.118
GMM distance test statistic of exogeneity		1.718			11.81
p-value of GMM distance test statistic of endogeneity		0.190			0.00273

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

Figure 8: β coefficients of *Coup Risk* and *Coup Risk*Aid*. *CBI* as dependent variable.



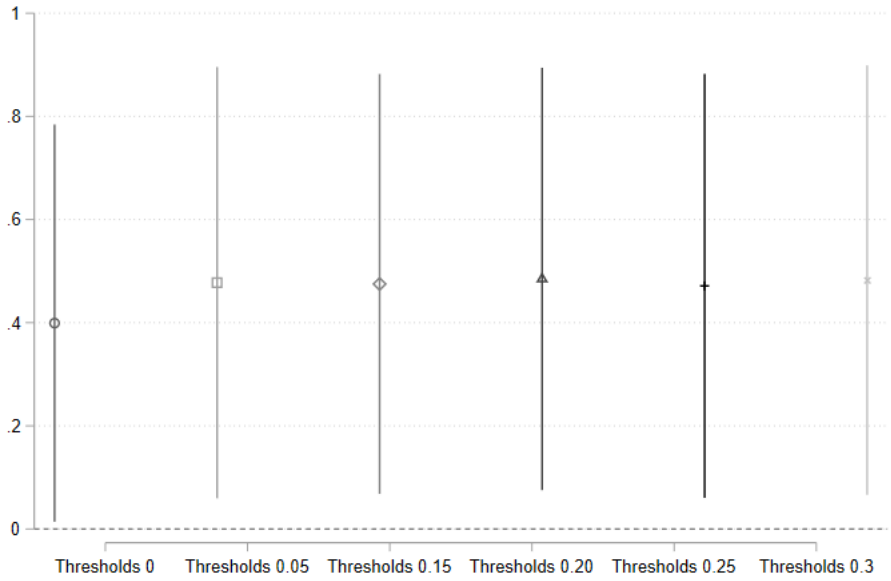
Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

To corroborate these findings, I investigate how changing the threshold of the amount of unearmarked aid used to code the variable *Aid* affects model estimates. In this sense, I code the variable *Aid* six more times using as thresholds 0, 0.05, 0.15, 0.2, 0.25 and 0.3 US dollars per capita. Figure 9 and 10 display, respectively, the point estimates and their 95% confidence intervals for the variables *Coup Risk* and *Coup Risk*Aid*. Notably, changing the threshold does not affect the model results. Table 7A in the appendix displays model estimates for these additional specifications.

Moreover, to further the analysis taking into account temporal lags of the effects of coup risk, I run my model two more times forwarding my dependent variable by 1 and 2 periods. Table 8A in the appendix fully presents the results. While in both these additional specifications the main independent variables do not change the sign of their coefficients, yet, in both specifications statistical significance decreases.

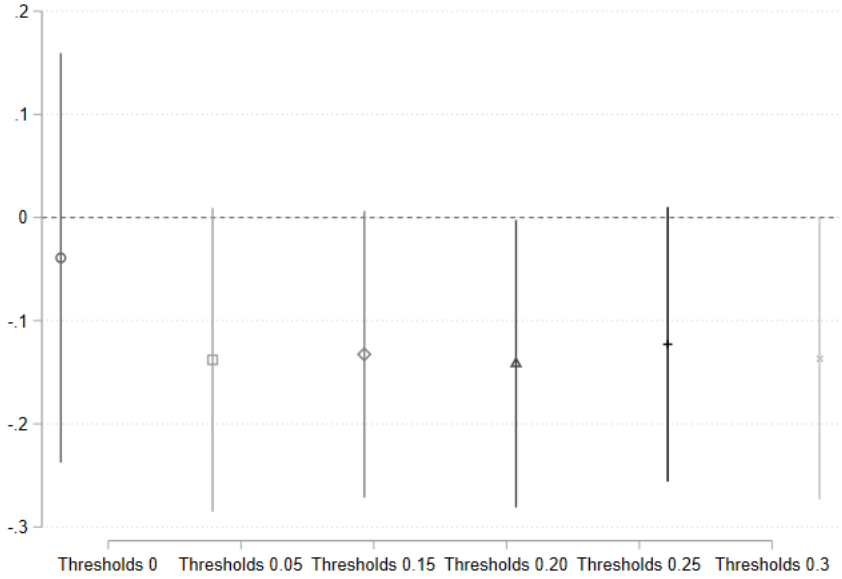
Finally, as additional robustness checks I test my hypothesis using as dependent variable two alternative dummy variables. The first dummy is *Coup-proofing* and assumes value 1 if in

Figure 9: β coefficients of *Coup Risk*. Alternative *Aid* thresholds. *CBI* as dependent variable.



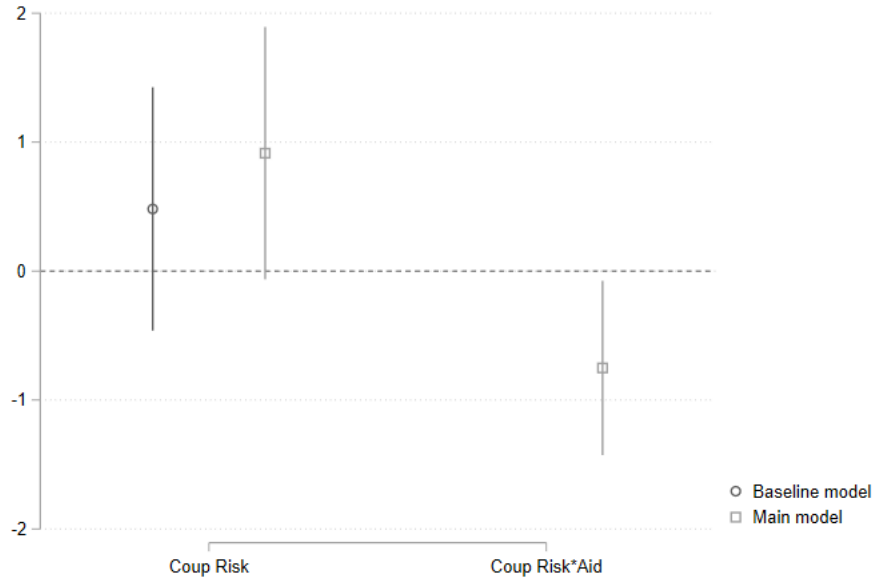
Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

Figure 10: β coefficients of *Coup Risk*Aid*. Alternative *Aid* thresholds. *CBI* as dependent variable.



Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

Figure 11: β coefficient of *Coup Risk* and *Coup Risk*Aid*. *Coup-proofing* as dependent variable.

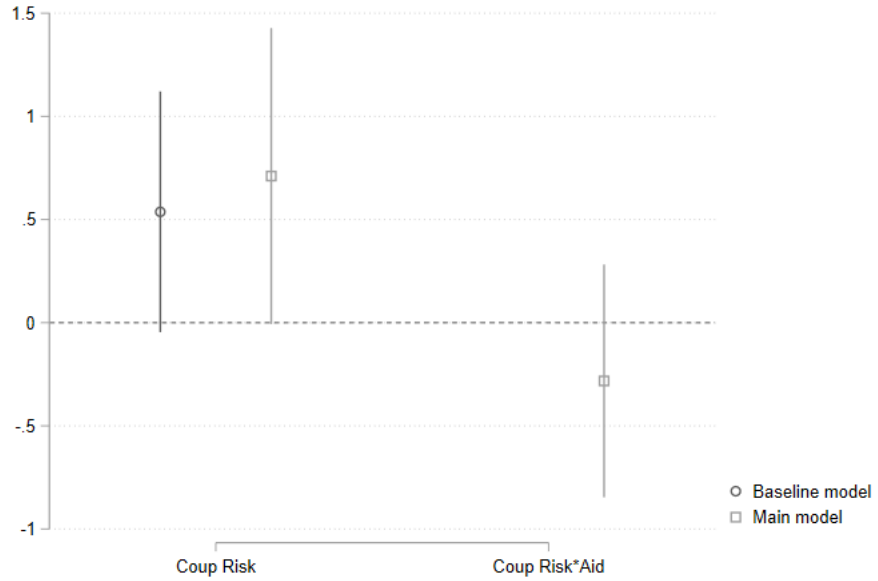


Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

the country there are more than 1.5 and less than 2.5 military rival units. I code this variable using data from the *CBI*. Indeed, as Böhmelt and Pilster (2015) note, counterbalancing efforts are most effective in opposing coups when in a country are present about two equally strong military organizations. Results are in line with those above presented. Figure 11 plots point estimates and their 95% confidence intervals for the variables *Coup Risk*, *Aid* and their interaction. Table 9A in the appendix displays full results from this additional model.

The second dummy variable is *Coup-proofing (SSFD)* and assumes value 1 if in the country is present one or more counterweights to the army and 0 otherwise according to the State Security Forces Dataset (De Bruin, 2019). As in the main analysis, both *Coup Risk* and *Coup Risk*Aid* have the expected sign. Figure 12 plots point estimates and their 95% confidence intervals for the variables *Coup Risk*, *Aid* and their interaction. Table 10A in the appendix displays full results from this additional model.

Figure 12: β coefficients of *Coup Risk* and *Coup Risk*Aid*. *Coup-proofing (SSFD)* as dependent variable.



Points represent coefficient estimates while lines their 95% confidence interval. The dashed horizontal line is set on 0.

5.7 The Bangladeshi case

Bangladesh well exemplifies the proposed relation between unearmarked aid, coup risk and institutional coup-proofing. Figure 13 plots the amount of donors' commitments as general budget support and the value of the counterbalancing index over time. Between 1975 and 1991, the year in which the parliamentary republic was restored, Bangladesh suffered a period of tense civil-military relations. Only in 1975, the country experienced a bloody military coup in August, an abortive counter-coup on November 3rd and merely four days later a "sepoy mutiny" through which General Ziaur Rahman consolidated his power (Islam, 1984). Between 1977 - the year in which Ziaur took over the presidency formally - and 1981, there were nineteen coup attempts (Islam, 1984). The assassination of Ziaur in a failed coup that year pushed the country further into instability. In fact, just one year after Lt. General Ershad seized power justifying its intervention affirming that Bangladeshi political indiscipline, corruption, devastated economy, administrative stalemate, and food crises were

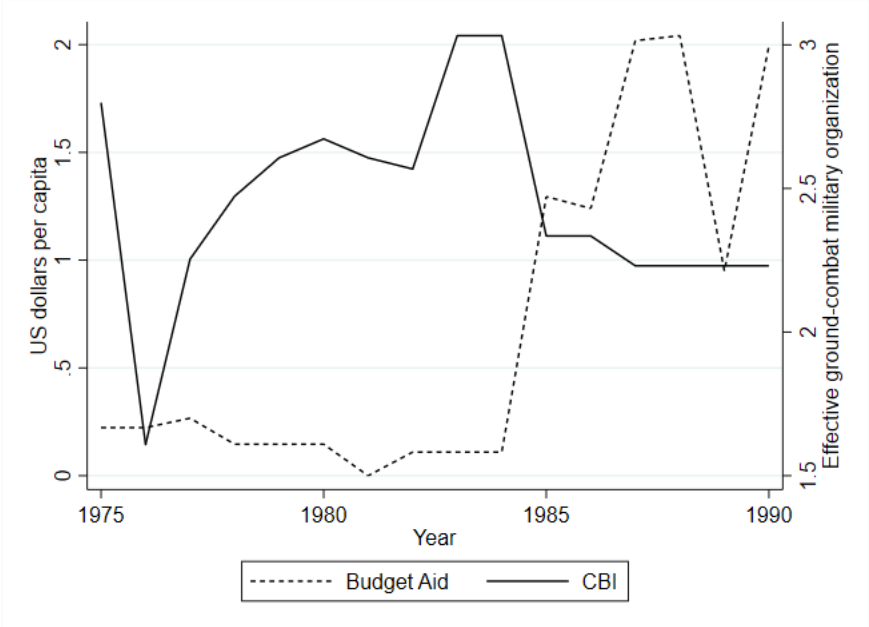
threatening national security (Bertocci, 1982).

Notably, the relative strength of the counterweights to the Bangladeshi army changed over time oppositely to the relative amount of unearmarked resources donors provided. During the rule of Ziaur, donors allocated very little or no unearmarked resources. Between 1977 and 1981 Bangladesh received an average of 0.11 US dollars per capita for a total of ≈48.4 millions US dollars. In the same period, Ziaur undertook substantive institutional coup-proofing efforts increasing the strength of Bangladeshi paramilitary units. In 1977 the Bangladeshi army counted 59.000 men, the five infantry brigades were divided into 17 battalions, and there were 20.000 paramilitary militia volunteers (Paxton, 1977). Five years later, the infantry brigades were divided into 27 battalions, and the paramilitary volunteers had outnumbered the soldiers in the army (Paxton, 1981). In turn, when three years after Ershad's successful coup donors increased progressively the allocation of unearmarked contributions, the new Bangladeshi leader followed a different coup-proofing strategy. Between 1985 and 1990 donors committed an average of 1.5 US dollars per capita for a total of ≈1.38 billion US dollars. In the same period, the regime of Ershad's reached record levels of venality (Blair, et al., 1992) while restoring the strength of the army vis-à-vis the paramilitary formations. Notably, the number of soldiers rose by 20.000 units, while the number of paramilitary volunteers decreased by 11.000 units (Paxton, 1983; 1990).

5.8 Conclusions

As discussed and as recent developments in Mali showed, coup-plotters pose a real threat to incumbent leaders. To face the risk of being ousted by the military, leaders can resort to different strategies. In this paper, I investigate if and to what extent access to unearmarked international aid affects leaders' strategies to face coup-risk. I argue that access to unearmarked aid decreases leaders' willingness to face coup risk resorting to institutional coup-proofing activities. In fact, as institutional coup-proofing increases the risk of preventive coups (Finer, 2002) and reduces military fighting effectiveness(Böhmelt and Pilster,

Figure 13: Unearmarked commitments and institutional coup-proofing in Bangladesh.



The dashed line illustrates the four-year moving average of donors' resources committed as general budget support to Bangladesh. The continuous line represents the number of effective ground-combat military organizations in the country.

2011), when leaders enjoy access to discretionally allocable resources, then they prefer implementing other coup-proofing strategies than institutional coup-proofing as, for example, buying-off potential rivals allocating private goods. In turn, lack of access to such resources binds leaders to face coup risk implementing institutional coup-proofing.

On the empirical side, first, this paper proposes an instrumental variable approach to examine the impact of coup risk on institutional coup-proofing. Second, it suggests a set of historical, geographical and meteorological variables to estimate coup risk. I find that leaders who do not have access to unearmarked aid are indeed more likely to face coup risk implementing institutional coup-proofing strategies than leaders who enjoy such resources. Results are robust to a series of different model specifications.

These results contribute to increase our understanding of when, to what extent and under which circumstances, leaders implement institutional coup-proofing as a strategy to face coup risk. At the same time, these findings advance our knowledge regarding how and

when leaders use aid as a tool to increase their survival chances.

5.9 Appendix

In the next pages, Table 5A presents the descriptive statistics of the dataset while Table 6A shows the estimate of the model of coup attempt used to predict coup risk. To model coup attempts I follow a two-stage approach resorting to a logit model via a control function estimator. This is to take into account for the latent variable coup risk affecting both the dependent variable and some of the regressors as as GDP and the level of foreign direct investments (FDI). As discussed, my independent variable is a dummy that assumes value 1 if a country experienced at least one coup attempt in a given year according to the Coup d'etat Dataset (Powell and Thyne, 2011) and 0 otherwise. As regressors, I include the GDP growth, military expenditure and its inter-year change, FDI, a dummy variable accounting for the country being an autocracy[53], a dummy variable accounting for the country being ruled by a military regime, the number of coup-attempts occurred in the last five years and its squared term. The set of excluded instruments for the endogenous regressors GDP, FDI, military expenditure and its inter-year change includes the percentages of ice-free coast within 100 km, land with tropical climates, desertic surface, fertile soil, an index of terrain ruggedness,[54], the proportional inter-year change of a weighted measure of countries' average monthly precipitation[55] and its lagged value, the lagged value of surface temperature anomaly and its inter-year change[56], and two dummy variables accounting for the country being a former colony and the year being prior to 1991. These variables are proxies for the chances of a country to have access to trade routes, develop its economy, strengthen state capacity and experience conflict (Fearon and Latin, 1999; Gallup et al., 1999; Buhaug and Gates, 2002; Miguel et al. 2004; Buhaug and Lujala, 2005; Disdier and Head, 2008; Feyrer. 2009; Hendrix, 2011; Dell et al., 2012).

[53]This dummy assumes value 1 if in the given year the country's polity2 score is equal or minor than -5 and 0 otherwise

[54]I code these variables following Nunn and Puga (2012).

[55]Our World in Data: https://ourworldindata.org/grapher/average-monthly-precipitation?tab=chart

[56]Data is based on the HadCRUT analysis from the Climatic Research Unit (University of East Anglia), https://ourworldindata.org/grapher/hadcrut-surface-temperature-anomaly

Figure 14: Distribution of Coup Risk over values of Aid

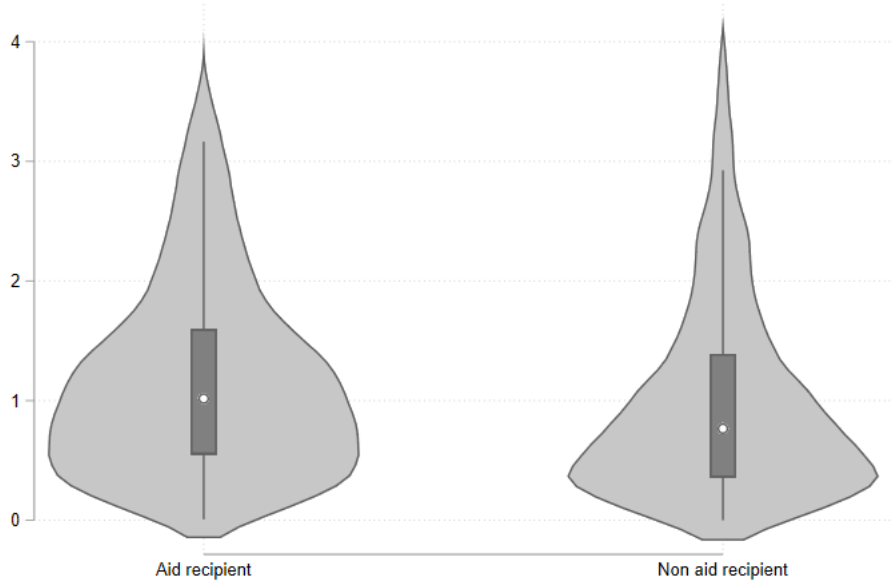


Figure 14 shows the distribution of the variable *Coup Risk* over the values of the variable *Aid*. At the same time, Table 7A, 8A, 9A and 10A shows model estimations for the additional specifications discussed previously. In particular, Table 7A and Table 7A show, respectively, how changing the threshold to define the variable *Aid* and how forwarding the dependent variable of one and two periods affects results. Finally Table 9A and Table 10A show results from the two logit models estimated via a control function estimator and having as dependent variables, respectively, *Coup-proofing* and *Coup-proofing (SSFD)*.

