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

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Abstract

To study the effect of political and institutional changes on the economy, we look at share prices in the Santiago exchange during the tumultuous political events that characterized Chile in the early 1970s. We use a transparent empirical strategy, deploying previously unused daily data and exploiting two largely unexpected shocks which involved substantial variation in policies and institutions, providing a rare natural experiment. Allende's election and subsequent socialist experiment decreased share values, while the military coup and dictatorship that replaced him boosted them, in both cases by magnitudes unprecedented in the literature.

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12 September, 1970:

Kissinger: "The big problem today is Chile"

Nixon: "Their stock market went to hell"

1 Introduction

The election of Salvador Allende's socialist government in Chile in 1970 and its subsequent reversal by a military coup in 1973 provide a curiously unexploited opportunity to study the effect of institutional shocks on economic outcomes.[1] Unidad Popular (UP), the left-wing political coalition that supported Allende, promised, and after elected took steps to implement profound changes to economic institutions and the structure of property rights, towards the final goal of replacing capitalism with some form of socialism. The military coup ended Allende's socialist experiment and promised a return to pro-business policies, but now under authoritarian rule.[2]

From a research standpoint, the importance of these events lies not only in the large institutional and policy variation involved, but also in the fact that the outcome of the 1970 election was a surprise. Prior to the election, for example, the leading daily *El Mercurio* had published a number of polls showing Jorge Alessandri (a rightwing independent who had been president from 1958 to 1964) leading Allende by a considerable margin (Table 1). We will use data from vote expectation surveys to show that the perceived probability of a socialist victory was indeed rather low, particularly among potential shareholders (Tables 4 and 5).[3] Moreover, while an attempt to remove Allende from power was expected by many, an attempted military coup had already failed earlier in the year, so the success of the coup in September 1973 could not have been entirely anticipated.

Natural experiments allowing convincing identification of the effect of sharp changes in economic institutions on the valuation of assets seldom arise. As a result of Hotelling-

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[1] The epigraph is from a 12:32pm telephone conversation in Washington. Source: Library of Congress, Manuscript Division, Kissinger Papers, Box 364

[2] Major sources on the history of the Allende government and of the military coup are Stallings (1978); Sigmund (1977); Nef (1983); Larrain and Meller (1991)

[3] Besides the quantitative evidence that we will provide here, the fact that the Allende victory was largely unexpected is reported also in Sigmund (1977, pp. 106-110); Marash (1988); Navia (2004); Hersh (1983, p. 273); NSC (1970).

Downs pressures for platform convergence (Downs, 1957), in closely contested elections with uncertain outcomes party programs are rarely radically different when it comes to fundamental economic institutions. Non-electoral institutional shocks, such as those arising from a revolutionary transfer of power, are rarely unanticipated and are typically associated with other relevant changes that confound the pure 'institution shock effect', making identification virtually impossible.

To assess the stock-market reaction to these two shocks we employ daily data on the General Index of Stock Prices (IGPA) calculated by the Santiago exchange, a capitalization-weighted index that includes most listed companies. Historical daily data on the IGPA index is proprietary, and we purchased it from the Santiago exchange. We complement this information with newly digitized data on individual stocks.[4]

Figure 1 displays the IGPA in a long window around our period of interest. Having risen under Alessandri, stock market valuations had declined during the presidency of Eduardo Frei Montalva (1964-1970), a Christian Democratic leader who enacted redistributive policies, most notably in the areas of education, land reform and taxation (Ffrench-Davis, 1973; Kirkendall, 2004; Thome, 1971). They decreased further during Allende's socialist presidency, before experiencing a strong revival after the military coup.

2   The Unidad Popular electoral victory

Allende's margin of victory over the runner-up Alessandri in the 1970 election was just 1.34%.[5] Respecting a longstanding political tradition, Allende would later be confirmed as president.

In the first trading day after the election,[6] the IGPA fell by 22%. This constitutes

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[4]We hand-collected data on the daily prices of individual stocks listed in the Santiago exchange from copies of the Chilean newspaper *El Mercurio*, which we accessed in microfilm format at Yale University library.

[5]Allende 36.61%; Alessandri 35.27%; Tomic (Christian Democratic) 28.11%.

[6]This was Tuesday September 8: the market was closed the Monday after the election. Although the management of the stock exchange declared that activity had been interrupted because of "technical reasons" (*El Mercurio*, 1970b), contemporary observers countered that the stock market had actually been closed in an attempt to mitigate financial panic due to the election outcome. For example, the US magazine *TIME* wrote that "fearful of a stampede of scared investors, the Santiago stock market closed for a day for the first time since 1938.". (*TIME*, 1970)

the largest daily decrease in share prices ever recorded in Santiago in the period for which we have data (1961-2016). Compared with the empirical distribution of daily fluctuations in the IGPA until that day, this daily change is 25.8 standard deviations below the sample mean (16.1 standard deviations if considering the whole 1961-2016 period), and in absolute value is 2.5 times larger than the previous maximum deviation. Figure 2 displays trading days before and after the election on the horizontal axis (with the first trading day after the event equal to zero) and the IGPA index on the vertical axis. For ease of interpretation, a vertical red dashed line corresponds to the last trading day before the election.

Stock prices kept falling for around 15 trading days after the event, and stabilized at a much lower level around the end of the month. Between September 3 1970 (the last trading day before the election) and September 30, the IGPA fell by 48.6 percentage points.

