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Baland, Jean-Marie; Robinson, James A.

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Land and Power: Theory and Evidence from Chile

by Jean-Marie Baland and James A. Robinson*

Abstract: We study the connection between employment and political control. Many employment relationships concede rents to workers. For example, when worker effort is crucial for production, but only imperfectly observed. We show that, depending on the political institutions, the presence of such rents allows employers to use the threat of withdrawing them to control their workers' political behavior. We thus demonstrate that employment does not simply generate income, it also gives *power* to control the behavior of others.

The analysis focuses on the salient example of political control, where landlords coerce the votes of their workers in the absence of a secret ballot. The model we develop generates predictions about electoral outcomes which can be tested by investigating the impact of the introduction of an effective secret ballot. Such an institutional reform reduces landlords' control, and in consequence, we should observe changes in voting behavior, since workers whose votes were previously controlled and sold can now vote freely.

We test the predictions of the model by examining in detail the effects of the introduction of the secret ballot in Chile in 1958. We show that, consistent with our theory, the political reforms led to large changes in voting behavior. Before the reforms, localities with more pervasive patron-client relationships tend to exhibit a much stronger support for the right-wing parties, traditionally associated with the landed oligarchy. After the reform however, this difference across localities completely disappeared.

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> "It is the most cruel mockery to tell a man he may vote for A or B, when you know that he is so much under the influence of A, or the friends of A, that his voting for B would be attended with the destruction of him. It is not he who has the vote, really and substantially, but his landlord, for it is for his benefit and interest that it is exercised in the present system." David Ricardo ([1824], 1951-1973, p. 506)

In this paper we study the connection between employment and political control. Many employment relationships concede rents to workers. For example, when worker effort is crucial for production, but only imperfectly observed. We show that the fact that employers already concede rents to workers may allow them, depending on the political institutions, to use the threat of withdrawing these rents to control their political behavior. We thus demonstrate that employment does not simply generate income, it also gives *power* to control the behavior of others.

The most salient example of such a connection arises in the absence of a secret ballot. When voting is not secret, it becomes feasible to buy, sell and coerce votes. While there are recorded instances of an individualized market for votes, the main stylized fact which emerges from the case study literature is that rather than individuals freely selling their votes to politicians, employers usually control and supply the votes of their employees in exchange for money, favors or policies. More specifically, as discussed by Ricardo (1824), employers are usually landlords.

That landlords control the political activities of their workers has historically been a pervasive characteristic of agrarian economies.[1] In Britain, before the introduction of the secret ballot in 1872, this factor was critical in determining the outcome of rural elections. As observed by Lord Edward Stanley in 1841,"when any man attempted to estimate the probable result of a county election in England, it was ascertained by calculating the number of the great landed proprietors in the county and weighing the number of occupiers under them."[2] Throughout the

[1] As Edward E. Malefakis (1970, p. 98) summarized the situation in nineteenth century rural Andalucía, "a man's job depended on his vote."

[2] Quoted in George S. R. Kitson-Clark (1951, p. 112). Frank O'Gorman (1989, p.20) estimates

nineteenth century radicals and reformers complained about the lack of a secret ballot in Britain (see Brian Kinzer, 1982, Gary Cox, 1987 and Norman Gash, 1977). In Germany, despite the fact that a democratic parliament was introduced in 1848 there is a mass of evidence that rural voters were controlled by landed interests. Bismarck even supported an extension of voting rights in 1871 because he thought that the control exercised by landlords over rural voters would offset the rising influence of urban workers (Reinhard Bendix's, 1964, p. 97, Theodore S. Hamerow 1974, pp. 299-300).

