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**THE POLITICAL VALUE OF LAND:
DEMOCRATIZATION AND LAND
PRICES IN CHILE**

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ABSTRACT

The Political Value of Land: Democratization and Land Prices in Chile*

Though models of political economy suggest that changes in political institutions, such as democratization, should have large effects on policies and economic outcomes, the empirical literature finds ambiguous results. It is important, however, to 'unbundle' democratic reforms into more specific changes, for instance the introduction of secrecy of balloting, and be more specific about the mechanisms linking these to economic outcomes.

To this end we develop a simple model of the economic consequences of the absence of a secret ballot. While providing workers with employment, landlords can also impose some degree of political control. When voting is not secret, landlords can dictate who their workers should vote for. As votes are used by the landlords to accumulate political rents, vote control increases the demand for labor and for land. The introduction of secret ballot should lead to a fall in the price of land in those areas where patron-client relationships and vote control were the strongest.

We test the predictions of the model by examining in detail the evolution of land prices in Chile around May 31st. 1958, for which we collected original data. A characteristic of rural Chile at this time was the *inquilinaje* system, by which a worker, the *inquilino*, entered into a long term, often hereditary, employment relationship with a landlord, and lived on his landlord's estate. We show that the introduction of the secret ballot in 1958 had implications for land prices which are perfectly consistent with the predictions of our model. Political rents represented 25% of the value of the land in Chile prior to 1958.

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The Political Value of Land: Political Reform and Land Prices in Chile[*]

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1. Introduction

The most basic claim of political economy is that the political process matter for government policy, economic institutions and resource allocation. This process is shaped by political institutions which help to determine which agents have agenda setting power, how preferences are aggregated and who the veto players are. If this conception is correct, then changes in political institutions, by re-allocating power and authority, ought to have important implications for policy, institutions and resources allocation.

The empirical evidence on this topic is surprisingly unsettled. On the one hand, the current conventional wisdom (Barro, 1997) is that there is no robust effect of democracy on economic growth (though see Persson and Tabellini, 2006, 2008). In addition Gil, Mulligan and Sala-i-Martin (2004) have claimed that democracies and dictatorships have the same policies, at least in some dimensions (see also Cheibub, 1998). On the other hand, other studies report significant effects of democracy on inequality (Rodrik, 1999), on life expectancy (Besley and Kudamatsu, 2006, Kudamatsu, 2006), on education (Baum and Lake, 2003, Lindert, 2003, Brown and Hunter, 2004, Avelino, Brown and Hunter, 2005, Stasavage, 2005) and on electricity consumption (Brown and Mobarak, 2009). More recent studies have begun to look for redistributive effects of democracy conditional on other circumstances, for instance state capacity (Soifer, 2009) or the strength of elites at the time of transition (Albertus and Menaldo, 2009). Relatedly, Bond, Barndt, Gerring and Moreno (2005) argue for an important role for the history of democracy in a country. As with the statistical literature, the case study evidence is similarly ambiguous. For example, while Lapp (2004) argues that democratization in Latin America stimulated land reform, other studies emphasize popular disillusion with democracy for failing to induce social or policy change (e.g. Mainwaring, Bejarano and Pizarro Leongomez, 2006, perhaps because democratic political parties are 'captured' see Coppedge, 1994, for the Venezuelan case).

There seem to be three main problems with this work. First, they typically rely on aggregate cross-country comparisons. Second, they are not specific about

the mechanisms that link democracy to particular social or economic outcomes. Third, they focus on simple dichotomies between democracy and authoritarianism even though much evidence suggests that institutional variation within democracy is of great importance. For instance, while Argentina had universal male suffrage after the promulgation of the 1853 Constitution the passing of the Saenz Peña Law in 1914 was of greater consequence. The Law aimed to eliminate electoral corruption and fraud, but it destabilized the political status quo and led to the coup of 1930 (Smith, 1978). In addition, Besley, Persson and Sturm (2010) show that the abolition of literacy tests and poll taxes by the Voting Rights Act in 1965 led to large changes in taxation and economic performance in the US South by facilitating the voting of Black people. Further, Ansolabehere and Snyder (2008) and Bruhn, Gallego and Onorato (2009) show that legislative malapportionment in the US and elsewhere has important implications for public good provision and the distribution of government expenditures.

In this paper we focus on the economic consequences of the introduction of the secret ballot in Chile in 1958. Prior to this date the absence of a secret ballot led to a lot of coercion in voting, particularly in rural areas (Baland and Robinson, 2008). Landlords used their economic control over dependent workers, known as *inquilinos*, to determine who they voted for, a practice which was feasible given that voting was in effect observable. We build a simple model which predicts that prior to 1958, the political benefits that accrued to landlords from controlling the votes of their workers, would be capitalized in the land price. The theoretical model predicts that the introduction of a secret ballot ought to lead to a fall in the price of land. We then use monthly data on land prices between August 1956 and December 1960 and show that the empirical predictions of our model are highly consistent with the data. In particular, we find that prior to the introduction of the secret ballot land prices were systematically higher in provinces where *inquilinos* formed an important part of the labor force, but fell dramatically in exactly the same provinces after the 1958 electoral reform. We also present a variety of other pieces of evidence which support our interpretation, and discuss the close association that existed before 1958 between landownership, the employment of *inquilinos* and right-wing support.

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Our evidence therefore is consistent with political reform, in the form of the introduction of the secret ballot, having a significant impact on relative prices, and in consequence resource allocation. The contribution of this research to the literature is that it shows the advantage of conceptualizing how authoritarian political practices worked and using that to derive a specific prediction about the impact of the introduction of a democratic reform using micro data. There may of course be limits to the external validity of the findings. For example, in the Latin American context, it is possible that 'authoritarian practices' can survive the introduction of a secret ballot (O'Donnell, 1993, Gibson, 2005, Acemoglu, Robinson and Santos, 2009). A notable difference of Chile was that it developed a much more effective and strong central state than other Latin American countries which allowed it to effectively implement the reform.