Table 5A: Summary statistics

	Mean	Median	Std.Dev.	Min	Max	Obs
CBI	1.72		0.65	1.00	4.58	2733
Coup-proofing (SSFD)	0.68		0.46	0.00	1.00	1688
Coast	36.94		36.54	0.00	100.00	2733
Soil	37.23		21.59	0.00	88.65	2733
Tropical	37.08		42.26	0.00	100.00	2733
Ruggedness	1.24		1.07	0.04	6.20	2733
Desert	4.49		11.48	0.00	77.28	2733
Colonized	0.83		0.37	0.00	1.00	2733
Δ Precipitation	0.03		0.26	-0.86	3.41	2733
Cold war	0.40		0.49	0.00	1.00	2733
Δ Temperature	0.03		0.54	-3.88	2.42	2733
Temperature	0.34		0.55	-1.83	4.66	2733
GDP growth	0.02		0.08	-0.44	1.34	2733
Military Expenditure	3.01		4.13	0.00	117.35	2733
FDI	2.54		5.21	-28.62	103.34	2733
Autocracy	0.28		0.45	0.00	1.00	2733
Military	0.13		0.34	0.00	1.00	2733
Past coups	0.26		0.74	0.00	9.00	2733
Duration	23.98		17.79	0.00	64.00	2733
Duration*Aid	13.47		17.45	0.00	64.00	2733
Coup Risk	1.11		0.83	0.00	4.04	2733
Coup Risk*Aid	0.72		0.85	0.00	3.93	2733
Aid	0.61		0.49	0.00	1.00	2733
Aid over GDP	0.02		0.03	0.00	0.32	2733
Δ Natural Revenues	0.01		0.27	-1.52	3.27	2733
Δ GDP	0.02		0.07	-0.58	0.85	2733
HIEF index	0.45		0.27	0.01	0.89	2733
Population	16.27		1.34	12.97	21.03	2733
Δ Military Personnel	-0.82		31.87	-1100.00	410.00	2733
Conflict	0.20		0.40	0.00	1.00	2733
Democracy	0.54		0.50	0.00	1.00	2733
Military	0.13		0.34	0.00	1.00	2733
Cold war	0.40		0.49	0.00	1.00	2733
Year	1994.57		11.32	1972.00	2013.00	2733

Table 6A: Logit model of coup attempt.

VARIABLES	(1) Model 1A Second Stage Coup	(2) Model 1A First Stage GDP growth	(3) Model 1A First Stage Military Expenditure	(4) Model 1A First Stage Δ Military Expenditure	(5) Model 1A First Stage FDI
Autocracy	-0.026	-0.003	1.543***	-0.026	-0.250
	(0.094)	(0.004)	(0.597)	(0.107)	(0.489)
Military	0.139**	0.007*	-0.620	-0.063	-0.436
	(0.069)	(0.004)	(0.497)	(0.054)	(0.322)
Past coups	0.049	-0.005	-0.026	0.045	0.216
	(0.085)	(0.004)	(0.246)	(0.050)	(0.373)
Past coups^2	-0.008	0.000	-0.012	-0.012	-0.040
	(0.013)	(0.001)	(0.041)	(0.009)	(0.057)
Coast		0.000	0.014**	0.000	0.002
		(0.000)	(0.006)	(0.001)	(0.006)
Soil		0.000	-0.039***	-0.001	-0.007
		(0.000)	(0.012)	(0.001)	(0.012)
Tropical		-0.000	-0.019***	0.001	-0.007
		(0.000)	(0.005)	(0.001)	(0.007)
Ruggedness		-0.000	0.007	0.013	-0.186
		(0.001)	(0.119)	(0.022)	(0.196)
Desert		-0.000	0.005	-0.000	-0.027
		(0.000)	(0.026)	(0.002)	(0.024)
Colonized		-0.004*	-0.093	0.018	0.720
		(0.002)	(0.779)	(0.041)	(0.537)
Δ Precipitation		0.003	1.765*	0.751	0.709
		(0.011)	(0.977)	(0.593)	(0.574)
Δ Precipitation		0.002	1.242**	-0.406	0.504
		(0.008)	(0.609)	(0.310)	(0.745)

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Table 6A – continued from previous page

Cold war		0.008	0.529	0.115	-2.644***
		(0.011)	(0.716)	(0.229)	(0.721)
Δ Temperature		0.001	-0.265**	0.088	0.166
		(0.002)	(0.135)	(0.113)	(0.310)
Temperature		0.001	-0.572**	0.072	0.024
		(0.002)	(0.274)	(0.072)	(0.375)
GDP growth	-12.595***				
	(2.329)				
Military Expenditure	-0.006				
	(0.023)				
Δ Military Expenditure	0.079				
	(0.218)				
FDI	-0.041				
	(0.050)				
athrho2_1					1.621**
					(0.734)
athrho3_1					-0.095
					(0.116)
athrho4_1					-0.434
					(0.356)
athrho5_1					0.356
					(0.407)
athrho3_2					-0.044*
					(0.025)
athrho4_2					-0.321**
					(0.146)
athrho5_2					0.052***
					(0.018)
athrho4_3					0.328***

Continued on next page

Table 6A – continued from previous page

						(0.096)
athrho5_3						-0.029**
						(0.014)
athrho5_4						0.009
						(0.009)
lnsigma2						-2.644***
						(0.076)
lnsigma3						1.190***
						(0.193)
lnsigma4						0.753*
						(0.397)
lnsigma5						2.002***
						(0.216)
Constant	0.032	0.024***	4.029***	-0.106	4.025***	
	(0.302)	(0.007)	(0.941)	(0.138)	(0.989)	
Observations	3,747	3,747	3,747	3,747	3,747	3,747
Cluster SE	YES	YES	YES	YES	YES	YES
AUROC	0.853	0.853	0.853	0.853	0.853	0.853

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

Table 7A: The impact of coup risk and aid on institutional coup-proofing. *CBI* as independent variable. Additional thresholds for the variable *Aid*.

	(1)	(2)	(3)	(4)	(5)	(6)
	Model 2A	Model 3A	Model 4A	Model 5A	Model 6A	Model 7A
	0 US Dollars	0.05 US Dollars	0.15 US Dollars	0.2 US Dollars	0.25 US Dollars	0.3 US Dollars
VARIABLES	CBI	CBI	CBI	CBI	CBI	CBI
Coup Risk	0.399**	0.478**	0.475**	0.485**	0.471**	0.483**
	(0.196)	(0.213)	(0.208)	(0.209)	(0.210)	(0.212)
Aid	-0.027	0.125	0.138*	0.152**	0.144*	0.160**
	(0.153)	(0.094)	(0.081)	(0.077)	(0.075)	(0.078)
Coup Risk*Aid	-0.039	-0.138*	-0.133*	-0.142**	-0.123*	-0.137**
	(0.101)	(0.075)	(0.071)	(0.071)	(0.068)	(0.070)
Observations	2,733	2,733	2,733	2,733	2,733	2,733
Number of ID	122	122	122	122	122	122
Adjusted R-squared	-0.078	-0.108	-0.113	-0.118	-0.114	-0.120
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES	YES	YES
R-squared by hand	-0.0108	-0.0387	-0.0431	-0.0480	-0.0445	-0.0498
F statistic	2.790	2.760	2.701	2.698	2.688	2.678
p-value of F-statistic	2.80e-06	3.52e-06	5.55e-06	5.69e-06	6.15e-06	6.62e-06
F-stat for weak identification	24.67	25.54	25.77	25.51	25.47	25.07
F-stat for underidentification	34.52	34.87	35.05	34.83	34.80	34.57
p-value of underidentification LM statistic	3.19e-08	2.69e-08	2.45e-08	2.73e-08	2.77e-08	3.12e-08
Hansen J statistic	2.150	2.469	2.593	2.727	2.625	2.761
p-value of Hansen J statistic	0.143	0.116	0.107	0.0987	0.105	0.0966
GMM distance test statistic of exogeneity	4.897	10.43	13.08	12.62	11.85	11.83
p-value of GMM distance test statistic of endogeneity	0.0864	0.00542	0.00144	0.00182	0.00268	0.00270

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8A: The impact of coup risk and aid on institutional coup-proofing. *CBI* as independent variable. Dependant variable forwarded.

VARIABLES	(1) Model 8A Second Stage Main Model CBI 1-years forward	(2) Model 9A Second Stage Main Model CBI 2-years forward
Coup Risk	0.409*	0.367
	(0.216)	(0.226)
Aid	0.123	0.119
	(0.089)	(0.092)
Coup Risk*Aid	-0.109	-0.089
	(0.072)	(0.073)
Aid over GDP	1.436*	1.165
	(0.741)	(0.761)
Δ GDP	0.102	0.163
	(0.151)	(0.151)
HIEF index	-0.944	-0.700
	(0.710)	(0.748)
Population	0.127	0.180
	(0.172)	(0.164)
Δ Military Personnel	0.001***	0.001***
	(0.000)	(0.000)
Conflict	0.138**	0.113*
	(0.066)	(0.063)
Democracy	-0.068	-0.053
	(0.081)	(0.080)
Military	-0.455**	-0.430**
	(0.188)	(0.190)
Cold war	-0.371*	-0.278
	(0.223)	(0.239)

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Table 8A – continued from previous page

Δ Natural Revenues	-0.036	-0.004
	(0.022)	(0.022)
Observations	2,750	2,764
Number of ID	122	122
Adjusted R-squared	-0.068	-0.055
Country FE	YES	YES
Year FE	YES	YES
Cluster SE	YES	YES
R-squared by hand	-0.00150	0.00998
F statistic	2.994	2.466
p-value of F-statistic	5.82e-07	3.41e-05
F-stat for weak identification	25	25.86
F-stat for underidentification	34.50	35.64
p-value of underidentification LM statistic	3.22e-08	1.82e-08
Hansen J statistic	1.535	1.984
p-value of Hansen J statistic	0.215	0.159
GMM distance test statistic of exogeneity	12.40	8.260
p-value of GMM distance test statistic of endogeneity	0.00203	0.0161

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

Table 9A: The impact of coup risk and aid on institutional coup-proofing. *Coup-proofing* as independent variable.

VARIABLES	(1) Model 10A Coup-proofing	(2) Model 11A Coup Risk	(3) Model 12A Coup Risk*Aid
Coup Risk	0.711*		
	(0.366)		
Aid	0.414	0.122	1.709***
	(0.319)	(0.085)	(0.092)
Coup Risk*Aid	-0.282		
	(0.288)		
Duration		-0.012***	0.008***
		(0.002)	(0.001)
Duration*Aid		-0.003	-0.025***
		(0.002)	(0.002)
Aid over GDP	-3.573	2.719**	1.755*
	(2.376)	(1.107)	(0.971)
Δ Natural Revenues	-0.064	0.003	0.058*
	(0.082)	(0.034)	(0.032)
Δ GDP	0.918**	-0.543***	-0.223
	(0.401)	(0.194)	(0.163)
HIEF index	-0.514	0.510***	0.298***
	(0.345)	(0.113)	(0.083)
Population	0.019	0.047*	0.006
	(0.059)	(0.025)	(0.018)
Δ Military Personnel	0.001	-0.000	-0.000
	(0.001)	(0.000)	(0.000)
Conflict	0.032	-0.010	0.026
	(0.152)	(0.068)	(0.061)
Democracy	-0.283*	-0.114*	-0.099**
	(0.168)	(0.062)	(0.046)
Military	-0.731**	0.913***	0.516***

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Table 9A – continued from previous page

	(0.342)	(0.091)	(0.075)	
Cold war	-0.611	0.360**	0.203***	
	(0.387)	(0.150)	(0.066)	
Δ Temperature		-0.078***	-0.034***	
		(0.013)	(0.012)	
athrho2_1				-0.330*
				(0.175)
athrho3_1				-0.184
				(0.131)
athrho3_2				0.871***
				(0.054)
lnsigma2				-0.686***
				(0.039)
lnsigma3				-0.774***
				(0.037)
Constant	-0.125	-0.094	-0.702**	
	(1.004)	(0.421)	(0.291)	
Observations	2,733	2,733	2,733	2,733
Country FE	NO	NO	NO	NO
Year FE	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES
AUROC	0.639	0.639	0.639	0.639

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

Table 10A: The impact of coup risk and aid on institutional coup-proofing. *Coup-proofing (SSFD)* as independent variable.

VARIABLES	(1) Model 13A Coup-proofing (SSFD)	(2) Model 14A Coup Risk	(3) Model 15A Coup Risk*Aid
Coup Risk	0.914*		
	(0.499)		
Aid	1.006**	0.117	1.912***
	(0.475)	(0.108)	(0.109)
Coup Risk*Aid	-0.751**		
	(0.345)		
Duration		-0.014***	0.009***
		(0.003)	(0.002)
Duration*Aid		-0.003	-0.030***
		(0.003)	(0.003)
Δ Temperature		-0.094***	-0.054***
		(0.019)	(0.018)
Aid over GDP	2.089	1.511	0.576
	(3.415)	(1.168)	(0.954)
Δ Natural Revenues	0.143	-0.033	0.038
	(0.100)	(0.042)	(0.038)
Δ GDP	-0.143	-0.817***	-0.402
	(0.751)	(0.303)	(0.256)
HIEF index	-0.677	0.613***	0.299***
	(0.609)	(0.153)	(0.106)
Population	0.008	-0.000	-0.025
	(0.100)	(0.034)	(0.025)
Δ Military Personnel	-0.001	-0.000	-0.000
	(0.001)	(0.000)	(0.000)
Conflict	0.123	-0.028	0.022
	(0.269)	(0.081)	(0.072)
Democracy	-0.630**	-0.172**	-0.114*

Continued on next page

Table 10A – continued from previous page

	(0.317)	(0.072)	(0.061)	
Military	-0.962**	0.819***	0.492***	
	(0.466)	(0.102)	(0.082)	
Cold war	-0.879**	-0.050	-0.150*	
	(0.415)	(0.186)	(0.082)	
athrho2_1				-0.325
				(0.283)
athrho3_1				-0.060
				(0.228)
athrho3_2				0.873***
				(0.061)
lnsigma2				-0.651***
				(0.045)
lnsigma3				-0.764***
				(0.043)
Constant	0.349	1.331**	0.156	
	(1.860)	(0.553)	(0.392)	
Observations	1,718	1,718	1,718	1,718
Country FE	NO	NO	NO	NO
Year FE	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES
AUROC	0.721	0.721	0.721	0.721

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

6 Chapter 3 - Assessing sub-national foreign aid allocation in post-conflict countries: the case of Nepal

6.1 Abstract

International aid plays an important role in the reconstruction of war-torn societies after the end of civil war, but its effectiveness depends on whether aid reaches the neediest recipients. We study how power sharing in Nepal's post-conflict transition affected the political capture of aid. We argue that despite the explicit inclusion of disadvantaged groups in the Comprehensive Peace Agreement from 2006 and the 2007 Interim Constitution, districts that neither aligned with the Maoist insurgents nor the government during the civil war remained politically disadvantaged. A possible causal mechanism is the low threat potential of non-combatant groups, which results in under-representation during peace negotiations and in post-conflict institutions. We present statistical evidence that districts that did not support any of the two former warring factions receive systematically less aid during the post-conflict period, regardless of economic need or damage caused by fighting. However, the main parties do not appear to actively target their own supporters with higher aid allocations. We conclude that the political settlement after the Nepali Civil War was successful in enfranchising supporters of the Maoist insurgents, but other marginalized groups still suffer distributional disadvantages.

6.2 Introduction

International aid plays an important role in the reconstruction of war-torn societies after the end of civil war. Political goals promoted by the international community include reconciliation, political stability and economic development. However, promoting any of these goals crucially depends on whether reconstruction programs address the underlying causes of conflict and whether aid reaches the intended recipients. Outside of post-conflict settings,

aid frequently is at risk of being captured by powerful political interests (e.g. Bueno de Mesquita & Smith, 2009; Winters, 2014). Post-conflict environments have the potential to differ if a civil war ended with a peace agreement. First, the political settlement raises the hope that previously disenfranchised groups achieve better distributional outcomes. And second, the international donor community is often heavily invested in underwriting the new political order and should actively seek to avoid aid capture. To investigate this dynamic, we study the role of the Comprehensive Peace Agreement that ended the Nepalese Civil War in 2006 and the Interim Constitution of 2007 for ensuring power sharing and avoiding political capture of aid. In this article, we explore whether the agreement was successful in suppressing the partisan allocation of aid flows to supporters of the party in power, and whether the agreement's stated goal of enfranchising a wide array of previously marginal groups was achieved.

A key policy tool in the reconstruction of post-civil war societies is development finance. Aid flows typically are largest in the immediate aftermath of a conflict and coincide with an uptick in economic activity (Collier & Hoeffler, 2004). Aid ideally helps to rebuild destroyed infrastructure and replenish physical capital (Kang & Meernik, 2005) and has at least the potential to play an important role in addressing grievances that have fueled the conflict (Savun & Tirone, 2012). Though experimental work has generated important insights about the effectiveness of local interventions (e.g. Mansuri & Rao, 2004; Fearon et.al., 2009), studies that consider the overall outcomes of aid programming in post-conflict societies are few and tend to pay no attention to which population groups actually benefit from aid flows (Findley, 2018). An important reason for this are data limitations, in combination with a lack of theoretical work characterizing the political economy of aid allocations in post-conflict societies.

This project innovates on both counts. We draw on literatures that connect political patronage to political stability and that highlight the role of aid for patronage, to develop arguments about the role of peace agreements for aid flows in post-conflict societies. On the

data side, existing works are limited by a lack of information about which groups benefit from aid flows and a dearth of disaggregated measures of economic outcomes. We overcome these challenges by leveraging geographic information on a host of key variables. This allows us to bring together data on aid allocations (AidData, 2017) , and information on politically relevant groups based on casualty data (Joshi & Subodh, 2015) and elections results (Election Commission of Nepal; Kollman et al., 2011), as well as census data (Open Nepal data hub). Going beyond data availability, Nepal presents an ideal case to study how a peace agreement affects aid flows and thus the prospects of political stability. The country has experienced a major civil war (1996 – 2006) and relatively successful peace process. The reconstruction period is well defined as beginning with the 2006 Peace Agreement and the 2007 Interim Constitution, and ending with the devastating earthquake in 2015. The earthquake reshaped reconstruction needs and international aid flows and also broke an inter-party stalemate about the final political settlement, ushering into the adaptation of the 2015 Constitution. Nepal is heavily aid dependent, with roughly one third of government expenditure accounted for by Official Development Aid (World Bank, 2016). Nepalese society is characterized by strong inequalities between the center (Kathmandu) and the periphery. These differences also run along ethnic, class and geographic lines. The Maoist insurgency that fueled the civil war drew on grievances associated with these cleavages. The different social dimensions of the conflict do not map perfectly into each other, making the country a fertile testing ground for exploring how different population groups fared in receiving aid transfers during the country's reconstruction period. There is also useful variation in the governing arrangements since the end of the civil war. Between the first post-war elections in 2008 and the second round in 2013, changing governing coalitions have included the insurgent Communist Party of Nepal (Maoist) (hereafter CPN(M) or Maoists), and the main parties of government during the conflict, the Nepali Congress (NC) and the Communist Party of Nepal (Unified Marxist Leninist) (hereafter UML).

