

Are regime changes always bad economics?

Evidence from daily financial data ^{*}

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Abstract

Political instability is commonly thought to discourage investment and reduce economic growth. We challenge this theory by finding that different types of instability have disparate effects on stock returns. 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. Abnormal 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 examination of the 2002 failed coup against Hugo Chavez reveals returns of +10%. 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 expected direction and magnitude of abnormal returns is therefore dependent on the type of regime change and its expected impact on economic policy.

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Investors, multinational firms, development agencies, and aid organizations rank political risk as a top consideration when making investment decisions in emerging markets.¹

Unstable governments have, for example, been argued to be less likely to invest in the legal system and the protection of property rights (Svensson 1998), and to be more likely to increase taxes (Devereux and Wen 1998). This is supported by empirical research showing that political instability—as measured by regime change frequency, political violence, or indices of uncertainty derived from news reports—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 the variance of stock market returns increases in response to economic policy uncertainty (Jensen and Schmith 2005; Leblang and Mukherjee 2005; Liu and Zhang 2015).

In contrast to these cross country studies, we: (1) examine the impact of various types of instability (coups, resignations, assassinations, and protests) separately, and (2) conduct our analysis using event studies of daily financial data. Event studies examine the effect of an unexpected event on stock prices *at the time of the event* (i.e. a local average treatment effect) to determine if returns are systematically different from predicted. This interrupted time-series approach mitigates the endogeneity problems ubiquitous in previous cross country regressions. Confounding events would need to also occur on the same day, and do so for a large portion of all of our independently tested events in order to influence our estimates.²

We analyze 13 successful coups, 8 assassinations, 15 forced resignations, and 11 public protests—the full sample of events for which national-level daily financial data is available. Like previous research, we find that coups, assassinations, resignations, and public protests all cause large increases in financial volatility. However, we also 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 show that while political instability concerns investors, instability does not systematically depress investment. Investors recognize when instability may be in their favor. Methodologically, we employ a method less susceptible to endogeneity concerns, and integrate event studies with synthetic control methods to allow for control portfolios in situations where an obvious control portfolio candidate is not present. While we do not view theoretical development as our main contribution, we do 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.

¹In the *World Investment and Political Risk* (2013) report (most recent), executives of multinational enterprises ranked political risk as the second most important constraint for foreign direct investment (FDI) in developing countries (after macroeconomic instability). In *World Investment and Political Risk* (2011) and *World Investment and Political Risk* (2012), political risk was ranked the most important constraint for FDI in developing countries - even greater than macroeconomic instability.

²A growing body of work uses event studies to assess political phenomenon. For example, political events have been used to estimate the effect of political connections on firm value (e.g., Faccio 2006; Fisman 2001; Goldman, Rocholl and So 2009).

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). However, if market returns reflect investor expectations about future economic growth and returns, such hypotheses may be too simplistic. Investors may view even a coup as a “positive” event if the current regime is anti-business or anti-global.

Not all regime changes are equivalent. Resignations, assassinations, and coups have all been used as proxies for instability in previous research. However, some regime changes—such as the sudden resignation of an ineffective leader—may lead to increased stability. By contrast, assassinations can occur seemingly at random and a successor may be unclear. Coups can occur in the name of democracy or autocracy. These differences are often overlooked in past empirical strategies, which have proxied for instability in terms of the number of coups (Alesina et al. 1996; Londregan and Poole 1990), assassinations or revolutions (Barro 1991), or have combined various metrics 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.

An active 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 that “good coups” are not the norm (Derpanopoulos, Frantz, Geddes and Wright 2016; Powell and Thyne 2011; Thyne and Powell 2016; Varol 2011), others argue that 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. The theory and research above 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. As our event study approach allows us to analyze individual coups separately from others, we can test this prediction. 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 are from the Global Financial Data database, which includes the longest available daily time series of stock prices. We collect national stock index data on every country in which there was a coup or coup attempt, an assassination or failed assassination, or a forced resignation and for which daily financial data is available.⁴ The longest available

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

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

daily time series for 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. The Coup d’etat dataset includes the date of successful, attempted, plotted, and alleged coups. We focus on successful coups because the other classifications are contentious, and the choice of dataset and classification methodology would directly alter our findings.⁵

The Coup d’etat Events handbook also provides a list of 1) auto-coups⁶, 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 we 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.⁷

We further supplement the CSP data with leadership data from Archigos Version 4.1, which allows us 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).

A list of the political events in our dataset and whether they resulted in democratic or autocratic shifts is shown in [Table A.2](#). Coups tend to have the largest impact on the level of democratization as a number of countries have subsequently transitioned from democracies to anocracies or autocracies. On the other hand, neither assassinations nor resignations tend to have much impact on the level of democratization.

The discussion above shows that there is considerable debate about classification of regime changes. We recognize that some readers may feel certain events are missing based on their own substantive knowledge. We rely on commonly used third-party classifications in order to minimize the possibility that our results are driven by our own subjective classifications. The one exception is that we separately analyze the failed coup attempt in Venezuela in April 2002 in which President Hugo Chavez was removed from office for two days, 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.

[Figure 1](#) plots the absolute value of daily stock returns averaged across all events and shows that the absolute value of returns on the event day (day 0) are significantly larger than on any other day. In addition, the magnitude of returns begins increasing just before the

⁵[Needler \(1966, p. 617\)](#) has 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 Center for Systemic Peace states that it 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.”

⁶Defined by Center for Systemic Peace as the “occurrence of subversion of the constitutional order by a ruling (usually elected) executive and the imposition of an autocratic regime.”

⁷Note 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.

event day and remains high for a short period after. This suggests that financial volatility increases during the days surrounding regime changes, although it does not provide any evidence on mean returns. [Impact of Political Instability on Stock Returns](#) tests these results more formally. It will first formally estimate the amount of volatility surrounding all irregular regime changes, then analyze coups, assassinations and resignations separately and determine what impact they have on mean returns.

