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Institutional shocks and economic outcomes: Allende's election, Pinochet's coup and the Santiago stock market

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Research question

- How do political institutions affect economic outcomes?
- To what extent does the value of firms depend on the political-institutional context in which they operate?
- Although we may care little about stock market dynamics *per se*, it makes sense to turn to the stock market to investigate these issues:
  - stock market prices reveal investors' estimates of (the present value of) the expected stream of future profits.
  - Relevant stock market effects are likely to signal changes in growth prospects, distribution of income and incentives for private investment.
  - Stock market data are available at higher frequencies than other economic indicators, helping identification.

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What we know so far:

- Very difficult to identify empirically the effect of political change: endogeneity; anticipation effects; Downsian tendencies in elections; non-electoral shocks typically associated with other relevant confounding changes.
- Existing evidence on partisan effects almost exclusively confined to US presidential elections [exception: *Herron (2000)* on UK 1992 election]
  - US stock market tends to react positively to Republican victories *(Snowberg, Wolfers and Zitzewitz, 2007)*; but overall Democratic presidencies are associated with higher returns even controlling for other factors (*Santa-Clara & Valkanov, 2000*).
- *Girardi (forthcoming)* uses regression-discontinuity to demonstrate a strong negative stock market reaction to left-wing electoral victories in a panel of worldwide national elections.
- *Dube, Kaplan & Naidu (2011)*: stocks of exposed US firms react positively to US-backed coups and top-secret coup authorizations.
- Relevant value of political connections has been demonstrated in several contexts (including Nazi Germany - *Ferguson & Voth, 2008*)

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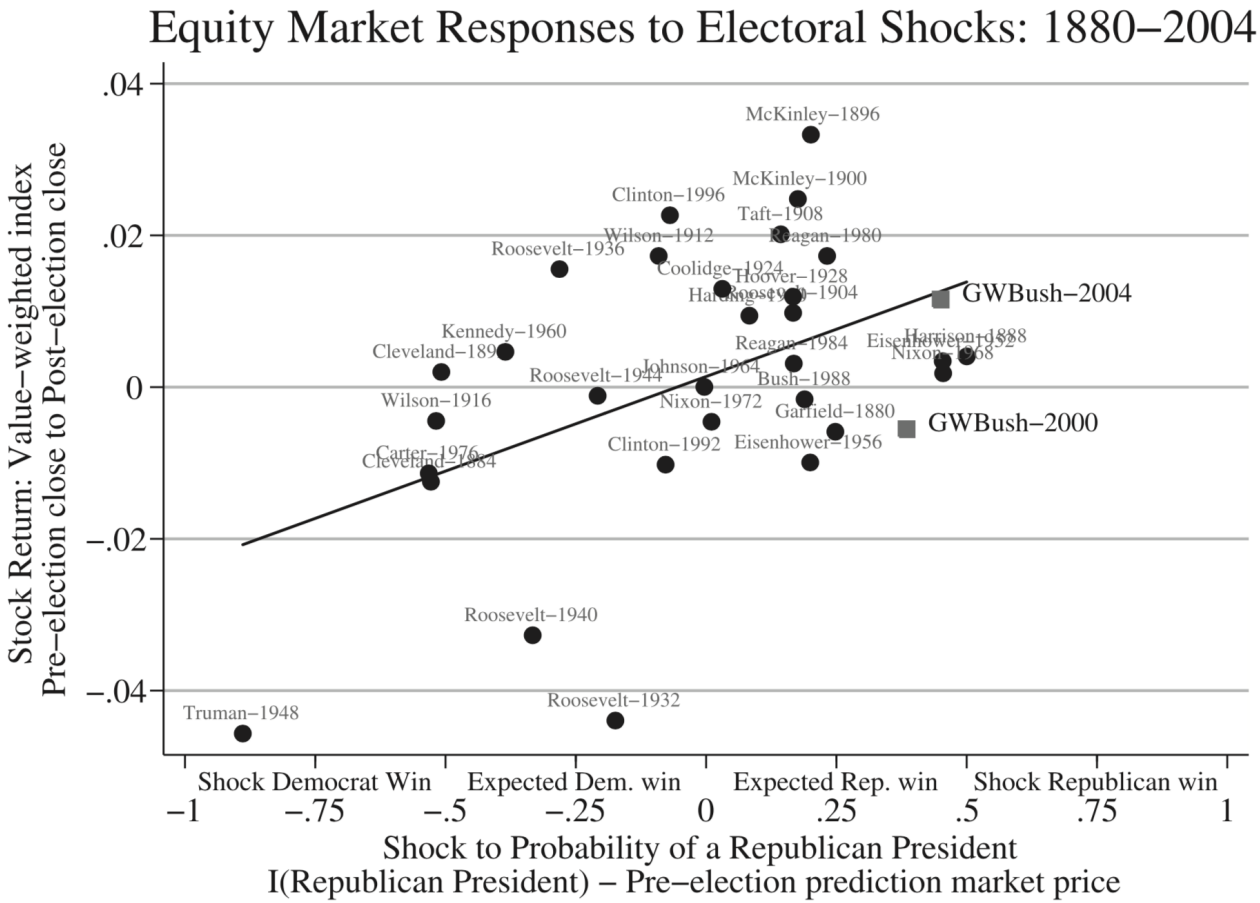
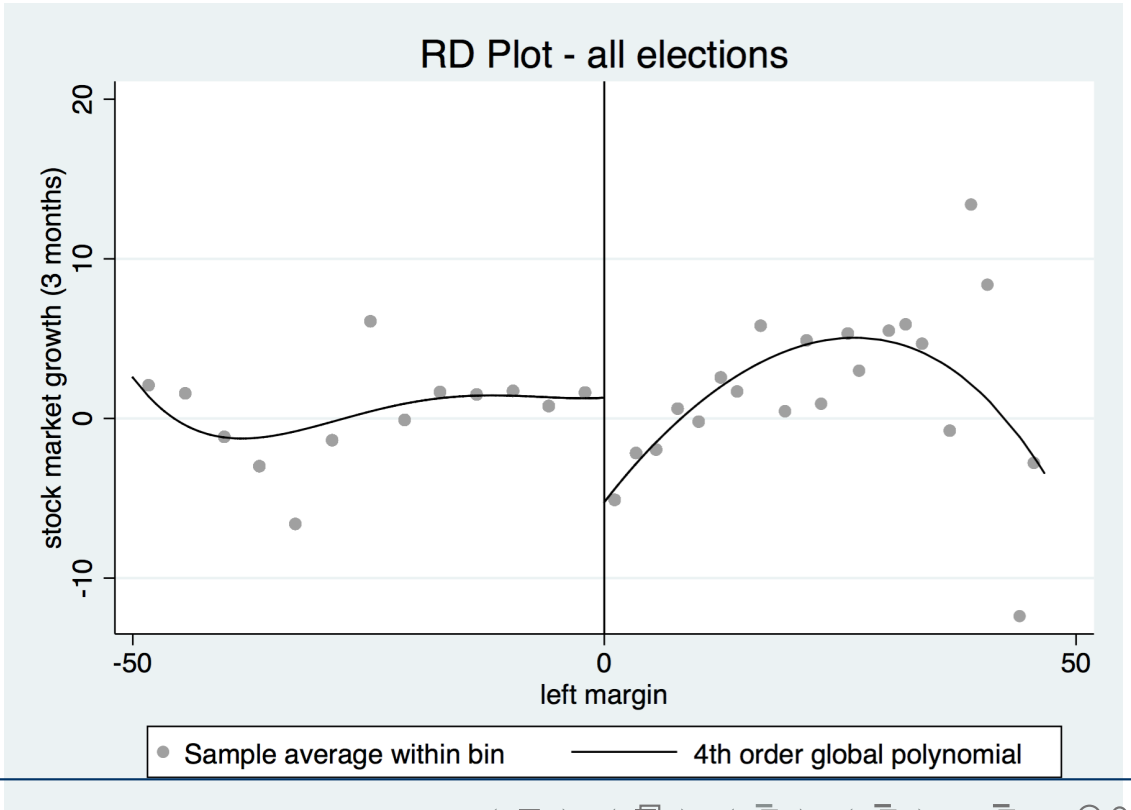
Snowberg, Wolfers and Zitzewits (2007) on US Presidential elections