To study the effect of the Comprehensive Peace Agreement and Interim Constitution, we

focus on variation in support for the former warring factions across different regions of Nepal. The conventional logic of clientelism in aid allocations suggests that areas that provided the Maoists with most support during the civil war should stand to receive more aid when the Maoist are in power, and likewise for government supporting areas and the NC and UML. However, the Peace Agreement recognized wider social justice issues and promised a more equitable treatment of groups. From this perspective, civil war allegiance should be no important determinant of post-conflict support, at least not once objective reconstruction and other measures of need are taken into account.

The Comprehensive Peace Agreement also promised to enfranchise population groups who did not openly align with the warring faction during the civil war, and these promises also feature prominently in the Interim Constitution of 2007. While peace agreements often focus on the concrete mechanisms of power sharing, appeals to wider social justice are not as common. This makes the Nepalese peace process stand out, but also raises the important question whether marginalized population groups in Nepal in fact benefited from the reconstruction process, regardless of their participation in the conflict and representation during peace negotiations. Non-belligerents can't credibly threaten future violence, and therefore are not part of the process that seeks to commit belligerents to lay down their arms. As a result, the risk increases that such groups fall by the wayside during the reconstruction phase and have their needs not addressed. This in turn carries with it the seeds for future grievances and renewed conflict.

The implication of these considerations for Nepal are twofold. First, if the political process was successful in achieving the social goals laid out in the Peace Agreement and the Interim Constitution, aid allocations should have not shown marked signs of benefiting the party in power. In addition, they should have reflected the economic needs of different regions, regardless of whether people in these regions participated in fighting. Alternatively, if the process was unsuccessful in reaching these aims, aid allocations would have followed detectable patronage patterns, benefiting supporters of the party in power. Areas that sided

with either of the factions that negotiated the Comprehensive Peace Agreement should have been better served with aid projects in the reconstruction phase than areas in which the population did not side with either the government or the Maoist insurgents. Such an outcome would mean that the Nepalese peace process has created a framework which perpetuates inequalities and allows new grievances to grow, seeding the conditions for renewed conflict, albeit between new opposing factions.

To preview results, we find that there are no overt patterns of aid allocations benefiting either the supporters of the CPN(M) nor the UML, when these parties were in control of the crucial Ministry of Peace and Reconstruction. The peace process therefore seems to have successfully avoided clientelism among the former warring factions. However, marginalized areas which support neither of the main parties systematically receive lower aid allocations.

This article makes a number of contributions. First, previous works find that peace agreements can be successful in producing sustainable peace if they pay attention to distributional justice (Druckman & Albin, 2011). In contrast, our findings highlight that even if an agreement succeeds in drafting former combatants into the political process, groups that did not participate in the armed struggle are at risk of continued marginalization. Second, foreign aid constitutes an important source of income in post-conflict countries, and allocating aid to where it is needed most is a precondition for successful economic recovery. Our results show that allocative efficiency is not easy to achieve, even if a peace agreement and new constitution formally acknowledge the need for greater equality. In this sense, as the resources donors are willing to allocate are likely to decrease if the economic consequences of the unfolding COVID-19 crisis will be as severe as expected, it is important to further our understanding of the drivers of aid allocation to limit resource wasting. Finally, the study identifies political misallocation of reconstruction aid as a potentially important source of the often observed gap between the stated policy goals of western donor governments and realized development outcomes.

In the following, we first present the case for our thesis in the context of the Nepalese

civil war. We then turn to the existing academic literature on post-conflict development aid and articulate our central argument more fully. In the succeeding section we discuss data and methodological choices for the statistical analysis, followed by a presentation of the empirical results. We conclude with a summary of our findings.

6.3 Fighting patterns and aid allocations in Nepal

The central argument of this paper is that social goals enshrined in a peace agreement are at risk of failure if a) the political settlement enables the allocation of reconstruction aid to follow a spoils politics logic, and b) non-combatant groups systematically benefit less from post-conflict distributional settlements than those groups who sided with the insurgents or the government. It is important to highlight that these two sources of failure can operate independently. For example, former combatant groups can be equally well served with reconstruction aid, irrespective of who holds political power, thus breaking the spoils logic. Yet, previously marginalized groups that did not take up arms may continue to be short-changed. Likewise, in principle it is possible that non-combatant groups themselves can engage in spoils politics, though in reality it is less likely that such groups accede to the levers of power. Before developing these arguments in more detail below, we illustrate how they apply to the case of Nepal's civil war and post-conflict politics.

Nepalese society at the beginning of the Maoist uprising in 1996 was characterized by strong social and economic divisions along a large number of cleavages. These included a geographic dimension, with Kathmandu as center of economic and political activity, and less advantaged regions, in particular the Mid- and Far West. There were strong inequalities along caste and ethnic lines, as well as concentrated land holdings and leftovers of a feudal system that rewarded civil servants with the right to exploit large tracts of land (Deraniyagala, 2005; Joshi Mason, 2007; Lawoti 2010, 2012; Sharma et Al., 2014). In addition there existed strong gender disparities. At the same time, the country was set on a path to modernization, with the first multi-party elections held only in 1991, after a his-

tory of monarchical rule. The elections had raised expectations about social improvements, which in turn went unfulfilled (Shakya, 2012). The relative contribution of these pervasive inequalities in Nepalese society to the outbreak of the civil war is contested. Commentators using qualitative narratives tend to highlight them as driving force of the conflict (e.g. Deraniyagala, 2005). In contrast, more systematic statistical studies come to contradicting results, attributing fighting activity variously to poverty and geographic remoteness though not inequality (Do & Iyver, 2010), geography and inequality (Murshed & Gates, 2005), and road density but not poverty or inequality (Acharya, 2009). Despite this mixed picture, it is a fact that the Maoist insurgency broke out in one of the most economically and socially deprived regions of the country, and quickly found strong support there. In addition, the programmatic demands of the CPN(M) insurgents centered on overcoming historic inequalities (Huang 2016).

Prior to the civil war, spoils politics in Nepal was not based on membership in a majority ethnic group, but manifested itself in a number of ways. The rewards from holding power disproportionally went to privileged landowners, who benefited from a skewed distribution of land holding together with weak enforcement of tenant rights (Sharma et al., 2014), civil servants, and elites located in the politically and economic dominant Kathmandu valley. These varied sources of division are reflected in the Comprehensive Peace Agreement from 2006 and the 2007 Interim Constitution, which explicitly promised to address injustices towards "women, Dalit, indigenous people, Madhesi, oppressed, excluded and minority communities and backward regions", as well as ending discrimination based on "class, caste, language, gender, culture, religion and region". (Para 33 (d)). Power sharing was written into the Interim Constitution with a minimum 1/3 quota for women in the Constituent Assembly, and provisions for parties to "ensure proportional representation of women, Dalit, oppressed communities/ indigenous peoples, backward regions, Madhesi and other Classes, as provided in law." (Para 63(4)[57])

[57]The 2015 Constitution which replaced the Interim Constitution retained these provisions.

In the empirical analysis, we leverage some of these cleavages to create a statistical baseline model under the assumption that post-conflict aid allocations in Nepal were in fact driven by economic needs and social justice concerns. We then enrich this model with variables that capture spoils politics and the combatant status of different population groups.

Given the non-ethnic nature of cleavages in the Nepalese civil war (or rather acknowledging the absence of a majority ethnic cleavage), we conceptualize spoils politics as being centered around the degree of support for the Maoist insurgency on the one hand and the government forces on the other hand. It is well documented by the literature that support for the CPN(M) strongly correlated with a sense of grievances towards elites and the government in the Kathmandu valley. For example, although the Maoists used strategic violence to intimidate local populations into supporting them, removing local elites by force and granting ownership rights to peasants who worked the land was highly popular among local populations (Lawoti, 2010). In fact, Maoist indoctrination directly sought to appeal to social rights, arguably playing an instrumental role in creating long-lasting political activism among disadvantaged groups. The resulting political activism has outlasted the end of the conflict (Huang, 2016).

Given this context, we focus on aid allocations channeled towards geographic regions that were ideologically aligned with either the Maoist insurgency or the main government parties as evidence of spoils politics in the immediate post-conflict years in Nepal. The main parties in power during the conflict were the Nepali Congress and the Communist Party of Nepal (Unified Marxist-Leninist). The CPN(M) enjoyed surprising electoral success in the 2008 Constituent Assembly elections, and in the following years shifted in and out of government responsibility. We focus on the Ministry of Peace and Reconstruction as key resort for influencing the flow of reconstruction aid and investigate whether regions aligned with the CPN(M) or the UML received higher aid commitments during the years that the respective party was in power (the NC ended up politically sidelined).

While fighting eventually encompassed most of Nepal, support for the CPN(M) and the

government side was not evenly distributed. For example, the Maoists struggled to find support in the low lying Terai, a region which historically also has harbored mistrust against the Kathmandu elites (Kantha, 2010). A lack of partisan attachments meant a lack of voice during the peace negotiations. Tellingly, violent protests erupted among Madhesi groups in the region in the intermediate aftermath of the signing of the Interim Constitution in 2007. The protests succeeded in ensuring greater legislative presentation of the region in the upcoming elections that year[58]. However, this well publicized incident illustrates the challenges faced by groups that were non-aligned during the civil war. To evaluate how being on the political sidelines affected access to reconstruction aid, we compare aid flows between regions that provided major electoral support to the main parties involved in the civil war, and those regions that remained outside the political mainstream. If the Interim Constitution did not succeed in lessening social inequalities, despite nominal guarantees for all marginalized groups, areas that did not support the Maoists or the Government during the conflict should end up receiving less aid, irrespective of objective needs, and spoils politics.

6.4 Theoretical framework and literature

The following section puts the arguments developed in this paper in the context of the existing literature. The theoretical starting point is the stylized insight that governments in poor countries frequently rely on spoils politics and anticipate potential threats of violent resistance to their rule (e.g. Padró I Miquel, 2007; Dal Bó & Powell, 2009). Existing works have highlighted various aspects that foreign aid plays for spoils politics, and these take on particular salience in post-conflict situations.

From a political economy perspective, aid generally allows rulers to buy off would-be opponents or increase suppressive tactics (Bueno de Mesquita Smith, 2009; Morrison 2009). However, reliance on aid is not cost-free. With increasing dependence on aid flows for government expenditure, the risk of unforeseen shocks to government revenue increases,

[58]New York Times Feb 1, 2007. Accessed on 10.5.2020 at https://www.nytimes.com/2007/02/01/world/asia/01nepal.html

potentially undermining fragile political equilibria (Nielsen et al., 2011)[59]. Spoils politics in combination with aid dependence therefore introduces an element of risk in a post-conflict context. This represents a direct mechanism through which reconstruction aid in post-conflict environments can contribute to political destabilization. Evidence for the role of aid in spoils politics comes from numerous studies. Briggs (2014) shows that project aid in Kenya in the 1990s overwhelmingly favored members of the president's ethnic base. Hodler and Raschky (2010) show that in countries with weak institutions, the birth region of the incumbent ruler tends to receive more aid than other regions. Further examples for political aid allocation come from pre-electoral 2005 Zimbabwe[60], post-flooding 2010 Pakistan[61] and the Philippines (Atkinson, Hicken, Ravanilla, 2011). Finally, Jablonski (2014) establishes that even multilateral aid allocations are not immune from domestic political pressures.

Going beyond the direct allocation of aid, as part of spoils politics, local public goods tend to benefit well defined groups that are aligned with the ruler (e.g. Franck & Rainer, 2012; Ejdemyr et al., 2017). To the extent that aid flows free up government resources, aid dependency should increase the ability of a ruler to reward supporters, even if aid allocation decisions themselves are unaffected by spoils considerations. However, to our knowledge there are no studies that explore the role of reconstruction aid for spoils politics in post-conflict environments[62]. Local public good provision is of particular importance in post-conflict

[59]This risk can't be fully eliminated even if donors are willing to counteract it (Steinwand, 2015).

[60]McGreal, Chris. "Mugabe accused of using food as a political weapon in Zimbabwe," The Guardian, June 4, 2008, available at https://www.theguardian.com/world/2008/jun/04/unitednations.zimbabwe, accessed on February 2019. Tweedie, Neil. "A hungry future for poor voters who oppose Mugabe," Daily Telegraph (London), March 26, 2005, available at https://www.telegraph.co.uk/news/worldnews/africaandindianocean/zimbabwe/1486512/A-hungry-future-for-poor-voters-who-oppose-Mugabe.html, accessed on February 2019.

[61]Rashid, Ahmed, "Pakistani flood relief must start with fighting corruption," Washington Post, September 6, 2010, available at http://www.washingtonpost.com/wp-dyn/content/article/2010/09/05/AR2010090502816.html, accessed February 2019. Crilly, Rob and McElroy, Damien, "Pakistan in Political Crisis Amid Allegations of Flooding Aid Corruption," The Daily Telegraph (London), August 23, 2010, available at http://www.telegraph.co.uk/news/worldnews/asia/pakistan/7960923/Pakistan-in-political-crisis-amid-allegations-of-floodingaid-corruption.html, accessed on February 2019. Kheshgi , Khalid and Hashash, Sara, "Pakistan Relief Effort Hampered By Corruption," The Sunday Times, August 15, 2010, available at http://www.thesundaytimes.co.uk/sto/news/world$_n$$ews/Asia/article$370642.$eceaccessedonFebruary$2019.

[62]Some works look at the effects of aid in post-conflict societies in general, but don't account for variation in institutions or aid allocation patterns. Collier and Hoeffler (2004) make the case that foreign aid can help

societies, because fighting results in damages to local infrastructure and the health and employment prospects of local populations, which in turn require greater public resources (Collier et al., 2003).

A second causal link connecting spoils politics and political instability runs through the structural features that render disadvantaged groups dissatisfied with the status quo. The literature on civil war has identified exclusion from power sources and distributional benefits as major driving force of conflict (Acemoglu & Robinson, 2000; Dal Bó Powell, 2009), especially where cleavages run across ethnic lines (the so-called 'grievance' explanation of politics, e.g. Buhaug et al., 2008). Obviously, in post-conflict environments dissatisfaction with distributional outcomes will be a particularly sensitive issue if the conflict was driven by such grievances in the first place.

Civil wars that end with a negotiated settlement or a peace agreement are particularly well suited to test whether the logic of spoils politics can be overcome. The literature shows that compared with other outcomes (such as war being fought to a stalemate, or one-sided victory), peace settlements tend to improve the balance of political power between former contestants, as former rebel groups gain political recognition. Hartzell and Hoddie (2003) show that of 38 negotiated civil war settlements between 1945 and 1998, all except eight included political power sharing terms[63]. Clearly, peace agreements shape post-war political institutions, thus creating venues to "mitigate and channel societal competition", where "no single set of antagonists is capable of imposing its will" (Hatzell & Hoodie 2007, p.11).

From these observations follow three possible scenarios for the relationship between reconstruction aid and spoils politics in post-conflict societies. The first is the most normatively positive. Political settlements create venues through which the economic and political needs of previously disenfranchised groups can find expression and therefore promise to reduce inequalities and address grievances. From this perspective, peace agreements are a politi-

foster growth in the aftermath of conflict by helping to restore infrastructure. Donaubauer et al. (2016) show that aid is more effective in restoring social infrastructure than economic infrastructure.

[63]Six out of those eight at least featured territorial power sharing terms.

cal tool to overcome spoils politics, and success is equated with ex-post greater equality in distributional outcomes.

However, a second scenario is that a settlement does create political mechanisms that can achieve more distributional equality, but these mechanisms depend on ongoing patronage and consequently are only open to powerful and well-organized groups. D'Arcy and Cornell (2016) provide an example of this dynamic. They illustrate how constitutional reforms in Kenya in 2010 devolved powers to the regions and succeeded in creating patronage opportunities for a large number of population groups. However, those groups that did not gain effective political representation because of their geographic settlement patterns lost out from redistribution.

In the context of a post-conflict environment, it is reasonable to assume that non-belligerent groups are politically marginal whereas former combatants are active negotiation partners in crafting a peace agreement. Distributional gains for under-represented non-combatant groups are therefore not guaranteed during reconstruction. Former rebel groups might be perfectly content with ensuring access to resources for their own supporters only. Such an outcome would constitute a failure to build lasting peace, since legitimate grievances will go unaddressed, with the potential to undermine long-term reconstruction and peace building goals.

In the following empirical section, we explore in detail which of these visions took hold in the aftermath of Nepal's civil war. We test the following hypotheses that summarize the case for a successful suppression of spoils politics and foreign aid in post-conflict settings:

Hypothesis 3: *Aid allocations during the reconstruction phase were not influenced by political parties rewarding their supporters.*

Hypothesis 4: *Population groups that were not actively participating in the civil war received aid in line with their economic and social needs.*

As discussed above, we expect that either of these two hypotheses could fail, but it is not necessary for both of them to fail simultaneously.

6.5 Empirical Analysis

To address the hypotheses presented above we use cross-section time series analysis on geographically disaggregated data. The unit of analysis are administrative districts per year, and the data cover 2008 to 2013. The choice of time period has pragmatic and conceptual reasons. Geographically disaggregated data on aid allocations is currently only available until 2013. Importantly though, the data almost completely cover the immediate reconstruction period, beginning with the 2008 Constituent Assembly election and ending with the great earthquake of 2015. This catastrophe not only caused tremendous damage and reshaped redevelopment priorities. It also prompted a final political settlement that had previously eluded the country's parties.

Our dependent variable is aid commitments measured as dollars per capita. We rely on the Nepal AIMS Geocoded Research Release that geocodes all projects from the Government of Nepal's Aid Information Management System (AIMS)[64]. Geocoding allows for matching projects to Nepal's 75 pre-2015 districts. We focus on commitments instead of disbursements, because political influence on allocation decisions is more readily expressed at the commitment stage. In addition, the data coverage for commitments is more comprehensive.

To detect the influence of spoils politics, we concentrate on which party held the influential office of the Minister for Peace and Reconstruction. Control of the ministry repeatedly changed hands between the CPN(M) and CPN(UML). The Nepali Congress, as Nepal's historic main party and the Maoists' main antagonist during the war, only held power for a few months at the beginning of the time under consideration, and therefore is excluded from this part of the analysis. We encode the years during which the CPN(M) was in charge of the reconstruction ministry as 1, and assign 0 otherwise, and do the same for the UML. The resulting dummy variables are called Maoist PR and UML PR. There were a few instances in which the ministry position was vacant, but the CPN(M) provided the Minister for Lo-

[64] AidData. 2016. NepalAIMS_GeocodedResearchRelease_Level1_v1.4.1 geocoded dataset. Williamsburg, VA and Washington, DC: AidData.

cal Development. We attribute these instances to Maoist PR. As a result, we identify the CPN(M) as holding power in 2008, 2011, and 2012 and the UML in 2009 and 2010[65]. To measure political support, we rely on the results of the 2008 Constituent Assembly elections. The connection between voting behavior and politicians rewarding its supporters by steering aid towards them should be straightforward. We concentrate on three parties, the Nepali Congress and CPN (UML), as largest parties that were part of multi-party politics prior to the civil war and held government power during the war, and the CPN(M), as instigator of the civil war. The data are based on published election results by the Election Commission of Nepal[66] and the Constituency-level elections archive (Kollman et al. 2011). Since each district did send several representatives to the Constituent Assembly, we encode the share of representatives a party was able to capture per district. In the statistical analysis, evidence of spoils politics is captured by an interaction between the vote share variables and the dummies for holding political power.