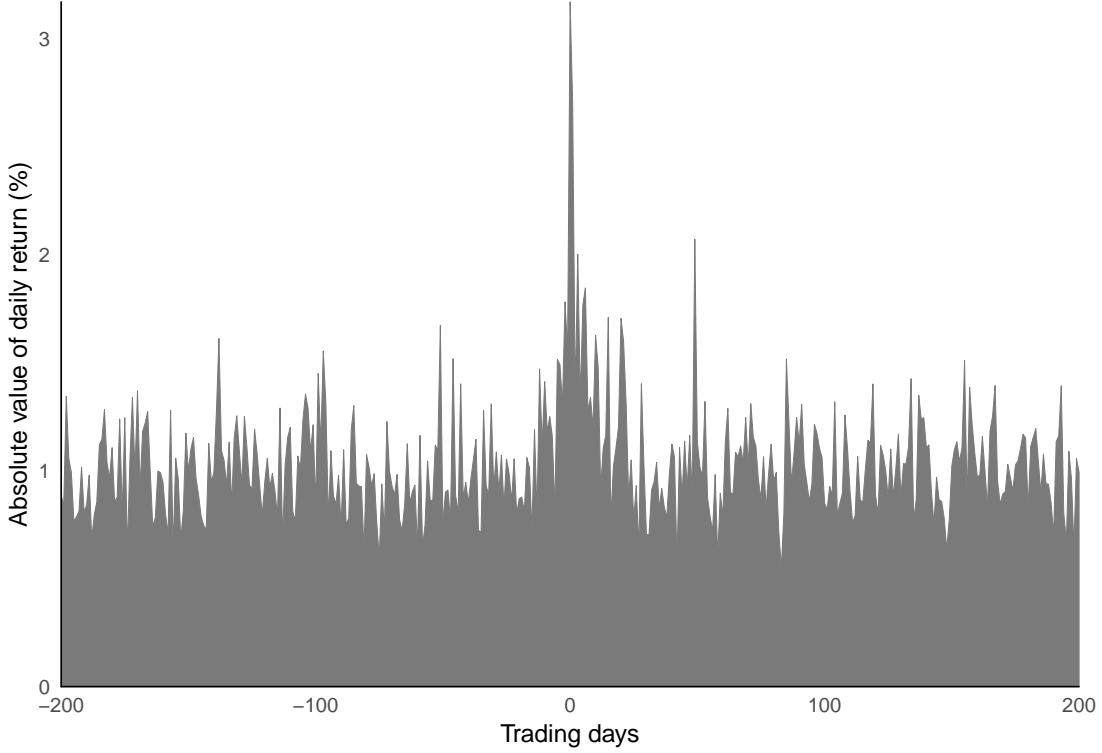


Figure 1: Absolute value of daily returns

Estimation strategy

Volatility

We first examine the effect of irregular regime changes on financial volatility. Our 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 \(2005\)](#), we use the GARCH (1,1) specification. In particular, for national stock index i ,

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

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

For the magnitude and direction of the effect of irregular regime changes on stock returns, we 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,

$$R_{it} = \mu_i + \epsilon_{it}, \quad (1)$$

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” surrounding the date of each coup, $AR_{i\tau} = R_{i\tau} - \hat{\mu}_i$, where τ is a date in the event window, and $\hat{\mu}_i$ is estimated in an “estimation window” preceding the event window with [Equation 1](#). We 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 : $CAR(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$. Standard errors and p-values are calculated using asymptotic t-statistics as in [MacKinlay \(1997\)](#).⁸

We define the event date as the first trading day in which the market could have reacted to news of the event.⁹ When events occurred on weekends, we 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.¹⁰ 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 the event date plus 19 days $(0, 19)$. In addition, we present results for the pre-event windows $(-1, -7)$ and $(-1, -20)$.

We use a constant mean return model instead of a market model to maximize the number of observations and because our unit of analysis is the country-wide market index (not firms).¹¹ To address concerns regarding use of a constant mean return model, we integrate synthetic control methodology ([Abadie, Diamond and Hainmueller 2010](#); [Abadie and Gardeazabal 2003](#)) with event study estimation. In short, we create a “synthetic” control portfolio for each event and compare observed returns to the synthetic returns. 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

⁸It 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).

⁹For example, during the October 12, 1999 coup d’etat 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. We code October 14th, the day in which the market re-opened, as the event day.

¹⁰In other words, for cumulative abnormal returns prior to the event date, we 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 .

¹¹Plausible 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.

portfolio and the event country are most similar in the estimation window.

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

Impact of Political Instability on Stock Returns

Volatility

[Figure 2](#) shows the mean volatility ($\bar{\sigma}_t$) 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.