- betting data to build a measure of the 'surprise' associated with election results (dummy for Republican victory minus ex-ante probability of Republican victory)
- Republican victory raises equity valuations by 2–3 percent



Girardi (work in progress) on worldwide national elections

- over 700 national elections in which it is possible to identify (center-)left vs. conservative parties/candidates;
- regression-discontinuity design to identify causal effects (including anticipation effects);
- preliminary result: (center-)left electoral victories decrease stock market values by around 6%



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Dube, Kaplan & Naidu (2011) on US-backed coups

- use the timing of (top-secret) coup authorizations to estimate the effects of US-backed coups on the value of the US companies that stood to benefit from the coups (firms that had been expropriated by the government that the coup overthrown).
- event-study technique: abnormal returns
- The average effect of a coup authorization is around 13% for a fully nationalized company.

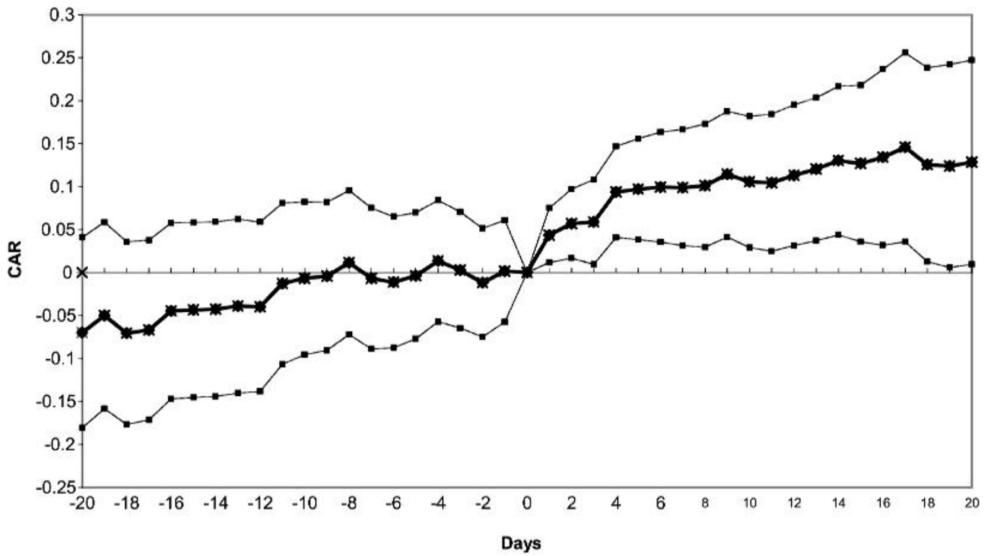

FIGURE I
Cumulative Abnormal Returns: All Countries

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Ferguson & Voth (2008) on the rise of the Nazi regime in Germany

- identify firms linked to the Nazi movement before its ascent to power
- these firms outperformed the rest of the German stock market between Jan and Mar 1933 (when Hitler gained power) by 5 to 8%
- unable to establish evidence on the overall stock market effect of Nazi's rise to power, due to confounding global stock market trends (see graph below)

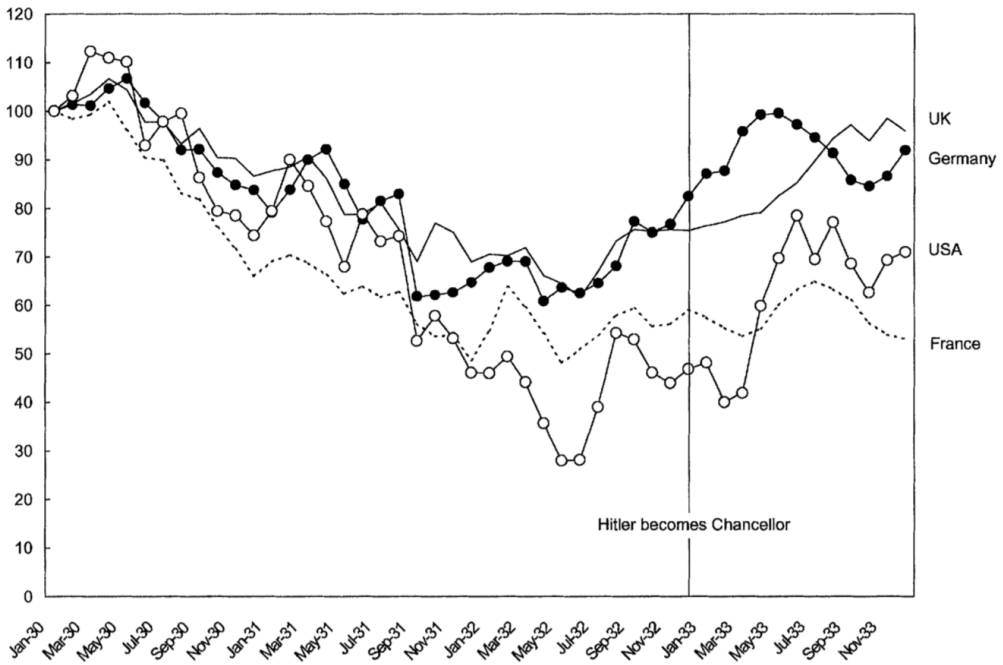

FIGURE I
Stock Market Indices, January 1930–December 1933, United Kingdom, Germany, United States, and France

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Something missing in the existing literature?

- We have little or no evidence on the overall stock market effects of *really large* political shocks, involving substantial variation in economic institutions.
- US elections, about which we know a good deal thanks mainly to the work of Snowberg, Wolfers and Zitzewitz, can display relevant policy divergence between parties, but arguably no large difference when it comes to fundamental economic institutions.
- On episodes of institutional change, we have some evidence on the cross-section of returns (like in the case of the rise of the Nazi party in Germany or of US-backed coups) but little evidence on aggregate stock market effects.

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This paper:

- To assess the effect of large political-institutional changes, we look at share prices in the Santiago exchange during the tumultuous political events that characterized Chile in the early 1970s.
- We exploit two largely unexpected shocks that involve substantial variation in economic policies and institutions: Allende's election in 1970 and the military coup in 1973.
- Previously unexploited daily aggregate data and newly-digitized firm-level data.
- Voting expectations data to show that Allende's election was a genuine surprise, especially for the wealthy who could trade stocks.
- We will demonstrate that the effects of substantial political shocks can be extremely large – an order of magnitude greater than those found by existing studies which look at milder shocks.
- We will attempt a tentative analysis of the mechanisms that may have produced such large effects (this is work in progress).

