# The Determinants of Foreign Policy Volatility 

Dissertation

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## By

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## Abstract

To the casual observer of states' relations, countries like the United States appear to always clearly define other countries as either allies (e.g., Canada) or enemies (Cuba). This neat separation makes it easier to deal with everyday matters such as trade tariffs, because it allows countries to quickly discern whom to sanction and whom to support. Upon closer inspection, however, it appears that relations between states are far more volatile-that is, they are characterized by inconsistent shifts between episodes of intense cooperation and episodes of bitter violence. For instance, in January 2011 Pakistan issued a military threat to India to desist from its nuclear program. A mere week later, India forcibly accused Pakistan of harboring terrorist attacks on Indian soil. In April of the same year, the two countries instituted a joint working group to enhance trade ties between them. Yet, at the beginning of May, India started conducting military exercises at the border with Pakistan, causing Pakistan's violent retaliation. What propels states to embrace volatile foreign policies?

This dissertation investigates the presence of volatility in states' foreign policy, and it offers a theory of its determinants. Specifically, it presents a conceptualization of volatile foreign policy as being characterized by inconsistent shifts between
cooperative and conflictual actions, distinguishing volatility from other characteristics of unstable foreign policy behavior-such as cyclical or trending behavior . It demonstrates that understanding volatility is crucial because volatile relations breed violence by increasing states' uncertainty over the likelihood of conflict recurrence, which in turn increases the probability of conflict recurrence. It also shows that volatile relations are pivotal relations, in that volatile dyads are more likely both to be more involved in crises and to share membership of a greater number of International Organizations.

This dissertation advances a theory of volatility that integrates dynamics present both at the domestic and at the international arena: states will be willing to explore cooperative policy options with an opponent when they can negotiate from a position of power. Yet, contrary to common expectations, the presence of multiple and heterogeneous interests will lead to more, not less, volatility: when foreign policy-making authority responds to multiple and heterogeneous domestic interests, states will be less likely to establish a coherent foreign policy, because satisfying those domestic interests will often require to engage in a diverse set of activities. Thus, the interaction between heterogeneous domestic interests and the power position in the international system will make states more subject to volatile behavior.

I test this theory of volatility complementing existing event datasets with originally collected event data on the foreign policy interactions of rivals for the years

1948-2009. I then build an index $H$ of institutions' heterogeneity, to measure the degree to which the foreign policy of a country is the reflection of an heterogeneous set of multiple domestic interests.

To investigate volatility in the international arena, this dissertation utilizes a number of diverse methodological tools: the definition of the concept of volatility is obtained through concept formation analysis; the impact of volatile behavior on uncertainty is tested with a heteroskedastic probit model, and the pivotal role of volatile relations is assessed through a bivariate probit ; the identification of volatility in the relations between states is obtained through the Box-Jenkins analysis of the time series of foreign policy interactions; the theory of volatility is tested with panel data models-such as the Arellano-Bond specification of dynamic models, as well as panel data models with fixed effects, random effects and panel corrected standard errors.

## Dedication

All'amatissimo Jonathan.

## Acknowledgements

To paraphrase Yogi Berra, writing a dissertation is ninety percent mental and the other half is physical. And therefore, throughout the years I've incurred many, many debts.

First of all, with my committee members, who have invested a lot of time and energy in training me for this project. The PhD is a medieval institution for many, many aspects, from the most superficial ones (the concept of doctus, from which the word doctorate derives), to the most consequential ones (i.e., the idea of specializing in a topic and researching it extensively). My favorite medieval component of the PhD is the practice of having students apprehend the craft of research from their mentors, as it was in guilds. In my committee, I found invaluable mentors who have pushed me to be a better student, a better scholar, and ultimately a better person. My advisor Bear Braumoeller, Jane Box-Steffensmeier, Luke Keele, Ted Hopf, and Irfan Nooruddin: it has been, both literally and figuratively, a committee of giants.

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## Vita

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## Chapter 1 : Introduction

To the casual observer of international relations, countries like the United States appear to always plainly classify other countries as either allies (e.g., Canada) or enemies (Iran). This net separation makes it easier to deal with everyday matters such as trade tariffs: for instance, US policy makers, when dealing with Canada and Iran, know whom to sanction and whom to endorse. ${ }^{1}$ The almost mechanical, automated fashion in which the United States deals with these relations, in turn, reinforces the predictability of these interactions. Foreign policy relations between the United States and Canada or the United States and Iran have been consistent, and thus, reliably steady for the past thirty years.

Upon closer inspection, however, relations between states tend to often be volatile: states often engage in contradictory, self-defeating behavior, as their foreign policies rapidly and irregularly shift between episodes of intense cooperation and episodes of bitter violence. A recent example from India and Pakistan illustrates these volatile dynamics. In January 2011 Pakistan officially demanded that India desist from its nuclear program. A mere week later, India forcibly accused Pakistan of harbor-

[^0]ing terrorist attacks on Indian soil. Shortly afterward, the two countries managed with difficulty to resume conversations about outstanding military and economic bilateral issues, and, after long and agonizing negotiations, they instituted a joint working group to enhance trade ties in April of that same year. Yet, at the beginning of May, India started conducting military exercises at the border with Pakistan, catalyzing Pakistan's violent protests, and de facto bringing those painfully achieved bilateral negotiations to an end (Fisman, Hamao and Wang, 2014). Similarly, Japan and China, for example, have significantly increased the level of trade with each other, while also getting more and more involved in the Senkaju / Daioyu islands disputes-often at the cost of disrupting those profitable trade ties. ${ }^{2}$

Multiple examples of volatile behavior can be reported. Yet no IR theory-whether in the Realist, Liberal, or Constructivist paradigm—even attempts to explain the circumstances under which states pursue their grand strategies combining, often counterproductively, conflict and cooperation. The majority of IR theories focuses instead on explaining solely one type of behavior, either conflictual or coopera-tive-for instance, why states wage wars, or why they trade.

I propose a theory of the conditions under which states engage in incongruent behavior-what I can volatile foreign policy. Volatility is the outcome of the interaction between dynamics unfolding both at the domestic and the international level: the unbridled competition among domestic groups and a state's relative power su-

[^1]periority. Superior power acts as a permissive condition for volatility: it expands the available strategies at a state's disposal to include more cooperative and combative options, allowing the stronger state to act inconsistently towards its weaker rival. Yet the precipitant cause of grand strategic volatility is competition among multiple and heterogeneous domestic groups. Whether the government chooses cooperative or conflictual options will have redistributive implications for these groups. For narrowly self-interested reasons, therefore, these groups will attempt to impose their preferred foreign policies-cooperative or aggressive-over others. Thus, when no single group dominates this process, the state's foreign policy will swing back and forth inconsistently from conflict to cooperation.

I test this theory collecting original data on the foreign policy interactions between strategic rivals in the period 1946-2008, and a multiplicity of diverse methodological tools: concept formation, bivariate and heteroskedastic probits, and time series models of volatility.

By theorizing both cooperative and conflictual behavior, the study of volatility demands to consider and parse out all the different tools that states have at their disposal to conduct foreign policy, and explain when and why some them are preferred over others. At present, most approaches to the study of IR focus instead on either cooperative or conflictual episodes in the conduct of foreign policy-such as wars, interventions, agreements, and so on. Such an approach to the study of international relations usually builds on an over-simplification of states' behavior,
whereupon all the foreign policy actions that do not correspond to the action of interest get collapsed together in the same, residual category (for an exception, see Reed 2000). Collapsing of all non-events in the same category can be mis-leading, because it conflates a set of very diverse foreign policy actions together.

If all the non-instances of war are encompassed together in the category of "peace," for instance, then theoretical explanations will be challenged to explain cases of dogs that don't bark-that is, cases where the condition for war were present, but states decided not to go down that route. This is especially true in light of the findings in the literature on foreign policy substitution (Bennett and Nordstrom, 2000; Morgan and Palmer, 2000) on the importance of taking into consideration the alternative courses of actions available to a state in explaining the motivations behind the decision of a state to engage in a specific foreign policy behavior. For example, the decision of a state not to wage war against another might entail that that state opted for cooperative ventures, or simply for less conflictual undertakings (such as increasing military spending, acquiring nuclear weapons, and so on). Assuming away the differences in the non-war behavior, or in any of the behaviors of interest, this current approach tends to increase the risks of under-determination (that is, the risk of not having enough evidence to distinguish between competing theoretical claims). By contrast, the concept of volatility, being a measure of the variance in the behavior of states, re-directs the study of foreign policy toward thinking more realistically of foreign policy as a strategy
carried out by one country toward another with multiple-and at times even self-defeating-instruments.

### 1.1 Overview

In the following pages, I report a summary of what each chapter in this dissertation deals with.

### 1.1.1 Conceptualizing Volatility in Foreign Policy

This chapter offers a conceptualization of volatility in foreign policy. While the concept of volatility has been used in other subfields of political science--for example in the study of GDP volatility, or electoral volatility, amongst others-it has never been used as a heuristic device to understand foreign policy. I define volatility in foreign policy as the presence of inconsistent shifts between cooperation and conflict in a state's conduct of foreign policy. This section introduces the theoretical and analytic components of the dissertation because, as Sartori $(1970,1038)$ explains, concept formation is a fundamental prerequisite of any empirical investigation because " $[\mathrm{w}] \mathrm{e}$ cannot measure unless we first know what we are measuring."

To introduce the concept of volatility to the study of foreign policy, this chapter utilizes the conceptualization methodology outlined by Gerring (1999), and there-
fore proceeds to demonstrate that volatility meets all the criteria of goodness as defined in Gerring (1999): familiarity, resonance, parsimony, coherence, differentiation, and depth. Thus, the chapter is divided into five sections. In the first section, I provide a conceptualization of volatility as a a characteristic of those foreign policy interactions that shift inconsistently between cooperation and conflict. I explain that the conceptualization of volatility that I propose satisfies both the criteria of parsimony and resonance because, respectively, it relies exclusively on two connotations (change and inconsistency) and it is expressed in a vocable, "volatility," that is used in common parlance to evoke precisely these two connotations. In the second section, I demonstrate that the concept of volatility that I propose satisfies the criterion of differentiation because it refers to a very specific kind of change in the relations between states: to this end, I compare volatility to other concepts, such as instability, that are used in International Relations (IR) to describe specific features of inter-state relations. In the third section, I establish the familiarity of the concept of volatility by showing how the concept has been used in other subfields of the discipline, such as election studies and international political economy, and that the concept shows similar traits across those subfields. The fourth section presents the operationalization of the concept of volatility as the shifting conditional variance in the time series of the foreign policy behavior of states. It demonstrates that this operationalization satisfies the criteria of coherence because it allows to consistently and reliably identify the same dynamics as defining volatile behavior across dif-
ferent cases. It also demonstrates that this operationalization satisfies the criterion of depth, because, by differentiating across different types of volatility, it allows to parse out (and test for) the specific dynamics that bring about volatile behavior.

### 1.1.2 Measuring Volatility in Foreign Policy

Following the conceptualization of volatility, this chapter of my dissertation delves more deeply into the issue of how to measure volatility. Ultimately, I operationalize volatility as the residuals from a Box-Jenkins procedure applied to the time series of the foreign policy interactions between states-where these interactions are measured through event data. Event data record foreign policy interactions taking place between states, such as forming an alliance, requesting material help, recalling a diplomatic contingent and so on. By distinguishing between different degrees of conflict and cooperation among states, event data help addressing the issue of heterogeneous zeroes present in many studies of conflict and cooperation. In general, because they use an expanded list of categories aimed at capturing various facets of foreign policy, event data allow students of International Relations (IR) to paint a more complete picture of the dynamics at work in the international arena, be they conflictual or cooperative, than data that concentrate exclusively on disputes, crises, or even intergovernmental organizations do (Schrodt, 2012).

The chapter therefore is divided in two parts. The first part discusses the advantages and disadvantages of using event data to capture dynamics taking place
in the international system. In particular, I focus on two issues: the exclusion of secret event and of media bias. I explain how these two issues are likely to impact the measurement of foreign policy between the two countries. The second part delves into the specifics of how different event data were collected, and how a coherent time series of the foreign policy interactions between states were produced. To build continuous time series of foreign policy interactions between countries, I merge multiple data sets. Up to 1978, I rely on a data set readily available (Copdab data set). After 1979, depending on the countries I analyze, I expand on existing data sets by both collecting my own data and merging the pre 1978 data with other, existing data (Weis data set). In order not to compromise my inference, I need to make sure that there is no systematic difference between data collected pre 1979 and post 1979. Specifically: is each data source equally likely to capture similar events? And is each data source weighing similar events in the same way, in the scale applied? To do so, I experiment with different procedures, and I choose the most effective one by choosing the one that minimizes the MSE and MAPE for the out-of-sample forecast.

### 1.1.3 Does Volatility in Foreign Policy Matter?

This chapter addresses the question of why the study of volatility is important by illustrating the leverage that this heuristic can offer to better capture the relations between states: specifically, I use volatility as an independent variable and I show
that volatile relations are both pivotal and dangerous.
Volatile relations are dangerous because volatility in foreign policy behavior increases uncertainty in the interactions between states-and therefore they increase the probability of conflict recurrence. Precisely because volatile relations are bound to change, and to do so in an inconsistent manner, I argue that volatility will catalyze uncertainty in the relation between states. The mechanism that I posit is one of (lack of) learning: volatility catalyzes uncertainty because the inconsistent shifts between cooperation and conflict make it impossible for countries to form consistent expectations on-that is, to learn about-the behavior of the counterparts. Rather than increasing the number of contentious issues within a dyad, volatility increases the uncertainty over the way in which these issues are dealt with: will the counterpart concede over the issue of the Himalaya mountains given the ongoing trade-related negotiations, or will it be combative about it, this time? To determine whether volatility is a predictor of uncertainty over conflict recurrence, I test for whether the presence of volatile dyads among crisis actors is positively correlated with uncertainty over crisis recurrence. To model the effects of volatility on uncertainty, I build on the correspondence between uncertainty over outcomes and variance in their probability distribution that has been established, among others, by Maoz (1990, 110-111) and Huth, Bennett and Gelpi $(1992,481)$. Thus, empirically, the risk associated with an event taking place is then measured as the predicted probability of that event taking place, and the uncertainty as the variance
registered around those predicted probabilities. Specifically, to model predictors of risk and predictors of uncertainty separately, I follow Reed (2003) and Mattiacci and Braumoeller (2012) and I use an heteroskedastic probit model (Alvarez and Brehm, 1995), a probit in which the error variance is not fixed to unity but rather is assumed to vary in systematic ways. I find that volatility is a significant predictor of uncertainty over conflict recurrence.

Not only is volatility an important determinant of uncertainty, it also qualifies our theoretical conceptions of the effect of domestic regimes on the way states behave in the international system. In particular, volatile dyads are both more likely to engage in violent crises as well as to share membership of an above average number of IGOs. They are, therefore, pivotal, because volatile dyads are at the centre of those behaviors that are most studied in IR. This result emerges from a bivariate probit analysis of the behavior of relevant dyads in the period 1945-2008. At a deeper level, this finding challenges the way we study the impact of domestic institutions in the international arena. Usually we think of a democratic domestic regime as increasing the probability that states will join IGOs while at the same time decreasing the likelihood that they would engage in violent and hostile behavior. My finding confirms this understanding of foreign policy. Yet I also find that volatile interactions predict both more cooperation and conflict behavior. Substantively, since the presence of volatile behavior is determined both by the domestic regime and the superiority of power in the international system, this result implies
that not all representative regimes are created equal, and that the distribution of power in the international system has an important function in explaining behavior in the international system. If the institutional openness that characterizes democracy alone can predict less conflict and more cooperation, when that permeability of domestic institutions to domestic interests combines with power superiority, that openness actually translates into incongruent behavior.

### 1.1.4 The Determinants of Volatility in Foreign Policy

This chapter presents the theory of volatility that I advance in my dissertation. Focusing on foreign policy behavior between strategic rivals, I posit that volatility is the outcome of an interaction between dynamics unfolding both at the domestic and the international level: the unbridled competition among domestic groups and a state's relative power superiority. By power superiority, I intend superiority in military and material capabilities. The mechanism that I posit as operating at the international level is one of resource availability: states that enjoy a superiority of power with respect to their counterpart have both more cooperative and more conflictual options at their disposal to deal with their counterparts. They have more conflictual options, because they have multiple tools with which to engage in hostile actions: simply put, Costa Rica cannot military assault another country, and China before October 1964 could not directly conduct a nuclear attack on another country. But they also have more cooperative options because, that superiority of
power affords them greater security. The more secure in its power a state will be, the more willing it will be to engage in "tit for tat" kind of strategies, which in turn will lead to the state being more willing to cooperate with its counterpart.

Power prevalence sets a permissive cause for volatility, in that it expands the range of possible options available to states to both conflictual and cooperative options. But superiority of power alone does not explain why states engage in volatile behavior: it could well be that states that have preponderant power decide to constantly cooperate with another country. The precipitant (or catalyzing) cause for volatility originates from the fact that domestically each foreign policy decision will impact domestic groups differently, and therefore the presence of multiple actors with heterogeneous distributional preferences will translate into inconsistent shifts between cooperation and conflict. The mechanism that I posit operating at this level is redistributive one. Because each foreign policy decision has distributive consequences on each domestic group, advantaging some and disadvantaging others, these groups will try to advance their own agenda on the definition of foreign policy, and when that fails, they will be asking for side-payments in foreign policy from the other groups. The aggregate effect of the presence of multiple and heterogeneous interests that control the definition of foreign policy is therefore the presence of sudden shifts between cooperative and conflictual behavior.

In advancing this theory of volatility, I build on several crucial theoretical insights, both in the literature on conflict in the international arena, and in the lit-
erature on the domestic determinants of conflict and cooperation. These theories provide important pieces in the puzzle of volatility, but, as I explain at length in the chapter, in order to capture volatility it becomes fundamental to relax some of the assumption they advance-such as the assumption of unitary actor, or of fungibility of foreign policy options.

### 1.1.5 Testing the Theory of Volatility in Foreign Policy

This chapter tests the theory that I advance in the previous chapter. In order to do so, it first presents the operationalization of the two key concepts in the the-ory-power superiority with respect to the counterpart and the presence of multiple and heterogeneous interests in the domestic realm. Specifically, I build an original indicator of the presence of multiple and heterogeneous interests in the domestic realm, and in the chapter I compare it to others commonly used in the discipline (such as veto players, as well as the winning coalition indicator), to show how and when it differs. I then proceed to test my theory. I restrict my sample to strategic rivalries.

Focusing my research on looking for volatility within rivalries has several advantages. First, the concept of rivalries encompasses a set of politically relevant dyads. Second, by concentrating on rivalries, I can make a focused comparison on what determines volatility and how volatility impacts the foreign policy behavior of the dyad. Finally, rivalries represent a particularly suitable subset of dyads
to perform a focused comparison because they constitute a heuristic device that identifies pairs of states who cultivated highly reciprocal foreign policies-that is, foreign policies that were highly dependent on what the counterpart was doing, as in the case of the US and Soviet Union.

I define volatility in foreign policy as the presence of inconsistent shifts between cooperation and conflict through time. To measure those inconsistent shifts, I use the residuals from a Box-Jenkins analysis of the residuals of the time series of the foreign policy activity directed from one member of the dyad to the other.

I structure my data in panel fashion, with $\mathrm{N}=52$ and $\mathrm{T}=59$. The panel data structure makes it possible to gain leverage from variation that is both cross-sectional and longitudinal (Greene, 2003). With different sources of variation, however, also come different forms of heterogeneity (within and across units), as well as autocorrelation within units, heteroskedasticity between units, contemporaneous correlation between units, spatial correlation and so on. To model them, I test my theory using multiple models: a fixed effects model, a random effects model with robust standard error, and a linear regression model with panel corrected standard er-rors-where the disturbances are assumed to be correlated across panels-with the assumption of an $\operatorname{AR}(1)$ type correlation in the standard errors within each panel.

Each of these model addresses some of the issues presented by the panel data structure, but none of them addresses them all at the same time. Therefore, the take-away point in the Table with the results is not to be found in a single result,
but rather in the fact that the same result holds across different model specification.

### 1.1.6 Conclusions

This final chapter will tie together the investigation of the determinants of foreign policy volatility conducted throughout the dissertation, fulfilling three goals. I will start by summarizing my argument and the theory of volatility I advance. Next, I will summarize the empirical evidence that I gathered throughout the dissertation. Before concluding, I will set forth the future directions in which I intend to extend my research on foreign policy volatility.

I intend to delve into the interaction between volatile behavior within alliances and volatile behavior within rivals. I test my theory on volatile behavior by looking at a subset of dyads in the international system—rivals. Yet rivalries seldom happen in a void: for instance, the relations between the US and the USSR were an important factor in understanding the relations between the US and its allies, and vice-versa. In the chapter, I present a DCC-GARCH model of the interactions between the US, South Korea and North Korea during the Six-Party talks over North Korea's nuclear weapons acquisition. The Talks took place intermittently over the course of about ten years between 2003 and 2012, and involved both allies and rivals of North Korea: the United States, Japan, South Korea, Russia, China, and North Korea. In particular, I find that the correlation between the volatility registered in the foreign policy conducted on the part of the US toward South Korea
and the volatility registered in the foreign policy conducted on the part of the US toward North Korea is not constant through time. I conclude therefore by tracing a description of plausible extensions for the study of volatile international behavior.

# Chapter 2 : A Conceptualization of 

## Volatility in Foreign Policy

In this dissertation, I investigate the determinants of volatile relations: what determines inconsistent shifts between cooperation and conflict in the relations between states? While the concept of volatility has been used rather frequently in political science to describe behavior between actors, to my knowledge, the concept has not often been applied to foreign policy. ${ }^{1}$ To introduce the study of volatility in international politics, this chapter presents a conceptualization of volatility. This section introduces the theoretical and analytic components of the dissertation. As Sartori $(1970,1038)$ explains, concept formation is a fundamental prerequisite of any empirical investigation because "[w]e cannot measure unless we first know what we are measuring."

In introducing the concept of foreign policy volatility, this chapter aims to demonstrate that it meets all the criteria of goodness as defined in Gerring (1999) (see Table 2.1): familiarity, resonance, parsimony, coherence, differentiation, and depth. Thus, the chapter is divided into five sections. In the first section, I provide a con-

[^2]ceptualization of volatility as a characteristic of those foreign policy interactions that shift inconsistently between cooperation and conflict. I explain that the conceptualization of volatility that I propose satisfies both the criteria of parsimony and resonance because, respectively, it relies exclusively on two connotations (change and inconsistency) and it is expressed in a vocable, "volatility," that is used in common parlance to evoke precisely these two connotations. In the second section, I demonstrate that the concept of volatility that I propose satisfies the criterion of differentiation because it refers to a very specific kind of change in the relations between states: to this end, I compare volatility to other concepts, such as instability, that are used in International Relations (IR) to describe specific features of inter-state relations. In the third section, I establish the familiarity of the concept of volatility by showing how the concept has been used in other subfields of the discipline, such as election studies and international political economy, and that the concept shows similar traits across those subfields. The fourth section presents the operationalization of the concept of volatility as the shifting conditional variance in the time series of the foreign policy behavior of states. It demonstrates that this operationalization satisfies the criteria of coherence because it allows to consistently and reliably identify the same dynamics as defining volatile behavior across different cases. It also demonstrates that this operationalization satisfies the criterion of depth, because, by differentiating across different types of volatility, it allows to parse out (and test for) the specific dynamics that bring about volatile behavior.

Gerring (1999) identifies two other criteria, theoretical utility and field utility: I address how the concept of volatility satisfies both of them in the subsequent two chapters. Specifically, in Chapter III I show that volatility presents great field utility because volatility uncovers consequential dynamics in the international system: states that show volatile behavior tend to be more dangerous, because volatility propels uncertainty which in turn catalyzes conflict recurrence; and they tend to play a pivotal role in the international system, because volatile dyads are both more prone to conflict and more likely to join international organizations together. Similarly, in Chapter IV I demonstrate that volatility presents great theoretical utility, by showing how volatility offers a different heuristics that emphasizes the importance of looking and modeling the interplay between cooperative and conflictual policies in the international arena, without artificially dichotomizing the two areas.

In sum, this chapter demonstrates that the introduction of the concept of volatility in International Relations (IR) is an important heuristic in the study of international politics. The chapter does so by showing how establishing the concept of foreign policy volatility addresses an important gap in the way we make sense of the workings of the international system and that volatility identifies an important and well defined phenomenon in international politics.

### 2.1 The Concept of Volatility: Parsimony and

## Resonance

In this section, I provide a conceptualization of volatility that satisfies the criteria of parsimony-that is, the requirement that the concept relies on few, essential attributes-and of resonance-that is, the requirement that the vocable used to describe the concept is diffused enough in common parlance to be intuitively clear.

I define volatility as a characteristic of international relations whereupon foreign policy interactions inconsistently shift back and forth between cooperation and conflict. Following Goertz (2006, 6-10), I identify two core attributes of the concept of volatility, inconsistency and change: I define these as the core dimensions of volatility because these are the components of the concept that have "causal powers when the [...] [concept] interacts with the outside world,like the atomic structure of cooper has causal powers in explaining how copper interacts with the outside world by constituting a good conductor of electricity" (Goertz, 2006, 28). In other words, these two characteristics set the concept of volatility apart from other concepts by identifying the defining properties of the concept, that is, those traits that both uniquely identify volatile behavior and explain the repercussions of volatile behavior in the international system. Thus, for relations to be characterized as volatile, they have to involve inconsistent transitions from cooperative actions to conflictual actions, and vice versa.

By change, I mean the transition between cooperative and conflictual acts. To define what constitutes a cooperative and a conflictual action, I follow Goldstein (1992), who builds a scale of foreign policy actions by putting all foreign policy events on a continuum from the least cooperative (-10) to the most cooperative $(+10)$. The scale in turn classifies each foreign policy action by determining "the affect or tension implicit in a series of actions taken by one nation towards another" (Goldstein, 1992, 370). Cooperative acts range from asking for more information about a proposal and yielding on an issue, to making an economic or military agreement and extending military protection. Conflictual acts range from expressing criticisms to starting a military attack. In sum, cooperation refers to any kind of foreign policy initiative that responds favorably to requests of the counterpart (such as yielding, admitting wrongdoing, agreeing to meet and so on), that requests cooperation (such as asking for material assistance) or that proposes to join forces in carrying out initiatives that will be mutually beneficial (signing substantive agreements, increasing diplomatic relations and so on). Conversely, conflict refers to any kind of foreign policy initiative that shows opposition to a policy put in place by the counterpart (such as turning down a proposal or halting negotiations, cutting aid) or displays a violent reaction to it (such as threatening with force, seizing territory, and engaging in military confrontations).

By inconsistency, I mean that changes are erratic—that is, they neither respond to specific trends nor do they occur during regular phases. For instance, as I explain
at length later in the chapter, it could be the case that in democracies, foreign policy becomes systematically more or less aggressive during elections: in that case, we would still witness a shift in foreign policy behavior, but one that takes place at regular points in time. Cooperative and conflictual actions might recur at different points in time, as opposed to, for instance, relations that are steadily conflictual or steadily cooperative, and as opposed to relations that undergo regular phases of conflict or cooperation.

The identification of change and inconsistency as the two core characteristics satisfies Gerring (1999) criterion of parsimony for the concept of volatility, as the list of defining attributes is limited to two.

At the same time, the choice of the word "volatility" to identify a concept whose core characteristics of change and inconsistency satisfies Gerring (1999) criterion of resonance, because the term "volatility" is becoming the most popular vocable used in common language to describe a condition of sudden change taking place in the quantity of interest in common language. To demonstrate this point, in Figure 2.1 I employ Google N-Gram ${ }^{2}$ to trace the usage of the word volatile and volatility throughout the last two centuries in books written in English, and to compare it to the usage of other, similar words, such as unstable and instability and turbulence and turbulent. From Figure 2.1 it emerges clearly that, at least since the Seventies, there has been a resurgence of this vocable. Unfortunately, data are only available up to 2008. Yet the term volatility has seen an even greater resurgence after 2008, as a

[^3]
## Google books Ngram Viewer



Figure 2.1: Google N-Gram for volatility.
function of the Great Recession. This has been the case because volatility is used in finance to describe movements of prices in the stock market, and "volatility" has therefore entered the common vocabulary as the vocable of choice to identifies sudden, inconsistent shifts in the quantity of interest. Therefore, it is reasonable to expect that, were data to extend all the way to 2013, the positive trend in the use of the word would be seen as continuing at perhaps an even steeper rate.

### 2.2 Volatility in Relation to Other Concepts:

## Differentiation

In this section, I demonstrate that the concept of volatility that I just defined meets the criterion of differentiation, that is to say, that the concept of volatility is clearly distinguishable from other concepts used in IR to describe similar phenomena. To
this end, I explain how the two core elements of the concept of volatility (inconsistency and change), by constituting necessary and jointly sufficient conditions (Braumoeller and Goertz, 2000; Goertz and Starr, 2003; Goertz, 2006) to identify volatility, set the concept of volatility apart from other concepts used in IR.

Volatility, by describing change in the relations between states, is antithetical to the concept of stability. Deutsch and Singer $(1964,391)$ define stability as "the probability that the system retains all of its essential characteristics; that no single nation becomes dominant; that most of its members continue to survive; and that large-scale war does not occur." This definition highlights two characteristics of the concept of stability as employed in IR. First, the concept of stability is mostly used to describe a property of relations between states at the systemic level, rather than the dyadic level: the concept of stability incapsulates the lack of changes in the distribution of power and resource (Niou, Ordeshook and Rose, 2007, 64-68). Second, stability is defined as the absence of change (Gaddis, 1986), but nothing is specified as to the degree of cooperation that is expected among countries in periods of stability.

Because it describes relations between states that are changing, volatility is distinct from stability. But because it describes a very specific, inconsistent kind of change, volatility is also distinct from other concepts that are used to describe change in the relations between states.

Volatility is different than the improvement or deterioration of international rela-
tions: improvement and deterioration are notions that imply the presence of a trend, a general direction towards which relations are moving. When relations improve or deteriorate, they change, but they do so gradually and following a specific course or direction. The key distinction then between the concept of volatility and the concept of improvement or deterioration is the fact that volatility implies inconsistent shifts between cooperation and conflict, whereas improvement (deterioration) indicates constant movement toward more cooperation (conflict). Obviously, the concept of volatility and the concept of improvement or deterioration of the relations overlap, both conceptually and empirically: it could be the case that relations between two states are volatile but also improving, as in the case, for instance, of relations between the US and the former Soviet Union after the end of the Cold War (Mastanduno, 1997). But this overlap is not complete: relations that are improving or deteriorating do not need to be volatile-for instance, relations were not volatile between China and Taiwan after China's nuclear explosion in 1964 (Ross and Jiang, 2001)—and relations that are volatile do not necessarily improve or deteriorate, as in the case of India and Pakistan after the 1998 nuclear tests (Ganguly, 1995).

Similarly, the inconsistency of the shifts between cooperation and conflict sets volatile relations apart from cyclical relations. Cyclical relations are defined by the presence of regular phases-that is, they exhibit seasonality: for instance, Ward $(1981,233)$ finds a cyclical component in the US foreign policy towards the Soviet Union, because during elections the US foreign policy exhibits specific, peculiar


Figure 2.2: Ideal-typical illustrations of the concepts-simulated data of volatile, seasonal and trend time series
patterns. ${ }^{3}$ Cyclical relations, like volatile ones, bounce back and forth between cooperation or conflict, however they do so through phases, that is, in a predictable way, responding to a set of exogenous, routine stimuli such as the occurrence of elections.

Finally, the concept of volatility as I present it here encompasses the concept of instability as currently used in IR literature, because the concept of volatility looks at dynamics in both the cooperative and conflictual realm of foreign policy, whereas

[^4]the concept of instability is simply employed to describe the recurrence of violent behavior. The words "instability" and "volatility" are synonyms in the vernacu-lar-that is, they are used interchangeably. In IR however, these two words designate two different ideas. That words that are considered synonyms in common parlance come to acquire different meanings in a specific discipline is not unusual-in fact, Sartori (1970) argues, the creation of such different meanings is at the heart of every discipline. For instance, the words "earthquake" and "shock" are categorized as synonyms in the vernacular. However, in seismology, these two words are not used interchangeably, as earthquakes identify a very specific set of shocks. ${ }^{4}$

By the same token, the concept of instability in IR has taken a very specific set of meanings, one that, I argue, only captures a subset of the behaviors included in the concept of volatility that I present. Across the many contexts in which it is employed in studies of IR, the concept of instability always refers to the recurrence of crises or violent disputes. This is the case whether the concept of instability is investigated in the context of regional interactions (Kapur, 2008; Narang, 2010), in the domestic realm (Nincic, 2010), or even in instance of nuclear weapons acquisition
(Hart, 1960; Snyder, 1965; Jervis, 1993). ${ }^{5}$

[^5]Thus, I contend that, conceptually, instability represents only a subset of volatility, because, while both these concepts describe situations in which states rapidly change their course of behavior, instability, by focusing on the recurrence of conflict, conflates together all those cases in which states engage in deep cooperation as well as violent conflict, as in the case of India and Pakistan, versus those cases where states only swing back and forth between conflict and no interaction, as in the case of the relations between Turkey and Iraq.

In sum, the concept of volatility is different from other concepts that describe relations between states, because it describes a very peculiar kind of inconsistent change in behavior-a feature that sets it apart from concepts of improvement, deterioration or cyclicality-or because it encompasses changes in both cooperation and conflict-a feature that instead sets it apart from the concept of instability.