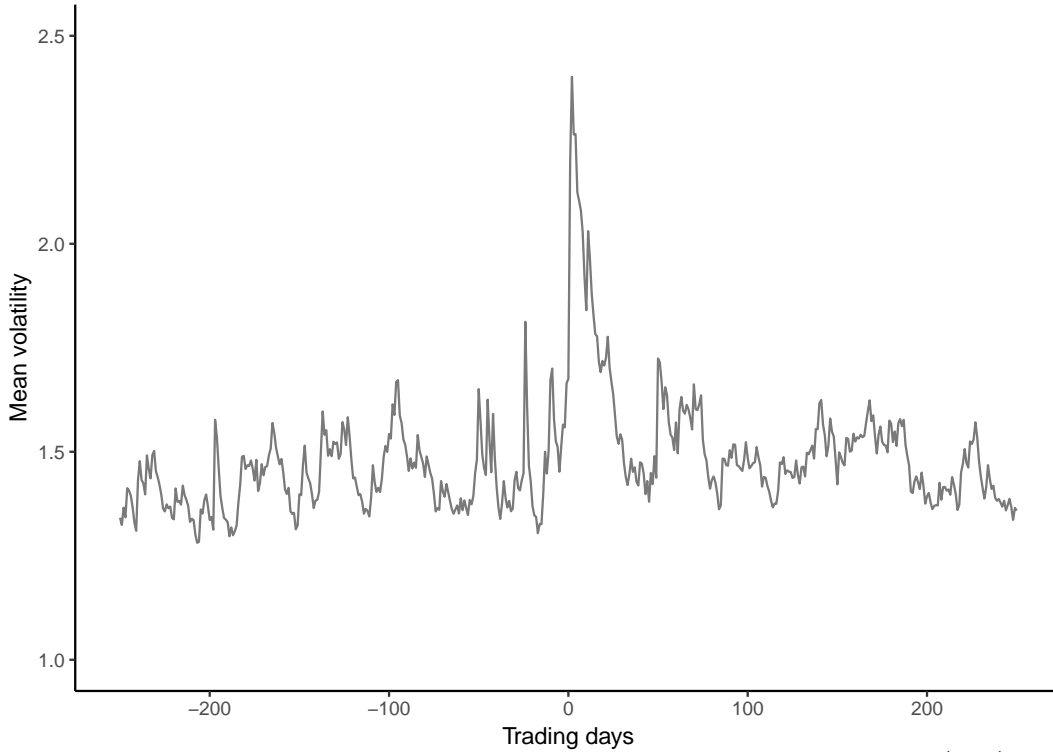


Figure 2: Mean of volatility estimates from GARCH(1,1) models

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

Coups

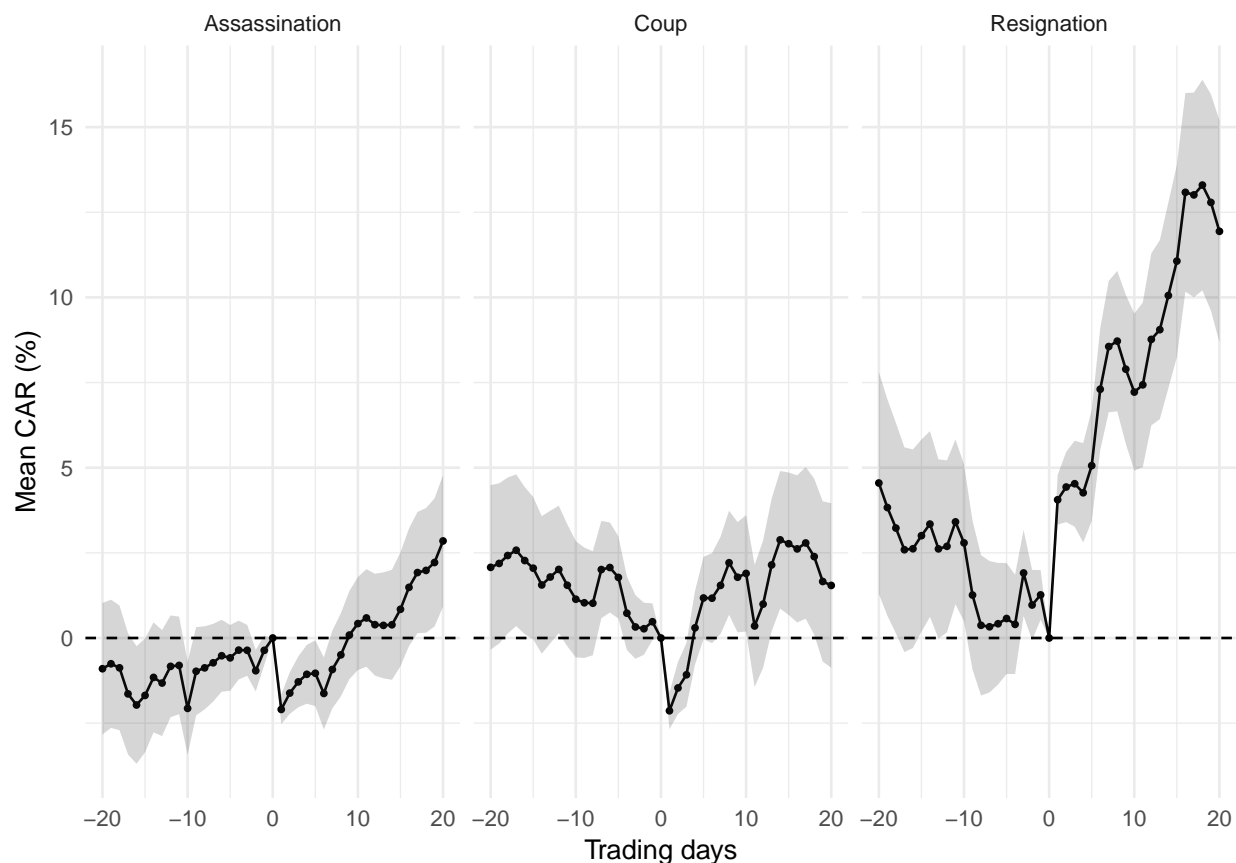


Figure 3: Mean cumulative abnormal returns by type of regime change

Figure 3 shows the mean cumulative abnormal returns by each type of regime change we analyze.

Individual results for all coups in our sample and mean results for all coups can be found in Table A.3. 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.¹³ 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, there is evidence that assassinations decrease stock prices (see [Figure 3](#)). The results in [Table A.4](#) are produced from analyses identical to those in [Table A.3](#) but for assassinations rather than coups. 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.¹⁴

Resignations

In contrast to coups and assassinations, abnormal returns following resignations are large and positive (see [Figure 3](#) and [Table A.5](#)). The mean event day abnormal return is over 4% and the positive returns are persistent and grow larger over time (mean 20-day CAR \approx 12%). Furthermore, event day ARs are only negative and statistically significant at even the ten percent level in two out of the fifteen resignations (Pakistan on April 19, 1993 and Tunisia on June 31, 2011).

These results are again consistent with our hypothesis that different events will have disparate effects, and that resignations may lead to positive returns as resignations typically occur because of 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.

For example, the resignation of Ferdinand Marcos as President of the Philippines in February 1986 was associated with an approximately 13% positive event day AR. Prior to his resignation, the Philippine regime was known for rampant corruption, crony capitalism, extreme inequality, high unemployment, failed import substitution industrialization policy, and oligarchic control of the economy ([Overholt 1986](#); [Traywick 2014](#)). In fact, the

¹³Based on Center for System Peace Polity IV polity score of 6. Values of 6-10 are defined as democracies.

¹⁴One 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).

Philippines was the least preferred site for foreign investment amongst East Asian capitalist economies (Overholt 1986).

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.¹⁵ 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 in [Public Protests](#) in the appendix.¹⁶ When taking directionality into account, it appears that public protests have no effect on stock returns. However, this occurs because some political movements increase stock prices while others decrease them, and the absolute value of stock returns are approximately 1.5% higher during public protests (see [Table A.7](#)).¹⁷

Exploring possible 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). In addition, when the successor in an irregular regime change is clear, investors may have strong priors about the effect of the new leader on economic and/or market performance. Two possible mechanisms that could be driving the differences may therefore be: (1) whether the regime change is associated with an authoritarian or democratic shift in governance, and (2) whether a new leader is clearly more pro or anti business than their predecessor.

We first attempt to explore these mechanisms by aggregating all of the events in our sample by whether they resulted in a shift in an authoritarian or democratic direction.¹⁸ We find suggestive evidence that regime changes associated with authoritarian shifts are on average perceived negatively by investors (see [Table A.8](#)), while those that move governance in a democratic direction are on average perceived positively (see [Table A.9](#)). We refer to this evidence as suggestive despite statistical significance due to the small sample of cases which fit these criteria, particularly with regard to democratic shifts. We observe ten cases associated with an authoritarian shift in governance. Only two of these events result in positive CARs, and neither are significantly different from zero. Five cases resulted in a democratic shift in governance. Three of these five cases result in positive CARs. 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. However, the majority of the positive returns from democratic regime changes come from the 12% positive CAR associated with the resignation of Ferdinand Marcos in the Philippines in 1986.

¹⁵Indeed, corporate investors in the 2013 MIGA *World Investment and Political Risk* ranked civil disturbances as the fourth most concerning type of political risk.

¹⁶The set of resignations includes all those listed in either the Coup d'état 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](#).

¹⁷These results hold when controlling for emerging market index fluctuations.

