Political Instability and Financial Markets

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July 2, 2013

Abstract

I examine the relationship between political instability and the daily returns of national stock indices. Financial volatility increases dramatically following (and just before) "irregular" regime changes caused by coup d'état, assassinations, and resignations. Some of the pre-resignation volatility occurs because of public protests such as riots and popular demonstrations that helped spawn the resignation in the first place. However, these irregular regime changes have disparate effects on the direction of stock returns. Abnormal returns following resignations are large and positive (6%) while abnormal returns following assassinations are negative and smaller in magnitude (1%). The impact of coups tends to be negative, but some events such as the temporary ousting of Hugo Chavez during the 2002 Venezuelan coup d'état attempt result in positive abnormal returns of 20% or more.

1 Introduction

Investors, firms and development agencies are all concerned with political risk in emerging markets. Government's can reduce asset returns, firm profits and overall economic performance by implementing unfavorable policies. In the 2011 Multilateral Investment Guarantee Agency (MIGA) *World Investment and Political Risk* report, executives of multinational enterprises (MNEs) ranked political risk as the most important constraint for foreign direct investment (FDI) in developing countries over the next three years. The most pressing risks involved government regulatory policies and failed commitments, although political violence was also a concern. [1]

[1]The types of political risk of most concern to investors in developing countries (ranked in order of importance) were 1) adverse regulatory changes, 2) breaches of contract, 3) transfers and convertibility re-

A common hypothesis is that political instability discourages investment and reduces economic growth by increasing policy uncertainty. Some cross country empirical evidence is consistent with this hypothesis: political instability, as measured by regime change frequency or political violence, is negatively correlated with investment, GDP growth and financial development in cross country regressions (Alesina et al. 1996; Alesina and Perotti 1996; Roe and Siegel 2011). In particular, Alesina et al. (1996) show that countries have lower growth in years in which there are major government changes such as coups. On the other hand, Londregan and Poole (1990) finds that coups have no effect on economic growth.

Of course, a change in government might promote growth if the new regime adopts better economic policies or is less corrupt than its predecessors. Alesina et al. (1996) takes this possibility seriously but argues that the negative effects of policy uncertainty dominate the positive effects of coups staged by pro growth factions. Conversely, Londregan and Poole (1990) present evidence suggestive of a bimodal distribution of coups in which neither the effects of pro-growth or anti-growth coups dominate.

As in Alesina et al. (1996), I use "irregular" regime changes such as coups, assassinations and resignations as an indicator for political instability. The major innovation of this paper is that, in contrast to the aforementioned cross country studies, I analyze the impact of political instability using daily financial data. To the extent that these irregular transfers of power are unpredictable and unrelated events do not bias the results, this allows me to use market expectations to quantify the economic impact of regime changes. The advantage of this event study approach is that it allows me to isolate the effect of irregular regime changes and mitigate the endogeneity problems that are nearly ubiquitous in cross country regressions.

My main finding is that financial volatility increases dramatically following (and just before) coup d'état, assassinations, and resignations. However, these irregular regime changes have disparate effects on the direction of stock returns. Abnormal returns following resigna-

strictions, 4) civil disturbances, 5) non-honoring of government guarantees, 6) expropriation nationalization, 7) terrorism and 8) war.

tions are large and positive (6%) while abnormal returns following assassinations are negative and smaller in magnitude (1%). The impact of coups tends to be negative, but some events such as the temporary ousting of Hugo Chavez during the 2002 Venezuelan coup d'état attempt result in positive abnormal returns of 20% or more. I also present evidence showing that volatility increases during public protests such as riots and popular demonstrations that cause leaders to resign. These findings provide important insights into the expected impact of episodes of political instability on economic performance.

This paper is most closely related to four branches of literature. The first analyzes the economic impact of political instability. This area contains a number of theoretical models in addition to the empirical work already mentioned. These models tend to focus on government policy instruments that affect private rates of return on investment. The general idea is that political instability causes governments to act myopically and adopt inefficient policies. For instance, Svensson (1998) argues that governments are less likely to invest in the legal system and the protection of property rights when political uncertainty is high. Similarly, Devereux and Wen (1998) propose a model in which political instability causes governments to leave fewer assets to their successors which forces them into increasing capital taxes. The knowledge of future taxation causes the private sector to reduce current investment which reduces future output.

The second strand examines the impact of leaders on political and economic outcomes. Jones and Olken (2005) identify plausibly exogenous leadership transitions using the deaths of leaders from either natural causes or accidents. Their results indicate that leaders influence policy outcomes (particularly monetary policy) and economic growth. Jones and Olken (2009) find that transitions to democracy are more likely after the assassinations of autocrats. Other work has focused on leaders in the private sector. In particular, Bertrand and Schoar (2003) estimate CEO fixed effects and show that private sector leaders have important effects on the profits of firms.

The third uses event studies to assess political phenomenon. A growing body of work uses

political events to estimate the effect of political connections on firm value (e.g. Fisman 2001; Faccio 2006; Goldman, Rocholl and So 2009). Other studies in "forensic economics" have used political events to study illicit transactions such as insider trading (Dube, Kaplan and Naidu 2011). Guidolin and La Ferrara (2007) used the sudden death of rebel leader, Jonas Savimbi, to show that Angolan diamond mining companies benefited from the Angolan civil war. DellaVigna and La Ferrara (2010) detect illegal arms trading by identifying events that increase or decrease conflict intensity.

The fourth looks at how the variance of stock market returns reacts to political events. Leblang and Mukherjee (2005) show that right-wing governments increase the mean and volatility of stock prices in the United States and Britain. Jensen and Schmith (2005) find that a rise in the popularity of a Brazilian presidential candidate with uncertain future policies, Luiz Inácio Lula da Silva, increased the volatility (but not the mean return) of the Brazilian stock market.

2 Data

Political data are primarily drawn from the Center for Systemic Peace's (CSP) Polity IV Coup d'état dataset and Coup d'état Events handbook. The Coup d'état dataset incudes the date of 1) successful coups, 2) attempted coups, 3) plotted coups and 4) alleged coup plots. I focus on successful coups because it is difficult to classify failed coups. Needler (1966, p. 617) has even gone so far as to say that "the categories of coups that were aborted, suppressed, or abandoned melt into each other and into a host of other non-coup phenomena so as to defy accounting."

The Coup d'état Events handbook provides a list of 1) auto-coups, 2) the ouster of leadership by foreign forces, 3) the ouster of leadership by rebel forces, 4) assassinations of the executive and 5) resignations of the executive due to poor performance and/or loss of authority. Daily financial data is available for countries in categories 4 and 5, so I supplement the coups with assassinations and resignations to form a list of "irregular" regime changes.

The resignations are those in which the ruling executive was coerced to resign due to poor performance, public discontent and popular demonstrations.

I further supplement the CSP data with leadership data from Archigos Version 2.9, which allows me to identify additional cases in which a "leader lost power through irregular means." Irregular transfers of power are those in which leaders do not leave office "in a manner prescribed by either explicit rules or established conventions." Nearly all removals by irregular means result from the threat or use of force (e.g. coups, revolts and assassinations).

Financial data are from the Global Financial Data database, which includes the longest available time series of stock prices. I collect data on national equity indices and two global equity indices, the S&P/IFC Emerging Market Investable Composite and the Morgan Stanley Capital International (MSCI) World Index. The S&P/IFC index includes securities from emerging markets while the MSCI index includes securities from developed markets only. I collect stock index data on every country in which there was a coup or coup attempt, an assassination or failed assassination, or a forced resignation.[2]The longest available time series for these stock indices are listed in table 1.