In Figure 2.2, I report the ideal-type representation of each of the concept illustrated: in each plot, the horizontal axis represents time, whereas the vertical axis represents a conflict-cooperation continuum, where foreign policy actions are ranked based on how cooperative and how conflictual they are (see Goldstein, 1992). Each of the different plot describes what patterns of volatile, cyclical or improving relations would look like empirically. For instance, volatile relations are characterized by inconsistent changes in behavior, shifting from cooperation to conflict and vice versa at irregular time periods. Unstable relations on the other hand also look at irregular behavior, but focus exclusively on the conflictual side
of the interaction, completely ignoring what happens in the realm of cooperation. Therefore, the concept of instability comprises only a subset of the behaviors identified by volatility—as exemplified by the light gray line in the graph. Cyclical relations and deteriorating relations express change as well, but not inconsistent one: in the case of cyclical relations, shifts in behavior take place at regular intervals, whereas in the presence of deterioration, they follow a specific trend.


Figure 2.3: Venn diagram representation of the relations between the different concepts illustrated. The overlap between the diagrams represent the fact that relations that are, for instance, volatile, might also experience instability. However, the parts in each diagram that do not overlap represent instead each concept's unique description of change in state's behavior. For instance, relations might be cyclical, but not volatile. To explain volatility, I intend to capture the parts of the volatility circle where there is no overlap.

To give a graphical representation of the relationship between these concepts
that I have described, I use Venn diagrams (see Figure 2.3). There are five takeaway point from the Figure. First, all the concepts depicted in the Figure represent specific characteristics of the way states interact with one another in the international arena, thus the universe of cases is relations between states. Second, stability refers to all those relations that develop steadily, without major changes, be these changes trends (as in the case of improving or deteriorating relations), phases (as in the case of cyclical relations), or inconsistent shifts (as in the case of volatile and unstable relations), thus stability is the complement of the union of all the concepts here illustrated. Third, volatility identifies a unique set of behaviors that is not described by the other concepts illustrated here, as exemplified by the areas contained in the volatility diagram that do not overlap with the diagram of the other concepts: in particular, volatility does not just refer to change, but rather to change between cooperation and conflict that happens inconsistently through time. Fourth, the concept of instability as currently used in IR only represents a subset of the behaviors identified by the concept of volatility, because instability is used to describe exclusively the recurrence of conflict, without taking into consideration what happens in the realm of cooperation. Finally, these concepts that are used to describe change in the relations between states, while different, are not mutually exclusive, as exemplified by overlapping areas of the different diagrams. As it appears from the Figure, there could be volatile relations that have cyclical components to it-for instance, those volatile relations that comprise at least a democracy-and there could
be volatile relations that are gradually improving.
Finally, two clarifications are in order. Volatility, like instability and seasonality, is an attribute of the relation: an emergent property of the interactions between states. In this sense, volatility is different from the rules of behavior that regulate those interactions, such as reciprocity or bureaucracy (Goldstein and Freeman, 1990). Specifically, reciprocity is a rule of foreign policy behavior that prescribes to, in Ward (1981) words, "do unto others what they have recently done to you," thus giving rise to action-reaction dynamics (Richardson, 1960). Bureaucracy on the other hand refers to the bureaucratic inertia that characterizes foreign policy, according to which the foreign policy of a country is mainly the product of the bureaucratic agencies that administer it (Dixon, 1988, 249). The relation between volatility and these rules of behavior -whether volatility is a product of reciprocity, whether more bureaucracy suppresses volatility or whether the conditions that increase reciprocity also catalyze volatility- is an empirical matter, and will be investigates in the next chapters.

Second, there is yet another concept that is (less) used in the discipline to describe change in the relation between states, turbulence. In common parlance, "turbulence" can be considered a synonym word for "volatility," yet in IR turbulence refers specifically to a concept that has been introduced by Rosenau $(1990,1997)$ to indicate the modern condition of the international system (for an application, see Nieman, 2011). The concept, however, has a very imprecise connotation: by signi-
fying at the same time the behavior of relevant actors and the characteristics of the international system that bring the behavior about, it conflates together both the determinants of turbulence and the outcome of turbulence. Specifically, Rosenau $(1990,56)$ claims that turbulence "in world politics is to be found not in individuals or groups but in their interactions," thus characterizing turbulence as a connotation of international behavior, yet he also describes turbulence as being "manifested in technological breakthroughs, authority crises, consensus breakdown, revolutionary upheavals, generational conflicts and other forces that restructure the human landscape in which they erupt" (Rosenau, 1990, 8), thus defining turbulence as those conditions that he identifies later on as the very determinants of turbulence (Rosenau, 1990, 12-17). Because the concept of turbulence as present in IR conflates together both the determinants of turbulence and the outcome of turbulence, introducing the concept of volatility to describe inconsistent shifts in behavior between cooperation and conflict between states is more efficient than adopting the concept of turbulence: it allows me to clearly define the meaning of the concept without having to deal with all the strings attached to the concept of turbulence.

In sum, this section has illustrated that the concept of volatility that I present in this dissertation satisfies the criterion of differentiation: the concept is sufficiently distinguishable from other concepts used in the discipline to describe the dynamics of the interactions between states. I demonstrated that volatility describes a very peculiar kind of changing relations between states, those characterized by incon-
sistent shifts between conflict and cooperation, and that, while volatility and other concepts such as cyclicality are not mutually exclusive concepts, they do capture quite different dynamics.

### 2.3 Volatility in Other Subfields: Familiarity

In this section, I demonstrate that volatility constitutes a familiar concept in political science, both because it is a concept that has been used in other subfields and because it displays similar connotations across these subfields. In the characterization proposed by Gerring (1999), familiarity is different from resonance: familiarity refers to the degree to which an academic or lay audience is acquainted with the concept, while resonance refers to the degree to which the specific vocable evokes the idea represented by the defining characteristics of the concept.

Volatility is a familiar concept not only because it is a concept investigated in other subfields of political science, but also because it maintains similar connotations across all these other subfields: it is conceptualized as inconsistent changes in the quantity of interest; it represents the outcome of aggregate behavior spurred by political processes; it is catalyzed by uncertainty; and it presents deleterious effects. I explore each of these characteristics in the following paragraphs.

Volatility has been studied in four different areas of political research. Studies of electoral volatility look at shifts in the number of votes that parties obtain in consecutive elections (Lipset and Rokkan, 1967; Pedersen, 1979; Bartolini and Mair, 1990;

Roberts and Wibbels, 1999; Heath, 2005; Madrid, 2005; Birnir, 2007; Mainwaring and Zoco, 2007; Nooruddin and Chhibber, 2008), or even changes within the history of voters' identification with a specific party across elections (Keele and Wolak, 2006). Trade volatility instead, refers to shifts in the amount of trade registered between two countries across years (Rose, 2005; Mansfield and Reinhardt, 2008; Gray and Potter, 2012). Similarly, economic volatility describes difference in the Gross Domestic Product (GDP) (or other measures of economic performance) of a country through time (Henisz, 2004; Leblang and Mukherjee, 2004, 2005; Fatas and Mihov, 2005; Down, 2007; Klomp and de Haan, 2009; Nooruddin, 2011). Finally, exchange rate volatility indicates sudden changes in exchange rates, that is, in the value of one currency with respect to another (Chowdhury, 1993; Hays, Freeman and Nesseth, 2003; Moore and Mukherjee, 2006; Leblang and Bernhard, 2006).

Research on volatility in these different issue areas displays four common characteristics. First, although different measures are used, volatility is always conceptualized as a inconsistent shifts in the quantity of interest. Madrid $(2005,1)$ defines electoral volatility as the shifts in the number of votes for one party from one election to another. Klomp and de Haan (2009) measure economic volatility as the deviation from the normal GDP per capita, and specifically," the relative standard deviation of the growth rate of GDP per capita"(Klomp and de Haan, 2009, 311).

Second, volatility, this unpredicted rapid change in the quantity of interest, is conceptualized as an aggregate behavior-that is, the behavior of an abstract entity
composed of a group of people, such as voters or investors-that is the function of political variables-that is quantities related to a country's system of government, such as the structure of the government, the party system, the affiliation to intergovernmental organizations and so on. For instance, electoral volatility is conceptualized and measured as the change in total (national or local) vote for a party between two consecutive elections (Bartolini and Mair, 1990, 20), and is, therefore, a system property (Bartolini and Mair, 1990, 20), a characteristic that emerges from the political system. The central question in the literature on electoral volatility then becomes how much of electoral volatility is a function of existing social and ethnic cleavages (Lipset and Rokkan, 1967) versus the party system (Bartolini and Mair, 1990), or an interaction of the two (Heath, 2005). For Madrid (2005), electoral volatility is a function of the failure by the main parties in Latin America to guarantee representation to the indigenous population, as this specific sector of the electorate shifts their vote around searching for the party that can best represent their interests. ${ }^{6}$ Similarly, Rose (2005) and Mansfield and Reinhardt (2008) identify membership in international political institutions such as the WTO as an important determinant of trade volatility, albeit reaching opposite conclusions.

Third, the mechanism that is usually posited to connect these political variables to volatility is uncertainty. In other words, these political features-for instance, party system or WTO membership-create volatility because they make it harder

[^6]for the actors involved-for instance, voters or traders-to anticipate with precision the future conditions in which they will find themselves operating.

For instance, Mainwaring and Zoco (2007) show that the decrease in uncertainty among voters brought about by the the stabilization of inter party competition decreases electoral volatility decreases through time. Henisz (2004) argues that policy volatility decreases if there are institutions in place that provide checks and balance (as in the case, for instance, of veto players) because this kind of institutions reduces uncertainty by "minimiz[ing] the ability of politicians to respond to short-term political or social incentives to favor one group over another or transfer resources from society to the public sector"(Henisz, 2004, 6). With respect to electoral volatility, Klomp and de Haan (2009) parse out the uncertainty mechanism further by distinguishing between the uncertainty that can be generated by the political regime, and the uncertainty that originates instead from then variability of specific policies put in place. Nooruddin $(2011,103)$ clarifies the role of uncertainty in bringing about volatility by stressing that "credible constraints against policy change encourage private economic actors to engage in increased investment activity because they do not have to worry that governments will change policies arbitrarily, unilaterally or drastically." Leblang and Bernhard (2006) show that potential political change, as represented by campaigns and cabinet formations in parliamentary systems, increases exchange rate volatility by increasing uncertainty for stockholders.

Finally, in all these studies volatility reflects an inability to stay the course and
therefore ultimately presents deleterious effects. For instance, electoral volatility is more frequent-and more pernicious-in the case of new democracies, and in particular on ethnic homogeneous new democracies, where "due to political socialization, membership in an ethnic group functions as a stable information cue for political choices in an environment of low political information"(Birnir, 2007, 602). Down (2007) emphasizes how the insecurity generated by trade volatility increases demands for compensation on the part of domestic publics. ${ }^{7}$ Gray and Potter (2012) demonstrate that volatility in economic indicators—for instance, in GDP per capita-imposes on states to offer compensation to different domestic groups, and it further marks the divide between countries at the core of international economy and those at the periphery by exposing these latter to greater uncertainty.

In sum, in this section I have showed that the concept of volatility enjoys familiarity in political science: not only is it used in multiple subfields, its core connotations also remain fairly stable across subfields. I extend the study of volatility to the political activities on the international arena. While volatility in political time series such as presidential approval has been investigated by Maestas and Preuhs (2000) and Gronke and Brehm (2002) among others, to my knowledge, there is not such an investigation of volatility in foreign policy series.

[^7]
### 2.4 Operationalizing Volatility: Coherence and Depth

In this section, I present the operationalization of the concept of volatility that I intend to use and I demonstrate that the operationalization of the concept satisfies the criterion of coherence and depth. Specifically, I operationalize volatility as the time varying conditional variance of the time series of states' foreign policy actions. Substantively, this operationalization captures precisely the inconsistent shifts between cooperation and conflict that define the concept of volatility as I have defined it, because it detects the presence of a changing variance in a time series. I argue that this operationalization satisfies the criterion of coherence, because it provides a coherent measure of volatility across time. Further, I argue that this operationalization satisfies the criterion of depth, because, by differentiating across different types of volatility, it allows to parse out (and test for) the specific dynamics of volatile behavior.

In order to move from the abstract concept of volatility that I delineated in Section 1 to its empirical analysis, I create a concept tree where I vertically organize the attributes of volatility by levels of abstraction (see Figure 2.4). The concept tree constitutes a heuristic device that enables to move down on the scale of abstraction to help identify the best measurement of volatility (Munck and Verkuilen, 2002, 13).

The defining characteristics of volatility are change and inconsistency. To measure change, I use event data (Schrodt, 2012). Event data represent a collection of all foreign policy actions carried on by one state ("source") towards another ("tar-


Figure 2.4: Concept Tree for Volatility.
get"), scaled from least to most cooperative (Goldstein, 1992). Examples of the kind of foreign policy activities registered are: "expressing accord," "appealing for economic cooperation," "engaging in cooperation," "attacking," "threatening," and so on. ${ }^{8}$ In order to capture both the fluctuation between conflict and cooperation, as well as the inconsistency of the fluctuation, I use the residuals from a correctly specified Box-Jenkins model of temporal dependence in a country's foreign policy series.

This operationalization procedure provides an accurate measure for the concept at hand, because by focusing on the residuals of the Box-Jenkins procedures on the

[^8]time series of foreign policy interactions, it makes it possible to focus exactly on all the change in behavior that is inconsistent. The residuals from the Box-Jenkins procedure are in fact stripped from all the other kinds of change-that is, as behavior that cannot be explained by previous behavior (autoregressive, AR processes), long term trends (moving average, MA processes), or phases (seasonality).

In formal terms, the conditional mean of the series of interest $y_{t+1}$ is expressed as (Enders, 2008):

$$
\begin{equation*}
E_{t} y_{t+1}=a_{0}+a_{1} y_{t} \tag{2.1}
\end{equation*}
$$

Once the temporal process that is embedded in the series is correctly specified and stripped from the data, the residuals left are:

$$
\begin{equation*}
\epsilon_{t}=\hat{y}_{t}-y_{t} \tag{2.2}
\end{equation*}
$$

These residuals represent volatility, in that they represent shifts in foreign policy behavior that are not accounted for when identifying other forms of change, such as trends or phases. To be more specific, to determine whether the strategic rivalries in Table 2.2, I execute the following procedure:

- I gather event data on each of those thirty strategic rivalries, from 1948 to 2010: I merge different source and I scale the data using Goldstein (1992) scale,
following a procedure that I detail in the next chapter;
- For each dyad $(i, j)$, I build a time series of the foreign policy actions carried on by $i$ and directed towards $j$, as well as a time series of the foreign policy actions carried on by $j$ and directed towards $i ;{ }^{9}$
- For each of those time series, I test for the presence of stationarity, integration or fractional integration using various tests: the Augmented Dickey-Fuller test (Dickey and Fuller, 1979), the Phillips-Perron test (Phillips and Perron, 1988) and the Kwiatkowski-Phillips-Schmidt-Shin test (Kwiatkowski et al., 1992);
- I determine the time dynamic in the data employing the Box-Jenkins procedure: using a series of diagnostic tests to uncover the processes at work in the time series at hand, such as autocorrelation function (ACF) and partial autocorrelation function (PACF) graphs, as well as fitting various autoregressive and moving average ARIMA( $\mathrm{p}, \mathrm{d}, \mathrm{q}$ ) models and using the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) to determine the more parsimonious model for the time series (McCleary and Hay, 1980; Enders, 2008);

Using the residuals from a Box-Jenkins procedure applied to the time series of the foreign policy interactions of one country toward another allows me to focus on inconsistent change in behavior between states. In the next chapters, I employ these measure in two different contexts. In fact, in Chapter V, I generate panel data from the standard deviation of the residuals from annual time series, using directed dyads, to perform a time series cross sectional analysis of the determinants of volatility. The test will investigate my theoretical claim on the determinants of volatile behavior. In Chapter III, to compare the different implications between volatile and non-volatile behavior in the international system, I dichotomize the measure of volatility, so that I can parse out clearly relations that are volatile from

[^9]those that are not. Specifically, the procedure for doing classic volatility analysis follows exactly the procedure I delineated above, with an extra-step at the end. Once the most parsimonious model for the time series has been identified, I analyze the residuals from the correct $\operatorname{ARIMA}(p, d, q)$ specification to determine the presence of volatility through the Ljung-Box test statistic (Ljung and Box, 1978) and Engle's ARCH test (Engle, 1984).

In time series, volatility defines a characteristic of the variance of the whole time series: if a series is volatile, then the conditional (or short term) variance changes through time and is therefore not constant throughout the series.

In substantive terms, if the time series of the foreign policy actions of one country towards another shows volatility, then the actions of a country towards another will shift unexpectedly between cooperation and conflict. ${ }^{10}$

Volatility implies the presence of heterogeneity in the data generating process, and that this heterogeneity can be captured by modeling the variance of the error term of the model, because the error term varies at least in part systematically.

There are various options to model volatility in the time series, and the study of volatility constitutes one of the fastest growing areas of research in time series anal-

[^10]ysis, while offering important insights for political time series as well (Maestas and Preuhs, 2000).

The most intuitive model is the autoregressive conditional heteroskedastic (ARCH) model. In more technical terms, the study of volatility in time series starts by focusing on the error variance $\sigma^{2}$ of the series, which is then:

$$
\begin{equation*}
E_{t}\left[\left(y_{t+1}-a_{0}-a_{1} y_{t}\right)^{2}\right]=E_{t} \epsilon_{t+1}^{2} \tag{2.3}
\end{equation*}
$$

In the ARCH model, this variance is not assumed to be constant, but rather to be determined by an $\operatorname{AR}(\mathrm{p})$ process:

$$
\begin{equation*}
\hat{\epsilon}_{t}^{2}=\alpha_{0}+\alpha_{1} \hat{\epsilon}_{t-1}^{2}+\alpha_{2} \hat{\epsilon}_{t-2}^{2}+\ldots+\alpha_{q} \hat{\epsilon}_{1-q}^{2}+\nu_{t} \tag{2.4}
\end{equation*}
$$

where $\nu_{t}$ is a white noise process and $\alpha_{0}$ is greater than zero and $\alpha_{1}$ has to be positive but smaller than 1 . If the $\alpha$ values are different from zero, the conditional variance of $y_{t}$ evolves according to this autoregressive process. ${ }^{11}$ Thus:

[^11]\[

$$
\begin{equation*}
\epsilon_{t}=\nu_{t} \sqrt{\alpha_{0}+\alpha_{1} \hat{\epsilon}_{t-1}^{2}} \tag{2.5}
\end{equation*}
$$

\]

The generalized ARCH (GARCH) model expands on the ARCH and allows the variance to be an ARMA $(\mathrm{p}, \mathrm{q})$ process, while threshold ARCH (TARCH) and the exponential GARCH (EGARCH) models allow for different effects of good or bad events on the volatility of the series (Enders, 2008). Gronke and Brehm (2002) combine together an ARCH model and a multiplicative heteroskedasticity model to build an ARCH-MH model where the variance is a function of the square of the residuals in the previous periods and of a series of explanatory variables, to model the volatility in the presidential approval rates as a function of partisanship (Gronke and Brehm, 2002, 432-433):

$$
\begin{equation*}
\hat{\epsilon}_{t}=\alpha_{0}+\alpha_{1} \hat{\epsilon}_{t-1}^{2}+\mathbf{z}_{\mathbf{t}} \gamma \tag{2.6}
\end{equation*}
$$

The two authors identify predictors for the mean, as well as for the variance. They test their theory with data on public opinion, specifically presidential job approval in the past sixty years.

So, what is the connection between the operationalization of volatility as the residuals from the correct Box-Jenkins specification, and the operationalization of
volatility as the presence of auto-correlation throughout the time series? Both operationalizations successfully isolate that change in foreign policy behavior that shows inconsistency through time. What sets the two apart is the fact that ARCH models define volatility as a property of the series as a whole, and therefore utilizing this conceptualization of volatility amounts to distinguishing between countries which conduct a volatile foreign policy towards other countries, and countries which do not, over a period of fifty years. I apply this operationalization of volatility to explore volatility as an independent variable in Chapter II, because it makes it possible to compare across cases of volatile rivalries and non-volatile rivalries.

The advantage of using these two measures for the two different chapters relies on the specific role that volatile foreign policy behavior plays in each: in Chapter III, volatility is best operationalized as a property of the series, so that it becomes possible to divide the set of enduring rivalries of between volatile and non volatile, and compare the behavior of the two sets. In Chapter V, where volatility is the dependent variable, on the other hand, focusing on changes in the residuals of the foreign policy series through time allows me to provide a fine-grained explanation of how the main variables of interest account for variations in volatility through time, and across different cases.

In general, focusing on the residuals of the correctly specified Box-Jenkins procedure and hereford on the varying variance in the time series of interest allows me to satisfy the criterion of coherence: by deducing the presence of volatility con-
sistently across different time series-that is, across different cases-with specific tests, this operationalization ensures the reliability and consistence of the concept across cases. This is particularly evident when this operationalization of volatility is compared to other operationalizations of the concept that are currently used in other studies. Other approaches to the study of volatility look at changes in the variable of interest across units of time. For instance, to capture trade volatility, Mansfield and Reinhardt (2008) operationalize the concept as "the change in the value of exports from country $i$ to country $j$ from time $t$ to time $t+1$." Gray and Potter $(2012,798)$ follow a similar approach for economic volatility, although they extend the time frame of the comparison, "by taking the natural $\log$ of the difference in the variable in question and then the square root of the 5 -year moving average, multiplying that quantity by the square root of the number of years in the sample ( 25 years, for our primary specifications)." Studies of electoral volatility employ the Pederson index (Pederson, 1983), which takes the difference in the number of votes received by a party at time $t$ and time $t-1 .{ }^{12}$ Measuring volatility in international politics as the changing variance of the time series of a country's foreign policy towards another through time provides a more coherent metric than the ones I just illustrated: rather than imposing a structure to the volatility, by assuming a priori that it emerges in difference registered across a pre-determined period of time, such as one year or five years, this approach deductively extrapolates such

[^12]structure from the data by testing for the null hypothesis of independence in the residuals of an ARIMA ( $\mathrm{p}, \mathrm{d}, \mathrm{q}$ ) process-employing, for instance, the Ljung-Box test statistic (Ljung and Box, 1978) and Engle's ARCH test (Engle, 1984).

Moreover, by deductively extrapolating from the structure of the data, this method does not impose any artificial thresholds on the shifts between cooperation and conflict that are required to define an interaction as volatile. Because of that, this method to operationalize volatility does not systematically discriminate on the basis of states' material or ideational capabilities when determining the presence of volatility, as exemplified by the fact that two dyads with very different set of both material and ideational capabilities, such as the US and the USSR and Greece and Turkey, are both identified as volatile.

Furthermore, this operationalization satisfies the criterion of depth as presented by Gerring (1999). Not only does this approach allow me to dynamically measure volatility through time, rather than simply controlling for time (Powell and Tucker, 2012, Table 3), it also makes it possible to specify the structure that volatile behavior assumes: by making it possible to differentiate across different structures of volatility, it allows the researcher to investigate the mechanisms that generate volatility and to further parse out different kinds of volatility. For example, Engle and Ng (1993) propose to analyze the news impact curve to distinguish between cases where volatility is affected differently by positive and negative shocks-that is, cases where the time series of interest is either over predicted or under predicted
by its past values. Precisely because it is more accurate and flexible, this measure also makes it possible to compare differences within and across cases. In other words, by inductively deducing the structure of the volatility present in the data, this operationalization of volatility makes it possible to investigate why some foreign policy interactions display volatility and others do not, as well as why those interactions that do display volatility might in fact present different structures of volatility.

### 2.4.1 Volatile Relations in Strategic Rivalries

To focus the analysis and further enhance comparability between cases of volatility and across cases of volatility and cases of non volatility, I measure volatility within a subset of dyads: strategic rivalries.

The concept of rivalry is a heuristic device through which scholars have identified those pairs of states that entertain hostile relations. There are multiple definitions of what counts as a rivalry (Goertz and Diehl, 1995; Diehl and Goertz, 2001; Maoz and Mor, 2002; Hewitt, 2005; Klein, Goertz and Diehl, 2006; Colaresi, Rasler and Thompson, 2007), and Colaresi, Rasler and Thompson $(2007,50)$ identify at least six. In particular, it is possible to broadly distinguish between two methods to identify rivalries: a dispute density approach (Hewitt, 2005; Diehl and Goertz, 2001; Bennett, 1998; Maoz and Mor, 2002) and a perceptual approach (Thompson, 2001; Colaresi, Rasler and Thompson, 2007). In the dispute density approach, rival-
ries are identified by the number of wars or crises in which the dyad is involved. In the perceptual approach, states are defined as rivals if there develops a sentiment of enmity between the two countries.

Focusing my research on looking for volatility within enduring rivalries has several advantages. First, the concept of rivalries encompasses a set of dyads whose international activity has been at the centre of many IR studies. Specifically, with some variation depending on which definition is adopted, since World War II, over ninety percent of all wars have taken place between rivals (Colaresi, Rasler and Thompson, 2007, 89), almost seventy-eight percent of wars since 1816 (Thompson, $2001,588)$ and three-fourths of all militarized disputes (Diehl and Goertz, 2001, 61).

Second, by concentrating on rivalries, I can make a focused comparison (George and Bennett, 2005,67 ) on what determines volatility and how volatility impacts the foreign policy behavior of the dyad. In other words, by comparing relations that share a similar propensity to engage in conflict, I can focus the analysis on what causes some of these relations to be volatile and others to be stable. ${ }^{13}$

Finally, rivalries represent a particularly suitable subset of dyads to perform a focused comparison because they constitute a heuristic device that identifies pairs of states who cultivated highly reciprocal foreign policies-that is, foreign policies that were highly dependent on what the counterpart was doing, as in the case of the US and Soviet Union. ${ }^{14}$ In other words, the dyadic component in their relation

[^13]is quite strong. In other kind of relations, such as alliances, researchers have shown that this has not been the case, and in fact to model relations between pairs of allies is fundamental to understand the whole network of alliances in the system (Cranmer, Desmarais and Menninga, 2012; Cranmer, Desmarais and Kirkland, 2012).

I employ the perceptual approach to the identification of rivalries and I look at strategic rivalries (Thompson, 2001; Colaresi, Rasler and Thompson, 2007). Thompson $(2001,560)$ uses three necessary and jointly sufficient criteria to identify strategic rivalries: " $[t]$ he actors in question must regard each other as (a) competitors, (b) the source of actual or latent threats that pose some possibility of becoming militarized, (c) enemies." While some of the rivalries identified through the two approaches overlap (Colaresi, Rasler and Thompson, 2007, Table 2.2), this conceptualization has several advantages over the dispute density one. The dispute density approach, by imposing an arbitrary frequency of disputes as a prerequisite for a dyad to constitute a rivalry, identifies a very unstable set of enduring rivalries, that is, a set that changes profoundly as a function of rather minor changes in the coding criteria (Colaresi, Rasler and Thompson, 2007, 52). Not only is this set unstable, it is also skewed towards comprising dyads with major military capabilities, as those are the ones that will be more likely to have the resources to engage in conflict with greater frequency: in so doing, the dispute density approach discounts the possibility that countries that regard themselves as competitors or enemies might find other conflictual policies that substitute for engaging in violent disputes (Mor-
gan and Palmer, 2000; Bennett and Nordstrom, 2000; Clark, Nordstrom and Reed, 2008).

I report the list of enduring rivalries that I consider in Table 2.2. Strategic rivalries can last for a different amount of time, given that time is not a component of the definition of strategic rivalries (Thompson, 2001)—whereas it is in the definition of enduring rivalries, see Goertz and Diehl (1995) and Diehl and Goertz (2001). To facilitate the comparison across volatile and non-volatile cases, I focus on those strategic rivalries that last at least thirty years and that develop on or after 1948. So I exclude both cases where the rivalry lasts less than 30 years (as in the case of the rivalry between Tanzania and Uganda, which stretches from 1971 to 1979) and cases that develop before 1948 (such as, for instance, the rivalry between Mexico and the US, that extended from 1821 to 1848) (Colaresi, Rasler and Thompson, $2007,50)$. I drop cases where there are not enough event data going back to 1948. ${ }^{15}$ I choose the 1948 threshold because data are only available starting from 1948. Using a thirty year minimum duration as a criterion to include dyads allows me to decrease heterogeneity in the sample without substantively decreasing variation. This is the case because the minimum duration decreases heterogeneity because it excludes rivalries that are remarkably shorter than most, such as those that last five or ten years. Recall that Thompson (2001) identifies three necessary and jointly sufficient conditions to identify a rivalry: " $[t]$ he actors in question must regard each

[^14]other as (a) competitors, (b) the source of actual or latent threats that pose some possibility of becoming militarized, (c) enemies." It is plausible to hypothesize that the dynamics that sustain these conditions for 10 years might be dramatically different from the dynamics that sustain them for 30 years. At the same time, the minimum duration does not affect variation in the sample because there is no requirement that rivalries engage in violent conflict during that period of time with a set frequency (and in fact, there is no requirement for them to engage in violent conflict at all), and therefore strategic rivalries that last at least thirty years are not uniquely composed of states with great material capabilities.

There remain 26 strategic rivalries, nine of which are "consensus rivalries", that is, dyads that count as rivalries according to every classification of rivalries in the literature (Colaresi, Rasler and Thompson, 2007, Table 2.2): these 26 strategic rivalries in turn correspond to about 50 foreign policy time series. Out of these 52 foreign policy time series, 36 display volatility (about 72\%) , and 14 do not. Looking at it from the perspective of dyads rather than single states, out of 25 dyads, in 14 dyads both countries pursue a volatile foreign policy, in 8 dyads only one of the members does and finally in 3 dyads none of them does.

In the next chapter, I describe in detail the procedure I use to determine whether the foreign policy of a member of a dyad with respect to the other member is volatile.

### 2.5 Conclusions: Theoretical and Field Utility

What explains inconsistent shifts between cooperation and conflict in states' interactions? I explore this empirical question by looking at the determinants of volatility in international relations. In this chapter, I laid the groundwork to address this puzzle by providing a conceptualization of volatility in international politics as the inconsistent shifts in foreign policy between episodes of cooperation and episodes of conflict. Specifically, I proceed to demonstrate that the concept of volatility that I present here satisfies the criteria of conceptual goodness identified by Gerring (1999) (see Table 2.1).

In the next chapter, I show that volatility also meets two other criteria that Gerring (1999) presents. In Chapter II I show how the concept increases our understanding of the dynamics that characterize the international system, thus satisfying the criteria of field utility. In particular, I demonstrate in the next chapter that volatile relations are uniquely pivotal and uniquely dangerous. They are pivotal in the international system because volatility uniquely increases the likelihood that states will be both more involved in crises and in IOs. But these relations are also more dangerous, because volatility increases uncertainty and thus, conflict recurrence.

In Chapter III, I demonstrate that volatility also meets the criteria of theoretical utility, because it is a new heuristic that offers a different representation of foreign policy, not as a set of distinct episodes in time-wars, crisis, IOs institution, and so
on-but rather as a set of strategies, some cooperative and some conflictual, that states have at their disposal to pursue their objectives in the international arena. I then go on to presenting my theory of volatile behavior.
Table 2.1: Criteria of conceptual goodness for volatility Instance

| Criteria | Instance |  |
| :--- | :--- | :--- |
| Familiarity | Is the concept recognizable in the discipline? | Volatility used in other subfields |
| Resonance | Could it stick in the field? | Volatility used in common language |
| Parsimony | Is the list of defying attributes tight? | Volatility as change and inconsistency |
| Coherence | Is the meaning consistent? | Volatility operationalized as variance in time |
| Differentiation | Is it different from other concepts? | Volatility as distinct from current concepts |
| Depth | Is it informative? | Volatility as the defining characteristic of foreign policy |
| Theoretical Utility | Does it enrich our theories? | Volatility as providing a novel heuristic |
| Field Utility | Does it point to useful empirics? | (see Chapter IV) |
|  |  | Volatile relations as dangerous and pivotal |
|  |  |  |

Table 2.2: List of strategic rivalries

| Rivalry | Consensus Rivalry | Both Volatile | One Volatile | None |
| :---: | :---: | :---: | :---: | :---: |
| Afghanistan-Pakistan | X |  | X |  |
| Argentina-Chile | X | X |  |  |
| Cambodia-Thailand |  |  | X |  |
| China-India | X | X |  |  |
| China-South Korea |  | X |  |  |
| China-Phillippines |  |  |  | X |
| China-US | X |  | X |  |
| China-Japan | X |  | X |  |
| Cuba-US |  | X |  |  |
| Egypt-Israel | X |  | X |  |
| Greece-Turkey | X | X |  |  |
| India-Pakistan | X | X |  |  |
| Iraq-Israel |  |  | X |  |
| Iraq-Kuwait |  |  |  | X |
| Iraq-Saudi Arabia |  | X |  |  |
| Iraq-Turkey |  |  |  | X |
| Iraq-UK |  |  | X |  |
| Israel-Syria |  | X |  |  |
| Japan-South Korea |  | X |  |  |
| Jordan-Syria |  | X |  |  |
| North Korea-South Korea | X | X |  |  |
| North Korea-US |  | X |  |  |
| Peru-US |  |  | X |  |
| Russia-US |  | X |  |  |
| Syria-Turkey |  |  | X |  |
| Thailand-Vietnam |  | X |  |  |

## Chapter 3 : Measuring Volatility

The previous chapter offers a conceptualization of foreign policy volatility-which I define as the presence of inconsistent shifts between cooperation and conflict in the behavior of one country toward another. Therefore, this chapter describes the data I employ to measure foreign policy volatility.