¹⁸As defined by the Polity project

A similar analysis is not possible for shifts from pro or anti business leaders, as examples of such clear and plausibly exogenous shifts in leader economic ideology do not exist in our sample.¹⁹ We therefore look outside of the sample above and conduct an in-depth case study of a seemingly pro-business and anti-socialist coup followed by the reinstatement of a socialist government: the 2002 failed coup against Hugo Chavez in Venezuela. The coup replaced a left-wing populist government with a new pro-business president, and therefore provides a natural test of the effects of both pro-business and anti-business regime changes separately from simple uncertainty because investors reacted to an expected regime change twice: first, when Chavez was ousted, and second, when he was reinstated.

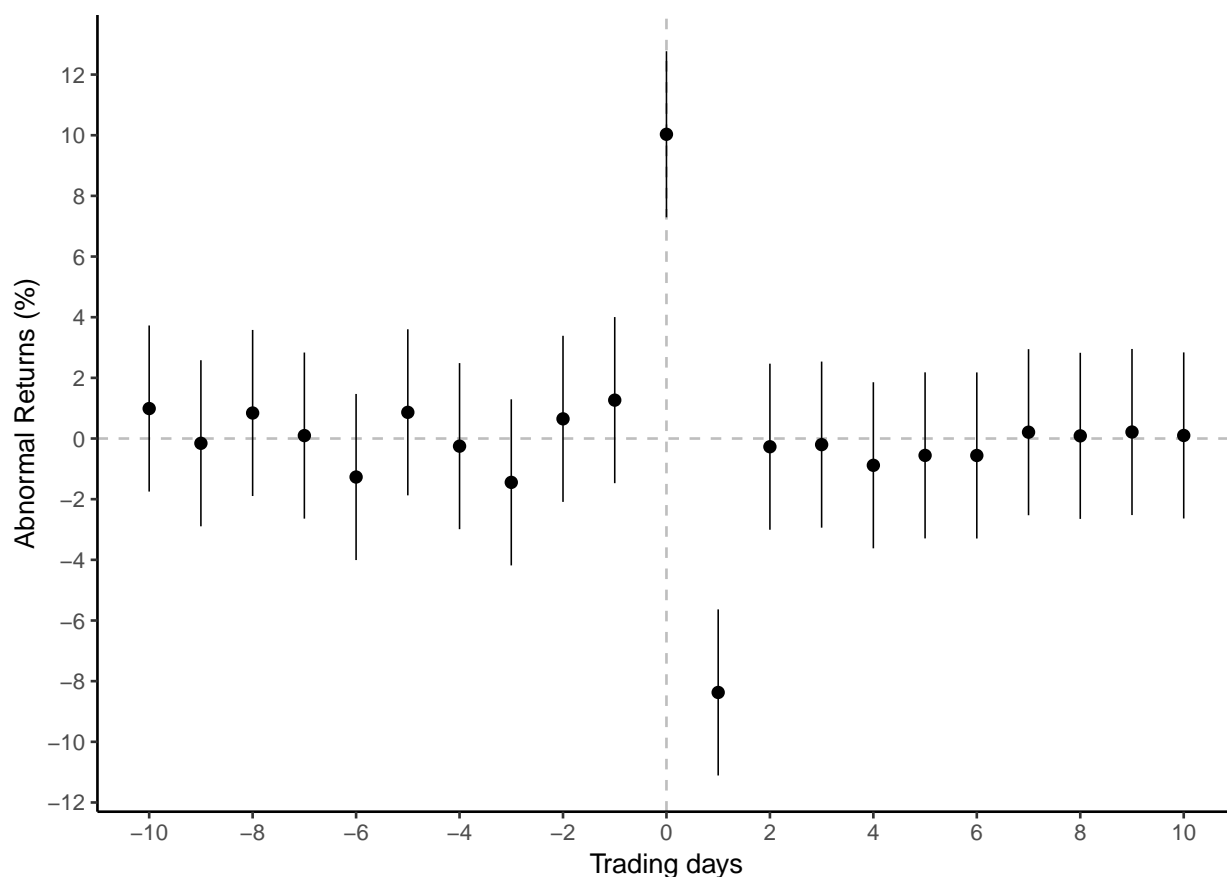


Figure 4: Abnormal returns surrounding the 2002 Venezuelan coup attempt

Figure 4 shows CARs for the 10 days prior to and following the event, along with 95% confidence intervals. The abnormal return on April 12, the first trading day in which investors could react to the coup, was +10%. The market reacted in the opposite direction to Chavez's reinstatement as president: the abnormal return on the next trading day, April 15, 2002, was -8%. The results in Figure 4 are particularly striking given the discrepancy between the ARs on event days 0 and 1 and all other days. Consistent with our earlier findings that

¹⁹Based 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.

coups tend to have pre and post-event CARs that are statistically indistinguishable from zero, the only days on which the 2002 Venezuelan coup d'état attempt ARs are statistically different from zero is on event days 0 and 1 after the coup attempt. The almost 0% 10-day CAR preceding the coup makes this an ideal case as it implies that investors were completely unaware of the coup plot, increasing our confidence that the abnormal returns capture the true effect of the Chavez to Carmona and Carmona to Chavez regime changes on stock returns. This failed coup therefore demonstrates a large positive market reaction to the attempted overthrow of a socialist leader, and an equally large negative reaction to his reinstatement. More generally, the large magnitudes and precision of these effects suggest that investors primarily value transition to a pro-business government regime, regardless of how the regime change is achieved.

Robustness

There are some potential concerns with the results in the [Coups](#), [Assassinations](#), and [Resignations](#) sections. First, the abnormal returns could have been driven by factors unrelated to the regime changes. Second, the true effects of regime changes on firm value may be underestimated if investors had apriori information. Third, the reported means are based on small sample sizes so confidence intervals based on normally distributed abnormal returns 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 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). 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. The intuition is that we should not observe significant abnormal returns when performing an identical test on dates where no intervention (i.e. a politically unstable event) occurred. Observing such effects 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.

[Figure 5](#) shows CARs estimated with the event date shifted 1-year (365 days) into the future. In contrast to [Figure 3](#), there are no discernible abnormal returns in [Figure 5](#). 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 3](#) therefore suggests that the main results are not merely an artifact of the data.