Table 1: List of Stock Indices

Country	Stock Index	Begin Date	End Date
Argentina	Beunos Aires SE General Index	Dec-66	Jan-13
Australia	Australia ASX All Ordinaries	Jan-58	Jan-13
Bangladesh	Dhaka SE Index	Jan-90	Apr-09
Canada	Canada S&P/TSX 300 Composite	Jan-76	Jan-13
Chile	Santiago IGBC General Index	Jan-75	Jan-13
Colombia	Colombia IGBC General Index	Jan-92	Jan-13
Ecuador	Ecuador Bolsa de Valores de Guayaquil (BVG)	Jan-94	Nov-11
Egypt	Cairo SE Index	Dec-92	Jan-13
Emerging Market	S&P/IFC Emerging Markets Investable Composite	Jul-95	Jan-13
France	France CAC All-Tradable Index	Sep-68	Jan-13
Greece	Athens SE General Index	Oct-88	Jan-13
India	Bombday SE SENSEX	Apr-79	Jan-13
Indonesia	Jakarta SE Composite Index	Apr-83	Jan-13
Iran	Tehran SE Price Index	Jan-95	Mar-12
Israel	Tel Aviv 100 Index	May-87	Jan-13
Japan	Tokyo SE Price Index (TOPIX)	Jan-53	Jan-13

Continued on next page

[2]The list of failed assassinations are from Jones and Olken (2009). Coup attempts are those in category 2 in the CSP Coup d'état dataset.

Table 1 – *Continued from previous page*

Country	Stock Index	Begin Date	End Date
Latin America	Dow Jones Latin America Index	Jan-92	Jan-13
Lithuania	Lithuania Lit-10 Index	Jan-99	May-05
Malaysia	Malaysia KLSE Composite	Jan-80	Jan-13
Nepal	Nepal NEPSE Stock Index	Jul-97	Jul-99
Netherlands	Netherlands All-Share Price Index	Jan-80	Jan-13
Pakistan	Karachi SE 100 Index	Jan-89	Jan-13
Paraguay	Asuncion SE PDV General Index	Oct-93	Sep-08
Peru	Lima SE General Index	Jan-82	Jan-13
Philippines	Manila SE Composite Index	Jan-86	Jan-13
Portugal	Oporto PSI-20 Index	Jan-86	Jan-13
Singapore	Singapore FTSE ST Index	Jul-65	Jan-13
South Korea	Korea SE Stock Price Index	Jan-62	Jan-13
Southeast Asia	Dow Jones Southeast Asia Index	Jan-92	Jan-13
Spain	Madrid SE General Index	Aug-71	Jan-13
Sri Lanka	Colombo SE All-Share Index	Dec-84	Jan-13
Sweden	Sweden OMX Affarsvarlden General Index	Jan-80	Jan-13
Taiwan	Taiwan SE Capitalization Weighted Index	Jan-67	Jan-13
Thailand	Thailand SET General Index	Apr-75	Jan-13
Tunisia	Tunisia SE Index	Dec-97	Jan-13
Turkey	Instanbul IMKB 100 Price Index	Oct-87	Jan-13
Ukraine	Ukraine PFTS OTC Index	Jan-98	Jan-13
United Kingdom	UK FTSE All-Share Index	Nov-62	Jan-13
United States	Dow Jones Industrial Average	Feb-1885	Jan-13
Uruguay	Bolsa de Valores de Montevideo Index	Jan-08	Jan-13
Venezuela	Dow Jones Venezuela Stock Index	Jan-92	Jul-07
Venezuela	Caracas SE General Index	Jan-94	Jan-13
World	MSCI World Price Index	Jan-76	Jan-13
Zambia	Lusaka SE Index	Jan-02	Apr-06
Zambia	Zambia LuSE Index	Jan-02	Apr-06

To gain perspective on the relationship between irregular regime changes and the stock market, figure 1 plots the absolute value of daily stock returns averaged across all events. Returns are for 250 trading days—approximately one calendar year—before and after regime changes.

The absolute value of returns on the event day (trading day 0) are significantly larger than on any other day. In addition, the magnitude of returns begins increasing just before the event day and remains high for a short period after it. This suggests that financial volatility increase during the days surrounding regime changes, although it does not provide any evidence on mean returns.

The next section (section 3) will test these results more formally. It will first analyze

coups, assassinations and resignations separately and determine whether they increase mean returns. It will then combine all irregular regime changes and estimate the effect of regime changes on the variance of returns.

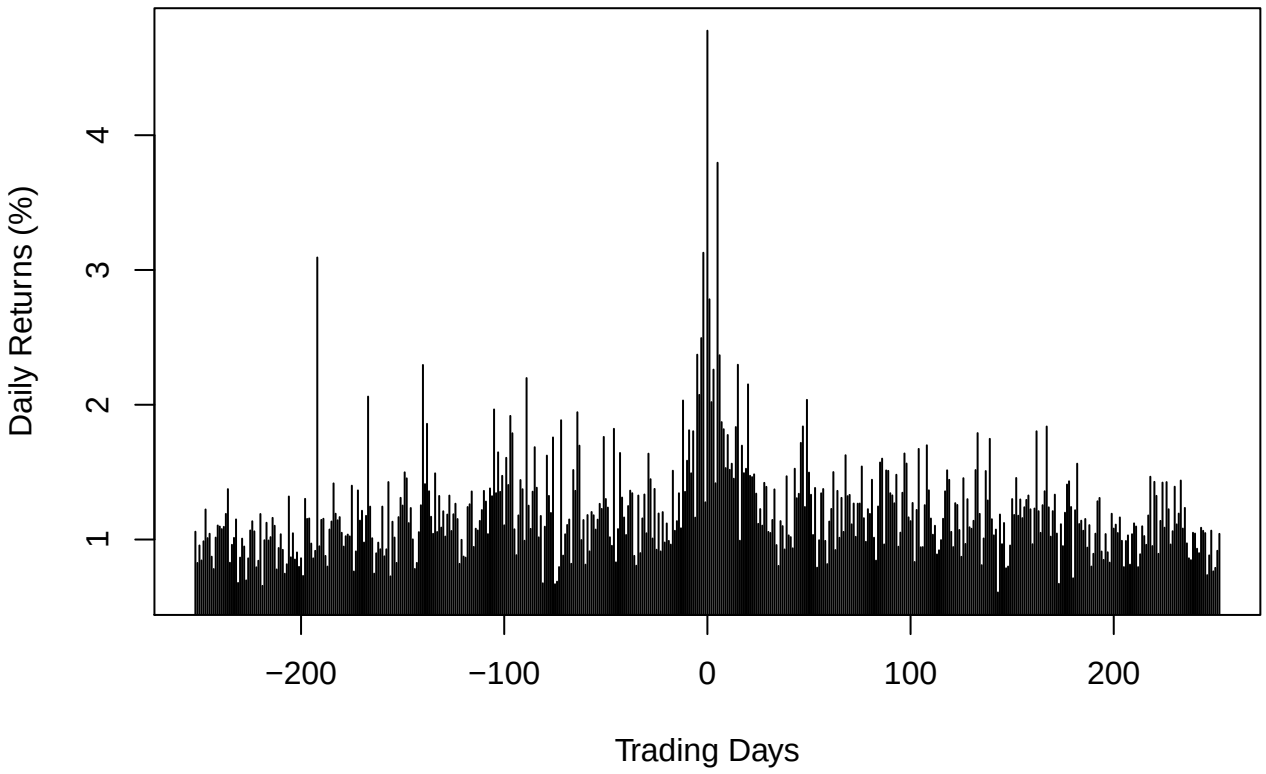

Figure 1: Absolute Value of Daily Returns

3 Irregular Regime Changes

3.1 Abnormal Returns

I begin my analysis by studying the effect of irregular regime changes on stock returns. I follow the standard event study methodology as presented by, among others, MacKinlay (1997) and Campbell, Lo and MacKinlay (1997). Normal performance is measured with a

constant mean return model[3],

$$R_{it} = \mu_i + \epsilon_{it}, \tag{1}$$

where R_{it} is the logged return of national stock index i on trading day t and ϵ_{it} is the error term. I calculate abnormal returns (ARs), in an "event window" surrounding the date of each coup, $AR_{i\tau} = R_{i\tau} - \widehat{\mu}_i$, where τ is a date in the event window, and $\widehat{\mu}_i$ is estimated in an "estimation window" preceding the event window with equation 1. I use a 41 day event window (i.e. 20 pre-event trading days, the event day, and 20 post-event trading days). The estimation window is the 250 trading days prior to the start of the event window. The abnormal returns are then used to generate cumulative abnormal returns (CARs) between event day τ_1 and event day τ_2: $CAR(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$.