In particular, I illustrate two aspects of the measuring of volatility. First, I present the data that I collect to gauge episodes of conflict and cooperation in the foreign policy of one country toward another. Second, I present the procedures that I employ to triangulate from different data sources. Thus, this chapter is divided as follows: in the first section, I discuss the data I employ-event data-describing the sources, the original data collection procedure I employ, as well as the advantages and drawbacks of the data. In the second section, I focus instead on the weights and methods I use to form coherent series out of data that come from multiple sources.

### 3.1 Measuring Volatility: Event Data

Event data record foreign policy interactions taking place between states, such as forming an alliance, requesting material help, recalling a diplomatic contingent
and so on. By distinguishing between different degrees of conflict and cooperation among states, event data help addressing the issue of heterogeneous zeroes present in many studies of conflict and cooperation. Consider the literature on rivalries that I describe in Chapter I: when looking at the non conflictual behavior that takes place within the rivalrous dyad, scholars fail to distinguish between the presence of peaceful interaction and the presence of no interaction at all, by coding conflict as " 1 " and everything else as " 0 ." In general, because they use an expanded list of categories aimed at capturing various facets of foreign policy, event data allow students of International Relations (IR) to paint a more complete picture of the dynamics at work in the international arena, be they conflictual or cooperative, than data that concentrate exclusively on disputes, crises, or even intergovernmental organizations do (Schrodt, 2012).

### 3.1.1 Advantages and Drawbacks of Using Event Data

Utilizing event data raises two main concerns. First, as King and Lowe $(2003,617)$ recognize, events data are imperfect because they rely on wire reports, newspapers and other journalistic accounts, and thus coverage is not uniform. A lot of the time nothing happens between states (King and Zeng, 2001): states go about their daily business without paying too much attention to each other, there is simply not much going on in the data. While the fact that there are periods of time where nothing really happens between states does not represent as big of a problem for
time series analysis as it does for logistic regression, it can still be addressed through sampling design as King and Zeng (2001) suggest, by focusing on dyads that have an actual history of frequent interactions. Thus, in this dissertation, I disregard dyads for which little data are available (see Chapter I, Table 2, for a list of the countries included in the analysis). ${ }^{1}$

Second, since newswires and journals are chosen as the source, then only what constitutes public information at the moment when the event takes place is coded: nothing is left on record of the secret meetings between states' representatives, or any secret agreements. Perhaps the most convincing example of how the information that constitutes public knowledge is but a fragment of what takes place in the international system is the wealth of secret diplomatic cables released by Wikileaks in 2011. Yet with respect to the issue of secrecy, it is important to distinguish between the issue of analyzing event data and the issue of understanding foreign policy. As for the issue of understanding foreign policy, it is clear that event data can be supplemented with archival resources or biographies and memoirs of the various actors involved to get a better understanding of the developments within the dyad. In this sense, event data's exclusive reliance on public information does not constitute a damning issue for doing research.

As for the issue of analyzing data, the fact that event data exclusively rely on public information represents an important asset of event data. Notice that secret and non secret events still respond to the same foreign policy agenda: for instance,

[^15]the US secret attempts to kill Fidel Castro were embedded in a larger, overt policy to obstruct the institution a Communist regime in Cuba. Yet, precisely because actors conduct some actions in secrecy, that is, under the assumption that their content will never be revealed to the public, they respond to different stimuli when engaging in those types of actions, as the literature on audience costs has demonstrated (Schultz, 2001; Slantchev, 2006; Tomz, 2007; Baum and Potter, 2008; Weeks, 2008). In technical terms, this entails that the data generating process that produces events that are kept secret is different from the one that produces data that are not kept secret. Thus, focusing exclusively on event that constitute public information guarantees to avoid an important source of heterogeneity in the data.

### 3.1.2 Multiple Sources for Event Data

I use multiple sources of data to build a time series of the relations between states from 1948 to 2009. Using different sources is common practice when building a data set, but in the case of time series, it is important to make sure that the different sources do not cause heterogeneity and / or discontinuities within a time series. Table 3.1 illustrates the differences across the features of the sources. Here, I explain how I derive time series from multiple, non overlapping sources. I describe each of them in the following subsections.

Table 3.1: Event Data Sources

|  | Ontology | Source | Time Period |
| :---: | :--- | :--- | :--- |
| Copdab | Copdab | Multiple | $1948-78$ |
| Weis | Weis | New York Times | $1966-1998$ |
| Tabari | CAMEO | Newswires | $1998-2009$ |

### 3.1.3 Original Data

For most of event data past 1992, I collect original data using the software for automated extraction of information TABARI (Schrodt, 2006). Event data collected through an automated system such as TABARI rely on a process of information extraction, that is, "a constrained form of natural language understanding in which only pre-specified information is acquired from textual data, often by filling a template "(King and Lowe, 2003, 638). There are two main components of the process of information extraction: an information extraction system and an ontology. An information extraction system is a software tool that is fed language (usually in the form of newsleads from newswires such as Reuteurs Business Briefing) and proceeds to parsing, analyzing and quantitatively summarizing the events described in such language. Currently, the most used information extraction tools are the Virtual Research Assistant Reader (VRA) and the Textual Analysis by Augmented Replacement Instructions (TABARI). The first one is proprietary, the second is open source and available from the website of the Kansas Event Data System (KEDS).

Both software tools work through an event ontology or protocol, a category typology that assigns a number to each event on a scale that ranks such events based on how cooperative or how conflictual they are. For instance, the Integrated Data
for Event Analysis (IDEA) ontology relies on 157 categories, comprising codes for military engagement, humanitarian aid and natural disaster (223, 073, 96). Different ontologies have been produced (see table 3.1), the most used being IDEA, WEIS and CAMEO. ${ }^{2}$ IDEA seems to be the most comprehensive, but translating between different ontology merely amounts to recoding a variable (the relations between IDEA and the other ontologies is described on the IDEA website and King and Lowe 2003, Table 1).

### 3.1.3.1 An Example

In this section, I illustrate an instance of coding event data through the information extraction software TABARI. Specifically, I use TABARI to code some of events going on in Egypt and involving Egypt and Israel in 2010. This activity involved several step. I retrieved newswires from the online database Lexis-Nexis, filtered them using PERL code, fed them to TABARI (which runs on TERMINAL exclusively on Mac OS X), together with the available dictionaries on actors and verbs, and collected the final product, a .txt document that can be readily imported in STATA or R with information on the actors involved, the action carried on and a number on the CAMEO ontology scale associated with each action.

The final file looks exactly like the two examples I report here: the coded record contains the data when the event takes place, the "source" (the state doing the ac-

[^16]tion), the "target" (the state affected by the action), the numeric code associated with a specific category in the ontology of interest and the exact snippet of the coded sentence that is used to assign the event to the specific category.

The White House Friday called on the new authorities in Egypt to honor existing peace agreements with Israel after the resignation of president Hosni Mubarak.

Coding: 110211 USAGOV EGY 20 (Make an appeal or request)

## CALLED ON EGYPT

### 3.1.4 Existing Data

To code events taking place between 1948 and 1992, I use several datasets.

- COPDAB (ICPSR study 7767, Azar, 1979): data are present for all states for interactions both across and within countries from 1948 to 1978. The data set assigns a scale to each event, from 1 (extremely cooperative act) to 15 (war). The dataset also reproduces the specific verb of the action it is coding and a brief description of the issue area involved (e.g., observation number 1187624 reports the signing of the Arusha Agreements by qualifying it as a foreign policy act of "political agreement" between Neatherland and Kenya and including other countries involved in the negotiations Tanzania, Uganda, and the European Community).This makes it easier to understand how the COPDAB coding compares to other sources.
- WEIS (ICPSR study 5211, McClelland, 1978): data are present for all states for interactions across countries from 1966 to 1978. Events are coded according to 16 categories (going from yielding to waging war) and many subcategories. For instance, Category 5, Promise, has the following subcategories: political support (51), material support (52), support in the future (53), continuation of ongoing support (54). The time frame is almost the same as for COPDAB data and although categories are more refined, there seems to be not much difference between the two data.
- LEVANT (Gerner, Schrodt and Yilmaz, 2009): event data coded via the CAMEO ontology for the countries in the Middle East, from April 1979 to December 2009. Events are coded in automated fashion, and the source is Reuters.
- CASIA: event data coded via the Weis ontology for the countries in Central Asia (including Afghanistan, Armenia, Azerbijan, Kazakstan, Kyrgistan, Tajikistan, Uzbekistan and Turkmenistan), from 1989 to 1999. Events are coded in automated fashion, and the source is Reuters Business Briefing.
- CHINA: event data coded via the Weis ontology for China and its neighboring countries, from 1989 to 1999. Events are coded in automated fashion, and the source is Reuters Business Briefing.
- INDIA: event data coded via the Weis ontology for India and its neighboring countries, from 1987 to 1997.Events are coded in automated fashion, and the source is Reuters Business Briefing.
- GULF: event data coded via the Weis ontology for the Gulf Region, from April 1979 to April 1999. Events are coded in automated fashion from Nexis-Lexis and Reuters.
- TURKEY: event data coded via the CAMEO coding scheme for Turkey and its neighboring countries for the period 3 January 1992 to 31 July 2006 . Events are coded in automated fashion from Nexis-Lexis and Agence France Press. ${ }^{3}$

I describe the procedures I use to create a time series from these different sources in the remaining part of the chapter. Event ontologies for COPDAB and Weis are available through their respective codebooks. I report the CAMEO event ontology in the Appendix .

### 3.1.5 A Note on Scaling

When reading newswire feeds, it is necessary to categorize each event as an instance of broader categories of events, such as, for example, expressing the intent

[^17]of cooperating militarily, attacking with the military and so on. This creates nominal level data. Scaling these data consist of going one step forward and actually creating a continuum of cooperation and conflict, and assesses how cooperative or conflictual each event is. In this dissertation, I scale the event data from the different sources with the Goldstein (1992) scale. This is the most widely used scale for Weis data (Schrodt, 2007, 4) and ranks all the categories in the Weis dataset on a continuum from most conflictual (-10) to most cooperative (10). ${ }^{4}$ For instance, the Weis category "to apologize" is weighted as 2.0, because it is considered to be twice as cooperative as "to ask for clarification", which instead is weighted as 1.0 on the scale. The advantages of scaling event data are multiple. First, scaling allows to use interval level methods on nominal level data (Schrodt, 2007, 4). Second, scaling makes it possible to take into consideration the substantial differences in the degrees of cooperation and conflict that each foreign policy events present, as the example makes clear.

The issue of scaling is a controversial one in the field of event data. Ultimately, scaling allows to use interval level methods on nominal level data (Schrodt, 2007, 4). Scaling these data consist of going one step forward and actually creating a continuum of cooperation and conflict, and assessing how cooperative or conflictual each event is. For instance, expressing the intent of cooperating economically acquires the value of 5.2 on the scale, which means that it is considered to be is half as cooperative a gesture than retreating militarily (10 on the scale). Much of the

[^18]controversy revolves around the question: who is to decide how cooperative or conflictual an event is? Or, in other words, how to create credible scales?

Goldstein (1992) gathers a panel of experts and calculates the mean values of the value proposed by those eight experts (all Goldstein's fellow assistant professors at USC). This is the most widely used scale for Weis data (Schrodt, 2007, 4). The alternative to the use of scales is event counts: in the Duvall and Thompson most widely used category based typology, there are four categories: verbal conflict, material conflict, verbal cooperation and material cooperation.

Yet scaled data is to be preferred to its alternative, event counts, for three reasons. First, the task of scaling event is not that far removed from the task of categorizing an event. In other words, deciding that an event constitutes an instance of expressing one's intent of cooperating militarily entails an exercise of abstraction that requires no smaller of a judging call than declaring that expressing the intent of cooperating is half as cooperative a gesture as retreating militarily. The task of linking empirical phenomena to higher conceptual categories is indeed a quintessential task in research. In other words, creating a four category event count is in no way less arbitrary than creating a scale. In practice, it amounts to scaling a set of categories as being equally cooperative: to use the example provided above, the Weis category "to apologize" would be considered equivalent to the Weis category "to ask for clarification". So, using event counts does not spare the researcher from scaling data, it simply forces them to scale all the events in the verbal cooperation
categories as the same.
Second, it is (computationally) easy to experiment with different scales to assess the degree to which results are affected by scaling choices. In this sense, scaling is as systematic and replicable, and can be done as quickly and inexpensively, as any automated system of scaling (see Schrodt, 2007, 6).

Third, the advantages of scaling events over the alternative, event counts, are substantial: using those four categories requires reducing dramatically the degree to which our data reflects the empirical variation. This is the case because there the procedure of cramming together all instances of verbal cooperation, for instance, amounts to putting in the same category the intent to cooperate militarily and making an optimistic comment about the interaction between states.

Thus, I opt for scaled data over event count data.

### 3.2 Measuring Volatility: Weights and Scales

To measure the degree to which a foreign policy is volatile, it is important to capture inconsistent shifts between cooperation and conflict through time, Therefore, I need to build time series for the relation between dyads—pairs—of states. To do so, I will have to merge multiple data sets. Up to 1978, I rely on a data set readily available (Copdab data set). After 1979, depending on the countries I analyze, I expand on existing data sets by both collecting my own data and merging the pre 1978 data with other, existing data (Weis data set). The pre-1978 (Copdab) and the post-1978
(Weis) data sets differ in terms of:

- Procedures applied for coding (human coders vs machine coding)
- Sources of the data (newsfeeds such as Reuters and Associated Press, or historical accounts of the pages of the New York Times)
- Scales (i.e., how conflictual or cooperative each foreign policy action is deemed to be)
- Time period covered (obviously)

In order not to compromise my inference, I need to make sure that there is no systematic difference between data collected pre 1979 and post 1979.

Specifically, there are two issues arising:

1. Making sure that on average, every time a specific foreign policy event occurs, the two data sets (Copdab for pre 78 and Weis for post 78) are equally likely to capture it. In other words, if event A (say amassing troops on some state's border) happens pre or post 78, it should be equally likely to appear in both data sets.
2. Making sure that throughout the whole period (1948 till 2010), the two data sets (pre 79 and post 79) code events consistently. In other words, if event A (say, again, amassing troops on some state's border) is weighted as being
twice as conflictual as event B (say, recalling diplomats from another country), it should be so for both data sets.

Events data rely on the process of information extraction, that is, "a constrained form of natural language understanding in which only pre-specified information is acquired from textual data, often by filling a template "(King and Lowe, 2003, 638). There are two main components of the process of information extraction, an information extraction system and an ontology. An information extraction system is a software tool that is fed language (usually in the form of newsleads from newswires such as Reuteurs Business Briefing) and proceeds to parsing, analyzing and quantitatively summarizing the events described in such language. Currently, the most used information extraction tool is the Textual Analysis by Augmented Replacement Instructions (TABARI). ${ }^{5}$ For data up to 1992, I don't need to use this information extraction tool, because I can rely on existing data sets, Weis (19661992) and Copdab (1948-1978).

Both the data available through Copdab and Weis and the data I am collecting with TABARI rely on an event ontology or protocol, a category typology that assigns a number to each event. Each category is then weighted and ranked on the basis of how cooperative or conflictual they are.

For instance, consider the two events below:

The White House Friday called on the new authorities in Egypt to honor

[^19]existing peace agreements with Israel after the resignation of president Hosni Mubarak. Coding: 110211 USAGOV EGY 20 (Make an appeal or request) CALLED ON EGYPT

```
US intelligence officials faced tough questions from lawmakers Wednesday
    over Egypt's Muslim
    Brotherhood, acknowledging they are unsure of the opposition
    group's views and goals
Coding: 110217 EGYREBMBR USASPY 90 (Investigate)
US INTELLIGENCE QUESTIONS FROM EGYPT'S MUSLIM
```

The first event, in the CAMEO ontology, belongs to category 020, and is weighted as a 3 on the scale that captures cooperation between -10 to 10 . The second event belongs to the category 090, and is weighted as a -2 instead (see Appendix for a sample of the CAMEO ontology and the Weis scale values associated with it).

The data that I have to stitch together for my dissertation differ both in terms of the categories (or ontologies) they utilize and of the scales they apply to those categories.

### 3.2.1 Task 1: How Similar Are the Series?

While the Copdab data set extends from 1948 till 1978, the Weis data stretch from 1966 to 1992. There is thus an overlap of twelve years that is crucial to accomplish the first task, namely, making sure that, if the same event takes place, the two data sets are equally likely to capture it.

Reuveny and Kang $(1996,290)$ propose to look at the years where the two data sets actually overlap (there is in fact a 12 year overlap between the data sets I need to merge, between 1966 and 1978) and create for those years two data sets two time series. So, there would be two weekly (or even quarterly) time series for events taking place between two countries, one coming from the data set that extends from 1948 to 1978 and the other coming from the data set that extends from 1966 on to 2010. On those two time series, Reuveny and Kang (1996) propose to apply the following procedure:

1. From the pre 1978 and post 1978 data set, only select the overlapping observations (1966-78) and form weekly time series from them
2. Check for unit roots, to make sure the series are stationary. If it is not stationary, difference the series.
3. Run a simple correlation, to get an estimate between -1 and 1 of how the variables are correlated, irrespective of the autocorrelations in the series
4. Look at whether the series from the two data sets have similar ACF and PACF
5. regress one on the other and estimate $\beta$ (splicing the series). Then, use the $\beta$ to transform all the observations in the data set for the years 1948 to 1978 into a format that is compatible with the observations post 1978, and then create the full time series from 1948 till 2010.

Building on Reuveny and Kang (1996), I apply the following procedure, and I will illustrate it with an example-dyadic interaction between Israel and Egypt.

### 3.2.1.1 Plot the series first

Figure 1 represents the weekly time series for foreign policy action carried on by Israel towards Egypt (on the left) and the ones carried on by Egypt towards Israel (to the right) between 1966 and 1978, the time span when Copdab data (which expands back to 1948) and Weis data (which expands forward to 2000) overlap. Grey lines represent cooperation, black ones conflict.

The data sets seem to similarly capture a spike in cooperation around 1974 from Israel to Egypt (graphs to the left) and from Egypt to Israel (graph to the right). Clearly, however, the two data sets scale cooperation and conflict differently, as appears from the $y$ axis in the figures, with the Copdab data set weighting acts of cooperation very heavily compared to conflictual ones.


Figure 3.1: Foreign Policy Actions, Israel towards Egypt and Egypt towards Israel.

### 3.2.2 Checking for unit roots

Next on, I will check for unit roots, to make sure the series are stationary. If the series is stationary, then it means that "the joint distribution of any set of observations must be unaffected by shifting all the times of observation forward or backward by any integer $k$. ." (Box, Jenkins and Reinsel, 1970, 24). This means that a change of time origin has no consequences on the properties of the series. So, controlling for stationarity before investigating the properties of a series is key to make sure that in fact, whatever the properties are, they hold throughout the series. Which also mean here that the auto covariance between, for instance $z$ and $z_{t-2}$ is the same, no matter which $z$ I look at (Box, Jenkins and Reinsel, 1970, 26).

It is fundamental to control first for stationarity: the presence of stationarity implies that the mean and variance are constant over time and the auto covariance
only depends on the lag (Cowpertwait, Metcalfe and Metcalfe, 2009, 121), so this is a fundamental step to compare the effects of lags across series.


Figure 3.2: ACF and PACF for both Copdab and Weis data.

Figure 2 focuses just on the foreign policy actions from Israel towards Egypt, looking exclusively at cooperation (the series represented by the black line in Figure 1), plotting the ACF and PACF with 8 lags (so, 2 months). For both the Copdab (top) and the Weis (bottom), the persistence in the ACF graph hints at the presence of integration in the series. More in general, comparing the top and the bottom graphs (ACF to the left and PACF to the right), it is possible to detect similar patterns of time dependence.

### 3.2.2.1 Differentiate the series

Since the series of both cooperation and conflict from Israel to Egypt seem to be integrated, I differentiate them and plot the ACF and PACF again, in Figure 3. Looking at the ACF graphs, it seems possible to conclude that once the series is differentiated, we don't need to worry about it being integrated anymore. Moreover, focusing on the PACF, both the cooperation and the conflict series seem to be characterized by a MA process.

Comparing the ACF and PACF of the series is crucial. If, indeed, events that happen should have the same likelihood to appear in both data set, then I should be able to seen similar pattern of time dependency in the two series (because the two series would contain the same events, and should be equally likely to capture events as they happen in the real world).


Figure 3.3: ACF and PACF for both Copdab and Weis data.

### 3.2.2.2 Find the appropriate ARIMA model

While Figure 4 seems to show similar time dependency pattern in cooperation (and conflict) from Israel to Egypt when cooperation is measured using the Copdab and the Weis data set, it is important to go beyond the eyeball test and find the appropriate ARIMA model. I use the Box-Jenkins methodology and compare different model specifications on the basis of both (1) their AIC and (2) the pattern of significance of their coefficients to find the most appropriate model.

|  | Isr-Egy |  | Egy-Isr |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Cooperation | Conflict | Cooperation | Conflict |
| Weis | ARIMA(0,0,4) | ARIMA(0,0,2) | ARIMA(0,0,3) | ARIMA(0,0,3) |
| Copdab | ARIMA(0,0,3) | ARIMA(0,0,4) | ARIMA(0,0,4) | ARIMA(0,0,3) |

In the table, I report the ARIMA specification that fits each time series best. It appears as though the Copdab and the Weis series are indeed capturing similar processes, with some slight differences. For instance, cooperation from Israel to Egypt (first column from the left) is an MA process, with 4 lags in the case of Copdab and 3 in the case of Weis. In general, however, there seems to be a medium term. So, shocks in the differentiated series only persist for $q$ time periods, and then they disappear. In Figure 5, I plot the Residuals for the time series on cooperation and on conflict initiated from Israel towards Egypt, to show that the residuals after specifying the correct ARIMA model are actually white noise.


Figure 3.4: ACF and PACF for both Copdab and Weis data.

### 3.2.2.3 Regress the series

So far, I have been looking at the Copdab and Weis series and try to answer the question of whether every time a specific foreign policy event occurs, the two data sets (Copdab for pre 78 and Weis for post 78) are equally likely to capture it. I answer this
question positively by

1. Comparing a plot of the two time series: do they seem to describe similar patterns of cooperation and conflict?
2. plotting their ACF and PACF: is there a similar pattern of time dependency in the series?
3. Specifying the appropriate ARIMA model: again, is there a similar pattern of time dependency in the series created by the two different data sets?

However, the issue remains: are similar foreign policy issues weighted similarly in the different datasets?

### 3.2.3 Task 2: Weighting the Series

The second task entails making sure that similar series actually weight the same foreign policy event in a comparable manner. Clearly, this represents an important component of stitching the two series: a method should be devised so that the transition from one to the other is as seamless as possible.

To accomplish this task, I explore three options.

### 3.2.3.1 Method 1: Splicing the Data

Reuveny and Kang $(1996,290)$ propose to look at the years where the two data sets actually overlap and create for those years two data sets two time series. Then, they propose to regress the Weis time series on the Copdab time series and estimate a coefficient $\beta$ (splicing the series).

$$
\beta=\frac{\operatorname{Cov}(C o p d a b, W e i s)}{\operatorname{Var}(C o p d a b)}
$$

The idea behind splicing is that the estimate of the ratio of the covariance of the two series over the variance of the Copdab series will provide with the best method to seamlessly convert the two data series.

Colaresi $(2004,560)$, building on this procedure, proposes to create fitted values, by using the intercept and the coefficient from this bivariate model to transform the Copdab coefficients from 1948 till 1966 into Weis-like event scores. Given that these are time series, both the dependent variable and the dependent variable are going to be characterized by the presence of autocorrelation. OLS coefficients, however,
while inefficient, will still be unbiased (and consistent).

$$
\widehat{\text { Copdab }}_{48-78}=\beta_{0}+\beta_{1} \text { Copdab }_{48-78}
$$

I provide an example of the Reuveny and $\operatorname{Kang}(1996,290)$ and Colaresi (2004) approach and regress the residuals from the ARIMA model of the Copdab time series on the residuals from the ARIMA model of the Weis one, to get a coefficient. If the model is correct, the residuals should be white noise. I report my results in the table.

|  | Isr-Egy |  | Egy-Isr |  |
| ---: | :---: | :---: | :---: | :---: |
|  | Cooperation | Conflict | Cooperation | Conflict |
| Coefficient | -3.42 | $-2.08^{* *}$ | -2.98 | 0.086 |
| St.Er. | 2.31 | 0.131 | 2.41 | 0.071 |
| B-G test | 3.61 | 3.68 | 12.43 | $16.11^{* *}$ |

I also perform a Breusch-Godfrey test for serial correlation. The lack of statistical significance of most of the coefficients is usually an indicator of the possible presence of autocorrelation, and in fact only in one case do I reject the null of the presence of autocorrelation in the coefficients. I don't correct for autocorrelation because I only need the coefficients to use as weights for the series. In the presence of autocorrelation, coefficient estimates are unbiased, consistent and inefficient.

Once I get the coefficients, I use them as "weights": in other words, I multiply the Copdab series by the absolute value coefficients all the way back to 1948, and I
then merge the series so obtained with the Weis data series.


Figure 3.5: The new, scaled Cobdab series (black lines) and the old one (gray lines).

Thus, at this point, one would use the coefficients so obtained to weight all the Copdab observations between 1948 and 1978, and then create a time series that goes
all the way from 1948 till 2009.

### 3.2.3.2 Method 2: Latent Variable Approach

Another possible approach is the one based on Bayesian inference for latent variables. This would entail positing that there exist a true, yet latent, level of cooperation or conflict between dyads $\xi$, and we can only observe some indicators y of it through time.

Jackman (2005) uses this approach to compare the outcome of public opinion polls in the eve of Australian elections. The latent variable $\xi$ here is proportion of the electorate that supports a certain party. The polls have two sources of error: the sampling error $\epsilon_{t}$ and what he calls house effects, time-invariant biases specific to each survey house. The model specified is (Jackman, 2009, 473):

$$
\mathrm{y}_{t}=F_{t} \xi_{t}+W_{t} \delta+\epsilon_{t}
$$

The equation posits that the observed value $y_{t}$, in this case the percentage of the polled electorate that supports a certain party, is a function of the latent variable $\xi$, the specific house administering the poll $W_{t}$ and the sampling error $\epsilon_{t}$. The parameter of interest is $\delta$, which estimates the bias of each house administering the poll. Figure 2 represents the fitted value from equation (3), and the data points from the various polls through time (listed in the legend).

The idea of calculating the bias of the Weis or Copdab data sets is very appealing, in that it would allow to weight both series by their bias and it relies on a well known procedure. But the biggest obstacle to applying this method to the study


Figure 3.6: Replication of Figure 6 in Jackman (2005). "Estimated Coalition share of first preference vote intentions and pointwise $95 \%$ confidence intervals. Individual polls are represented with a plotted point at their respective point estimates." (p 512)
of event data is that, in order to estimate those biases, it is necessary to specify the latent variable $\xi$ itself, which in this case Jackman $(2005,509)$ identifies as the percentage of votes actually achieved by the party in election day:

This is an important constraint; without being able to anchor the estimated levels of Coalition support to the actual election outcome, the model unravels, it being impossible to simultaneously estimate underlying levels of support for the Coalition and house effects. (Jackman, $2005,509)$

What would be the true value of the latent variable for conflict or cooperation between countries? Numbers of trade treaties? Number of MIDs? There seems to be no obvious candidate.

### 3.2.3.3 Method 3: Item Response Theory

Schrodt (2007) uses Item Response Theory (IRT) to accomplish two tasks: comparing data gathered through two different newswire agencies (Reuters and Agence France Press)and inductively creating a scale that would constitute an alternative to the Goldstein (1992) scale for Weis tailored to each dyad. The basic logic is explained as:

In the IRT model, the probability of an event being reported in an interval of time for a particular dyad (for example Israel and Lebanon) and news source is modeled as a logistic function on a unobserved latent trait. The score on this trait can then be computed as a function of these probabilities, with rare events indicating that a higher score on the latent trait than common events (Schrodt, 2007, 3).

The algorithm employed is the following:

$$
\operatorname{Pr}(\mathrm{Y}=1)=1 \overline{1+e^{\alpha_{i}\left(\theta-\beta_{i}\right)}}
$$

where the probability of getting the correct answer $\operatorname{Pr}(\mathrm{Y})$ is a function of a latent variable $\theta$, of the difficulty of the question $\beta_{i}$, and the degree of discrimination for a specific question $\alpha_{i}$, that is, the transition between a correct or incorrect answer. Here, the equivalent of the "questions" are the 20 categories of event. The difficulty is measured in terms of frequency: the most frequent an event category is, the least difficult it is considered. Each news sources would have different values of $\alpha_{i}, \beta_{i}$ and associated with them, depending on the likelihood of generating
events of a particular type: the rarest the event, the most difficult to generate it will be considered.

This attempt seems to be successful, but the scales so produced do not seem to constitute a substantial improvement on Goldstein (1992) scale for Weis (Schrodt, 2007, 22). The technique seems to be less useful to reconcile different news sources, and a " fundamental problem lies in the inductive character of the estimation, and the assumption that common events are "easy" and hence less important" while "the expert weighting of the Goldstein scale, in contrast, takes into account the fact that globally, force events are relatively rare, and consequently receive a high weight" (Schrodt, 2007, 24).

Another assumption of the IRT model that seems to be problematic is the Guttman scale structure assumption, whereupon if an event is harder to catch (or more latent) than another, it will also be less likely. In particular, as conflict becomes more and more likely, and thus easier to catch, then cooperation might become less and less likely, thus harder to catch (Schrodt, 2007, 25) .

### 3.2.3.4 Method 4: Converting the Scale Directly

One final, and perhaps the most straightforward way, to deal with this issue seems to be the more straightforward is simply to take the "raw" categories in the Copdab data set (the data set stretching from 1948 to 1978) and convert it to Goldstein (1992) scale for Weis data, so as to create a seamless transition from the pre to the post 1978 data. This is the equivalent of what Phil Schrodt did for the CAMEO ontology he
devised. He simply associated each category to a value in the Goldstein (1992) scale for Weis data (see Appendix).

### 3.2.3.5 An Argument in Favor of Method 4

Ito apply Method 4, and simply use the Goldstein (1992) scale for Weis data on Copdab data. Method 4 is the most direct one. The advantages of this method are several. Unlike Method 2 and 3, it does not have to rely on assumptions or data requirements (such as knowing the latent variable $\xi$ or abiding by the Guttman scale assumption). And unlike Method 3, it avoids smoothing the data too much.

In Figure 2, I represent the stitched series for foreign policy actions carried out by the USSR towards the US from 1948 till 1989, distinguishing between cooperative and conflictual acts. The top row reports the series stitched according to Method 4, and the bottom row represents the series stitched with Method 1 (splicing the data).

Analyzing the four time series obtained with the different methodologies, the features that they exhibit are similar (in terms of stationarity and fractional integration), yet, when tested for structural breaks, the spliced data do not present any break pre 1978, only after 1978. Since the 1978 data are the ones obtained from the fitted values, it appears clearly that splicing the data might be smoothing them excessively, and in so doing it introduces heterogeneity between pre and post 1978 data. Similarly, a comparison of the RMSE values for spliced and simply weighed series confirms the fact that simply weighing the series does a better job at guaranteeing
a seamless transaction from one data source to the other.


Figure 3.7: Foreign Policy Actions, stitched with Method 4 (top row) and Method 1 (bottom row).

### 3.3 Conclusions

In the previous chapter, I defined volatile foreign policy behavior as the presence of inconsistent shifts between cooperation and conflict in the foreign policy behavior of one country toward another. In this chapter, I describe the procedure put in place in order to measure those inconsistent shifts between cooperation and conflict in the international system. First, I describe the sources and the software through which I collect the data; second, I compare different methods used to derive a coherent time series of a country's foreign policy actions from multiple event data sources, explaining why I choose one over the other.

While these first two chapters address an important question-namely, what is volatility, and how can it be measured?-the issue of relevance is still left unanswered. In other words, why is it important to study volatile behavior? What is it to be gained, empirically and theoretically, from an investigation of volatility in foreign policy? The next chapter focuses precisely on these questions.

## Chapter 4 : Why Volatility Matters

In Chapter I, I introduced the concept of volatility by defining it as a characteristic of those international relations that shift inconsistently between episodes of conflict and episodes of cooperation. I demonstrated that the concept so defined satisfies several of the criteria of goodness identified by Gerring (1999) (see Chapter I, Table 1). In Chapter II, I delved more in depth on issues of measurement and data collection. Yet, the analysis presented in Chapters I and II leaves an important question unanswered: does studying volatility matter? In other words, does investigating the presence of volatile behavior in the international system help us learning something about how interactions in the international system work?

In this chapter, I demonstrate that in fact the study of volatility uncovers important dynamics in the international system, and therefore this conceptual construct satisfies the criterion of field utility as presented by Gerring (1999). Specifically, I demonstrate that volatility is a consequential concept in the study of the international arena by presenting empirical evidence that volatile relations are both dangerous-in that volatility in the interactions between states catalyzes uncertainty—and pivotal—in that volatile dyads are more likely to engage in those kinds of behavior that are at the heart of many studies of IR.

Therefore, this chapter is divided in two sections. The first section investigates the connection between volatility and uncertainty. I argue that volatility catalyzes uncertainty in the international system because states that have volatile relations cannot form consistent expectations as to what the behavior of the counterpart in specific situations might be. I test my argument by using volatility as a predictor of variance in a heteroskedastic model of crisis recurrence. The second section demonstrates that volatile relations are pivotal relations: precisely because they shift inconsistently between cooperation and conflict, dyads that display volatility in their interaction will be at the centre of many of the foreign policy behaviors of great interest, such as joining International Organizations (IOs) and initiating crises. I test my argument by using volatility as a predictor of both IOs membership and crisis initiation in a bivariate probit model.