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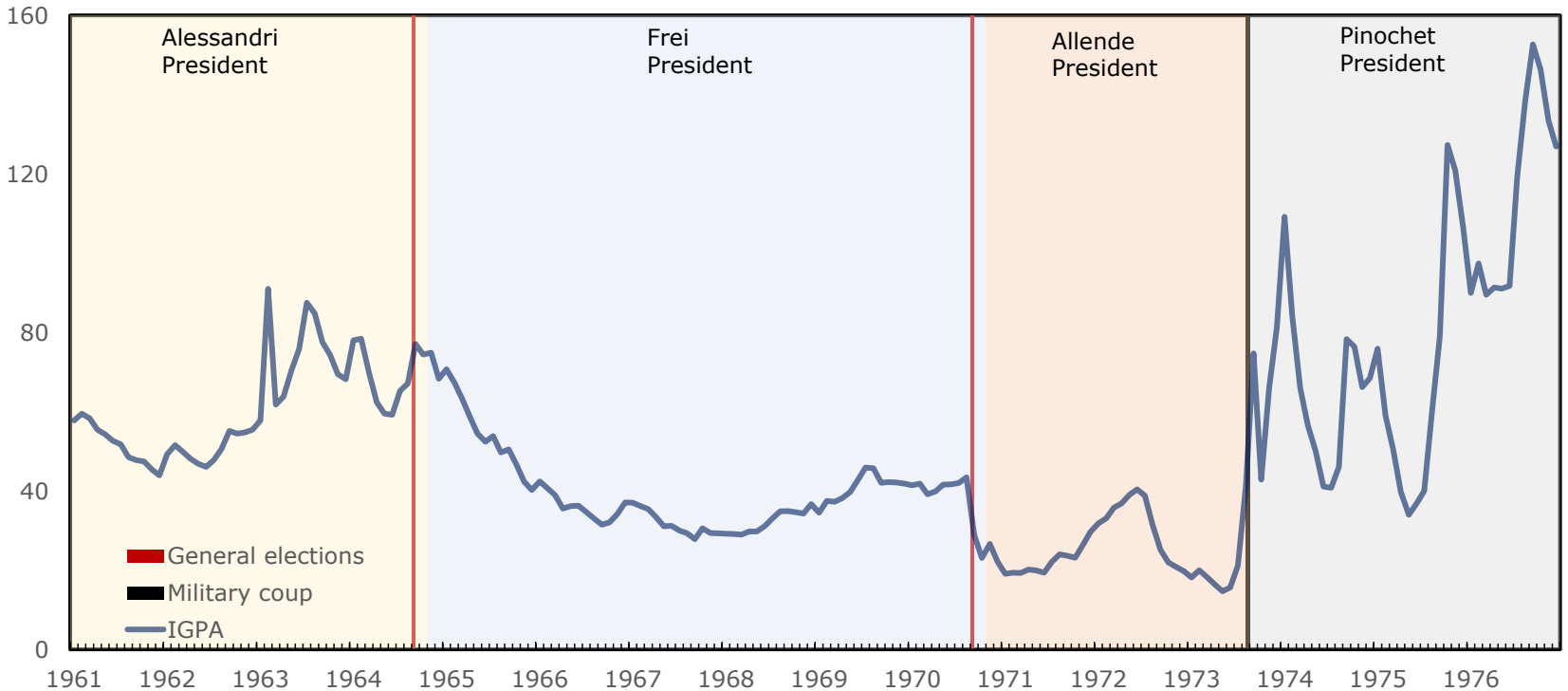
The IGPA Index (General Index of Stock Prices)

Figure: Deflated IGPA index (monthly, 1976=100)



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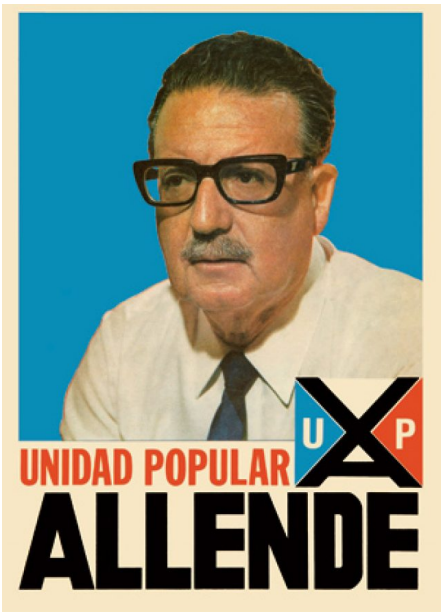
The 1970 Presidential election

Jorge Alessandri
Rightwing independent, supported by **Partido Nacional**.
Had been president from 1958 (when he beat Allende in close election) to 1964.



Salvador Allende
Candidate of leftwing coalition **Unidad Popular**. Platform of structural reforms (nationalizations, increased popular participation) with the explicit aim of kick-starting a transition towards a socialist economy.

Radomiro Tomic
Candidate of the centrist/center-left **Partido Demócrata Cristiano**.
In power from 1964 to 1970 with President Eduardo Frei, PDC had enacted gradual redistributive reforms (land reform, increased education investment).

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Opinion pools predicted a Alessandri victory by a rather large margin

Table 1: Voting intention surveys taken before the 1970 Presidential election (summary published on El Mercurio on Aug 30 1970)

Survey date	Area	n	Tomic	Alessandri	Allende	Undecided	Allende margin
11-13 April	Gran Santiago	1,217	26.3%	38.9%	25.0%	9.8%	-15.4
24-27 April	Gran Santiago	1,108	28.3	40.6	27.1	4.0	-14.1
24-27 April	Valparaiso-Vina	621	28.4	42.4	25.4	3.8	-17.7
24-27 April	Concepcion-Talcahuano	648	37.1	30.0	23.5	9.4	-15.0
29 May-9 June	National	3,711	26.7	32.4	26.3	14.5	-7.1
19-23 June	Gran Santiago	1,333	28.1	37.4	31.3	3.2	-6.3
11-14 July	Gran Santiago	1,243	21.2	41.9	31.5	5.5	-11.0
11-14 July	Concepcion-Talcahuano	676	32.8	29.6	33.5	4.0	+0.7
8-16 Aug	National	4,104	26.8	40.3	29.5	3.4	-11.2
8-11 Aug	Gran Santiago	1,296	26.2	39.0	27.3	7.5	-12.6
21-24 Aug	Gran Santiago	1,290	26.8	40.3	29.5	3.4	-11.2

Allende margin = Allende share - max(Alessandri share, Tomic share), with shares recalculated after excluding the undecided. Source: p.35 of the Aug 30, 1970 issue of El Mercurio