To test the second hypothesis, we need to capture which population groups neither supported the Maoists nor were aligned with the government during the conflict. If the peace agreement was successful in enfranchising all parts of society, we would expect those population groups to be not systematically disadvantaged when receiving reconstruction aid. One possibility to identify population groups that abstained from taking sides in the conflict would be to rely on data of fighting activity and identify which districts contributed least to overall casualties, the reasoning being that such districts did not provide much support to either the Maoists or the central government.

Unfortunately, while this is a feasible way to identify support for the Maoists, a similar logic does not hold for the government side. Joining the armed forces is likely a poor signal of ideological alignment with the government, since the country is very poor and the state with its security forces represents an important source of income. In addition, the location

[65]In case the ministry was occupied by officials from both parties in the same year, the coding attributes power to the party that held the position for at least 7 months during this year.

[66]http://election.gov.np/election/np

of fighting activity is not necessarily a good reflection of ideological support either. While in the early years the conflict was located in areas that constituted the home base of the Maoists, fighting eventually spread throughout much of the country. The presence of Maoists insurgents in a region invited government reactions, but the rebel's presence by itself is not necessarily indicative of support by the local populations.

To avoid these pitfalls, we rely on the same voting data as before to identify the population groups that were least aligned with either the Maoists or the government during the conflict. Specifically, we assume that low voting shares for both the CPN(M) and the major parties NC and UML are indicative for a stance against both the Maoists and the major government parties. This measurement strategy relies on the assumption that voting behavior in 2008 is a good proxy for political alignments during the conflict which ended in 2006. The main challenge to this approach is that voters who did not support either the main parties or the Maoists during fighting may have cast their vote for them after the end of the conflict anyways, perhaps anticipating that sending a UML or CPN(M) representative to parliament might be the most effective way to ensure economic benefits are brought home to their districts. The unexpected electoral success for the CPN(M) and its reversal in the subsequent election suggest that something like this was at work. However, casting this overly broad net is working in favor of our research question, since we seek to identify districts that did not support either party during the conflict. Overestimating the support basis of the major parties is a conservative measurement strategy, as those areas that did not follow the national electoral trend in 2008 are more likely to be in durable opposition to the UML, NC and CPN(M). We call the variable for aggregate electoral support for the three main parties Main parties share and the complement Other parties share. Again, these variables are coded in terms of shares of representatives each party captures in a district.

For control variables, we turn to the Open Nepal hub[67] and the UCDP Georeferenced Event Dataset (GED) (Sundberg Melander, 2013) to obtain data on infrastructure, demo-

[67]http://data.opennepal.net/datasets

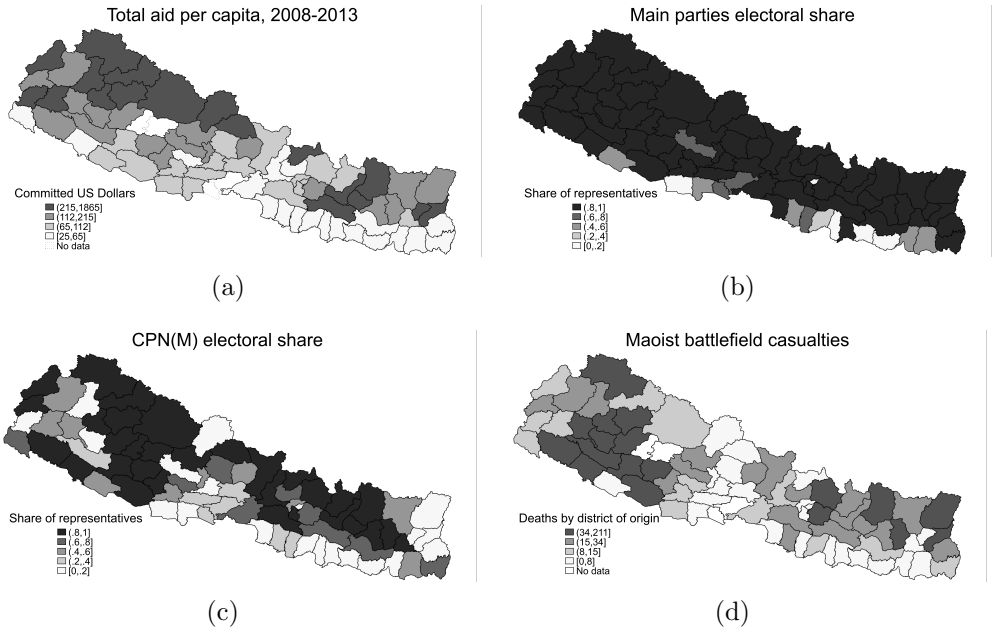

Figure 15: Geographical distribution of main variables

graphics, geography and the share of insurgent, civilian and army fatalities as percent of the population per district. The rationale is to control for the intensity of fighting and the resulting need for reconstruction aid. Human development constitutes another significant source of need for aid funding. We capture this using a battery of variables including the adult illiteracy rate, the percentage of children under age five who are malnourished, and the poverty incidence rate defined as the proportion of individuals living in that area who are in households with an average per capita expenditure below the national poverty line[68]. We also control for the level of infrastructure in a district using as proxies the percentage of the population with access to safe water and the road density[69].

To tap into regional differences, we include a set of categorical variables indicating what is known in Nepal as development region (Central, Eastern, Far-Western, Mid-Western or Western), and also a proxy for the Kathmandu valley. Another proxy captures the districts where the Maoists formally announced a Jan Sarkar, or 'people's government'. These districts

[68] According to the Nepalese Central Bureau of Statistics, the official monetary poverty line in local prices was NRs 19,261 in 2011 (Pokharel 2015). As of 2011 average transaction rate, this corresponded to 0.7 US$ per day.

[69] All of these variables are available for 2011 only.

Table 5: Summary statistics

	Mean	Median	Std.Dev.	Min	Max	Obs
Aid Per Capita	26.31		69.47	0.00	879.17	375
Maoist PR	1.20		0.75	0.00	2.00	375
UML electoral share	0.20		0.28	0.00	1.00	375
NC electoral share	0.20		0.30	0.00	1.00	375
Maoist electoral share	0.49		0.42	0.00	1.00	375
Main parties share	0.89		0.25	0.00	1.00	375
Other parties share	0.11		0.25	0.00	1.00	375
Terai	0.24		0.43	0.00	1.00	375
Civilian casualties	0.01		0.01	0.00	0.07	375
Total casualties	0.07		0.07	0.00	0.41	375
Adult illiteracy rate	42.52		11.32	15.96	66.11	375
Infant malnutrition	42.81		10.91	16.20	65.70	375
Poverty Incidence	27.66		13.34	4.00	64.10	375
Road density	575.68		924.70	0.00	3541.00	375
Percentage without safe water	19.83		12.21	2.14	48.12	375
Kathmandu	0.01		0.11	0.00	1.00	375
Jan Sarkar	0.36		0.48	0.00	1.00	375
Development Region	2.91		1.51	1.00	5.00	375
Population (1,000s)	349.16		277.08	5.83	1688.13	375
Year	2011.00		1.42	2009.00	2013.00	375

stand out because they were the only ones in which the Maoists created their own village- and district-level governments during the conflict. This approach follows Hachhethu (2006), Hutt (2004), Kiyoko (2008a, 2008b), Sudheer (2004) and Shneiderman and Turin (2004).

6.6 Results

We begin the analysis with descriptive statistics of the key variables. Figure 15 shows the geographic distribution of, respectively, total aid per capita (a), political support for the main parties (b), and political support for the Maoists both electorally (c) and in terms of the number of people killed by the state during fights (d). A few patterns emerge. First, the CPN(M), UML, and NC dominated the 2008 elections throughout much of the country. In 61 of the 75 districts, more than 80 percent of representatives were provided by one of the three parties. The 14 districts in which the vote share for the main parties remained below 80 percent almost all were located in the country's southern low lands, i.e. the Terai. The political stronghold of the CPN(M) lies in Nepal's Midwest region. This is where the insurgency originated, and here the party dominated in the 2008 election. However, the Maoists also garnered support in the Hill and Mountain areas of the Central region around Kathmandu. These areas account for much of the unexpected overall electoral success of the CPN(M). The comparison with our second measure of Maoist core support is instructive. People dying in fights with the central government mainly were at home in the Midwestern stronghold of the CPN(M), but also in the Mountain areas and Hill lands in the East. Turning to aid allocations, per capita spending is highest in the high Mountain regions of the Midwest and West, with some Hill and Mountain areas east of Kathmandu also receiving much aid. Aid spending is somewhat lower in the Hill lands of the Midwest region, which constitute the heartland of the Maoist insurgency, and clearly lowest throughout the Terai.

Visually inspecting these patterns provides a first indication that post-conflict aid allocations were targeting the very poorest areas of Nepal in the mountainous north-west, suggesting a needs-based approach. However, there is some overlap with areas of political

support for the CPN(M), and a clear lack of political support for the three main parties in the Terai, accompanied by very low aid allocations to these lowland areas. This suggests that not all of the distributive goals set out in the Interim Constitution were met during the reconstruction.

Before drawing any firm conclusion, we need to rule out spurious correlations and therefore turn to multivariate analysis. All models were estimated using OLS and report panel-corrected standard errors (Beck & Katz 1995). They all include a lagged dependent variable to deal with serial correlation and year-dummies to soak up variation in overall aid commitments. We start with a baseline specification that links a district's reconstruction needs, socio-economic conditions and geography to aid allocations (Table 6). If the political settlement was successful in enfranchising disadvantaged population groups, we should expect this model to do the main work in explaining aid allocations. To test this notion further, in Tables 7 and 8 we add the variables that capture patronage involving the main parties and their supporters, by including the electoral share variables for UML, NC, and CPN(M) and their respective interactions. A successful end to spoils politics would mean that both voting behavior per se and the interactions hold little explanatory power, and also don't much affect the associations revealed in the baseline model. Finally, in Table 9 we do the same with the variable Other parties share, to explore how districts fare that provide little political support for either side of the former warring factions. Again, if the peace process was successful in enfranchising population groups beyond those aligned with the warring parties, this variable should have little effect on aid allocations while leaving the baseline model intact.

Beginning with the baseline specification in Table 6, we first separately enter the variables meant to capture (1) reconstruction needs, (2) socio-economic needs, and (3) regional effects. Somewhat surprisingly, model (1) provides no evidence that reconstruction needs as measured by casualty numbers are related to aid allocations. Perhaps this lack of association is owed to the nature of fighting in remote and underdeveloped areas, which did not result in large-scale infrastructure damage. Of the socio-economic variables, we find infant

malnutrition and poverty incidence are significant predictors of aid allocations. Likewise, infrastructure needs as measured by a lower road density are associated with higher aid allocations. Of the region dummies, the Kathmandu valley receives substantively more aid than other districts, more than 1.6 standard deviations, despite controlling for population size, and with the full set of controls in model (4). Likewise, districts that were hosts to self-governing Maoist Jan Sarkar entities robustly receive less per capita aid. A weak negative effect for the Eastern Development Region disappears with all controls. Finally, more populous districts receive less aid per capita than more sparsely settled districts. This suggests a bias in aid allocations towards low density and potentially politically overrepresented districts.

In equation (4) all variables are entered simultaneously. Socio-economic needs continue as important drivers of aid allocations. However, effect sizes are somewhat attenuated, and infant malnutrition loses statistical significance.[70] In addition, there is now a negative relationship between the total casualties from the civil war and aid allocation. Still, equation (4) paints a carefully optimistic picture of aid allocations driven by objective social and economic needs. Except for Kathmandu there appears to be no preferences for specific regions or districts that were particularly hard hit by fighting. Substantive effects of socio-economic variables are considerable. For example, for the share of people in a district living below the poverty line, moving from the mean (27.7 percent) up one standard-deviation (plus 13.3 percent), aid per capita allocations increase on average by 20 US Dollars. This increase represents 76 percent of the average per capita aid allocations for each district (26.30 Dollars).

[70]There appears to be a negative relationship between lacking access to safe water and aid allocations, but this is only weakly statistically significant.

Table 6: OLS – Aid Allocation as function of reconstruction needs and socioeconomic needs, 2008-2013 observations

VARIABLES	(1) Aid Per Capita	(2) Aid Per Capita	(3) Aid Per Capita	(4) Aid Per Capita
Adult illiteracy rate		-1.217		-0.526
		(0.892)		(0.779)
Infant malnutrition		1.321**		0.684
		(0.596)		(0.514)
Poverty Incidence		2.092***		1.502**
		(0.783)		(0.712)
Road density		-0.015**		-0.011*
		(0.006)		(0.006)
Percentage without safe water		-0.450		-0.815*
		(0.595)		(0.473)
Civilian casualties	437.745			41.610
	(358.697)			(114.053)
Total casualties	-24.345			-105.149**
	(16.531)			(41.195)
Kathmandu			113.917***	115.698***
			(40.968)	(38.583)
Jan Sarkar			-26.340**	-11.024**
			(11.383)	(4.532)
Eastern Development Region			-8.939*	-6.579
			(5.239)	(10.675)
Far Western Development Region			0.286	-4.987
			(11.038)	(30.929)
Mid Western Development Region			14.997	25.970
			(14.601)	(23.952)
Western Development Region			8.032	5.189**
			(11.597)	(2.112)
Population (1,000s)			-0.095***	-0.078***
			(0.036)	(0.026)

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Table 6 – continued from previous page

Constant	17.297	-16.233	65.781**	37.258
	(14.946)	(28.023)	(27.076)	(28.969)
Observations	375	375	375	375
R-squared	0.070	0.174	0.158	0.214
Number of ID	75	75	75	75

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Next we look at the evidence for spoils politics. Table 7 adds the electoral share variables for the Maoists, UML and NC to the previous specification, as well as the dummy for whether the Maoists controlled the Ministry of Peace and Reconstruction (PR), Table 8 repeats this exercise for UML control of the PR ministry. All models continue to have year intercepts and the regional dummy variables. Coefficients are not reported for space reasons. In the different models we interact the Maoist PR variable with the vote shares of the different parties, to identify whether aid allocations were sensitive to variations in political support for the CPN(M). If spoils politics did not play a role, we would expect that adding these partisan variables to the base model does not reveal much additional information, as voting patterns and office holding should have no great influence on aid allocations.

Beginning with model (1) we see that this is not the case and voting patterns matter. Districts that voted more heavily for the Maoists received on average more aid than other districts. There are also positive relationships for the UML and NC electoral shares, but both are estimated with more uncertainty. To disentangle which party reacted to electoral incentives and how, we first interact the Maoist PR variable separately with the vote shares of the three main parties (models 2-4). Model 2 reveals a surprising pattern. More voting for the Maoists is associated with higher aid allocations, but only if the CPN(M) itself is not in control of the Peace and Reconstruction ministry. With the CPN(M) in power, the marginal effect of adding to the Maoist electoral share can't be distinguished from zero[71]. Checking for the other parties, aid allocations are not sensitive to the UML electoral share when the Maoists hold power (model 3). Model 4 shows a negative relationship between aid allocations and voting for the Nepali Congress when the Maoists do not hold power. But as in model 2, with the Maoists in charge this negative effect washes out[72]. Together, these three models provide solid evidence that aid allocations under CPN(M) leadership of the Peace and Reconstruction ministry did not favor the voters of any of the three main parties. To confirm this insight, in model 5 we pool the vote share for all major parties and repeat

[71] Chi-squared(1 dgf)=0.08, p>chi-squared=0.78.
[72] Chi-squared(1 dgf)=0.14, p>chi-squared=0.70.

the exercise from the previous three models, with the same outcome. Main parties share is only associated with higher aid allocations when the Maoists do not hold power.

Table 7: OLS – Aid Allocation as function of voter support for main parties, Maoist PR, 2008-2013 observations

VARIABLES	(1) Aid Per Capita	(2) Aid Per Capita	(3) Aid Per Capita	(4) Aid Per Capita	(5) Aid Per Capita
Maoist PR		7.173	-12.634**	-17.265***	27.557***
		(6.442)	(5.881)	(4.185)	(3.364)
Maoist electoral share	29.624**	36.489***			
	(11.735)	(7.864)			
Maoist PR*Maoist share		-33.366***			
		(11.947)			
Civilian casualties	65.428	47.278	50.913	51.721	48.612
	(121.956)	(113.510)	(132.733)	(114.975)	(111.010)
Total casualties	-139.257***	-132.636**	-104.446**	-118.736***	-117.042**
	(52.755)	(55.676)	(40.694)	(45.089)	(46.330)
Adult illiteracy rate	-0.364	-0.452	-0.518	-0.521	-0.346
	(0.743)	(0.762)	(0.764)	(0.775)	(0.748)
Infant malnutrition	0.808	0.866	0.664	0.738	0.700
	(0.562)	(0.584)	(0.507)	(0.531)	(0.519)
Poverty Incidence	1.472**	1.467**	1.504**	1.461**	1.509**
	(0.693)	(0.687)	(0.710)	(0.692)	(0.711)
Road density	-0.009	-0.010	-0.011*	-0.010*	-0.010*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Percentage without safe water	-0.829*	-0.757*	-0.828*	-0.807*	-0.845*
	(0.466)	(0.449)	(0.483)	(0.468)	(0.483)
Population (1,000s)	-0.069***	-0.070***	-0.078***	-0.080***	-0.068***
	(0.023)	(0.023)	(0.026)	(0.027)	(0.022)
UML electoral share	23.481*		2.721		
	(14.058)		(20.233)		
NC electoral share	7.815			-39.672***	
	(7.495)			(10.559)	
Maoist PR*UML share			1.325		
			(24.210)		

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Table 7 – continued from previous page

Maoist PR*NC share				33.142*	
				(18.172)	
Main parties share					49.103***
					(5.848)
Maoist PR*ALL share					-45.558***
					(5.686)
Constant	4.810	16.943	49.985*	54.591*	-2.353
	(27.773)	(25.978)	(26.212)	(27.861)	(23.291)
Observations	375	375	375	375	375
R-squared	0.224	0.229	0.214	0.222	0.225
Number of ID	75	75	75	75	75

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Despite these encouraging findings, the results in Table 7 also reveal that electoral shares do matter for aid allocations in the three years in which the Ministry for Peace and Reconstruction was not in Maoist hands. To confirm this notion, Table 8 repeats the exercise with the UML in charge of the ministry. Interestingly, like the CPN(M), the UML does not privilege its own supporters when holding power (model 1). But under its leadership aid allocations are higher in districts that voted Maoist (model 2), and they increase even more when looking at the vote share for the three main parties combined (model 4). To get some sense of the size of this effect, for a one standard deviation increase in the main parties electoral share (a plus of 24.5 percentage points), per capita aid allocations increase by 11.20 dollars (relative to a mean of 36.30 dollars). At the same time, under UML leadership, districts supporting the Nepali Congress see lower aid allocations (model 3), though the substantive effect is modest (a drop of 4.80 dollars for a one standard deviation or 30 percentage point increase in electoral share).