### 4.1 Volatility as a Predictor of Uncertainty

If the relations between two countries are volatile, this means that they will shift inconsistently between cooperation and conflict. Precisely because volatile relations are bound to change, and to do so in an inconsistent manner, I argue that volatility will catalyze uncertainty in the relation between states. The mechanism that I posit is one of (lack of) learning: volatility catalyzes uncertainty because the inconsistent shifts between cooperation and conflict make it impossible for countries to form consistent expectations on-that is, to learn about-the behavior of the counter-
parts. For instance, in May 2014 the Indian Prime Minister, in discussing ways in which to promote trade ties between the two countries, urged his Pakistani counterpart to guarantee that there would be no government-supported Pakistani attacks on Indian soil. ${ }^{1}$ The exhortation of the prime minister reflected the frequent, if unpredictable, disruptions caused to the trade talks between India and Pakistan by the allegedly Pakistan-sponsored terrorist attacks in Indian soil-for instance, the Mumbai attacks of 2008, which brought to a dramatic halt the Composite Dialogue to expand the MFN principle between the two nations. ${ }^{2}$

This leads to the following hypothesis:

## Hypothesis 1

Volatility in the relations between states increase uncertainty between dyad members.

It could also be the case, however, that greater volatility is correlated instead with less uncertainty. For instance, it could be argued that volatile relations, precisely because characterized by inconsistent shifts between conflict and cooperation through time, decrease the level of uncertainty between states. So, to keep with our example, it could be the case that Indian leaders in 2014 can easily anticipate that trade talks with their Pakistani counterparts will be derailed by terrorist attacks allegedly sponsored by the Pakistani government. In other words, volatility could

[^20]become a habit (Hopf, 2010) to states, and push them toward less uncertain relations. Thus:

## Hypothesis 2

Volatility in the relations between states decreases uncertainty between dyad members.

### 4.1.1 Research Design and Model

To test for the link between volatility and uncertainty, I focus on uncertainty over crisis recurrence. Uncertainty over conflict recurrence is of particular interest because the presence of such uncertainty has been linked by researchers to conflict: in other words, uncertainty is a consequential outcome of volatility, because uncertainty is the catalyzer of one of the most studied events in IR: international conflict. ${ }^{3}$

To determine whether volatility is a predictor of uncertainty over conflict recurrence, I test for whether the presence of volatile dyads among crisis actors is positively correlated with uncertainty over crisis recurrence. ${ }^{4}$

To model the effects of volatility on uncertainty, I build on the correspondence between uncertainty over outcomes and variance in their probability distribution that has been established, among others, by Maoz (1990, 110-111) and Huth, Ben-

[^21]nett and Gelpi $(1992,481)$. The idea informing these approaches is to distinguish between the risk and the uncertainty of an event happening. The risk of an event is the probability attached to that event. The uncertainty, or ambiguity, is instead the range of the values that the probability can take. For instance, the risk of event A happening can be estimated to be $90 \%$, but the uncertainty can be $5 \%$-thus constituting a probability range for that event going from $85 \%$ to $95 \%$. One can then estimate an event $B$ as displaying the same risk of happening as event $A$-that is, $90 \%$-but being more (or less) uncertain—for instance, uncertainty could be estimated at $10 \%$ (or 2\%) (Curley and Yates, 1985). ${ }^{5}$

Thus, empirically, the risk associated with an event taking place is then measured as the predicted probability of that event taking place, and the uncertainty as the variance registered around those predicted probabilities. Specifically, to model predictors of risk and predictors of uncertainty separately, I follow Reed (2003) and Mattiacci and Braumoeller (2012) and I use an heteroskedastic probit model (Alvarez and Brehm, 1995), a probit in which the error variance is not fixed to unity but rather is assumed to vary in systematic ways.

[^22]
### 4.1.2 The Heteroskedastic Probit Model

The heteroskedastic probit distinguishes between two kinds of predictors: those that affect changes in the mean of the probability distribution of the dependent variable $\left(\mathbf{x}_{\mathbf{i}}\right)$ and those that produce change in its variance $\left(\mathbf{z}_{\mathbf{i}}\right)$. The likelihood function of the heteroskedastic probit model is:

$$
\begin{equation*}
\ln L(\hat{\beta}, \hat{\gamma} \mid Y)=\sum_{y_{i}=1}^{N} y_{i} \ln \Phi\left(\frac{\mathbf{x}_{\mathbf{i}} \beta}{\exp \left(\mathbf{z}_{\mathbf{i}} \gamma\right)}\right)+\left(1-y_{i}\right) \ln \left[1-\Phi\left(\frac{\mathbf{x}_{\mathbf{i}} \beta}{\exp \left(\mathbf{z}_{\mathbf{i}} \gamma\right)}\right)\right] \tag{4.1}
\end{equation*}
$$

To test whether volatility increases uncertainty, I model the variance of the distribution of the independent variable as a function of whether actors in the crisis have volatile foreign policies towards each other. The advantage of using the heteroskedastic probit instead of a regular probit to model the determinants of uncertainty is that the model allows to keep the predictors of uncertainty $\mathbf{z}_{\mathbf{i}}$-that is, of the variance- distinct from the predictors $\mathbf{x}_{\mathbf{i}}$ of the occurrence of the event of interestthat is, of the mean of the distribution of the dependent variable.

The difference between a regular probit and a heteroskedastic probit emerges more clearly in the predicted probabilities. For the probit model, the predicted probability of witnessing the outcome of interest is:

$$
\begin{equation*}
\operatorname{Pr}\left(y_{i}=1\right)=\Phi\left(\mathbf{x}_{\mathbf{i}} \beta\right) \tag{4.2}
\end{equation*}
$$

By contrast, in the heteroskedastic probit model we relax the assumption that $\sigma$ is constant and equal to 1 :

$$
\begin{equation*}
\operatorname{Pr}\left(y_{i}=1\right)=\Phi\left(\frac{\mathbf{x}_{\mathbf{i}} \beta}{\exp \left(\mathbf{z}_{\mathbf{i}} \gamma\right)}\right) \tag{4.3}
\end{equation*}
$$

Thus, in the heteroskedastic probit, the effects of the predictors of the mean $\mathbf{x}_{\mathbf{i}}$ as well as of the predictors of the variance $\mathbf{z}_{\mathbf{i}}$ on the dependent variable, are both reflected in the predicted probabilities. By keeping the predictors of the mean distinct from the predictors of the variance, however, the model allows the researcher to disentangle the different effects of the two, and to model variance and mean as a function of different variables. Therefore, to test whether the presence of volatile dyads amongst crisis actors is positively correlated with uncertainty over crisis recurrence, I estimate a heteroskedastic probit and utilize volatility as a predictor of variance.

### 4.1.3 Data and Variables

Data: I utilize data on international crises from the International Crisis Behavior (ICB) dataset. The dataset comprises all events that meet three conditions: "a threat to one or more basic values, an awareness of finite time for response to the value threatened and a heightened probability of involvement in military hostilities" (Brecher and Wilkenfeld, 1997, 3). I select crises that are triggered on or after
1945. Data are available for crises developing up to 2007 , however, since the dependent variable focuses on whether crises recur five years after they ended, the dataset contains no information as to whether crises that end in 2003 have resumed or not. Therefore, I limit my data to crises ending in 2002,

Independent Variables: The variable Rivalry is a dummy variable for whether the crisis involves at least one dyad that constitutes a strategic rivalry in the definition of Thompson (2001) for thirty years or more, starting from 1948, as listed in Table 2 in Chapter 1. ${ }^{6}$ The variable Both Volatile is a dummy variable that is equal to 1 if among the crisis actors there is at least one strategic rivalry in which both countries display volatile foreign policies towards their counterpart, and 0 otherwise. The variable One Volatile is also dichotomous, but it acquires the value one if only one of the members of the dyad has volatile foreign policies towards their counterpart, but not both, and zero otherwise. Crises where at least one rivalry is involved constitute $30 \%$ of the sample. Crises where at least one of the rivalries has both members of the dyad displaying volatile relations constitute $22 \%$ of the sample. Finally, crises where at least one of the rivalries has only one member of the dyad displaying volatile relations constitute $10 \%$ of the sample. ${ }^{7}$

[^23]Dependent Variable: the variable Outcome of Crisis is a dummy variable for whether the crisis recurs in the five years following the end of the crisis. $41 \%$ percent of the 286 crises analyzed recur after five years.

Controls: I control for both the characteristics of the crisis and the characteristics of its outcome. Thus, the variable Issues codes how many distinct issues were at stake between adversaries during the crisis.The variable Super Power Role codes the combined US and USSR involvement in the crisis, ranging from no involvement at all (0) to both actors being crisis actors (5). The variable Crisis Severity reports the intensity of the violence registered in each crises, ranging from no violence (0) to full scale war (4). The variable Crisis Gravity is an ordinal variable that codes the importance of the issues at stake, ranging from economic threat to threat to existence. To control for indicators of how the crisis ends, I include two variables, Satisfaction and Outcome. The variable Satisfaction is an ordinal variable that assumes values between zero and five to code the extent to which the actors involved in the crisis were satisfied with the outcome, while the variable Outcome is a dummy for whether a formal agreement was signed at the end of a crisis or not.

### 4.1.4 Results and Analysis

Table 4.1 reports the results from the analysis. I test two distinct specifications of the model. In Model I I investigate a scenario where the risk of a crisis recurring is a
function of the crisis involving at least one strategic rivalry, and the uncertainty connected to recurrence is a function instead of the crisis involving at least one strategic rivalry with one or both members of that rivalry displaying volatility in the foreign policies towards the other member of the rivalrous dyad. Conversely, in Model II, I investigate the opposite scenario: the risk of a crisis recurring is a function of the crisis involving at least one strategic rivalry with one or both members of that rivalry displaying volatility in the foreign policies towards the other member of the rivalrous dyad, and the uncertainty connected to recurrence as a function instead of the crisis involving at least one strategic rivalry. Therefore, to test whether volatility has an impact on uncertainty, in Model I I use Both Volatile and One Volatile as predictors of the variance. I then control for whether volatility is instead a predictor of the probability of crisis recurrence in Model II, by using Both Volatile and One Volatile as predictors of the mean.

For both Model I and Model II, the likelihood-ratio test demonstrates that an heteroskedastic probit is to be preferred to a simple probit-that is, a probit that has the same specification as the heteroskedastic probit, but that models the variance as uniformly equal to one across the sample. Substantively, this result indicates that the process of conflict recurrence displays heterogeneity.

Results, however, differ across the two models. In Model I, Both Volatile and One Volatile are both significant predictors of the variance. Substantively, this result indicates that volatility is a significant predictor of uncertainty. Yet. as illustrated in

Model II, Both Volatile and One Volatile are not significant predictors of the mean in the recurrence model. Taken together, these results indicate that volatility impacts the uncertainty related to crisis recurrence, rather than the actual risk that the crisis recurs.

Conversely, the presence of at least one rivalry among the actors in a crisis is not a significant predictor of uncertainty-as indicated by the coefficient for Rivalry in Model II—nor it is a significant predictor of the recurrence of the crisis itself ( $p=0.141$ ). The lack of statistical significance for the coefficient for Rivalry in the mean predictor model might seem puzzling: even though the concept of strategic rivalries does not require that members in a dyad engage in violent behavior to qualify as rivalries, nonetheless these are relations between countries that confront each other over and over again over the same contentious issues, often using violence. ${ }^{8}$

From the data, two possible explanations for this non-finding emerge. First, although the data comprise crises in which different levels of violence were employed, eighty-three per cent of the crises reported (236 out of 286) do not involve more than clashes between the parties. At the same time, rivalries are overwhelmingly involved in those crises that reach the highest level of violence: $40 \%$ of those 50 crises that reach the maximum level of violence have at least one rivalry among the crisis actors, versus the $27 \%$ of those crisis that do not reach the maximum level

[^24]of violence (full scale war). As Colaresi and Thompson (2002b, 284) find, "[c]rises in rivalry dyads, as opposed to non-rivalry crises, are more likely to entail midlevel threats, militarized techniques, and war." Second, the coefficient for Rivalry is a significant predictor of crisis recurrence in the regular probit model-that is, a probit whose specification is limited to the recurrence model in the heteroskedastic probit-( $p=0.065$ ).

Taken together with the finding that the heteroskedastic probit is a more appropriate model for the data at hand, as proved by the likelihood-ratio test, the non significance of Rivalry as a predictor of both the risk and the uncertainty linked to conflict behavior and the fact that Both Volatile and One Volatile are both significant predictors of the uncertainty over crisis recurrence clarify the nature of the relation between strategic rivalries and crisis recurrence: while the presence of at least one strategic rivalry among the crisis actors might be correlated with higher probability of recurrence, as demonstrated by the p-value of the coefficient in the regular probit, what really drives the connection between rivalries and crises recurrence is not the fact that rivals engage often in hostile behavior. If that were the case, then the coefficient for Rivalry in the heteroskedastic probit would be a significant predictor of the mean, that is, of the risk of crisis recurrence. Rather, what drives the connection between rivalries and crisis recurrence is the fact that the recurrence of hostile behavior in these dyads is interspersed by cooperative acts, and this fact increases the uncertainty over conflict recurrence. This conclusion is corroborated by the fact
that the coefficient for Both Volatile and One Volatile are significant predictors of the variance in the heteroskedastic probit.

|  | Model I |  | Model II |
| :---: | :---: | :---: | :---: |
| Constant | $\beta$ | . $384 \dagger$ | . 222 |
|  |  | (0.306) | (.291) |
| Rivalry |  | -. 136 |  |
|  |  | (.127) |  |
| Both Volatile |  |  | -. 084 |
|  |  |  | (.102) |
| One Volatile |  |  | -. 008 |
|  |  |  | . 047 |
| Crisis Severity |  | -. 021 | -. 031 |
|  |  | (.026) | (.041) |
| Outcome |  | . 015 | -. 019 |
|  |  | (.036) | (.036) |
| Crisis Gravity |  | -.033† | -. 017 |
|  |  | (.025) | (.023) |
| Super Power Role |  | -. 002 | . 012 |
|  |  | (.010) | (.018) |
| Satisfaction |  | -. 029 | -. 003 |
|  |  | (.024) | (.009) |
| Issues |  | -. 010 | -. 027 |
|  |  | (.027) | (.041) |
| Rivalry | $\gamma$ |  | . 345 |
|  |  | (.657) |  |
| Both Volatile |  | 1.536* |  |
|  |  | (0.026) |  |
| One Volatile |  | -2.231*** |  |
|  |  | (.706) |  |
| Issues |  | -. 211 | -. $591 \dagger$ |
|  |  | (.236) | (.447) |
| Super Power Role |  | -. 177 | -. 176 |
|  |  | (.186) | (.149) |
| N |  | 286 | 286 |
| Log-Likelihood |  | -185.683 | -181.465 |
| Likelihood Ratio test |  | $7.818 \dagger$ | $6.375 \dagger$ |

Table 4.1: Heteroskedastic Probit model of conflict recurrence after five years. Standard errors in parenthesis. ${ }^{* * *} \mathrm{p} \leq .001,{ }^{* * *} \mathrm{p} \leq .005,{ }^{*} \mathrm{p} \leq .05, \dagger \mathrm{p} \leq .10$

In the analysis reported in Table 4.1, I analyze the effects of volatility on uncertainty by parsing out the effects of having among the crisis actors a strategic rivalry where only one party to the dyad conducts a volatile foreign policy and the effects of having a strategic rivalry where both parties conduct a volatile foreign policy. While the coefficients for Both Volatile and One Volatile are both statistically significant, their signs are different. Specifically, results point to the fact that when only one member of the dyad displays volatile foreign policy behavior, uncertainty increases, but when both do, uncertainty increases. The results therefore present mixed evidence for Hypothesis I and II: on the one hand, volatility is significantly correlated with uncertainty; on the other, volatility increases uncertainty only when both countries display volatile behavior. In sum, both the lack of learning mechanism and the habit logic successfully describe the impact of volatility in the relations between states: when both states are volatile, the unpredictability raises at levels that trigger great uncertainty between parties to a dispute. Yet when only one party to the dispute displays volatile behavior, the uncertainty is even reduced.

Ultimately, then, what is the impact of volatility on uncertainty? In Figure 4.1 I plot the effects of volatility on uncertainty over the probability of conflict recurrence. Specifically, I calculate that uncertainty as the variance in the predicted probabilities of conflict recurrence. ${ }^{9}$ I compare a scenario of minimum volatility-that

[^25]is, crises where among the crisis actors there are no volatile relations at all-and a scenario of maximum volatility-that is, crises where among the crisis actors there is at least one dyad where relations are volatile for both and at least one dyad where relations are volatile for just one. ${ }^{10}$ As it appears in Figure 4.1, moving from a scenario of no volatility to a scenario of maximum volatility entails an increase in the uncertainty surrounding the probability of crisis recurrence.

Therefore, volatility increases uncertainty by increasing the variance in the predicted probabilities of crisis recurrence.

A similar effect emerges when looking at the confidence intervals around the predicted probabilities. Recall, from Expression 4.3, that in the heteroskedastic probit, the predicted probabilities of an event occurring are a function of the predictors of the mean, as well as of the predictors of the variance. In Figure 4.2, I again compare a scenario of minimum volatility to one or maximum volatility. This time, I focus on how the impact of Gravity of Crisis on the probability of conflict recurrence changes depending on whether the crisis is characterized by volatile relations or not. In the graph on the left, lines represent predicted probabilities. In the graph on Clarify (Tomz, Wittenberg and King, 2003): I take 1000 random draws from a multivariate normal centered around the estimated coefficients from the heteroskedastic probit and with variance equal to the variance-covariance matrix of those coefficients. I then calculate the predicted probabilities with each of those 1000 simulated coefficients and use the mean and variance of the distribution that emerges to estimate, respectively, the predicted probabilities and the variance around them.
${ }^{10}$ The first scenario is one where Both Volatile and One Volatile are both equal to zero (203 cases). The second scenario is one where Both Volatile and One Volatile are both equal to one ( 9 cases). Obviously these are discrete events, and the line connecting the two dots has just illustrative purposes. Because there is no clear scale of variance-for instance, values for variance are not bound between 0 and 1, as in the case of the probability of conflict recurrence-I use a scale from the minimum value to the maximum value registered in the data, and, since these values are idiosyncratic, I do not report the value on the vertical axis: what matters in this analysis is not the specific amount of uncertainty, but whether volatility increases or decreases it.


Figure 4.1: Effect of volatile relations on uncertainty over crisis recurrence. Unlike a predicted probabilities plot, where the $y$-axis is meaningfully stretching between 0 and 1, a predicted variance plot has no natural candidate for minimum and maximum values, which emerge idiosyncratically from the data themselves.
the right, lines represent $95 \%$ confidence intervals around those predicted probabilities. As it emerges, Gravity of Crisis has a greater positive impact on the probability of conflict recurrence in volatile scenarios: the line for the predicted probabilities in volatile scenarios is steeper and further removed from the 0.5 probability of recurrence. However, the uncertainty related to that effect is also greater, as indicated by the width of the $95 \%$ confidence intervals represented on the plot to the right in Figure 4.2.

I check for the robustness of these findings. Freeman et al. (2011) demonstrate that the optimization algorithms tend to often fail to converge to a single parameter vector for the heteroskedastic probit, a problem not faced with traditional probit
model. They build a profile plot of the log likelihood function of the heteroskedastic probit and they identify the presence of a plateau, which accounts for the difficulties often encountered by the search algorithm. They find that the presence of this plateau is more likely if all the covariates that predict the variance of the model assume exclusively positive values. To address this possibility, they thus suggest to both allow the $\mathbf{z}$ variables in the model to assume negative values and to use the BFGS search algorithm, as it outperforms all the others in their analysis. The symptom of the presence of such plateau, according to Freeman et al. (2011), is the presence of large positive coefficients for the predictors of the variance. Even though this is not the case in the results in Table 4.1, I check for the robustness of my results be re-coding predictors of the variance to take on negative and positive values. The results for the predictors of the variance are consistent with the results shown here.


Figure 4.2: Effect of Gravity of Crisis on the probability of crisis recurrence in relations characterized by different degrees of volatility.

### 4.2 Volatile Relations as Pivotal

The importance of studying volatile relations also stems from the fact that volatile dyads, precisely because they bounce inconsistently between friendly and hostile behavior, are at the centre of some of the most studied phenomena in the international system—namely IOs membership and crises onset.

In the interactions within a dyad, IOs joint membership and crisis initiation represent the peak of, respectively, the cooperation and conflict behavior-that is, they represent some of the most cooperative and conflictual foreign policy episodes that take place within a dyad. Studies shows that these two phenomena are deeply related, as joint IO membership reduces the likelihood that two country engage in violent behavior (Russett and Oneal, 1999; Russett, Oneal and Davis, 1998; Boehmer, Gartzke and Nordstrom, 2004; Haftel and Thompson, 2006; Pevehouse and Russett, 2006; Hasenclever and Weiffen, 2006; Shannon, 2009; Shannon, Morey and Boehmke, 2010). Not only are both IOs membership and crisis involvement interconnected phenomena, but the same institutional factor-domestic regime-has been found to influence IO membership (Jacobson, Reisinger and Mathers, 1986; Mansfield and Pevehouse, 2006; Boehmer and Nordstrom, 2008; Mansfield and Pevehouse, 2008; Poast and Urpelainen, 2012) as well as crisis onset (Leeds and Davis, 1997; Smith, 1998; Asal and Beardsley, 2007; Brulé, Marshall and Prins, 2010).

While the connection between IOs and crises has been investigated and some factors, such as democracy, have been identified as important determinants of both,

IO membership and crisis initiation have often been identified as antithetical phenomena: joint IO membership reduces the recurrence of crisis and democracy is positively correlated to joining IOs but negatively correlated to crisis recurrence. This result in turn reflects the propensity of scholars of IO to perform a strict compartmentalization between episodes of cooperation and conflict that take place in the international system. Not only does this compartmentalization intuitively sound arbitrary, but research on foreign policy substitutability empirically demonstrates that it is not appropriate (Most and Starr, 1984;Bennett and Nordstrom, 2000; Clark, Nordstrom and Reed, 2008): states think of cooperation and conflict as tools at their disposal to advance their agenda, and might substitute conflictual actions with cooperative ones when they deem it appropriate.

The concept of volatility, by describing relations that shift inconsistently between cooperation and conflict, emphasizes the importance of understanding cooperative and conflictual episodes in the international system as complementary, rather than exclusive. It is precisely these inconsistent shifts between cooperation and conflict that make volatile dyads more likely to both be involved in more IOs and initiate crises: since members to the volatile dyad cannot stay the conflictual or cooperative course, they will engage in both a remarkable level of conflict and a remarkable level of cooperation. In this sense, great cooperation and great conflict are not antithetical, and volatile behavior is positively correlated to both.

Therefore, while I investigate the connection between domestic regime and volatil-
ity in the next chapter, I show here that, even controlling for regime type, volatility is a predictor of both IO membership and crisis behavior, and is positively correlated to both. In this sense, volatile dyads are pivotal in that they are at the centre of most of the political activity in the international system.

### 4.2.1 The bivariate probit model

To demonstrate that volatile behavior is a predictor of both IOs membership and crisis initiation, I estimate a bivariate probit.

An extension of the regular probit, the bivariate probit considers two dichotomous, independent variables rather than just one. The disturbances in the two variables are correlated, so that the general specification for the model from Greene $(2003,710)$ is as follows:

$$
\begin{aligned}
& \mathrm{y}_{1}^{*}=\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}+\epsilon_{1} \\
& \mathbf{y}_{\mathbf{2}}^{*}=\mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}}+\epsilon_{2}
\end{aligned}
$$

$$
\mathbf{y}^{*}=\left\{1, \text { if } y_{j}^{*}<10, \text { if } y_{j}^{*} \leq 1\right.
$$

where $j=(1,2)$, and $\mathbf{y}_{\mathbf{j}}^{*}$ are latent, unobserved variables related to the observable variable $\mathbf{y}_{\mathbf{j}}$. The disturbance terms $\epsilon_{1}, \epsilon_{2}$ follow a joint normal distribution with $E\left[\epsilon_{1}\right]=E\left[\epsilon_{2}\right]=0, \operatorname{Var}\left[\epsilon_{1}\right]=\operatorname{Var}\left[\epsilon_{2}\right]=1$ and $\operatorname{Cov}\left(\epsilon_{1}, \epsilon_{2}\right)=\rho$. When $\operatorname{Cov}\left(\epsilon_{1}, \epsilon_{2}\right)=0$, then two separate probit models can be estimated, instead of a bivariate one. Substantively, the model indicates the presence of two related processes: the probability of observing one outcome is not independent from the probability of observing
the other. In fact, the presence of one might make the occurrence of the other more or less probable, depending on the sign and the magnitude of $\rho$. In so doing, the model assumes a common data generating process behind the two outcomes, and then it allows to test for it, by estimating the correlation coefficient $\rho$ and testing for its statistical significance. The likelihood function for the bivariate probit is:

$$
\begin{aligned}
& \ln L\left(\hat{\beta}_{1}, \hat{\beta}_{2} \mid Y\right)=\sum_{i=1}^{N} y_{i}\left\{\mathbf{y}_{\mathbf{i} 1} \mathbf{y}_{\mathbf{i} \mathbf{2}} \ln \Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right)\right. \\
+ & \mathbf{y}_{\mathbf{i} \mathbf{1}}\left(1-\mathbf{y}_{\mathbf{i} \mathbf{2}}\right) \ln \left[\Phi\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}\right)-\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right)\right] \\
+ & \mathbf{y}_{\mathbf{i} \mathbf{2}}\left(1-\mathbf{y}_{\mathbf{i} \mathbf{1}}\right) \ln \left[\Phi\left(\mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}}\right)-\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right)\right] \\
+ & \left.\left(1-\mathbf{y}_{\mathbf{i} \mathbf{1}}\right)\left(1-\mathbf{y}_{\mathbf{i} \mathbf{2}}\right) \ln \left[1-\Phi\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}\right)-\Phi\left(\mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}}\right)-\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right)\right]\right\}
\end{aligned}
$$

where $\Phi_{2}(., ., \rho)$ is the cumulative distribution function of a bivariate normal distribution with correlation coefficient $\rho$, and $\Phi($.$) is the cumulative distribution func-$ tion of a univariate normal distribution. Accordingly, there are four possible outcomes, and the predicted probabilities for each are expressed as follows:

$$
\begin{align*}
& \operatorname{Pr}\left(y_{1}=1, y_{2}=1\right)=\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right)  \tag{4.4}\\
& \operatorname{Pr}\left(y_{1}=1, y_{2}=0\right)=\Phi\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}\right)-\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right) \\
& \operatorname{Pr}\left(y_{1}=0, y_{2}=1\right)=\Phi\left(\mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}}\right)-\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}} ; \rho\right) \\
& \operatorname{Pr}\left(y_{1}=0, y_{2}=0\right)=1-\Phi\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}\right)-\Phi\left(\mathbf{x}_{\mathbf{2}} \beta_{\mathbf{2}}\right)-\Phi_{2}\left(\mathbf{x}_{\mathbf{1}} \beta_{\mathbf{1}}, \mathbf{x}_{\mathbf{2}} \beta_{2} ; \rho\right)
\end{align*}
$$

There are two main advantages to using the bivariate probit model: first, the model
assumes and tests for the presence of correlation between two independent variables. Second, the model enables to specify the correlates of each dependent variable distinctly with a set of covariates $\mathbf{x}_{\mathbf{1}}$ and $\mathbf{x}_{\mathbf{2}}$. Therefore, researchers employ bivariate probit models are employed to test the determinants and the extent of the correlation between two empirical processes. For instance, Denny and Doyle (2008) uses a bivariate probit to investigate the effects of cognitive abilities on both electoral turnout and interest in politics. Similarly, Staton (2006) investigates whether the same factors that propel courts to issue a specific decision also influence the likelihood that the court will release a press statement on it. Reed (2000) instead models conflict onset and conflict escalation with a censored bivariate probit-a bivariate probit that accounts for selection effects in one of the two dependent variables- to determine whether those factors that make the occurrence of conflict more likely also influence the likelihood that the conflict will escalate. Similarly, Kimball (2006) models alliance formation and conflict, to test both the direct and indirect link between the two: direct, because alliance formation might increase the likelihood of conflict, and indirect because the same factors that affect the likelihood of alliance formation will also increase the likelihood of conflict onset. Brooks (2007) uses a bivariate probit to see how processes of diffusion impact the decision of a state between two different pension models. ${ }^{11}$

[^26]By the same token, I estimate a bivariate probit with two distinct equations: one where I model IO membership and another where I model crisis onset. I use volatility as a predictor of both. I want to demonstrate that volatile relations are correlated with some of the most commonly investigated international behaviors, crisis occurrence and IO membership. Utilizing the bivariate probit allows me to test for whether volatile dyads are both more likely to join IOs and engage in violent behavior while I model (and test for) the presence of unobservables that influence the probability of a dyad joining an IO as well as the same dyad getting involved in a crisis. Specifically, I build into the model-and test for- the possibility that it is the sheer level of "political activity" between dyads (Quackenbush, 2006) that makes them both more likely to join an IO and to engage in a crisis. In practice, if $\rho$ is statistically significant and positive, then there are unobservable factors that make dyads both more likely to join an international organization and to get involved in an international crisis.

Specifically, I estimate a bivariate probit without correcting for partial observability. Poirier $(1980,209)$ proposes to employ the bivariate probit to study cases of partial observability, that is, instances in which "the observed binary outcome does not reflect the binary choice of a single decision-maker, but rather the joint unobserved binary choices of two decision-makers." The issue of partial observability arises when the modeler wants to specify how the decision of each member of the dyad to go along with a specific course of action or not impacts the probability of
witnessing the outcome of interest. For instance, Przeworski and Vreeland (2002) investigates why agreements between the International Monetary Fund (IMF) and governments fail, parsing out the effects on the outcome of a decision of the IMF and a decision of the government. If we see an agreement, both countries must have agreed to it $-\operatorname{Pr}\left(y_{1}=1, y_{2}=1\right)$. But if we do not, it could be the case that neither party wanted it $-\operatorname{Pr}\left(y_{1}=0, y_{2}=0-\right.$ or that only one did $-\operatorname{Pr}\left(y_{1}=1, y_{2}=0\right.$, or $\operatorname{Pr}\left(y_{1}=1, y_{2}=0\right)$. In other words, the issue of partial observability emerges in those circumstances in which studies are aimed at a comparison within cases-for instance, cases of IMF and government agreements success and failures. The focus of the analysis here, however, is not understanding how the decision of each member of a volatile or a non volatile dyad influences the likelihood of both countries being involved in a crisis as well as joining an IO. Rather, the focus is on whether the presence of a volatility within a dyad influences the probability of the dyad as a whole becoming involved in a crisis as well as joining an IGO or not, as opposed to cases where there is no volatile behavior in the dyad. In other words, I am interested here in "across-case" comparison-that is, a comparison between volatile dyads and non volatile dyads-rather than in a "within-case" comparison-that is, a comparison between the two members of a volatile dyads. For this reason, distinguishing between cases where both members of the dyad refuse to do something (to engage in a crisis, or to join and IGO) and cases where only one does is not helpful, given this framework, where in fact the lack of this distinction represents a feature, and
not a bug. ${ }^{12}$

### 4.2.2 Data and Analysis

Data: Following Shannon, Morey and Boehmke (2010), I am using panel data for the years 1950-2000. Each observation is a dyad that that meets two criteria: (1) both members of the dyad are considered members of the international system according to the criteria identified by the Correlates of War (COW) Project, and (2) the dyad has been involved in at least one conflict during the fifty year period, as defined by Maoz (2005)'s Dyadic MIDs Dataset. The dataset comprises 1845 dyads and 51 time periods. ${ }^{13}$

Independent Variable: The main independent variable is Both Volatile, a dummy variable that equals 1 if the dyad is involved in a strategic rivalry for more than thirty years and both members of the dyad display volatile behavior towards each other, and 0 otherwise (see Chapter I, Table 2). Notice that in the definition of volatility that I employ here I do not account for those dyads in which only one of the two

[^27]members displays volatile behavior, as I did in the previous model through the variable One Volatile. Because I am interested in seeing how the volatility present in the behavior of a dyad changes its behavior when compared to all the other dyads, I limit the definition of cases of volatility to those cases where both members of a dyad conduct volatile foreign policy.

Controls: Following Boehmer and Nordstrom (2008) I control for the major factors that push dyads to join IOs: domestic regime, trade levels and alliance system. I code domestic regime with their Polity III score. In the models reported in Table 4.2, I control for each member of the dyad's regime separately, but I also run analysis where I create a dummy to measure the effect of both countries being democracies (1) or not (0). To measure trade, I report the net exports between the two countries in each year, and to account for alliance similarity, I report the S-score of the members of the dyad (Signorino and Ritter, 2002). I also include a dummy, Rivalry, for whether the dyad is involved in a strategic rivalry for more than thirty years (Thompson, 2001).