I define the event date as the first trading day in which the market could have reacted to news of the event. For example, during the October 12, 1999 coup d'état in Pakistan led by General Pervez Musharraf, the army announced that Prime Minister Nawaz Sharif had been dismissed after market hours at 10:15 pm. I code October 14th, the day in which the market re-opened, as the event day. When events occurred on weekends, I change the event date to the following Monday.

$(0, \tau - 1)$ is used to denote the τ-day period beginning with the event day and $(-1, \tau)$ to denote the negative τ-day period beginning with the day prior to the event day. In other words, for cumulative abnormal returns prior to the event date, I aggregate backwards starting at the day of the event. For example, $CAR(-1, -2)$ is the sum of the abnormal returns on event date -1 and event day -2.

I report abnormal returns separately for coups, assassinations and resignations because they may have distinct effects on stock returns. Table 2 shows abnormal returns for national

[3]A constant mean return model is used instead of a market model in order to maximize the number of observations (plausible market indices such as the MSCI World Index and the S&P/IFC Emerging Markets Investable Composite Index only begin in 1976 and 1995 respectively). That said, results are insensitive to the use of a market model.

stock indices both preceding and following coup d'état. Standard errors and p-values are calculated using asymptotic t-statistics as in MacKinlay (1997). [4]

Table 2: Abnormal Returns Following Coups

		Post-Event CAR			Pre-Event CAR		Days to
Country	Event Date	(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	rebound
Argentina	6/8/1970	−1.975***	−14.267***	−15.259***	0.582	4.331	1
		(0.623)	(1.649)	(2.787)	(1.649)	(2.787)	
Argentina	3/22/1971	0.871	13.92***	23.733***	−0.243	0.252	
		(1.339)	(3.542)	(5.987)	(3.542)	(5.987)	
Argentina	4/5/1976	27.915***	−16.187	−6.824	44.763**	61.163**	
		(6.874)	(18.188)	(30.744)	(18.188)	(30.744)	
Thailand	10/6/1976	−0.51	0.759	1.296	0.662	1.138	1
		(0.607)	(1.606)	(2.714)	(1.606)	(2.714)	
Thailand	10/20/1977	−0.994	3.794	5.978	9.66***	10.057*	1
		(1.203)	(3.182)	(5.379)	(3.182)	(5.379)	
South Korea	12/12/1979	−1.831*	−3.797	−39.244***	−2.002	−4.709	3
		(1.092)	(2.889)	(4.884)	(2.889)	(4.884)	
Thailand	2/25/1991	−7.56***	1.781	12.072	5.68	26.286**	1
		(2.904)	(7.682)	(12.985)	(7.682)	(12.985)	
Peru	4/6/1992	−8.424***	−16.609***	−38.526***	0.193	−10.344	4
		(1.906)	(5.044)	(8.526)	(5.044)	(8.526)	
Pakistan	10/14/1999	−7.741***	−9.439*	−7.365	3.64	5.38	5
		(2.092)	(5.535)	(9.356)	(5.535)	(9.356)	
Nepal	10/4/2002	0.082	1.51	5.288	−0.742	−0.195	1
		(1.196)	(3.163)	(5.347)	(3.163)	(5.347)	
Thailand	9/19/2006	−1.832	−3.835	−1.071	1.589	−1.066	14
		(1.261)	(3.336)	(5.639)	(3.336)	(5.639)	
Bangladesh	1/11/2007	−0.191	10.826***	17.837***	−2.874	1.248	1
		(1.502)	(3.973)	(6.715)	(3.973)	(6.715)	
Means							
All Coups		−0.182	−2.629	−3.507	5.076***	7.795**	3.2
		(0.718)	(1.899)	(3.209)	(1.899)	(3.209)	
Excluding 4/5/1976		−2.737***	−1.396	−3.205	1.468	2.943	3.2
		(0.472)	(1.248)	(2.109)	(1.248)	(2.109)	

Notes: Standard errors are in parentheses. Statistical significance at the 10%, 5%, and 1% level is denoted by *, ** and *** respectively. "Days to rebound" is the number of trading days following a negative stock return for the national stock index to return to pre-event level.

Event day ARs are negative for all coups except the 1971 and 1976 coups in Argentina. The 1976 coup in Argentina appears to be somewhat of an anomaly. The ARs on the event day are larger than for any other regime change in the sample (28%). It is also the only coup with statistically significant (and extremely large) 7-day and 20-day pre-event CARs.

[4] It is appropriate to use the standard normal distribution to calculate test statistics because the length of the estimation window is sufficiently long (250 trading days).

Finally, although the event day abnormal return is large and positive, the 7-day and 20-day post-event CARs are negative.

Event day ARs for the 1970 coup in Argentina, the 1979 coup in South Korea, the 1991 coup in Thailand, the 1992 coup in Peru, and the 1999 coup in Pakistan are all negative and statistically different than zero. Moreover, all of these cases except Thailand have negative post-event CARs and pre-event CARs that are statistically indistinguishable from zero.

If the 1976 coup in Argentina is dropped from the sample, the average coup has a -2.7% event day AR. Even so, markets usually recovered quickly: the market returned to its pre-coup level following a negative event day stock return within 5 trading days in all but one case.

Although it is tempting to dismiss the 1976 Argentina coup as an outlier, there is reason to to believe that coups can in fact result in large positive abnormal returns. The 2002 failed coup d'état attempt against Hugo Chavez is a case in point. On the evening of April 11, 2002, coup plotters removed Chavez from office and later detained him. Pedro Carmona, a Venezuelan business leader, was named the transitional President of Venezuela. Two days later, on April 13, 2002, a popular uprising led to Chavez's reinstatement as president.

The event is a perfect natural experiment because investors reacted to an expected regime change twice: first, when Chavez was ousted, and second, when he was reinstated. It provides an estimate of the market's valuation of a transition from the Chavez regime to the Carmona regime and its valuation of a transition from the Carmona regime back to the Chavez regime. It is therefore a good example of the impact of a shift from a left-wing populist government to a pro business regime on the value of the largest firms in an emerging market.

Figure 2 provides graphical evidence on the effect of the coup attempt. The top panel shows CARs for the 10 days prior to and following the event, along with 95% confidence intervals. The daily ARs and corresponding confidence intervals are displayed in the bottom panel. The abnormal return on April 12, the first trading day in which investors could react to the coup, was 19.5%. The market reacted similarly, albeit in the opposite direction, to

Chavez's reinstatement as president: the abnormal return on the next trading day, April 15, 2002, was -14%.