Overall the models in Tables 7 and 8 provide mixed evidence for the role of partisanship in post-conflict aid allocations. Neither the Maoists nor the UML appear to privilege their own voters when holding the Ministry of Peace and Reconstruction. This is a strong indicator that spoils politics did not have an influence on reconstruction aid after the 2008 election. However, aid allocations appear to be sensitive to voting with the UML in charge of the ministry, but not in the sense usually associated with spoils politics. Instead, the UML appears to positively support CPN(M) voting areas. It is possible that this constituted a reaction to the unexpected electoral success of the Maoists, in an attempt to win back support, though we find little evidence of this in contemporary published records. Overall, it appears that the peace settlement was relatively successful in helping to overcome conventional forms of spoils politics where parties directly cater to their own supporters (hypothesis 1). We next turn to the issue of marginalized groups that were not party to the conflict. In line with hypothesis 2, if the peace agreement was successful, we should not observe systematic discrimination against these groups, with aid being allocated according to socio-economic

need. As discussed above, we use the electoral share for parties other than the major three (CPN(M), UML, NC) as indicative of lacking alignment with either the Maoist cause or the government during the civil war, as marginalized areas closely track with poor voting results for these parties. As a result, the empirical approach is complementary to the analysis of partisan patterns above.

Table 8: OLS – Aid Allocation as a function of voter support for main parties, UML PR, 2008-2013 observations

VARIABLES	(1) Aid Per Capita	(2) Aid Per Capita	(3) Aid Per Capita	(4) Aid Per Capita
UML PR	12.634**	-7.173	17.265***	-27.557***
	(5.881)	(6.442)	(4.185)	(3.364)
UML electoral share	4.045			
	(17.381)			
UML PR*UML share	-1.325			
	(24.210)			
Civilian casualties	50.913	47.278	51.721	48.612
	(132.733)	(113.510)	(114.975)	(111.010)
Total casualties	-104.446**	-132.636**	-118.736***	-117.042**
	(40.694)	(55.676)	(45.089)	(46.330)
Adult illiteracy rate	-0.518	-0.452	-0.521	-0.346
	(0.764)	(0.762)	(0.775)	(0.748)
Infant malnutrition	0.664	0.866	0.738	0.700
	(0.507)	(0.584)	(0.531)	(0.519)
Poverty Incidence	1.504**	1.467**	1.461**	1.509**
	(0.710)	(0.687)	(0.692)	(0.711)
Road density	-0.011*	-0.010	-0.010*	-0.010*
	(0.006)	(0.006)	(0.006)	(0.006)
Percentage without safe water	-0.828*	-0.757*	-0.807*	-0.845*
	(0.483)	(0.449)	(0.468)	(0.483)
Population (1,000s)	-0.078***	-0.070***	-0.080***	-0.068***
	(0.026)	(0.023)	(0.027)	(0.022)
Maoist electoral share		3.123		
		(11.171)		
UML PR*Maoist share		33.366***		
		(11.947)		
NC electoral share			-6.530	
			(17.182)	

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Table 8 – continued from previous page

UML PR*NC share			-33.142*	
			(18.172)	
Main parties share				3.545
				(9.585)
UML PR*ALL share				45.558***
				(5.686)
Constant	37.351	24.116	37.325	25.203
	(29.877)	(24.791)	(29.791)	(22.775)
Observations	375	375	375	375
R-squared	0.214	0.229	0.222	0.225
Number of ID	75	75	75	75

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 9 we present some of the previous models, recoded in a way that emphasizes the effect of lower electoral support for the main parties. Model 1 shows that voting for other parties is strongly associated with lower aid allocations. Models 2 and 3 report substantively the same information as model 5, Table 7 and model 4, Table 8, but with the Main parties share variable recoded as Other parties share. We can see that under the Maoists aid allocations do not differ in districts that support other parties (model 2), while under UML leadership voting for other parties is associated with lower aid allocations (model 3). These patterns raise the question about the source of the UML's animosity towards areas that did not vote for major parties. One of the contentious issues in post-conflict Nepal is how the new federal system, which was introduced as part of the peace agreement, maps onto population cleavages. While the Maoists supported drawing district boundaries along ethnic lines, both NC and UML opposed such districts on grounds of promoting particularism (Strasheim Bogati 2016). The most prominent dispute in concrete terms concerns the relative autonomy awarded to majority Hindu population groups in the Terai, which continue to be deemed by some Nepalese elites to be too closely aligned to India[73].

[73]According to Nayak (2011) and Miklian (2009) the Pahadis – people from the hill region – and political elites in Kathmandu believe that India has been supporting the 'One Madhes One Pradesh' demand and that it aims to balkanise Nepal leveraging on the Madhesi.

Table 9: Aid Allocation as function of support for main parties involved in peace agreement, only 2008-2013 observations

VARIABLES	(1) Aid Per Capita	(2) Aid Per Capita	(3) Aid Per Capita	(4) Aid Per Capita
UML PR			18.001***	20.092***
			(4.274)	(4.555)
Other parties share	-25.147***	-49.103***	-3.545	-7.486
	(9.295)	(5.848)	(9.585)	(26.946)
UML PR*Other parties share			-45.558***	-47.622***
			(5.686)	(7.543)
Terai				-9.376
				(9.291)
UML PR*Terai				-19.933***
				(6.660)
Terai*Other parties share				3.298
				(35.634)
Maoist PR*Terai*Other parties share				28.409**
				(13.842)
Civilian casualties		48.612	48.612	140.667
		(111.010)	(111.010)	(90.562)
Total casualties	-112.614**	-117.042**	-117.042**	-133.805**
	(54.393)	(46.330)	(46.330)	(51.972)
Adult illiteracy rate	-0.354	-0.346	-0.346	-0.259
	(0.751)	(0.748)	(0.748)	(1.060)
Infant malnutrition	0.710	0.700	0.700	0.711
	(0.516)	(0.519)	(0.519)	(0.512)
Poverty Incidence	1.518**	1.509**	1.509**	1.486**
	(0.696)	(0.711)	(0.711)	(0.723)
Road density	-0.010*	-0.010*	-0.010*	-0.008
	(0.006)	(0.006)	(0.006)	(0.006)
Percentage without safe water	-0.842*	-0.845*	-0.845*	-1.068**
	(0.490)	(0.483)	(0.483)	(0.478)

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Table 9 – continued from previous page

Population (1,000s)	-0.068***	-0.068***	-0.068***	-0.058**
	(0.024)	(0.022)	(0.022)	(0.025)
Peace	Reconstruction Ministry = 1,		-18.001***	
		(4.274)		
Maoist PR*Other parties share		45.558***		
		(5.686)		
Constant	31.503	46.750*	28.749	27.945
	(28.313)	(26.502)	(28.910)	(42.690)
Observations	375	375	375	375
R-squared	0.218	0.225	0.225	0.228
Number of ID	75	75	75	75

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As we have seen in the descriptive statistics, non-support for the main parties geographically maps well onto the Terai region. This raises the important question whether aid allocations under the UML are influenced primarily by electoral considerations or are driven by more fundamental ethnic antagonism. Unfortunately, we were unable to obtain reliable data on ethnic composition broken down by district. Instead, in model 4 we include an indicator variable for all districts that geographically belong to the lower Terai region. To parse the source of lower aid allocations, we add interactions of the Terai variable with the UML PR dummy, and the other parties electoral share variable, as well as a three-way interaction of the Terai variable, the UML PR dummy, and the electoral share variable. This allows us to evaluate whether aid allocations under UML control of the Ministry of Peace and Reconstruction are a function of voting behavior or reflect discrimination against the Terai region. Model 4 in Table 9 reports the results. To help with interpretation we consider the following quantities of interest (Table 10): The marginal effect of having the UML in power a) with no support for other parties & outside the Terai region; b) with full support for other parties, outside the Terai region; c) with no support for other parties, in the Terai, d) with full support for other parties, in the Terai. We are interested in comparing the influence that voting behavior has on aid allocations under UML leadership inside and outside the Terai, i.e. the difference in marginal effects between scenarios a) and b), and c) and d). Both inside and outside the Terai aid allocations drop when the UML holds power in reaction to voting for other parties. However, this drop is considerably smaller inside the Terai. Whereas outside the Terai moving from zero to 100 percent electoral share incurs a penalty of 47.62 dollars per capita, inside the Terai this decrease is only 19.21 dollars. Clearly, electoral behavior plays a larger role for aid allocations under UML leadership outside the Terai.

How does the effect of voting behavior compare to any animus displayed towards the Terai region when setting voting aside? The answer is not straightforward. If the major parties have full electoral support (scenarios a) and c)), districts in the Terai are worse off under the UML, with on average 19.93 dollars per capita less in aid. However, when fully supporting other parties (scenarios b) and d)), districts in the Terai come out ahead, with 8.48 dollars more in aid per capita than districts outside. Overall then, there is evidence that with the UML in charge of the Ministry of Peace and Reconstruction there is a penalty for voting for other parties, and likewise for districts in the Terai,

Table 10: Comparison of marginal effects of UML PR.

$x_1 = voteshareotherparties; x_2 = Terai$		
Scenario	Effect of UML PR	Differences
a) $x_1 = 0; x_2 = 0$	20.09***	
b) $x_1 = 1; x_2 = 0$	20.09-47.62= -27.53***	b)-a)=-47.62
c) $x_1 = 0; x_2 = 1$	20.09-19.93=0.16	c)-a)=-19.93
		d)-c)=-19.21
d) $x_1 = 1; x_2 = 1$	20.09-47.62-19.93+28.41= -19.05***	d)-b)=8.48
*** p$\leq 0.01, **p \leq 0.05, *p \leq 0.1$		

but the later heavily depends on voting behavior. This is because the two conditioning factors move in opposite directions. Where other parties are strong in the Terai there is less disadvantage in aid allocations than where they are weak. In fact, aid allocations to a district in the Terai that elects 100 percent representatives from other parties are statistically indistinguishable under the UML and the CNP(M) (scenario c). To sum up, there is a clear association between a lack of major party support and lower aid allocations during the reconstruction phase, contradicting hypothesis 2. Before interpreting this as unequivocal failing of the peace agreement, it is important to point out that the substantive shortfalls in aid to marginalized districts is only occurring in the two years under which the UML held the Ministry of Peace and Reconstruction. This is in line with the UML as a party that supports a Kathmandu-centered view of the Nepalese polity. Even then, when looking at the Terai as region that hosts the most visible ethnic cleavage in Nepali politics, aid shortfalls occur under the UML, but only in districts that provide relatively high support to the major parties. Where other parties are strong, there is no aid penalty under UML leadership. As the political gains of parties supporting the Madhesi in the Terai came at the expense of the UML, NC and CPN(M) (Miklian 2009), this suggests that the UML is sensitive to grievances in the region when they find open political expression, and a more neglectful approach is taken where political support for the main parties is taken for granted. On balance though, we have to reject hypothesis 2. The political settlement after the civil war was precisely meant to take politics out of the question of distributional fairness in Nepali politics. The role of the UML in skewing aid allocations during the reconstruction period suggests that this was not achieved. This squares with the political discussions about the future shape of the Nepalese federalism, which were only

resolved after the 2015 earthquake in the Second Constituent Assembly. Future work will need to show whether this final settlement was more successful in bridging the social divides that were still visible during the reconstruction period.

6.7 Conclusions

This paper explores the important role of political capture of foreign aid for successful reconstruction in post-conflict societies. We focus on Nepal to explore to what extent power sharing enshrined in the 2006 Comprehensive Peace Agreement and the 2007 Interim Constitution insulated aid allocations from partisan influence. We theorize that areas that supported the former warring factions were rewarded with more aid than areas where people did not join the fight, and we find statistical evidence to this effect. Importantly, we are able to show that with the UML in control of the Ministry of Peace and Reconstruction, districts that support neither of the main parties in the 2008 elections received substantially less foreign aid, after controlling for human development indicators and other factors associated with the need for aid funding. While this only indirectly maps onto past conflict behavior, the possibility that active conflict participation is a prerequisite for adequate political presentation and leverage during peace negotiations has troubling implications for the incentives of nonaligned groups in multi-group or multi-ethnic conflicts. If staying on the side lines does not pay, escalation might be difficult to prevent. Outside mediators need to take lessons about the role of nonaligned groups seriously. More research is needed to establish the relevance of this link in different conflict scenarios.

On the positive side, we could not find evidence of traditional spoils politics, where the party in power channels aid towards its own supporters. This has encouraging implications for the effectiveness of powersharing in Nepal. Political capture of aid flows in post-conflict situations has the potential to undermine the donor community's policy response, and entrench distributional inequalities that can feed into political unrest in the future. Developing a better theoretical understanding of the political economy of aid allocation processes in post-conflict environments is an important first step. Also needed is more fine-grained empirical analysis of sub-national processes. The increasing availability of geo-coded data of aid flows, political entities, and political alignments such as those based on ethnicity should enable researchers to make progress on this important

subject.

7 Chapter 4 - Rebuilding energy infrastructures in post-conflict countries: assessing the impact on the manufacturing sector

7.1 Abstract

Conflicts severely depress the manufacturing sector of affected countries and jeopardize its recovery once peace is re-established. Yet, I claim that donors' commitment to restore and develop infrastructures to generate, distribute, store and manage energy may boost an upswing of the manufacturing sector in post-conflict settings. This is because, first, as opposed to conventional developmental aid, post-conflict aid is proven to be unusually productive and unlikely to trigger the appreciation of the real exchange rate. Second, because restoring and enhancing energy infrastructures is expected to increase the return on investments in the manufacturing sector. In this sense, I expect donors' commitments targeting energy infrastructures to encourage investments in the manufacturing sector and thus support its growth in the post-conflict period. To test my hypothesis, I resort to a cross-section time-series two stages least squares multivariate analysis covering 45 post-conflict countries between 1970 and 2013. I find that donors' commitment to rebuild and enhance energy infrastructures in post-conflict countries has positive effects on the manufacturing sector of recipient countries both in the short and in the medium term. Results are robust to different specifications of the model and do not depend on the chosen length of the post-conflict period. These findings contribute both to shed more light on the impact of foreign aid in fragile and post-conflict countries, and to the literature investigating the impact of electrification in developing economies.

7.2 Introduction

In 1988 Haughton stated that "current knowledge about how to approach the redevelopment of war-torn economies is a mile wide and an inch deep" (Haughton, 1988, p.5). Since then, scholars and practitioners furthered our knowledge regarding how to sustain post-conflict economies. In

this paper, I investigate if and to what extent post-conflict foreign aid targeting infrastructures to generate, distribute, store and manage energy – from now on energy infrastructures - contributes to restoring the manufacturing sector of recipient economies. So far, literature investigating the impact of post-conflict aid focused mostly on aggregate economic performances such as GDP growth rather than on the effects on specific sectors. This paper addresses this shortcoming to provide donors and policymakers with information to plan, understand and assess effective interventions to restore post-conflict economies.

The literature agrees on the negative impact of instability and conflicts on affected countries as they damage the human, social, financial and physical capital and weaken the central state (Collier, 1999; Maxwell and Reuveny, 2000; Teodosijevic, 2003; Robinson et al. 2006; Anand, 2009; Collier 2010; Mitchell and Thies, 2012; Collier and Duponchel, 2013). Notably, conflicts are likely to increase countries' dependency on natural resources revenues as they severely affect the output of the manufacturing and cropping sectors while they intensify the exploitation of natural resources (Chauvin and Rohner, 2009; Brunnschweiler and Bulte, 2009). Warring factions do not have the incentive to completely destroy the natural resources extraction plants present in the country as such plants increase the expected value of victory and represent a valuable source of revenues to fund the fights[74]. In turn, the collapse of social and political stability has a strong negative impact on labour-intensive, institutional/transaction-intensive and export-dependent sectors - as the manufacturing one (Chauvin and Rohner, 2009). What is worst is that exactly those sectors most affected by the conflict may be unable to recover to pre-war levels and restart to grow once that peace is recovered. Indeed, countries with torn societies and unstable leaders – as post-conflict ones - are likely to experience over-extraction of natural resources that in turn can trigger the so-called Dutch disease and further depress the production of tradable goods (Corden and Neary,1982; Neary and Van Wijnbergen, 1986; Javaid and Riazuddin 2009; Collier, 2010).

Yet, donors' commitment to rebuild energy infrastructures may reverse this scenario. Indeed, despite aid flows may lead to an appreciation of the real exchange rate further depressing the manufacturing sector of recipient countries (Michaely, 1981; Van Wijnbergen, 1986; Rajan and

[74]In the words of Lujala (2010, p.23) "for the rebels, the effort and investment in fighting may be justified by the chance of winning control over resources located in the area the rebels originate from."

Subramanian, 2011), I claim that foreign aid targeting energy infrastructures in post-conflict countries positively affects the manufacturing sector. This is because, first, post-conflict aid tends to be unusually productive and does not lead to an appreciation of the real exchange rate (Collier and Hoeffler, 2002; Schmidt-Hebbel, 2007). Second, as rebuilding power plants and energy supply networks increases manufacturing firms' productivity and expected profits, donors' commitment to restoring energy infrastructures encourages investments in the manufacturing sector. For example, lower production costs due to electrification may incentivize entrepreneurs to reinvest in their activity as better technology becomes affordable and overcoming financial constraints to access the vital export market becomes possible (Chakravarty and Xiang, 2011; Askenazy et al. 2015; Krasniqi and Mustafa, 2016).

There are several reasons to focus on the impact of aid on the manufacturing sector of post-conflict countries. First, economies with an underdeveloped manufacturing sector and relying on the extraction of natural resources tend to suffer from reduced economic growth, limited political liberties and meagre domestic as well as foreign investments (Gylfason, 2006; Collier and Goderis, 2008; Mavrotas et al., 2011). Moreover, the development process is more at risk when economic diversification is limited (OECD and WTO, 2019). It follows that, as negative economic shocks and economic grievances increase the risk of conflict (Miguel et al., 2004; Collier and Hoeffler, 2004), studying the effects of aid on the economy's productive sectors contributes indirectly to understanding how to promote and sustain peace. At the same time, as the structure of the economy influences the extent to which governments can extract and allocate resources discretionally, investigating how to encourage and strengthen productive rather than extractive sectors contributes to understanding how to promote more accountable post-conflict governments. Second, as donors' resources are limited, it is important to know how they affect recipient countries to best allocate them. This latter issue may become more relevant in the narrow future if the economic consequences of the unfolding COVID-19 crisis are as severe as expected. Finally, it is relevant to focus on post-conflict countries as post-conflict development differs substantially from development in more traditional environments. If on one hand foreign aid tends to be very productive (Collier and Hoeffler, 2002), on the other hand, the vulnerability of post-conflict countries increases the risk of severe consequences in case of wrong policies.

To test my hypothesis, I resort to a cross-section time-series two stages least squares multivariate analysis covering 45 post-conflict countries between 1970 and 2013. I find that aid targeting energy infrastructures increases the value added of the manufacturing sector as a share of the recipient country's GDP in the short and the medium term. Results are robust to different specifications of the model and do not depend on the chosen length of the post-conflict period.