Dependent Variables: To calculate the IO membership dependent variable, I calculate for each year the average of the number of IOs of which dyads across the sample share membership. Then, I create a dummy that is equal to 1 if , in that year, the specific dyad under consideration is member of a number of IOs that is above the
average, and zero otherwise. In the models shown in Table 4.2, I look at IO membership as defined by the COW International Governmental Organization (IGO) Data (v2.1) (Pevehouse, Nordstrom and Warnke, 2004). I also run additional models, not reported, where I use the same operationalization (1 if the dyad has joint membership of a number of IOs equal or above the value for the 75 th percentile across the sample), but a different definition of the IOs to begin with: specifically, I use Expanded IO, that is COW IOs plus the ones identified in Shannon (2009) and another that instead only focuses on Interventionist IOs as defined by Shannon, Morey and Boehmke (2010). The crisis dependent variable is a dummy variable that equals 1 for the first year during which states in a dyad are involved in a crisis, and 0 otherwise. Data on IO membership comes from Shannon, Morey and Boehmke (2010), while data on crisis involvement comes from Asal and Beardsley (2007).

### 4.2.3 Results and Analysis

Table 4.2 reports the results from the analysis. Specifically, Model I is estimated on a subset of the data-that is, on those dyads that contain at least one major power or that contain two contiguous states-whereas Model II is estimated on the full sample. To account for the effects of time dependency within each cluster of data, where each cluster is defined as a dyad throughout the years under analysis, I estimate the standard errors of the coefficients non parametrically using bootstrapping
(Keele, 2008).

|  | Model I | Model II |
| :---: | :---: | :---: |
| IO Equation |  |  |
| Rivalry | -. 0441 | -. 084 |
|  | (.094) | (.090) |
| Both Volatile | . 963 *** | .847*** |
|  | (.146) | (.160) |
| Democracy $_{1}$ | .035*** | . 034 *** |
|  | (.001) | (.001) |
| Democracy ${ }_{2}$ | .046*** | . 045 *** |
|  | (.001) | (.001) |
| Trade | .000*** | .000*** |
|  | (.000) | (.000) |
| S-score | -.978*** | -1.062 *** |
|  | (.045) | (.039) |
| Constant | . 193 *** | . 262 *** |
|  | (.016) | (.012) |
| Crisis Equation |  |  |
| Rivalry | .622** | .639** |
|  | (.217) | (.227) |
| Both Volatile | . 699 ** | .631** |
|  | (.268) | (.248) |
| Democracy ${ }_{1}$ | -. 014 ** | -.014*** |
|  | (.005) | (.004) |
| Democracy $_{2}$ | -.020** | -. 025 *** |
|  | (.005) | (.005) |
| Constant | -2.577*** | -2.607 *** |
|  | (.044) | (.047) |
| N | 18367 | 21197 |
| $\rho$ | .170*** | .135*** |
| Likelihood Ratio test | 13.625*** | 9.509** |

Table 4.2: Bivariate Probit model of IO membership and crisis involvement. Bootstrapped standard errors in parenthesis. ${ }^{* * *} \mathrm{p} \leq .001$,*** $\mathrm{p} \leq .005,{ }^{*} \mathrm{p} \leq .05, \dagger \mathrm{p} \leq .10$

Several interesting findings emerge. First, Both Volatile is a significant predictor of both joint IO membership and crisis involvement: as the sign shows, the presence of volatility in a dyad increasing the likelihood both behaviors. The behavior
of volatile dyads stands out even more when compared to the behavior of other kinds of dyads, such as rivalries. The coefficient for the dummy Rivalry is only a significant predictor for crisis involvement, but not for IO membership. Conversely, the domestic regime of the members of the dyad is a significant predictor of both behaviors, but the sign of the coefficients for the variables Democracy $y_{1}$ and Democracy $_{2}$ show that the regime impacts both results in different direction.

Thus, what is striking about volatility is not just that it is a significant predictor of both phenomena, but that it makes both more likely. In this sense, this result shows how volatile dyads play a pivotal role in some of the most studied events in the international arena. Finally, the correlation coefficient $\rho$ is positive and significant, and even if the magnitude of the $\rho$ is not huge, it nevertheless indicates the presence of unobservables that make dyads involved in crisis also more likely to be involved in a substantial number of IOs. ${ }^{14}$ When I estimate Model I and Model II controlling for domestic regimes by adding a dichotomous variable Joint Democracy coded 1 if both members of the dyads are democracy (with a Polity III score above zero) and 0 otherwise, the signs and significance are the same for the variables, but the correlation coefficient between the two dependent variables decreases (respectively, $\rho=.046$ for the model in the reduced sample, and $\rho=.027$ in the full sample) and is no longer significant ( $p=0.264$ and $p=0.472$ ) therefore suggesting that the unobservable variable that causes dyads to both join more IOs and get in-

[^28]volved in more crises might in fact be the joint democratic regime. To illustrate the


Figure 4.3: Predicted probabilities for bivariate probit model (Model I on the left and Model II on the right) with $95 \%$ confidence intervals. Both dyad members are democracies.
difference in behavior between volatile and non volatile dyads, I plot the predicted probabilities for each of the possible four outcome, distinguishing between cases where both members of the dyads are democracies (Figure 4.3), cases where they are both autocracies (Figure 4.4), and cases where one is a democracy and the other is an autocracy (Figure 4.5), with $95 \%$ confidence intervals. I compare a scenario where the dyad is volatile (Both Volatile=1, light gray lines) and one in which the dyad is not volatile (Both Volatile=0, dark gray lines).

Across the figures, two main trends emerge. First, volatility decreases the probability that the dyad is neither involved in a crisis nor it shares membership of


Figure 4.4: Predicted probabilities for bivariate probit model (Model I on the left and Model II on the right) with $95 \%$ confidence intervals. Both dyad members are autocracies.
numerous IOs: $\operatorname{Pr}\left(\mathrm{y}_{1}=0, \mathrm{y}_{2}=0\right)$ is lower when both members of the dyad pursue a volatile foreign policy than it is when neither is. Conversely, volatility increases the probability that the dyad is both involved in a crisis and it shares membership of numerous IOs: $\operatorname{Pr}\left(\mathrm{y}_{1}=1, \mathrm{y}_{2}=1\right)$ is higher when both members of the dyad pursue a volatile foreign policy than it is when neither is. The impact of volatility is statistically significant both when the outcome is $\operatorname{Pr}\left(\mathrm{y}_{1}=0, \mathrm{y}_{2}=0\right)$ and when it is $\operatorname{Pr}\left(y_{1}=1, y_{2}=1\right)$ : the $95 \%$ confidence intervals do not overlap. Substantively, volatility makes more of a difference in predicting the probability that none of the two outcomes of interest will be seen $\operatorname{Pr}\left(\mathrm{y}_{1}=0, \mathrm{y}_{2}=0\right)$ then it does in predicting the probability that both of the two outcomes of interest will be seen $\operatorname{Pr}\left(\mathrm{y}_{1}=1, \mathrm{y}_{2}=1\right)$ : the predicted probabilities and the confidence intervals around them in the volatile
and the nonvolatile scenario lay further away from one another for $\operatorname{Pr}\left(\mathrm{y}_{1}=0, \mathrm{y}_{2}=0\right)$ then they do for $\operatorname{Pr}\left(\mathrm{y}_{1}=1, \mathrm{y}_{2}=1\right)$. Interestingly, these results hold across all regime type combinations.


Figure 4.5: Predicted probabilities for bivariate probit model (Model I on the left and Model II on the right) with $95 \%$ confidence intervals. Dyads composed by one autocracy and one democracy.

### 4.2.4 Clarification

If a state's foreign policy toward another is volatile, it does not trivially mean that that state will systematically engage in more crises and more joint IO membership with its counterpart in the dyad. This is true both given the conceptualization and the operationalization of volatility that I present here. Conceptually, volatility is defined as the presence of inconsistent shifts between cooperation and conflict:
this definition encompasses behaviors such as the one between Pakistan and India (where the extremes of the continuum comprise both military crises and MFN status trade treaties) and cases such as the US and Russia (where, in the 2000s, relations were also volatile, but never quite reached the extremes reached within the India-Pakistan dyad). To capture empirically these shifts between cooperation and conflict without using the severity of either cooperation or conflict as a metric for volatility, I operationalize the presence of volatility, for this chapter, with an Engle's ARCH test for autocorrelation in the residuals from a Box-Jenkins procedure on the time series of the foreign policy actions of one state toward another. The test evaluates therefore the presence of heteroskedasticity in the residuals-that is, whether the variance in the residuals is constant through time or not. It is the presence of heteroskedasticity in the residuals that measures the occurrence of inconsistent shifts between cooperation and conflict-and not the presence of extreme behavior per se.

### 4.3 Conclusions

What determines the presence of inconsistent shifts between cooperation and conflict? In Chapter I, I laid the groundwork to address this puzzle by providing a conceptualization of volatility in international politics as the inconstant shifts between episodes of cooperation and episodes of conflict, to demonstrate that it satisfies the criteria of goodness identified by Gerring (1999) (see Chapter I, Table 1).

This chapter has tackled a crucial question: does volatility matter? Is there anything we can learn about how the international system works by looking at dyads whose behavior displays volatility? I have argued that volatility is an important phenomenon because volatile dyads are both dangerous and pivotal relations. Volatility increases uncertainty, and these inconsistent shifts prompts states to engage in both more cooperative and more conflictual behavior. To test this argument I estimated an heteroskedastic probit, with volatility as the predictor of the variance of the distribution of the dependent variable, conflict recurrence. I also estimated a bivariate probit, to show that volatility is both a predictor of higher IO membership and crisis initiation on the part of a dyad.

In the next chapter, I offer a theory of the determinants of volatility, and I then proceed to test it.

## Chapter 5 : Theory

In this chapter, I present a theory of volatility in foreign policy. Volatility is the outcome of an interaction between dynamics unfolding both at the domestic and the international level: the unbridled competition among domestic groups and a state's relative power superiority. Superior power acts as a permissive condition for volatility: it expands the available strategies at a state's disposal to include more cooperative and combative options, allowing the stronger state to act inconsistently towards its weaker rival. Since each of these options has redistributive implications, the catalyzing condition for volatility is the competition among multiple and heterogeneous domestic groups to impose one course of foreign policy action over others. For narrowly self-interested reasons, therefore, these groups will attempt to impose their preferred foreign policies-cooperative or aggressive-over others. Thus, when no single group dominates this process, the state's foreign policy will swing back and forth from conflict to cooperation.

### 5.1 Theory: The Determinants of Foreign Policy

## Volatility

To explain volatility, I will start by providing a definition of foreign policy. I define foreign policy as the set of policies put in place by the government of a country toward another one, spanning through the diplomatic, military, and economic realm. Because it involves the actual policies put in place on the part of one country, foreign policy is different from grand strategy, which instead refers to the general principles that inspire the foreign policy of that specific country, or, as Posen $(1984,7)$ puts it, "the collection of means and ends with which a state attempts to achieve security. ${ }^{1}$ For instance, containment and engagement are examples of grand strategies that were explored by the United States toward China in the Nineties (Shambaugh, 1996), but the actual foreign policy carried on by the US was characterized by a diverse set of episodes of trade agreements, human rights violations complaints, the so-called third Taiwan crisis, and so on.

To theorize volatility in foreign policy, I make two assumptions-that is, I advance two theoretical statements for which I do not directly test in my research, but on which I build in order to theorize volatility.

First, I assume that states' leaders aim at preserving their country-that is to say, they want to avoid having their own country conquered or annexed by other

[^29]countries. Countries' leaders will always prioritize the security of their country over any other goal. In other words, while leaders can select and elaborate different grand strategies, their over-arching objective will always be to preserve the survival of their own country. There is an important debate in IR, and especially within the realist paradigm, on whether states prioritize security or power (Rose, 1998; Taliaferro, 2001; Snyder, 2002). Here, I assume that states are survival-seekers: whenever given a choice, states' leaders will try to avoid having their state disappear (being annexed or conquered, for instance). Obviously, it is hard in practice to disentangle the goals of power and security: power can be a means to achieve greater security, and countries decide to acquire more power in order to guarantee their security (Mearsheimer, 2001). Yet the assumption that states will, on average, prioritize security over power is both more parsimonious and more accurate when applied to a broad category of states-that is, beyond just great and major powers.

My second assumption is that the international system is anarchic, in the Waltzian sense of a lack of a legitimate monopoly of the use of force that is comparable with the one present at the domestic level (Waltz, 1979, 103), rather that the sense of lack of order. ${ }^{2}$ It is important to notice that the assumption of an anarchic international system does not entail denying the presence of areas of greater hierarchy within the international system (for instance, the European Union) (Lake, 1996). Instead, the assumption of anarchy emphasizes the difference between the domestic and

[^30]the international system: there is a substantial difference between the amount of recourse that is available against violations of domestic law as opposed to violations of international laws. In other words, while other states might team up and use force to punish or attack another state, there is also no recourse to some higher power with a legitimate monopoly of the use of force for those states that get attacked.

Both assumptions constitute cornerstones in the IR literature and the empirical record shows that they are reasonable, to the point of being ingrained in the layman's belief system (Kertzer and McGraw, 2012). Finally, both assumptions need to be accurate, even though not always precise. What this means is that they should hold on average, while they might fail at capturing extant behavior at times.

Foreign policies are carried on in an anarchic environment by a subset of each countries' population, what we usually call their government or leaders. These are individuals who are appointed by their countries' population-in a manner that can be more or less inclusive-and that therefore respond to this domestic population, or, more precisely, to that subset of the population which has the power to (re)-appoint them. This subset of the population amounts to their constituency. In a nutshell, the core objective of a country's leadership will be to use different foreign policy tools to advance the interests of their constituencies, while knowing that they are operating in an anarchic system.

Different foreign policy options can be used to achieve the same objective. For
instance, the decision to improve a state's security can be achieved by joining an alliance or by increasing defense spending (what Waltz 1979 calls, respectively, internal or external balancing). The international level, and in particular the differences in the distribution of resources in the international system-or structure-determines the amount and type of foreign policy tools available to them. Whether external balancing is available or not depends on the distribution of material capabilities in the system. Yet the choice of achieving a specific goal, such as national security, with one tool rather than another affects the distribution of resources in the domestic realm: it advantages some groups and disadvantages others. For instance, increasing defense spending presents advantages for those sectors of the population who benefit from defense contracts, while burdening tax-payers. In this sense, the choice of a specific foreign policy tool is the outcome of the interaction between the international and the domestic level. ${ }^{3}$

Given this theoretical framework that I just laid out, when are we more likely to observe volatile foreign policy behavior? I claim that volatility is the outcome of the interaction between multiple, heterogenous domestic interests and a state's relative power superiority in the international system. These two factors constitute individually necessary and jointly sufficient conditions for volatility in foreign policy: in other words, the absence of each of these two factors decreases the likelihood of volatility, while the presence of both together increases it (Braumoeller and Go-

[^31]ertz, 2000; Goertz, 2006). ${ }^{4}$

While both these two factors are necessary conditions for the outcome of interest, the roles they play in bringing about volatility is different. I conceptualize the preponderance of power as a permissive cause of volatility-that is, a condition whose absence prevents the outcome of interest to occur. By power preponderance, I intend power superiority—and more specifically, superiority in military and material capabilities. The mechanism that I posit as operating at the international level is one of resource availability: states that enjoy a preponderance of power with respect to their counterpart have both more cooperative and more conflictual options at their disposal to deal with their counterparts. They have more conflictual options because they have multiple tools with which to engage in hostile actions: simply put, Costa Rica cannot militarily assault another country, and China before October 1964 could not directly conduct a nuclear attack on another country. But they also have more cooperative options because, as I explain in greater detail in the

[^32]next section, that preponderance of power affords them greater security, which in turn will lead to the state being more willing to cooperate with its counterpart.

Power prevalence sets a permissive cause for volatility, in that it expands the range of possible options available to states to both conflictual and cooperative options. But preponderance of power alone does not explain why states engage in volatile behavior: it could well be that states that have preponderant power decide to constantly cooperate with another country. The precipitant (or catalyzing) cause for volatility originates from the fact that domestically each foreign policy decision will impact domestic groups differently, and therefore the presence of multiple actors with heterogeneous distributional preferences will translate into inconsistent shifts between cooperation and conflict. The mechanism that I posit operating at this level is a redistributive one. Because each foreign policy decision has distributive consequences on each domestic group, advantaging some and disadvantaging others, these groups will try to advance their own agenda on the definition of foreign policy. When that fails, the losing constituencies will be asking for sidepayments in foreign policy from the other groups. As I explain at length in the next section, these side-payments represent the key to understanding the emergence of volatile foreign policies.

The aggregate effect of the presence of multiple and heterogeneous interests that control the definition of foreign policy is therefore the presence of sudden shifts between cooperative and conflictual behavior. ${ }^{5}$ Therefore, if there exist multiple

[^33]and heterogeneous interests regulating the formulation of foreign policy, and if a state has multiple ways (or opportunities) to achieve a specific objective, the same foreign policy objective (such as security, or economic growth) will be more likely to be pursued through different foreign policy tools-that is, tools that advantage different subsets of the domestic public.

To further clarify the interactions between these two mechanisms, in Figure 5.1, I represent the interactive effect between the international system and the domestic realm. The $x$-axis represents time, and the $y$-axis represents a scale of foreign policy action from less to more cooperative, while the line traces the foreign policy actions of the country in question. As argued, power preponderance with respect to the counterpart will determine the range of options available to one country: in other words, it will determine whether the line representing foreign policy can shift towards the upper section of the y-axis. The presence of multiple and heterogeneous interests controlling the definition of the foreign policy of the country, on the other hand, will determine whether the line representing foreign policy will shift inconsistently up and down in the graph.
work specified by Waltz (1959), in that it emphasizes the relevance of parsing out the presence of a enhancing and triggering causes. However, in this case I use the term "precipitant" (Ross, 2012, 66) rather than "efficient" cause because for Waltz (1959), the efficient conditions for the outcome of interest are the accidental, immediate, pretext conditions for the outcome of interest, whereas in my theory the presence of multiple and heterogeneous interests at the domestic level is to be understood as a systematic propellant for volatile action, rather than an accidental one. In this sense, precipitant causes are closer to the idea of catalyzing (or contingent) causes put forward by Thompson (2003).


Figure 5.1: The sources of volatility. Square brackets denote changes in the viability of cooperation, or the range of possible outcomes. The availability of options is a function of relative power preponderance, I argue. The configuration of domestic preferences drives the line between the square brackets, as indicated by the arrows.

### 5.1.1 Causal Processes and Dynamic Theories

The theory that I advance therefore builds on the interaction between two mechanisms residing in two different levels of analysis: a resource availability one operating at the international level, and a redistributive one at the domestic level. Through the use of multiple, interactive mechanisms--what Tilly (2001) and Tilly
and Goodin (2006) define as processes ${ }^{6}$-the theory aims to explain dynamic, nonequilibrium behavior in the international system.

Processes are seldom used to explain international relations. "Middle-range" theories-that is, theories that offer explanations of specific empirical puzzles in the international arena, instead of proposing paradigm-like statements on ontology and epistemology-tend to focus on single mechanisms, such as power differential, or the preferences of countries' leaders, and so on.

The elaboration of middle-range theories that focus exclusively on one mechanism to explain states' behavior in the international arena is in great part a function of the paradigm-centered debates that has long characterized IR (Kuhn, 1996). ${ }^{7}$ Because so much of the debate between different paradigms-that is, between different basic conceptions of the way the international system works-revolves around the primacy of one level of analysis over the other(s) (Singer, 1961), and because each level of analysis emphasizes a specific set of mechanisms (Hedström and Swedberg, 1998, 13), the middle-range theories that emerge from these paradigms tend to embrace a "residual variance" approach to theorizing (Moravcsik, 1993, 13). In other words, these theories identify one main explanatory factor, one that belongs to a specific level of analysis, and all the behavior that does not conform to the prediction is attributed (yet not modeled as!) to mechanisms residing at the other

[^34]level of analysis, which acts as an "imperfect transition belt" for the main level of analysis under consideration. ${ }^{8}$ This dynamic is so entrenched in the field of IR that attempts to integrate different levels of analysis in a coherent fashion-as in the case of Neoclassical Realism—have been dubbed degenerative research programs (Vasquez, 1997; Rathbun, 2008). Perhaps the debate in IR where the deep connection between paradigms and levels of analysis is more evident is the agentstructure debate (Wendt, 1987; Dessler, 1989), because the discussion on the ontological priority of actors or of structure, or even their mutual constitutions (Hopf, 1998), ultimately lays the foundations for methodological and epistemological arguments aimed at privileging (if not exclusively focusing on) one level of analysis over the others. ${ }^{9}$ Similarly, the debate that ensued at the end of the Cold War on which paradigm was best suited to explain events in the international arena also revolved around the appropriateness of the different level of analysis (Gaddis, 1992; Hopf and Gaddis, 1993; Legro and Moravcsik, 1999; Feaver et al., 2000).

By contrast, the theory that I offer aims at specifying the impact of both levels of analysis, as well as to explain how they interact with each other. This feature of the theory is particularly important given the puzzle at hand: volatile, dynamic foreign policy behavior, which constitutes the quintessential non-equilibrium behavior. As systems theory have emphasized, in order to explain non-equilibrium behavior, it

[^35]is important to look at both the structure of the interaction and the actors, as well as to understand how the two interact (Albert and Cederman 2010, 13, Cederman 2010, 131). In this case, in order to explain when and how states' foreign policy interactions shift inconsistently between cooperation and conflict, it is important to understand both what states can do and when they can do it.

In this sense, an understanding of the interaction between different mechanisms operating at different levels of analysis is an important component of the elaboration of dynamic theories. In turn, formulating a dynamic theory of volatility is crucial, because volatility is an inherently dynamic heuristic. It is worth noting that not all theories of volatility offer a dynamic explanation for it. For instance, Henisz (2004) argues that volatility is brought about by the absence (or a reduced number) of veto players-that is, all those actors that have to agree in order for a new policy to be implemented. The exclusive focus on the permissive condition for volatility, however, renders this theoretical statement under-determined. By under-determined, I mean that the statement is unable to parse out different empirical processes that take place. Specifically, the veto-player theory of volatility assumes that the absence of stability will bring about the same kind of change (volatility) in all circumstance. In so doing, this theory assumes away the different kinds of change that are possible (see Chapter I)—such as trends, cycles, and so on. By assuming that those factors that guarantee the absence of stability also bring about a very specific kind of change (such as volatility), and not others (such as the
presence of cycles, or trends), these approaches give rise to under-determined predictions. This is the case because specifying the conditions that determine the loss of stability can only shed a light on the conditions that make change more likely, yet cannot provide an explanation for when change happens, and which form change takes.

In the following two sections, I will explain the international and domestic determinants of volatility in greater detail.

### 5.1.2 The International Level

I argue that the permissive condition for volatile behavior on the part of one country resides at the international level, and specifically in the distribution of material capabilities. Relative power preponderance-that is, power superiority with respect to the opponent-constitutes a permissive condition for volatile behavior because it provides states with a great array of options, both cooperative and conflictual.

I use a rather narrow definition of what counts as power. In terms of the conceptualization of power offered by Barnett and Duvall (2005), I focus on compulsory power. Compulsory power denotes relationally-specific influence-that is, power is exerted from one actor directly onto another, as opposed to institutional power, which instead works in a diffused manner-and that operates through the interactions between these actors-as opposed to working through social relations of constitution, as in the case of structural power. I further define this compulsory
power as those material capabilities that allow one state to successfully defend itself in the case of conflict occurrence. Rather than using the raw count of material capabilities that a state has (Mearsheimer, 2001), I define the power of a country as its proportion of material capabilities present in the system of states at any point in time. In so doing, I posit that it is the distributional, structural aspect of power that determines its permissive function, because, as Braumoeller (2012, 10-11) explains, "in a system actions may produce outcomes that can only be understood in the context of the larger picture." In other words, in order to understand, theorize, and model the permissive effects of compulsory power in the interactions between states in the international system, it is necessary to understand the relative power position of that state, because of the interconnected nature of the system.

The mechanism that I postulate is resource availability: the presence of military superiority guarantees more options to the state, not just conflictual, but also cooperative ones. The direct, positive connection between a country's capabilities and its military options has been explored at length, and has constituted an important topic of discussion within debates such as the one on the offense/defense balance (Jervis, 1978; Hopf, 1991; Glaser and Kaufmann, 1998). ${ }^{10}$ To claim that the more military capabilities one state has relative to another, the more conflictual options it acquires is straightforward and fairly uncontroversial (Horowitz, 2010). For instance, in order for a state to launch a nuclear attack, it will have to acquire nuclear weapons, as well as certain ballistic missiles capabilities (Mettler and Reiter, 2012).

[^36]As the nuclear example perfectly elucidates, however, an increase in available material and military resources does not entail that the state will use those resources. In fact, it could be that some of those military capabilities will make states less likely to engage in conflict (Van Evera, 1998). Rather, claiming, as I do, that power superiority expands the set of resources available simply means that a state that has more capabilities will have more options than a state which has less capabilities. ${ }^{11}$

Relative superiority in material capabilities, I argue, will expand the range of available options to also include cooperative options, because it will allow states to feel secure enough to engage in cooperative behavior. To identify preponderant power as a permissive condition for cooperative behavior, I build on the definition of cooperation in the international system as a Prisoner's Dilemma. In this framework, mutual cooperation is preferred to mutual defection, but unilateral defection is better than both mutual cooperation and unrequited cooperation. This set-up makes it possible to explain the hard cases for cooperation to emerge: cooperation would be much easier if it constituted the dominant strategy, as when the predominant culture is a cooperative one-for instance, in a Kantian system (Wendt, 1999).

Yet the dyads that I am considering, as illustrated at length in Chapter I, all constituted hard cases to explain for the emergence of cooperation, because they are all strategic rivalries, and therefore they hold resentment and distrust toward each

[^37]other.

By adopting a Prisoner's Dilemma framework to explain the conditions under which cooperation enters the realm of possibilities for a survival-seeking state in an anarchic system, I draw a connection between cooperation, vulnerability, and survival. In so doing, I build on a large theoretical and empirical tradition, which has especially been focused on presenting the implication of trade relations for the vulnerability of a state, dating back to Kant (see, among many other recent examples, Copeland 1996,Barbieri 1996, Gartzke, Li and Boehmer 2001). Perhaps the most recent and poignant example of the connection between cooperation, vulnerability, and security is the debate over the implications for America's security of China's holdings of US Government Debt (Drezner, 2009; Littlefield, 2010; Nye Jr, 2010). ${ }^{12}$

Does claiming that relative power superiority enhances the availability of cooperative options by making a state secure enough to risk the sucker's payoff entail claiming that every time, say, the US signs a trade agreement with Peru, American leaders worry about whether that trade agreement will threaten the survival of the country? In other words, does the sucker's payoff always correspond to the demise of the country, every time a state attempts cooperation? I would answer

[^38]this question in the negative. There is a difference between saying that survival is the ultimate goal of a country and concluding that every cooperative act will be judged as threatening that survival. What I claim instead is that the feasibility of cooperative acts-that is, of working with another state to achieve a common goal, according to the definition of cooperation that I provide in Chapter I—is evaluated on the basis of how that cooperative act engenders vulnerability, and therefore it is judged against the over-arching goal of survival.

Perhaps the most famous example of using the Prisoner's Dilemma to explain what makes cooperation possible to begin with is Axelrod (1997)'s discussion of "tit for tat" strategies. The advantage of specifying what makes cooperation emerge in the Prisoner's Dilemma framework is that it allows to explain what makes cooperation possible to begin with, rather than simply elucidating what sustains cooperation after assuming it has developed. In fact, for Axelrod (1997) cooperation is not even an equilibrium condition-that is, a state that stays in place, unless something exogenous interferes. Rather, he specifies the exact conditions that need to hold to make that cooperation stay. These features of his theoretical framework make it especially useful to explain the emergence of cooperation in the context of strategic rivalries. There are instead theoretical approaches that seek to explain how cooperation becomes the equilibrium behavior on the part of states, once it has already been established through an exogenous shock-for instance the "spillover" mechanism suggested by Mitrany (1966) and Haas (1958), or the information provision
mechanism investigated by Keohane (1984), or even the advent of a Kantian culture proposed by Wendt $(1999,297)$. Yet Axelrod (1997) provides one of the few arguments that can be used to understand the conditions that make cooperation possible in the first place in an anarchic environment. The thrust of his theory is finding an answer to the question "under what conditions will cooperation emerge in a world of egoists without central authority?" (Axelrod, 1997, 3).

Axelrod (1997) does not identify power superiority as a condition for "tit for tat" strategies like I do here. Instead, he points to the fact that interactions will be repeated through time for an indefinite period, and that this repetition will create a shadow of the future that will give players an incentive to cooperate in the immediate time period. The assumption that cooperation will be repeated through time, and that the actors do not know for how long, is at the basis of the efficacy of "tit for tat" strategies, because it makes unilateral defection costly. I relax this assumption, and theorize instead that what makes unilateral defection costly is the presence of relative power superiority within a dyad of states. Specifically, state A will be more able and willing to explore cooperative ventures with state $B$ if it has superior power relatively to state $B$. Power preponderance immunizes state $A$ from fears that state B will engage in unilateral defection, because it provides state A with the ability to survive (and even punish B for) defection, just as repeated interactions for an indefinite period does. Therefore, relative power superiority guarantees that tools of cooperation are available to states-not that the state will
actually cooperate. ${ }^{13}$
In this sense, the international environment impacts the presence of volatility in foreign policy through a mechanism of resource availability: a state will be more likely to engage in cooperative behavior if they can do so from a position of power. Many theories explain why states will actively seek cooperation in (certain areas of) foreign policy to begin with—because of their national identity (Hopf, 2002), the worldview of the domestic public (Braumoeller, 2008), their domestic interests (Simmons, 1997), or even the prevalent culture among democratic countries (Wendt, 1999). These theories look at specific characteristics of the domestic environment as catalyzers for cooperation. In looking at the international environment, I identify the characteristics of that environment that make cooperation possible to begin with.

In sum, I argue that relative material power superiority acts as a permissive condition for volatility, by making both conflictual and cooperative foreign policy tools available to states. In particular, I argue that material power superiority expands the tools of foreign policy available to states to include cooperative options, because it allows these states to negotiate cooperative ventures from a position of

[^39]power, in an anarchic environment.

### 5.1.2.1 Relative Power Superiority as a Permissive Condition

Why then is preponderance of power an important factor to understand the permissive conditions for volatility? And why such a narrow conception of power as material capabilities? Remember that, as I clarify in Chapter I, cooperation does not refer to a specific foreign policy realm, such as trade or security, but rather to the activity of working together towards common objectives. In an anarchic system where states are interested in their own survival, regardless of whether it is a self-help system or not (Wendt, 1992), the permissive conditions for cooperative foreign policies resides in the ability of the state to open up to cooperation without risking too much in terms of their own survival. In other words, whether states assume hostile intentions by their counterpart or not, if their ultimate goal is the survival of the state, then states will prefer to cooperate from a position where that survival is guaranteed to them. When cooperating, states will be wary of the risks associated with working together with their counterparts to reach common objectives, and negotiating from a position of power will allow them to feel more secure that they will not risk too much.

Obviously power can take multiple forms, some material and some ideational (Wendt, 2000; Mattern, 2004)—think also of soft power (Nye, 2004), or smart power (Nye, 2009). What makes relative material capabilities the relevant permissive conditions for cooperation is the fact that those material capabilities are the ones that
will be more likely to be activated in a self-help system if and when the physical survival of the state is at risk. In other words, since in an anarchic environment each country has an interest in preserving its own physical survival, what enriches the options available to a state in terms of cooperation more directly is the presence of those material capabilities that will grant it survival in case things go awry.

The statement that the preponderance of material power enhances the options available to a state in the international system stands on two building blocks: first, that cooperation in an anarchic system when states are interested in their own survival (as my two assumptions state) is a risky enterprise; second, that power, especially material power, expands the realm of possibilities for a country. Both building blocks boast a long and noble pedigree in IR. Cooperation is conceptualized prevalently as a public good, that is, as a non-rivalrous and non-excludable resource on which countries will have an incentive to free-ride (Stone, Slantchev and London, 2008). Even for those explanations that intend to provide an alternative to this prevalent, economic conceptualization of cooperation, theorize that states have to basically be almost "brain-washed" (to provide a colorful alternative to the concept of persuasion) before they can change their ways and embrace a more cooperative behavior (Checkel, 2005). On the other hand, the study of preponderant power as a permissive condition for action in the international system constitutes one of the central tenants of hegemonic power theory (Gilpin, 1981), where preponderant power gives a country the opportunity to become the hegemon of the
system, but not necessarily the willingness to do so. More recently, the debate on the implications of the unprecedented unipolarity of the United States has brought back to the fore the implications of a preponderance of power on foreign policy decisions. Part of the debate has focused on whether preponderance of power, by providing the unipole with a greater amount of foreign policy tools, will translate into the choice of more assertive and violent tools of foreign policy (Snyder, Shapiro and Bloch-Elkon, 2009; Monteiro, 2011) or not (Wohlforth, 1999; Schweller, 2010).

Neoclassical realists have also theorized foreign policy behavior as crucially depending on an interaction between domestic and international dynamics (Rose, 1998). Schweller (2004), for example, claims that domestic politics plays a key role in explaining why states might fail to balance, even though their position in the international system prescribes them to, and why they decide instead to bandwagon (Schweller, 1994). While my theory shares with Neoclassical realist accounts the basic concept that in order to understand foreign policy it is impossible to only look at one level of analysis, it also differs from it in several, important ways.