The behavior of individual stocks suggests that the continuing substantial decline in share values in the days immediately after the 'Allende shock' was partly due to the fact that many stocks were not traded at all in the immediate aftermath of the election. According to the daily commentary of stock-market activity published on *El Mercurio*, the market was partly frozen in the first trading day after the election, with would-be sellers struggling to find buyers (*El Mercurio*, 1970a).

Indeed, 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 shares decreased on average by 40.8% that day, and then by a further 17.8% in the rest of the month. For those stocks, therefore, we do observe substantial delayed adjustment, but the bulk of the decrease happened immediately. The part of the adjustment which was not immediate may be explained by the acquisition of new information in the aftermath of the election – for example the growing certainty that Allende would be confirmed as President by the National Congress – and/or by the fact that it took some time for investors to fully 'digest' the consequences of an Allende presidency.

The 96 stocks that were not exchanged in the first trading day after the election,

but were then exchanged in the rest of the month, fell on average by 37.1 percentage points between election day and September 30.

Importantly, as shown in Table 2, the fall in share prices was broad, with little differences across industries. Among the seven sectors in which firms were classified by contemporary sources, the standard deviation of the percentage change in valuations is just 10.3% of the average change. This suggests that shareholders' concerns about property rights and profitability in publicly-held firms were pervasive across the whole economy, not just in sectors explicitly targeted for nationalization, such as banking, insurance and mining.

The 1970 presidential election also coincided with a record increase in dividends paid by firms listed in the Santiago Exchange. A large spike took place in the months of August, September and October 1970, as shown by the dashed line in Figure 3.[7] We also calculate a 12-months moving average (the blue line), in order to show that the spike in dividends persists also after netting out seasonal effects. This dividends' boom, that to the best of our knowledge has gone unnoticed in the literature so far, is likely to reflect the desire of many shareholders to take their wealth out of Chilean publicly-held firms.

3   The coup d'etat

On Tuesday 11 September 1973, a military coup deposed Allende's socialist government and established a military dictatorship. The Santiago exchange remained closed in the four trading days before the coup and for three trading days after.[8] The market reaction to this event was extraordinary. In the first trading day after the coup (Sep 17), the IGPA rose by almost 80 percentage points – as displayed in Figure 4. This daily change lies above the sample average registered until that day by 67.1 standard deviations, and is 5.5 times larger than the previous maximum. It remains, to date, the largest daily IGPA increase on record. Although a marked positive trend is visible in the 25 trading

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[7]We digitized historical data on (deflated) monthly dividends paid by firms listed in the Santiago stock exchange from Malamakis (1983).

[8]   Immediately after the coup, the exchange was closed – like most other trading activities – because of civil unrest. It is tempting to speculate that the closing of the stock market between September 5 and 10 (that is, in the days leading to the coup) was related to the forthcoming regime change, but we were unable to find any direct evidence to this effect.

days before the coup, which seems to indicate some anticipation effect, the timing and magnitude of the jump is clearly suggestive of a strong positive reaction of share prices to this regime change.

A possible concern about this evidence is that part of this jump may have been a nominal effect due to inflation. Although it is usually safe to assume inflation effects to be negligible when analyzing daily changes, in this case 13 days passed between the last trading day before the event (Sep 4) and the first after (Sep 17), and inflation in Chile was high at the time. Discounting the change in the IGPA index between Sep 4 and Sep 17 on the basis of the officially recorded monthly inflation rate for September 1973, we are still left with a 67% real increase in share prices in one trading day.[9]

4   Causality tests

In this Section we provide evidence supporting the hypothesis that the sharp market movements that we have documented can be interpreted as measuring the causal effect of the 'Allende-shock' and of the subsequent coup.

4.1   Comparison with the overall distribution of returns

As a first step, we ask how likely are these movements to just reflect the ordinary sources of variation in stock prices experienced in the Santiago exchange. To this end, Figure 5 compares the magnitude of the jumps observed after the two events with the overall distribution of IGPA daily changes. Clearly, both the Allende election and the coup coincided with unprecedented deviations from normally observed changes in prices.

4.2   Time-series analysis

Second, we perform a time-series analysis controlling for some potential confounders. Specifically, we control for autoregressive dynamics, domestic inflation and movements in the US stock market and international copper price (of which Chile was – and still is – by far the first world producer).

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[9]The officially recorded monthly CPI inflation rate for September 1973 is taken from Malamakis (1983). Using the CPI series provided by the OECD Main Economic Indicators (accessed in July 2017) yields an identical figure.

We regress the daily percentage change in the IGPA index (with respect to the previous trading day) on its lags, the change in the price level, the change in the US S&P 500 index and the change in the price of copper in the Chicago Mercantile Exchange (in US dollars).[10] We include a dummy equal to one in the first trading day after the event. We thus estimate the following regression:

$$\Delta IGPA_t = \alpha + \sum_{j=1}^{p} \delta_j \Delta IGPA_{t-j} + \sum_{j=0}^{p} \sigma_j \Delta SP500_{t-j} + \sum_{j=0}^{p} \phi_j \Delta P_{t-j} +$$
$$+ \sum_{j=0}^{p} \mu_j \Delta Copper_{t-j} + \beta D_t + \epsilon_t \qquad (1)$$

where $IGPA$ is the natural log of IGPA, P is the natural log of the Consumer Price Index, $SP500$ is the natural log of the US S&P 500 stock price index, $Copper$ is the natural log of the copper price and D is a dummy variable equal to one in the first trading day after the event considered,[11] and ϵ is the error term. Table 3 displays results from different specifications.