This research builds on the paper of Baland and Robinson (2008) who provided the first formal analysis of how employment may imply political control in the absence of a secret ballot. They developed a model of employment under moral hazard, where landlords are conceding rents to workers as part of an optimal labor contract. When voting is not secret, landlords control the voting behavior of the worker. The focus of their paper was on the microfoundations of political control and testing empirically for the political changes their model predicted would be the consequence of the introduction of the secret ballot.

Related literature also includes Summerhill (1995) developed a simple model of the idea that political rents accrue to landowners, with an application to the nineteenth century Brazil. Dekel, Jackson and Wolinsky (2008, 2009) developed a model of vote buying and studied how the equilibrium price of a vote relates to the underlying fundamentals and institutions. They did not examine the consequences of vote buying for asset prices nor consider the comparative statics of reform. Finally, Naidu (2009) shows that the disenfrachisement of blacks in the US South in the 1890s led to an increase in land prices, though through the mechanism of lower tax rates on landowners.

2. Political control and the Employment Relation

We first present a simple model to explore the link between land prices and political rents. Consider an agrarian economy with $n + \ell$ agents: ℓ landlords and n workers. The workers have no access to the capital market. There are L units of land available, owned by the landlords. Workers have no land. To simplify notation we assume that all landowners are endowed with the same amount of land s, with $s = L/\ell$.[1] There is a single produced consumption good which is chosen as numeraire and has its price normalized to unity. The production function of a farm using s units of land and employing m workers is $F(s, m)$, which is strictly increasing in both arguments, concave and exhibits constant returns to scale. We let $f(\frac{s}{m}) = F(s, m)/m$ stand for the output per worker on such a farm. All agents have the option to be self-employed and earn a real income of $\underline{w}$.

We assume that when working for a landlord, workers earn a real wage, w, which is higher than their reservation wage, $\underline{w}$. Such rents may arise for a variety of reasons, for instance to induce workers to exert the optimal level of effort when working. Let R denote the amount of labor rent that a landlord must concede to each of his workers to induce optimal effort: $R = w - \underline{w}$.[2]

We now consider voting behavior and imagine that agents also have ideological preferences, so that each agent gets an increase in utility equal to σ when he can freely vote for the party or politician of his choice. To simplify, assume that workers prefer the left-wing party, while the landlords prefer the right-wing party. Utilities are linear in income, so that the utility for an agent working for a landlord and voting freely is given by:

$$U^w = \underline{w} + R + \sigma, \tag{2.1}$$

while that of a self-employed worker voting freely is given by:

$$U^{se} = \underline{w} + \sigma. \tag{2.2}$$

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[1]This assumption is irrelevant to the results described below as we assume constant-returns to scale. Under decreasing returns to scale, access to the capital market by right-wing agents would make the distribution of land equal across farms.

[2]For a more detailed model of the labor contracts offered to *inquilinos* see Sadoulet (1992) and Baland and Robinson (2008).

Political parties buy votes, and propose a price per vote equal to p, which we consider as exogenously given here. (One should think of the type of favors that can be exchanged for votes quite generally. Only in some cases will this actually be a transfer of income.) We now argue that the threat of taking away a worker's rents can be used by the landlord to control his vote. For this to be true, the worker should find it optimal to work for the landlord and vote the way he wants him to, which implies that the utility he gets there is (weakly) greater than his utility as a self-employed agent selling his vote to whichever party he wishes:

$$\underline{w} + R \geq \underline{w} + p + \sigma. \tag{2.3}$$

Because the employer is already giving rents to the worker, if $R \geq p + \sigma$, the threat of withdrawing these rents also allows him to control his voting behavior. Employment does not simply generate profits, it also gives *power* to control the behavior of others.[3]

We now consider how the presence of vote buying influences market clearing and the determination of factor prices. We first consider the optimal demand for labor in a farm of size s with m workers. When workers are politically controlled, profits are,

$$f\left(\frac{s}{m}\right) m - wm + pm \tag{2.4}$$

The first term in (2.4) is revenues, the second the expected wage bill, and the third the political rents that the landlord gets from selling the votes of his m workers at the price p. The optimal demand for labor is determined by the first-order condition with respect to m,

$$\left(f\left(\frac{s}{m}\right) - f'\left(\frac{s}{m}\right)\frac{s}{m}\right) - w + p = 0 \tag{2.5}$$

The equation (2.5) implicitly defines the optimal demand for labor as a function of parameters, which we write $m(s, p, w)$. As landlords compete to have access to land, in equilibrium land prices are such that profits are zero:

$$\left(f\left(\frac{s}{m(s,p,w)}\right) - w + p\right)\frac{m(s,p,w)}{s} = \pi \tag{2.6}$$

---

[3]For a more elaborate microfoundation see Baland and Robinson (2008).

Equation (2.6) implies the following result.[4]

Proposition 2.1. *In equilibrium the price of land incorporates political rents.*

Acquiring land is desirable not only for productive purposes, but also for the political rents attached to the political control of the workforce employed on it. Equilibrium prices on the land market reflect this mechanism. As a consequence, a political reform with stops votes being bought and sold, such as the introduction of an effective secret ballot, removes the ability of landlords to sell the votes of their workers and has the following implications:

Proposition 2.2. *The introduction of a secret ballot leads to a fall in the price of land.*

To see this result, note that political reforms remove the price of votes from (2.5) and (2.6). The introduction of a secret ballot stops vote buying and therefore the vote share of the right-wing party and the demand for labor by landlords also fall.

We are now in a position to discuss some of the assumptions made. First, note that when condition (2.3) does not hold, labor rents are not large enough to enable the landlord to control voting. To elicit the appropriate voting behavior the landlord must raise the wage further. In this situation, political reforms which stop vote buying lead to a fall in the wage rate. Second, if all agents had access to capital markets then there would be no land concentration: all land would be farmed by smallholders with no votes being controlled. To see this note that the price a self-employed agent is willing to pay for a plot of land of size $\frac{s}{m}$ is equal to $f(\frac{s}{m}) - \underline{w}$. The price that a landlord would be willing to pay is given by (2.6). Comparing those two expressions, and using condition (2.3), we obtain that a smallholder is always ready to offer a higher price than a landlord, because his labour cost is lower ($\underline{w}$ instead of $w - p$):

$$f(\frac{s}{m}) - \underline{w} \geq f(\frac{s}{m}) - w + p. \tag{2.7}$$

[4]For simplicity, we assume here that in equilibrium, $m(s, p, w)\ell \leq n$, implying that some left-wing agents end up self-employed in equilibrium.