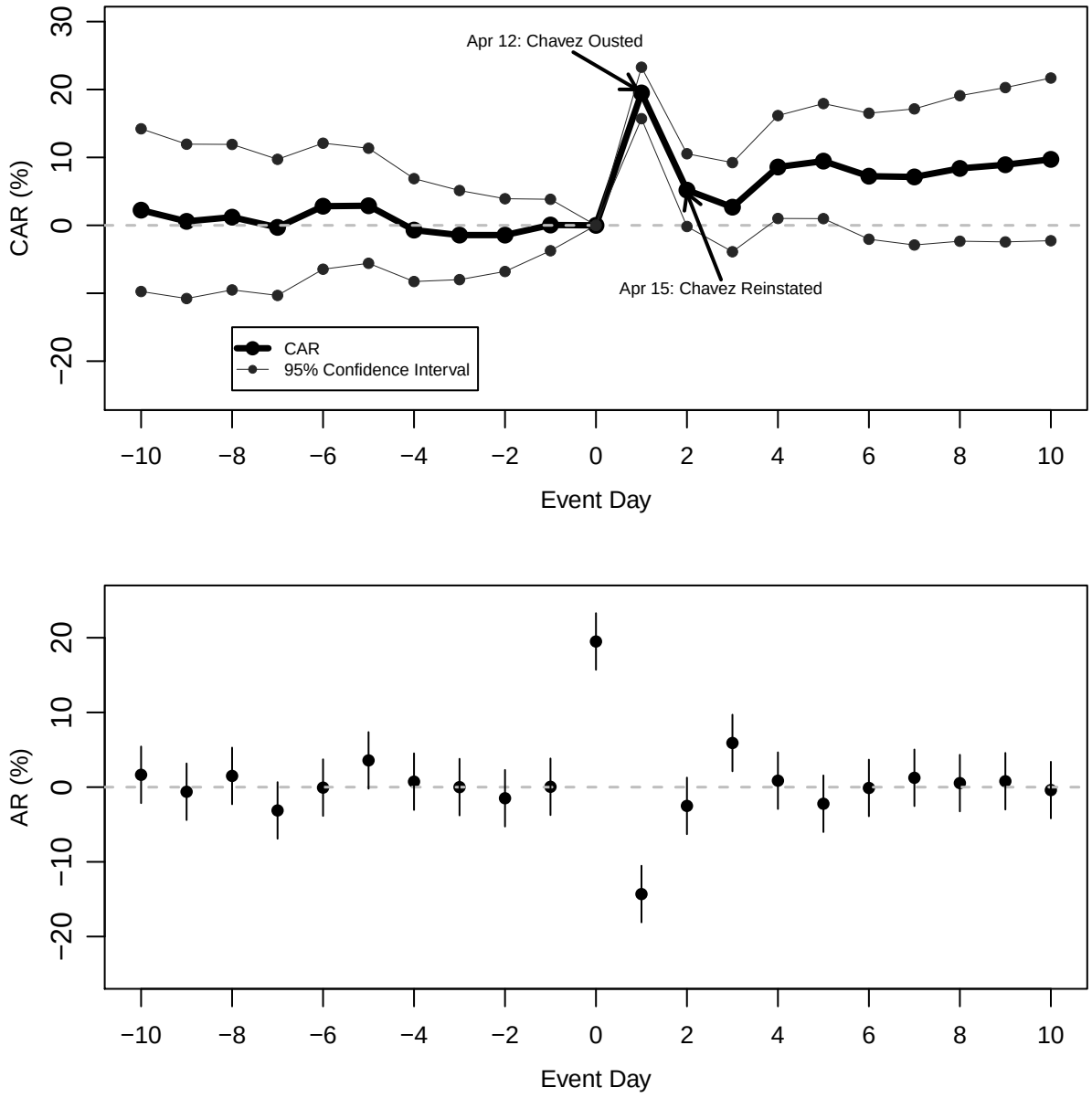

Figure 2: Abnormal Returns Surrounding the 2002 Venezuelan coup d'état attempt

The results in the figure are particularly striking given the discrepancy between the ARs on event days 0 and 1 and all other days. The only other day in which the ARs are

statistically different from zero is on the third trading day after the coup attempt.

The almost 0% 10-day CAR preceding the coup makes this an ideal case as it implies that investors were unaware of the coup plot. The unexpected nature of the event means that the abnormal returns capture the true value of the regime change from Chavez to Carmona more accurately than they otherwise would.

The results in table 3 are produced from analyses identical to those table 2 but for successful assassinations rather than coups. Like coups, there is some evidence that assassinations decrease stock prices. The mean event day abnormal return is negative and statistically different than zero. However, the result is driven almost entirely by three events: the shooting of U.S. President William McKinley on September 6, 1901; the assassination of U.S. President John F. Kennedy on November 22, 1963; and the assassination of Israeli Prime Minister Yitzhak Rabin on the evening of November 4, 1995.

Table 3: Abnormal Returns Following Assassinations

		Post-Event CAR			Pre-Event CAR		Days to
Country	Event Date	(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	rebound
United States	9/6/1901	−4.529***	−3.106	−9.065	−0.784	3.311	963
		(1.283)	(3.396)	(5.74)	(3.396)	(5.74)	
United States	11/22/1963	−2.980***	2.724**	2.446	−2.717**	−2.865	1
		(0.464)	(1.227)	(2.074)	(1.227)	(2.074)	
South Korea	10/26/1979	−0.422	−8.281***	1.532	0.287	−0.851	12
		(0.98)	(2.592)	(4.381)	(2.592)	(4.381)	
India	11/5/1984	−0.364	0.508	−3.004	−3.898**	0.771	1
		(0.69)	(1.826)	(3.087)	(1.826)	(3.087)	
Sweden	3/3/1986	0.546	3.333	6.884	−2.598	3.347	
		(1.08)	(2.856)	(4.828)	(2.856)	(4.828)	
Sri Lanka	5/3/1993	0.943	1.244	6.52*	−1.079	−2.004	
		(0.783)	(2.071)	(3.501)	(2.071)	(3.501)	
Israel	11/5/1995	−4.117***	−3.309	−1.828	−0.117	−9.08	1
		(1.455)	(3.849)	(6.506)	(3.849)	(6.506)	
Nepal	6/12/2001	−0.537	3.825	17.309	6.819	4.47	19
		(3.567)	(9.437)	(15.951)	(9.437)	(15.951)	
Mean		−1.433**	−0.383	2.599	−0.511	−0.363	6.8
		(0.558)	(1.476)	(2.495)	(1.476)	(2.495)	

Notes: Standard errors are in parentheses. Statistical significance at the 10%, 5%, and 1% level is denoted by *, ** and *** respectively. "Days to rebound" is the number of trading days following a negative stock return for the national stock index to return to pre-event level. The mean days to rebound excludes the assassination of William McKinley on November 6, 1901.

There is no evidence of post or pre-event CARs in almost any of the assassinations. As

with coups, the number of days that it took the stock market to rebound to pre-event levels is fairly low. One exception is the assassination of William Mckinley in which the stock market didn't fully recover for 963 days, or almost 4 calendar years. However, this was likely caused by the Panic of 1901, which began when the stock market crashed on May 17th, 1901, and not by McKinley's death (although the assassination may have exacerbated the panic). In any case, the length of this time period is so long that I omitted it when calculating the mean days to rebound in the figure.

As shown in table 4, and in contrast to coups and assassinations, abnormal returns following resignations are large and positive. The mean event day abnormal return is a little over 6% and event day abnormal returns are only negative and statistically significant at even the ten percent level in one out of the fifteen resignations (Tunisia on June 31, 2011). But positive stock returns are short lived: the 7 day cumulative abnormal return is nearly identical to the event day abnormal return and the 20 day cumulative abnormal return is not statistically different from zero.

The positive event day abnormal return following resignations is not surprising since resignations occurred because of "poor performance and/or loss of authority." Leaders were often ousted following corruption charges, financial crises, and/or political violence. For example, consider Suharto's resignation from office as the President of Indonesia on May 1998, just after the 1997 Asian Financial Crisis.