Column 1 provides estimates using the whole available sample period (1961-2016). Columns 2 and 3 (our preferred specifications) employ, for each event, a time-window including the 500 trading days before the event. In columns 4 and 5 we exclude the S&P 500 index and the copper price from the regression. In columns 6 and 7 we again use all control variables, but restrict the time-window to 250 trading days before each event. In all specifications, the lag length p is chosen on the basis of the BIC criterion (resulting in $p = 5$ when using the whole sample and $p = 1$ when using only a time-window before the events).

The effect of the 'Allende shock' and of the coup on the IGPA index remain virtually

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[10]Historical data on the S&P 500 index was retrieved from Yahoo Finance. The time-series for the daily spot price of copper (in US dollars per pound) in the Chicago Mercantile Exchange is from the CME and was downloaded from Quandl. The CPI index is taken from Malamakis (1983), which covers the 1960-1992 period, and interpolated with the CPI series from the OECD MEI for the post-1992 observations used in column 1 (the two series are virtually identical in the 1970-1992 period in which they are both available). Both before and after 1992, the domestic CPI is available only at the monthly frequency. To avoid abrupt jumps in the first day of each month, we produce a smoothed daily series through cubic splines interpolation. To perform the interpolation, we attribute the monthly average to the middle of each month. We take all variables in percentage changes because standard unit-root tests indicate that the outcome variable as well as the controls are non-stationary.

[11]In the specification which includes both events (column 1), we include two dummy variables.

unchanged across all regressions, and very close to the unconditional changes observed in the first trading day after the events (-21.88% and +79.20%, respectively). We conclude that US macroeconomic conditions, the international copper market and domestic inflation did not contribute in any meaningful way to the jumps in stock market values observed after the institutional shocks examined.[12]

4.3 Panel two-way fixed effects regression

Third, to control for the influence of potential global and regional common shocks not captured by the variables included in equation 1, we use major Latin American and global stock markets as a comparison group. Specifically, we include in the comparison group the MSCI world index and the US, Mexican and Brazilian stock markets.[13]

Figure 6 displays this exercise graphically, showing that that the shifts in share valuations after our events of interest are not explained at all by global and regional trends. Following this approach, we estimate a two-way fixed-effects regression in a panel composed by Mexico, Brazil, United States and Chile. We estimate the model in two versions: (a) using deflated stock indexes as the independent variable (b) using nominal indexes as the independent variable and including the price level as a control variable. Observations are at a monthly frequency.[14]

The first version implies estimating the following regression

$$\Delta r_{it} = \alpha_i + \delta_t + \beta_1 D_{1it} + \beta_2 D_{2it} + \epsilon_{it} \tag{2}$$

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[12]A potential concern regarding this exercise is that copper price changes are partly endogenous to the performance of Chilean mining firms, both because of reverse causality and unobserved confounders. In a robustness test not reported here (available from the authors upon request) we find that results are unchanged if the copper price is excluded from the regressions or substituted with the index of global demand for industrial commodities developed by Kilian (2009).

[13]The MSCI World Index was retrieved from www.msci.com; the US and Mexican indexes are taken from the OECD Monthly Monetary and Financial Statistics (MEI); the Brazilian index is the IBOVESPA (downloaded from the website of the Institute for Applied Economic Research (Ipea) at www.ipeadata.gov.br). All indexes are deflated with the Consumer Price Index. The World CPI Index was downloaded from the International Monetary Fund International Financial Statistics (IFS); the US and Mexican CPIs were taken from the OECD Main Economic Indicators (MEI); the CPI for Brazil was downloaded from Ipea.

[14]Stock indexes for Mexico and Brazil were not available at a higher frequency.

While the regression corresponding to the second version is

$$\Delta y_{it} = \alpha_i + \delta_t + \gamma \Delta CPI_{it} + \beta_1 D_{1it} + \beta_2 D_{2it} + \epsilon_{it} \tag{3}$$

Δr is the percent change in the deflated stock index; Δy is the percent change in the nominal stock index;[15] ΔCPI is the percent change in the consumer price index; α_1 are country-specific intercepts and δ_t are (monthly) time-dummies. D_1 is an indicator for the Allende electoral victory (ie, a dummy equal to one in Chile in September 1970), while D_2 is an indicator for the coup (equal to one in Chile in September 1973). The estimation period is 1970m1-1975m12.

The resulting estimated effect of the 'Allende shock' on monthly stock valuations is -45% (cluster-robust standard error: 2.1%) when estimated from eq.2 and -52% (cluster-robust standard error: 2.1%) when estimating eq. 3. The effect of the military coup is 80.8% (cluster-robust standard error: 3.3%) from eq. 2 and 100.8% (cluster-robust standard error: 2.8%) from eq.3. We thus conclude that using these major American stock markets as a control group confirms the effect sizes inferred from the IGPA daily changes.

