Are regime changes always bad economics? Evidence from daily financial data *

Devin Incerti† and Trevor Incerti‡

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Abstract

Political instability is commonly thought to discourage investment and reduce economic growth. We challenge this consensus by showing that instability does not systematically depress investment as investors recognize when instability may be in their favor. Using an event study approach, we examine daily returns of national stock indices in every country that experienced an irregular regime change subject to data availability. Returns following resignations are large and positive (+4%), while those following assassinations are negative and smaller in magnitude (-2%). The impact of coups tends to be negative (-2%), but we show that a pro-capitalist coup results in large positive returns. We find suggestive evidence that authoritarian or anti-capitalist regime changes are more likely to be perceived negatively by investors than democratic or pro-business changes. The impact of political instability on investment is therefore dependent on the type of regime change and its expected impact on economic policy.

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†Senior Data Scientist, Genentech. devin.incerti@gmail.com

‡Corresponding author. PhD Candidate in the Department of Political Science, Yale University. trevor.incerti@yale.edu.

Investors rank political risk as a top consideration when investing in emerging markets.[1] Research shows that political instability is negatively correlated with investment, financial development, and GDP growth in cross country regressions (Aisen and Veiga 2013; Alesina and Perotti 1996; Alesina, Özler, Roubini and Swagel 1996; Baker, Bloom and Davis 2016; Fosu 1992; Jong-A-Pin 2009; Roe and Siegel 2011), and that stock market variance increases in response to economic policy uncertainty (Jensen and Schmith 2005; Leblang and Mukherjee 2005; Liu and Zhang 2015).

However, how different types of political instability affect markets remains unknown. In contrast to aforementioned cross country studies, we: (1) examine the impact of various types of instability (coups, resignations, assassinations, and protests) separately, and (2) conduct event studies of daily financial data. Event studies estimate a local average treatment effect of an unexpected event on stock prices *at the time of the event*. This interrupted time-series approach mitigates the endogeneity problems in previous cross country regressions—confounding events would need to occur on the same day as instability, and do so for a large portion of all of our independently tested events in order to influence our estimates.

We analyze the full sample of politically unstable events for which national-level daily financial data is available.[2] Like previous research, we find that all types of political instability cause large increases in financial volatility. However, we find that abnormal returns are large and positive (+4%) following resignations and tend to be negative and smaller in magnitude following assassinations and coups (-2%). We also examine the failed 2002 Venezuelan coup, as it allows us to estimate the effects of both a pro-business coup (+10%), and the reinstatement of a left-wing populist (-8%) on the same market.

Our primary contributions are empirical and methodological. Empirically, we provide the first estimates of financial market reactions disaggregated by type of political instability. We show that while political instability concerns investors, it does not systematically depress investment. Investors recognize when instability may be in their favor. The capital flows we document are not insubstantial—in many cases they represent larger shocks than the 2008 stock market crash. Methodologically, we (1) employ a method less susceptible to endogeneity concerns than previous studies, and (2) integrate synthetic control and event study methods to allow for control portfolios in situations where an obvious control portfolio is not present. We do not view theoretical development as our main contribution, but find evidence that authoritarian regime changes are more likely to lead to negative returns, and that leaders who are clearly pro-business can be rewarded by investors, even if they use extra-judicial methods to take power.

Reexamining market response to irregular regime changes

Conventional theory and cross-country empirical evidence suggests that political instability depresses financial returns and economic growth (Boutchkova, Doshi, Durnev and Molchanov 2012; Irshad 2017; Le and Zak 2006; Lehkonen and Heimonen 2015; Lensink, Hermes and Murinde 2000). But if market returns reflect investor expectations about future economic growth and returns, such hypotheses may be too simplistic. Investors may view even a coup

[1] Executives of multinational enterprises rank political risk as among the most important constraint for foreign direct investment (FDI) in developing countries (*World Investment and Political Risk* 2011,1,1).

[2] 13 coups, 8 assassinations, 15 forced resignations, and 11 public protests.

as a "positive" event if the current regime is anti-business or anti-global.

Not all regime changes are equivalent. Some regime changes—e.g., the resignation of an ineffective leader—may foreshadow better policy. Assassinations can occur seemingly at random, and a successor may be unclear. Coups can be democratic or autocratic. These differences are often overlooked in past studies, which have proxied for instability using the number of coups (Alesina et al. 1996; Londregan and Poole 1990), assassinations or revolutions (Barro 1991), or combined events into single indices (Alesina and Perotti 1996; Gupta 1990; Jong-A-Pin 2009; Venieris and Gupta 1986).[3] By contrast, we estimate effects separately for coups, assassinations, resignations, and protests.

Debate also exists on the subject of "good coups"—i.e., coups that lead to democratization or economic liberalization—and their effect on economic growth. Most research suggests "good coups" are not the norm (Derpanopoulos, Frantz, Geddes and Wright 2016; Powell and Thyne 2011; Thyne and Powell 2016; Varol 2011). Others argue the negative effects of uncertainty dominate any positive effects (Alesina et al. 1996), or that the expected impact of coups is neutral as some enhance growth while others depress it (Londregan and Poole 1990). But while "good coups" may be the minority, they have become more frequent (Marinov and Goemans 2014) and could have positive economic effects (Girardi and Bowles 2018; Meyersson 2016).

Different types of regime changes may therefore have disparate effects on markets and/or economic growth. Previous research suggests that coups should on average lead to negative returns, but sometimes lead to positive returns when the coup's instigators are clearly more pro-market than the regime they replace. Assassinations should have a neutral or negative impact as they increase uncertainty, but institutional responses to assassinations vary by country. By contrast, resignations may be viewed positively on average, as they typically signal the departure of an ineffective leader.

Data

Financial data is from the Global Financial Data database—the longest available daily time series of stock prices. We collect national stock index data for every country in which there was a coup, assassination, or resignation and daily financial data is available.[4] These stock indices are listed in Table A.1.

Political data are primarily drawn from the Center for Systemic Peace's (CSP) Polity IV Coup d'etat dataset and Coup d'etat Events handbook. We form a list of "irregular" regime changes from successful coups,[5] assassinations of the executive, and resignations of the executive[6] as daily financial data is available for countries in these categories. We supplement

[3]Note that these studies vary by metrics included in the indices, method of aggregation, and outcome variable of interest.

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

[5]For example, Needler (1966, p. 617) states 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 CSP is "confident that [its] list of successful coups is comprehensive" but does not extend this confidence to attempted or failed coups, and Powell and Thyne (2011) state that it is "difficult to identify more ambiguous forms of coup activity, such as coup failures, plots, and rumors."

[6]Resignations are those in which the ruling executive was coerced to resign due to poor performance,

the CSP data with Archigos Version 4.1 leadership data, which allows us to identify some additional cases of coups, assassinations, and protests. A list of the political events in our dataset and whether they resulted in democratic or autocratic shifts is shown in Table A.2.

There is considerable debate about classification of regime changes. We recognize that some readers may feel certain events are missing. We rely on common third-party classifications to minimize the possibility our results are driven by our own classifications. The one exception is that we separately analyze the 2002 failed coup in Venezuela, as it provides a natural test of the impact of the seemingly successful removal of a left-wing populist with a pro-business regime, and the ensuing reinstatement of a left-wing populist.

Estimation

Volatility

To examine the effect of irregular regime changes on financial volatility, we use 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), we 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.

Abnormal returns

To estimate the magnitude and direction of the effect of irregular regime changes on stock returns, we follow standard event study methodology (Campbell, Lo and MacKinlay 1997; MacKinlay 1997). Normal performance is measured with a constant mean return model,

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

where R_{it} is the logged return of national stock index i on trading day t and ϵ_{it} is the error term. We calculate abnormal returns (ARs) in an "event window" around the date of each event, $AR_{i\tau} = R_{i\tau} - \widehat{\mu}_i$, 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. We use a 41 trading day event window (20 pre-event days, event day, and 20 post-event days) and 250 trading day estimation window. The ARs are then used to calculate cumulative abnormal returns

public discontent and popular demonstrations.Note that the Polity IV definition of "poor performance" is not synonymous with poor *economic* performance, and in practice the reasons cited for resignation across events are: loss in conflict/war, anti-authoritarian protest, corruption scandals, Supreme Court ruling against unconstitutional actions, contested elections, and abuse of power.