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The fact that, with perfect capital markets, smallholders are always willing to outbid landowners for land follows from the fact that the labor rents that landlords transfer to workers exceed the political rents they receive from parties. Therefore, even though it is still true that the ability of landlords to sell votes increases their demand for land, land is still more valuable to smallholders. The interaction of the two market failures is therefore crucial. With imperfect capital markets but without labour rents, electoral corruption would not affect the price of land, as workers would then have to be fully compensated for the control of their votes. With labor rents but no capital market imperfections there is no inefficiency either.

3. The Impact of the 1958 Ballot Reform in Chile

3.1. Political control in Chile

Like most Latin American countries, upon gaining independence from Spain, Chile adopted republican institutions. These became institutionalized in the 19th century and elections determined presidential succession without military or other intervention. Like all other nascent democracies in the nineteenth century, the franchise was restricted by wealth and literacy restrictions. Moreover, voting was not secret. Fraud, coercion and electoral corruption were all used to systematically influence the outcomes of elections and consolidate landed interests (see Posada-Carbó, 2000, and Lehoucq and Molina, 2002). Even the ending of open voting with the Electoral Law of 1925 did little to restrict corruption: to vote for a particular party, a voter had to request that party's ballot, thus making it possible to know who he or she was voting for (Castro, 1941, p. 35, Cruz-Coke, 1984, pp. 27-29). Petras and Zeitlin (1968, p. 510) document that: "until 1958, elections were carried out with each political party having a separate ballot ... Thus the *patrones* often simply gave the ballots for the party of their choice to the *inquilinos*, and provided them and nearby peasants with transportation to and from the polling places." (For more evidence see also Kaufman, 1972 and Loveman, 1976.)

On the basis of these institutions, Chile formed a relatively stable, though

restricted democracy (with the exception of the military coups between 1924 and 1932, a period dominated by Colonel Carlos Ibáñez). The landed oligarchy provided the traditional constituency of the two right-wing parties, the Conservative and the Liberal (see, e.g., Gil, 1966). The existing party system was shocked however by the return of the former dictator Carlos Ibáñez as a populist presidential candidate in 1952. Ibáñez formed a very heterogenous coalition of mostly leftist groups and capitalized on the general disillusionment with the traditional parties. In 1958, in an attempt to destabilize the current status quo, he supported the introduction of the full Australian ballot. Law 12.889 was promulgated and effectively put an end to the control of votes.

3.2. The political impact of secret ballot in Chile

Baland and Robinson (2008) provide a detailed analysis of the political changes that followed the introduction of the secret ballot in 1958. We summarize the main trends at the provincial level here. The sources, and the precise methodology followed, are described in Appendix 1. In Table 1, we present information on the proportion of *inquilinos* in 1955 and 1965, as well as the electoral results for the 1957 and 1961 parliamentary (all of the congress and half of the senate) elections across the main regions of Chile. (The picture is similar if one takes the 1965 parliamentary election results instead.)

INSERT TABLE 1 HERE

Two major trends emerge from these figures: (i) before 1958, support for the right-wing parties came from provinces where the institution of *inquilinaje* was the most prevalent (in the Central Urban and the North Central Valley regions), and (ii) this support disappeared after the introduction of the secret ballot, with large falls in votes for the right-wing parties, and large rises in votes for the Christian Democratic party, and to a lesser extent the left-wing parties.

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3.3. Land prices and the introduction of the secret ballot

Our model predicts that the electoral reforms of 1958 should lead to a fall in the price of land.[5] To examine this issue, we collected data from the most important national Chilean newspaper, *El Mercurio*, from August 1956 to December 1960 (22 months before and 31 months after the reform). This newspaper has a large advertisement section each week which provides nation-wide announcements of farms offered for sale. While the content of the advertisements vary widely, we restricted our sample to farms of more than 50 hectares offered for sale for which we know the size of the farm, its price and its province of location and left out all the other sales advertised.[6] By doing so, we gathered information on 1117 farms proposed for sale over this period.

The information we have is subject to a number of problems. First, these are asking prices by sellers, and not final sale prices. Moreover, while many farms for sale were advertised in *El Mercurio,* not all of them were, which may matter if those two types of farms differ systematically along some dimension. This problem may also be reinforced by our collection strategy, which excluded small farms and offers with not enough information. Lastly, another worry arose as inflation was high during this period, and we only had at our disposal the annual consumer price indices (or the index of agricultural prices which follows a very similar pattern). We therefore had to compute within each year (by loglinear interpolation from July, 1 of year Y to July, 1 of year $Y + 1$) the average weekly consumer price index, which was then used to deflate the nominal price of land (1/7/56=100) to obtain the real price of land (real price per hectare), the variable of interest here.

In Table 2, we present some descriptive statistics about the average price of one hectare of land before and after the promulgation of the electoral reform law on May 31, 1958. Across Chile, real land prices fell by 36% following the reform,

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[5]We found two published studies of the behavior of land prices in Chile over this period (CIDA, 1966, p. 343, and Hurtado et al., 1979) both of which find, as we do, significant falls in land prices after 1958. We do not emphasize the results of these studies because their samples and methodologies are unclear.

[6]Sizes came in two different measures, the hectare and the Chilean cuadra. We assumed here that one cuadra was equal 1.44 hectare. We attempted to avoid repeated announcements by deleting identical announcements within 18 months of the first announcement.

from an average of 171,000 pesos per hectare before 1958 to 109,000 pesos per hectare after. The median price per hectare followed a similar trend, as it fell by 30% from 81,000 to 56,000 pesos per hectare. The second and third lines of Table 2 report the average price of land according to the presence of *inquilinos* in the agricultural labour force. Two stylized facts emerge: (i) land was more expensive in provinces where there are more *inquilinos* and (ii) the price of land fell much more in provinces with a lot of *inquilinos*.