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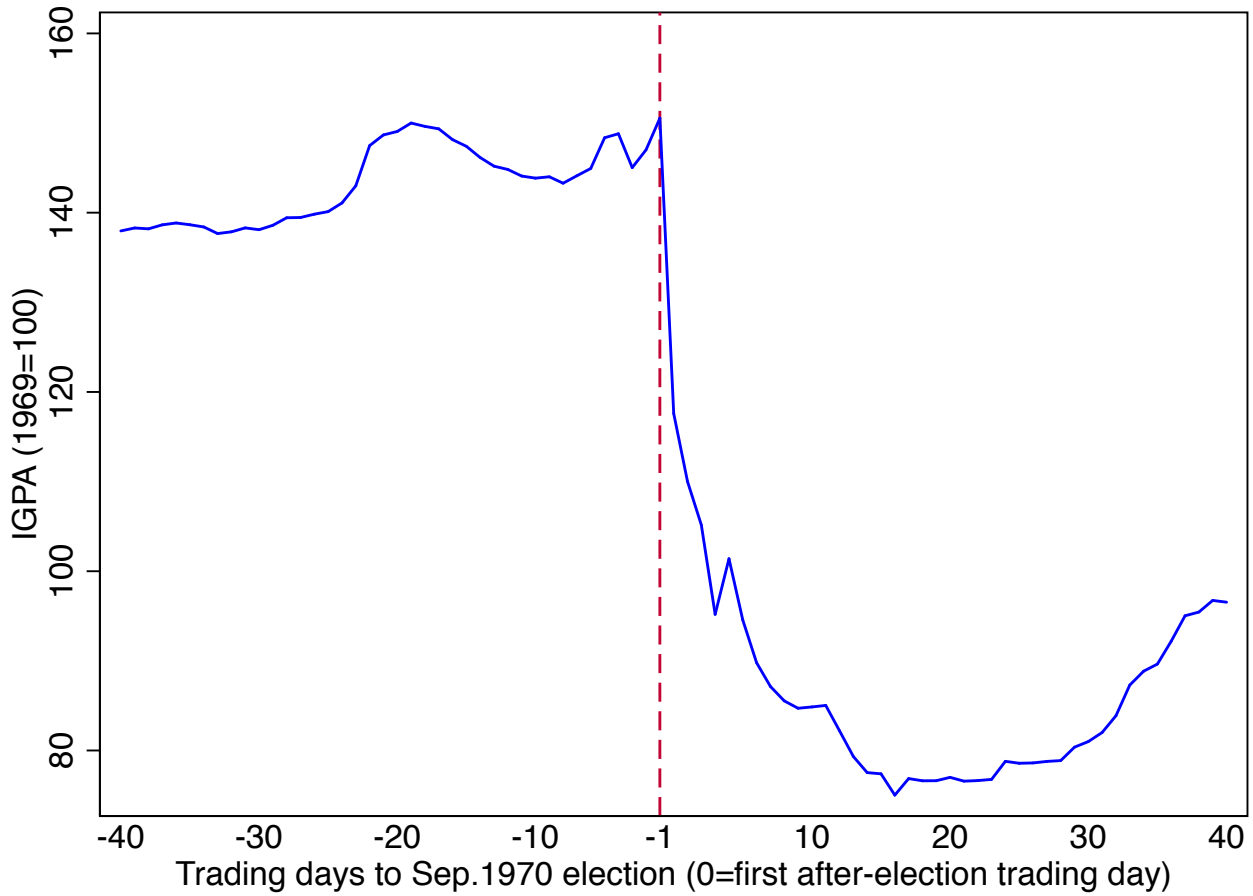
The UP electoral victory

- Defeating expectations, Allende won with 36.6% of the vote (Alessandri = 35.3%; Tomic = 28.1%). He was later confirmed President by Congress, following longstanding political tradition.
- In the first trading day after the election, stock prices in Santiago (measured by IGPA index) fell by 22 percent.
  - Largest decrease in share prices ever recorded in Santiago in the period for which daily data exist (1961-2016).
  - This daily change is 25.8 standard deviations below the sample mean; 2.5 times larger than the previous maximum deviation.
- Stock prices kept falling for around 15 trading days, stabilizing around the end of September 30, 48.6 percentage points below the pre-election value.

Figure: IGPA index around the September 4 1970 election



vertical red dashed line = last trading day before the election

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Insights from firm-level data (1)

- We hand-collected firm-level data from contemporary copies of the newspaper *El Mercurio*.
- Firm-level data sheds light on the continuing decline in average share values in the days following the election (as opposed to immediate adjustment).
- Out of 167 listed firms that we observe both immediately before and immediately after the election, only 32 were effectively exchanged in the first trading day after the election.
- Those 32 shares decreased on average by 40.8% that day, and then by a further 17.8% in the rest of the month: some delayed adjustment remains but the bulk of the decrease was immediate.
- The 96 stocks that were not exchanged in the first after-election trading day, but were exchanged in the rest of the month, fell on average by 37.1% between Sep 4 and Sep 30.

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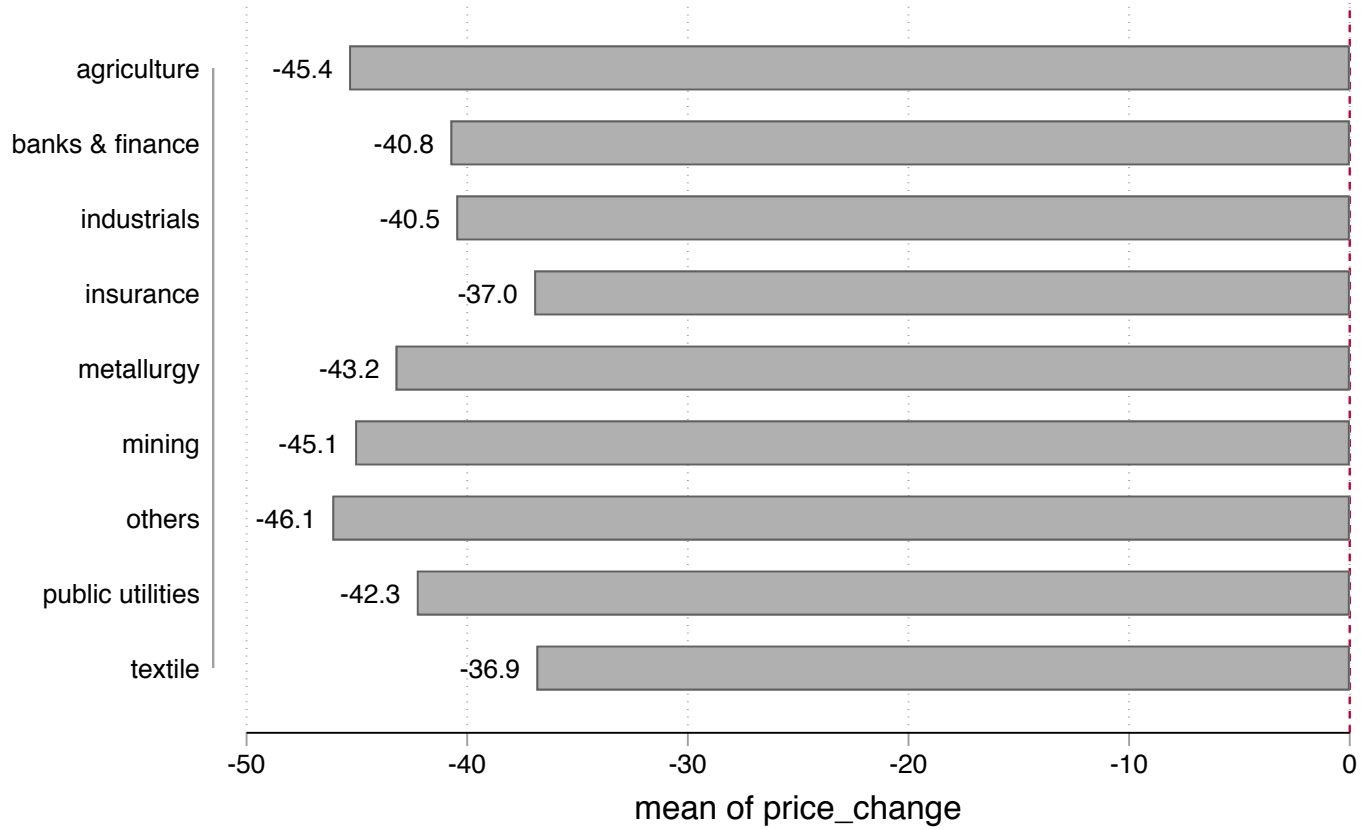
Insights from firm-level data (2)

- The fall in share prices was remarkably broad, with strikingly small differences across sectors.