Landlords control over rural elections was greatly facilitated where balloting was open (see Richard J. Goldstein, 1983, p. 15). However, even when there was a supposedly secret ballot (and not open voting), strategies were found to keep voting under control. Thus, in the German case, political parties often printed their own ballots: "given that ballots had to be obtained from the candidates themselves or from their agents, it was often physically impossible for a poor man to vote for anyone but the squire's choice" (Margaret L. Anderson, 1993, p. 1467).[3] Even countries such as France, which moved early to universal male suffrage (after 1848) and free elections (after 1871), only introduced an effective (though non-Australian)[4] secret ballot in 1913. Before this "the ballots frequently had subtle but distinct marks, such as paper thickness, colour and size, from which the election officials could deduce a voter's decision. This information was then passed on to notables who could easily punish such wayward voters since they frequently were his tenants or employees" (Marcus Kreuzer 1996, p. 108).

Similar tactics were used and remain up to the present day in democratic third world countries.[5] Nowhere is the evidence about landlord control of elections so conclusive as in Latin America. Following independence most Latin American

that by 1807 this resulted in the outcomes of 300 parliamentary seats being a foregone conclusion. He describes in detail the system of patronage linking high politicians such as Walpole with members of parliament, typically Whig 'oligarchs,' who controlled the local electorate.

[3]For further evidence on the German case see David Blackbourn (1988) and the section on Germany in Ralph Gibson and Martin Blinkhorn (1991).

[4]The 'Australian ballot' has become synonymous with perfectly secret voting and refers to a situation where all political alternatives are on a single government produced ballot paper. It derives its name from the fact that the first use of such a ballot was in Australia in 1856.

[5]For evidence from India see Atul Kohli (1990, pp. 227-228) and Jan Breman (1974).

countries adopted liberal constitutions committing themselves to regular elections, yet with few exceptions, Latin American societies did not become consolidated democracies with free regular elections contested by all adults until the 1980's.[6] In Colombia, the country which has the longest experience of formal democracy in Latin America and where the military has played the most marginal of political roles, the equivalent of the Australian ballot was legislated only in 1988 and introduced first in 1990. In Chile the control of voting by landowners was very frankly discussed in the debate leading up to the introduction of the secret ballot in 1958 in language strikingly similar to that used by Lord Stanley quoted above. For example, Socialist senator Martones argued in favor of introducing the secret ballot because, "if that law [the old electoral law without a secret ballot] did not exist, instead of there being 9 Socialist senators there would be 18, and you [the Conservatives] would be reduced to 2 or 3 ... [laughter] you laugh, but the truth is that there would be not 2 Conservative senators from O'Higgins and Colchagua, which corresponds exactly to the number of *inquilinos* in the fundos which belong to the Conservative hacendados in that region. Conservatives would have only one or perhaps none."[7]

We develop a model of labor contracting with moral hazard and limited liability in the rural sector.[8] Absent politics, landlords find it optimal to concede rents to workers to induce effort. Introducing politics, we show that the presence of these rents allows landlords to pay less than the full opportunity cost of the votes of their workers, and thus possibly to profitably offer a contract stipulating both

[6]See Stanley L. Engerman and Kenneth L. Sokoloff (2005) and Jonathan Hartlyn and Arturo Valenzuela (1998). For Brazil see Eul-Soo Pang (1973), Richard Graham (1990) and José de Souza Martins (1996).

[7]A "fundo" is a large farm and a "hacendado" a large landowner and an *inquilino* was a permanent worker on such farms. Quoted in *El Mercurio*, Saturday May 19, 1958, p. 20.

[8]Why does electoral corruption seem to be more significant in rural as opposed to urban areas? Our model suggests three factors which indicate that urban votes may be more expensive to buy and hence political corruption relatively less attractive in urban settings. First, as suggested by Stephen A. Marglin (1973) it may be the case that rents are lower in factories and urban environments. This means that, to induce effort, employers need to pay only a small wage premium. Second, it may be harder to monitor voting and political activities in anonymous urban environments. Third, workers in the cities may enjoy superior alternative employment opportunities, which reduce the scope for political control by their employers.

economic and political (voting) behavior.[9] This feature also implies that it is cheaper for political parties to buy votes indirectly through landlords since this means they can avoid fully compensating workers for the value of their votes. We study the implications of these phenomena for the functioning of factor markets.