First, the role played by the international and domestic realms are different: in Neoclassical accounts, the international system acts as the catalyzing condition for action, rather than as the permissive condition. Specifically, in neoclassical accounts, the relative power position of a country in the international arena drives its actions (Rose, 1998, 146), albeit the effect is mediated by leaders' perceptions of that power. In my theory, by contrast, relative power positions set a permissive condi-
tion for volatile foreign policy behavior-whereupon the lack of relative material superiority decreases the likelihood of volatile behavior. In this sense, my theory sits at the intersection of Neoclassical approaches and Innerpolitik perspectives such as the one put forward by (Trubowitz, 1992, 1998; Moravcsik, 1997): like Neoclassical realists, I recognize the importance of modeling the interaction between domestic and international factors, yet, as in Innerpolitik approaches, I theorize the domestic environment as the catalyst for foreign policy action. Second, and relatedly, Neoclassical realists assume that states seek to shape the international environment, rather than to merely guarantee their own survival, and that in turn, it will be their relative power position to shape and determine their objective. As I argued earlier, I assume instead that states are security-seekers, because this assumption more realistically captures the behavior of those states that are not major powers in the system—a logical statement that indeed is akin to saying that states' relative power position in the system influences their objectives. Third, the mechanism through which domestic dynamics matter for Neoclassical realists is different: the key in this theoretical approach is grasping the degree to which leaders are independent from societal and elite control, because the greater their independence, the more free they will be to follow the dictates of the international system (see also Fordham 2002). So, for instance, Schweller $(2004,172)$ cites the presence of veto-points in the domestic system as a condition for the lack of responsiveness on the part of states to international constraints. In this sense, domestic environments
work as an "imperfect transmission belt" (Lobell, Ripsman and Taliaferro, 2009, 4) for the stimuli that the international system produces. In the theory I advance, on the other hand, it is the multiplicity and diversity of interests at the domestic level that catalyzes foreign policy behavior. Finally, there is a tendency in this approach to see the military realm as distinct from the economic one: Sterling-Folker (2009) claims that the security realm is plagued by tribalism between citizens holding different national identities, in a way that the economic realm is not. I drop this dichotomization between security policy and economic policy, put foreign policy on a conflict-cooperation continuum, and test empirically for what brings about inconsistent shifts between cooperation and conflict throughout the different realms.

Finally, it is worth noting that this statement on material capabilities as the permissive condition for volatile behavior does not say anything about whether power superiority will bring about more conflict or more cooperation. For instance, according to power transition theory (Organski, 1968, 1981), power parity increases the possibility of conflict between two countries: as Lemke and Werner (1996) explains, material power is conceptualized as a precipitant cause for behavior, rather than a permissive one (on this point, see also DiCicco and Levy 1999). Similarly, power superiority might translate not only into less conflict, but also into more cooperation: the stronger state might be able to coerce the weaker one into cooperating all the time, and the weaker state might never be able to defect, because it is successfully deterred from doing so. It could also be the case that the stronger
states, anticipating that the weaker state will never defect, will also avoid defecting at any point in time. All of these scenarios can easily be contemplated in the theoretical framework that I put forward, which simply states that power superiority increases the opportunities for both cooperative and conflictual actions. To explain the precipitant conditions for volatility, I now turn to domestic factors.

### 5.1.3 The Domestic Level

I argue that, given a state's preponderance of power with respect to their counterpart, volatile foreign policy on the part of a state is more likely when foreign policy responds to multiple, heterogeneous interests. Specifically, I posit a resource redistribution mechanism: the choice to implement a specific policy over another invariably determines a specific allocation of resources within each country. Because each foreign policy has distributive consequences-that is, it affects the distribution of material and symbolic resources-the pursuit of one foreign policy over another (for example, the decision to increase defense spending rather than joining an alliance, or the decision to impose restrictions to trade on certain goods) has redistributive consequences in the aggregate on different population groups. ${ }^{14}$ Therefore, each foreign policy option will catalyze the support of some groups, but it might also catalyze the opposition of other groups.

When the elaboration of foreign policy reflects the presence of multiple and het-

[^40]erogeneous interests, the foreign policy that a country conducts will be more likely to shift inconsistently. This is the case because the redistributive consequences of each policy will make it so that in order for one course of action to be approved, side-payments will have to be provided to those in the government coalition who are not to benefit from it as much as the others. These side-payments, I argue, will take the form of different foreign policy actions, for the most part. The net result of the presence of these side payments, therefore, will be an incoherent foreign policy that shifts inconsistently between cooperation and conflict.

To assess whether interests are heterogeneous, it becomes fundamental to look at cleavages, defined as "divisions on the basis of some criteria of individuals between whom conflict may arise" (Lane and Errson in Selway 2011, 48). Cleavages can be identified in terms of ethnicity, religion, income, source of occupation, and so on. Heterogeneous interests are present when there exist less cross-cuttingness in social cleavages (Lipset, 1963; Rokkan, N.d.). The lack of cross-cuttingness is akin to the concept of statistical independence, as explained by Selway (2011), whereupon knowing where one individual stands with respect to race says nothing about where that individual stands with respect to religion or income. When there is less cross-cuttingness in society, that is, when cleavages do not overlap, then interests within society are more likely to be heterogeneous, because each individual identifies herself or himself exclusively with one social characteristic (such as wealth, religion, ethnicity, and so on).

To be clear, I am not claiming that when there is heterogeneity of interests, no clear policy will emerge, because coalitions will be hard to form: the support for prohibitionist policies in the United States on the part of a coalition as heterogeneous as the one composed of bootleggers and baptists speaks to this point quite nicely (Yandle, 1989). What I am instead claiming is that, for a given number of cleavages in a society, cases where individuals belong specifically to a subgroup of the population-that is, when all the people who belong to ethnicity A also belong to religion 1, while all those that belong to ethnicity B also belong to religion 2—will be more prone to volatile foreign policy behavior than cases where individuals belong to multiple subgroups of the population at once-for instance, when a random individual who belongs to ethnicity A has an equal probability of belonging to religion 1 or 2 . This is the case because in a society with no-overlapping cleavages it will be more difficult to formulate one specific policy that appeals to everybody. For instance, take the recent case of trade policy between Japan and South Korea: if in the Japan all nationalists were also interested in protectionism, whereas all those that were not concerned with nationalism were also interested in free trade with South Korea, then a free trade policy with South Korea would designate clear winners and losers in the domestic realm. Losers will require compensation in the form of side-payments. Side-payments could take the form of verbal condemnations of South Korea, verbal threats, and so on-where the range of options is determined by the relative power position. The net effect would be volatile foreign policy. If
instead cleavages were overlapping, a free-trade policy would have found support amongst both nationalists and non-nationalists.

Side-payments in the form of policies have been studied in the context of international bargaining as a way to achieve cooperative outcomes (Mayer, 1992). Side-payments translate into shifts between cooperation and conflict because they might take the form of a different international foreign policy, or they might prevent the actual achievement of lasting cooperation. Therefore the net effect of the presence of these multiple and heterogeneous interests, I argue, is to increase the probability of volatility, that is, of inconsistent changes between cooperation and conflict in the foreign policy of one country. Take for instance the relation between the United States and China: while numerous groups in the United States had interests in freely trading with that country, vociferous sections of the domestic public were also concerned with the human rights violation record of China, and this tension defined foreign policy of the United States in the Nineties, characterized at the same time by protestations on issue of human rights as well as increasing trade flows. ${ }^{15}$

These side-payments do not have to take the form of foreign policy actions, and instead could take the form of domestic rewards for the coalition that is affected negatively by a specific foreign policy action. This feature of the foreign policy

[^41]process however does not constitute a problem for the theory. Two scenarios can emerge: if the probability that the side-payments translate into foreign policy actions rather than domestic ones is random, then it will make it even harder to find significant evidence to support my theory, as the presence of multiple and heterogeneous interests might correlate with volatility only at times. If instead that probability depends on the amount of relative power a state has, then the test of the theory will be able to capture this nuance and reflect it in the pattern of significance. ${ }^{16}$

There are three key components (building blocks) to the theoretical argument I am advancing. First, that states can pursue similar foreign policy objectives through different foreign policies. For instance, if a country decides to escalate tensions with another one, it could do so by increasing its defense spending, or by joining a defensive alliance with a more powerful state (the classic distinction between internal balancing and external balancing, Waltz 1979), or by severing diplomatic ties with its opponent. This very insight is at the basis of the literature on foreign policy substitutability, which points precisely to the presence of multiple pathways to obtain similar objectives (Most and Starr, 1984; Bennett and Nordstrom, 2000; Clark, Nordstrom and Reed, 2008). I depart from this literature by relaxing the assumption that states are unitary actors (Milner and Tingley, 2011, 40), because this assumption masks the fact that each of the possible alternatives present very differ-

[^42]ent redistributive implications: if, for instance, the United States chose to expand its military budget rather than joining a military alliance, certain constituencies-such as those living in states where the defense industry employs a lot of people, like Virginia-will be affected differently than others. ${ }^{17}$

The second key component to my theory is that that foreign policy is, at the domestic level, about foreign politics, because it is about "who gets what, when, and how" (Lasswell and Dwight, 1950). The investigation of the dynamics catalyzed by the foreign policy pursued by states have mainly focused on a subset of foreign policies, those dealing with trade. The redistributive consequences of trade deal and aid packages on the domestic constituencies of the government have been found to significantly impact the probability that those deals go through (Milner and Tingley, 2011), to deeply shape the perception of another country in the public (Fordham and Kleinberg, 2011), and even to determine how representatives vote (Kleinberg and Fordham, 2013). These redistributive consequences, I argue, affect all realms of foreign policy: the study of IR has largely ignored the redistributive consequences of, for instance, security policies (Narizny, 2007). Yet, since states have quite a number of choices when it comes to advancing their own national interest, the specific policy they choose will affect each group differently. For instance, the decision on the part of India to invest in a nuclear program and to authorize its second nuclear explosion in Pokhran affected the Indian population dif-

[^43]ferently, boosting investments in some (geographic and social) sectors of society, while subjecting most of the population to the economic sanctions that ensued. ${ }^{18}$ For this reason, I argue that in order to fully grasp the impact of the domestic sphere of a country on the elaboration of its foreign policy it becomes important to take into consideration those redistributive consequences that each policy put in place-be it in the economic, diplomatic, or security realm-presents.

The third building block of my theory is side-payments. In order to understand the way foreign policy works, it is important to model the presence of side-payments-that is, material or symbolic compensations that are required by one group to dampen the adverse consequences of the specific foreign policy chosen-because domestic groups that will be hurt or will not receive as much from a specific course of action chosen will ask to be indemnified. Given the difficulty of making direct side-payments in the form of money (see Mayer 1992, 806), that indemnification will often require the pursuit of different foreign policy actions. The effects of multiple and heterogenous interests controlling foreign policy has been mainly investigated in the literature on coalition governments. The predominant research question, however, has been how the presence of coalitions in the government have affected the likelihood that the state would engage in a specific course of action: whether that country would be, on average, more or less peaceful (Leblang and Chan, 2003; Palmer, London and Regan, 2004; Kaarbo and Beasley, 2008; Kaarbo,

[^44]2012; Elman, 2000), or more or less able to achieve their own agenda in the international realm (Clare, 2010). In my theory, I depart from this approach to the study of how multiple and heterogeneous interests affect foreign policy by arguing that the aggregate effect of the presence of these interests is not so much to be found in an increase in the probability that the state will pursue a specific course of action over another-for instance, engaging in more or less wars and entering more or less crises—but rather in the likelihood that, through time, the policy of the state will inconsistently shifts between cooperation and conflict. By focusing on how coalition governments impact the specific likelihood of witnessing one outcome, these approaches miss the aggregate impact, which I argue is the presence of inconsistent shifts between cooperation and conflict, or volatility.

In sum, the net effect of the redistributive consequences of foreign policy, then, will be inconsistent shifts between cooperation and conflict. The effects of multiple and heterogenous interests controlling foreign policy has been mainly investigated in the literature on coalition governments. In the next section, I explain where my theory stands with respect to the three main explanations of the systematic impact of domestic interests in foreign policy.

### 5.1.4 Competing Explanations of the Impact of Domestic Politics in Foreign Policy

The impact of domestic variables on the international system has long constituted an important topic of research when explaining foreign policy activity (Gourevitch, 1996), and it has been studied in the context of issues ranging from trade policy (Edward, Milner and Rosendorff, 2002), to alliances (Leeds, 1999; Gartzke and Gleditsch, 2004; Powell, 2010), to international crises (Schultz, 1998b). Three domestic determinants of foreign policy decision making have been identified: domestic institutions, interest groups, and public opinion.First, the specific institutions in a country. For instance, in the debate on democratic peace, domestic mechanisms rely mainly on the specific institutional configuration of the regime that allows citizens to monitor and keep in check their leaders (Lake, 1992). This same institutional mechanism of regular and transparent elections arguably makes it too costly to engage in long wars with no clear prospective of victory (Bueno De Mesquita et al., 1999) and provides governments with an opposition which clearly informs the opponent about the resolve of a democratic regime (Schultz, 1998a, 1999). The second motor of domestic explanations of foreign policy is interest groups. Various foreign policies generate winners and losers, which means that citizens have a stake in organizing and trying to lobby the government. For example, scholars of the determinants of compliance to international organizations rely on the concept of interest groups getting mobilized by international organizations and acquiring
a stake in their government compliance (Dai, 2005; Alter, 2008). The third often investigated domestic catalyzer of foreign policy is public opinion (Mueller, 1973). Here, studies have focused on what mobilizes public opinion in favor or against a specific policy, such as engaging in a military conflict (Lian and Oneal, 1993; Oneal and Bryan, 1995), whether more successful wars are more likely to mobilize domestic support (Gelpi, Feaver and Reifler, 2006; Voeten and Brewer, 2006; Gelpi, Feaver and Reifler, 2009) or it is rather the perceptions of the political motivations adduced to engage in conflict (Eichenberg, 2005). Little has been offered in the way of explaining how and why we should expect public opinion to matter, so that the strongest argument for such a political impact remains the one offered by the literature on audience costs (Fearon, 1994; Schultz, 1998a, 2001; Tomz, 2007). On the other hand, the literature on foreign policy decision-making have largely ignored external constraints to decision-makers activity and focused instead on providing a theory of the principles that guide decision-makers' activity-whether it is safe to assume rationality, bounded rationality, and so on. On the (rather vast) literature on foreign policy decision-making, and on the pros and cons of the rationality assumption, as well as schemata, heuristics, bias and information processing, see Allison and Zelikow 1971; Jervis 1976; Cottam 1977; Herrmann 1986; Khong 1992; Stein and Welch 1997; Simon 1997b; Mintz et al. 1997; Simon 1997a; Sylvan and Haddad 1998; Steinbruner 2002; Mintz 2005 and Brule 2005. For applications of prospect theory in IR, see Jervis 1992; Levy 1996 and McDermott 2001.What sets the selec-
torate theory, veto players theory, and two-level games theory aside is that these explanations intend to offer a systematic approach to explain the effect of domestic politics-rather than one aspect of the domestic polity, or rather than the effect of rationality and bias on the elaboration of foreign policy—and therefore they constitute the natural interlocutor for my theory that seeks to explain inconsistent change between cooperation and conflict.

I focus here on those IR theories that have advanced theories of systematic explanation of the impact of domestic politics on foreign policy: selectorate theory, veto players, and two-level games. These theories aim at providing a mechanism through which the various factors residing in the domestic realm (interests, institutions and public opinion) affect the definition of foreign policy as a whole. In this section, I will explain where my theory stands with respect to each of these approaches: which assumptions it shares, which ones it relaxes, and why it is better equipped to explain volatility.

There are at least three models that have been proposed for—or adapted to—the systematic explanation of the impact of domestic politics on foreign policy: selectorate theory, veto players, and two-level games.

Selectorate theory explains foreign policy decisions by looking at two institutions, the selectorate (S)—defined as the section of the population that has a say in the choice of the leader, as defined by the electoral rules-and the winning coalition (W), which instead represents the subsection of the selectorate whose support
the leader needs to stay in power. When W is small with respect to S , the leader will try to stay in power providing people in the winning coalition W with private goods, that is, goods that only benefit them. Conversely, when $W$ is large with respect to $S$, then the leader will provide public goods, that is, goods that benefit all members of the society (Bueno De Mesquita et al., 1999; Bueno De Mesquita and Smith, 2005). Like selectorate theory, I also build on the assumption that leaders seek to stay in office. However, I depart from this approach by relaxing two key presuppositions whose theoretical consequences have been heavily criticized and proved empirically as being incorrect. ${ }^{19}$ First, I relax the assumption that leaders can choose policies can be dichotomized between those benefit society at large, and those whose benefits can only be felt by a subset of the population, those composing the winning coalition. Take for instance one of the classic examples that selectorate theory identifies of a public good, national security (Morrow et al., 2008, 393): by claiming that the benefits of national security are public goods-that is, they benefit everybody indistinctly-the theory masks the redistributive consequences that each specific policy designed to achieve national security has. Going back to my previous example, then, if a leader decides to pursue national security by increasing their defense budget and investing in the navy rather than by joining defensive alliances, or investing in other sectors of defense, those will advantage some sec-

[^45]tors of the population (such as those invested in the production of those goods) and not others (such as tax payers). ${ }^{20}$ Relatedly, the second assumption that I relax is the one about the preferences of the winning coalitions being homogenous. This assumption amounts to saying, for example, that the Democratic or the Republican coalition that supports the American President is consistent in their preferences over specific policies. This assumption in the selectorate theory is sustained by the idea that policies are fungible-that is, that the loss that the choice of one policy can bring about to a group can be dampened with some amount of money (for an example, see Bueno De Mesquita and Smith 2009, 322). This simplifying assumption is often unrealistic, as Mayer (1992) explains, because it often ignores the symbolic content of many of the foreign policies put in place. For example, Bueno De Mesquita and Smith $(2009,322)$ argues that, had the Turkish people been poorer, or the $W$ to $S$ ratio in the country smaller, the United States would have been able to secure access to NATO bases in Turkey in 2003, during the Iraq war, thereby buying off the domestic opposition to overcome the fact that " the idea of assisting a predominately Christian nation to invade a fellow Muslim nation was domestically unpopular." Instead of assuming either the presence of uniform preferences within the winning coalition or the provision of a monetary recompense of some sort on the part of the leader, my theory models the actual presence of side-payments taking the form of specific foreign policies that are put in place to compensate parts of

[^46]those interests that control for foreign policy.
The two-level games theory of international politics posits that the emergence of international agreements is the function of the concomitant impact of the international and the domestic spheres (Putnam, 1988). International leaders sitting at the negotiating table play a two-level game, where one level is the international one (level I) and another is the domestic one (level II). The likelihood of an agreement being reached is a function of the degree to which the international and the domestic win-sets—defined as the set of all possible agreements that would win support on level II (Putnam, 1988, 437)—overlap. The theory of volatility that I propose shares with the two-level games approach the centrality attributed to the interaction between the domestic and the international level to explain interactions in the foreign policy arena. I depart from the approach to modeling the interaction between the international and the domestic level proposed here in one important way. In the two-level game theory, both levels are theorized as permissive causes-that is, as causes whose presence might or might not make an outcome more likely, but whose absence makes the outcome impossible-because the theory is not set to explain what brings states to the negotiating tables to begin with, but rather what would allow the parties to reach an agreement (Putnam, 1988, 437). Permissive causes are insufficient to explain the occurrence of an outcome such as inconsistent shifts between cooperation and conflict, because they explicitly specify the conditions that might make an outcome more likely, without explaining what
catalyzes that outcome. Permissive causes are akin to necessary causes in that if they are not present, than the outcome cannot be present, but they are not sufficient causes, in that their presence does not automatically lead to the outcome of interest. ${ }^{21}$ The two-level games theory also models the effects of domestic sidepayments on the elaboration of foreign policy, but it does so by concentrating on how the possibility of side-payments makes reaching agreements more likely. Instead, I elaborate farther on this key insight on the importance of side-payments to understand foreign policy outcomes, and I model the aggregate effect of these side-payments through time, and across different realms of foreign policy, and I argue that, given a certain power configuration in the international system, the volatility in foreign policy is precisely the outcome of the presence of multiple and heterogeneous domestic interests that guide foreign policy that catalyze those sidepayments. ${ }^{22}$

Finally, the veto players approach posits the centrality of veto players-that is, those institutional or partisan actors whose agreement is necessary in order for a new policy to be adopted, and therefore to change the legislative status quo-in explaining policy stability (Tsebelis, 2011). Specifically, the higher the number of veto players and the more diverse their preferences, the smaller the win-set, that is, the set of outcomes that can replace the status quo. Like the veto player theory,

[^47]the theory I advance to explain foreign policy volatility recognizes that, as Tsebelis $(2011,19)$ puts it, " specific outcomes are the result of both prevailing institutions and the preferences of the actors involved." However, I argue that veto players theory is poorly suited to explain volatility, because, as Tsebelis (2011, 20-30) makes clear, it theorizes the conditions for the endurance of stability, and the absence of those conditions cannot be taken to explain the occurrence of change, let alone a specific kind of change such as volatility.

Stability is defined as the size of the win-set: a smaller win-set implies a smaller probability of change when compared to a larger win-set. Yet the presence of a larger win-set simply sets more possibility for change, it does not explain if or when change will take place: a larger win-set is, in other words, simply a permissive cause for change, and therefore if applied to the analysis of volatility, it will give rise to under-determinate predictions. ${ }^{23}$ Therefore, knowing that the more veto players there are, the more stability there will be does not quite explain how volatility takes place. Instead, my theory builds on a different approach to the explanation of change, by researching both the permissive cause for volatility (in my case, a prevalence of power in the international system) and the catalyzing cause-the presence of multiple, heterogeneous interests that control foreign policy. While the idea that the presence of multiple, heterogeneous interests catalyzes the occurrence

[^48]of change runs contrary to some application of veto-player theory to the explanation of foreign policy (see especially Henisz 2004), it is at the very basis of the literature on public choice, which has demonstrated how policy change-or cycling-is propelled by the presence of heterogeneous preferences, of multiple alternatives that can be paired against each other, and of a simple majority rule (Arrow, 1951; McKelvey, 1976).

### 5.2 Testable Hypotheses

In sum, I argue that the presence of volatility-intended as inconsistent shifts between cooperative and conflictual behavior-is the outcome of the interaction between the relative power position of a country and the presence of multiple, heterogenous interests controlling the elaboration of its foreign policy at the domestic level.

## Hypothesis 1

Volatility is a function of the interaction of relative power preponderance and the presence of multiple, heterogeneous interests at the domestic level.

Notice that my theory does not advance specific hypotheses for the lower-order terms of the interaction. In other words, my theory does not specify the effect of the presence of multiple and heterogeneous interests when a state has no power preponderance in the international system, and, conversely, it does not specify the
effect of such relative power preponderance when a state is not characterized domestically by multiple and heterogeneous interests. ${ }^{24}$

This feature of the theory descends from the fact that the theory specifies each factor as individually necessary, and the two of them together as jointly sufficient. The lower-order term of the interaction represents the effect of one factor when the other factor is absent. It is only the presence of both together than guarantees the presence of the outcome-they are jointly sufficient-whereas the absence of each prevents the outcome of interest from developing-given that they are individually necessary. However, in the absence of the permissive condition for volatility, the effect of the presence of multiple and heterogeneous interests in under-determined, and vice-versa.

Therefore, the empirical pattern that would fail to disprove my theory is one in which the upper-order term of the interaction is positive and significant. I explain which pattern of evidence disproves my theory in the next section.

### 5.2.1 Alternative Hypotheses

The most obvious candidate for an alternative hypothesis is the one for which the interaction between relative power preponderance and the presence of multiple and heterogeneous interests does not bring about volatile foreign policy.
${ }^{24}$ On the interpretation of the effect of each component of the interaction, see Braumoeller (2004).

## Hypothesis 2

The interaction between the presence of relative power preponderance in the international system and the presence of multiple, heterogeneous interests at the domestic level does not increase the likelihood of volatile behavior.

Yet there are more interesting empirical patterns that run contrary to my theoretical predictions. Because I theorize that the domestic and the international level indicators are individually necessary and jointly sufficient, there exist two kinds of empirical patterns that might disprove my theory. The first empirical pattern that would disprove my theory is the one where the international level does not matter at all. If the international level does not matter at all, then it is not individually necessary, and the international and domestic level are not jointly sufficient.

## Hypothesis 3

Volatility is a function exclusively of the presence of multiple and heterogeneous domestic interests.

In this scenario, as I will explain more at length in the next chapter, where I introduce my measures, the coefficients for the interaction and the coefficient for the lower-order term for the domestic indicator are both statistically significant and positive, which means that the presence of multiple and heterogeneous interests brings about volatility, whether there is power preponderance or not. But the indicator for power preponderance has to be non-significant.

Similarly, the other empirical pattern that would challenge my theory is the one where only the international distribution of power matters, as the recent debate on the effect of unipolarity would lead one to expect (Wohlforth, 1999; Schweller, 2010; Monteiro, 2011).

## Hypothesis 4

Volatility is a function exclusively of relative power preponderance in the international system.

In this scenario, as I will explain more at length in the next chapter, where I introduce my measures, the coefficients for the interaction and the coefficient for the lower-order term for the international indicator are both statistically significant and positive. The lower order term for the domestic indicator has instead to be not significant. Taken together, this pattern of results would indicate that preponderance of power brings about volatility, whether there are multiple and heterogeneous interests in the domestic realm or not. The claim that the international system, if not precisely power preponderance, is the only factor that explains inconsistent shifts between cooperation and conflict has been advanced in theories of foreign policy hedging (Foot, 2006; Atanassova-Cornelis, 2011; McDougall, 2012; Kuik et al., 2012). Hedging has been defined as the intention of one country to cooperate with another while also seeking "insurance policy" to deal with sudden deterioration in the relation with another country (Foot, 2006, 87-88). This theory builds on a uni-
tary actor assumption, whereupon states' leaders are able at any point in time to decide on the strategy they deem more appropriate.

Finally, I also test the veto players theory directly (Henisz, 2004).

## Hypothesis 5

Volatility decreases if the number of veto players increases.

### 5.3 Conclusions

In this chapter, I presented a theory of volatility as the outcome of two individually necessary and jointly sufficient conditions. Preponderance of power establishes a permissive condition, while multiple and heterogeneous domestic interests offer the precipitant condition. In the next chapter, I offer a statistical test of this theoretical preposition.

## Chapter 6 : Empirical Analysis

This project intends to investigate the determinants of foreign policy volatility-which I define as the presence of inconsistent shifts between cooperation and conflict in the foreign policy behavior of one state toward another. In the previous chapter, I advanced a theory of volatility in foreign policy behavior. Volatile foreign policy behavior on the part of a country, I have argued, is the outcome of the interaction between power superiority (permissive condition) and domestic institutions where multiple and heterogeneous interests control foreign policy (precipitant condition). I then derived testable hypotheses from this theoretical claim, also specifying what type of evidence would contradict my theory. In this chapter, I test those observable implications that descend from the theory, and I discuss the implications for the test for the theoretical claim itself.

### 6.1 Building an Index of Heterogeneity

Before delving in depth in the research design, I explain in this section how I intend to operationalize the presence of multiple and heterogenous interests that control
foreign policy development.
To operationalize the presence of multiple, heterogeneous interests within a country, I build an index that reflects the presence of these interests in the domestic realm.

The index is equal to zero if the regime does not reflect the preferences of a country's population-which I measure by looking at whether the selection of the government is subject to regular elections (XROPEN in Polity IV). The rationale for doing so is to easily select those countries where the government is not likely to reflect the preferences of the population (whether the interests in that population are heterogeneous or not), but is instead in the hands of a selected, homogeneous elite. Moreover, when interacted in the model with the capability ratio, the coefficient for the capability ratio will therefore give the impact on volatility of capabilities for regimes where governments are not subject to regular elections. ${ }^{1}$

If the government recruitment is regular and open and there are cross-cutting cleavages, the index is equal to 1 . If the recruitment is competitive and cleavages are not cross-cutting, the index is equal to 2. Data come from The Cross-National Indices of Multi-Dimensional Measures of Social Structure (CIMMSS) (Selway, 2011). As argued in the previous chapter, the importance of the presence of cleavages-defined as "division on the basis of some criteria of individuals, groups, or organizations [between] whom conflict may arise. These criteria can be ascriptive, such as race,

[^49]caste, ethnicity, language, or attitudinal, that is, ideology, preference, class, or religion" (Lane and Ersson in Selway 2011, 48)—in the explanation of a population's interests have been established in the IR literature mostly by the literature on trade. Because I intend to explain the effects of these interest on the full spectrum of foreign policy behavior-specifically, on the inconsistent shifts between cooperation and conflict-I depart from the literature on domestic dispositions on trade in two ways. First, I do not assume that a specific cleavage dimension in (or identity of) the domestic constituency has greater salience when it comes to foreign policy than others. Any given foreign policy decision can have redistributive consequences on multiple dimensions-such as the economic, or ethnic, or religious dimension, and so on-and identifying one of these as the most salient one would amount to unduly assuming that that one policy unequivocally mobilizes one identity over all the others. ${ }^{2}$ The debate over India's acquisition of the nuclear weapon clarifies this point. The decision of India to pursue a nuclear weapon had different implications for the population of India on multiple dimensions, therefore imposing costs and benefits according to different cleavages, such as a geographic cleavage, an economic cleavage and even a ethnic-religious cleavage. Specifically, the acquisition of the bomb shifted the conduct of the conflict with Pakistan at the borders, thus affecting differently people living in different parts of the country (ge-

[^50]ographic cleavage). It also imposed different costs and brought different employment opportunities for different sectors of the population-tax-payers and those who worked on the Pokhran explosion- (economic cleavage). Finally, the decision on the part of India to pursue the weapon, and in particular the nuclear explosion in 1998, was seen by a sector of the population and by the party in government as an important boost for Indian pride, but arguably less so by other sectors of the population. Therefore, the foreign policy decision on the part of India to acquire nuclear weapons had different redistributive implications for people, and more importantly it affected the Indian population through multiple cleavages. Assuming that one of these dimension is more salient than all the others amounts to unduly assuming that the redistributive consequences over one cleavage were more important than those in another cleavage. ${ }^{3}$ The second, related way in which I depart from current approaches to modeling the impact of cleavages is by focusing on the degree to which these cleavages are cross-cutting, rather than simply looking at the number of cleavages in society.Selway $(2011,51)$ defines cross-cuttingness as follows: "cross-cuttingness is basically the concept of statistical independence, which tells us whether knowing to what group an individual belongs on $x$ tells us anything about which group she belongs to on $y$. If knowing what group on $x$ an individual belongs to tells us nothing what group on $y$ she belongs to, then we have perfect cross-cuttingness." To reflect theory, the first indicator in the index

[^51]takes the value of 1 if society shows a level of cross-cuttingness below .50 in all the following dimensions: ethnicity, language, religion, geography, and income. The index represents a constant through time, therefore serving the function of marking cross-sectional differences, rather than within country, temporal ones. ${ }^{4}$ As I have argued in the previous chapter, the presence of non cross-cutting cleavages denotes a society with more heterogeneous interests than one in which interests are instead overlapping because when individuals form distinct groups on the bases social characteristics such as ethnicity, language, religion, geography, and income those groups will be more likely to have a set of distinct characteristics when it comes to foreign policy. If for instance individuals residing near the border of a rival are those that nurture the more nationalistic sentiments, yet they do not belong to the income category that benefits from trade with that rival, then those individuals will be more likely to ask for foreign policy compensations that will bring to volatile foreign policy.

The index is equal to 3 if cleavages are not cross cutting and the government recruitment is competitive-that is, whether there is an actual election where everybody can compete (XRCOMP in Polity IV). This is different from (XROPEN, which instead captures the presence of regular elections-whether these are competitive or not. By including this indicators in the index, I make sure that the domestic institutions reflect the multiple interests present in the domestic population.

Finally, the index is equal to 4 if the cleavages are not cross cutting, the gov-

[^52]ernment recruitment is competitive, and the government that emerges from this selection is divided, following the operationalization put forward in Nooruddin (2011, 203-5). This component of the indicator allows me to capture the presence of multiple and heterogeneous interests at the government level (where heterogeneity is defined in terms of different parties controlling different sectors of government, such as the executive and the lower chamber).

In sum, this index is designed to capture the presence of multiple and heterogeneous interests in the domestic realm and to make sure that those are reflected at the governmental level. ${ }^{5}$ Figure 6.1 reports an histogram of the values assumed by the domestic indicator variable H : the plot on the top reports a version of the indicator where no distinction is made between weather the government that emerges in regular elections in a country with no cross cutting cleavages is divided or not, whereas the plot at the bottom reports that distinctions. Results are robust to either operationalizations. Countries that are coded as " 1 " in the version of the indicator that includes the distinction between divided governments and not include India in the second half of the 2000s as well as Pakistan in the first half of the 1970s. On the other hand, countries coded as zero include Cuba and Chile. Some countries (such as the US, China or Israel) keep the same score during the whole period under analysis, whereas others (such as India and Pakistan) swing back and forth between different values.

[^53]

Figure 6.1: Histogram of the domestic indicator H values, both in the version that differentiates between governments that are divided and governments that are not (bottom) and in the version that does not make this differentiation.

### 6.2 Research Design

To test my theory on the determinants of volatile foreign policy behavior, I look at 25 strategic rivalries (Thompson, 2001). Using a directed dyad approach, I gather event data on the foreign policy activity directed from one member of the dyad to another, for the years 1948-2006, and I analyze them utilizing several different panel data models. I explain each of these choice in detail in the following sections.

### 6.2.1 Rivalries

I restrict my sample to strategic rivalries. The concept of rivalry is a heuristic device through which scholar have identified those pairs of states that entertain hostile relations. There are multiple definitions of what counts as a rivalry (Goertz and Diehl, 1995; Diehl and Goertz, 2001; Maoz and Mor, 2002; Hewitt, 2005; Klein, Goertz and Diehl, 2006; Colaresi, Rasler and Thompson, 2007), and Colaresi, Rasler and Thompson $(2007,50)$ identify six definitions. It is however possible to broadly distinguish between two methods to identify rivalries: a dispute density approach (Hewitt, 2005; Diehl and Goertz, 2001; Bennett, 1998; Maoz and Mor, 2002) and a perceptual approach (Thompson, 2001; Colaresi, Rasler and Thompson, 2007). In the dispute density approach, rivalries are identified by the number of wars or crises in which the dyad is involved. In the perceptual approach, states are defined as rivals if there develops a sentiment of enmity between the two countries.