Average percentage change between Sep 4 and Sep 30 1970

The 1973 military coup

- On Tuesday September 11, 1973, a military coup deposed Allende's socialist government and established a military dictatorship.
- The Santiago Exchange was closed in the four trading days before the coup and for three days after.
- In the first trading day after the coup, the Santiago stock market rose by almost 80 percentage points.
  - Largest daily increase in the IGPA on record.
  - 67.1 Standard deviations above the sample mean registered until that day.
  - 5.5 times larger than the previous maximum.
- Is this overstated due to hyperinflation? If we deflate with the monthly inflation rate of Sep 1973, we are still left with a 67% real increase.
- Was a coup attempt unexpected? No, everyone expected a coup attempt. But they could not know its outcome: there were two unsuccessful coup attempts before (Oct 1970 and June 1973), there were 'constitutionalist' officials in the army, and Allende had strong popular support in the country.
  - If the coup outcome was substantially anticipated, then our (extremely large) estimates would severely underestimate the stock market impact.

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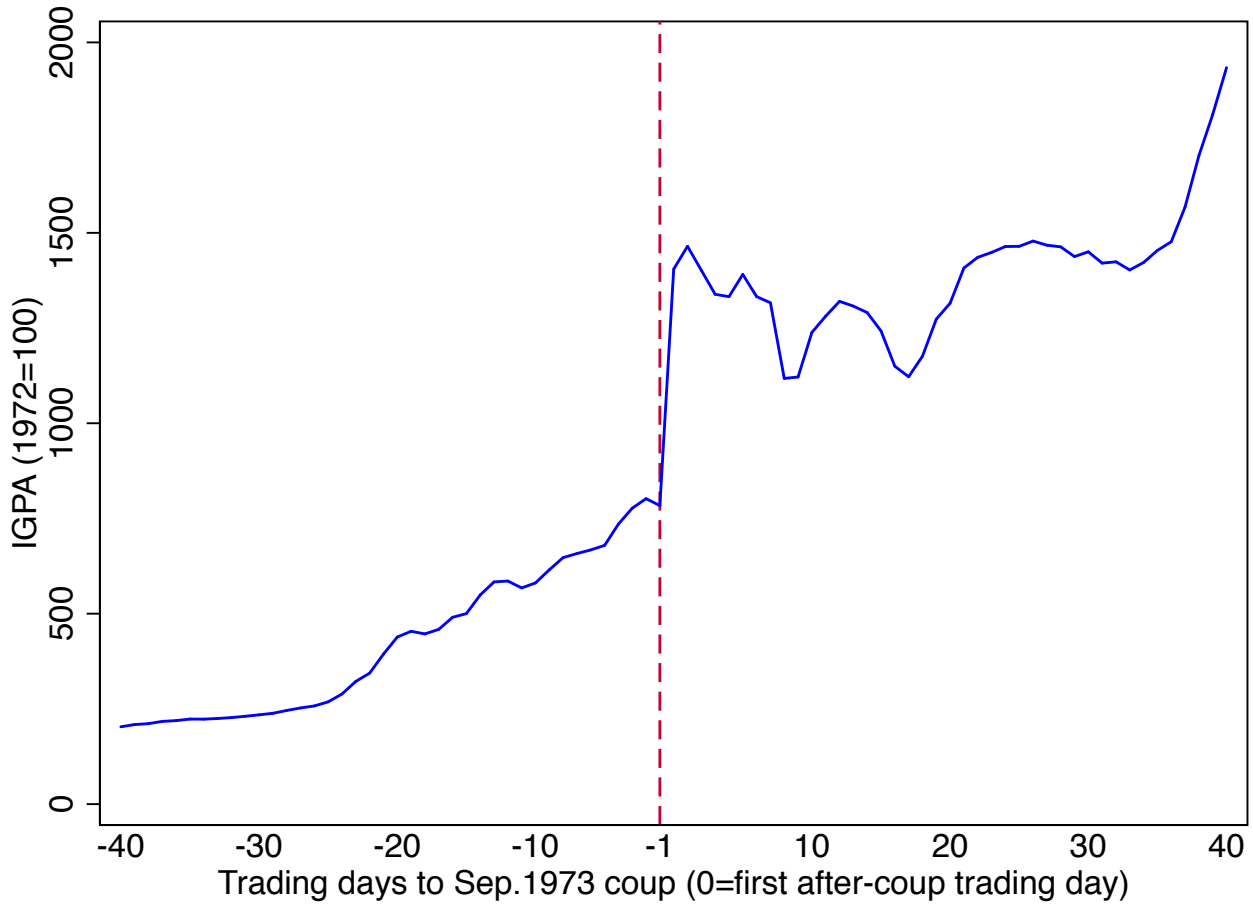
Figure: IGPA index around the September 11 1973 coup



vertical red dashed line = last trading day before the coup

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- Can we interpret the 48% stock market fall after Allende's election and the 80% increase after the military coup as the causal effects of these political shocks?
- Generally very hard to establish causality from aggregate time-series observations, with only two events. However the magnitude of these changes and their timing is strongly suggestive of a causal effect.

Evidence in favor of a causal interpretation:

- The magnitude of these changes makes them unlikely to reflect ordinary sources of share price variation.
- A time-series event-study methodology with different controls yields estimates equal to the daily unconditional changes that we have showed.
- Using other main global and Latin American stock market indexes as a control group does not change the estimates: common global or regional economic shocks unlikely to have contaminated our estimates.