The model we develop generates predictions about electoral outcomes which can be tested by investigating the impact of the introduction of an effective secret ballot. Such an institutional reform reduces landlords' control, and in consequence, we should observe changes in voting behavior, since workers whose votes were previously controlled and sold can now vote freely.

We examine these implications by considering the introduction of the secret ballot in 1958 in Chile. We show that, before the reform, the support for right-wing parties was substantially higher in the traditional 'oligarchic' Central Valley provinces which were characterized by long term patron-client relationships known in Chile as the *inquilinaje* system (see e.g. Elisabeth Sadoulet, 1992). Moreover, following the introduction of the secret ballot, it also fell substantially more in precisely those municipalities where *inquilinos* formed a larger share of the electorate. More specifically, using municipalities as our unit of observation, we estimate a panel model with municipality fixed effects over the period from 1949 to 1965 where the dependent variable is the vote share of right-wing parties. The main independent variable is the share of *inquilinos* in the electorate which we interact with year dummies. We show that prior to 1958, the estimated coefficient on *inquilinos* is positive and stable, while after 1958 it becomes negative. Most importantly, the sum of the coefficients is zero, suggesting that after the reform there was no correlation between the presence of *inquilinos* and votes for right-wing parties. We show that this result is robust to controlling for other covariates, such as land distribution and time effects, and to using a variety of alternative assumptions about the importance of *inquilinos* in the electorate.

The case study literature on the secret ballot focuses very much on coercion and corruption and has obviously noticed the fact that systematic biases can

[9]Though we model political control in terms of voting, the analysis extends to other types of political activities (such as types of protests, riots, demonstrations and other forms of collective action). Such a model would have similar results to the one we present.

be introduced into elections because of such phenomena (e.g., our discussion of nineteenth century Germany above). In the Chilean case, scholars such as Brian Loveman (1976), Timothy R. Scully (1992) or Arnold J. Bauer (1995), have noted the significance of the control of *inquilinos* for the political power of the right before 1958, and linked the introduction of the secret ballot to the rise of socialism. Daniel Hellinger (1978) analyzed electoral change in the Chilean countryside for the two presidential elections of 1958 and 1970, based on correlations from a restricted (and biased) sample of municipalities. He points out that there is a gradual erosion of support for the Right as manifested by a falling correlation between the vote for the Nationalists and the proportion of *inquilino*s in the agricultural workforce. He however fails to provide a consistent explanation for this change in rural voting pattern. Our contribution here is to provide a microfoundation for why landlords control voting behavior and provide the first systematic test of the impact of the 1958 reforms in Chile.

The incidence of secret balloting has been understudied by the literature on political economy and institutions (e.g., Cox, 1997, Torsten Persson and Guido Tabellini, 2000, 2003, Daron Acemoglu and James A. Robinson, 2006). Thomas Piketty (1999, 2000) and Eddie Dekel, Matthew O. Jackson and A. Wolinsky (2005) developed models of how an individualized market for votes might work and have studied the circumstances under which vote buying is socially undesirable. Related papers by James M. Snyder (1991) and Gene M. Grossman and Elhanan Helpman (1996) have looked at interest groups buying politicians with 'campaign contributions.' All of these theoretical papers focus on very different issues than those we study. An important distinction is that these scholars, and most others in the political economy literature, focus on the efficiency of government policy. We focus on why vote buying is linked to employment and how this influences factor markets. We also provide empirical evidence supporting our model. Most closely related to our research, William Summerhill (1995) developed a simple model of the idea that political rents accrue to landowners and tried to estimate the impact of electoral reform on the economy using data from nineteenth century Brazil.

I. The Model

A. The Fundamentals

We consider a discrete time infinite horizon model of the rural sector. There is a unit mass of agents and a proportion x of rural agents have access to the capital market and can therefore purchase land and hire workers. All rural agents have the option to be self-employed and earn an income of $\underline{w}$. We let m denote the proportion of rural agents who become agricultural workers, and $1-m-x$ those who remain self-employed.