5   Gauging anticipation effects

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 changes in stock market valuations that provide the basis for our analysis are bound to underestimate the effect of these shocks to political institutions: market valuations before the election must have had already internalized some non-zero probability of a socialist victory; similarly, before the 1973 coup some anticipation effect may have been due to awareness of the increasing possibility of an event of this type, given the political and economic context, or to private information. Unfortunately, there is no information allowing quantification of the extent of the anticipation effect in the

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[15]We take stock indexes in percentage changes because a Im-Pesaran-Shin unit-root test for panel data indicates that both nominal and deflated stock indexes are likely to be non-stationary (the p-value for the null hypothesis that all panels contain a unit root is 0.99 for nominal indexes and 0.49 for deflated indexes in our estimation period.)

case of the military coup. On the other hand, surveys conducted before the 1970 election allow some quantification with respect to the 'Allende shock'. In what follows, we use data from vote expectation surveys to obtain a measure of the perceived probability of a socialist victory. We focus on the wealthy individuals that were likelier to hold shares. We then use this information to recover an approximate estimate of the overall effect of the 'Allende shock'. We show in the appendix that voting intentions surveys, while clearly inferior to vote expectation data for our purposes, yield similar estimates.

5.1 Voting expectations and perceived probability of Allende victory

The value of the IGPA in the day before the 1970 election can be seen as a weighted average of expected valuations conditional on the three possible election outcomes, with weights given by perceived probabilities.[16] As a result, we can recover an estimate of the overall effect as the observed price change divided by the estimated surprise (defined as one minus the ex-ante perceived probability of the event). We use the vote expectation surveys conducted by Eduardo Hamuy, founder in 1957 of an innovative public opinion research program at the University of Santiago (Cordero, 2009, pp. 75-76), to obtain an approximate measure of the 'surprise'.

Hamuy's surveys asked (mostly) residents of the Santiago metropolitan area, among other questions, "who do you think will win the upcoming presidential election?".[17] Results are reported in Tables 4 and 5.[18] In the two months before the election, the share of responders predicting an Allende victory has been stable and near 30% overall (second column of Table 5).[19]

Importantly, the share predicting an Allende victory is significantly lower among the wealthier individuals who were much more likely to hold shares in the Santiago

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[16]As usual in the literature, in this discussion we are abstracting from risk aversion, as we have no measure of the degree of risk aversion of investors in the Santiago stock market in that period.

[17]Our translation. The original question in spanish was: "En su opinion, cual de los candidados cree usted que generà la proxima eleccion presidencial?". In some of the surveys the wording is slightly different: "En este momento, cual cree usted que es el candidato que tiene mejores posibilidades de triunfo?".

[18]We downloaded Hamuy's datasets from the online archive of the Roper Center for Public Opinion Research (Cornell University).

[19]Graefe (2014) shows that vote expectation surveys are among the best predictors of electoral outcomes, and that their role is comparable to that of prediction markets. Favorable results on the predictive power of voting expectation surveys are found also by Rothschild and Wolfers, 2012.

stock market. This is shown in Table 5, where we use four alternative proxies for wealth, based on the information contained in Hamuy's surveys. In the third column, we define as wealthy an individual who declares to live in a 'luxury mansion', 'luxury apartment' or 'upper-middle class home' (the remaining categories are 'lower-middle class', 'modest', 'poor' and 'very poor'). In the fourth column, we look at socio-economic status (as assessed by the interviewer), including those who are classified as displaying a 'very good' or 'good' socio-economic level (other categories are 'regular', 'bad' and 'very bad'). In the fifth column we use a more restrictive classification, including only those with 'very good' socio-economic level. Finally, in the last column we consider those who declare that their income 'is well sufficient and allows them to save some money' (excluded categories are 'sufficient, no difficulties'; 'not sufficient, some hardship'; 'not sufficient, great hardship'). The fact that wealthier individuals were less likely to predict an Allende victory clearly holds across different surveys and different proxies for wealth. In surveys performed in the last two months before the election, during which time figures appear rather stable, the share predicting an Allende victory among the wealthy varies between 11.4% and 19.2% depending on the proxy employed for wealth, with a simple average of 15.5%. We employ a logit model to estimate the predicted probability of expecting an Allende victory for an individual with an upper-middle class or luxury home and a salary sufficient to accumulate savings.[20] The resulting estimate is 13.7%. We interpret this as the ex-ante probability of an Allende victory perceived by potential investors.[21] Combined with the observed 48.6% cumulative fall in share prices in the aftermath of the election, this suggests an overall effect around 56%.

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[20]The logit model indicates that the socio-economic status as assessed by the interviewer provides no significant explanatory power, after controlling for house type and salary (the p-value on the socio-economic status variable is 0.94, while coefficients on the house type and salary variables are significant with $p < 0.01$).

[21]Of course, the assumption that the average perceived probability of the event among respondents is equal to the share of respondents 'expecting' the event is a crude one. However, a more sophisticated approach would require information on the shape of the distribution of underlying perceived probabilities, which is not available.

6 Conclusions

The evidence we have presented contributes to a growing literature on the effect of political shocks on financial markets (e.g. Dube, Kaplan, and Naidu, 2011; Snowberg, Wolfers, and Zitzewitz, 2007) by documenting the effect of one of the sharpest electoral shocks in recent history and its subsequent reversal.

Of course, the price change we observe after each event equals the overall effect of the institutional shock times the surprise (defined as one minus the ex-ante probability of the event). The overall effect of expected policy differences between a Alessandri regime and a UP regime is therefore larger than the 48.6% fall in prices observed after the election. Importantly, the evidence we have presented is not limited to voting intention polls, but includes data on vote expectations by social class. As we have shown, pre-election surveys suggest that the perceived ex-ante probability of a socialist victory was around 14% among the wealthy individuals who were likelier to trade stocks. The implied overall effect would then be a 56% decrease in values. The marked increase in stock prices prior to the coup may reflect an analogous internalization of some positive likelihood of a regime change. If this is the case, the difference in stock market valuations associated with the two regimes is considerably greater than the 80 percent one-day change in stock prices.