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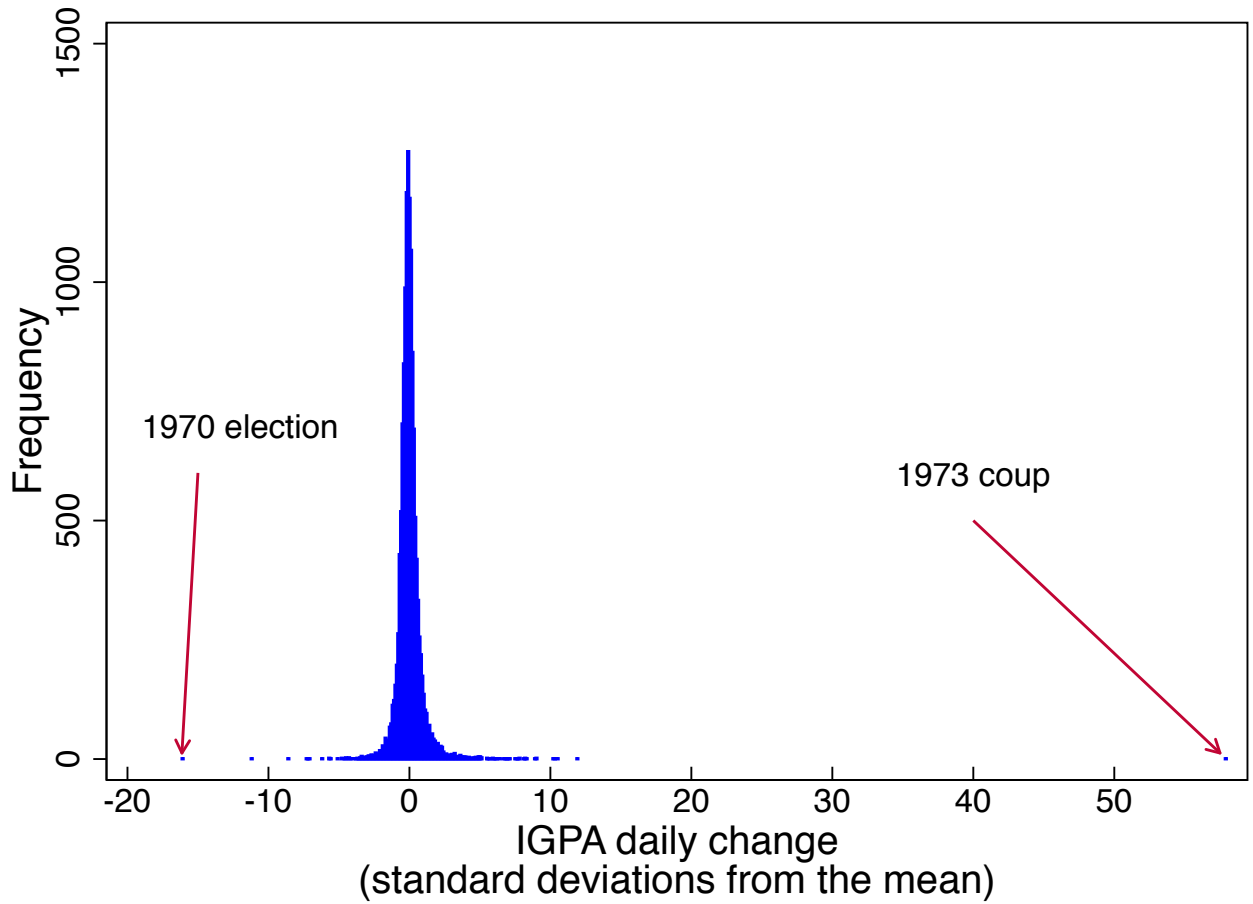
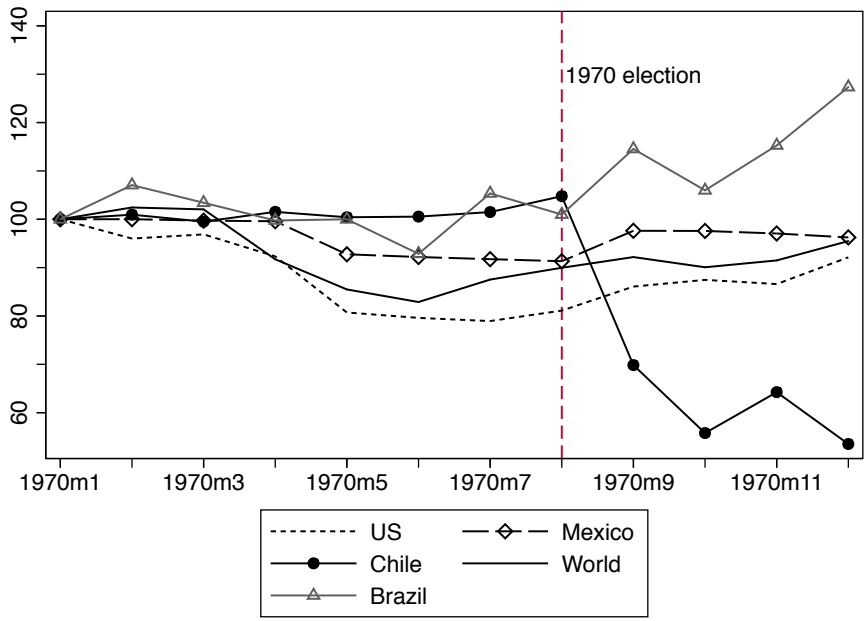
How likely are these price changes to just reflect random noise?

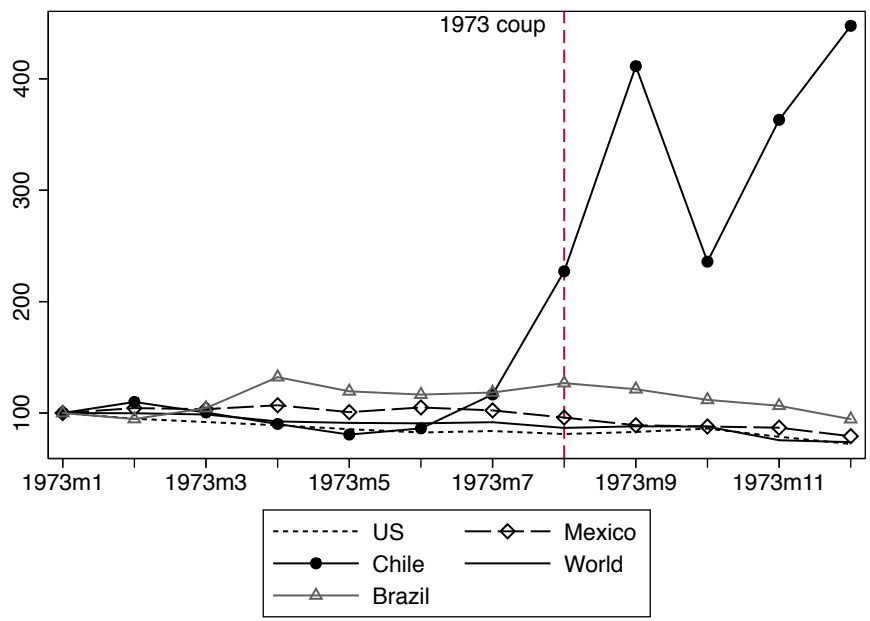
Figure: Empirical distribution of IGPA daily percentage changes (1961-2016, bin width 0.10)



Did regional or global financial/economic shocks/trends influence the sharp price movements we have documented?



(a) 1960 Presidential election



(b) 1973 military coup

Figure: Deflated stock indices: Chile vs. World, US, Brazil and Mexico

These jumps represented large deviations from the behavior of global stock markets.

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- We estimate the effect of the 1970 election and the 1973 coup using standard event-study techniques (cumulative abnormal returns).
- Event-study specification:

$$R_t = \beta X_t + \gamma E_t(k) + \epsilon_t \text{ for } k = 0, 20 \quad (1)$$

  - R = daily return;
  - X = vector defining normal returns';
  - E(k) = indicator that takes value 1 for a k-day period beginning with the event day and zero otherwise.
  - Estimation window = 250 trading days before the event + k days after.

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- We estimate CARs using four alternative specifications:
  - Constant mean return model: normal returns are just average pre-event returns (typically used when outcome is a broad index).
  - Autocorrelation-augmented: include lagged returns in X.
  - Global market factor-augmented: include the $SP500$ US stock index in the X vector, as a proxy for international financial trends.
  - Autocorrelation plus global market-factor augmented.
- We also try 'non-standard but sensible' alternative specifications, which include as control variables the rate of inflation and the price of copper (of which Chile is the first world producer).
- Results: cumulative abnormal returns are analogous to the unconditional changes: these factors did not affect the stock market movements we have documented.