To ensure that results of the placebo test based on 1-year did not occur by chance, [Figure A.2](#) plots event-day abnormal against the number of days shifted. 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 (≥ 110 days), the event day AR is only statistically significant in one

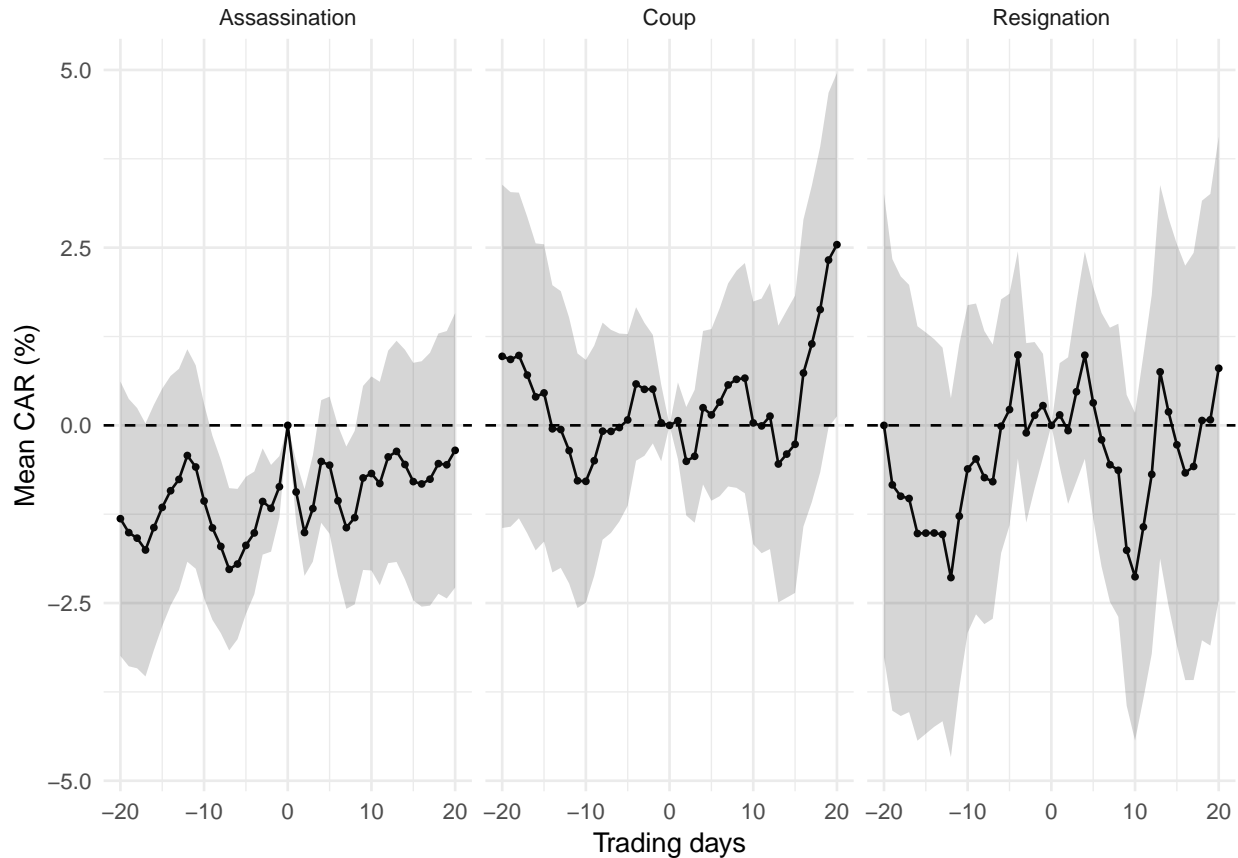


Figure 5: Event date shifted forward by one year

case (day 365 for assassinations). 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 on the extent to which regime changes appear to be unexpected. For instance, the CARs prior to assassinations and coups presented in ?? 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.

Second, we 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 A.1](#).²⁰

²⁰See Appendix A for a more formal explanation.

Non-parametric statistical techniques that are free from distributional assumptions are used to address concerns about inferences from small sample sizes. We employ the sign and the rank tests, which are based on the sign and the rank of the event day ARs respectively.²¹ 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 1 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 is consistent with Figure 1.

Table 1: Non-parametric tests of the impact of regime changes

Event Type	Regime Change Country			Synthetic Control Portfolio			Wilcoxon Rank Test p-Value
	Mean CAR (0,0)	Rank p-value	Sign p-value	Mean CAR (0,0)	Rank p-value	Sign 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.

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 events combined (1% level) when using two-sided p-values from the Wilcoxon rank test.²² In sum, the synthetic control and small sample tests suggest that the main results are not a result of deviations from normality or confounding world events.

Discussion and Conclusion

While conventional wisdom suggests markets dislike the political instability associated with regime changes, we show that this is not necessarily always the case. Unexpected changes in ruler virtually always increase market volatility, but the directionality is not always negative

²¹See section 8 in MacKinlay (1997) for more details.

²²The Wilcoxon rank test is a non-parametric statistical technique that can be used to compare differences between matched samples.

as markets can be given a boost when a new regime is expected to offer a more democratic or pro-business environment than the previous one.

Coups and other types of regime changes remain common, highlighting their relevance for economic and political development. Our sample consists of 5 coups, 1 assassination, 7 resignations, and 7 instances of public protest since 2000. The Arab spring is perhaps the most notable, with protests in response to oppressive regimes and low living standards spreading throughout the Middle East in late 2010. There have also been a number of failed coups such as the 2002 coup attempt against Hugo Chavez and the 2016 failed coup in Turkey.²³ Yet despite their frequency there is little evidence on their economic consequences.

This paper helps fill the evidence gap by using an event study approach that exploits daily returns of national stock market indices. This approach provides well-identified estimates of an economic effect of regime changes that is less susceptible to endogeneity bias than prior cross country studies. Furthermore, the large sample of political events in our study increases the generalizability of our findings.

The results are consistent with the idea that perceptions of government competence and changes in government have large impacts on investor confidence. But although the effect of regime changes and protests on stock volatility is substantial, the effect on the direction of stock returns is less certain. Abnormal returns following resignations are large and positive (+4%), abnormal returns following assassinations are negative and smaller in magnitude (-2%), and abnormal returns following coups also tend to be negative (-2%). Our examination of pre-event trends in abnormal returns suggests that the positive returns we observe following resignations are not driven by investors anticipating resignations, but not coups or assassinations. CARs trend downward in the days preceding resignations, but if investors anticipated a resignation that brought a more competent leader and increased stability, pre-event CARs should also trend positive.

A preliminary test of mechanisms suggests that democratic regime changes are typically preferable to authoritarian regime changes to investors. However, the returns surrounding the failed 2002 coup that temporarily ousted Hugo Chavez from power in Venezuela show that even democratically subversive coups can have positive effects if the instigators are clearly pro-business. These results are consistent with previous research showing that the coup replacing Allende in Chile increased stock market valuations ([Girardi and Bowles 2018](#)).