Prior to the crisis, the Indonesian economy suffered from a number of ailments including crony capitalism, poor corporate governance, growing short-term debt and a corrupt banking system (Radelet and Sachs 2000). In addition, Suharto's ill health created considerable policy uncertainty, which only added to the financial panic in Indonesia. Indonesia was also hesitant to adopt structural reforms which further weakened its economic image. As a result, the crisis gave additional ammo to opposition leaders and public opposition culminated in riots in mid-May 1998. Suharto eventually lost his military support and was forced to resign.

Table 4: Abnormal Returns Following Resignations

		Post-Event CAR			Pre-Event CAR		Days to
Country	Event Date	(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	rebound
Argentina	6/18/1982	19.024***	23.876**	16.811	−4.556	31.332*	
		(3.786)	(10.017)	(16.931)	(10.017)	(16.931)	
Philippines	2/26/1986	16.354***	26.725***	6.775	−0.715	2.756	
		(1.184)	(3.134)	(5.297)	(3.134)	(5.297)	
Bangladesh	12/7/1990	1.403	0.295	−1.498	3.102	2.236	
		(1.047)	(2.771)	(4.683)	(2.771)	(4.683)	
Thailand	5/25/1992	3.231**	−5.956	4.312	−4.73	−9.041	
		(1.451)	(3.838)	(6.487)	(3.838)	(6.487)	
Pakistan	4/19/1993	−3.155	4.408	2.487	−0.037	−0.449	1
		(2.214)	(5.858)	(9.902)	(5.858)	(9.902)	
Pakistan	11/6/1996	4.824***	1.145	−1.762	−3.379	−5.666	
		(1.445)	(3.823)	(6.462)	(3.823)	(6.462)	
Turkey	6/30/1997	1.842	1.647	−7.769	11.595	3.228	
		(2.764)	(7.312)	(12.36)	(7.312)	(12.36)	
Indonesia	5/20/1998	12.212*	15.852	−2.492	−26.136	−46.059	
		(7.195)	(19.036)	(32.177)	(19.036)	(32.177)	
Philippines	1/19/2001	16.355***	27.527***	34.324***	−11.851**	−2.676	
		(2.082)	(5.51)	(9.313)	(5.51)	(9.313)	
Argentina	12/20/2001	14.021***	−15.182***	−2.991	14.697***	36.004***	
		(1.97)	(5.212)	(8.809)	(5.212)	(8.809)	
Lithuania	4/6/2004	0.163	−3.852	−10.059*	1.447	2.32	
		(1.289)	(3.412)	(5.767)	(3.412)	(5.767)	
Ukraine	12/28/2004	5.117*	14.189*	20.098	3.864	33.336**	
		(2.907)	(7.692)	(13.001)	(7.692)	(13.001)	
Ecuador	4/20/2005	−0.095	−0.322	−0.907	−1.379	1.171	
		(0.939)	(2.485)	(4.201)	(2.485)	(4.201)	
Nepal	4/25/2006	2.311***	8.969***	9.884***	−2.872	−5.002*	
		(0.674)	(1.783)	(3.014)	(1.783)	(3.014)	
Tunisia	1/31/2011	−1.425*	3.859*	−9.933**	−12.599***	−12.793***	3
		(0.857)	(2.268)	(3.833)	(2.268)	(3.833)	
Mean		6.146***	6.879***	3.819	−2.236	2.047	2
		(0.686)	(1.814)	(3.066)	(1.814)	(3.066)	

Notes: Standard errors are in parentheses. Statistical significance at the 10%, 5%, and 1% level is denoted by *, ** and *** respectively. "Days to rebound" is the number of trading days following a negative stock return for the national stock index to return to pre-event level.

3.2 Volatility

Although irregular regime changes have disparate effects on the direction of stock returns, the results from section 3.1 suggest that all of these political events increase financial volatility. However, since stock volatility is not directly observable, one must decide how to best estimate volatility. My estimates are obtained from a generalized autoregressive conditional

heteroskedasticity (GARCH) model estimated using 1000 pre-event days, the event day and 1000 post-event days. As in Jensen and Schmith (2005) and Leblang and Mukherjee (2005), I use the GARCH (1,1) specification. In particular, for national stock index i,

$$R_{it} = \mu_i + \epsilon_{it}, \qquad \epsilon_{it} \sim \mathcal{N}\left(0, \sigma_{it}^2\right),$$

where μ_i is a constant and,

$$\sigma_{it}^2 = \gamma_i + \alpha_i \epsilon_{i,t-1}^2 + \beta_i \sigma_{i,t-1}^2.$$

The key parameter of interest is the conditional variance, σ_{it}^2. The one-period-ahead volatility forecasts, σ_{it}, are larger when $\epsilon_{i,t-1}^2$ and $\sigma_{i,t-1}^2$ are larger. In other words, the model predicts that large shocks will be followed by other large shocks.

Figure 3 shows the mean volatility ($\overline{\sigma_t}$) estimates from the GARCH (1,1) model across all irregular regime changes for 30 trading days prior to and 30 days after each event. Volatility appears to increase slowly just before the regime change, which suggests that investors sometimes have information about the events before they occur. Nonetheless, there is still an enormous volatility jump on the day of the regime change. Volatility then decreases to normal levels within a month of the event.

The smaller figure within figure 3 expands the volatility estimates to the 250 trading days before and after each regime change. As expected, the volatility estimates stay between a narrow range at nearly all dates except those surrounding the regime change.

3.3 Robustness

There are three potential concerns with the results in section 3.1. First, the abnormal returns could have been driven by factors unrelated to the regime changes. Second, the reported means are based on small sample sizes so confidence intervals based on normally distributed abnormal returns may be inappropriate. Third, the true effects of irregular regime changes