Even without taking account of the likely partial internalization of some probability of both events, the stock price changes we have observed are of a different order of magnitude than those found in the previous literature, which mostly focused on US elections, arguably reflecting much larger policy divergence in the events we study. Stock market effects of this magnitude imply that institutional/political regime changes can have very substantial impacts on investment incentives, wealth inequality, and other determinants of growth and distribution.

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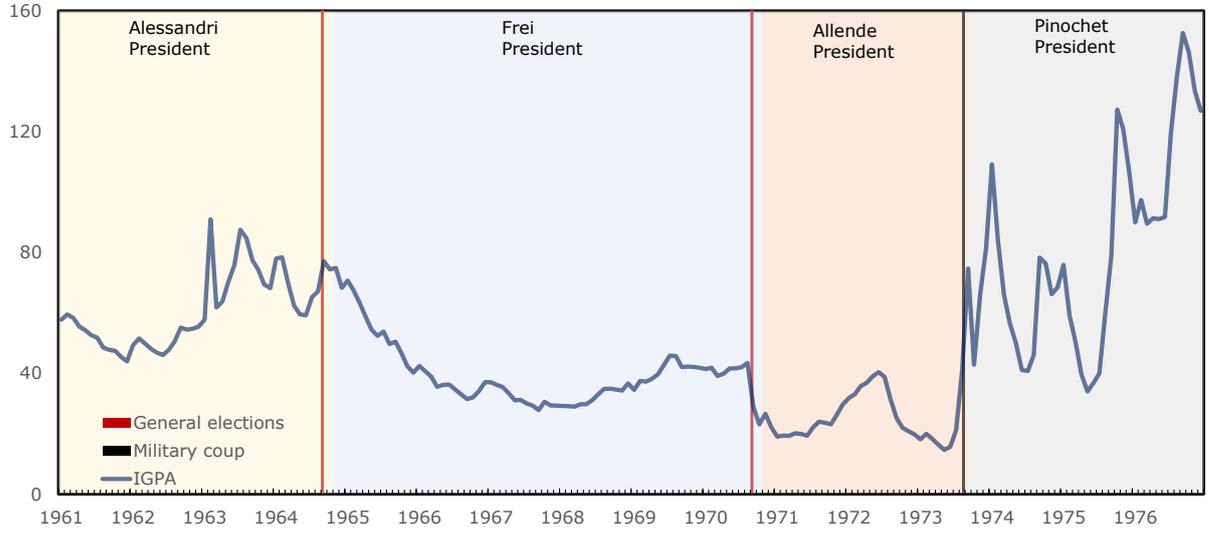Figure 1: Deflated IGPA index (monthly, 1976=100)

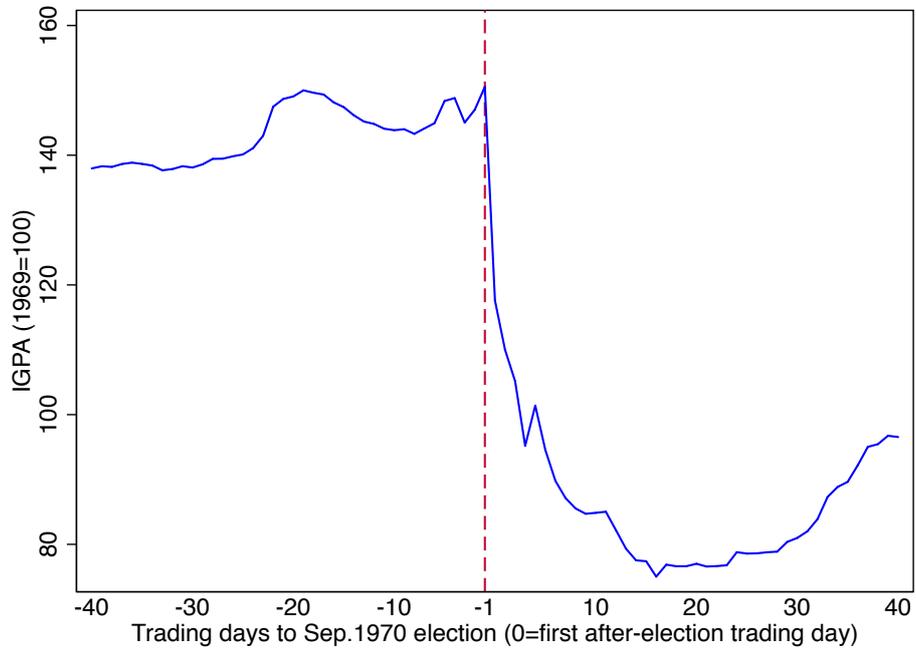Figure 2: IGPA index around the September 4 1970 election