Focusing my research on looking for volatility within rivalries has several ad-
vantages. First, the concept of rivalries encompasses a set of politically relevant dyads. Specifically, with some variation depending on which definition is adopted, since World War II, over ninety percent of all wars have taken place between rivals (Colaresi, Rasler and Thompson, 2007, 89), almost seventy-eight percent of wars since 1816 (Thompson, 2001, 588) and three-fourths of all militarized disputes (Diehl and Goertz, 2001, 61).

Second, by concentrating on rivalries, I can make a focused comparison (George and Bennett, 2005, 67) on what determines volatility and how volatility impacts the foreign policy behavior of the dyad. In other words, by comparing relations that share a similar propensity to engage in conflict, I can focus the analysis on what causes some of these relations to be volatile and others to be stable. ${ }^{6}$

Finally, rivalries represent a particularly suitable subset of dyads to perform a focused comparison because they constitute a heuristic device that identifies pairs of states who cultivated highly reciprocal foreign policies-that is, foreign policies that were highly dependent on what the counterpart was doing, as in the case of the US and Soviet Union. ${ }^{7}$ In other words, the dyadic component in their relation is quite strong. In other kind of relations, such as alliances, researchers have shown that this is not been the case, and in fact to model relations between pairs of allies is fundamental to understand the whole network of alliances in the system (Cranmer, Desmarais and Menninga, 2012; Cranmer, Desmarais and Kirkland, 2012).

[^54]
### 6.2.2 Dependent Variable: Volatility in Foreign Policy

I define volatility in foreign policy as the presence of inconsistent shifts between cooperation and conflict through time. To measure those inconsistent shifts, I take the standard deviation of the square of the residuals from a Box-Jenkins analysis of the annual time series of the foreign policy activity directed from one member of the dyad to the other, using a procedure that I detail in Chapter I. Specifically, I start with the time series of the foreign policy actions of state $i$ toward state $j$, and I employ a Box-Jenkins procedure to derive the residuals. In formal terms, the conditional mean of the time series of interest $y_{t+1}$ is expressed as (Enders, 2008):

$$
\begin{equation*}
E_{t} y_{t+1}=a_{0}+a_{1} y_{t} \tag{6.1}
\end{equation*}
$$

Once the temporal process that is embedded in the series is correctly specified and stripped from the data, the residuals left are:

$$
\begin{equation*}
\epsilon_{t}=\hat{y}_{t}-y_{t} \tag{6.2}
\end{equation*}
$$

I then square these residuals and take the standard deviation of these residuals from each annual series. Because I look at directed dyads of rival states, the dependent variable corresponds then to the standard deviation of the residuals from
a Box-Jenkins analysis of the time series at time $t$ of the foreign policy activity directed from state one member of the dyad toward the other, for $i$ directed dyads and $t$ years, with $i=1 \ldots N$ directed dyads and $t=1 \ldots T$ years.

As I explain in depth in Chapter III, I use event data, such as data from COPDAB, WEIS, CAMEO, as well as independently collected data using the software TABARI (Azar, 1979; McClelland, 1978; Schrodt, 2006). Data are scaled using Goldstein (1992). By collecting all the information about everyday foreign policy events between countries, event data make it possible to study the full spectrum of foreign policy interaction-that is, to look both at cooperation as well as conflict in the military, economic, and diplomatic realms. Using residuals from a Box-Jenkins procedure, on the other hand, allows me to focus on those kind of shifts between cooperation and conflict that are truly inconsistent. This is the case because the BoxJenkins analysis allows me to correctly specify the kind of time dependency present in the foreign policy time series, and to model it. Such time dependency comprises empirical phenomena such as the presence of cycles (seasonality) and trends. As I explain in Chapter I, I conceptualize those as being different from volatility. By using the residuals from the Box-Jenkins procedure, after those processes have been stripped from the data, I improve the construct validity of my test, assuring that the dependent variable reflects the concept of volatility I define in my theory.

Figure 6.2 reports the mean, minimum, and maximum values of the dependent variable (volatile behavior) for a subset of the dyads in the sample. The values are
represented on the $x$-axis, while each dyad member is represented on the $y$-axis in proximity to the its counterpart in the dyad. From the Figure, there emerges a reciprocity effect: the volatility statistics for each member of the dyad are close and comparable to those of the counterpart. Moreover, certain dyads such as ChinaJapan and India-Pakistan have comparable levels of volatility on average, yet the range of values that the volatility for India-Pakistan can reach is almost double the levels that can be reached in the dyad China-Japan.


Figure 6.2: Summary statistics of the dependent variable (volatile behavior) for a subset of the dyads in the sample.

While providing an intuitive picture of the summary statistics of the depen-
dent variable (volatile behavior) for a subset of the dyads in the sample, Figure 6.2 fails to highlight the temporal variation in volatility within each dyad. To display the temporal variation in volatility, as well as the cross-sectional one, Figures 6.3 to 6.6 represent the five-year moving average (plots on the left) and moving standard deviation (plots on the right) of the yearly volatility registered in each year. The picture of volatility that emerges from these Figures is a more complex one. For instance, Figure 6.2 points out that the volatility registered between North Korea and South Korea is smaller on average than the one between the US and the USSR / Russia. However, a comparison between Figures 6.5 and 6.6 shows that through time, the moving average and standard deviation of the volatility between North Korea and South Korea is smaller than the moving average and standard deviation of the volatility between the US and the USSR/Russia, except for the years of the Korean war.

Comparing the same countries through time, other interesting patterns of volatility emerge: for instance, analyzing the dyad US-USSR/Russia, it is possible to see that Russia displays greater variance in its volatile behavior toward the United States. The difference in the variance of volatility for the US and USSR/Russia decreases in the 1990s, only to spike up again in the 2000s. Conversely, the average level of volatility between the two countries is more similar than the variance in the volatility (as demonstrated by the fact that the lines in the left-hand plot in Figure 6.6 are closer together than they are in the right-hand plot in Figure 6.6) and


Figure 6.3: Five-year moving average (left) and moving standard deviation (right) of yearly volatility for China and Japan


Figure 6.4: Five-year moving average (left) and moving standard deviation (right) of yearly volatility for India and Pakistan


Figure 6.5: Five-year moving average (left) and moving standard deviation (right) of yearly volatility for North and South Korea.


Figure 6.6: Five-year moving average (left) and moving standard deviation (right) of yearly volatility for US and USSR/Russia.
while the average level of volatility drops considerably in the 1990s after the end of the Cold War, it then rises again in the next decade, especially as far as Russia is concerned.

### 6.2.3 Independent Variables

My theory claims that volatility is the product of the interaction between the power position in the international system that a country holds and the presence of multiple, heterogeneous interests controlling its foreign policy. To operationalize the relative power position of a state, I use its CINC score from the Correlates of War data set (Singer, Bremer and Stuckey, 1972; Singer, 1988). The measure reflects a conception of international power as constituted prevalently by material capabilities. Specifically, since I use a directed dyad approach, I measure the relative power position of country A with respect to country B by taking the ratio of country A's capabilities to country B's capabilities.

For the domestic indicator, I create an index of the heterogeneity $H$ to capture the degree to which foreign policy reflects multiple and heterogeneous interests, as I described at the beginning of this chapter.

Per Hypothesis 1, my theoretical expectation is that the interaction between the international level indicator and the domestic level indicator is positive and statistically significant. I do not expect the lower order terms of the interaction to have any particular sign or significance: in other words, I claim that the effect of each in
the absence of the other is indeterminate when it comes to volatility (Braumoeller, 2004). What I expect is that the effect of one term on the other will be significantly shaped, mediated by the other.

### 6.2.4 Controls

In order to accurately capture the impact of the interaction between the presence of multiple and heterogeneous interests at the domestic level and the relative power superiority of one country with respect to its counterpart, I control for possible alternative factors that might impact both the dependent variable and my independent variable. Thus, I control for the presence of volatility in the behavior of the counterpart, to measure the dyadic component of volatility-that is, how much of the volatility of one of the parties to the dyad arises in response to the volatile behavior of the counterpart. It could be the case that states facing volatile counterparts also become more volatile in their foreign policy behavior-or, conversely, it could be the case that states compensate for their counterpart's volatility by embracing a more cautious and stable behavior.

I also control for the capabilities of the counterpart: opponents who are strong, in absolute terms, might make a state less likely to carry forward a volatile foreign policy, in fear of retaliation. Data come from the COW capability index. I measure the counterpart's volatility using exactly the same procedure as I do when I measure the dependent variable (only measuring the volatility of country B, rather
than country A, in each direct dyad).
Finally, I control for one plausible, alternative explanation for volatility in foreign policy-the presence of veto players. The presence of veto players is measured by recording both the number and the ideological distance of those individuals that are constitutionally required to agree to a policy in order to change the status quo, using POLCON (Henisz, 2013). It could be the case that the presence of veto players decreases the likelihood of policy volatility. The greater the number of people who need to agree in order for foreign policy to change, the more foreign policy behavior will be characterized by inertia. As I explain at greater length in the previous chapter, this theory of volatility emphasizes what prevents volatile behavior from materializing, without actually providing an explanation for when and how we are more likely to witness volatility.

### 6.2.5 Model

I structure my data in panel fashion, with $\mathrm{N}=52$ and $\mathrm{T}=59$. The panel data structure makes it possible to gain leverage from variation that is both cross-sectional and longitudinal (Greene, 2003). With different sources of variation, however, also come different forms of heterogeneity (within and across units), as well as autocorrelation within units, heteroskedasticity between units, contemporaneous correlation between units, spatial correlation and so on.

Thus, I test my theory using multiple models: a fixed effects model, a random
effects model with standard error clustered within each unit or panel, and a linear regression model with panel corrected standard errors-with a panel-specific $\operatorname{AR}(1)$ type correlation in the standard errors within each panel. I use a directed dyad approach, whereupon I model the determinants of volatile foreign policy behavior directed from country A to country B, and vice versa. I explain the models below. The base structure for panel data models looks like follows (Cameron and Trivedi, 2005):

$$
\begin{equation*}
y_{i t}=\alpha_{i t}+\mathbf{x}_{i t} \beta_{i t}+e_{i t} \tag{6.3}
\end{equation*}
$$

where $i=1, \ldots, N$ represents each unit or panel (in this case, each directed dyad) and $t=1, \ldots, T$ represents instead each time period (in this case, years from 1948 to 2009). Each of the models estimated tackles some of the issues presented by these type of data differently. For instance, fixed-effect models allows for each panel to have a different intercept, thus:

$$
\begin{equation*}
y_{i t}=\alpha_{i}+\mathbf{x}_{i t} \beta_{i t}+e_{i t} \tag{6.4}
\end{equation*}
$$

This specification allows me to control for unobserved random variables that might be correlated to the regressor but that are also specifically characterizing each
unit or panel. In the case of random effects, the unobserved random variable $\alpha_{i}$ is distributed instead independently of the regressors $x$. Moreover, both $\alpha_{i}$ and $e_{i t}$ are assumed to be independently and identically distributed-that is, $\alpha_{i}=\left[\alpha, \sigma_{\alpha}^{2}\right]$ and $\epsilon_{i}=\left[\epsilon, \sigma_{\epsilon}^{2}\right]$. Both models therefore address the presence of unobserved individual heterogeneity-that is, heterogeneity that is idiosyncratic to each panel or unit. To control for heteroskedasticity in the residuals, I estimate both models with standard error clustered within each unit or panel. Finally, I complement fixed and random effect models with a pooled model with panel corrected standard errors. In the model, no unobserved random variable is modeled to capture the presence of idiosyncratic effects of each units:

$$
\begin{equation*}
y_{i t}=\alpha+\mathbf{x}_{i t} \beta_{i t}+e_{i t} \tag{6.5}
\end{equation*}
$$

but the disturbance term $e_{i t}$ can be assumed to be autocorrelated across time $t$ or correlated across units $i$. In this case, I specify a panel-specific $\operatorname{AR}(1)$ type correlation in the standard errors within each panel.

Each of these model addresses some of the issues presented by the panel data structure, but none of them addresses them all at the same time. Therefore, the take-away point in Table 6.1, where I report the results, is not to be found in a single model specification, but rather in the fact that the same result holds across
different model specification. ${ }^{8}$

### 6.3 Results

Table 6.1 reports the results from the different models. Several trends emerge from the data, and they hold across multiple model specifications. First, the regional power of a country has a negative effect of volatility for those countries whose foreign policy is not subject to multiple and heterogeneous interests-that is, the coefficient for Relative Power is negative. The effect is not statistically significant in the model with random effects. The negative effect of relative power on volatility declines as the foreign policy of a country increasingly reflects multiple, heterogeneous interests, as demonstrated by the fact that the the coefficient for $H X$ Relative Power is positive and statistically significant. This result provides support to Hypothesis 1 and failing to provide support for Hypothesis 2 in the previous chapter. This result also fails to provide support for Hypothesis 4, which stated that volatility was driven exclusively by a state's relative power, independent of what a state's domestic realm was like. Conversely, the effect of the presence of multiple heterogeneous domestic interests does not have an impact on the probability of volatile foreign policy when there is no relative power advantage-that is, when Relative Power is equal to zero. This result fails to provide support for Hypothesis 3,

[^55]which stated that volatility was driven by domestic interests, independent of what a state's relative power is.

Table 6.1: Cross sectional, time series models of foreign policy volatility

|  | Fixed <br> Effects | Random <br> Effects | PCSE |
| :---: | :--- | :--- | :--- |
| Relative Power | $-.016^{* *}$ | -.003 | $-.019^{* *}$ |
|  | $(.007)$ | $(.002)$ | $(.002)$ |
| H X Relative Power | $.081^{* *}$ | $.023^{* * *}$ | $.090^{* *}$ |
|  | $(.029)$ | $(.009)$ | $(.035)$ |
|  | -.088 | .095 | .110 |
| Veto Players | $(.118)$ | $(.082)$ | $(.094)$ |
|  | $(.128)$ | -.004 | -.065 |
| Counterpart's | 1.056 | .606 | $(.148)$ |
| Capabilities | $(.661)$ | $(.518)$ | -.163 |
| Counterpart's | .557 | $.578^{* * *}$ | $.553^{* * *}$ |
| Volatility | $(.016)$ | $(.171)$ | $(.024)$ |
| Constant | .060 | $.060^{* *}$ | $.116^{* *}$ |
|  | $(.048)$ | $(.024)$ | $(.037)$ |
| Hausman | 36.98 |  |  |
| $\rho$ | .087 | .017 |  |
| N | 52 | 52 | 52 |
| T | 59 | 59 | 59 |
| Standard errors presented in parentheses beneath coefficient estimates. |  |  |  |
| $\dagger$ significant at the .10 level, ${ }^{*} .05$ level, ${ }^{* *} .01$ level, ${ }^{* * *} .001$ level. |  |  |  |

While coefficients tell a consistent story across different model specifications, I complement Table 6.1 with a graphic representation of the effects of the interaction between relative power and the presence of multiple and heterogeneous interests in the domestic realm. Figure 6.7 reports the marginal effects of the domestic indicator H on volatility for different levels of Relative Power, with 95\% confidence intervals (light blue dots). The Figure shows the crucial interactive nature of the relation between relative power and the presence of multiple, heterogeneous interests. When
there is no power superiority (that is, when Relative Power is held constant to zero, as in the case of Cuba-Us in 1952 and 1953), the presence of multiple and heterogeneous interests has no significant impact on the likelihood of volatile behavior. Conversely, when the level of superiority in power of country A in the directed dyad increases, the presence of multiple and heterogeneous interests significantly increase the likelihood of volatile behavior. ${ }^{9}$


Figure 6.7: The marginal effect of the domestic indicator $H$ on volatility for different levels of Relative Power, with 95\% confidence intervals (light blue dots).

Figure 6.8 represents instead the marginal effect of relative capabilities on volatility for different levels of the indicator for multiple and heterogeneous domestic
${ }^{9} \mathrm{~A}$ (non-exhaustive) list of directed dyads with, respectively, mean, 90 th percentile, and maximum value for Relative Power are: US-USSR in 1972-73, Turkey-Iraq in the 1950s, Syria-Israel in the 1960s; US-North Korea in the 1980s, China-Taiwan in 1988, Great Britain-Iraq in 1967; and for the value at the maximum, US-Cuba in the 1950s.
indicators H, with $95 \%$ confidence intervals. Again, the plot highlights the interactive nature of the relation between the presence of multiple and heterogeneous domestic interests and relative power superiority. In regimes where no regular and fair elections are held $(H=0)$, increasing levels of power superiority make volatile behavior significantly less likely, whereas for increasing levels of representation of multiple and heterogeneous interests, relative power superiority systematically and significantly increases the likelihood of volatile behavior.


Figure 6.8: The marginal effect of Relative Capabilities on volatility for different levels of the indicator for multiple and heterogeneous domestic indicators H , with $95 \%$ confidence intervals (light blue dots).

Together with the results in the Table, Figures 6.7 and 6.8 demonstrate that volatility is the outcome of the interaction between relative power superiority in
the international system and the degree to which its foreign policy is defined by multiple, heterogeneous interests. Volatility is defined as the the presence of inconsistent shifts between cooperation and conflict in the foreign policy behavior of a country towards another. My theory posits two conditions to explain its presence: first, a range of cooperative and conflictual acts toward the counterpart have to be in the realm of possible behaviors for a country, a range which is extended by relative power superiority; second, the behavior of that country has to effectively shift inconsistently between cooperation and conflict, a dynamic that I argue is being catalyze by the presence of multiple, heterogeneous interests controlling the definition of a country foreign policy. As a matter of fact, the interaction term is positive and significant. The lower order term for Relative Power is significant, but negative, while the lower order term for $H$ is not distinguishable from zero: power preponderance or the presence of multiple, heterogeneous domestic interests per se do not increase volatility. ${ }^{10}$

Finally, in order to fully capture the interactive effect of the domestic and the international indicator on the likelihood of volatile behavior, I complement the previous Figures with Figure 6.9, a three-dimensional perspective plot where both the interactive independent variables are represented, together with an axis for the dependent variable, volatility. The graph confirms that volatility is proportional to

[^56]the interaction between relative power superiority and the presence of multiple and heterogeneous interests at the domestic level-by showing that the value of volatility augments as both independent variables increase.


Figure 6.9: Perspective plot of the effects of interaction between relative power and the presence of multiple and heterogeneous interests at the domestic level on the likelihood of volatile behavior.

As for the control variables, the counterpart' s volatile behavior is also an important driver of volatility. This result is quite intuitive: studying the interactions between members of a dyad, there is a certain degree of reciprocity in behavior that is captured by the significant and positive coefficient for volatility. However, as the previous paragraph's discussion makes clear, the reciprocity within the dyad tells only part of the story, because an important component of volatility lies in the
interaction between domestic and international factors-the presence of multiple and heterogeneous interests at the domestic level as well as relative power with respect to the counterpart. Conversely, the material capabilities of the counterpart neither significantly increase nor significantly decrease a state vulnerability. Similarly, the presence of veto players has no significant impact on volatility. As the theoretical discussion in the previous chapter makes clear, in order to explain volatility, a dynamic process, it is important to capture the dynamic interaction between those factors that make volatility possible (or permissive conditions) and those that make volatility likely (catalyzing conditions). Both the counterpart's material capabilities and the presence of veto players arguably single out permissive (or even prohibitive) conditions for volatility, rather than actual motors of volatility.

### 6.3.1 Robustness Checks: the Independent Variable

To check the robustness of these results, I use two different operationalization of the domestic indicator $H$ for the presence of multiple and heterogeneous interests in the domestic realm. In the first robustness check, I operationalize $H$ in the exact same way as I do before, except I use the indicator POLITY rather than XROPEN to messure whether the domestic regime fails to reflect the preferences of a country's population. The rest of the operationalization of the indicator $H$ remains the same. Both variables come from the Polity IV data set, and the XROPEN indicator is one
of the components of the POLITY indicator, so by operationalizing a regime's responsiveness to the preferences of a country's population with POLITY, I utilize a broader definition of what goes into defining whether a country is responsive or not-rather than focusing on whether elections are regular or not. In particular, I look at countries whose POLITY score is equal to -10 , which in my sample corresponds to, in various years, North Korea, Afghanistan, Saudi Arabia, Jordan, and so on. My results are robust to this specification of the domestic indicator, as I show in Figures 6.10, 6.11, and 6.12.


Figure 6.10: The marginal effect of Relative Capabilities on volatility for different levels of the indicator for multiple and heterogeneous domestic indicators H , with $95 \%$ confidence intervals (light blue dots), with $H$ coded with the Polity indicator.


Figure 6.11: The marginal effect of Relative Capabilities on volatility for different levels of the indicator for multiple and heterogeneous domestic indicators H , with $95 \%$ confidence intervals (light blue dots), with $H$ coded with the Polity indicator.

### 6.3.2 Robustness Checks: the Dependent Variable

Finally, I test my theory on a different dependent variable. Rather than using the standard deviation of the residuals from a Box-Jenkins procedure on the annual time series of the actions carried on by country A toward country B, I simply use the standard deviation of the annual time series of the actions carried on by country A toward country B. I define my main variable of interest, volatility, as the presence of inconsistent shifts between cooperation and conflict. While volatility is undoubtedly a form of instability, in conceptualizing volatility (see Chapter I) I parse out this kind of inconsistent change from other types of instability-such as


Figure 6.12: Perspective plot of the effects of interaction between relative power and the presence of multiple and heterogeneous interests at the domestic level on the likelihood of volatile behavior, with $H$ coded with the Polity indicator.
the presence of recurring behavior during specific phases (cycles) or the presence of a consistent trajectory toward more cooperation or more conflict (trends). Here, I do away with that more fine-grained distinction between volatility and other forms of instability, and I test whether the interaction between relative power superiority and the presence of multiple and heterogeneous interests in the domestic realm increases instability broadly defined-which I operationalize as the annual standard deviation in foreign policy behavior, rather than only volatility.

My results are robust to this specification of the dependent variable, as shown in Figures 6.13,6.14, and 6.15. While this is an interesting result, this foreign policy
measure contains a host of different forms of instability (phenomena such as inconsistent shifts between cooperation and conflict, but also cycles that respond to specific phase in time such as elections, and even trends toward more cooperative or conflictual relations). The amount of noise in the measure makes it hard to draw a clear causal mechanism between the presence of multiple and heterogeneous interests at the domestic level and relative power superiority and the presence of foreign policy instability. Yet this result points to the power of the connection between the interactive effect of domestic interest and power positions and the presence of instability (whether accurately defined as volatility or broadly defined as any and all forms of instability occurring in foreign policy) in the international realm.


Figure 6.13: The marginal effect of Relative Capabilities on foreign policy instability for different levels of the indicator for multiple and heterogeneous domestic indicators H, with $95 \%$ confidence intervals (light blue dots).


Figure 6.14: The marginal effect of Relative Capabilities on foreign policy instability for different levels of the indicator for multiple and heterogeneous domestic indicators H, with $95 \%$ confidence intervals (light blue dots).


Figure 6.15: Perspective plot of the effects of interaction between relative power and the presence of multiple and heterogeneous interests at the domestic level on the likelihood of foreign policy instability.

### 6.4 Conclusions

In this chapter I offer a statistical test of the theory of volatile foreign policy behavior that I presented in the previous chapter. I describe the operationalization that I adopt of the presence of multiple and heterogeneous interests. I then introduce the operationalization of the dependent variable, volatile foreign policy behavior, exemplifying the type of cross-sectional and temporal variation in the data under analysis. After describing my research design, I illustrated the main results of the model I estimated on my panel data.

I find that volatile foreign policy behavior-defined as the presence of inconsistent shifts between cooperation and conflict in a state's behavior toward another state—is the function of the interaction between the presence of multiple, heterogeneous interests at the domestic level and relative power superiority with respect to the counterpart at the international level. These results are robust to different specifications of the indicator for the presence of multiple and heterogeneous interests at the domestic level, as well as to a more broad definition of instability, using a different specification of the dependent variable.

Leveraging both cross-sectional and temporal variation, these results highlight the importance, in understanding volatility, to model both permissive conditions and catalyzing conditions for volatility, as both contribute in fundamental ways to bringing about inconsistent changes between cooperation and conflict.

## Chapter 7 : Conclusion

In recent years, the relations between China and Japan have witnessed remarkable processes of cooperation and astounding episodes of conflict. With increased military activities near the contested Senkaku/Diaoyu islands whose reverberation threaten to destabilize the whole East Asian region, the two states have resumed strong nationalist claims and policies. ${ }^{1}$ At the same time, there has been a conscious efforts on the part of both countries to boost trade and economic activities between the two countries. Japanese Premier Shintso Abe often made nationalist remarks against China and positive ones about trade with China in the same breadth. ${ }^{2}$ Yet why would state engage in this type of inconsistent shifts between cooperative and conflictual behavior? Theories of foreign policy hedging (Foot, 2006; AtanassovaCornelis, 2011; McDougall, 2012; Kuik et al., 2012) have argued that this is indeed rational behavior on the part of states. Hedging has been defined as the intention of one country to cooperate with another while also seeking "insurance policy" to deal with sudden deterioration in the relation with another country (Foot, 2006, 87-88).

This theory builds on a unitary actor assumption, whereupon states' leaders are

[^57]able at any point in time to decide on the strategy they deem more appropriate. Yet these theories neither consider nor explain why states would voluntarily engage in behavior that is ultimately quite self-defeating: to keep with the example of China and Japan, not only are trade flows affected by the military tensions over the Senkaku/Diaoyu islands, firms in each country that trade more often with the other country are also more likely to get discriminated against more often. ${ }^{3}$

Why and when, then, do states decide to pursue their grand strategies combining, often counterproductively, conflict and cooperation? This dissertation set to explore precisely this puzzle. I propose a theory of the conditions under which states engage in incongruent behavior—what I can volatile foreign policy. Volatility is the outcome of the interaction between dynamics unfolding both at the domestic and the international level: the unbridled competition among domestic groups and a state's relative power superiority. Superior power acts as a permissive condition for volatility: it expands the available strategies at a state's disposal to include more cooperative and combative options, allowing the stronger state to act inconsistently towards its weaker rival. Yet the precipitant cause of grand strategic volatility is competition among multiple and heterogeneous domestic groups. Whether the government chooses cooperative or conflictual options will have redistributive implications for these groups. For narrowly self-interested reasons, therefore, these groups will attempt to impose their preferred foreign policies-cooperative or ag-

[^58]gressive-over others. Thus, when no single group dominates this process, the state's foreign policy will swing back and forth inconsistently from conflict to cooperation.

I test this theory collecting original data on the foreign policy interactions between strategic rivals in the period 1946-2008, and a multiplicity of diverse methodological tools: concept formation, bivariate and heteroskedastic probits, and time series models of volatility.

In introducing the concept of volatility in foreign policy, this dissertation aims at proposing a new heuristic in the study of international relations-and one that provides a more fine-grained and realistic description of state's foreign policies in the international system. When studying international relations, IR scholars often decide to investigate the determinants of war (Blainey, 1988; Van Evera, 2013; Levy and Thompson, 2009; Goemans, 2000); or the conditions that make peace possible (Levi, 1964; Oneal, Russett and Berbaum, 2003; Betts, 1992); those states that breed long-term rivalries between themselves (Goertz and Diehl, 1995; Klein, Goertz and Diehl, 2006; Colaresi and Thompson, 2002a); or those states that decide to join forces in an alliance to pursue their own agenda (Cranmer, Desmarais and Menninga, 2012; Cranmer, Desmarais and Kirkland, 2012; Powell, 2010; Kimball, 2006). These important conceptual categories that we apply to the study of the international arena are helpful in clarifying crucial moments in states' foreign policy interactions, such as the momentous decision to spend resources in waging wars,
or the commitment to form trade unions or to join a defense organization. Yet precisely because they focus exclusively on critical foreign policy events, these heuristic tools should be complemented with others that provide a more fine-grained picture of the interactions between countries in the international system. By looking at shifts between cooperation and conflict in the foreign policy of one state toward another, the concept of volatility builds a continuum on a wide array of cooperative and conflictual events-such as public declarations of support, or the renewal of a trade agreement, or military and economic threats, and so on. Moreover, volatility is an important complement to existing concepts and heuristics in International Relations also because it does assume a dichotomization between the security and economic realm of international relations. In other words, by looking at cooperative and conflictual behavior as part of a continuum, and investigating when and why states inconsistently shift between one or the other, therefore doing away with an often weak distinction between what counts as a security issue and what counts instead as an economic issue-think, for instance, about typical international relations' phenomena such as sanctions and energy security, whose determinants and implications range widely between military and economic issues.

The theory that I offer aims at specifying the impact of both levels of analysis, as well as to explain how they interact with each other. This feature of the theory is particularly important given the puzzle at hand: volatile, dynamic foreign policy behavior, which constitutes the quintessential non-equilibrium behavior. As
systems theory have emphasized, in order to explain non-equilibrium behavior, it is important to look at both the structure of the interaction and the actors, as well as to understand how the two interact (Albert and Cederman 2010, 13, Cederman 2010, 131). In this case, in order to explain when and how states' foreign policy interactions shift inconsistently between cooperation and conflict, it is important to understand both what states can do and when they can do it. An understanding of the interaction between different mechanisms operating at different levels of analysis is an important component of the elaboration of dynamic theories. In turn, formulating a dynamic theory of volatility is crucial, because volatility is an inherently dynamic heuristic: explaining volatility demands specifying both the conditions that catalyze inconsistent shifts between cooperation and conflict possible, and those that make it possible to begin with.

### 7.1 Future Directions for Research on Volatility

This dissertation proposes a theory of foreign policy volatility, and it tests it on a subset of states in the international system-those that engage in strategic rivalries. There are several advantages to this approach. First, the concept of rivalries encompasses a set of politically relevant dyads; second, by concentrating on rivalries, I can make a focused comparison (George and Bennett, 2005, 67) on what determines volatility and how volatility impacts the foreign policy behavior of the dyad; third, rivalries represent a particularly suitable subset of dyads to perform a
focused comparison because they constitute a heuristic device that identifies pairs of states who cultivated highly reciprocal foreign policies-that is, foreign policies that were highly dependent on what the counterpart was doing, as in the case of the US and Soviet Union.

While studying of the determinants of volatility in foreign policy behavior that focuses on strategic rivalries allows for a more accurate test, it does open other, interesting questions. What is the connection between a state's volatile behavior toward its rival and its volatile behavior toward its ally? In other words, does volatile behavior toward a rival become more or less recurrent when a a state also exhibits volatile behavior toward a common rival?

To provide an initial investigation of this issue, I analyze the interactions between the United States, South Korea, and North Korea. These represent the quintessential interaction between defensive allies (South Korea-United States, see Leeds, Long and Mitchell 2000) and strategic rivals (North Korea-South Korea and North Korea-United States, see Colaresi, Rasler and Thompson 2007). I focus on the years 2003-2009, when the three countries were involved in the Six-Party Talks-that is, those negotiations between Russia, Japan, China, United States, South Korea, and North Korea over North Korea's nuclear weapons acquisition. Using my original data on the weekly interactions between United States, South Korea, and North Korea, I estimate a dynamic conditional correlation GARCH model (Engle and Sheppard, 2001; Lebo and Box-Steffensmeier, 2008)

Table 7.1 reports the results of a DCC-GARCH model on the four weekly time series of the foreign policy actions of: the US toward South Korea, of South Korea toward the US, of the US toward North Korea, and of South Korea toward North Korea. The GARCH model is specified as $(1,1)$. The DCC-GARCH model is a twostep model where the first stage estimates univariate GARCH models for each of the variables (here, four of them: the US policy toward South Korea, South Korea's policy toward the US, of the US toward North Korea, and of South Korea toward North Korea), and the second stage takes the standardized residuals from the first model and calculates a time-varying correlation matrix. In other words, the first stage simply estimates separate GARCH models for each of the $k$ series, where $k=1$ represent the total number of series studied:

$$
\begin{equation*}
h_{t}=c_{0}+a_{1} \epsilon_{t-1}^{2}+b_{i} h_{t-1}+m_{1} \epsilon_{2 t-1} I_{\epsilon>0} \tag{7.1}
\end{equation*}
$$

The standardized residuals from this $\operatorname{GARCH}(1,1)$ equation are then used to calculate the conditional covariance matrix $H_{t}$

$$
\begin{equation*}
H_{t}=D_{t} R_{t} D_{t} \tag{7.2}
\end{equation*}
$$

the $R_{t}$ time-varying conditional correlation matrix is then calculated as follows:

$$
\begin{equation*}
R_{t}=(1-\alpha-\beta) \bar{R}+\alpha \epsilon_{t-1} \epsilon_{t-1}^{\prime}+\beta R_{t-1} \tag{7.3}
\end{equation*}
$$

where $\alpha$ and $\beta$ are the coefficients of interest for the DCC part of the DCCGARCH model. In sum, the DCC-GARCH model, by modeling the correlation between the different levels of volatility experienced in the interactions between North Korea, South Korea, and the US, addresses the question: when does an increase in the volatility of one country's foreign policy toward another (say, an ally) translates into an increase in volatility in the foreign policy of that country toward another (say, a rival)? Table 7.1 shows that the $\alpha$ coefficient is not significant, but the $\beta$ coefficient is, therefore pointing to the fact that the correlations between the different levels of volatility are not constant through time. The $\beta$ coefficient is not close to 1 , indicating low persistence in the series of correlations.