(CARs) between event day τ_1 and event day τ_2: $CAR(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$. Standard errors and p-values are calculated using asymptotic t-statistics as in MacKinlay (1997).[7]

The event date is the first trading day a market could react to news of the event. $(0, \tau-1)$ denotes the τ-day period beginning with the event day and $(-1, \tau)$ denotes the negative τ-day period beginning with the day prior to the event day. We present results for the sum of abnormal returns over the post-event windows of the event date only $(0, 0)$, the event date plus 6 days $(0, 6)$ and 19 days $(0, 19)$, and the pre-event windows $(-1, -7)$ and $(-1, -20)$.

We do not use a market model (where a market index is included as a control) to maximize the number of observations and because our unit of analysis *is* the country-wide market index (not firms).[8] To address concerns regarding use of a constant mean return model, we combine synthetic control methods (Abadie, Diamond and Hainmueller 2010; Abadie and Gardeazabal 2003) with event study estimation. We create a "synthetic" control portfolio for each event, where each country is given a weight representing its influence in the 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.

Formally, 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 A.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.[9] The set of possible countries in the control portfolio consists of all countries listed in Table A.1.

Impact of Political Instability on Stock Returns

Volatility

Figure 1 shows the mean volatility $(\overline{\sigma_t})$ estimates across all irregular regime changes for 250 trading days prior to and 250 days after each event. Volatility stays between a narrow range at nearly all dates except those surrounding the regime change. Volatility appears to increase slowly just before the regime change, albeit not to a degree out of line with previous fluctuations. This may suggest 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.

Coups

Figure 2 shows the mean CARs by each type of regime change we analyze for the event day, as well 20 days before and after the event. Individual results for all coups in our sample and mean results for all coups can be found in Table A.3.

[7] 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).

[8] 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.

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

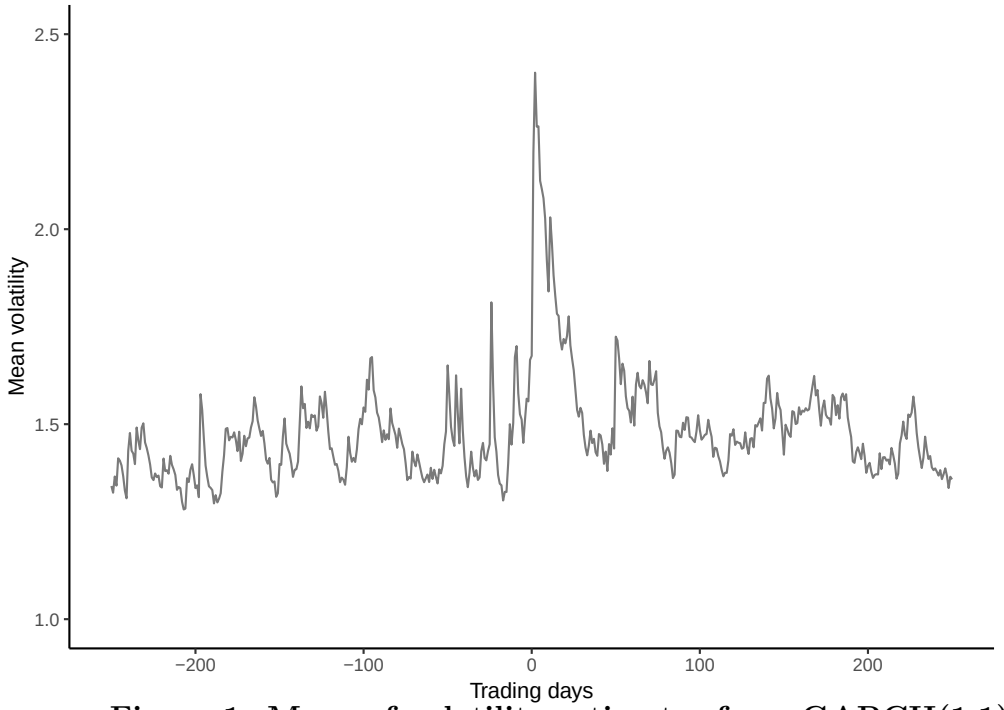

Figure 1: Mean of volatility estimates from GARCH(1,1) models

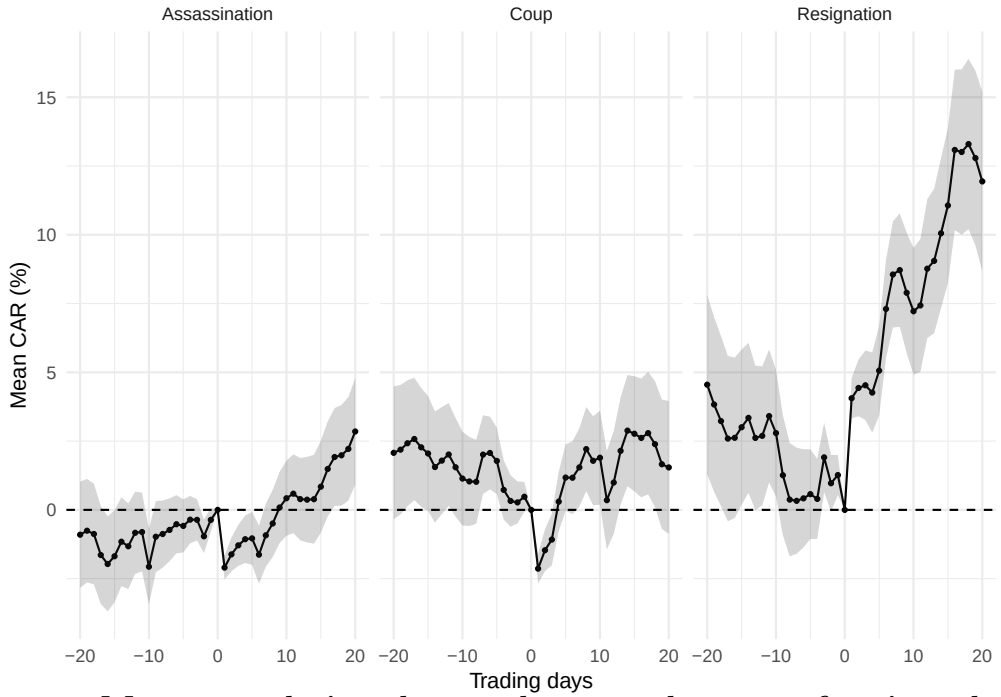

Figure 2: Mean cumulative abnormal returns by type of regime change

The average coup has a −2.1% event day AR. Event day ARs for the 1970 coup in Argentina, 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. In all of these cases, the coup either overthrew a democratically elected government or changed governance from one military ruler to another. The initial negative reaction followed by additional post-event negativity is consistent with the expected market reaction from a successful authoritarian coup followed by post-event consolidation of power.

The only events with positive ARs are the 1971 coup in Argentina and the 2002 coup in Nepal. These results provide evidence that coups do not necessarily lead to negative abnormal returns. While the 1971 Argentinian coup did result in another military leader, it did so while calling for free and democratic elections and replaced a government that had adopted extreme protectionist economic policies. In fact, by 1973 Argentina had transitioned to a democracy.[10] The 2002 coup in Nepal resulted in a monarchical restoration, but occurred after the country's prime minister postponed general elections, itself a democratically subversive action.

Assassinations

Like the majority of coups, we find that assassinations decrease stock prices (see Figure 2 and Table A.3). The mean event day abnormal return is negative and statistically different than zero.

These results are consistent with our hypothesis that assassinations should have a negative effect as they occur seemingly at random and increase uncertainty. While the mean effect of assassinations is negative, it is smaller in magnitude than for coups. Unlike a coup, an assassination may not necessarily be expected to cause immediate change in economic policy, particularly in the presence of an institutionalized line of succession. As such, we would expect CARs to be negative due to increased instability and uncertainty, but smaller in magnitude to a coup or resignation due to greater expectations of policy inertia.