There are a number potential avenues for future research. First, more research is needed to identify the pro and anti market characteristics of regime changes. There may be pro or anti market features of regime changes that are more nuanced than those identified in this paper. Similarly, it would be useful to identify additional mechanisms through which regime changes effect stock returns. In the case of Chile, [Girardi and Bowles \(2018\)](#) show that increasing stock market valuations were caused by changes in private property rights rather than economic growth prospects or wage costs. Research focusing on the mechanisms in other settings would help generalize these findings. Lastly, it would be helpful to determine the extent to which stock market returns translate to broader economic development outcomes. [Meyersson \(2016\)](#) has made progress on this front by examining the impact of coups on a number of outcomes in addition to economic growth including investment, debt, inflation,

²³The Turkish coup attempt led to negative event-day CARs of approximately -7%. See Figure A2 for a visual depiction.

infant mortality, and years of schooling. It would be fruitful to examine whether the direction of the effects of different types of regime changes on these outcomes are consistent with their stock market effects, or if investor perceptions are at odds with certain development goals. Such research can help enlarge the body of evidence on the extent to which regime changes cause institutional and political change, and, in turn, have significant consequences for economic development.

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	Istanbul 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 = $-10 \leq \text{score} \leq -6$, anocracy = $-5 \leq \text{score} \leq 5$, and democracy = $6 \leq \text{score} \leq 10$.

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.²⁴

Table A.3: Abnormal returns following coups

Country	Event Date	Post-Event CAR			Pre-Event CAR		Days to rebound
		(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	
Argentina	06/08/1970	-1.919 (0.949)	-0.530 (2.510)	-2.011 (4.243)	0.247 (2.510)	4.728 (4.243)	204
Argentina	03/22/1971	0.925 (1.216)	14.294 (3.218)	24.218 (5.439)	0.131 (3.218)	0.274 (5.439)	
Bangladesh	01/11/2007	-0.320 (1.166)	10.351 (3.086)	14.883 (5.217)	-0.896 (3.086)	2.250 (5.217)	2
Egypt	07/03/2013	-0.346 (1.515)	5.169 (4.009)	7.144 (6.776)	6.776 (4.009)	-4.869 (6.776)	2
Nepal	10/04/2002	0.090 (1.206)	1.563 (3.190)	5.567 (5.392)	-1.014 (3.190)	-0.493 (5.392)	2
Pakistan	10/14/1999	-7.737 (1.943)	-9.431 (5.141)	-7.130 (8.690)	4.151 (5.141)	4.900 (8.690)	36
Peru	04/06/1992	-6.819 (2.210)	-5.814 (5.848)	-25.027 (9.885)	-2.075 (5.848)	-10.519 (9.885)	5
South Korea	12/12/1979	-1.784 (1.152)	-3.474 (3.047)	-24.465 (5.150)	-1.678 (3.047)	-6.187 (5.150)	418
Thailand	10/06/1976	-0.541 (0.639)	0.837 (1.691)	0.731 (2.859)	0.001 (1.691)	0.713 (2.859)	3
Thailand	10/20/1977	-0.951 (1.232)	4.096 (3.260)	7.290 (5.510)	9.961 (3.260)	10.198 (5.510)	2
Thailand	02/25/1991	-7.326 (2.884)	2.860 (7.631)	14.162 (12.899)	6.326 (7.631)	26.262 (12.899)	7
Thailand	09/19/2006	-0.481 (1.094)	-2.640 (2.894)	0.111 (4.892)	1.848 (2.894)	0.131 (4.892)	17
Thailand	05/23/2014	-0.571 (1.201)	2.800 (3.177)	4.591 (5.370)	2.350 (3.177)	-0.424 (5.370)	5
Mean		-2.137 (0.424)	1.545 (1.121)	1.543 (1.896)	2.010 (1.121)	2.074 (1.896)	58

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.

²⁴Treating this twelve day period as a single day CARs results in a positive abnormal return of 58%, a fluctuation that seems qualitatively unreasonable.

Assassinations

Table A.4: Abnormal returns following assassinations

Country	Event Date	Post-Event CAR			Pre-Event CAR		Days to rebound
		(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	
India	11/05/1984	-2.416 (0.668)	-1.259 (1.767)	-2.416 (2.987)	-3.916 (1.767)	1.344 (2.987)	5
Israel	11/05/1995	-3.460 (1.473)	-3.177 (3.897)	0.743 (6.587)	-0.857 (3.897)	-10.316 (6.587)	12
Nepal	06/12/2001	-0.513 (3.513)	2.965 (9.295)	15.516 (15.711)	5.956 (9.295)	1.791 (15.711)	20
South Korea	10/26/1979	-0.364 (1.058)	-9.376 (2.800)	1.186 (4.734)	0.690 (2.800)	-0.368 (4.734)	14
Sri Lanka	05/03/1993	-3.231 (0.767)	-0.983 (2.030)	3.515 (3.432)	-0.541 (2.030)	-1.360 (3.432)	7
Sweden	03/03/1986	0.698 (0.927)	5.038 (2.452)	10.908 (4.145)	-3.754 (2.452)	0.955 (4.145)	
United States	09/07/1901	-4.522 (1.283)	-3.055 (3.394)	-8.920 (5.738)	-0.733 (3.394)	3.456 (5.738)	963
United States	11/22/1963	-2.973 (0.470)	2.451 (1.242)	2.267 (2.100)	-2.666 (1.242)	-2.720 (2.100)	2
Mean		-2.098 (0.550)	-0.924 (1.456)	2.850 (2.462)	-0.728 (1.456)	-0.902 (2.462)	146

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.

Resignations

Table A.5: Abnormal returns following resignations

Country	Event Date	Post-Event CAR			Pre-Event CAR		Days to rebound
		(0,0)	(0,6)	(0,19)	(-1,-7)	(-1,-20)	
Argentina	06/18/1982	18.892 (3.334)	24.904 (8.822)	65.863 (14.912)	-2.819 (8.822)	28.234 (14.912)	
Argentina	12/20/2001	14.015 (1.976)	48.103 (5.227)	62.191 (8.836)	14.656 (5.227)	36.165 (8.836)	
Bangladesh	12/07/1990	0.323 (0.871)	1.002 (2.305)	2.171 (3.896)	1.880 (2.305)	3.654 (3.896)	
Ecuador	04/20/2005	-0.084 (0.945)	-0.249 (2.499)	-0.595 (4.225)	-1.305 (2.499)	0.710 (4.225)	
Indonesia	05/20/1998	2.817 (3.392)	4.296 (8.974)	4.543 (15.168)	-2.695 (8.974)	-17.868 (15.168)	
Lithuania	04/06/2004	-0.575 (1.137)	-3.319 (3.007)	-11.704 (5.083)	2.182 (3.007)	5.426 (5.083)	159
Nepal	04/25/2006	1.915 (0.665)	8.132 (1.760)	9.937 (2.975)	-1.951 (1.760)	-4.205 (2.975)	
Pakistan	04/19/1993	-3.265 (1.108)	-0.432 (2.930)	2.771 (4.953)	-0.312 (2.930)	-0.485 (4.953)	15
Pakistan	11/06/1996	5.084 (1.416)	1.229 (3.746)	-0.441 (6.331)	4.182 (3.746)	7.597 (6.331)	
Philippines	02/26/1986	12.938 (0.477)	21.473 (1.263)	23.086 (2.134)	-1.847 (1.263)	-6.884 (2.134)	
Philippines	01/19/2001	1.150 (1.591)	16.837 (4.209)	18.469 (7.115)	-5.382 (4.209)	3.581 (7.115)	
Thailand	05/25/1992	3.248 (1.433)	-6.574 (3.793)	3.789 (6.411)	-5.085 (3.793)	-10.841 (6.411)	
Tunisia	01/31/2011	-2.705 (0.671)	2.982 (1.776)	-11.787 (3.002)	-13.610 (1.776)	-13.445 (3.002)	5
Turkey	06/30/1997	2.010 (3.015)	-2.861 (7.976)	-7.629 (13.481)	12.876 (7.976)	4.532 (13.481)	
Ukraine	12/28/2004	5.118 (2.797)	12.837 (7.401)	18.445 (12.511)	4.170 (7.401)	32.085 (12.511)	
Mean		4.059 (0.496)	8.557 (1.312)	11.941 (2.217)	0.329 (1.312)	4.550 (2.217)	59