There are L units of land which are owned by landowners with each owning $L/x = l$ units of land. There is a single numeraire consumption good which is produced from land and labor. The technology is characterized by a standard constant returns to scale neoclassical production function. On a farm, output of a worker in any period is equal to $\tilde{\theta} g\left(\frac{l}{n}\right)$ where n is employment, g is the intensive form of the production function so that $g' > 0$ and $g'' < 0$, and $\tilde{\theta}$ is a plot-specific stochastic shock to output which is distributed independently across plots and time and can take two values, θ and 0 (by normalization) (since we focus on stationary equilibria we do not introduce time subscripts). The probability that θ occurs in period t depends on the effort exerted by a worker in that period.[10] Effort, ε, takes two values, $\varepsilon \in \{0, e\}$. If $\varepsilon = e$, θ occurs with probability γ^h, while if $\varepsilon = 0$, θ occurs with probability $\gamma^l < \gamma^h$.

While output is perfectly observable by the landlord, the level of effort exerted by the worker is not. This induces a moral hazard problem. We assume that effort can never be observed so that the only possible wage contract depends on the realization of $\tilde{\theta}$.

There are also two political parties, 'Left' (denoted L) and 'Right' (denoted R) competing for votes to win an election and all individuals have exogenous preferences for one of these parties which means that they get utility from voting for the party they prefer (as in a standard probabilistic voting model).

All agents in the rural sector have per-period utility functions which are linear

[10] We use a variant of a model which has become standard in the development literature, see for example Abhijit Banerjee, Paul Gertler and Maitreesh Ghatak (2002)

in consumption, c, effort, ε, and voting decision σ^j for $j = L, R$ which depends on the ideological orientation of the agent. Thus, $U(c, \varepsilon, \sigma^j) = c - \varepsilon + \sigma^j$ is the utility of an agent of type j if they vote for the party they prefer, otherwise it is $U(c, \varepsilon, \sigma^j) = c - \varepsilon$. All agents maximize the expected present discounted value of utility and discount the future at rate $\beta \in (0, 1)$.

Political party j, if it wins power, has per-period utility function,

$$U_j = W^j - M_j, \ j = R, L$$

and $-M_j$ otherwise, where W^j is the gain in utility for party j if it wins the election and M_j represents the amount of rents (income) transferred by party j to other agents in the society so that neither party is liquidity constrained. The price that a party offers for the vote of an agent will in general depend on the occupation of the agent: let p_ℓ^j be the price paid by party j to a landlord, p_w^j be the price paid by party j for the vote of a worker, and p_s^j be the price paid for the vote of a self-employed agent.[11] Let μ be the impact of one vote in party j's favor on party j's chances of winning the election.[12] From this we can deduce that the maximal price that party j would be prepared to pay for a vote is μW^j.

B. Timing of the game

The stage game has the following timing:

- The political parties non-cooperatively announce a price at which they will purchase votes from each type of rural agent.
- The land market opens with each landlord deciding how much land to buy.
- Landowners hire workers by proposing a contract.

[11] Though we focus our analysis on situations where political parties directly purchase votes, the model is consistent with other interpretations. For example, instead of buying votes, parties may offer policies which favor landlords, or give landlords elected positions.

[12] In a previous version of the paper we provided microfoundations for this assumption with an explicit model of voting under proportional representation and legislative bargaining (see David Austen-Smith, 2000, and David P. Baron and Daniel Diermeier, 2001).

- Agents sell votes to the political parties.
- Workers vote and choose their effort level.
- Production takes place and the output shock $\tilde{\theta}$ is observed.
- Landlords and the political parties observe voting behavior and the state of nature.
- Rents are distributed by the political parties, wages are paid and workers may be fired and consumption takes place.

We now characterize the stationary subgame perfect equilibrium of this game.

II. Electoral Corruption and Resource Allocation

For ease of exposition we first characterize the outcome of political competition for votes. We do so by assuming, as will be the interesting case, that landlords control and sell the votes of their workers. In the next section we analyze the circumstances under which this will happen in equilibrium. To keep the discussion focused we assume that all landowners are right-wing while all other agents are left-wing. In addition we assume that the right-wing party values winning more than the left-wing party. This will have the implication that the right-wing party will be prepared to pay more for votes than the left-wing party.