There is no evidence of post or pre-event CARs in almost any of the assassinations. This is consistent with expectations as assassinations are typically not predictable. As with coups, the number of days that it took the stock market to rebound to pre-event levels is fairly low.[11]

Resignations

Unlike coups and assassinations, abnormal returns following resignations are large and positive (see Figure 2 and Table A.5). The mean event day abnormal return is over 4%, and the positive returns grow larger over time (mean 20-day CAR $\approx$ 12%). Event day ARs are only negative and significant at even the ten percent level in two of the fifteen resignations.

These results are consistent with our hypothesis that resignations may lead to positive returns as they typically occur due to poor performance and/or loss of authority. Among our sample of events, leaders were ousted following loss in conflict/war, anti-authoritarian protest, corruption scandals, Supreme Court ruling against unconstitutional actions, contested elections, and abuse of power.

[10] Based on Center for System Peace Polity IV polity score of 6. Values of 6-10 are defined as democracies.

[11] One exception is the assassination of William Mckinley in which the stock market didn't fully recover for 963 days. 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.

The resignations analyzed encompass leaders who left office because of poor performance, public discontent and popular protests. Protests preceding these resignations may therefore also affect financial markets[12], so we analyze all protests that preceded the resignations in Public Protests. Including directionality, public protests have no effect on stock returns as some increase stock prices while others decrease them (see Table A.7). In absolute terms, stock returns are approximately 1.5% higher during public protests.

Mechanisms

While markets may generally dislike political instability, the immediate effect of regime changes on markets may not always be unpredictable. For example, investors may generally value democracy if it is perceived to provide stronger property rights and lower susceptibility to capital appropriation (North and Weingast 1989; Przeworski and Wallerstein 1982; Svensson 1998). Investors may also have priors about a new leader's economic ideology. Two mechanisms that could be driving positive or negative returns may therefore be: (1) whether the regime change is associated with an authoritarian or democratic shift, and (2) whether a new leader is clearly more pro or anti business than their predecessor.

We therefore first aggregate the events in our sample by whether they resulted in an authoritarian or democratic shift.[13] We find suggestive evidence that regime changes associated with authoritarian shifts are on average perceived negatively by investors (see Table A.8), while democratic shifts are perceived positively (see Table A.9). Of ten authoritarian shifts, only two result in positive CARs, and neither are significantly different from zero. Three of five cases involving democratic shifts result in positive CARs, and the positive CARs persist in the follows weeks. Of the two negative CARs, one is not significantly different from zero, and the other is associated with a forced market closure that lasted 17 days.

A similar aggregated analysis is not possible for shifts from pro or anti business leaders, as examples of clear shifts in leader economic ideology do not exist in our sample.[14] We therefore look outside our sample and examine a (failed) pro-business coup followed by the reinstatement of a socialist leader: the 2002 failed coup against Hugo Chavez in Venezuela. This provides a natural test of the effects of both pro and anti business regime changes separately from simple uncertainty because investors reacted to a regime change twice: first, when Chavez was ousted, and second, when he was reinstated.

Figure 3 shows CARs and 95% confidence intervals for the 20 days surrounding the event. The abnormal return on the first trading day investors could react to the coup was +10%. When Chavez was reinstated, the abnormal return was -8%. The 0% 10-day CAR preceding the coup implies that investors were completely unaware of the coup plot, increasing our confidence that the abnormal returns capture the true effect of the regime changes. This failed coup demonstrates a large positive market reaction to the attempted overthrow of a socialist leader, and an equally large negative reaction to his reinstatement. The large

[12]Indeed, corporate investors in the 2013 MIGA *World Investment and Political Risk* ranked civil disturbances as the fourth most concerning type of political risk.

[13]As defined by the Polity project.

[14]Based on matching our cases with codings from the The Ideology of Heads of Government (HOG) database, as well as surveys of news reports on the day of each event. In all cases, no clear economic ideological shift can be identified.

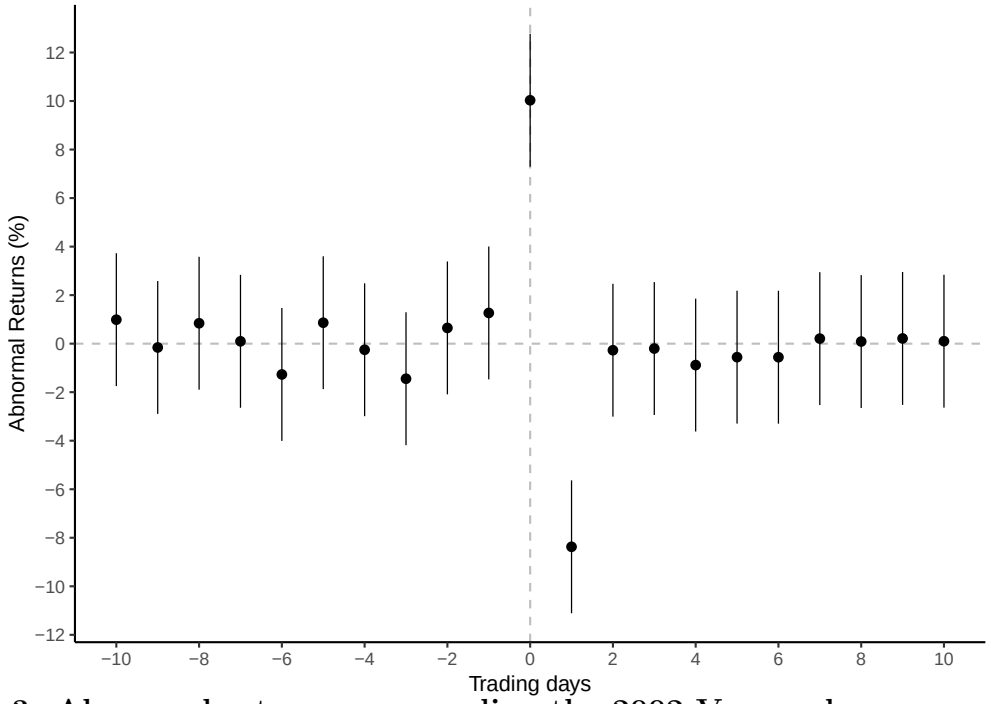

Figure 3: Abnormal returns surrounding the 2002 Venezuelan coup attempt

magnitudes and precision of these effects suggest that investors value transition to a pro-business government regime, regardless of how the regime change is achieved.

Robustness

Potential concerns with the results in the Coups, Assassinations, and Resignations sections are that: (1) the ARs could be driven by factors unrelated to the regime changes, (2) the effects of regime changes may be underestimated if investors had apriori information, and (3) confidence intervals based on normally distributed ARs may be inappropriate.

We explore these concerns in two ways. First, we reestimate mean CARs on a set of time-shifted placebo dates, with means computed across all events for each type of regime change. We should not observe significant CARs when performing an identical test on dates where no event occurred. This would call the research design and modeling assumptions into question, and raise concerns that the abnormal returns were caused by factors other than the regime changes. The results reinforce the main results: the ARs on the actual event date capture most of effect of the regime change, although effects can sometimes persist in the short event window following the event date. For a detailed descriptions of this analysis and results, see Robustness details.

Second, we create a synthetic control portfolio for each event. 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 A.1.[15]

[15]See Appendix A for a more formal explanation.

Third, non-parametric statistical techniques (sign and rank tests) free from distributional assumptions address concerns about inferences from small sample sizes.[16] Table 1 compares event day ARs and the absolute value of all combined returns (since some events increase returns while others decrease them) to the synthetic control portfolio using the non-parametric methods discussed above. The synthetic control and small sample tests suggest that the main results are not a result of deviations from normality or confounding world events (see Robustness details for a full discussion).

Table 1: 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	−2.137	0.006	0.022	0.024	0.702	1.000	0.002
Assassinations	−2.098	0.001	0.070	−0.125	0.255	0.453	0.078
Resignations	4.059	0.010	0.118	0.366	0.778	0.607	0.048
All (Absolute Value)	2.410	0.002	0.033	−0.079	0.879	0.955	0.000

Notes: Estimates for assassinations do not include the assassination of U.S. president William McKinley in 1901 because no control portfolios are available.