How does this result speak to correlation between the level of volatility between different foreign policies? Figure 7.1 reports a subset of the dynamic conditional correlations estimated by a DCC-GARCH. A test of non-constant correla-tion-which consists of testing for the null hypothesis of the standardized residuals form a constant conditional correlation model being iid (Engle and Sheppard, 2001)—points to the fact that correlation between residuals is not constant through time ( $p$ - value . $000, t-$ statistics of 25.88 ). The dynamic conditional correlations between any two of the series in the model $i$ and $j$ at time $t$ are calculated as follows:


Figure 7.1: Dynamic conditional correlations estimated by a DCC-GARCH on weekly event data of the foreign policy interactions between North Korea, South Korea, the United States and China over the period 2003-2009.

$$
\begin{equation*}
\rho_{i, j, t}=\frac{q_{i, j, t}}{\sqrt{q_{i i, t} q j j, t}} \tag{7.4}
\end{equation*}
$$

where $q$ "represents elements of the conditional variance-covariance matrix of the standardized residuals $\epsilon_{t}$ of the separate GARCH models" (Lebo and Box-Steffensmeier, 2008, note 23).

In the Figure, the vertical axis is bound between - 1 and 1, to represent the range of values that correlation can assume. The horizontal axis instead represents the period between the beginning of 2003 and the end of 2009, where each observation
represents a specific week within that period. Several interesting findings emerge. First, an increase of in volatile behavior on the part of the US toward South Korea does not seem to translate into greater volatility on the part of the US toward North Korea, and vice versa (red line). Substantively, this suggests scarce (if varying through time) correlation between the US foreign policy volatility toward its rival and the US foreign policy volatility toward its ally. An increase in the presence of inconsistent shifts between a country and its ally does not necessarily translate into a similar policy in the foreign policy of that country with its rival, and vice versa-even in a case, such as this one, where the rival (North Korea) is a common rival of the two allied countries (US and South Korea). Conversely, an increase of volatile behavior on the part of South Korea toward its rival, North Korea, translates into an increase in South Korea's volatile behavior toward its ally, the US, and vice versa (dark gray line). Finally, if South Korean behavior toward its rival North Korea becomes more volatile, so does the US behavior toward its ally South Korea (light blue line).

Taken together, these two last results challenge simplistic understandings of the relations with allies and rivals, and point instead to the conundrum posed by the necessity to navigate the complex interactions within alliances (Lanoszka, 2013; Debs and Monteiro, 2013; Goldstein, 1993; Snyder, 1984): on the one hand, volatile behavior toward a rival does not translate in more stable, less volatile behavior toward an ally; on the other, when faced with a subordinate ally that increases its
volatile behavior toward their common rival, the patron ally will also become more volatile in its behavior with the subordinate ally.

Even more interestingly, Figure 7.1 points to the fact that the degree to which volatile behavior from one actor to another is not constant through time-and in particular, in the case under analysis it seems to spike in one direction or the other precisely after the end of the second phase of the sixth round of negotiations in 2007, and around North Korea's announcement of a satellite launch (which would then take place in April 2009). In fact, while increases in volatility in the foreign policy of the US toward North Korea since 2003 do not seem to be correlated with increases in volatility in the foreign policy of the US toward South Korea (red line), that correlation spikes downward toward negative levels precisely around the first months of 2009, signaling a period when the increases in volatility in the foreign policy of the US toward North Korea translated instead in a decrease in volatility in the foreign policy of the US toward South Korea.

When and why, then is volatility in the relations between allies also more likely to correlated with volatility in the relation between allies and rivals? Under which conditions instead does that correlation decrease? In sum, the study of volatile foreign policy behavior in this dissertation raises interesting questions for future research on the multiple reverberations of the presence itself of volatile behavior in the relations between one state toward another. While we think of more momentous phenomena such as conflict as likely to spread between different coun-
tries (Most, Starr and Siverson, 1989; Starr and Siverson, 1998; Gleditsch, 2002), it is also the very occurrence of inconsistent shifts between cooperation and conflict in the everyday interactions between states that reverberates in far-reaching fashion through the international arena.

|  |  |
| :---: | :---: |
|  |  |
| Coefficients |  |
| $\mathrm{c}_{U S, S K}$ | 0.080 |
|  | $(0.079)$ |
| $\mathrm{a}_{U S, S K}$ | $0.176^{* *}$ |
|  | $(0.070)$ |
| $\mathrm{b}_{U S, S K}$ | $0.822^{* * *}$ |
|  | 0.050 |
| $\mathrm{~m}_{U S, S K}$ | 0.070 |
|  | $(0.064)$ |
| $\mathrm{c}_{S K, U S}$ | 0.042 |
|  | $(0.042)$ |
| $\mathrm{a}_{S K, U S}$ | $0.120^{* * *}$ |
|  | $(0.043)$ |
| $\mathrm{b}_{S K, U S}$ | $0.879^{* * *}$ |
|  | $(0.025)$ |
| $\mathrm{m}_{S K, U S}$ | 0.092 |
|  | 0.082 |
| $\mathrm{c}_{U S, N K}$ | $2.504^{* *}$ |
|  | $(1.096)$ |
| $\mathrm{a}_{U S, N K}$ | 0.044 |
|  | $(0.028)$ |
| $\mathrm{b}_{U S, N K}$ | $0.823^{* * *}$ |
|  | $(0.058)$ |
| $\mathrm{m}_{U S, N K}$ | 0.452 |
|  | $(0.228)$ |
| $\mathrm{c}_{S K, N K}$ | $0.001^{* * *}$ |
|  | $(0.000)$ |
| $\mathrm{a}_{S K, N K}$ | 0.000 |
|  | $(0.000)$ |
| $\mathrm{b}_{S K, N K}$ | $0.999^{* * *}$ |
|  | $(0.000)$ |
| $\mathrm{m}_{S K, N K}$ | $0.556^{* *}$ |
|  | $(0.193)$ |
| $\alpha$ | 0.046 |
|  | $(0.031)$ |
|  | $0.395^{* * *}$ |
| $(0.204)$ |  |

Table 7.1: DCC-GARCH model of the time series of the foreign policy of the US toward South Korea, of South Korea to the US, of the US to North Korea, and of South Korea to North Korea. Standard errors in parenthesis. ${ }^{* * *} \mathrm{p} \leq .001,{ }^{* * *} \mathrm{p} \leq .005$, * $\mathrm{p} \leq .05, \dagger \mathrm{p} \leq .10$

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## Appendix A : List of Event Data Categories

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04:[1.0] CONSULT
040:[1.0] Consult, not specified below
041:[1.0] Discuss by telephone
042: [1.9] Make a visit
043: [2.8] Host a visit
044:[2.5] Meet at a third ? location
045:[5.0] Mediate
046:[7.0] Engage in negotiation
05:[3.5] ENGAGE IN DIPLOMATIC COOPERATION
050: [3.5] Engage in diplomatic cooperation, not specified below
051: [3.4] Praise or endorse
052:[3.5] Defend verbally
053: [3.8] Rally support on behalf of
054:[6.0] Grant diplomatic recognition
055:[7.0] Apologize
056:[7.0] Forgive
057:[8.0] Sign formal agreement
06:[6.0] ENGAGE IN MATERIAL COOPERATION
060:[6.0] Engage in material cooperation, not spec below
061:[6.4] Cooperate economically
062:[7.4] Cooperate militarily
063:[7.4] Engage in judicial cooperation
064:[7.0] Share intelligence or information
07:[7.0] PROVIDE AID
070:[7.0] Provide aid, not specified below
071:[7.4] Provide economic aid
072:[8.3] Provide military aid
073: [7.4] Provide humanitarian aid
074:[8.5] Provide military protection or peacekeeping
075:[7.0] Grant asylum
08: [5.0] YIELD
080:[5.0] Yield, not specified below
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081:[5.0] Ease administrative sanctions, not specified below
    0811:[5.0] Ease restrictions on freedoms of speech and expression
    0812:[5.0] Ease ban on political parties or politicians
    0813:[5.0] Ease curfew
    0814:[5.0] Ease state of emergency or martial law
082:[5.0] Ease popular protest
083: [5.0] Accede to demands for political reform
    0831:[5.0] Accede to demands for change in leadership
    0832:[5.0] Accede to demands for change in policy
    0833:[5.0] Accede to demands for rights
    0834:[5.0] Accede to demands for change in institutions, regime
084:[7.0] Return, release, not specified below
    0841:[7.0] Return, release person(s)
    0842:[7.0] Return, release property
085:[7.0] Ease economic sanctions, boycott, embargo
086:[9.0] Allow international involvement
    0861:[9.0] Receive deployment of peacekeepers
    0862:[9.0] Receive inspectors
    0863:[9.0] Allow delivery of humanitarian aid
087:[9.0] De-escalate military engagement
    0871:[9.0] Declare truce, ceasefire
    0872:[9.0] Ease military blocka[-2.0]de
    0873:[9.0] Demobilize armed forces
    0874:[10.0] Retreat or surrender militarily
09:[-2.0] INVESTIGATE
090:[-2.0] Investigate, not specified below
091:[-2.0] Investigate crime, corruption
092:[-2.0] Investigate human rights abuses
093:[-2.0] Investigate military action
094:[-2.0] Investigate war crimes
10:[-5.0] DEMAND
100:[-5.0] Demand, not specified below
101:[-5.0] Demand information, investigation
102:[-5.0] Demand policy support
103:[-5.0] Demand aid, protection, or peacekeeping
104:[-5.0] Demand political reform, not specified below
    1041:[-5.0] Demand change in leadership
    1042:[-5.0] Demand policy change
    1043:[-5.0] Demand rights
    1044:[-5.0] Demand change in institutions, regime
105:[-5.0] Demand mediation
106:[-5.0] Demand withdrawal
107:[-5.0] Demand ceasefire
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108:[-5.0] Demand meeting, negotiation
11:[-2.0] DISAPPROVE
110:[-2.0] Disapprove, not specified below
111:[-2.0] Criticize or denounce
112:[-2.0] Accuse, not specified below
    1121:[-2.0] Accuse of crime, corruption
    1122:[-2.0] Accuse of human rights abuses
    1123:[-2.0] Accuse of aggression
    1124:[-2.0] Accuse of war crimes
    1125:[-2.0] Accuse of espionage, treason
113:[-2.0] Rally opposition against
114:[-2.0] Complain officially
115:[-2.0] Bring lawsuit against
12: [-4.0] REJECT
120:[-4.0] Reject, not specified below
121:[-4.0] Reject proposal, not specified below
    1211:[-4.0] Reject ceasefire, withdrawal
    1212: [-4.0] Reject peacekeeping
    1213: [-4.0] Reject settlement
122:[-4.0] Reject request for material aid
123:[-4.0] Reject demands for political reform
    1231:[-4.0] Reject demands for change in leadership
    1232:[-4.0] Reject demands for policy change
    1233: [-4.0] Reject demand for rights
    1234:[-4.0] Reject demand change in institutions, regime
124:[-5.0] Reject proposal to meet, discuss, or negotiate
125:[-5.0] Reject mediation
126:[-5.0] Defy norms, law
127:[-5.0] Reject accusation, deny responsibility
128:[-5.0] Veto
13: [-6.0] THREATEN
130: [-4.4] Threaten, not specified below
131:[-5.8] Threaten non-force, not specified below
1311: [-5.8] Threaten to reduce or stop aid
1312: [-5.8] Threaten to boycott, embargo, or sanction
1313: [-5.8] Threaten to reduce or break relations
132: [-5.8] Threaten with administrative sanctions, not specified below
1321: [-5.8] Threaten to impose restrictions on freedoms of speech and expression
1322:[-5.8] Threaten to ban political parties or politicians
1323: [-5.8] Threaten to impose curfew
1324: [-5.8] Threaten to impose state of emergency or martial law
133: [-5.8] Threaten collective dissent
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16:[-4.0] REDUCE RELATIONS
160: [-4.0] Reduce relations, not specified below
161: [-4.0] Reduce or break diplomatic relations
162: [-5.6] Reduce or stop aid, not specified below
1621: [-5.6] Reduce or stop economic assistance
1622: [-5.6] Reduce or stop military assistance
1623: [-5.6] Reduce or stop humanitarian assistance
163: [-6.5] Halt negotiations
164:[-7.0] Expel or withdraw, not specified below
1641:[-7.0] Expel or withdraw peacekeepers
1642:[-7.0] Expel or withdraw inspectors, observers
1643: [-7.0] Expel or withdraw aid agencies
165: [-7.0] Halt mediation
166: [-8.0] Impose embargo, boycott, or sanctions

17: [-7.0] COERCE
170: [-7.0] Coerce, not specified below
171: [-9.2] Seize or damage property, not specified below
1711: [-9.2] Confiscate property
1712:[-9.2] Destroy property
172: [-5.0] Impose administrative sanctions, not specified below
1721: [-5.0] Impose restrictions on freedoms of speech and expression
1722: [-5.0] Ban political parties or politicians
1723: [-5.0] Impose curfew
1724: [-5.0] Impose state of emergency or martial law
173: [-5.0] Arrest, detain, or charge with legal action
174: [-5.0] Expel or deport individuals
175:[-9.0] Use violent repression

18: [-9.0] ASSAULT
180: [-9.0] Use unconventional violence, not specified below
181:[-9.0] Abduct, hijack, or take hostage
182: [-9.5] Physically assault, not specified below
1821: [-9.0] Sexually assault
1822: [-9.0] Torture
1823: [-10.0] Kill by physical assault
183: [-10.0] Conduct suicide, car, or other non-military bombing, not spec below
1831: [-10.0] Carry out suicide bombing
1832: [-10.0] Carry out car bombing
1833: [-10.0] Carry out roadside bombing
184: [-8.0] Use as human shield
185: [-8.0] Attempt to assassinate
186: [-10.0] Assassinate

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19:[-10.0] FIGHT
190:[-10.0] Use conventional military force, not specified below
191:[-9.5] Impose blockade, restrict movement
192:[-9.5] Occupy territory
193:[-10.0] Fight with small arms and light weapons
194:[-10.0] Fight with artillery and tanks
195:[-10.0] Employ aerial weapons
196:[-9.5] Violate ceasefire
20: [-10.0] ENGAGE IN UNCONVENTIONAL MASS VIOLENCE
200: [-10.0] Engage in unconventional mass violence, not specified below
201: [-9.5] Engage in mass expulsion
202: [-10.0] Engage in mass killings
203: [-10.0] Engage in ethnic cleansing
204: [-10.0] Use weapons of mass destruction, not specified below 2041: [-10.0] Use chemical, biological, or radiologicalweapons 2042:[-10.0] Detonate nuclear weapons
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[^0]:    ${ }^{1}$ In fact, most recently, Canada and the US teamed up to impose sanctions on Iran. See "U.S., Britain and Canada slap new sanctions on Iran." CNN news. Available at <http:/ /www.cnn.com/2011/11/21/ world/meast/iran-sanctions/index.html>. Last accessed 01-14-2013.

[^1]:    ${ }^{2}$ "Japanese Factories Halt Production In China As Island Dispute Escalates", by Jennifer Cheung, Forbes, 9/20/2012 . "The Chinese And Japanese Economies Are Delinking: Prelude To Conflict?" by Gordon G. Chan, Forbes, 2/16/2014.

[^2]:    ${ }^{1}$ Rosenau (1990) uses the germane concept of "turbulence", though he never defines it clearly, which makes it hard to understand how close or far it is from the concept of volatility.

[^3]:    ${ }^{2}$ Available at $<$ http:/ / books.google.com/ngrams $>$.

[^4]:    ${ }^{3}$ See also Tetlock (1985) and Goldstein and Freeman (1990,50-55). On the increase of the effect of public opinion on foreign policy during elections, see also Aldrich et al. $(2006,488-489)$ and Foyle (1999). For the effects of elections on stock markets, see Pantzalis, David and Turtle (2000).

[^5]:    ${ }^{4}$ See the information available on the website of the Southern California Earthquake Center. Available at <http:/ / www.scec.org/education/ public/ allfacts.html>.
    ${ }^{5}$ The stability-instability paradox refers to the notion that "to the extent that the [hydrogen] bomb reduces the likelihood of full-scale war, it increases the possibility of limited war pursued by widespread local aggression."(Hart, 1960, 23). Snyder contends that the acquisition of nuclear weapons will make crises and militarized disputes more frequent because nuclear weapons prevent others from retaliating with a massive attack, therefore reducing the risk of escalation and emboldening the state that acquires nuclear weapons. As a counterpoint to this logic, Jervis emphasizes that nuclear weapons will make national leaders more cautious and less prone to violent undertakings tout-court, precisely because they increase the undesirability of crisis escalation.

[^6]:    ${ }^{6}$ Madrid (2005) in fact finds that electoral volatility is higher in those areas that have the larger proportions of indigenous population.

[^7]:    ${ }^{7}$ Conversely, Fatas and Mihov (2005) demonstrate how policy volatility depresses economic growth.

[^8]:    ${ }^{8}$ I explain in greater detail the different ontologies and sources that I use to analyze events data in the next chapter.

[^9]:    ${ }^{9}$ I include actions from both the executive and the legislative bodies.

[^10]:    ${ }^{10}$ Interactions that are similarly cooperative on average through time might differ in the degree to which they shift from cooperation to conflict. Similarly, interactions that display similar levels of volatility might exhibit different average levels of cooperation or conflict. Clearly the variance and the mean of a variable of interest are related, as the variance, or second central moment of a distribution, is defined as "a measure of the degree of spread of a distribution around its mean" (Casella and Berger, 2001, 59), but keeping them separate can help getting a better understanding of the data generating process (Braumoeller, 2006a). Finance has been the area where volatility has been studied the most (Taylor, 2008, 649): the intuition at the basis of the study of volatility is that investors are interested not just in knowing the rate of return of an investment, but also how rapidly such rate of return changes through time.

[^11]:    ${ }^{11}$ Enders $(2008,115)$ points to the properties of the $\epsilon_{t}$ sequence: the mean is zero, the variance is constant and all the elements are uncorrelated. However, the conditional variance of $\epsilon_{t}$ is dependent on the realized values of $\epsilon_{t-1}^{2}$, so that if these realized values are large, so is the value of the conditional variance of $\epsilon_{t}$.

[^12]:    ${ }^{12}$ For a set of studies that use instead the method I present here to capture volatility, see Leblang and Mukherjee 2004, 2005; Leblang and Bernhard 2006.

[^13]:    ${ }^{13}$ For an explanation of the importance of focused comparisons, see Fortna (2011).
    ${ }^{14}$ The foreign policy that the US pursued towards the Soviet Union Highly dependent, yet not exclusively dependent, on what the Soviet Union did, as argued by Goldstein and Freeman (1990).

[^14]:    ${ }^{15}$ Specifically, I drop the following cases: Cyprus-Turkey, Norway-Russia, Ghana-Togo, Honduras-Nicaragua, Venezuela-Guyana, Uganda-Sudan, Kenya-DRC, Kenya-Uganda, EthiopiaSudan.

[^15]:    ${ }^{1}$ The threshold that I identify is 15 events or less in over 10 years.

[^16]:    ${ }^{2}$ CAMEO stands for Conflict and Mediation Event Observations, available here: <http:/ / cameocodes.wikispaces.com/EventCodes>

[^17]:    ${ }^{3}$ All the datasets except Copdab and Weis are available here <http://web.ku.edu/ keds/data.html>. Last accessed February 9th, 2013.

[^18]:    ${ }^{4}$ I report the adaptation of CAMEO events to the Goldstein (1992) scale that I use in the Appendix.

[^19]:    ${ }^{5}$ This is open source and available from the website of the Kansas Event Data System (KEDS).

[^20]:    ${ }^{1 / \text { "India urges Pakistan to rein in militants", in China Daily Asia,By Nirmala Ganapathy, 05-28- }}$ 2014.
    ${ }^{2}$ "Pakistan-India Trade: What Needs To Be Done? What Does It Matter?", edited by Michael Kugelman and Robert M. Hathaway, Wilson Center Publications, page 3.

[^21]:    ${ }^{3}$ For a (non-exhaustive) list of the many many pieces of research on this topic, see Fearon (1994); Filson and Werner (2002); Slantchev (2003); Smith and Stam (2004); Meirowitz and Sartori (2008). For a critique of the relation between uncertainty and conflict recurrence, see Gartzke (1999).
    ${ }^{4}$ Notice the difference with the approach adopted by Keele and Wolak (2006, 680-681), whereupon the authors test whether value conflict is a predictor of partisan volatility by modeling value conflict as a predictor of the variance term in an heteroskedastic probit, therefore de facto operationalizing volatility as the variance term in an heteroskedastic probit.

[^22]:    ${ }^{5}$ The distinction between risk and uncertainty, or ambiguity, originates from Knight (2006). On the difference between risk and uncertainty, and on the different effects of both on human behavior, see Einhorn and Hogarth (1985); Kahn and Sarin (1988); Pulford and Colman (2007); Chow and Sarin (2001); Alary, Gollier and Treich (2010).

[^23]:    ${ }^{6}$ Crises have multiple actors. For instance, in the case of the Suez Canal nationalization crisis in 1956 (crisis number 152), the following actors were involved: France, UK, Egypt, Russia, USA, Israel.
    ${ }^{7}$ I derived a dichotomized One Volatile and Both Volatile variable from the continuous measure of volatility that I illustrate in the previous chapter, by performing the Ljung-Box test statistic (Ljung and Box, 1978) and Engle's ARCH test (Engle, 1984).

[^24]:    ${ }^{8}$ This latter point is proved by the fact that strategic rivalries often overlap with enduring rivalries, that is, a definition of rivalry that in contrast does include violence as one of the criteria (see Chapter I, Table 2).

[^25]:    ${ }^{9}$ This uncertainty is calculated as the variance of the simulated distribution of predicted probabilities. The values of all the other variables are held constant to their median value. Following Mattiacci and Braumoeller (2012), I take an approach similar to the one applied in the STATA program

[^26]:    ${ }^{11}$ Bivariate probit models are also utilized to test the hypothesis of (and account for ) endogeneity between two variables. For instance, Beardsley (2008) tests for the presence of endogeneity between mediation and crisis outcome by modeling the two as the distinct dependent variables in a bivariate probit, while allowing for mediation to also be present in the crisis outcome equation specification. A similar procedure is applied by Kimball (2006).

[^27]:    ${ }^{12}$ As explained by Przeworski and Vreeland $(2002,101)$, the partial observability problem identified by Poirier (1980) can be present in studies of international politics because "we observe only whether two countries have signed an agreement. If a treaty is in vigor, both countries must want it to be. But if it is not, we do not know which country-perhaps both-does not want it.[...] It takes both potential patterns to agree for cooperation to occur, while a unilateral action suffices for cooperation to cease." They use a first order Marcov process to model the probabilities that the willingness to cooperate shifts through time between two actors (Przeworski and Vreeland, 2002, 103-105). Xiang (2010, 287-8) as well builds on the bivariate probit with partial observability. He utilizes instead a split population model but relaxes the assumption of independence between the data generating processes of the zeroes and the ones, and choosing a bivariate normal distribution to model these processes. Finally, Braumoeller (2003) presents a more general case of a bivariate probit with partial observability, the Boolean model.
    ${ }^{13}$ Shannon, Morey and Boehmke (2010) use instead the dyad-dispute as the unit of analysis.

[^28]:    ${ }^{14}$ Both in Model I and Model II, the dummy variable One Volatile is not a significant predictor of crisis, but it is of IOs.

[^29]:    ${ }^{1}$ For one of the classic explorations of grand strategy, see Hart (1967). For a review of different definitions of grand strategy, see Narizny $(2007,6)$.

[^30]:    ${ }^{2}$ For a thorough distinction of the different meanings of anarchy in the international system, see Milner (1991).

[^31]:    ${ }^{3}$ Another way to think about the interaction between the international and the domestic level of analysis is to use the opportunity-willingness framework advanced by (Cioffi-Revilla, 1998), where the opportunity is set at the international level and the willingness at the domestic level.

[^32]:    ${ }^{4}$ Adopting a necessary and sufficient condition framework might seem to cast the theory in rather deterministic terms: the absence (or presence) of the necessary (or sufficient) condition is poised to impede (or bring about) the outcome of interest, which in turn is also simply either present or absent. This might run contrary to what we consider a probabilistic approach to the study of international relations, which instead is based on the idea that increasing levels of $X$ augment the likelihood that the outcome of interest Y will occur. Yet, if unpacked, the deterministic framework based on the dichotomy between presence and absence of the phenomena of interest, can be found as complementing the more diffused probabilistic approach, in that the two only differ in matters of degree (in fact, certainty is nothing if not a case in which probability is equal to 1 or 0 , so in this sense the probabilistic lingo encompasses the deterministic one). For instance, claiming that the presence of joint democracy decreases the likelihood of conflict between two countries, amounts to saying that once a certain threshold on, say, the Polity IV index (Marshall and Jaggers, 2002) has been surpassed, the likelihood of war decreases significantly enough to make that outcome highly unlikely. In turn, even the dichotomization of the dependent variable in the probit model, in the context of a latent variable approach, implies the establishment of thresholds, whereupon if the probability of an event is below a certain level, it gets assigned the likelihood of zero, and if it is above it, it gets assigned the probability of one, see King 1989.

[^33]:    ${ }^{5}$ The permissive / precipitant cause approach is similar to the permissive/efficient cause frame-

[^34]:    ${ }^{6}$ The concept of process as identified by Tilly (2001) is similar to the idea of mechanism concatenation discussed by Gambetta (1998), and even to the idea that Falleti and Lynch (2009) advances on the importance of thinking of mechanisms as interacting in a specific context. For a critique of Tilly (2001), see Bunge (2004) and Demetriou (2012).
    ${ }^{7}$ For an alternative framework for the debate in International Relations, see Jackson and Nexon (2009).

[^35]:    ${ }^{8}$ For an overview of the meaning of mechanisms and the implication of using mechanisms to theorize, see Hedström and Swedberg (1998); Mahoney (2001); Gerring (2008); Demeulenaere (2011).
    ${ }^{9}$ On the epistemologic and methodologic implications of ontology, see also Hollis and Smith 1991.

[^36]:    ${ }^{10}$ For a review of the debate, seeLevy (1984) and Lynn-Jones (1995).

[^37]:    ${ }^{11}$ Preponderance of power is a permissive condition for volatile foreign policy behavior because it expands the set of available options for how a state interacts with another. As Leffler (1992, 18-19) explains, "Preponderant power did not mean domination. It meant creating a world environment hospitable to the US interests and values; it meant developing the capabilities to overcome threats and challenges [...]."

[^38]:    ${ }^{12}$ Going beyond the Academic debate, see also Francis E. Warnock "How Dangerous Is U.S. Government Debt?" Council on Foreign Relations. Available at <http:/ / www.cfr.org/financial-crises/dangerous-us-government-debt/p22408> Last accessed 09/04/2013. Kenneth Rapoza "Is China's Ownership Of U.S. Debt A National Security Threat?" Forbes. Available at <http:/ /www.forbes.com/sites/kenrapoza/2013/01/23/is-chinas-ownership-of-u-s-debt-a-national-security-threat/>. Last accessed 09/04/2013. Tony Capaccio \& Daniel Kruger "China $\square$ s U.S. Debt Holdings Aren $\square \mathrm{t}$ Threat, Pentagon Says" Bloomberg.Available at <http: / / www.bloomberg.com/news / 2012-09-11 / china-s-u-s-debt-holdings-aren-t-threat-pentagon-says.html>.Last accessed 09/04/2013. Within the realm of policy discussion, see alsoDorn (2008) and Morrison and Labonte (2008).

[^39]:    ${ }^{13}$ This theoretical framework draws a connection between depth of cooperation and vulnerability (and therefore worries for the survival of the state), one that has been made more evident in the recent spread of the international financial crisis through the EU countries. Recurring to power superiority instead in order to explain the conditions under which cooperation will emerge in an anarchic environment makes it possible to relax the assumption of repeated interactions for an indefinite period of time. At the same time, if there is indeed repeated cooperation, preponderance of power does not operate against the classical mechanisms that maintain cooperation in a long term framework -such as the shadow of the future (Bearce, Floros and McKibben, 2009) or the discount factor (Blaydes, 2004) to kick in. This is the case because the preponderant state will rest assured that, in case its counterpart defects, its preponderant power will be enough to preserve its survival.

[^40]:    ${ }^{14}$ On the relation between distributive and redistributive mechanisms, see Braumoeller 2006b, 275.

[^41]:    ${ }^{15}$ For an investigation of the relation between human rights and trade, see Hafner-Burton (2005), and for one specifically on China and the US, see Cooper Drury and Li (2006). For a policy reflection on the issue of China and trade and human rights, see James Dorn, "Trade and Human Rights in China." Available here:<http:/ / www.cato.org/publications/commentary/trade-human-rightschina>. Last checked 06/01/2013.

[^42]:    ${ }^{16}$ Specifically, the expectation would be that the coefficient for the lower-order term for the domestic indicator will be negative and significant, while the interaction term will be positive and significant.

[^43]:    ${ }^{17}$ See for instance "Military Cuts Threaten Virginia's Pentagon-Dependent Economy." Bloomberg News. Available at [http://www.bloomberg.com/news/2011-11-17/military-cuts-threaten-defense-dependent-states.html](http://www.bloomberg.com/news/2011-11-17/military-cuts-threaten-defense-dependent-states.html). Last checked on 06/01/2013.

[^44]:    ${ }^{18}$ See Morrow and Carriere (1999); Mahapatra (1998); Kapur (2000). On the economic consequences of nuclear weapons acquisition, see Solingen (1994). On the different implications of the nuclear weapons acquisitions for different sectors of society, see Ganguly (1999).

[^45]:    ${ }^{19}$ Specifically, Weeks $(2012,329)$ points to the uneven distributional consequences of goods largely theorized as public, such as winning wars. Kennedy (2009) on the other hand demonstrates the weakness of the external validity of the concept of selectorate. See also Magaloni (2008) and Clarke and Stone (2008). For a critique of the concept of public good as used in the selectorate theory, see Bell (2011).

[^46]:    ${ }^{20} \mathrm{On}$ the redistributive implications of investing in different sectors of the military, see Heginbotham (2002).

[^47]:    ${ }^{21}$ On the relation between permissive causes and necessary causes, see Goertz and Levy (2007, 18).
    ${ }^{22}$ For applications of the insight of two-level games theory, seeMo (1995); Stasavage (2004); Chapman, Urpelainen and Wolford (2012); Weiss (2012).

[^48]:    ${ }^{23}$ Ehrlich (2007) also points to the incapability of veto players theory to explain change, focusing in particular on explanations of magnitude and direction of change. Tsebelis $(2011,33)$ specify this clearly in the theory: "I will be able to identify the conditions where change of the status quo is difficult or impossible (policy stability is high), but I will not be able to predict actual change."(Mansfield, Milner and Pevehouse, 2007) uses veto player theory to explain stability, conceptualized as the probability of a preferential trade agreement (PTA) not being signed.

[^49]:    ${ }^{1}$ I still build the heterogeneity index to form a continuum, however, in keeping with recent advancements in the IR literature, moving away from an oversimplifying dichotomization of domestic regimes between autocracies and democracies. See Weeks (2008) and Hankla and Kuthy (2013).

[^50]:    ${ }^{2}$ On the importance of avoiding assuming the politicization of all the cleavages present in a state's society, see Chandra (2005),Chandra and Wilkinson (2008) and Chandra (2009). On the identification of a critical conditional axis in order to understand the relation between domestic preferences and coalitions, see Solingen (1998).

[^51]:    ${ }^{3}$ For a comprehensive review of the debate within India on the implications of the pursuit of nuclear weapons, see Perkovich (2002).

[^52]:    ${ }^{4}$ The cross-cutting index is bounded between 0 and 1, see Selway (2011).

[^53]:    ${ }^{5}$ On the importance of capturing heterogeneity of preferences at various domestic levels, see Rogowski (1999).

[^54]:    ${ }^{6}$ For an explanation of the importance of focused comparisons, see Fortna (2011).
    ${ }^{7}$ The foreign policy that the US pursued towards the Soviet Union Highly dependent, yet not exclusively dependent, on what the Soviet Union did, as argued by Goldstein and Freeman (1990).

[^55]:    ${ }^{8}$ While all these models present evidence of a robust, positive correlation between the higher order term of the interaction term and the dependent variable, as predicted by my theory, I plan to further strengthen the robustness of these findings by estimating an Autoregressive Distributive Lag (ADL) model and an Error Correction Model (ECM) (De Boef and Keele, 2008), to directly model the presence of an effect of previous lags of the dependent variable.

[^56]:    ${ }^{10}$ Notice that the confidence intervals are represented in Figure 6.8 as they are in Figure 6.7, but they are much tighter than they are in Figure 6.7 (and therefore barely visible). This result reflects the fact that the coefficient for Relative Power is statistically significant, while the coefficient for $H$ is not, but also the fact that Relative Power ranges from 0 to above 200, whereas $H$ ranges from 0 to 1 .

[^57]:    ${ }^{1}$ "Chinese signaling in the East China Sea?", by M. Taylor Fravel AND Alastair Iain Johnston, The Washington Post, April 12th, 2014.

    2"Shinzo Abe: China is a 'Vital Economic Partner'", By Ankit Panda,The Diplomat, April 18th, 2014."Japan Is Back", by Shinzo Abe, Foreign Affairs,July / August 2013.

[^58]:    3"Japanese Factories Halt Production In China As Island Dispute Escalates", by Jennifer Cheung, Forbes, 9/20/2012.