INSERT TABLE 2 HERE

We now turn to the regression estimates. The model proposed in the preceding section implies that provinces where *inquilinos* constitute a more important part of the agricultural labour force should exhibit (i) higher land prices before the reform and (ii) a larger fall in land prices following the reform. For each farm i offered for sale during week t, we know its province of origin, I, its size, s_{it}, and its price per hectare, π_{it}. In the basic model, the prevalence of *inquilinos* is measured by the proportion of *inquilinos* in the agricultural labour force in the province of the farm, $\left(\frac{I}{l}\right)_I$. Controlling for farm size and various time trends, we investigate the existence of a structural break on the day of the reform (31st of May, 1958) in the relationship between land prices and the prevalence of *inquilinos* in the province.

The basic equation we estimate is the following:

$$
\ln \pi_{it} = \beta_0 + \beta_1 \ln s_{it} + \beta_2 \left(\frac{I}{l}\right)_I + \beta_3 t \tag{3.1}
$$

$$
+ \delta_0 R_t + \delta_1 R_t \ln s_{it} + \delta_2 R_t \left(\frac{I}{l}\right)_I + \delta_3 R_t t + \sum \gamma_T Y_T + D_I + \varepsilon_{it}, \tag{3.2}
$$

where Y_T are year dummies taking the value one if the sale takes place in year T, t is a weekly time trend, R_t is the reform dummy, which takes the value one if the sale is advertised after May 31, 1958, and zero otherwise, and D_I is a province fixed-effect, which takes a value one if the sale took place in that province.

INSERT TABLE 3 HERE

The results of the estimation are given in Table 3. The two first columns correspond exactly to the specification described in equation (3.2). In column

(1), the equation is estimated using Ordinary Least Squares with no provincial fixed effects, which allows us to estimate β_2, the impact of *inquilinos* on land prices before the reform. In column (2), we added provincial fixed effects. The pattern is striking: provinces with more *inquilinos* in the labour force tend to exhibit significantly higher land prices before the reform. However, prices fall more in those provinces following the reform, as the coefficient attached to $\left(\frac{I}{l}\right)_I$ after the reform is negative and significant.[7] Moreover, the reform dummy in itself is not significant: absent its effects through the proportion of *inquilinos* in the agricultural labour force, the reform had no impact on land prices. Finally, land prices per hectare are lower in larger farms, which may reflect (unobserved) differences in fertility or cropping intensity across farms. After the reform, it is possible that land prices fell more in larger farms, but that particular estimate is not robust.

Columns (3) and (4) present parallel estimations using the proportion of *inquilinos* in the population, with very similar results. In columns (5) and (6), we distinguished between the Central Urban and the North Central Valley regions which correspond to the political base of the landed oligarchy, and the other regions. In columns (7) and (8), we used the real price per hectare, instead of its logarithm, as the dependent variable. Our results are extremely close across those various alternatives. Although not reported here, our results are also robust to various functional alternatives (such as the use of a quadratic or higher degree polynomials for farm size, or the use of the total price of the farm), alternative measures of the predominance of *inquilinos*, and various truncations of the sample, for example only considering large farms.

Clearly, the 1958 electoral reform had a stronger impact in provinces with a high proportion of *inquilinos*. There is a clear structural break in farm prices, with farm prices falling more in provinces with a strong presence of *inquilinos*. The coefficient attached to the proportion of *inquilinos* in the labour force following the reform is equal to -1.996. With an average proportion of *inquilinos* in Chile of 12.4%, the average fall in land prices that can be attributed to the presence of

[7]It does not exactly compensate for the higher price before the reform, but this may be due to differences in fertility or cropping intensity across provinces.

inquilinos is therefore equal to 24.8% (-1.996×0.124). We interpret this figure as a measure of the share of political rents associated with the control of votes which are embodied in the price of land.

3.4. Vote buying and political rents

Is the observed magnitude of the fall in land prices a plausible consequence of political reform? We can check this if we have direct evidence on how much a vote cost to buy. Direct buying of votes by parties, a system known as the 'cohecho', was a major instrument used by political parties to rally urban voters at the beginning of the century, but it was never systematically used in the countryside, as landlords maintained their control over rural voters and were benefitting from their political influence in a variety of ways, among which were electoral positions for themselves and their relatives. Heise points out "There were even candidates that offered to pay more for votes than any other candidate in printed advertisements. ... The working class was convinced that a congressional or presidential candidate was entitled to pay for votes." Many voters thought that "when votes are not bought, politicians had stolen the money that the government had sent for the elections" (Heise, 1982, pp. 228-30). By the 1950s however, direct vote buying by the parties had virtually disappeared (see e.g. Scully, 1992, or Sinding, 1972), and the 1958 electoral reform formally banned this practice.

Nevertheless, we can use the fact that votes were bought in urban areas earlier in the century to get an estimate of how much we might except the price of land to fall if control votes were made impossible, at least if we assume that the value of services given by politicians to landlords for supplying votes would be roughly the same as the prices for votes bought openly in urban areas. From the few pieces of information provided by historical studies, we have an estimate of the price of a vote for the elections of 1909, 1915 and 1918 only. Prices vary a lot from one source to another (they are directly comparable since there was no inflation during this period), depending on the type of election (presidential or parliamentary), and the degree of competition between political parties. Thus, according to Heise (1982) prices varied between 25 and 35 pesos in 1909, 10 to 40 pesos in 1915,

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and 100 to 200 pesos (and even between 400 and 500 pesos, "equivalent to a one-year salary for a lower class person") for the 1918 parliamentary elections. The political history by Rivas Vicuña (1964, p. 579), himself an active politician in this period, reports an exceptional price of 2000 pesos for the 1915 presidential election.