Conclusion

Conventional theory suggests markets dislike political instability. We show that this is not always the case. Unexpected changes in ruler virtually always increase market volatility, but returns are not always negative. Markets can be given a boost when a new regime is expected to offer a more democratic or pro-business environment.

Despite their frequency, there is little evidence on the economic consequences of various types of political instability. We show that market returns following resignations are large and positive on average, but negative and smaller in magnitude following assassinations and coups. We also find evidence that investors tend to prefer democratic regime changes to authoritarian shifts, but that even democratically subversive coups can boost markets if the instigators are clearly pro-business.

There are a number of avenues for future research. First, more research is needed to identify the pro and anti market characteristics of regime changes. Second, more work is needed to determine the extent to which stock market returns translate to broader economic development outcomes. It remains unclear whether the direction of the effects of different types of regime changes on outcomes such as economic growth, investment, debt, inflation, infant mortality, and years of schooling are consistent with their stock market effects, or if investor perceptions are at odds with certain development goals.

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

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A Appendix

Data

Table A.1: List of stock indices

Date	Country	Begin Date	Start Date
Argentina	Beunos Aires SE General Index	Dec-66	Jan-17
Australia	Australia ASX All Ordinaries	Jan-58	Jan-17
Bangladesh	Dhaka SE Index	Jan-90	Jan-17
Canada	Canada S&P/TSX 300 Composite	Jan-76	Jan-17
Chile	Santiago IGBC General Index	Jan-75	Jan-17
Colombia	Colombia IGBC General Index	Jan-92	Jan-17
Ecuador	Ecuador Bolsa de Valores de Guayaquil (BVG)	Jan-94	Jan-17
Egypt	Cairo SE Index	Dec-92	Jan-17
Emerging Market	S&P/IFC Emerging Markets Investable Composite	Jul-95	Jan-17
Greece	Athens SE General Index	Oct-88	Jan-17
India	Bombday SE SENSEX	Apr-79	Jan-17
Indonesia	Jakarta SE Composite Index	Apr-83	Jan-17
Iran	Tehran SE Price Index	Jan-95	Jan-17
Israel	Tel Aviv 100 Index	May-87	Jan-17
Japan	Tokyo SE Price Index (TOPIX)	Jan-53	Jan-17
Latin America	Dow Jones Latin America Index	Jan-92	Jan-17
Lithuania	Lithuania Lit-10 Index	Jan-99	May-05
Malaysia	Malaysia KLSE Composite	Jan-80	Jan-17
Nepal	Nepal NEPSE Stock Index	Jan-01	Jan-17
Netherlands	Netherlands All-Share Price Index	Jan-80	Jan-17
Pakistan	Karachi SE 100 Index	Jan-89	Jan-17
Paraguay	Asuncion SE PDV General Index	Oct-93	Sep-08
Peru	Lima SE General Index	Jan-82	Jan-17
Philippines	Manila SE Composite Index	Jan-86	Jan-17
Portugal	Oporto PSI-20 Index	Jan-86	Jan-17
Singapore	Singapore FTSE ST Index	Jul-65	Jan-17
South Korea	Korea SE Stock Price Index	Jan-62	Jan-17
Southeast Asia	Dow Jones Southeast Asia Index	Jan-92	Jan-17
Spain	Madrid SE General Index	Aug-71	Jan-17
Sri Lanka	Colombo SE All-Share Index	Dec-84	Jan-17
Sweden	Sweden OMX Affarsvarlden General Index	Jan-80	Jan-17
Taiwan	Taiwan SE Capitalization Weighted Index	Jan-67	Jan-17
Thailand	Thailand SET General Index	Apr-75	Jan-17
Tunisia	Tunisia SE Index	Dec-97	Jan-17
Turkey	Instanbul IMKB 100 Price Index	Oct-87	Jan-17
Ukraine	Ukraine PFTS OTC Index	Jan-98	Jan-17
United Kingdom	UK FTSE All-Share Index	Nov-62	Jan-17
United States	Dow Jones Industrial Average	Feb-1885	Jan-17
Uruguay	Bolsa de Valores de Montevideo Index	Jan-08	Jul-16
Venezuela	Dow Jones Venezuela Stock Index	Jan-92	Jul-07
Venezuela	Caracas SE General Index	Jan-94	Jan-17
World	MSCI World Price Index	Jan-76	Jan-17
Zambia	Lusaka SE Index	Jan-02	Apr-06
Zambia	Lusaka SE Index	Jul-11	Jan-17

Table A.2: Regime changes

Date	Country	Political Outcome
	Coups	
06/30/1970	Argentina	Autocracy to autocracy
03/22/1971	Argentina	Autocracy to autocracy
03/24/1976	Argentina	Democracy to autocracy
10/06/1976	Thailand	Anocracy to autocracy
10/20/1977	Thailand	Autocracy to anocracy
12/12/1979	South Korea	Autocracy to autocracy
02/23/1991	Thailand	Anocracy to anocracy
04/05/1992	Peru	Democracy to anocracy
10/12/1999	Pakistan	Democracy to autocracy
10/04/2002	Nepal	Democracy to autocracy
09/19/2006	Thailand	Democracy to anocracy
01/11/2007	Bangladesh	Democracy to autocracy
07/03/2013	Egypt	Anocracy to anocracy
05/22/2014	Thailand	Democracy to anocracy
	Failed coup	
04/11/2002	Venezuela	Democracy to democracy
	Assassinations	
09/06/1901	United States	Democracy to democracy
11/22/1963	United States	Democracy to democracy
10/26/1979	South Korea	Autocracy to autocracy
10/31/1984	India	Democracy to democracy
02/28/1986	Sweden	Democracy to democracy
05/01/1993	Sri Lanka	Anocracy to anocracy
11/04/1995	Israel	Democracy to democracy
06/01/2001	Nepal	Democracy to democracy
	Resignations	
06/17/1982	Argentina	Autocracy to autocracy
02/25/1986	Philippines	Autocracy to democracy
12/06/1990	Bangladesh	Anocracy to anocracy
05/24/1992	Thailand	Anocracy to anocracy
04/18/1993	Pakistan	Democracy to democracy
11/05/1996	Pakistan	Democracy to democracy
06/30/1997	Turkey	Democracy to democracy
05/21/1998	Indonesia	Autocracy to anocracy
01/20/2001	Philippines	Democracy to democracy
12/20/2001	Argentina	Democracy to democracy
04/06/2004	Lithuania	Democracy to democracy
12/26/2004	Ukraine	Democracy to democracy
04/20/2005	Ecuador	Democracy to democracy
04/24/2006	Nepal	Autocracy to democracy
01/14/2011	Tunisia	Anocracy to democracy

Notes: The Polity score is used to classify political outcomes as follows: autocracy = $-10 \leq$ score ≤ -6, anocracy = $-5 \leq$ score ≤ 5, and democracy = $6 \leq$ score ≤ 10.