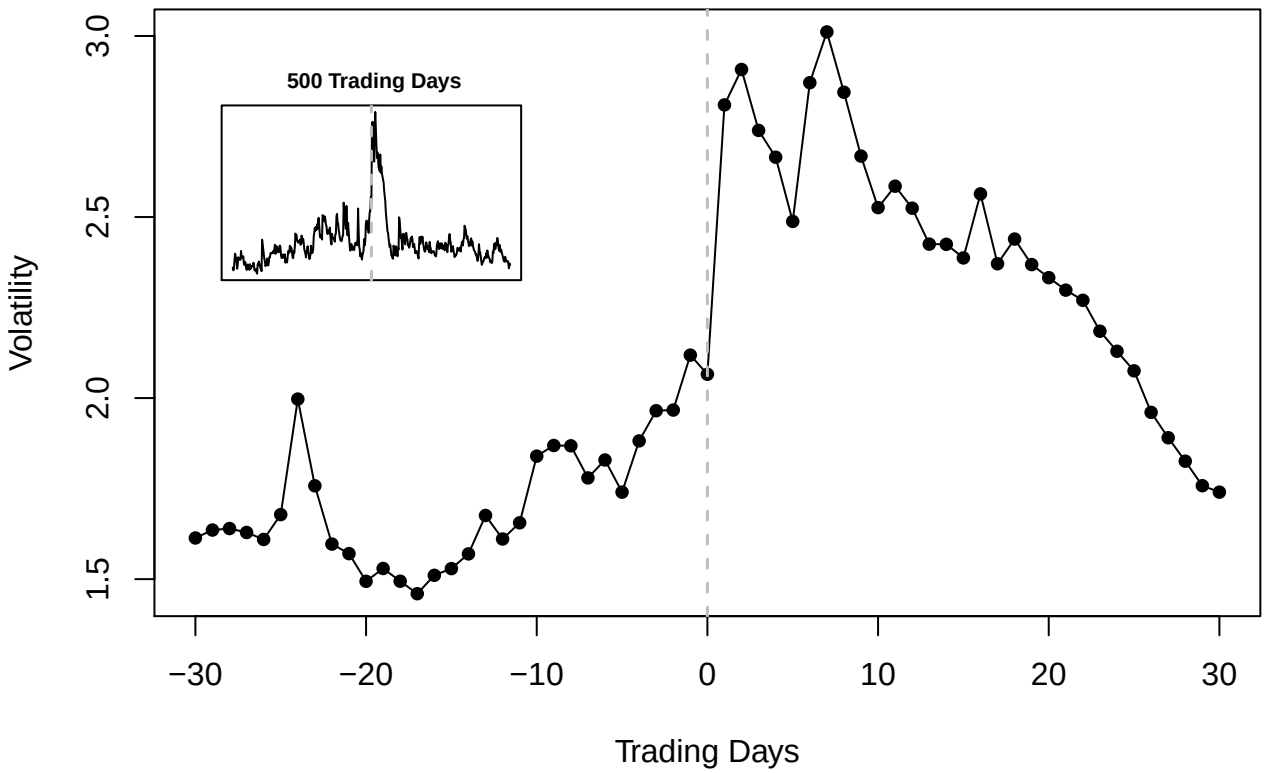

Figure 3: Mean of Volatility Estimates from GARCH(1,1) Models

on firm value may be underestimated if investors had apriori information.

To explore the first concern, I create a synthetic control portfolio for each event based on the techniques introduced in Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010). Each country is given a weight which represents its influence in the synthetic control portfolio. The weight is chosen so that the daily returns and the variance of the daily returns of the control portfolio and the event country are most similar in the estimation window. The set of possible countries in the control portfolio consists of all countries listed in table 1.[5]

The second concern is addressed using non-parametric statistical techniques, which are free from distributional assumptions. I employ the sign and the rank tests which are based

[5]See the appendix for a more formal explanation.

on the sign and the rank of the event day ARs respectively.[6] Both tests are less influenced by departures from normality than statistics based on traditional t-tests such as those reported earlier in this paper.

Table 5 compares event day ARs as well as "abnormal absolute returns" between the event country and the synthetic control portfolio using the non-parametric methods discussed above. The "abnormal absolute returns" are abnormal returns for the absolute value of stock returns. This is done to combine events since resignations tend to increase returns while assassinations and coups tend to decrease them. The idea that the absolute value of returns might increase during irregular regime changes is similar to the finding that volatility increases and consistent with figure 1.

Table 5: Non-Parametric Tests of the Impact of Regime Changes

	Regime Change Country			Synthetic Control Portfolio			Wilcoxon
Event Type	Mean CAR (0,0)	Rank p-value	Sign p-value	Mean CAR (0,0)	Rank p-value	Sign p-value	Rank Test p-Value
Coups	−0.182	0.008	0.083	0.235	0.980	1.000	0.034
Assassinations	−1.101	0.043	0.157	−2.342	0.236	0.157	0.688
Resignations	6.146	0.000	0.020	0.486	0.217	0.796	0.007
All (Absolute Value)	3.725	0.000	0.004	0.335	0.144	0.612	0.001

Notes:

As shown in table 5, the mean event day abnormal returns for coups, assassinations and resignations are all statistically different from zero at the 5% level using the rank test statistic and the abnormal returns for coups and resignations are significant at at least the 10% level using the sign test. In addition, abnormal absolute returns for all events are statistically significant at the 1% level using both the rank and sign statistics. On the other hand, the event day abnormal returns for the control portfolio are never statistically different from zero at even the 10% level. Finally, the difference in means between the regime change country and the control portfolio are statistically different from zero for coups, resignations and all events combined when using two-sided p-values from the Wilcoxon rank test.[7] In

[6] See section 8 in MacKinlay (1997) for more details.

[7] The Wilcoxon rank test is a non-parametric statistical technique that can be used to compare differences

sum, these results suggests that the results from section 3.1 are not an artifact of deviations from normality or confounding world events.

The third concern, which is that the political events in this paper are not unexpected, is addressed in a number of ways. First, one can note that neither the 7-day or the 20-day mean CAR from tables 2, 3 or 4 are statistically different than zero at even the 10% level. Although some of the irregular regime changes have statistically significant pre-event CAR's, most of them do not, and the ones that do do not always move in the same direction. For example, there was a negative 11.8% 7-day CAR preceding the resignation of President Estrada of the Philippines in January of 2001 and a positive 14.7% 7-day CAR preceding the resignation of President Fernando de la Rúa of Argentina in December of 2001, even though both resignations were associated with large positive event day abnormal returns.

Second, since the direction of the pre-trends is unclear, I examine whether there are different pre-trends for events with positive stock reactions than for events with negative stock reactions. As shown in figure 4, neither the "positive" nor "negative" events have pre-event CAR's that are statistically different from 0.

It is also worth noting that the post-event CAR(1,k) for $k \in (2, 19)$ is not statistically significant for either the "positive" or the "negative" events. Almost all of the stock-market reaction occurs on the first day that the market could react to the event which suggests that markets respond quickly to political events. This, in turn, implies that markets are reacting to news efficiently and that an event-driven trading strategy would not be profitable.

To check for the possibility that my previous results were spurious, a final placebo check examines whether there are abnormal absolute returns on the event day when the event day is shifted forward and backwards in time. Events are shifted backwards by 5, 10, 15, 20, 25 and 30 trading days and forwards by 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60 trading days.[8] Figure 5 graphs the abnormal absolute returns (labeled CAR(0,0) in the

between matched samples.

[8]Event days are not shifted backwards by more than 30 trading days to ensure than every country in the sample can be included. When events are shifted backwards by more than 30 trading days mean abnormal absolute returns continue to cluster around 0.