Even though there is thus large uncertainty about these amounts, as well as whether they are a good indicator of the potential political rents a landlord could secure by controlling votes, we can use these figures to approximate the corresponding amount in the 1950s. We shall do this by using two prices: a lower estimate of 40 pesos per vote in 1915, and a high price of 100 pesos per vote in 1915, so as to obtain a reasonable range of estimates.

We first have to take into account the change in the number of registered voters and inflation. The number of registered voters in 1915 was 591,000 (Cruz-Coke, 1984, pp. 36-7). The number of registered voters in 1957 was 1,284,159 (Direccion del Registro Electoral, 1957). A vote in 1957 is thus equal to 0.46 of a vote in 1915 (0.46=591,000/1,284,159). Inflation was endemic in Chile over this period, particularly in the 1950s (see the discussion above). The Consumer Price Index (CPI) went from 1 in 1915 to 181.3 in 1957 (Mitchell, 1998, Table H2, pp. 712-3).[8] Using the wheat price index, a simple computation yields the following result: taking into account inflation and the change in the number of registered voters, a price of 40 pesos for one vote in 1915 is equivalent to 3336 pesos in 1957. Similarly, a price of 100 pesos in 1915 corresponds to 8340 pesos in 1957.

In 1957, the minimum daily wage of an agricultural worker in Talca, a North Central Valley province, was set at 35 pesos (Mamalakis, 1983, Volume 2, Table 14.3), so that the price of a vote in 1915 corresponds in 1957 to 95 work-days at the minimum wage. If instead we use the higher price of 100 pesos in 1915, the sale of a vote was equivalent to 238 work-days at the minimum wage in 1957.

The above exercice can be extended by computing the discounted value of all political rents accruing to the lifetime voting right of one person. To do this, we

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[8]Wheat prices followed a similar trend, as 1 peso of wheat in 1915 was priced at 117.6 in 1957. The general index of agricultural producer prices similarly went from 1 in 1915 to 189.0 in 1957, (see Mamalakis, 1983, Volume 4, Table 4-5, pp. 222-3).

first take into account the frequency of elections: every 24 years, there are 13 elections (6 parliamentary, 4 presidential and 3 congressional, as only half of the Congress is re-elected at each parliamentary election). As a result, there are on average 0.54 elections per year. At an interest rate of r, the current discounted value of the political rents associated with a right to vote, R, is:

$$R = \frac{0.54 * V}{r}$$

where V is the value of one vote. In Table 4 below, we present the value of the political rents corresponding to the 1915 prices of 40 and 100 pesos per vote, using two different discount rates of 0.03 and 0.05. As Table 4 shows, the rents associated with the control of one vote lied between 33.8 and 140.6 months of average earnings for an agricultural worker.

INSERT TABLE 4 HERE

We illustrate the implications of these estimates by considering a large farm in the provinces of O'Higgins, Colchagua and Aconcagua in 1957. In those provinces, a large farm between 500 and 5000 hectares employed between 45.2 and 73.4 workers, out of which between 16.8 and 23.7 were *inquilinos* in the 1955 agricultural census. We computed the value of the farm by taking the mean value of a farm in that size range that was offered for sale in those three provinces. We then used the value of the political rents given in Table 4 under three different scenarios: a price per vote of 40 with a real interest rate equal to 3% and a price per vote of 100 with a real interest rate equal to 3% and 5%. As a percentage of the value of a farm, the political rents associated with the control of the *inquilinos'* votes then represent something between 3.7% and 13.2% of the value of the farm. Most *inquilinos* (and workers) lived with their families on the estate, and it is likely that the landlord also control their families' votes, and in particular that of their spouse. The political rents associated with the control of *inquilinos*, when we also include those arising from these additional votes, represent between 7.4 and 26.4% of the value of the estate. (In the absence of precise information on the structure of *inquilinos* families on such farms, we simply doubled the number of votes controlled). Though the evidence presented above as well as much of the historical discussion we cited emphasizes that *inquilinos* were the most likely to

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be politically controlled, it is also interesting to investigate the implications of the political control of all employees on such a farm. In this case, the political rents represent between 10.1% and 41.0% of the value of a farm. The discussion is summarized in Table 5 below.

INSERT TABLE5 HERE

This exercise is of course at best indicative of the value of a vote in 1957 since we have to assume some correspondence between the nature of electoral corruption in the 1950s and the system of explicit vote buying which took place at the beginning of the century. Moreover, inflationary pressures may have distorted relative prices. The figures obtained are often lower than the political premium estimated in the regression (24.8% of land prices for Chile). They certainly constitute a very conservative estimate of the political rents enjoyed by large landlords. First, the number of dependents on a large farm is probably underestimated, even if we take into account all workers since, for example, we omitted the workers' spouses, the landlord's tenants or his main trading partners. Secondly, the sale of votes is to some extent a metaphor which certainly does not capture all the political rents, including the social prestige, the political positions and the influence over policies (such as those with respect to the ability of trade unions to organize, or the allocation of local infrastructure), that landlords enjoyed.

3.5. Alternative Hypotheses

It seems hard to imagine that there is a plausible alternative story which can explain the facts we have shown before 1958 and what happened afterwards in Chile. However, there may be other possible interpretations of part of this evidence. Clearly, it is possible that real land prices might have fallen for several reasons apart from the fact that the secret ballot removed the political rents which had previously accrued to land ownership (and were capitalized in its value).

There is one other obvious main alternative hypothesis that accepts the fact that before 1958 electoral corruption stopped rural voters expressing their political preferences, but it emphasizes different mechanisms linking electoral reform to the data. This idea is that after electoral reform, a left-wing president and government

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was much more likely. Such a government would aim at redistributing income and assets, particularly land. Such redistribution, once anticipated, would clearly tend to reduce the attractiveness of holding land, thus leading to a fall in land prices. This hypotheses seems all the more convincing because we know ex post that agrarian reform became such an important political issue in the late 1960s and early 1970s in Chile.