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.²⁵ 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).²⁶

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.²⁷ 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.1, 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.²⁸ Public protests include popular demonstrations, riots, non-violent

²⁵Indeed, corporate investors in the 2013 MIGA *World Investment and Political Risk* ranked civil disturbances as the fourth most concerning type of political risk.

²⁶The 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.

²⁷Abnormal returns for this event are not shown in Table A.5 because the stock market was closed on the day of Mubarak's resignation.

²⁸The set of resignations includes all those listed in either the Coup d'etat Events Handbook or the

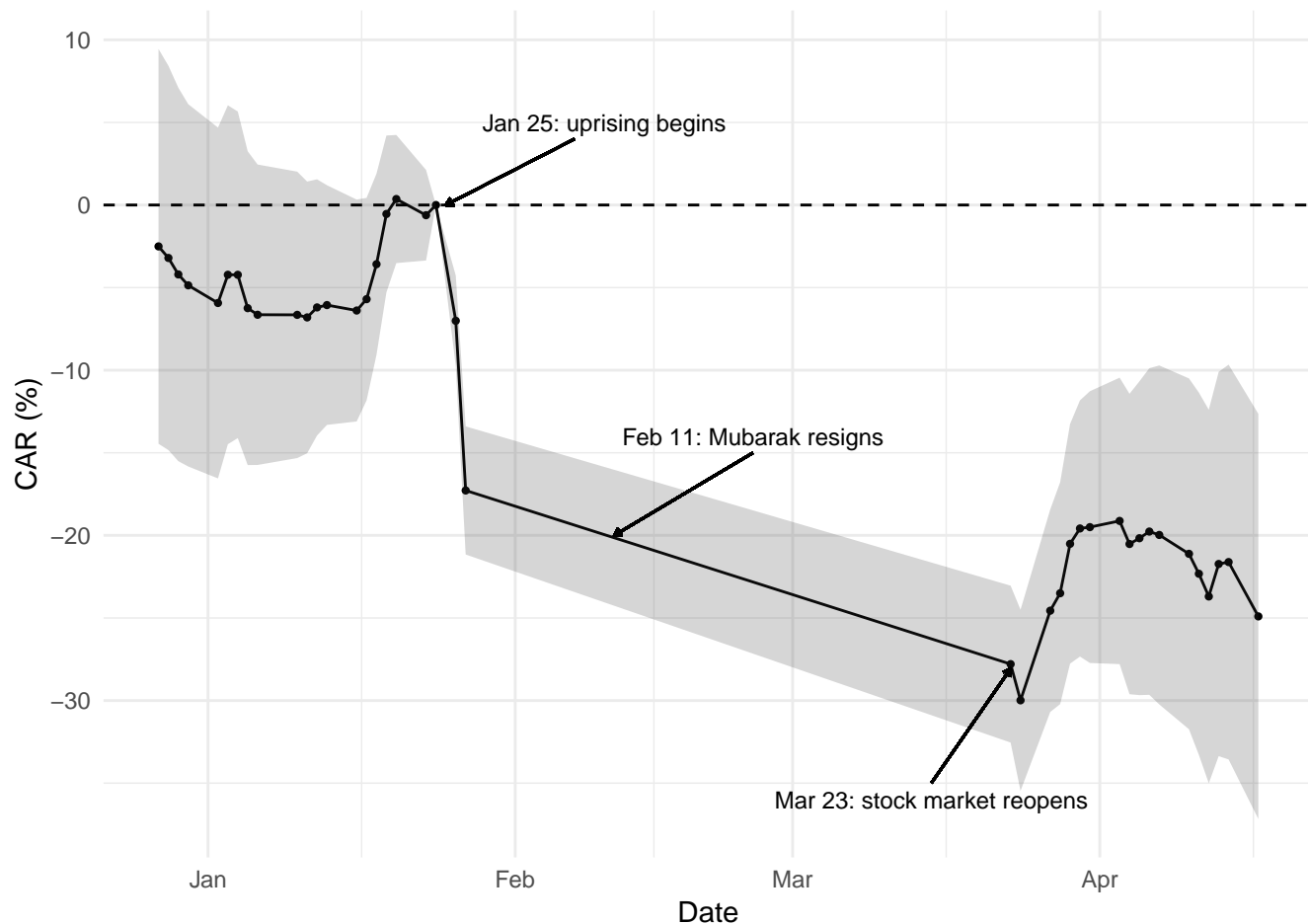


Figure A.1: Cumulative abnormal returns during the Egyptian revolution

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'état 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.1.²⁹

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 of resignations in Table A.5.

²⁹The 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.³⁰

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.

³⁰Volatility estimation methodology is described in detail in [Volatility](#).

Democratic vs. authoritarian regime changes

Table A.8: Abnormal returns following authoritarian regime changes

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

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

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

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.