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- Our exercise exploits the fact that the Allende election came as a surprise, and that the success (if not the occurrence) of the Pinochet coup could not have been entirely anticipated.
- Still, the effects we have documented are bound to be underestimated because of anticipation effects.
- In the case of the 1970 election, we are able to provide a measure of the perceived probability of a socialist victory (π) using vote expectation surveys, and therefore recover an estimate of the overall effect (adjusted for anticipation).

$$IGPA_{t-1} = E(IGPA_t|Allende)\pi + E(IGPA_t|non-Allende)(1-\pi) \quad (2)$$

$$\Delta IGPA_t = [E(IGPA_t|Allende) - E(IGPA_t|non-Allende)](1-\pi) \quad (3)$$

$$E(IGPA_t|Allende) - E(IGPA_t|non-Allende) = \frac{\Delta IGPA_t}{1-\pi} \quad (4)$$

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Estimating π from vote expectation surveys

- Eduardo Hamuy (sociologist at U of Santiago) performed vote expectation surveys before the 1970 election
  - '*Who do you think will win the upcoming presidential election?*'
- We use these surveys to obtain a measure of π, the ex-ante perceived probability of a socialist victory.
- We focus on the wealthy individuals that were much more likely to hold stocks, using three main proxies for wealth that are present in Hamuy's surveys:
  - Living in a upper-middle class or luxury home;
  - Socio-economic status as assessed by the interviewer;
  - Ability to accumulate savings.

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Figure: Hamuy's pre-electoral surveys: share of respondents expecting Allende to win the 1970 presidential election among the wealthy

month	whole sample	living in upper-middle class home or better	good or very good socio-economic status	very good socio-economic status	income sufficient to save money
3/1970	14.9% (n=625)	7.9% (n=103)	9.0% (n=149)	0% (n=10)	5.9% (n=43)
3/1970	19.3 (n=298)	2.4 (n=55)	5.3 (n=70)	5.7 (n=64)	21.4 (n=19)
5/1970	23.0 (n=679)	10.6 (n=103)	13.9 (n=126)	6.3 (n=19)	5.8 (n=62)
6/1970	26.4 (n=685)	20.8 (n=125)	24.9 (n=199)	11.1 (n=19)	13.3 (n=66)
7/1970	28.6 (n=473)	12.5 (n=77)	18.4 (n=123)	11.8 (n=19)	19.6 (n=54)
7/1970	30.9 (n=886)	15.2 (n=104)	19.3 (n=182)	7.1 (n=30)	15.5 (n=80)
8/1970	27.5 (n=721)	13.2 (n=121)	19.6 (n=183)	14.7 (n=43)	15.4 (n=45)
8/1970	30.8 (n=349)	18.0 (n=67)	n.a.	n.a.	n.a
7-8/1970	29.5 (n=2,429)	14.6 (n=369)	19.2 (n=488)	11.4 (n=92)	16.7 (n=179)

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- Logit model confirms that indicators of wealth are significantly related to a lower perceived probability of Allende victory.
- Predicted probability of expecting an Allende victory for an individual living in upper-middle class/luxury home and able to accumulate savings (our identikit of a financial investor): 13.7%
- Under some crude simplification assumption, we interpret this as the ex-ante probability of an Allende victory perceived by potential investors.
- The overall effect (given by $\frac{\Delta IGPA_t}{1-\pi}$) would then be -56%.

Why did the Allende election and subsequent coup have such enormous effects on stock market valuations?

Three possible (not necessarily mutually exclusive) explanations:

- confiscation of private capital stock;
- massive redistribution through wage increases (president had not much authority on tax policy, controlled by congress);
- expectation of a macroeconomic disaster due to poor economic management or disrupting opposition by capitalists (and foreign powers);

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Do growth expectations explain our results?

- Yearly returns on sectoral stock indices (retrieved from Global Financial Data) in the 1940-1968 period.
- We define growth sensitivity as the β of a sectoral stock price index with the time-series of real GDP growth.
- If the fall in prices after the 1970 election and/or the boom after the coup reflected poor growth prospects, stocks in more growth-sensitive sectors should have changed by a larger extent.
- Preliminary results (to be confirmed after obtaining a better sectoral classification of our firms):
  - No relation between growth sensitivity and the September 1970 fall in share prices.
  - A *negative relation* between growth sensitivity and after-coup price increases: growth sensitive stocks increased relatively less, probably because of the expectation of harsh austerity measures.

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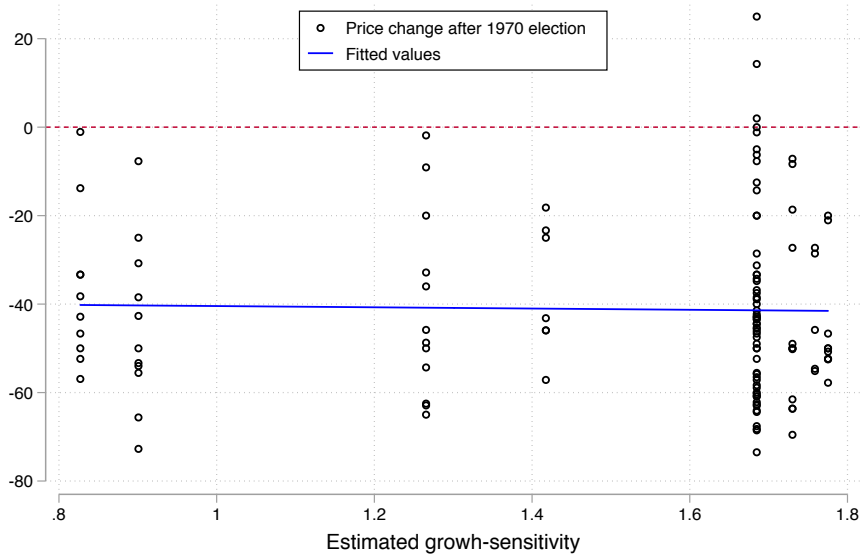
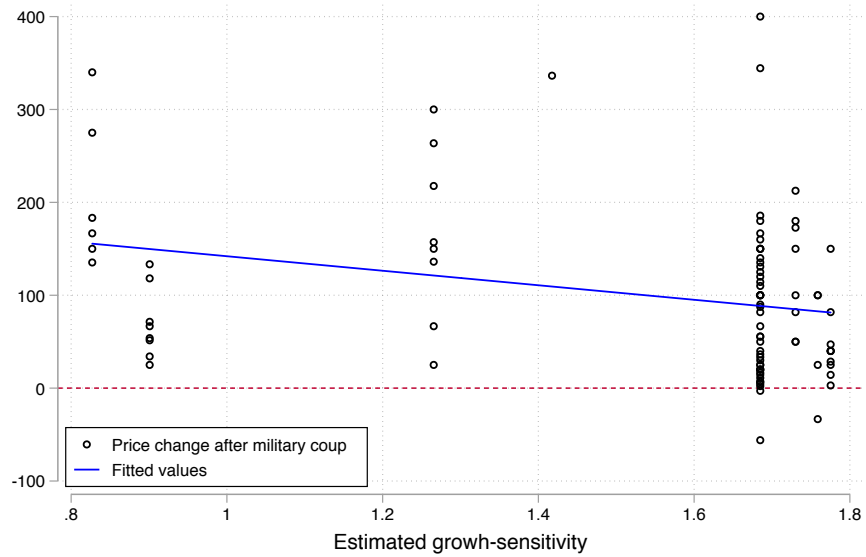
Growth prospects appear unlikely to explain our results.