There are two main problems with this alternative mechanism. The first concerns the implausibility that the land reforms of the late 1960s and early 1970s could have been anticipated in the late 1950s. The second concerns its inconsistency with our data. Firstly, the Alessandri government between 1958 and 1964 was Conservative and did not adopt a redistributive agenda at all. Therefore the politics of this government cannot account for the fall in real land prices. A clear piece of evidence on this is that after the 1958 election, the stock market actually rose! Figure 1 shows the real value of the stock market index in Chile from 1928 to 1978. The real value of stocks declined more or less continuously from the 1930s through to the coup of 1973, reaching their nadir with the election of Salvador Allende in 1970. Crucial for our argument here however is that there was an increase after Alessandri's election. Though the increase itself is small, what the picture does show is that the fall in the index actually levelled off after 1958 and only resumed its fall around 1966. This is directly contrary to the claim that asset prices were falling because of the anticipation of socialism. If this were true one would have expected a more rapid fall, not a rise.

INSERT FIGURE 1 HERE

Moreover, while agrarian reform had been occasionally discussed in Chile since the early 1920s, it was not treated as a policy that might seriously be implemented until the end of the 1960s. Some marginal land purchases and redistributions took place between 1962 and 1964 under the 1962 Law 15020, but they were explicitly targeted towards unused or abandoned estates. Very little land was redistributed during this period. (Actually, 70% of the land thus affected came from abandoned state farms, and 40% from a single large state farm in Talca.) As a result, the value of cultivated farm land could not have been affected by these minor reforms (for a detailed account of these, see Loveman, 1976). As Kaufman underlines, "the

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Alessandri administration did initiate some legislation dealing with peripheral issues in the land-tenure problem ... But it pointedly avoided any approach to the question of expropriating and redistributing large, private estates" (Kaufman, 1967, p. 9).

Land reform based on the size of properties only became a real issue in 1964-66 with the success of the Cuban revolution and the counterrevolutionary drive of United States foreign policy, particularly Kennedy's Alliance for Progress (see the discussion in Loveman, 1976, p. 220). The law was however voted only in July 1967, and its implementation started only in 1969. Consistent with this Swift (1971, p. 68) argues that "landowners did not really begin to fear expropriation until after July 1967, when it became possible to expropriate land for the motive of size alone." Moreover, after a study of agricultural investment behavior in the early 1960s, Swift concludes (p. 68): "The examination of investment behavior, therefore, does not clearly support an interpretation of lower investment through fear of expropriation". The evidence therefore suggests that the anticipation of land reform cannot have been the factor depressing land concentration and prices in the late 1950s. Instead, the most plausible explanation is the one proposed by our theory; with the introduction of the secret ballot the price of land fell since the return to landownership fell.

The second problem with this alternative hypothesis is that while the evidence we discussed above shows that land prices were generally falling after 1958, as one would expect if agrarian reform were anticipated, it is not in fact generally true that land concentration was falling. Actually, land concentration increased in 9 provinces. It was only in the Central Valley provinces where the traditional oligarchy and patrón-*inquilino* relations were concentrated that land distribution became more egalitarian. This observation is important because the land reform legislation that began to threaten the expropriation of large farms after 1967 in no way discriminated against the oligarchic Central Valley provinces. A large farm in Tarapacá or Talca, was just as likely to be redistributed as one in O'Higgins. While our theory does not explain why land concentration increased in provinces like Tarapacá, it is perfectly consistent with the fact that concentration went up (for example because of changes in technology). It seems implausible however

that in provinces where land concentration was already extremely high, people anticipating land reform would purchase more land and form larger farms.

One can think of other hypotheses consistent with parts of our story. First, there might be a secular falling trend in land prices (though actually the evidence in Hurtado et a. 1979, shows that deflated land prices rose steadily from the 1930s until the late 1950s). Yet, that the fall is closely associated with the presence of *inquilinos* in the province and tends to be more pronounced in exactly those provinces dominated by the landed oligarchy, directly supports our hypothesis. Second, the fall in land prices after 1958 might be due to the fact that land is often held as a hedge against inflation and, under the Alessandri government, the post 1958 period enjoyed much more monetary stability than the years before. As a result, landholders may have decided to sell the land they accumulated during the inflationary period, so that a general fall in land prices should occur after 1958. Once again, we cannot entirely disprove this other hypothesis, even though the fact that fewer land transactions occurred after 1958 argues against it (see Table 2). Alternatively, over the long-run demographic or technological factors could explain why land concentration may have fallen in some areas rather than others, or inter-provincial differences in the evolution of land prices.[9] First, there were no major demographic or technological changes over this period. Second, our data collection strategy was designed to avoid the impact of those long run trends on inter-provincial patterns of land price evolution since we collected land prices during a very short period of time (53 months around the reform). Nevertheless, these ideas can at best explain part of the overall picture while our theory provides a unified account of a whole set of political and economic phenomena.

4. Conclusions

In this paper we developed a specific model of how the absence of a secret ballot allowed landlords to control the votes of their workers. The model implies that political reform should lead to a fall in land prices. We tested the predictions of

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[9]Remember that we controlled for long run trends by using year dummies, provincial fixed effects and weekly trends.

the model by examining in detail the evolution of land prices in Chile in 1958, for which we found original data. A characteristic of rural Chile was the institution of *inquilinaje*, by which a worker, the *inquilino*, entered into a long term, often hereditary, employment relationship with a landlord, and lived on his landlord's estate. In this patron-client relationship, landlords fully controlled the votes of their *inquilinos* as long as voting was not secret. We showed that the introduction of the secret ballot in 1958 had implications for land prices which are perfectly consistent with the predictions of our model. The political premium associated with vote control and embodied in the price of land was not negligible as it represented on average 25% of the value of the land.

In the context of the wider debate about the economic consequences of democracy, our research suggests that it is important to unbundle 'democracy' by focusing on the consequences of more specific institutional changes and to clarify the mechanisms linking them to socio-economic outcomes.