vertical red dashed line = last trading day before the election

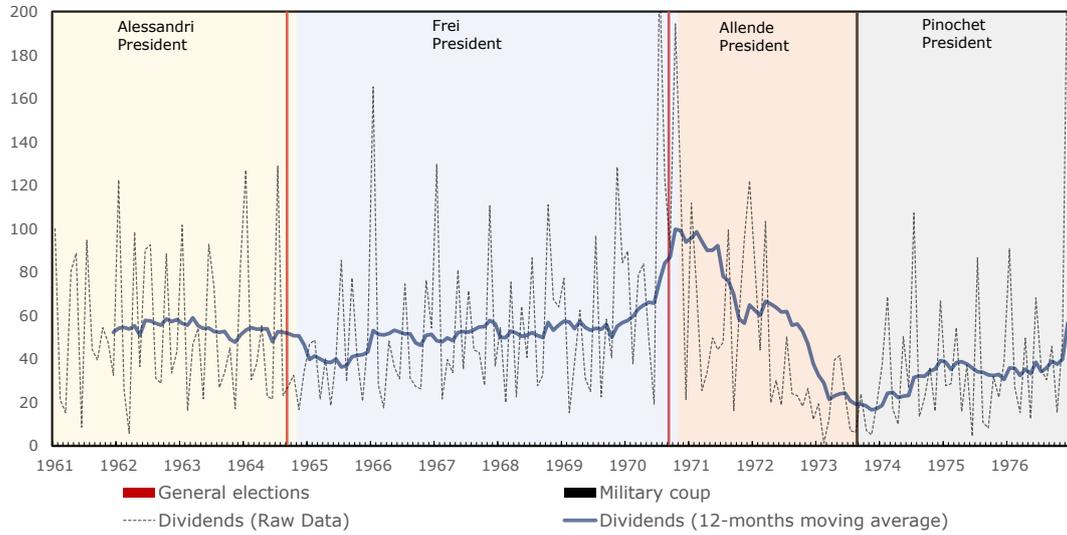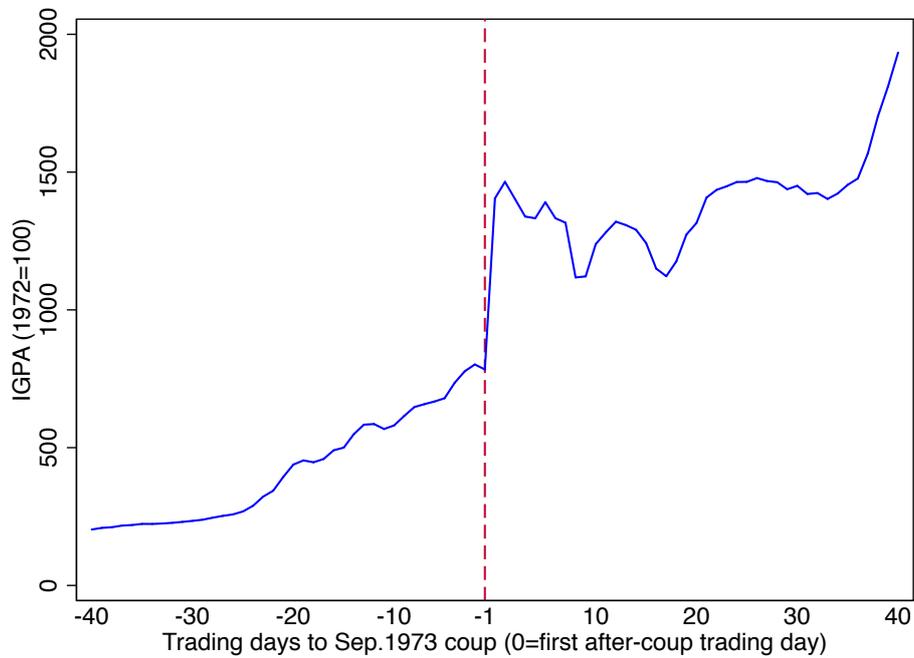Figure 3: Monthly real dividends paid by firms listed in Santiago