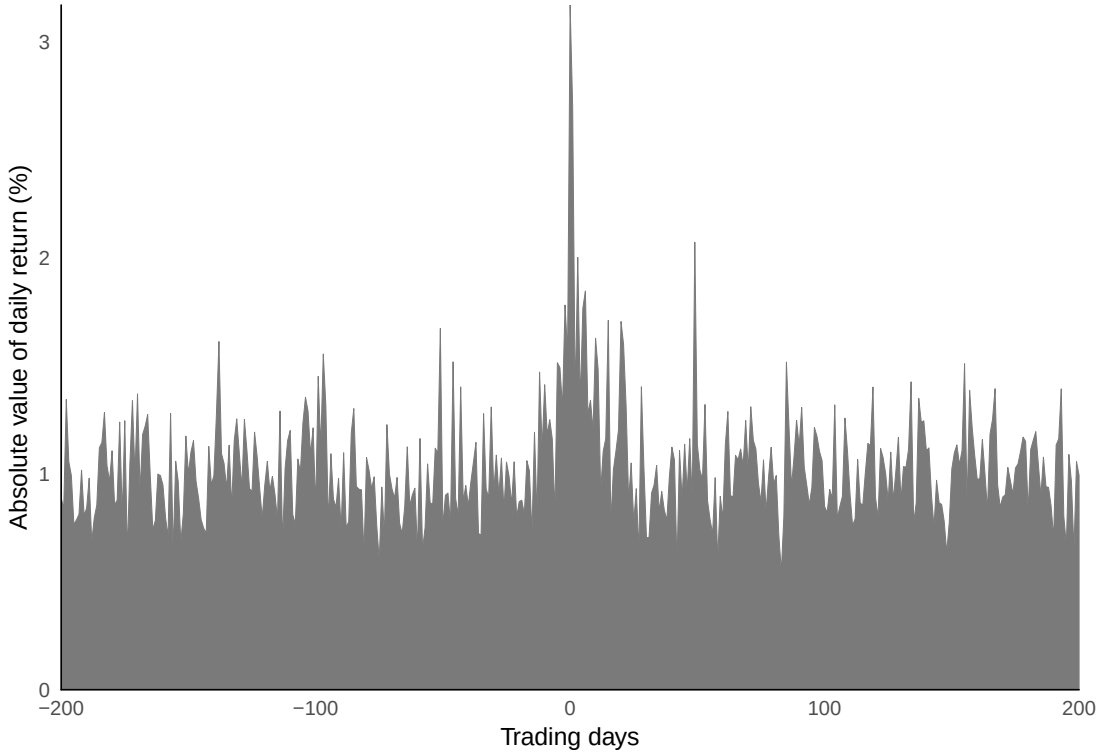

Figure A.1: Absolute value of daily returns

Event-level estimates: coups

Table A.3 shows abnormal returns for national stock indices both preceding and following coup d'etat. Table A.3 contains all coups presented in Table A.2, with the exception of the Argentinian coup of March 24, 1976 which is excluded from our analysis because the stock market remained closed for twelve days following the event.[17]

Table A.3: 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	06/08/1970	−1.919	−0.530	−2.011	0.247	4.728	204
		(0.949)	(2.510)	(4.243)	(2.510)	(4.243)	
Argentina	03/22/1971	0.925	14.294	24.218	0.131	0.274	
		(1.216)	(3.218)	(5.439)	(3.218)	(5.439)	
Bangladesh	01/11/2007	−0.320	10.351	14.883	−0.896	2.250	2
		(1.166)	(3.086)	(5.217)	(3.086)	(5.217)	
Egypt	07/03/2013	−0.346	5.169	7.144	6.776	−4.869	2
		(1.515)	(4.009)	(6.776)	(4.009)	(6.776)	
Nepal	10/04/2002	0.090	1.563	5.567	−1.014	−0.493	2
		(1.206)	(3.190)	(5.392)	(3.190)	(5.392)	
Pakistan	10/14/1999	−7.737	−9.431	−7.130	4.151	4.900	36
		(1.943)	(5.141)	(8.690)	(5.141)	(8.690)	
Peru	04/06/1992	−6.819	−5.814	−25.027	−2.075	−10.519	5
		(2.210)	(5.848)	(9.885)	(5.848)	(9.885)	
South Korea	12/12/1979	−1.784	−3.474	−24.465	−1.678	−6.187	418
		(1.152)	(3.047)	(5.150)	(3.047)	(5.150)	
Thailand	10/06/1976	−0.541	0.837	0.731	0.001	0.713	3
		(0.639)	(1.691)	(2.859)	(1.691)	(2.859)	
Thailand	10/20/1977	−0.951	4.096	7.290	9.961	10.198	2
		(1.232)	(3.260)	(5.510)	(3.260)	(5.510)	
Thailand	02/25/1991	−7.326	2.860	14.162	6.326	26.262	7
		(2.884)	(7.631)	(12.899)	(7.631)	(12.899)	
Thailand	09/19/2006	−0.481	−2.640	0.111	1.848	0.131	17
		(1.094)	(2.894)	(4.892)	(2.894)	(4.892)	
Thailand	05/23/2014	−0.571	2.800	4.591	2.350	−0.424	5
		(1.201)	(3.177)	(5.370)	(3.177)	(5.370)	
Mean		−2.137	1.545	1.543	2.010	2.074	58
		(0.424)	(1.121)	(1.896)	(1.121)	(1.896)	

Notes: Standard errors are in parentheses. "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 (it is calculated if the price decreases on the event day, not if the event day abnormal return is negative). Returns are inflation adjusted.

[17] Treating this twelve day period as a single day CARs results in a positive abnormal return of 58%, a fluctuation that seems qualitatively unreasonable.

Event-level estimates: assassinations

Table A.4: 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
India	11/05/1984	−2.416	−1.259	−2.416	−3.916	1.344	5
		(0.668)	(1.767)	(2.987)	(1.767)	(2.987)	
Israel	11/05/1995	−3.460	−3.177	0.743	−0.857	−10.316	12
		(1.473)	(3.897)	(6.587)	(3.897)	(6.587)	
Nepal	06/12/2001	−0.513	2.965	15.516	5.956	1.791	20
		(3.513)	(9.295)	(15.711)	(9.295)	(15.711)	
South Korea	10/26/1979	−0.364	−9.376	1.186	0.690	−0.368	14
		(1.058)	(2.800)	(4.734)	(2.800)	(4.734)	
Sri Lanka	05/03/1993	−3.231	−0.983	3.515	−0.541	−1.360	7
		(0.767)	(2.030)	(3.432)	(2.030)	(3.432)	
Sweden	03/03/1986	0.698	5.038	10.908	−3.754	0.955	
		(0.927)	(2.452)	(4.145)	(2.452)	(4.145)	
United States	09/07/1901	−4.522	−3.055	−8.920	−0.733	3.456	963
		(1.283)	(3.394)	(5.738)	(3.394)	(5.738)	
United States	11/22/1963	−2.973	2.451	2.267	−2.666	−2.720	2
		(0.470)	(1.242)	(2.100)	(1.242)	(2.100)	
Mean		−2.098	−0.924	2.850	−0.728	−0.902	146
		(0.550)	(1.456)	(2.462)	(1.456)	(2.462)	

Notes: Standard errors are in parentheses. "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 (it is calculated if the price decreases on the event day, not if the event day abnormal return is negative). Returns are inflation adjusted.

Event-level estimates: resignations

Table A.5: 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	06/18/1982	18.892	24.904	65.863	−2.819	28.234	
		(3.334)	(8.822)	(14.912)	(8.822)	(14.912)	
Argentina	12/20/2001	14.015	48.103	62.191	14.656	36.165	
		(1.976)	(5.227)	(8.836)	(5.227)	(8.836)	
Bangladesh	12/07/1990	0.323	1.002	2.171	1.880	3.654	
		(0.871)	(2.305)	(3.896)	(2.305)	(3.896)	
Ecuador	04/20/2005	−0.084	−0.249	−0.595	−1.305	0.710	
		(0.945)	(2.499)	(4.225)	(2.499)	(4.225)	
Indonesia	05/20/1998	2.817	4.296	4.543	−2.695	−17.868	
		(3.392)	(8.974)	(15.168)	(8.974)	(15.168)	
Lithuania	04/06/2004	−0.575	−3.319	−11.704	2.182	5.426	159
		(1.137)	(3.007)	(5.083)	(3.007)	(5.083)	
Nepal	04/25/2006	1.915	8.132	9.937	−1.951	−4.205	
		(0.665)	(1.760)	(2.975)	(1.760)	(2.975)	
Pakistan	04/19/1993	−3.265	−0.432	2.771	−0.312	−0.485	15
		(1.108)	(2.930)	(4.953)	(2.930)	(4.953)	
Pakistan	11/06/1996	5.084	1.229	−0.441	4.182	7.597	
		(1.416)	(3.746)	(6.331)	(3.746)	(6.331)	
Philippines	02/26/1986	12.938	21.473	23.086	−1.847	−6.884	
		(0.477)	(1.263)	(2.134)	(1.263)	(2.134)	
Philippines	01/19/2001	1.150	16.837	18.469	−5.382	3.581	
		(1.591)	(4.209)	(7.115)	(4.209)	(7.115)	
Thailand	05/25/1992	3.248	−6.574	3.789	−5.085	−10.841	
		(1.433)	(3.793)	(6.411)	(3.793)	(6.411)	
Tunisia	01/31/2011	−2.705	2.982	−11.787	−13.610	−13.445	5
		(0.671)	(1.776)	(3.002)	(1.776)	(3.002)	
Turkey	06/30/1997	2.010	−2.861	−7.629	12.876	4.532	
		(3.015)	(7.976)	(13.481)	(7.976)	(13.481)	
Ukraine	12/28/2004	5.118	12.837	18.445	4.170	32.085	
		(2.797)	(7.401)	(12.511)	(7.401)	(12.511)	
Mean		4.059	8.557	11.941	0.329	4.550	59
		(0.496)	(1.312)	(2.217)	(1.312)	(2.217)	

Notes: Standard errors are in parentheses. "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 (it is calculated if the price decreases on the event day, not if the event day abnormal return is negative). Returns are inflation adjusted.