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Appendix 1: Sources and methodology

'Total agricultural labour force' and '*inquilinos*' are the total number of agricultural workers and the total number of *inquilinos* working in the agricultural sector in 1955 and 1964-5 respectively. Source: III Censo Nacional Agricola Ganadero, 1955, Vol. 1-6, Servicio Nacional de Estadistica y Censos, Republica de Chile; IV Censo Nacional Agro-pecuario 1964-65, Vol. 1-26, Direccion de Estadistica y Censos, Republica de Chile.

'Right-wing votes' is the proportion of votes in favor of the 'Conservador', 'Conservador Tradicionalista' and 'Liberal' parties in the total number of valid votes, in the parliamentary elections of 1957 and 1961 respectively; 'radical' refers to the proportion of votes in favor of the 'Radical' and 'Radical Doctrinario' parties in the total number of valid votes, in the parliamentary elections of 1957 and 1961; 'christian democrat' is the proportion of valid votes in favor of the 'Falangia Nacional' in 1957 and the 'Democrata Christiano' party in 1961. The 'left' includes the proportion of valid votes in favor of the 'Communista', 'Socialista' and 'Socialista Popular' parties in 1957 and 1961. The regrouping of the political parties was made according to the methodology proposed by Valenzuela (1978). The sources for the electoral results are: Direccion del Registro Electoral, Election ordinaria de senadores y diputados al Congreso Nacional (periodo constitucional 1953-7), Chile; Direccion del Registro Electoral, Variacion Porcentual de los Partidos Politicos, 1957-1971, Chile.

Land prices were collected from the real estate section of El Mercurio, for all weeks running from August, 1 1956 to December, 31 1960. All the newspaper edition were available on microfilms at the UC-Berkeley library.

The data on *inquilinos* and agricultural workers in O'Higgins used in Table 5 can be found in the III Censo Nacional Agricola Ganadero, 1955.

Table 1: Agrarian relations, land concentration and electoral results in Chile

Region	Proportion of *inquilinos* in the labor force in 1955 (%)	Proportion of *inquilinos* in the labor force in 1965 (%)	Proportion of right-wing votes in 1957 elections (%)	Proportion of right-wing votes in 1961 elections (%)	Proportion of christian-democrat and left-wing votes in 1957 (%)	Proportion of christian-democrat and left-wing votes in 1961 (%)
Urban Central and North Central Valley provinces (Valparaiso, Santiago, Aconcagua, O'Higgins, Colchagua, Curico, Talca)	19.4	11.9	46.1	35.7	14.7	34.6
South Central Valley, Frontier and Little North Provinces (Maule, Linares, Nuble, Concepcion, Bio-bio, Arauco, Malleco, Cautin, Atacama, Coquimbo)	11.4	6.7	34.2	27.6	18.3	36.1
All other provinces (Valdivia, Osorno, Llanquihue, Chiloe, Aysen, Magallanes, Tarapaca, Antofagasta)	5.7	5.2	26.6	26.5	24.4	38.4
Chile	12.4	7.6	33.0	29.4	20.1	37.5

Note: except for Chile, the figures reported are simple averages across the provinces in the region.

Table 2: Real Prices per hectare before and after the reform (May 31, 1958)

	Proportion of *inquilinos* in the agricultural labor force (%)	Average price of land per hectare before the reform ($10^3$$, standard errors under brackets)	Number of sales observed before the reform	Average price of land per hectare after the reform ($10^3$$, standard errors under brackets)	Number of sales observed after the reform
Chile	12.4	171 (217)	585	109 (144)	532
Provinces with a low proportion of inquilinos in the agricultural labor force (below Chilean average)	7.6	83 (106)	170	66 (93)	156
Provinces with a high proportion of inquilinos in the agricultural labor force (above average)	17.6	207 (240)	415	127 (158)	376

Table 3: Real Prices per hectare before and after the reform (May 31, 1958)

	Dependent variable: log(real price per hectare)						Dependent variable: real price per hectare	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inquilinos in the agricultural labor force	6.215*** (0.683)	___	___	___	___	___	1445.6*** (121.9)	___
Inquilinos in the agricultural labor force*reform dummy	-2.223** (0.959)	-1.996** ((0.985)	___	___	___	___	-810.5*** (171.1)	-723.1*** (173.9)
Inquilinos in population	___	___	19.394*** (4.453)	___	___	___	___	___
Inquilinos in population*reform dummy	___	___	-14.204** (6.288)	-13.992** (6.138)	___	___	___	___
Central Urban and North Central regions dummy	___	___	___	___	0.567*** (0.073)	___	___	___
Central Urban and North Central regions dummy*reform dummy	___	___	___	___	-0.196* (0.106)	-0.208* (0.107)	___	___
Reform dummy (=1 if sale occurs after May 31, 1958)	0.270 (0.484)	0.174 (0.492)	0.369 (0.490)	0.145 (0.479)	-0.014 (0.46)	-0.034 (0.461)	13.79 (86.31)	-33.25 (86.87)
Log of Farm size	-0.631*** (0.025)	-0.621*** (0.026)	-0.672*** (0.026)	-0.625*** (0.025)	-0.638*** (0.025)	-0.621*** (0.026)	-61.55*** (4.47)	-60.80*** (4.53)
Log of Farm size*reform dummy	-0.078** (0.038)	-0.074* (0.038)	-0.078** (0.039)	-0.062 (0.037)	-0.074* (0.039)	-0.074* (0.039)	15.31** (6.81)	16.52** (6.78)
Weekly trend, weekly trend*reform dummy, year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
R2	0.608	0.523	0.574	0.523	0.597	0.523	0.364	0.239

Note: Within R2 is reported for provincial fixed effect estimates. The total number of observations is 1117.