These findings make different contributions to existing literature. First, they suggest that donors' decisions regarding what type of aid to allocate do affect the structure of post-conflict economies. This implies that donors' commitments play a fundamental role in creating the pre-conditions for long-lasting stable and diversified economic growth. Second, they advance current knowledge regarding the impact of investments in energy infrastructures in fragile developing countries.

The paper develops as follows. First, I describe the impact of conflicts on the economies of affected countries. Second, I discuss the role that foreign aid and energy infrastructures play in post-conflict countries and formalize my hypothesis. Then, I present methods, results and conclusion. Appendix concludes the chapter.

7.3 War and peace: the impact of conflicts on the economy

Notwithstanding conflicts may be a very lucrative business for some, unsurprisingly they generally devastate the economies of affected countries[75]. Conflicts disrupt the exchange of information and make entry into the activity more difficult (Collier, 2000). Additionally, they increase transaction costs, reduce public expenditure's efficiency diverting it from output-enhancing activities, decrease savings and reduce human, social, financial and physical capital (Collier, 1999). Moreover, because of the nature and the location of fights, civil wars tend to weaken the state, reduce the growth rate of resources, and divert labour from normal productive activities to conflict ones (Collier, 1995; 1999; Maxwell and Reuveny, 2000).

Yet, the impact of conflict varies across different economic sectors. Notably, while the decline

[75]Collier (1999) estimates that civil wars reduce the economy as a whole by around 2.2% per year respect to its path and Teodosijevic (2003) reports that agricultural production falls by about 1.5% per year in periods of conflict. Recalling Brauer (2000), Mitchell and Thies (2012; pp.224-225) remind that "the use of war machinery, such as heavy tanks, ammunition, and mines, also damages the soil, leading to erosion, compaction, loss of forage and shrubs".

of socio-political stability is likely to severely damage the manufacturing sector, the resource sector is likely to suffer less from conflict because of its limited linkages with the rest of the economy and inability to relocate (Brunnschweiler and Bulte, 2009; Mitchell and Thies, 2012). In this sense, the Syrian case is exemplar. Notwithstanding the disastrous war that paralyzed the economic activities of the country, Syrian oil extraction proceeded, albeit at lower rates, under the control of the government, the ISIS and the Kurds insurgents (Almohamad and Dittmann, 2016). Similarly, the Second Congo War did not stop coltan and diamond mining activities carried by the government, the Rwandese Patriotic Army, and the Uganda Peoples' Defence Forces (Asiimwe, 2004). In turn, labour-intensive, institutional/transaction-intensive and export-dependent activities as cropping or manufacturing are among the most negatively affected (Stewart et al., 1997; Chauvin and Rohner, 2009). This is because conflicts wreck institutions and reduce time-horizons, the supply of skilled workers and access to foreign markets. As a result, complex contracting, investments, and access to specific productive factors become impossible so that despite some firms may adapt to the war economy and survive, their productive capacity is significantly reduced (McDougal, 2010; Collier and Duponchel, 2013).

Additionally, there is the risk that natural resource dependence may become a chronic disease in the post-conflict setting further depressing the manufacturing sector. If the peace onset is not followed by a sense of security and low-intensity fights persists, the social capital might not recover and the depreciation rate of capital might not return to pre-war levels thus disincentivising agents from bringing back assets (Collier, 1995). This is likely to discourage investments exactly in those sectors that are not as linked to the territory as natural resources extraction e.g the manufacturing sector.

Further, the economy may recover only gradually from some of the effects of the disruption caused by the conflict and public expenditure on productive activities may not return to its pre-war levels (Collier, 1999). This is because the financial effort required by the conflict limits post-war spending while post-conflict governments' reluctance to drop military expenditure keeps diverting public resources toward the military sector (Collier, 1999). In this scenario, the government is unlikely to be able – or willing - to provide an adequate environment for firms that might thus face higher production costs and lower productivity than during the pre-conflict period. In these

conditions, it is difficult to expect the sectors that the conflict depressed the most to recover.

In turn, in post-conflict settings, the extraction of natural resources is likely to rise. If the war left a country with a torn society and an unstable leader, the faction in power has the incentive to increase the extraction of natural resources as much as possible to convert such wealth in assets under its control (Collier, 2010). Likewise, to reduce the risk of a new conflict outbreak, leaders can increase the extraction of resources to buy off potential opponents (Fjelde, 2009). In particular, if post-conflict rulers face a short time-horizon - as in the case of transitional cabinets for example - they have the incentive to over-extract natural resources since they value the future stock of resources only if they can retain the office (Robinson et al. 2006). These considerations matter as increasing the extraction of natural resources might trigger the so-called Dutch disease and further push deindustrialization in the post-conflict period (Corden and Neary,1982; Neary and Van Wijnbergen, 1986; Javaid and Riazuddin 2009).

7.4 What then must we do? The role of energy infrastructural post-conflict aid

Despite conflicts may deal a heavy blow to the manufacturing sector, I argue that donors' commitment to restore and enhance energy infrastructures can revamp the manufacturing sector of post-conflict countries. This is because post-conflict aid differs from more conventional developmental finance and investments in energy infrastructures are particularly effective in supporting the manufacturing sector.

Post-conflict aid differs from conventional developmental aid because of the specificity of the environment where it is allocated. While the purpose of the latter is to supplement domestic savings and reduce poverty, the former aims to protect displaced people and reconstruct the country (Demekas, 2002). Notably, because in post-conflict environments the need to restore infrastructures is combined with the collapse of domestic revenues, reconstruction aid is likely to be more productive than conventional aid (Collier and Hoeffler, 2002). Finally, as post-conflict aid eases supply and supports the tradable sector productivity, it does not increase the real exchange rate (Schmidt-Hebbel et al., 2007). This means that post-conflict aid is less likely to trigger the so-called

Dutch disease and hinder the manufacturing sector of recipient countries as Michaely (1981), Van Wijnbergen (1986), Rajan and Subramanian (2011) suggest.

At the same time, under the assumption that production factors are gross complements, improving energy infrastructures raises the productivity of labour and the stock of private capital. Moreover, it decreases the depreciation rate of capital as electrical equipment last longer, enfranchises firms from onerous energy back-up systems and reduces adjustment and entry costs that may prevent firms from responding to shocks. In doing so, energy infrastructures raise the expected rate of return on capital in the private sector which is a determinant factor of growth especially for small firms (Kessides, 1993; Hulten et al., 2006; Agénor and Blanca, 2006; Cook 2011; Kassem, 2018).

Not surprisingly, Escribano et al. (2010) underline that in developing countries poor electricity provision has a major negative effect on the total factor productivity. For example, in 1998 Nigeria where electric power accounted for 4.5% of the manufacturing sector's variable costs, power outages cost firms an average of 792 working hours while in Pakistan the direct costs of energy load shedding resulted in a 4.2% reduction in the volume of manufactured exports (Lee and Anas, 1992; Adenikinju, 2005). Conversely, there are several examples from countries where electrification increased the profitability of the manufacturing sector. In the canton of San Carlos in Costa Rica energy infrastructures supported the growth of food manufacturing firms, in China promoted manufacturing and repair capability into the countryside, while in Norway triggered the industrialization process in the first decades of the twentieth century (Timmer, 1976; Goddard, 1982; Venneslan, 2009). Likewise, the reduction of the cost of energy in India increased the productivity of the manufacturing sector lowering the cost of materials and inputs (Elhance and Lakshamanan, 1988; Goel, 2003) while in Java electrification rose the output and the turnover of firms (Kassem, 2018).

Finally, it is important to recall two final notions that explain why donors' commitments to restore energy infrastructures is expected to have a determinant positive impact on the manufacturing sector of post-conflict countries. First, assuming decreasing marginal returns of investments in infrastructures, we can presume the positive impact of donor's commitment to be terrifically substantial where power plants and power grids are absent or damaged as in post-conflict scenarios. Second, donors' support may be the only way to restore and enhance energy infrastructures in the

aftermath of conflicts. Indeed, after the peace onset, neither the local private sector nor the public one may have the willingness and the capacity to invest in energy infrastructures. These infrastructures are generally unattractive for the private sector as the owner may not internalize in the pricing structure the externalities that the infrastructure generates. At the same time, post-conflict governments may not be able or willing to undertake time-consuming and costly investments in a scenario where unexploded ordnance represent a serious hazard, the government's budget is limited and country leaders have incentives to keep diverting public resources toward the military sector (Collier, 1999; MacDonald, 2005; Anand, 2009). In fact, despite private investments in the generation of electricity and its distribution start to emerge about three years after the conflict, they are virtually absent for five years after the pace onset (Schwartz and Bannon, 2004; Schwartz, 2006).

In sum, I expect donors' commitment to restore and enhance energy infrastructures in post-conflict countries to support the recovery of the manufacturing sector. This is because, post-conflict aid targeting energy infrastructures is unlikely to trigger the appreciation of the real exchange rate while it is expected to increase productivity, profits and the return on investments in the manufacturing sector. In this sense, aid targeting energy infrastructures encourages investments in the manufacturing sector supporting its growth. Notably, the relevance of donors' commitments lies in the fact that they may be the only source of investments in energy infrastructures in post-conflict scenarios where such investments are most needed and productive.

More formally:

Hypothesis 5: *Post-conflict commitments to restore energy infrastructures increase the value added of the manufacturing sector as a percentage of the GDP.*

7.5 Methods

To test the hypothesis, I have compiled a dataset covering 46 countries that experienced at least one episode of internal conflict between 1970 and 2013[76]. The country-year is the unit of analysis. Following the UCDP Conflict Termination Dataset (Kreutz, 2010), I consider a conflict year as one where at least 25 battle-related deaths occurred. By this definition, my dataset includes both

[76]The limitation to 2013 is due to data coverage on donors' commitments.

periods following civil wars and shorter conflict episodes as coups. Yet, this does not affect my analysis as both events – despite with different intensity – contribute to depressing the manufacturing sector via the discussed mechanisms. The post-conflict period starts the year following a peace onset as coded in the UCDP Conflict Termination Dataset and ends in case of same conflict recurrence or new conflict outbreak. As a country may have experienced more than one conflict, it follows that the dataset includes both post-conflict periods. In case a country experienced more than one conflict simultaneously, the post-conflict period starts when the last of the simultaneous conflicts ended. Table 11A and Table 12A in the appendix present the descriptive statistics of the sample used for the main analysis and the list of included countries with the respective number of observations.

A limitation of this approach consists in the fact that the panel of post-conflict countries includes developed and/or large countries that experienced the end of sporadic, peripheric and/or geographically limited episodes of violence. Some examples are the United Kingdom in the aftermath of the Good Friday Agreement or China in the aftermath of the suppression of the 2008 Tibetan unrest. To address this issue, as a robustness check, I run my analysis one more time excluding observations from China, India, Indonesia, Mexico, and the United Kingdom. Results are not significantly different from the main analysis and Table 13A in the appendix fully presents them.

There is not a unique definition that states for how long a society should be considered a post-conflict one. Indeed, some processes show their results only in the long term, and it could take generations for a country to recover from a severe conflict (Brown et al., 2011). For this reason, I test the model using seven different timeframes between 4 and 10 years. For the sake of brevity, I discuss the results relative only to the 7-year timeframe. Tables 14A and 15A in the appendix fully present the results relative to the other timeframes.

To test the relation between donors' commitments to rebuild and enhance energy infrastructures and the manufacturing sector value added I resort to a two stages least squares time-series cross-section multivariate analysis. The following equation describes the second-stage equation:

$$ManuVA_{t+1,j} = \beta_0 + \beta_1 Aid_{t,j} + +\beta_2 \boldsymbol{X}_{t,j} + \beta_3 \theta_j + \epsilon_{t,j} \tag{5}$$

My dependent variable ManuVA measures the value added from the manufacturing sector as a percentage of the GDP. The data source is the World Bank Open Dataset[77] according to which " manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources"[78]. My independent variable is the total amount of commitments targeting energy production and supply per capita. To create this variable, I rely on the AidData Core Release dataset and coding scheme (Tierney et al., 2011) for donors' commitments and to the V-Dem dataset (Coppedge et al., 2019) for population estimates. Following the AidData coding scheme, I include as commitments' targeting energy infrastructures those allocated to energy generation and supply; energy policy and administrative management; power generation; electrical transmission; gas distribution; petroleum distribution and storage; and energy education.

Data on commitments are likely to be lumpy and the records of donors' commitments in recipient countries' national budget may not reflect the progress of disbursements. To address these issues, I code the variable Aid as a moving average. In each post-conflict year t Aid assumes the average value of donors' commitments in the previous four years except that in the first, second and third year. In these years, the value of Aid corresponds to the average value of donors' commitments in previous post-conflict years excluding conflict years preceding the peace onset. In other words, in the first post-conflict year, the value of Aid is the amount of aid committed in that year. In the second post-conflict year, the value of Aid is the average amount of commitments in the first two post-conflict years. Eventually, in the third year, the value of the variable Aid is the average of donors' commitments in the first three post-conflict years. So that:

[77] https://data.worldbank.org/

[78] https://data.worldbank.org/indicator/NV.IND.MANF.ZS

$$\mathcal{A}id_p = \begin{cases} Aid_p & p{=}1 \\ \frac{Aid_p + Aid_{p-1}}{2} & p{=}2 \\ \frac{Aid_p + Aid_{p-1} + Aid_{p-2}}{3} & p{=}3 \\ \frac{Aid_p + Aid_{p-1} + Aid_{p-2} + Aid_{p-3}}{4} & p > 3 \end{cases} \tag{6}$$

Where p = p-th year since the peace onset.

Yet, it may take years for donors' commitments targeting energy infrastructures to benefit the manufacturing sector. This is because, first, donors must commit funds, then disburse them, subsequently, projects have to be implemented and eventually firms have to adapt to them. Moreover, restoration and enhancement of the energy infrastructures of post-conflict countries is likely to have long-lasting effects. To consider these additional temporal dimensions, I forward my dependent variable of one period. As an additional robustness check, I run my main model four more times forwarding my dependent variable of two, three, four and five periods. Table 16A in the appendix presents the results from these four additional models.

As control variables, I include the number of years of conflict the country experienced before the peace onset; the number of years since the peace onset along with its squared and cubic term; three dummy variables accounting for the conflict outcome[79]; the log of the GDP growth and the value of the GDP per capita; the log of the population; the net inflow of foreign direct investments as a percentage of the GDP; the sum of exports and imports of goods and services as a share of the GDP; two dummy variables indicating if the country is under a democratic or military regime; a dummy variable assuming value 1 if the year is before 1991; and the difference between the value of the variable ManuVA at the conflict onset and at the peace onset. I include country fixed effects.

For the GDP and population values, the data source is the V-Dem dataset. For the level of trade and of foreign direct investments the data source is the World Bank Open Dataset. The first dummy variable accounting for the regime type assumes value 1 if in the given year the country's

[79] As conflict outcomes, following the UCDP Conflict Termination Dataset, I include low activity, victory or ceasefire. Peace agreement is dropped from the analysis as it is the baseline.

polity2 index score is equal or greater than 5 and 0 otherwise. The source for the polity2 index is the PoiltyIV project database (Marshall and Jaggers 2015). The index measures the political regime authority and approximates the level of democratization ranging from -10 (full autocracy) to +10 (full democracy). The second dummy variable accounting for the polity assumes value 1 if in a given year the regime type is coded as "indirect military", "military", "military-personal", "party-military" or "party-military-personal" in the V-Dem dataset.

The difference between the value of the variable ManuVA at the conflict onset and the peace onset, the number of years of conflict the country experienced before the peace onset, and the number of years since the peace onset with its squared and cubic term capture the impact of the conflict on the economy, peace dividends and phoenix effect. The conflict outcome dummies account for post-conflict dynamics as low-intensity fights or more stable scenarios. The GDP growth and the GDP per capita control for the capacity of more developed countries' firms to access advanced technology and to operate in a safe environment, while the size of the population for the presence of economies of scale and other effects of country size. The level of foreign direct investments and the level of trade proxy for the capacity of firms to access foreign capitals and markets. The two dummy variables accounting for the country's polity control for the quality of the institutional framework firms operate in. The dummy variable assuming value 1 if the year is before 1991 controls for time trends in donors' aid allocations, strategies and practices.

To corroborate my results I run the model one more time with a less parsimonious specification including as additional control variables the level of natural resources extracted as a percentage of the GDP, a dummy variable assuming value 1 if in the given year the country's polity2 index score is equal or smaller than -5, a variable accounting for the level of instability[80], the total amount of commitments per capita allocated and the level of inflation. For these variables, the data sources are respectively the World Bank Open Dataset, the PolityIV project dataset, the Cross-Section Time-Series Data Archive (Banks, 1997), the AidData dataset and the V-Dem dataset. Table 17A in the appendix fully present results from this more conservative specification.

Endogeneity of aid is a potentially critical issue. Donors may commit more aid targeting energy

[80]The variable accounts for the presence of assassinations, purging of governmental officials, guerrilla activity, protests, riots, and strikes as coded by Banks (Banks, 1997)

infrastructures exactly to those countries where the manufacturing sector is more underdeveloped. For this reason, I resort to a two stages least squares analysis to account for the bias introduced by the endogenous placement of aid. As excluded instrument for the endogenous regressor Aid, I use the pre-conflict infant mortality rate. To code this variable, I resort to data from the V-Dem dataset. As this variable considers values that precede the shock of the conflict, it is likely to satisfy the exclusion restriction and to do not suffer any reverse effect of the dependent variable. At the same time, with the other included instruments, it proxies for donors' priorities in post-conflict settings. Indeed, we can expect donors to be more prone to allocate more infrastructural aid in contexts where humanitarian needs are less urgent. As last robustness check, I test my model using as excluded instrument the pre-conflict level of urbanization. This variable captures the share of people living in urban areas as defined by national statistical offices. To code this variable, I resort to data from the World Bank Open Dataset. Assuming that donors intend at least to restore the development level that post-conflict countries enjoyed before the conflict outbreak and that energy infrastructures are a backbone of developed economies, it is fair to expect donors to commit more aid targeting these infrastructures to those countries that had high urbanization rates before the conflict. Results from this additional control are in line with those from the main analysis and fully presented in Table 18A in the appendix.