(a) 1960 Presidential election



(b) 1973 military coup

- β: textiles 0.83; mining: 0.90; banking 1.26; insurance 1.42; industrials 1.68; metallurgy 1.73; utilities 1.76; agric. 1.77.
- More growth-sensitive stocks did not fall more after Allende election;
- if anything, they increased *less* than other stocks after the military coup (statistically significant), probably expecting harsh deflationary measures. (caution: these are preliminary results)

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Do expected wage increases explain our results?

- We use the 1976 input-output Table for the Chilean economy (19 sectors) in order to calculate the overall 'wage requirement' of each sector, defined as direct and indirect labor costs per unit (*peso*) of output.

$$\text{wage requirement} = \ell(I_n - A)^{-1} \tag{5}$$

- Then we match the 19 sectors in the IOT with our sectoral classification, in order to see if sectors with higher wage requirement displayed larger price changes after the two events (work in progress: we need better sectoral classification of our firms)
- Preliminary results:
  - No significant relation between wage requirements and price changes after the 1970 election;
  - Significant positive relation between wage requirements and price changes after the 1973 coup.

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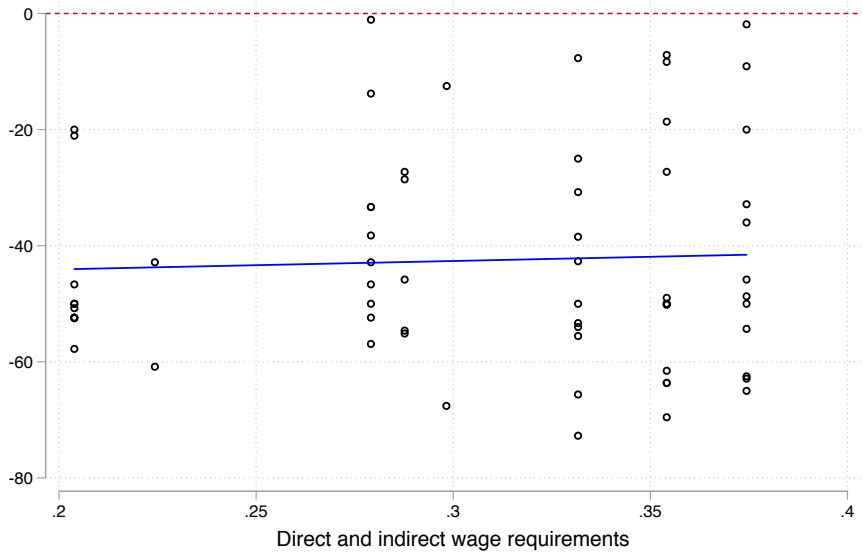
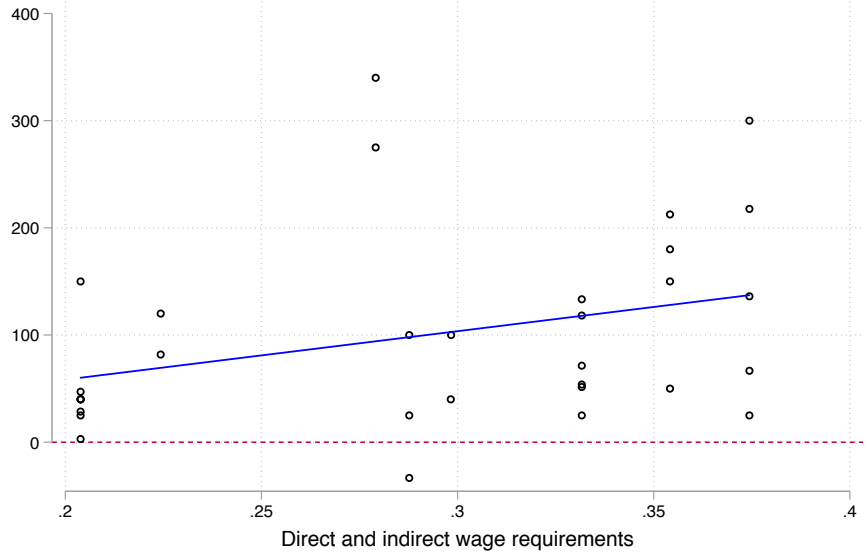
Expected changes in wages don't explain the fall after the 1970 election, but appear to have contributed slightly to the 1973 stock market boom



(c) 1960 Presidential election



(d) 1973 military coup

- Wage requirements: agriculture 0.20; 0.21 commerce; 0.22 food, drinks and tobacco; 0.28 textiles; 0.29 utilities; 0.30 paper and wood products; 0.30 Fishery; 0.33 Transport Equipment; 0.33 Mining; 0.35 Metallurgy and non-metal basic products; 0.36 Transport and communications; 0.37 Finance; 0.38 Construction; 0.44 Hotels, restaurants and other services;

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Conclusions

- Unexpected political shocks that imply substantial variation in economic institutions produce huge stock market effects.
- The effects we have found are of a different order of magnitude than those found in the previous literature, arguably reflecting much larger policy (and institutional) divergence.
- Stock market effects of this size are likely to signal substantial impacts on wealth inequality, growth and investment incentives.
- The huge effect of the 'Allende-shock' has probably been caused by fear of outright confiscation. This is consistent with the little differences across firms and sectors (UP had refused to provide a list of firms/sectors that would be nationalized) and with the results of our tentative analysis of possible channels.
- The stock market boom after the military coup was probably caused by an expected strengthening of private property rights, and partly by expected wage moderation. Growth prospects do not seem to have played a role: to the contrary growth-sensitive stocks jumped relatively less.

Supplemental materials

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Results of event-study estimation

Table 3: Effect of the 'Allende-shock' and of the 1973 coup on the IGPA index (Cumulative abnormal returns at different time-horizons)

	1970 election					1973 Coup				
	(k=1)	(k=5)	(k=10)	(k=15)	(k=20)	(k=1)	(k=5)	(k=10)	(k=15)	(k=20)
Constant mean return model	−21.99***	−36.22*	−54.28**	−63.50***	−65.11***	78.39***	70.19	50.40	61.07	56.55
	(0.04)	(20.51)	(21.83)	(23.09)	(24.63)	(0.14)	(72.59)	(79.40)	(80.15)	(81.79)
Autocorrelation-augmented	−22.87***	−50.67**	−64.14**	−69.75**	−67.96**	80.13***	72.6	47.11	56.81	52.2
	(0.24)	(25.30)	(27.25)	(29.73)	(31.10)	(0.32)	(84.45)	(83.58)	(84.83)	(84.55)
Global market factor-augmented	−22.0***	−36.20*	−54.25**	−63.22***	−64.78***	78.39***	71.27	51.20	62.38	57.77
	(0.06)	(20.41)	(21.74)	(22.92)	(24.40)	(0.15)	(73.18)	(80.53)	(81.85)	(83.24)
Autocorrelation and global market factor	−22.90***	−50.57**	−64.14**	−69.46**	−67.60**	80.14***	73.34	47.90	58.14	53.55
	(0.25)	(25.15)	(27.10)	(29.50)	(30.78)	(0.32)	(84.71)	(84.36)	(86.09)	(85.70)
Obs.	251	255	260	265	270	251	255	260	265	270

Robust standard errors in parentheses

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In the meanwhile dividends boomed. (A way to take wealth out of the country?)

Figure: Monthly real dividends paid by firms listed in Santiago