Time-shifted placebo test

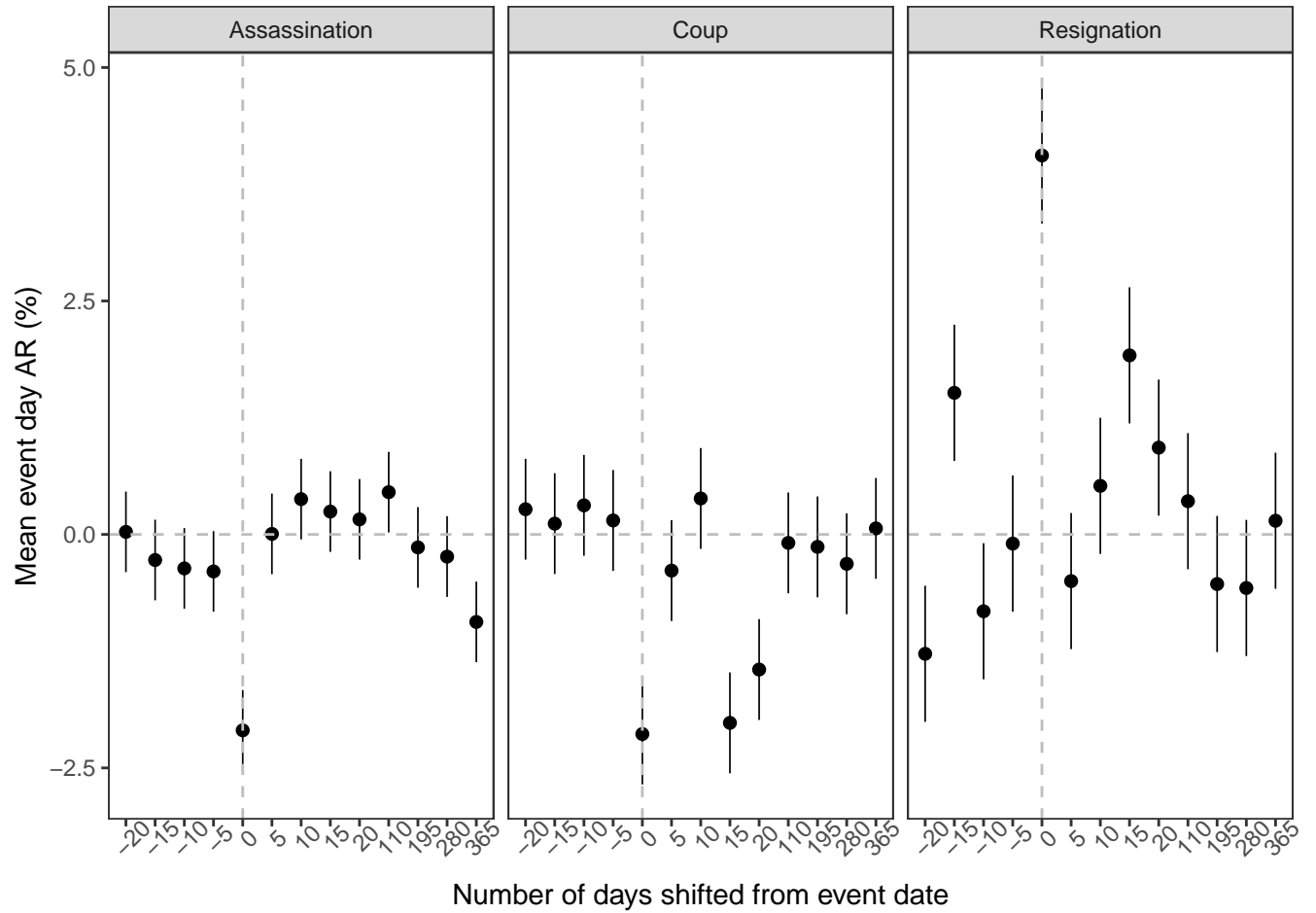


Figure A.2: Time-shifted placebo sensitivity analysis of mean event day abnormal return by type of regime change

Graphical depictions of additional events

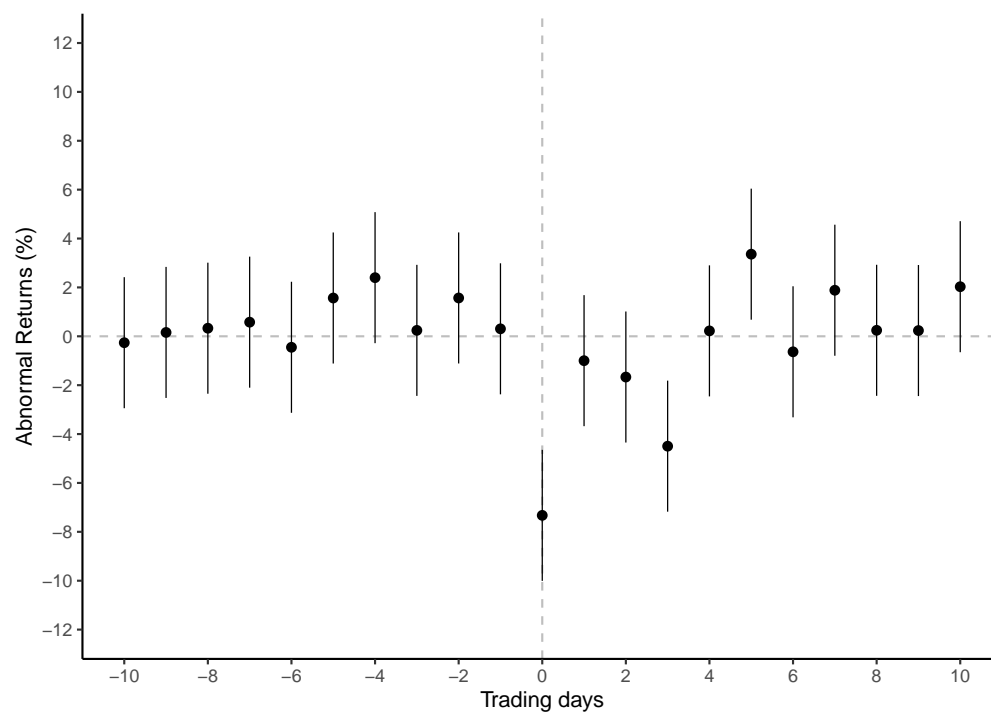


Figure A.3: Abnormal returns surrounding the 2016 Turkish coup attempt

Synthetic Control Portfolio

Let \mathbf{R}_k be the vector of returns for the event country in the estimation window, \mathbf{R}_{-k} be the vector of returns for all other countries in the estimation window, $\mathbf{X}_1 = (\mathbf{R}_k, \text{Var}(\mathbf{R}_k))$, $\mathbf{X}_0 = (\mathbf{R}_{-k}, \text{Var}(\mathbf{R}_{-k}))$, and \mathbf{W}_{-k} be a $((N-1) \times 1)$ vector of weights where N is the number of countries listed in [Table A.1](#). Then \mathbf{W}^* is chosen to minimize $(\mathbf{X}_1 - \mathbf{X}_0 \mathbf{W})' \mathbf{V} (\mathbf{X}_1 - \mathbf{X}_0 \mathbf{W})$ subject to $w_i \geq 0$ ($i = 1, 2, \dots, N-1$) and $\sum_i^{N-1} w_i = 1$, and the vector \mathbf{V} is chosen so that stock returns for the control portfolio during the estimation window are as close as possible to the event country.³¹

³¹See [Abadie and Gardeazabal \(2003\)](#) for further details.

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