7.6 Results

Table 11 presents estimates from the first and the second stage of the two stages least squares analysis. It is worth to recall that in IV analysis R^2 has no natural interpretation as SSR for IV can be larger than SST (Wooldridge, 2006). Looking at the first stage equation, the excluded instrument is statistically significant at 1% level and has the expected negative sign. This supports the intuition that donors commit more energy infrastructural aid to countries where humanitarian needs are less urgent. With regard the included instruments, only the size of the population, the level of trade, the GDP per capita, the amount of foreign direct investments and the length of the conflict are significant. The sign of these coefficients presents a coherent picture where poor small countries with open economies but low levels of foreign direct investments that suffered protracted conflicts tend to receive more aid targeting energy infrastructures than other post-

conflict countries. Turing at the results from the second stage, the variable Aid has a positive sign and is statistically significant at 5% level. Looking at the magnitude of the coefficient, results from the second stage suggest that, keeping all the variable constant at their means, an increase of one standard deviation of the variable Aid rises the share of the manufacturing sector value added of 4 percentage points. Likewise, and in other words, per each additional 10 US dollars per capita targeting energy infrastructures allocated to post-conflict countries, the share of the manufacturing sector value added increases of $\approx$ 4.8 percentage points. With regard to the controls, only the level of foreign direct investments is significant at 5% level and has an intuitive positive sign. It is worth noting that the values of the Kleibergen-Paap *rk* LM statistic and of the Kleibergen-Paap *rk* Wald F statistic indicate that the instruments are relevant and not weak (Baum et al., 2007; Staiger and Stock, 1997). Results do not statistically differ when I exclude from the analysis 37 observations from China, India, Indonesia, Mexico, and the United Kingdom as the coefficient of the variable Aid is equal to $\approx$ 0.46. Notably, the values of the Kleibergen-Paap *rk* LM statistic and of the Kleibergen-Paap *rk* Wald F statistic increase respectively from 14.077 to 14.323 and from 14.068 to 14.222 suggesting that the instruments perform better in predicting the amount of donors' commitments targeting energy infrastructures when I run the model using the reduced sample. At the same time, adding as additional controls the level of instability, natural resources dependency, inflation, the dummy variable accounting for the country being under an autocratic regime and the total amount of aid per capita that donors commit does not affect the results. As Table 17A in the appendix shows, the magnitude of the coefficient of the variable Aid is in line with previous results. When I include the additional controls, the coefficient of the variable Aid is $\approx$ 0.45. This value rises to $\approx$ 0.52 when I include the additional controls and I drop observations from China, India, Indonesia, Mexico, and the United Kingdom. In both cases, the level of significance of the variable Aid rises from 5% to 1% but the values of the Kleibergen-Paap *rk* LM statistic and of the Kleibergen-Paap *rk* Wald F statistic slightly decrease.

Table 11: The effect of Aid targeting energy production and supply on the manufacturing sector

	First stage	**Second stage**
VARIABLES	Aid	Manu VA_{t+1}
Pre-conflict infant mortality	-0.114***	
	(0.030)	
Duration	1.803	-1.026
	(1.614)	(1.050)
$Duration^2$	-0.403	0.225
	(0.463)	(0.298)
$Duration^3$	0.025	-0.012
	(0.039)	(0.025)
Population	-6.338***	0.317
	(2.272)	(1.375)
Democracy	-1.050	1.011
	(0.844)	(0.643)
Military	0.908	1.456
	(1.234)	(0.936)
Cease Fire	2.428	-1.979*
	(1.818)	(1.121)
Low Intensity	-0.467	-0.571
	(1.682)	(0.917)
Victory	-0.620	2.044*
	(1.900)	(1.155)
Trade	0.114***	-0.063*
	(0.031)	(0.032)
GDP growth	-4.017	0.719
	(3.990)	(2.376)
GDP per capita	-0.000**	-0.000
	(0.000)	(0.000)
FDI	-0.239***	0.134**
	(0.071)	(0.065)
War Length	0.445***	-0.022
	(0.121)	(0.056)
Δ Manu VA	0.201	-0.280
	(0.222)	(0.171)
Cold War	-0.830	0.260
	(1.278)	(0.791)
Aid		0.484**
		(0.195)
Observations	365	365
Number of ID	45	45
Country FE	YES	YES
Robust SE	YES	YES

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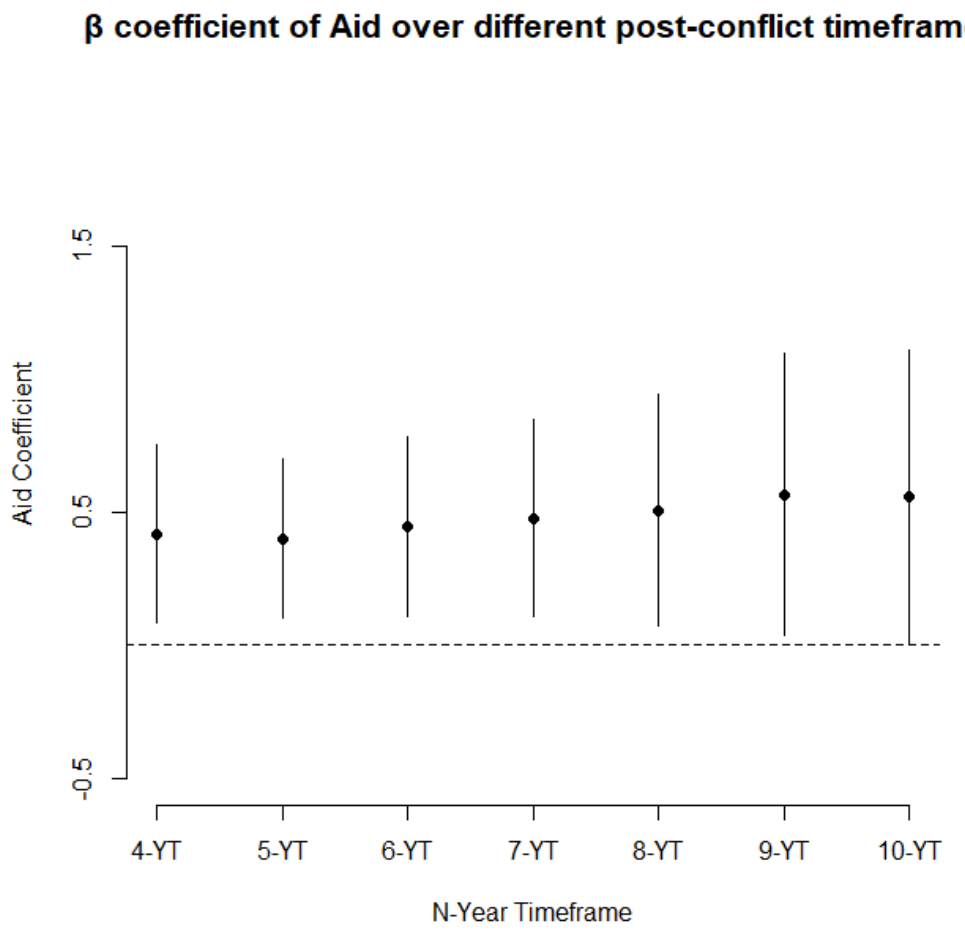
Table 11 – continued from previous page

	First stage	Second stage
Kleibergen-Paap rk LM statistic	,	14.077
Adjusted R-squared		-1.291
Kleibergen-Paap rk Wald F statistic		14.068
,		
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

As aforementioned, I test my model using different timeframes. Figure 1 plots the coefficients of the variable Aid for each timeframe. Each dot represents the value of the coefficient of the variable Aid for a given timeframe, the vertical lines represent the 95% confidence interval and the dashed horizontal line is set on 0. Interestingly, the length of the post-conflict period does not affect the sign of the coefficient and the variable Aid is always significant at 5% level except that in the 5-years timeframe where it is significant at 1% level. Yet, despite the magnitude of the estimated coefficients slightly increases with the length of the post-conflict period, none of the coefficients is statistically different from the others. As Table 14A and Table 15A in the appendix report, the longer is the post-conflict timeframe used to test the model, the lower are the values of the Kleibergen-Paap *rk* LM statistic and of the Kleibergen-Paap *rk* Wald F statistic. This implies that the set of instruments perform best in predicting values of the variable Aid temporally closer to the peace onset. This intuitively suggests that in the immediate post-war years, reconstruction, humanitarian and economic needs play a greater role as drivers of donors' commitments than in later phases of the post-conflict period.

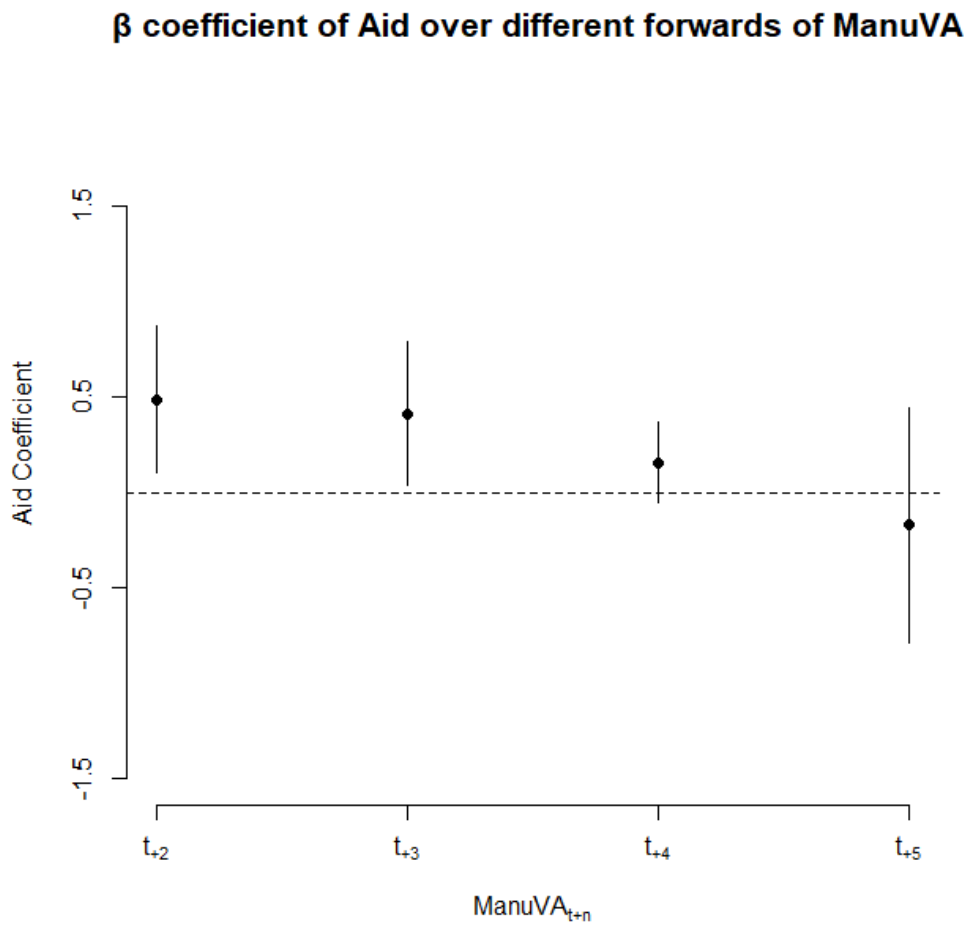
Figure 3 plots the coefficients of the variable Aid considering the additional forwards. Dots report the value of the coefficient of the variable Aid corresponding to a specific forward of the dependent variable. As before, vertical lines on each dot represent the 95% confidence interval and the dashed horizontal line is set on 0. Results show that when I forward the dependent variable of 2 and 3 periods - rather than 1 as in the main specification - the coefficient of the variable Aid is still positive and significantly different from 0 at 5% level. Notably, its magnitude is in line with previous findings. Yet, when I forward the dependent variable of 4 and 5 periods the coefficient is no longer significantly different from 0 and its magnitude drops from ≈ 0.5 to ≈ 0.16. These

Figure 16: coefficient of Aid over different post-conflict timeframes. Vertical lines representing the 95% confidence interval and dashed horizontal line set on 0.



results suggest that the positive impact of donors' commitments to restore and enhance energy infrastructures last in the medium term but tend to vanish in the long-term.

Figure 17: coefficient of Aid over different forwards of ManuVA. Vertical lines representing the 95% confidence interval and dashed horizontal line set on 0.



Eventually, as a final robustness check, I run my model using as alternative excluded instrument the pre-conflict urbanization level. Table 18A in the appendix fully reports the results. Despite the values of the Kleibergen-Paap *rk* LM statistic and of the Kleibergen-Paap *rk* Wald F statistic are lower than in the main model specification, they suggest that the new set of instruments is relevant and not weak as well. Notably, despite in this specification the coefficient of the variable Aid is $\approx .12$ units smaller than the coefficient estimated in the main specification, the difference is not statistically significant.

In conclusion, the hypothesis is not rejected. Indeed, there is strong evidence that the manufacturing sector of post-conflict countries benefits from donors' commitments to restore and enhance energy production and supply infrastructures. Notably, the effects of donors' commitments tend to last at least for three years since the allocation.

7.7 Conclusions

So far, studies focused on aid as one of the main tools for post-conflict reconstruction. Scholars and practitioners investigated and debated if and to what extent post-conflict aid promotes peace, its effects on the real exchange rate, economic growth, the labour market, foreign direct investments, the determinants of projects' success and the effectiveness of different development strategies (Demekas et al. 2002; Collier and Hoeffler, 2002; Collier et al., 2003; Suhrke et al., 2005; Schmidt-Hebbel, 2007; Greenberg and Zuckerman 2009; Barakat, 2009; Manning and Malbrough, 2010; Duponchel et al. 2010; David et al. 2011; Garriga and Phillips, 2014; Nunnenkamp, 2016). Yet, we know little regarding the impact of post-conflict aid on the different economic sectors of recipient countries. I aim to partially fill this gap investigating the effect of post-conflict aid targeting energy infrastructures on the manufacturing sector of recipient countries. I argue that donors' commitment to restore and enhance post-conflict countries' capacity to generate, store and distribute energy decreases manufacturing firms' costs and increase their productivity. As the expected return on investments in the manufacturing sector rises, agents have the incentive to reinvest in the sector thus leading to its growth.

To test my hypothesis, I resort to a cross-section time-series two stages least squares multivariate analysis covering 46 post-conflict countries between 1970 and 2013. Results show that donors' commitment to restore and enhance the energy infrastructures of recipient countries has a positive impact on the manufacturing sector both on the short and the medium term. Notably, the analysis suggests that allocating additional 10 US dollars per capita increases of ≈ 4.8 percentage points the value added from the manufacturing sector as a percentage of the GDP. These results hold when the post-conflict period is considered to last both only a few years after the peace onset and one decade since the breakout of peace.

These findings shed more light both on the effects of aid allocation on the rebuilding of war-torn societies and on the effects of energy infrastructures on fragile economies. In particular, they remark the difference between the impact of developmental aid in conventional environments and of reconstruction aid in post-conflict societies. In this sense, they suggest that unlike developmental aid allocated in conventional settings, aid targeting energy infrastructures in post-conflict environments promotes the manufacturing sector of recipient countries. This latter consideration implies

that donors targeting energy infrastructures with adequate policies, resources and strategies might help post-conflict countries to differentiate their economy, avoid natural resource dependency and thus decrease their vulnerability to external economic shocks. This is extremely relevant as natural resource dependency leads to reduced economic growth, investments and political liberties (Gylfason, 2006; Collier and Goderis, 2008; Mavrotas et al., 2011) while economic shocks and economic grievances are associated to the risk of conflict (Miguel et al., 2004; Collier and Hoeffler, 2004). In this sense, these findings point to donors and policymakers additional ways to promote and support sustainable economic development, long-lasting peace and the emergence of accountable leaders in post-conflict settings.

7.8 Appendix

In the following pages, Table 11A and Table 12A report the descriptive statistics of the main sample and the list of included countries with the respective number of observations. Table 13A shows the results of my analysis when I drop observations from China, India, Indonesia, Mexico, and the United Kingdom. Table 14A, Table 15A and Table 16A present the results of my analysis when I run the model using additional post-conflict timeframes and additional lags for the dependent variable. Table 17A reports the first and the second stage results when I add as additional controls a dummy variable indicating if in the country is ruling an autocracy, the relevance of natural resources revenues on the GDP, the level of inflation, the level of instability and the total amount of dollars per capita that donors commit. Notably, under Specification 1A I present results obtained running my model including all countries from the panel while under Specification 2A I present results obtained running the model excluding observations from China, India, Indonesia, Mexico, and the United Kingdom. Lastly, Table 18A displays results obtained when as excluded instrument I use the pre-conflict level of urbanization rather than the pre-conflict level of infant mortality.

Table 11A: Summary statistics

	Mean	Std.Dev.	Min	Max	Obs
Manu VA	13.41	6.74	0.26	34.13	365
Aid	5.89	8.44	0.00	41.54	365
Pre-conflict infant mortality	77.89	37.42	5.80	165.10	365
Pre-conflict urbanization	37.79	19.28	5.34	80.16	365
Duration	3.48	2.00	1.00	7.00	365
Duration^2	16.08	15.51	1.00	49.00	365
Duration^3	86.07	107.76	1.00	343.00	365
Population	16.76	1.29	14.70	21.03	365
Democracy	0.39	0.49	0.00	1.00	365
Military	0.18	0.39	0.00	1.00	365
Cease Fire	0.18	0.38	0.00	1.00	365
Low Intensity	0.34	0.47	0.00	1.00	365
Victory	0.34	0.48	0.00	1.00	365
Trade	60.74	30.11	6.32	156.86	365
GDP growth	0.03	0.08	-0.32	0.38	365
GDP per capita	5018.40	6117.92	615.00	37724.00	365
FDI	2.69	5.69	-5.39	55.08	365
War Length	3.72	4.47	1.00	18.00	365
Δ Manu VA	-0.22	2.67	-6.18	10.12	365
Cold war	0.34	0.47	0.00	1.00	365
Autocracy	0.36	0.48	0.00	1.00	365
Instability	1402.60	2180.79	0.00	26187.00	318
Natural revenues	10.76	13.58	0.11	64.17	364
Total commitments per capita	71.44	68.93	0.00	650.57	365
Inflation	15.70	50.16	-8.53	626.73	299

Table 12A: Countries included in the main sample and respective number of observations

Country	Number of observations
Angola	7
Argentina	7
Azerbaijan	12
Bangladesh	14
Burkina Faso	7
Burundi	7
Cameroon	7
Chad	8
Chile	6
China	5
Democratic Republic of Congo	3
Egypt	7
El Salvador	10
Georgia	8
Ghana	8
Guinea	7

Continued on next page

Table 12A – continued from previous page

Haiti	15
India	4
Indonesia	11
Ivory Coast	8
Kenya	7
Malaysia	16
Mauritania	2
Mexico	8
Morocco	10
Nepal	7
Niger	14
Nigeria	5
Pakistan	17
Panama	7
Paraguay	7
Peru	13

Continued on next page

Table 12A – continued from previous page

Republic of the Congo	12
Rwanda	8
Saudi Arabia	7
Senegal	2
Serbia	6
Sierra Leone	7
Sri Lanka	13
Tajikistan	2
Thailand	7
Togo	7
Tunisia	7
Uganda	6
United Kingdom	7
N	365

Table 13A: The effect of Aid targeting energy production and supply on the manufacturing sector. Observations from China, India, Indonesia, Mexico, and United Kingdom dropped.