Public Protests

The resignations studied in this paper are those in which leaders left office because of poor performance, public discontent and popular protests. It is therefore not unreasonable to expect the political actions preceding the resignations to have similarly large effects on financial markets.[18] To examine this, we explore all resignations that were driven by significant popular demonstrations, riots, non-violent civil resistance and other forms of public discontent (see Table A.6).[19]

Table A.6: 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 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.[20] 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, non-violent civil disobedience, and labor strikes.

The short-term impact of the Egyptian Revolution on the economy was disastrous. As shown in Figure A.2, abnormal returns on 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 Exchange 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, we explore all resignations that were driven by significant public protests.[21] Public protests include popular demonstrations, riots, non-violent

[18]Indeed, corporate investors in the 2013 MIGA *World Investment and Political Risk* ranked civil disturbances as the fourth most concerning type of political risk.

[19]The set of resignations includes all those listed in either the Coup d'etat Events Handbook or the Archigos Version 4.1 data set with available financial data. In practice, this is the 2011 Egyptian Revolution and the list of resignations in Table A.5.

[20]Abnormal returns for this event are not shown in Table A.5 because the stock market was closed on the day of Mubarak's resignation.

[21]The set of resignations includes all those listed in either the Coup d'etat Events Handbook or the

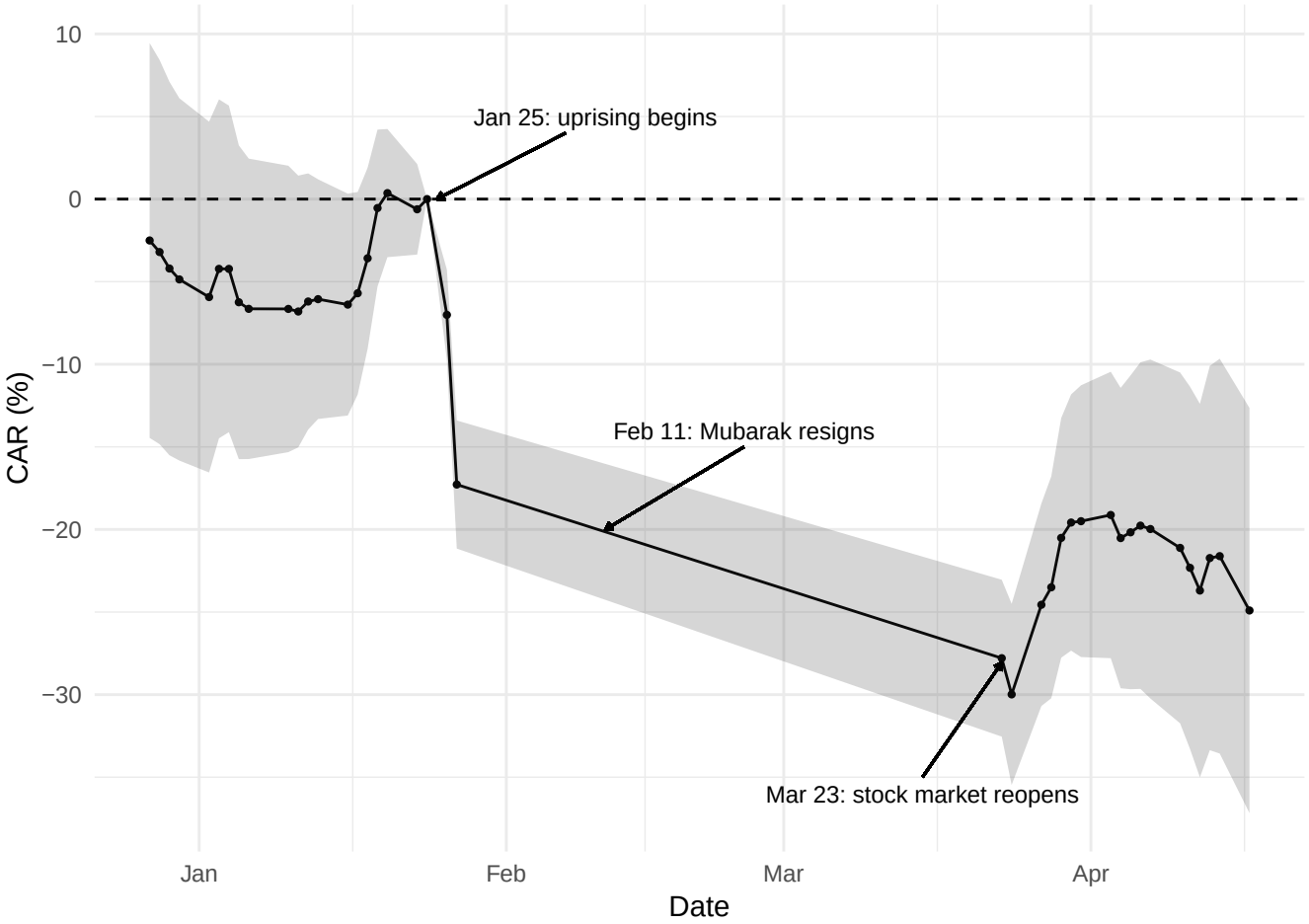

Figure A.2: Cumulative abnormal returns during the Egyptian revolution

civil resistance and other forms of public discontent. We find that both volatility and the absolute value of returns increase during times of protest. Similarly to coups, however, the direction of returns is dependent upon the nature of the protest in question.

The start and end dates in Table A.7 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'etat Events Handbook and Archigos Version 4.1. Additional Lexis Nexis searches were used to verify these descriptions.

In Table A.7, we 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 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.[22]

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.

Archigos Version 4.1 data set with available financial data. In practice, this is the 2011 Egyptian Revolution and the list or resignations in Table A.5.

[22]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.

As shown in column (2), the absolute value of stock returns are approximately 1.5% higher during public protests. These estimates would be biased if protest dates are correlated with higher world 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 1.5% higher during public protests. Finally, column (4) shows that stock volatility is approximately 1 percentage point higher during political movements.[23]

We therefore find that both volatility and the absolute value of returns increase during times of protest. Similarly to coups, however, the direction of returns is dependent upon the nature of the protest in question.

Table A.7: Effect of public protests on stock prices

	Returns	Absolute Value of Returns		Volatility
	(1)	(2)	(3)	(4)
Protest	0.261	1.485	1.313	0.891
	(0.700)	(0.412)	(0.387)	(0.346)
Emerging market index			0.075	
			(0.058)	
Event fixed effect?	Yes	Yes	Yes	Yes
Observations	3,537	3,537	2,676	3,537
Events	11	11	8	11

Notes: Standard errors clustered by event are in parentheses.

[23]Volatility estimation methodology is described in detail in Volatility.