Figure 4: IGPA index around the September 11 1973 coup

vertical red dashed line = last trading day before the coup

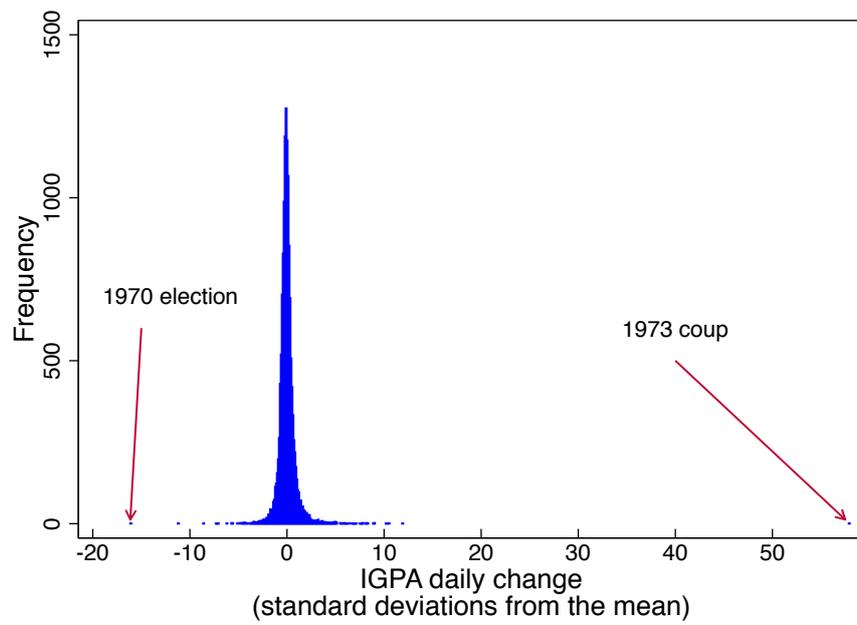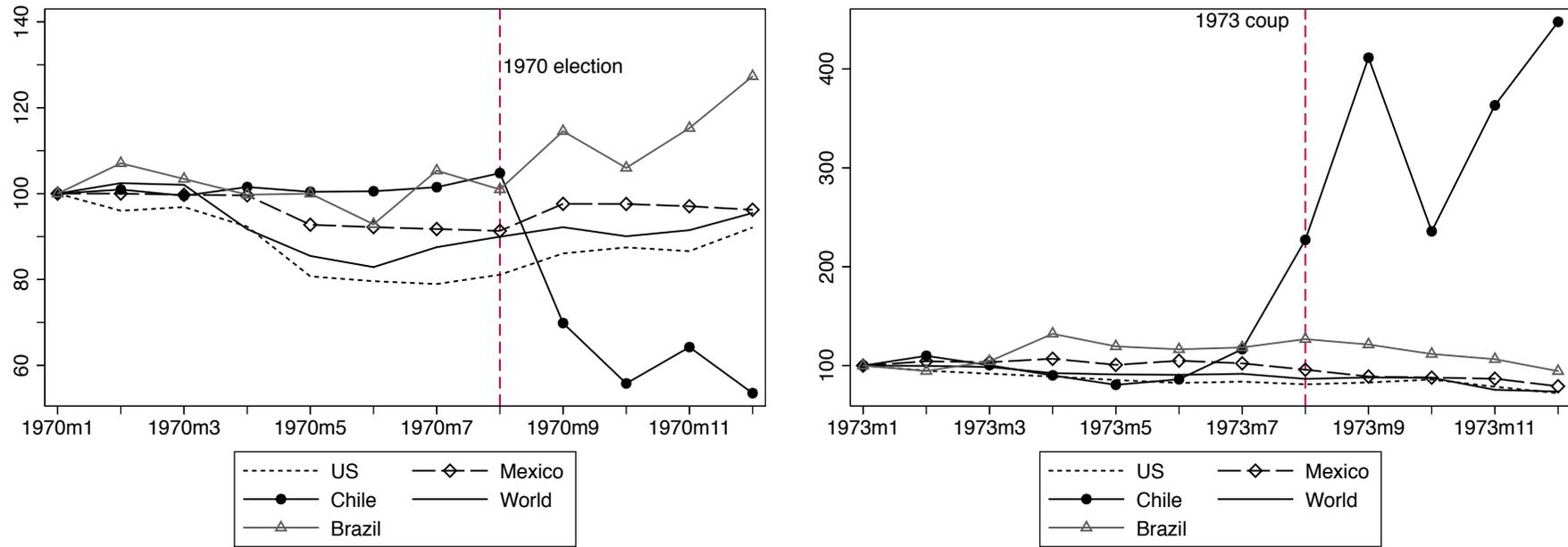Figure 5: Empirical distribution of IGPA daily percentage changes (1961-2016, bin width 0.10)

Figure 6: Deflated Stock Indices

vertical red dashed line = last monthly observation before the event

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

Table 2: Average price changes of stocks traded in the Santiago Exchange

	Sep 1970 presidential election				Sep 1973 military coup			
	first trading day (Sep 8)		until Sep 30		first trading day (Sep 17)		until Sep 30	
	n	change	n	change	n	change	n	change
All	32	-40.8%	128	-41.2%	48	85.4%	93	112.3%
Agriculture	3	-36.2%	10	-45.4%	5	56.3%	10	47.0%
Banking	5	-38.7%	10	-47.8%	5	102.1%	6	171.3%
Insurance	0	n/a	7	-37.0%	1	336.4%	1	336.4%
Metallurgy	5	-49.0%	12	-43.2%	3	113.2%	8	124.6%
Mining	2	-65.4%	11	-45.1%	1	27.3%	8	69.3%
Textile	1	-7.7%	10	-36.9%	4	89.0%	7	378.6%
Manuf. & others	16	-38.6%	68	-39.8%	29	77.5%	53	83.1%

Table 3: Robustness time-series regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: IGPA index % change						
Allende	-23.16	-22.16		-22.13		-22.90	
	(0.15)	(0.53)		(0.54)		(0.24)	
Coup	78.69		81.10		80.54		81.18
	(0.52)		(0.65)		(0.38)		(0.81)
Obs.	13,905	501	501	501	501	251	251
R^2	0.38	0.60	0.87	0.60	0.87	0.85	0.89
Window	1961-2016	500 obs	500 obs	500 obs	500 obs	250 obs	250 obs
IGPA lags	✓	✓	✓	✓	✓	✓	✓
Inflation	✓	✓	✓	✓	✓	✓	✓
Copper	✓	✓	✓			✓	✓
S&P500	✓	✓	✓			✓	✓

All control variables taken in percentage changes; Robust standard errors in parentheses.