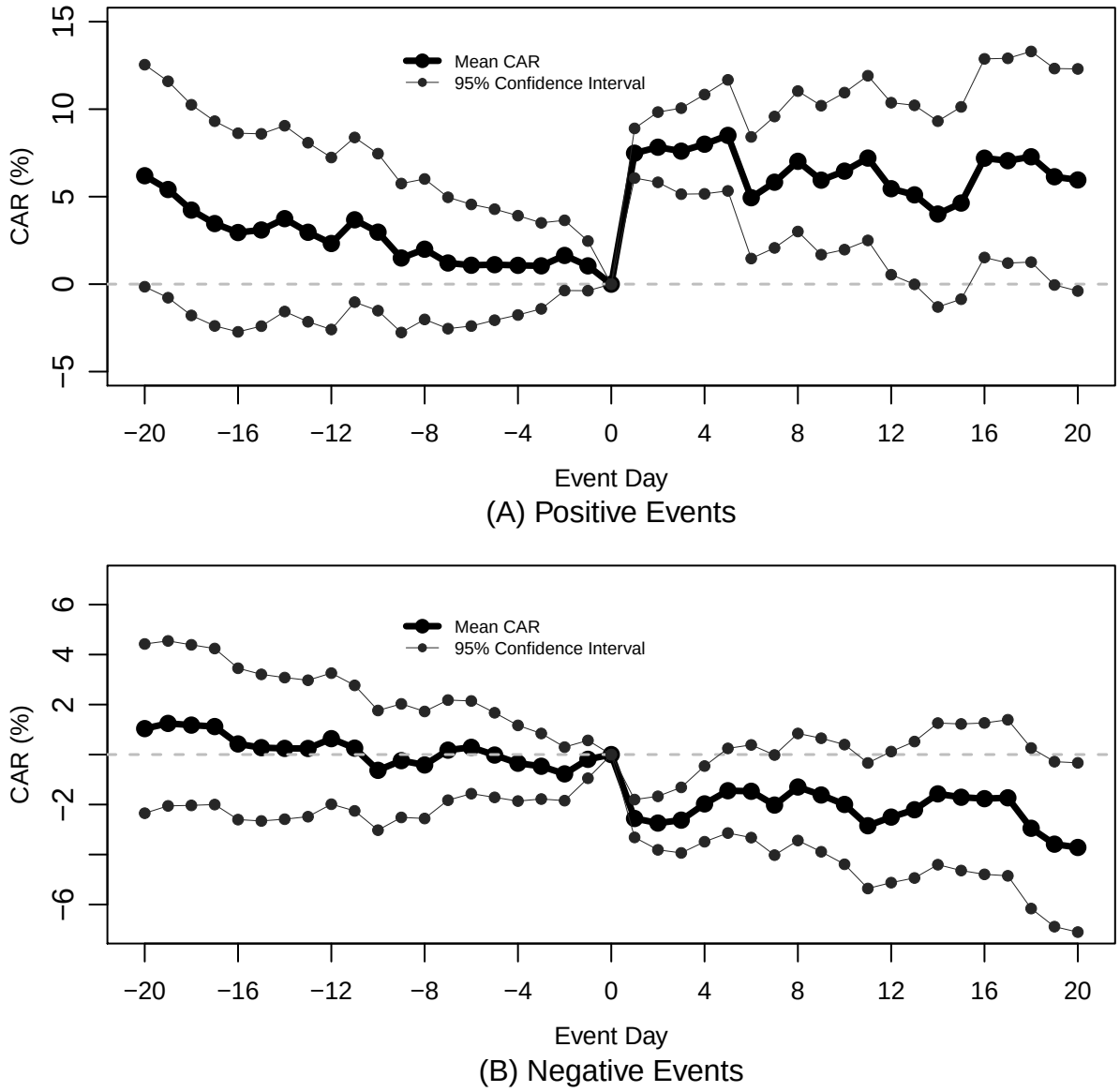

Figure 4: Mean Cumulative Abnormal Returns Surrounding Regime Changes

figure) against the number of days shifted.

The largest CAR(0,0) occurs when the events have not been shifted in time. Moreover, the backwards shifted event day abnormal absolute return is only statistically different from zero when the event day is shifted backwards by 5 days. On the other hand, the forwards

shifted CAR(0,0) is statistically significant when the event day is shifted forward by 5, 10, 15 and 20 days. These findings are consistent with figure 3, in which volatility began increasing around 5 trading days before the event and then started decreasing quickly about 20 trading days therafter.

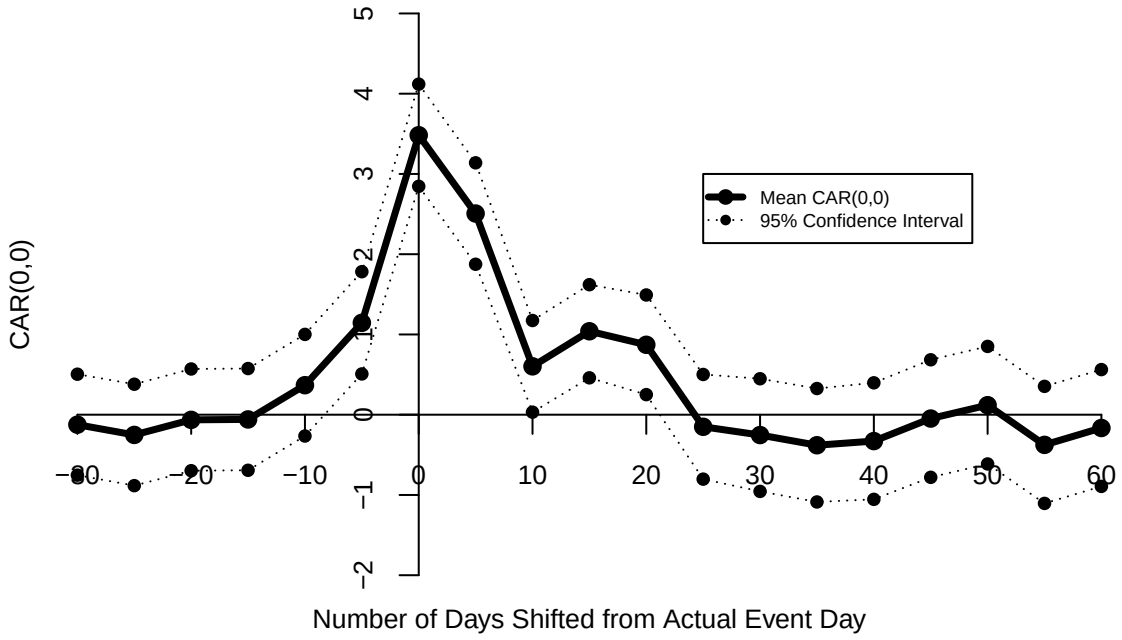

Figure 5: Time-Shifed Placebos for Absolute Abnormal Returns

4 Public Protests

The resignations studied in this paper are those in which leaders left office because of poor performance, public discontent and popular protests. While the previous section showed that the resignations themselves had large effects on stock returns and volatility, it is not unreasonable to expect the political actions preceding the resignations to have similarly large effects on financial markets. Indeed, corporate investors in the 2011 MIGA *World Investment and Political Risk* ranked civil disturbances as the fourth most concerning type of political

risk.

The most recent example of a popular uprising preceding a resignation is the 2011 Egyptian Revolution that resulted in the overthrow of President Hosni Mubarak's regime.[9] Clashes between security forces and protestors led to the deaths of hundreds of citizens and injuries to thousands more. The uprising began on January 25, 2011 when millions of protestors demanded the overthrow of the Egyptian leadership. Examples of public discontent included demonstrations, marches, riots and non-violent civil disobedience, and labor strikes.

While the Egyptian Revolution may have positive pro-democracy effects on the Egpytian political system, its short-term impact on the economy was disastrous. As shown in figure 6, abnormal returns the Egyptian Stock Exchange Index (EGX 30) were around -7% on January 26th and -10% the day after. To prevent further decline during the uprising, the Egyptian Stock Exchanged closed at the end of trading on January 27th. President Mubarak resigned on February 11, but the market remained closed until March 23, when CARs declined by another 9%, before rebounding slightly thereafter.

An important question is whether other popular uprisings have had similar adverse economic consequences. To examine this, I examine all resignations that were driven by significant public protests.[10] Public protests include popular demonstrations, riots, non-violent civil resistance and other forms of public discontent. These events are listed in table A.1 in the appendix.

The start and end dates in table A.1 are the dates that protests began and leader's resigned respectively. Resignations caused by popular uprisings were identified by examining the descriptions in the Coup d'état Events Handbook and Archigos Version 2.9. Additional Lexis Nexis searches were used to verify these descriptions. Start dates were determined

[9]Abnormal returns for this event are not shown in table 4 because the stock market was closed on the day of Mubarak's resignation.

[10]The set of resignations includes all those listed in either the Coup d'état Events Handbook or the Archigos Version 2.9 data set with available financial data. In practice, this is the 2011 Egyptian Revolution and the list or resignations in table 4.