Event-level estimates: democratic vs. authoritarian regime changes

Table A.8: Abnormal returns following authoritarian regime changes

		Post-Event CAR			Pre-Event CAR		Days to
Country	Event Date	(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	rebound
Bangladesh	01/11/2007	−0.320	10.351	14.883	−0.896	2.250	2
		(1.166)	(3.086)	(5.217)	(3.086)	(5.217)	
Egypt	07/03/2013	−0.346	5.169	7.144	6.776	−4.869	2
		(1.515)	(4.009)	(6.776)	(4.009)	(6.776)	
Nepal	10/04/2002	0.090	1.563	5.567	−1.014	−0.493	2
		(1.206)	(3.190)	(5.392)	(3.190)	(5.392)	
Pakistan	10/14/1999	−7.737	−9.431	−7.130	4.151	4.900	36
		(1.943)	(5.141)	(8.690)	(5.141)	(8.690)	
Peru	04/06/1992	−6.819	−5.814	−25.027	−2.075	−10.519	5
		(2.210)	(5.848)	(9.885)	(5.848)	(9.885)	
Thailand	10/06/1976	−0.541	0.837	0.731	0.001	0.713	3
		(0.639)	(1.691)	(2.859)	(1.691)	(2.859)	
Thailand	02/25/1991	−7.326	2.860	14.162	6.326	26.262	7
		(2.884)	(7.631)	(12.899)	(7.631)	(12.899)	
Thailand	09/19/2006	−0.481	−2.640	0.111	1.848	0.131	17
		(1.094)	(2.894)	(4.892)	(2.894)	(4.892)	
Thailand	05/23/2014	−0.571	2.800	4.591	2.350	−0.424	5
		(1.201)	(3.177)	(5.370)	(3.177)	(5.370)	
Turkey	06/30/1997	2.010	−2.861	−7.629	12.876	4.532	
		(3.015)	(7.976)	(13.481)	(7.976)	(13.481)	
Mean		−2.204	0.283	0.740	3.034	2.248	8
		(0.585)	(1.548)	(2.616)	(1.548)	(2.616)	

Notes: Standard errors are in parentheses. "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 (it is calculated if the price decreases on the event day, not if the event day abnormal return is negative). Returns are inflation adjusted.

Table A.9: Abnormal returns following democratic regime changes

		Post-Event CAR			Pre-Event CAR		Days to
Country	Event Date	(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	rebound
Indonesia	05/20/1998	2.817	4.296	4.543	−2.695	−17.868	
		(3.392)	(8.974)	(15.168)	(8.974)	(15.168)	
Nepal	04/25/2006	1.915	8.132	9.937	−1.951	−4.205	
		(0.665)	(1.760)	(2.975)	(1.760)	(2.975)	
Philippines	02/26/1986	12.938	21.473	23.086	−1.847	−6.884	
		(0.477)	(1.263)	(2.134)	(1.263)	(2.134)	
Thailand	10/20/1977	−0.951	4.096	7.290	9.961	10.198	2
		(1.232)	(3.260)	(5.510)	(3.260)	(5.510)	
Tunisia	01/31/2011	−2.705	2.982	−11.787	−13.610	−13.445	5
		(0.671)	(1.776)	(3.002)	(1.776)	(3.002)	
Mean		2.803	8.196	6.614	−2.028	−6.441	3
		(0.752)	(1.990)	(3.364)	(1.990)	(3.364)	

Notes: Standard errors are in parentheses. "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 (it is calculated if the price decreases on the event day, not if the event day abnormal return is negative). Returns are inflation adjusted.

Robustness details

We shift event dates surrounding the actual event date backwards and forwards in increments of five days (-20, 15, 10, 5, 0, 5, 10, 15, and 20 days) (shown in Figure 2). In addition, we extend the forward shifted event dates to one year (110, 195, 285, and 365 days) to capture dates that are likely to be completely unaffected by the regime change.

Figure A.3 shows CARs estimated with the event date shifted 1-year (365 days) into the future. In contrast to Figure 2, there are no discernible abnormal returns in Figure A.3. To ensure that results of the placebo test based on 1-year did not occur by chance, Figure A.4 plots event-day abnormal against the number of days shifted. There are a few instances in which there are statistically significant ARs in the same direction as the event day, but they are always smaller in magnitude than the ARs estimated using the actual event date and occur when dates are shifted within the post-event window (days 0-20), a period during which stock returns remain volatile and, in the case of resignations, there is a consistent upward trend in the CARs. Overall, these results reinforce the main results: the ARs on the actual event date capture most of effect of the regime change, although effects can sometimes persist in the short event window following the event date. These figures also provide evidence that regime changes appear to be unexpected. For instance, the CARs prior to assassinations and coups presented in Figure 2 tend to be close to zero, suggesting that investors were unaware that a negative event was likely to occur in the coming days. For resignations, CARs trend downward in the 10 days prior to the event; however, if investors were aware that a resignation were about to occur one would expect the pre-event CARs to be positive given the positive CARs observed in the post-event window. There is thus little evidence that the CARs in the post-event window are not capturing most of the effect caused by the regime changes.

There are a few instances in which there are statistically significant (at the 5% level) ARs in the same direction as those on the actual event day, but they are always smaller in magnitude than the ARs estimated using the actual event date and most occur when dates are shifted within the post-event window (days 0-20), a period during which stock returns remain volatile and, in the case of resignations, there is a consistent upward trend in the CARs. When dates are shifted forward further ($\geq$ 110 days), the event day AR is only statistically significant in one case (day 365 for assassinations). The event day ARs are considerably smaller in magnitude and are not statistically different from zero for either coups or resignations. Moreover, while CARs estimated using the actual event date for resignations trend upwards following the event day, there is no consistent trend in the placebo analysis. Figure 2 therefore suggests that the main results are not merely an artifact of the data.

As shown in Table 1, the mean event day abnormal returns for coups, assassinations and resignations are all statistically different from zero at the 1% level using the rank test statistic and the abnormal returns for coups and assassinations are significant at at least the 10% level using the sign test. In addition, abnormal absolute returns for all events are statistically significant at at least the 5% level using both the rank and sign tests. On the other hand, the event day abnormal returns for the control portfolio are never statistically different from zero at even the 10% level using the rank or sign tests. Finally, the difference in means between the regime change country and the control portfolio are statistically different from zero for coups (1% level), assassinations (10% level), resignations (5% level), and all