Table 4: Hamuy's pre-electoral surveys: answers to the questions *'Who would you vote for if the presidential election were to be held next Sunday'* and *'Who do you think will win the upcoming presidential election?'* – Whole sample

month	n	voting intention				expected winner			
		Tomic	Alessandri	Allende	no answer	Tomic	Alessandri	Allende	no answer
1/1969	677	18.3%	51.7%	13.3%	16.7%	-	-	-	-
2/1969	853	23.7	43.6	17.9	14.8	-	-	-	-
7/1969	537	22.9	46.2	18.2	12.7	-	-	-	-
3/1970	625	27.8	39.5	19.0	13.6	27.7	46.6	13.0	12.8
3/1970	298	31.2	33.6	24.5	10.7	25.5	43.3	16.4	14.8
5/1970	679	28.7	35.8	26.1	9.4	25.2	43.9	20.6	10.3
6/1970	685	38.5	25.1	25.7	10.7	39.9	25.0	23.2	12
7/1970	473	34.5	33.6	26.4	5.5	27.9	31.7	23.9	16.5
7/1970	886	26.0	35.4	33.2	5.4	23.7	39.3	28.1	8.9
8/1970	721	25.7	33.8	30.2	10.3	28.4	31.9	22.9	16.8
8/1970	349	26.7	37.0	31.5	4.9	26.9	35.0	27.5	10.6

Sample of adult residents of metropolitan Santiago (except for the first July 1970 survey and the June 1970 one, which were both taken in the 'Valparaiso and Vina del Mar' area). Face to face interviews. Source: CEDOP/Hamuy Archive. Datasets downloaded from the Roper Center for Public Opinion Research website.

Table 5: 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
tot. 7-8/1970	29.5 (n=2,429)	14.6 (n=369)	19.2 (n=488)	11.4 (n=92)	16.7 (n=179)

Shares calculated after excluding undecided and no answers. n = size of the subsample (including undecided and no answers). Sample of adult residents of metropolitan Santiago (except for the first July 1970 survey and the June 1970 one, which were both taken in the 'Valparaiso and Vina del Mar' area). Face to face interviews. Source: CEDOP/Hamuy Archive. Datasets downloaded from the Roper Center for Public Opinion Research website.

Appendix: Voting intention surveys and probability of Allende victory

We have reported voting intentions from Hamuy's data (Table 4) and from other surveys performed in the months leading to the 1970 election and published by the leading newspaper *El Mercurio* (Table 1). Not a single one of the Hamuy surveys has Allende as the front runner, although he clearly gained ground after his candidacy was confirmed by the UP in early 1970. Alessandri had announced his candidacy earlier, in 1969 (Navia and Osorio, 2017, p. 10).[1]

Concerning the other surveys, out of 11 opinion polls taken between April 1970 and the election (two at the national level, six taken in the 'Gran Santiago' area, two taken in Concepcion and Talcahuano, one taken in Valparaiso and Vina del Mar), only one (taken between July 11 and July 14 in Concepcion and Talcahuano) had Allende closely winning, while 9 (including the two taken at the national level) had Alessandri winning and 1 predicted a Tomic victory. The last national poll taken before the election indicated a 11.1% margin between Alessandri and Allende.

It is interesting to ask if the voting intention surveys in Table 1 (conducted independently of those of Hamuy, as far as we know) imply an ex-ante perceived probability of Allende victory broadly consistent with Hamuy's expectation surveys data (in which, in the overall population, 30% of responders expected an Allende victory). Of course this calculation requires some rule for inferring probabilities of victory from voting intentions, which is not straightforward. To provide a rough calculation, we use data from surveys and prediction markets concerning the 2000 Mexican presidential election to infer a relation between margins in voting intentions and probabilities of victory, and then apply this relation to the data in Table 1.

The Mexican electoral system can be considered analogous to the one holding in

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[1] Figure 1 in Navia and Osorio (2017, p. 11) appears to suggest that Allende suddenly gained a substantial lead in Hamuy's second August 1970 survey. This is not what is found in the Hamuy surveys as available at the Roper Center website (which is also the source cited by their article). We believe that this is a mistake caused by the fact that, as of August 10 2017 (when we last accessed the website), the ASCII version of the dataset available in the Roper Center website appeared to be mistaken, given that results, number of observations and number of options for each question did not coincide with the metadata and with the original documents reporting results (which the Roper Center also provides in scanned PDF format). The SPSS version of the dataset, instead, appears consistent with the metadata and the PDFs, and it contains the figures that we have reported in Table 4.

Chile in 1970: the president is elected in a multi-candidate election and a plurality of votes is sufficient to win the presidency.[2] Besides the electoral system, the 2000 Mexican election also shares other similarities with the Chilean 1970 election: three candidates received more than 10% of the vote each, the election was won by an opposition party which had never been in power before, and the outcome was largely a surprise. The Iowa Electronic Markets (IEM – one of the most popular prediction markets) provides data on implied probabilities of victory for the 2000 election in Mexico.[3] We match the IEM data with data on voting intentions from the Mexico 2000 Panel Study (as reported in Klesner, 2005) to infer a relation between shares in voting intention surveys and probabilities of victory.

According to the Mexico 2000 Panel Study, as of June (the election was held on July 2), 35% of respondents supported the incumbent PRI, 23% the PAN (who would eventually win the election) and 10% the PRD, while the remaining 32% of respondents supported none or were undecided. The margin between the PRI and the PAN candidates (after excluding the undecided) was 17.6%. The probability of a PAN victory implied by the IEM prediction market before the election was around 27%, while the probability of a PRI victory was around 73%. The ratio between the margin in perceived probabilities and in voting intention shares was therefore 2.6. If we apply the same ratio to the Chile 1970 election, the implied probability of an Allende victory would be 26%. Reassuringly, this figure is quite near to the share of responders expecting an Allende victory in the Hamuy's vote expectation surveys which we use as our main source (30%).

References

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[2]The US system, on which prediction markets data is most abundant, is substantially different, because of the role of the electoral college, and because of the consolidated two-party system, which generates races with only two competitive candidates.

[3]The 2000 election is the only Mexican presidential election covered by the IEM so far.

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