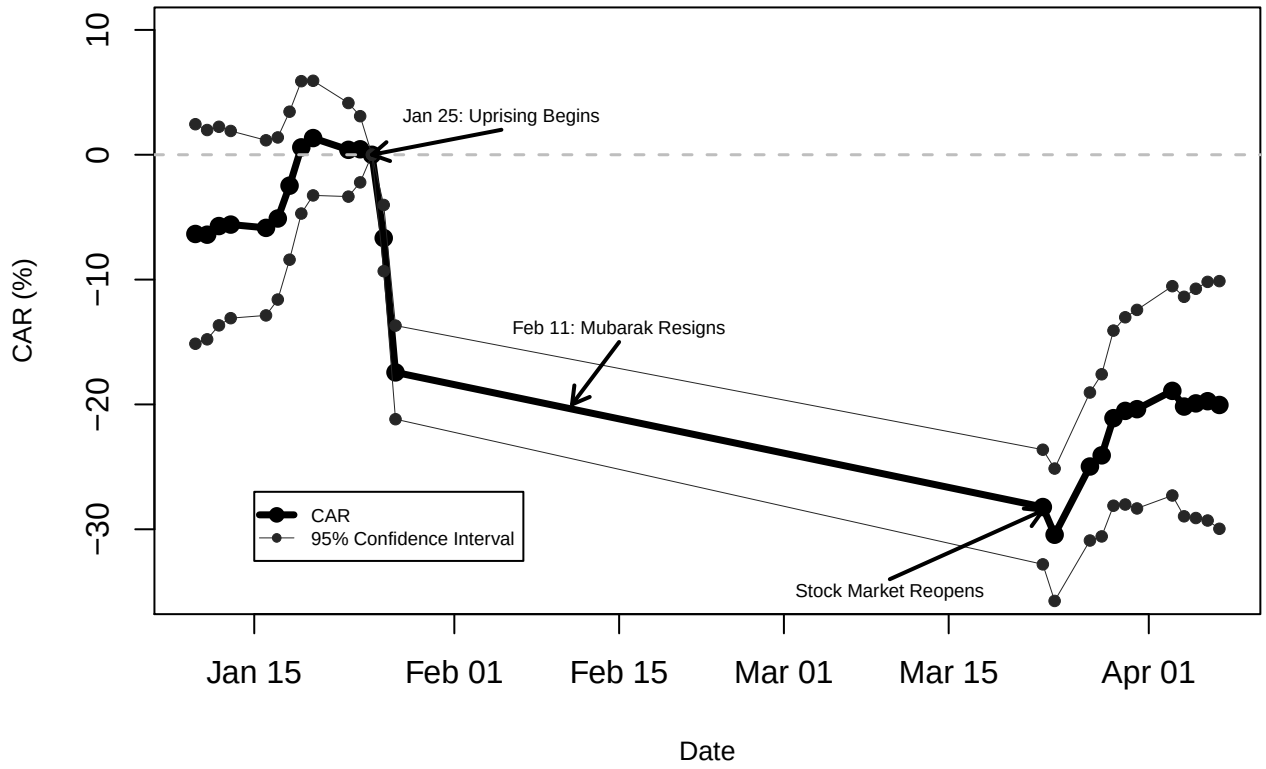

Figure 6: Cumulative Abnormal Returns During the Egyptian Revolution

through similar means.

In table 6, I examine whether public protests influence stock prices. The variable, *Protest* is equal to 1 during the dates in which citizens participate in political activities demanding the resignation of the executive are and 0 otherwise. Non-protest dates are the 250 days prior to the start dates and after the end dates listed in table A.1.[11]

Column (1) suggests that public protests have no effect on stock returns. However, this occurs because some political movements increase stock prices while others decrease them. As shown in column (2), the absolute value of stock returns are over 2% higher during public protests. These estimates would be biased if protest dates are correlated with higher world

[11]The volatility estimates used as the dependent variable in column (4) are estimated on the 250 days prior to the start date, the protest dates, and the 250 days following the end date.

or regional stock market indices. To address this potential confounder, column (3) controls for returns on the S&P/IFC Emerging Markets Investable Composite Stock Index. The coefficient on *Protest* barely changes and the absolute value of returns are still about 2% higher during public protests. Finally, column (4) shows that stock volatility is more than 1 percentage point higher during political movements.

Table 6: Effect of Public Protests on Stock Prices

	Returns	Absolute Value of Returns		Volatility
	(1)	(2)	(3)	(4)
Protest	0.282	2.113***	1.961***	1.148***
	(0.781)	(0.648)	(0.643)	(0.385)
Emerging Market			0.216*	
Index			(0.129)	
Event Fixed Effect?	Yes	Yes	Yes	Yes
Observations	3537	3537	2676	3537
Events	11	11	8	11

Notes: Standard errors clustered by event are in parentheses. Statistical significance at the 10%, 5%, and 1% level is denoted by *, ** and *** respectively.

5 Conclusion

This paper has examined the economic effects of irregular regime changes. It uses an event study approach to show that investors expect irregular regime changes to have large effects on equity returns. This methodology is less susceptible to endogeneity biases than studies that use cross country data.

The results are consistent with the idea that government competence is a random walk and that government changes have large impacts on investor confidence. Financial volatility surrounding regime changes, which is often characterized by large positive *and* negative stock returns, suggests that irregular regime changes increase policy uncertainty. The variation in the direction of abnormal returns is consistent with the idea that not all governments are created equally. Abnormal returns are likely positive following resignations because those leaders were the most likely to be "bad" leaders.

Although this study is based on only 35 events, the size of the effects suggests that it

should not be dismissed. Irregular regime changes are important economic events than can drastically alter the economic landscape. For instance, the 21.26% increase in the Venezuelan Stock Index following the temporary ousting of Hugo Chavez in 2002 is its 4th largest increase since 1994. In comparison, the Hong Kong Stock Index (Hang Seng Index) decreased by 21.7% following the 1989 massacre of Chinese protestors in Tiananmen square and the Dow Jones Industrial Average in the United States fell by 22.61% on Black Monday (1997), the largest one-day drop in its history.

A Appendix

Table A.1: List of Public Protests Preceding Resignations

Country	Name	Start Date	End Date
Philippines	EDSA 1/Yellow Revolution	2/22/1986	2/25/1986
Bangladesh	Bangladeshi Spring of 1990	11/27/1990	12/7/1990
Thailand	Black May	5/17/1992	5/20/1992
Indonesia	Indonesian Riots	5/12/1998	5/21/1998
Philippines	EDSA II	1/17/2001	1/20/2001
Argentina	Argentina Riots	12/16/2001	12/20/2001
Ukraine	Orange Revolution	11/22/2004	1/23/2005
Ecuador	Ecuadorian Protests	4/13/2005	4/20/2005
Nepal	Nepalese People's Revolution	4/6/2006	4/24/2006
Tunisia	Tunisian Revolution	12/18/2010	1/14/2011
Egypt	Egyptian Revolution	1/25/2011	2/11/2001

A.1 Synthetic Control Portfolio

Let $\boldsymbol{R}_k$ be the vector of returns for the event country in the estimation window, $\boldsymbol{R}_{-k}$ be the vector of returns for all other countries in the estimation window, $\boldsymbol{X}_1 = (\boldsymbol{R}_k, \text{Var}(\boldsymbol{R}_k))$, $\boldsymbol{X}_0 = (\boldsymbol{R}_{-k}, \text{Var}(\boldsymbol{R}_{-k}))$, and $\boldsymbol{W}_{-k}$ be a $((N-1)\times 1)$ vector of weights where N is the number of countries listed in table 1. Then $\boldsymbol{W}^*$ is chosen to minimize $(\boldsymbol{X}_1 - \boldsymbol{X}_0\boldsymbol{W})'\boldsymbol{V}(\boldsymbol{X}_1 - \boldsymbol{X}_0\boldsymbol{W})$ subject to $w_i \geq 0$ $(i = 1, 2, \ldots, N-1)$ and $\sum_i^{N-1} w_i = 1$, and the vector $\boldsymbol{V}$ is chosen so that stock returns for the control portfolio during the estimation window are are close as possible to the event country.[12]

[12]See Abadie and Gardeazabal (2003) for further details.

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