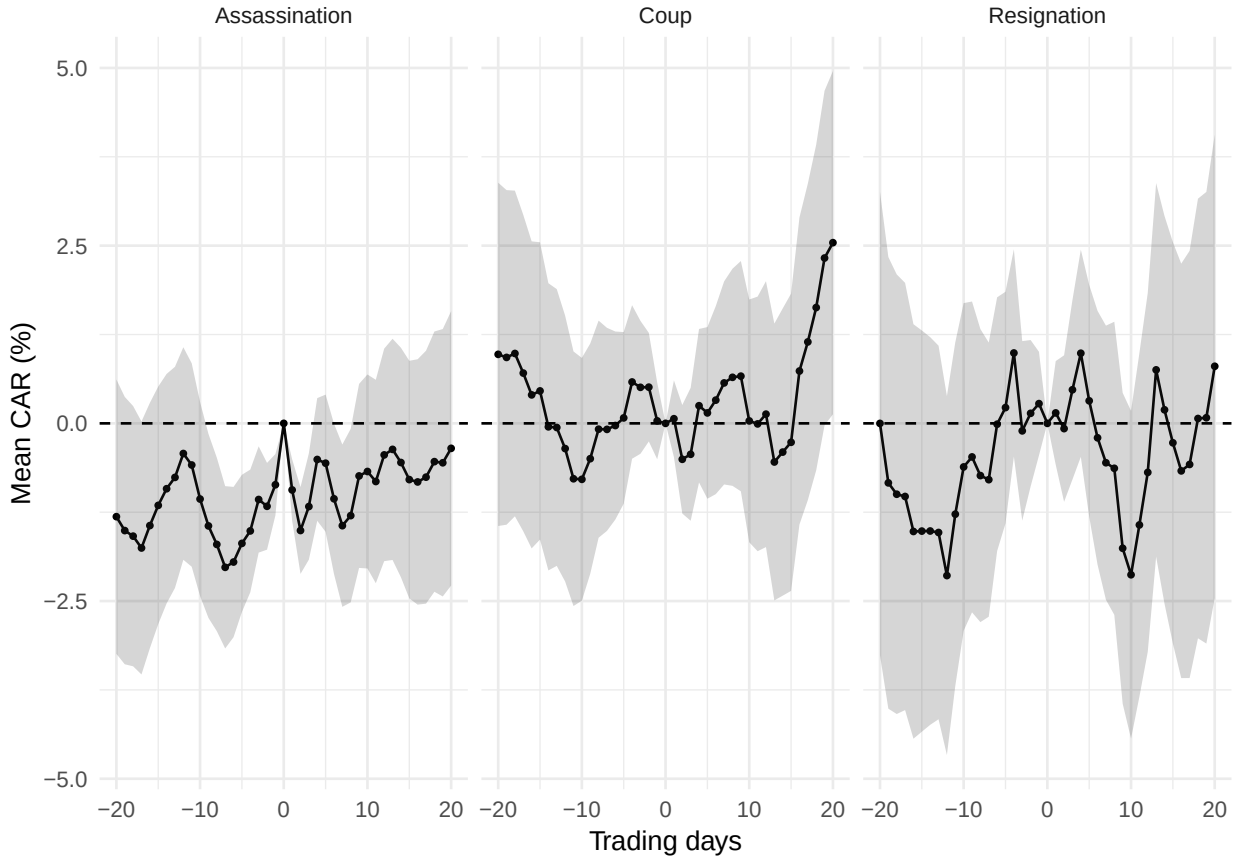

Figure A.3: Event date shifted forward by one year

events combined (1% level) when using two-sided p-values from the Wilcoxon rank test.[24]

[24]The Wilcoxon rank test is a non-parametric statistical technique that can be used to compare differences between matched samples.

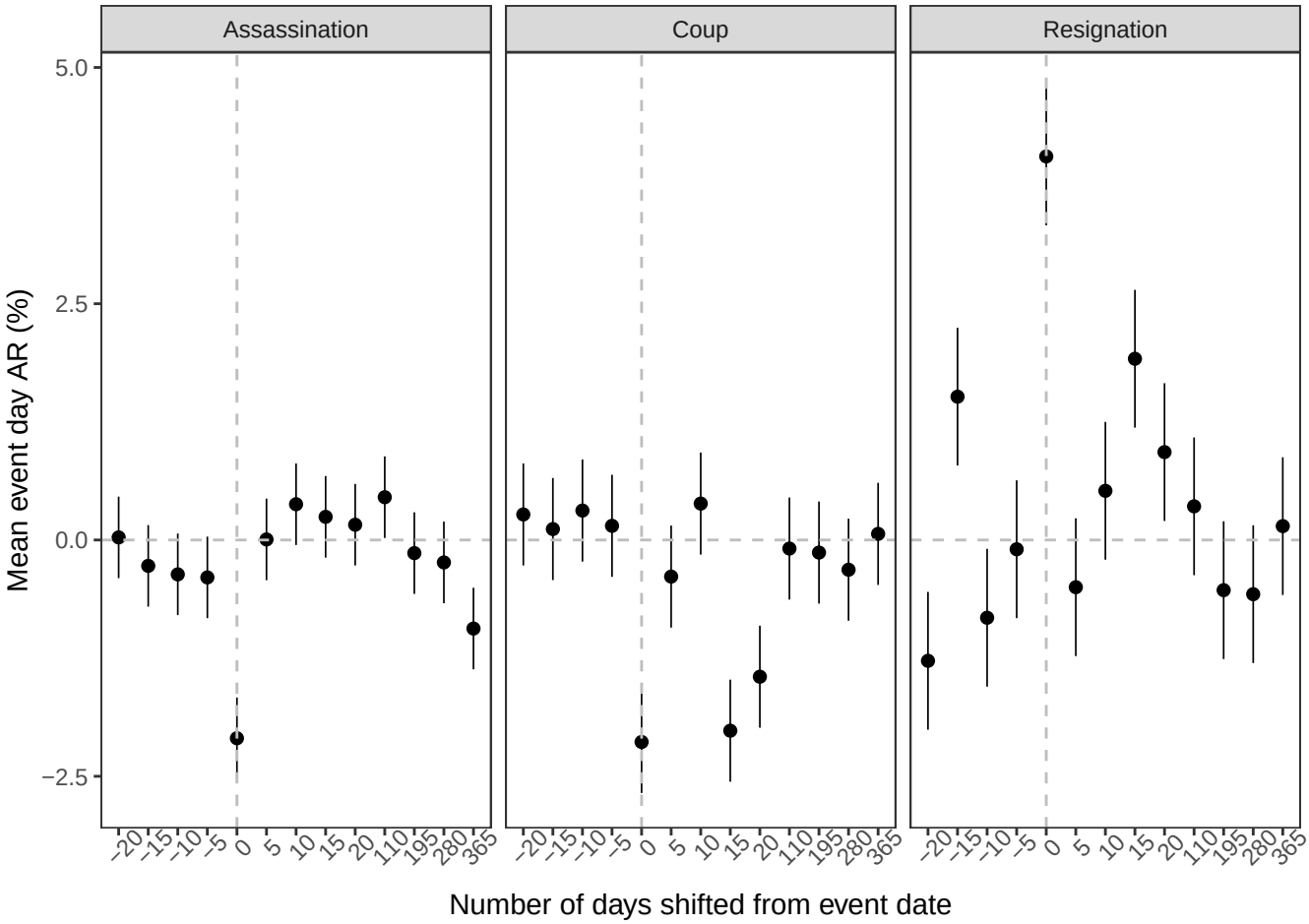

Figure A.4: Time-shifted placebo sensitivity analysis of mean event day abnormal return by type of regime change

Graphical depictions of additional events

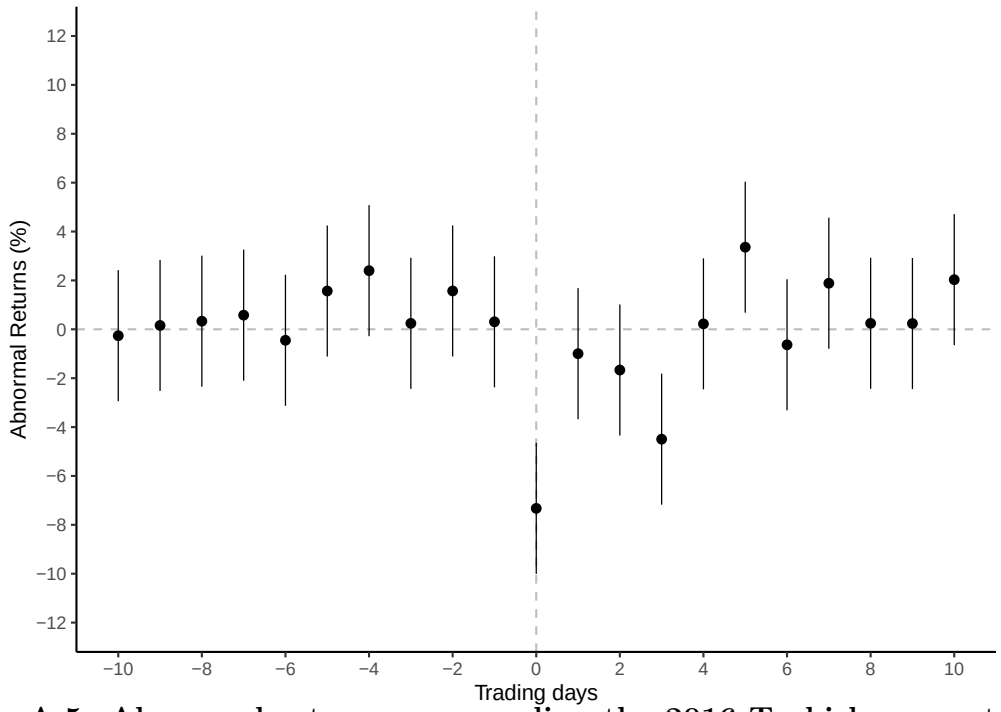

Figure A.5: Abnormal returns surrounding the 2016 Turkish coup attempt