Table 4: Price of a vote and political rents in 1957

	Discounted value of a voting right, R	Corresponding number of months of work for an agricultural worker at the minimum wage
Pv=40, r=0.03	60048	56.3
Pv=40, r=0.05	36029	33.8
Pv=100, r=0.03	150120	140.6
Pv=100, r=0.05	90072	84.4

Table 5: Political rents of a large farm in the Central Valley (1957)

Province	Farm size (hectares)	Value of a farm in 1957 (10^3\$)	Number of *inquilinos* per farm	Number of agricultural workers per farm	Political rents from *inquilinos* in % of the value of the farm			Political rents from *inquilinos* in % of the value of the farm when spouses are included		Political rents from all agricultural workers in % of the value of the farm	
					r=0.03, Pv=40	r=0.03, Pv=100	r=0.05, Pv=100	r=0.03, Pv=40	r=0.03, Pv=100	r=0.03, Pv=40	r=0.03, Pv=100
O'Higgins	1244	27050	23.7	73.4	5.3	13.2	7.9	10.6	26.4	16.4	41.0
Colchagua	1511	27050	16.8	45.2	3.7	9.2	5.5	7.4	18.4	10.1	25.2
Aconcagua	1512	27050	17.9	46.5	4.0	9.9	5.9	8.0	19.8	10.8	26.9

Figure 1. Chilean Real Stock Market Index, 1928-1978
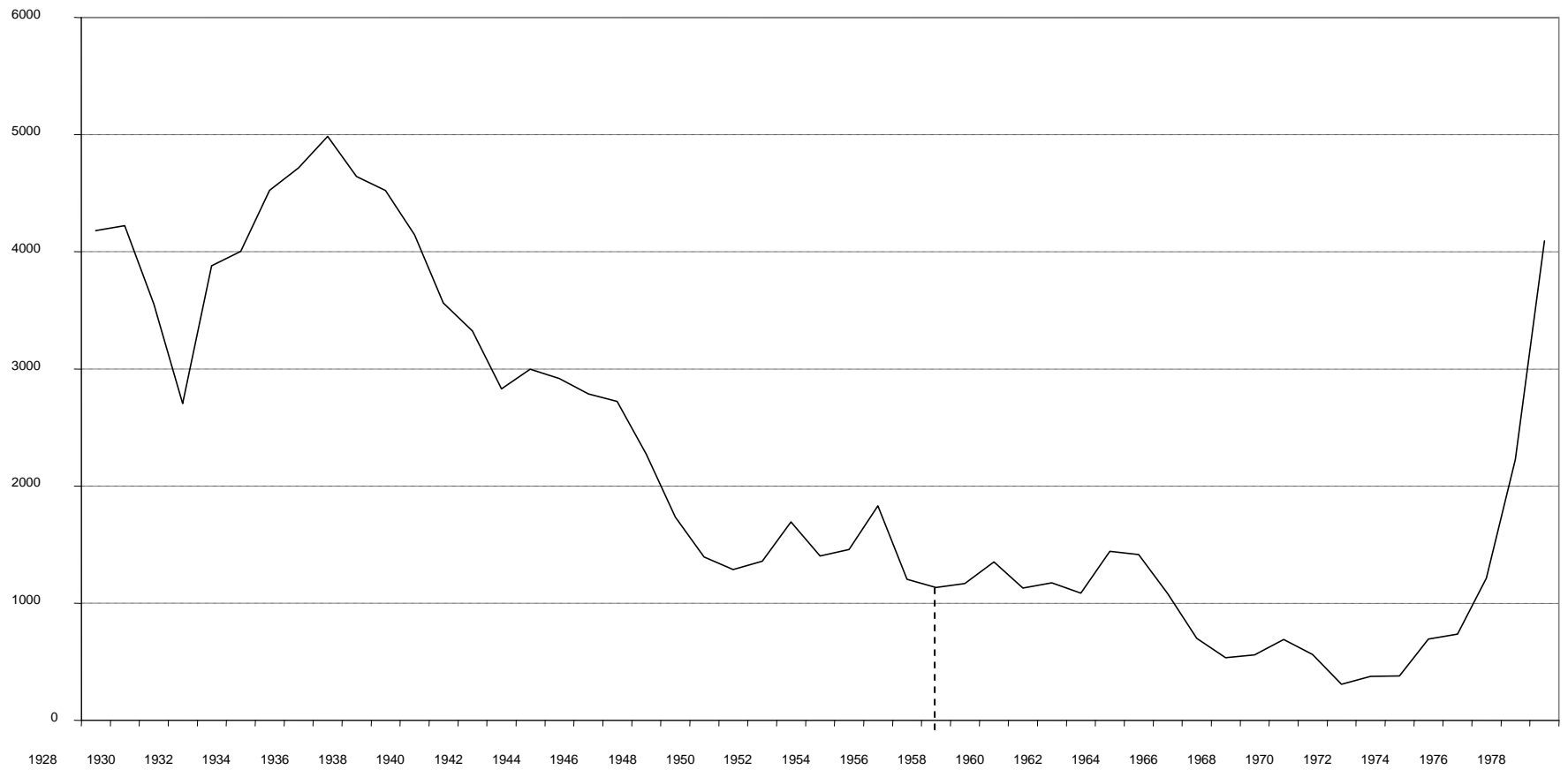
Source: Couyoumdjian, Millar, and Tocornal (1992)

Table A1: Description of the main variables used

Variable	# obs.	Mean	Standard Dev.	Median	Minimum	Maximum
Proportion of *inquilinos* in the agricultural labor force in 1955	25	0.118	0.104	0.130	0.008	0.240
Proportion of *inquilinos* in the agricultural labor force in 1965	25	0.076	0.059	0.078	0.004	0.143
Right-wing votes in 1957	25	0.350	0.129	0.343	0.133	0.702
Right-wing votes in 1961	25	0.294	0.114	0.296	0	0.496
Left and Christian-Democrat votes in 1957	25	0.192	0.113	0154	0.021	0.441
Left and Christian-Democrat votes in 1961	25	0.365	0.092	0.372	0.211	0.573
Real price of land between 1956 and 1960 (10^3\$)	1117	141.3	188.5	66.8	0.7	2093.0
Proportion of *inquilinos* in the population in 1957	1117	0.026	0.009	0.026	0.003	0.041
Farm size between 1956 and 1960	1117	1337	5192	258	50	78500