	First stage	**Second stage**
VARIABLES	Aid	ManuVA_{t+1}
Pre-conflict infant mortality rate	-0.119***	
	(0.031)	
Duration	1.639	-1.222
	(1.758)	(1.068)
Duration^2	-0.364	0.299
	(0.508)	(0.307)
Duration^3	0.021	-0.018
	(0.043)	(0.026)
Population	-4.990**	-0.501
	(2.296)	(1.453)
Democracy	-0.878	1.140*
	(0.902)	(0.664)
Military	0.182	1.901**
	(1.226)	(0.936)
Cease Fire	0.467	-1.327
	(2.129)	(1.054)
Low Intensity	-3.242	0.720
	(2.063)	(0.983)
Victory	-2.096	2.628**
	(2.039)	(1.268)
Trade	0.119***	-0.069**
	(0.032)	(0.032)
GDP growth	-3.305	0.114
	(4.169)	(2.366)
GDP per capita	-0.000**	0.000
	(0.000)	(0.000)
FDI	-0.250***	0.147**
	(0.074)	(0.064)
War Length	0.472***	-0.022
	(0.131)	(0.057)
Δ Manu VA	0.255	-0.301*
	(0.219)	(0.171)
Cold War	-0.396	0.315
	(1.299)	(0.768)
Aid		0.470**
		(0.189)
Observations	330	330
Number of ID	40	40
Country FE	YES	YES
Robust SE	YES	YES

Continued on next page

Table 13A – continued from previous page

	First stage	**Second stage**
Kleibergen-Paap rk LM statistic	,	14.323
Adjusted R-squared		-1.210
Kleibergen-Paap rk Wald F statistic		14.222

,

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 14A: The effect of Aid targeting energy production and supply on the manufacturing sector. Additional post-conflict timeframes: 4-Years, 5-Years, 6-Years

VARIABLES	(4-Year Timeframe) $ManuVA_{t+1}$	(5-Year Timeframe) $ManuVA_{t+1}$	(6-Year Timeframe) $ManuVA_{t+1}$
Aid	0.421**	0.404***	0.453**
	(0.175)	(0.157)	(0.179)
Duration	-1.028	-2.126	-1.056
	(3.355)	(1.888)	(1.273)
$Duration^2$	0.193	0.699	0.252
	(1.463)	(0.695)	(0.402)
$Duration^3$	0.001	-0.069	-0.016
	(0.193)	(0.077)	(0.038)
Population	-0.087	-0.044	-0.025
	(1.762)	(1.488)	(1.437)
Democracy	1.015	1.126*	0.981
	(0.680)	(0.645)	(0.604)
Military	1.535	2.005**	1.793*
	(1.130)	(0.973)	(0.971)
Cease Fire	-1.934	-2.030*	-2.032*
	(1.371)	(1.153)	(1.111)
Low Intensity	-1.305	-1.112	-0.842
	(1.221)	(1.018)	(0.952)
Victory	1.179	1.696	1.873*
	(1.309)	(1.134)	(1.116)
Trade	-0.083**	-0.070**	-0.061*
	(0.033)	(0.031)	(0.031)
GDP growth	-1.160	-0.519	-0.609
	(2.517)	(2.332)	(2.363)
GDP per capita	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)

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Table 14A – continued from previous page

	4-Year Timeframe	5-Year Timeframe	6-Year Timeframe
FDI	0.099	0.128**	0.130**
	(0.074)	(0.061)	(0.060)
War Length	-0.049	-0.036	-0.029
	(0.069)	(0.063)	(0.061)
Δ Manu VA	-0.359**	-0.345**	-0.346**
	(0.177)	(0.162)	(0.169)
Cold War	-0.505	-0.257	0.017
	(1.019)	(0.832)	(0.803)
Observations	244	290	330
Number of ID	44	45	45
Adjusted R-squared	-0.960	-0.778	-1.001
Country FE	YES	YES	YES
Robust SE	YES	YES	YES
Kleibergen-Paap rk LM statistic	12.317	15.104	13.935
Kleibergen-Paap rk Wald F statistic	12.709	14.408	13.940

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

Table 15A: The effect of Aid targeting energy production and supply on the manufacturing sector. Additional post-conflict timeframes: 8-Years, 9-Years, 10-Years

VARIABLES	(8-Year Timeframe) ManuVA^{t+1}	(9-Year Timeframe) ManuVA^{t+1}	(10-Year Timeframe) ManuVA^{t+1}
Aid	0.511**	0.571**	0.565**
	(0.228)	(0.277)	(0.286)
Duration	-1.090	-0.838	-1.303
	(0.929)	(0.875)	(0.855)
Duration^2	0.236	0.144	0.267
	(0.241)	(0.211)	(0.188)
Duration^3	-0.013	-0.005	-0.014
	(0.018)	(0.015)	(0.012)
Population	0.610	0.607	0.594
	(1.352)	(1.408)	(1.369)
Democracy	0.821	0.885	0.716
	(0.654)	(0.725)	(0.690)
Military	0.961	0.371	0.079
	(0.951)	(1.155)	(1.205)
Cease Fire	-1.896*	-2.004	-2.037
	(1.123)	(1.278)	(1.262)
Low Intensity	-0.519	-0.400	-0.602
	(0.886)	(0.955)	(0.955)
Victory	2.134*	2.116	2.088
	(1.221)	(1.363)	(1.392)
Trade	-0.059*	-0.056	-0.039
	(0.036)	(0.041)	(0.038)
GDP growth	0.440	0.052	-0.708
	(2.298)	(2.484)	(2.397)
GDP per capita	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)

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Table 15A – continued from previous page

	8-Year Timeframe	**9-Year Timeframe**	**10-Year Timeframe**
FDI	0.111	0.101	0.077
	(0.070)	(0.076)	(0.067)
War Length	-0.030	-0.026	-0.017
	(0.056)	(0.060)	(0.059)
Δ Manu VA	-0.234	-0.176	-0.136
	(0.175)	(0.184)	(0.178)
Cold War	0.046	0.042	-0.235
	(0.796)	(0.868)	(0.819)
Observations	393	423	453
Number of ID	45	46	47
Adjusted R-squared	-1.642	-2.669	-3.000
Country FE	YES	YES	YES
Robust SE	YES	YES	YES
Kleibergen-Paap rk LM statistic	12.070	9.640	9.298
Kleibergen-Paap rk Wald F statistic	11.671	8.987	8.528

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

Table 16A: The effect of Aid targeting energy production and supply on the manufacturing sector. Additional dependent variable forwards

VARIABLES	$ManuVA_{t+2}$	$ManuVA_{t+3}$	$ManuVA_{t+4}$	$ManuVA_{t+5}$
Aid	0.488**	0.414**	0.156	-0.173
	(0.197)	(0.194)	(0.107)	(0.316)
Duration	-0.665	-0.973	-0.770	0.406
	(1.028)	(0.944)	(0.608)	(1.140)
$Duration^2$	0.111	0.191	0.191	-0.142
	(0.290)	(0.264)	(0.177)	(0.325)
$Duration^3$	-0.002	-0.009	-0.013	0.014
	(0.024)	(0.022)	(0.015)	(0.027)
Population	-0.304	-0.359	-0.350	0.304
	(1.180)	(1.317)	(1.088)	(1.553)
Democracy	0.241	-0.130	-0.629*	-0.126
	(0.595)	(0.521)	(0.363)	(0.767)
Military	1.369	1.231	0.336	1.799
	(0.880)	(0.773)	(0.444)	(1.275)
Cease Fire	-2.236*	-2.226**	-0.797	-0.445
	(1.178)	(1.057)	(0.573)	(1.202)
Low Intensity	-0.751	-0.675	0.526	0.260
	(0.946)	(0.917)	(0.579)	(1.515)
Victory	1.544	0.809	-0.733	-1.384
	(1.235)	(1.216)	(0.658)	(1.744)
Trade	-0.054*	-0.051*	-0.031	-0.011
	(0.029)	(0.028)	(0.021)	(0.041)
GDP Growth	0.982	0.062	-2.423*	-4.366**
	(2.372)	(2.102)	(1.236)	(2.109)
GDP per capita	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
FDI	0.100	0.077	0.002	-0.042

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Table 16A – continued from previous page

	(0.062)	(0.059)	(0.036)	(0.085)
War Length	-0.017	-0.002	0.010	-0.027
	(0.060)	(0.051)	(0.040)	(0.073)
Δ ManuVA	-0.254	-0.148	0.077	0.103
	(0.175)	(0.165)	(0.073)	(0.131)
ColdWar		0.108	0.943*	1.237
		(0.691)	(0.532)	(0.904)
Observations	371	370	367	347
Number of ID	46	46	46	43
Adjusted R-squared	-1.361	-1.040	-0.088	-0.269
Country FE	YES	YES	YES	YES
Robust SE	YES	YES	YES	YES
Kleibergen-Paap rk LM statistic	15.726	14.445	14.283	8.151
Kleibergen-Paap rk Wald F statistic	16.084	14.842	14.659	12.092

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

Table 17A: The effect of Aid targeting energy production and supply on the manufacturing sector. Additional controls.

	Specification 1A		**Specification 2A**	
	(First stage)	(Second stage)	(First stage)	(Second stage)
VARIABLES	Aid	$ManuVA_{t+1}$	Aid	$ManuVA_{t+1}$
Pre-conflict infant mortality	-0.107***		-0.099***	
	(0.029)		(0.031)	
Aid		0.451***		0.522***
		(0.165)		(0.188)
Duration	1.467	0.021	1.755	-0.359
	(1.973)	(1.030)	(2.151)	(1.216)
$Duration^2$	-0.282	-0.106	-0.368	0.027
	(0.548)	(0.294)	(0.598)	(0.345)
$Duration^3$	0.011	0.017	0.017	0.007
	(0.046)	(0.025)	(0.050)	(0.029)
Population	-4.451	0.924	-3.511	0.264
	(3.722)	(1.632)	(3.838)	(1.777)
Democracy	0.130	1.059	0.033	1.322
	(1.504)	(0.864)	(1.592)	(0.984)
Military	1.868	0.351	1.816	0.373
	(1.323)	(0.961)	(1.315)	(1.004)
Cease Fire	-3.586	0.286	-3.397	0.170
	(2.751)	(1.416)	(2.781)	(1.524)
Low Intensity	-7.816***	1.566	-8.011***	2.443
	(2.724)	(1.747)	(2.773)	(1.975)
Victory	-6.668**	4.346**	-6.863**	5.034**
	(2.981)	(2.027)	(3.008)	(2.309)
Trade	0.140***	-0.054	0.148***	-0.073*
	(0.044)	(0.038)	(0.045)	(0.043)
GDP Growth	-3.441	-1.148	-2.624	-1.709
	(4.733)	(2.358)	(4.974)	(2.579)
GDP per capita	-0.000	-0.000	-0.000	0.000

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Table 17A – continued from previous page

	(0.000)	(0.000)	(0.000)	(0.000)
FDI	-0.347***	0.177**	-0.366***	0.222**
	(0.081)	(0.076)	(0.081)	(0.088)
War Length	0.398**	-0.035	0.364**	-0.025
	(0.160)	(0.070)	(0.167)	(0.077)
Δ ManuVA	0.655***	-0.490***	0.668***	-0.551***
	(0.211)	(0.172)	(0.209)	(0.185)
Cold War	-0.849	0.071	-1.133	0.558
	(1.652)	(0.846)	(1.693)	(0.983)
Autocracy	0.239	1.805**	0.359	1.773**
	(1.581)	(0.742)	(1.663)	(0.871)
Instability	0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Natural Revenues	-0.085	-0.037	-0.083	-0.039
	(0.090)	(0.055)	(0.090)	(0.058)
Total commitments per capita	0.014	-0.007	0.015	-0.009
	(0.011)	(0.005)	(0.011)	(0.006)
Inflation	0.014	-0.002	0.015*	-0.004
	(0.009)	(0.005)	(0.009)	(0.005)
Observations	296	296	270	270
Number of ID	40	40	35	35
Country FE	YES	YES	YES	YES
Robust SE	YES	YES	YES	YES
Kleibergen-Paap rk LM statistic		7.478		6.295
Adjusted R-squared		-1.262		-1.700
Kleibergen-Paap rk Wald F statistic		13.129		10.010

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

Table 18A: The effect of Aid targeting energy production and supply on the manufacturing sector. Pre-conflict urbanization level as excluded instrument

VARIABLES	Aid	ManuVA_{t+1}
Pre-conflict urbanization	0.536***	
	(0.145)	
Aid		0.360**
		(0.156)
Duration	1.619	-0.787
	(1.578)	(0.850)
Duration^2	-0.339	0.142
	(0.450)	(0.242)
Duration^3	0.019	-0.006
	(0.038)	(0.021)
Population	-5.195***	0.360
	(1.935)	(1.225)
Democracy	-1.087	0.830
	(0.771)	(0.558)
Military	1.666	1.403*
	(1.434)	(0.821)
Cease Fire	2.382	-1.812*
	(1.789)	(0.930)
Low Intensity	-0.931	-0.673
	(1.726)	(0.793)
Victory	0.585	1.703*
	(2.006)	(0.941)
Trade	0.098***	-0.046*
	(0.030)	(0.027)
GDP Growth	-2.355	0.474
	(3.577)	(2.168)
GDP per capita	-0.000*	-0.000
	(0.000)	(0.000)
FDI	-0.231***	0.106**
	(0.071)	(0.051)
War Length	0.365***	-0.008
	(0.130)	(0.049)
Δ ManuVA	0.075	-0.263*
	(0.251)	(0.146)
Cold War	-1.671	0.306
	(1.128)	(0.649)
Observations	379	379
Number of ID	47	47
Country FE	YES	YES
Robust SE	YES	YES

Continued on next page

Table 18A – continued from previous page

Kleibergen-Paap rk LM statistic	11.458
Adjusted R-squared	-0.740
Kleibergen-Paap rk Wald F statistic	13.630
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

8 Conclusions

In this thesis, I discuss and explore if, how, and to what extent resource windfalls affect fragile and post-conflict countries in order to advance our understanding of what determines state-building processes in these contexts. Notably, I first focus on the impact of resource windfalls on civil-military relations looking in detail at the nexus between discretionally allocable resources, coup risk and the implementation of institutional coup-proofing strategies. Then I examine how power-equilibria between former warring factions and non-combatant groups shape foreign reconstruction aid allocations at the subnational level. Finally, I investigate the conditions under which foreign aid can contribute to make recipient post-conflict economies less dependent on the extraction of natural resource revenues.

Looking at the results along general lines, the answer to the investigated question - what is the impact of resource windfalls in fragile countries? - is, not much surprisingly, indeed: *it depends*. Notably, there are two dimensions that emerge as relevant to understand what affects the impact of resource windfalls. The first dimension is the level of political and economic grievances present in the country. The second is the type of resources that country leaders have access to. While it is true that discretionally allocable resources might not have a positive impact on the development of fragile countries, especially when coup risk is high, it is also true that specific types of donors' interventions might actually contribute to reduce the vulnerability of recipient economies to exogenous shocks. Notably, it is important to remark how the empirical analyses discussed in the thesis shows that these two dimensions do not only affect countries separately but jointly as well.

In more detail, in the first two chapters of the thesis, I resort to an opportunity-willingness framework to investigate if and how access to discretionally allocable resources influences leaders' decisions regarding the extent to which to undertake institutional coup-proofing as a strategy to face coup risk. I show that leaders who enjoy revenues from natural resources or unearmarked foreign aid are less likely than others to react to coup-risk undertaking institutional coup-proofing efforts. I explain this finding by arguing that leaders who have access to discretionally allocable resources prefer to allocate such revenues to fund coup-proofing strategies that are not openly against the interests of the military - as institutional coup-proofing - to reduce the risk of a preventive coup.

In the second part of the thesis, I focus on resource windfalls in post-conflict scenarios and reconstruction settings. In particular, in the third chapter co-authored with dr. Steinwand, we explore how fighting patterns and voting behavior affected the distribution of donors' resources in post-conflict Nepal. Notably, we show how the peace agreement that concluded the Nepalese civil war in 2006 was unsuccessful in breaking spoil politics. In fact, we find that those segments of the Nepalese society that did not take a side during the conflict, and therefore did not take part in the peace negotiations, were systematically excluded from the allocation of foreign aid. A possible causal mechanism is the under-representation of groups that did not support any of the former fighting factions during peace negotiations and in post-conflict institutions.

Finally, in the last chapter of the thesis, I focus on the conditions under which post-conflict reconstruction aid contributes to strengthening the manufacturing sector of post-conflict economies. In fact, in this chapter, I show how donors' efforts in rebuilding facilities to produce and distribute energy in post-conflict countries have a statistically significant and positive impact on manufacturing production. The underlying theory is that donors' reconstruction aid targeting energy infrastructures is less likely than other types of aid to trigger the so-called Dutch disease, while, at the same time, it increases the expected returns of investments in the manufacturing sector thus boosting its recovery.

The findings presented and discussed in this thesis have several academic and policy implications. Notably, the first two chapters contribute to advance our understanding of civil-military relations introducing in a new willingness-opportunity framework the role that discretionally allocable resources - as natural resource revenues and foreign aid - play in shaping coup-proofing strategies. At the same time, these chapters shed more light on how the type and amount of resources that leaders enjoy affects their strategies to increase their chances to hold office when facing coup risk. In this sense, the first part of the thesis offers new insights into how state budgets and donors' policies contribute to leaders' survival. Further, the findings discussed in the first two chapters contribute to providing development-interested donors with more information to design specific policies and conditionality to achieve their goals. Indeed, as results suggest that unearmarked aid is likely to be diverted to funding coup-proofing strategies when coup risk rises, it is natural to assume that those donors who want to promote development should reconsider

the type of aid they allocate and, of course, the channels via which they allocate it. At the same time, results suggests that further coordination between donors as well as the development and the implementation of more accurate accounting system to manage the financial mechanisms funded by multilateral donors could contribute to reduce the capacity of recipient leaders to divert aid when they desire it. Finally, on the empirical side, the first two chapters of the thesis introduce a two-step strategy and a set of historical, geographical, and meteorological instrumental variables to capture the relation between coup risk and cup-proofing strategies controlling for the bidirectional relationship between these dimensions.

At the same time, the findings in the second part of the thesis expand our knowledge about the conditions under which reconstruction aid reaches potential beneficiaries in post-conflict countries and contributes to restarting the productive sectors of the national economy. The importance of the findings discussed in this section lies, first, in the fact that they show how post-conflict reconstruction aid might fuel new grievances in post-conflict countries even in the aftermath of conflicts settled via a peace agreement. Second, in the fact that they show how not all post-conflict reconstruction aid has the same impact on the economy of recipient countries. In this sense, the third and fourth chapters of the thesis provide policymakers with crucial information to design specific aid-allocation strategies and design precise conditionality to prevent that spoil politics or unintended effects of aid might jeopardize the achieved peace and post-conflict peace dividends.

Starting from these findings, there are several avenues for future research. Concerning the first part of the thesis, future research might and should focus on the impact of discretionally allocable resources on other types of coup-proofing strategies. At the same time, further research could direct efforts to investigate to what extent the fragmentation of donors and the predictability of future revenues influence leaders' decisions to undertake institutional coup-proofing rather than other coup-proofing strategies when coup risk rises.

Furthermore, future studies should take into consideration and explore more the effects of different types of reconstruction aid in post-conflict countries. Notably, future studies might focus, first, to investigate if and to what extent donors' commitment to rebuild the economic infrastructure of post-conflict countries has positive effects on the recipient country's export differentiation. Indeed, post-conflict economic infrastructural aid might contribute to reducing production and transport

costs and thus spur the recipient country's firms from depressed sectors to re-enter the national and foreign markets. Second, to explore the spillover effects of post-conflict foreign aid. In fact, while, on one hand, aid supporting post-conflict recovery may have strong positive spillover effects on countries sharing trade-flows or borders with aid recipient countries, on the other, the allocation of aid to post-conflict countries may come at the expenses of neighboring countries thus jeopardizing their economic growth.

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