The political parties engage in Bertrand competition. We first consider the situation in which the right-wing party will always wish to outbid the left-wing party for votes. This implies that $\mu W^R \geq \mu W^L + \sigma^L$ and the following prices are offered by the parties in equilibrium,

$$\text{Party } R \text{ offers } \begin{cases} p_\ell^R = \mu W^L - \sigma^R \\ p_w^R = \mu W^L \\ p_s^R = \mu W^L + \sigma^L \end{cases}$$

and,

$$\text{Party } L \text{ offers } \; p_\ell^L = p_w^L = p_s^L = \mu W^L$$

In this case, for any price that the left-wing party proposes for votes, the right-wing party is always willing to outbid that offer for the three categories of rural agents. As a result, in equilibrium, the left-wing party announces the maximal price it is ready to pay for one vote, μW^L. Given this price, landlords will be willing to sell their own votes to the right-wing party provided they can achieve the same utility level that they could by selling their votes to the left-wing party. This implies that the right-wing party must offer them a price at least equal to $p_\ell^R = \mu W^L - \sigma^R$. Landlords will also sell the votes of their workers if they are given the same price that is offered by the left-wing party, which is then the price the right-wing party announces. Lastly, for the self-employed agents, the right-wing party must compensate them for not voting for their own preferred party, which implies that he has to pay a price $p_s^R = \mu W^L + \sigma^L$ to those agents.

Given these prices, all rural agents sell their votes to the right-wing party, with right-wing landlords stipulating that their left-wing workers vote right-wing in their employment voting contracts.

In the case where $\mu W^L + \sigma^L \geq \mu W^R > \mu W^L$, then

$$\text{Party } R \text{ offers } \begin{cases} p_\ell^R = \mu W^L - \sigma^R, \\ p_w^R = \mu W^L, \\ p_s^R = \mu W^R, \end{cases}$$

and,

$$\text{Party } L \text{ offers } \begin{cases} p_\ell^L = \mu W^L, \\ p_w^L = \mu W^L, \\ p_s^L = \mu W^R - \sigma^L. \end{cases}$$

It is no longer optimal for the right-wing party to outbid the left-wing party for the votes of the self-employed agents. Now, rather than buying the votes of all rural agents, the right-wing party buys the votes of the landlords and their workers, but the self-employed sell their votes to the left-wing party. Here, moving from being self-employed to becoming a worker leads to a switch in voting behavior.

Under either scenario we have the following result.

Proposition 0.1. *It is cheaper for the right-wing party to buy votes from a landlord than to buy votes directly from the self-employed.*

This result follows immediately from the fact that in equilibrium $p_w^R < p_s^R$. This proposition has the implication that it will never be profitable for a rural agent to become a political entrepreneur, buying votes from individuals and then selling them to parties. For the rest of the paper we focus on the situation where $\mu W^R \geq \mu W^L + \sigma^L$, the analysis of the other parts of the parameter space follow directly.

III. Employment and Power

We solve for the stationary subgame perfect equilibrium of this game which is best from the point of view of landlords. In general a strategy for a landlord is a contract offer at date t which specifies wages as a function of $\tilde{\theta}$, a voting decision and the history of play up to t. For a worker a strategy determines an effort and voting decision as a function of the history and the contract offered at t.

We start by describing the optimal labor-voting contract. As is standard, we endow the landlord with all the bargaining power with respect to workers and he can therefore make take-it-or-leave-it contract offers to his worker(s) specifying his expected voting behavior and effort level. As there are two dimensions to the worker's behavior, there are four possible wages, corresponding to whether output is high or low, and whether the worker is observed voting for the specified party or not. We assume that liability is limited so that wages must be non-negative. To ensure maximal incentives, a landlord will optimally propose a wage, w, and continued employment if output is high and the worker is not observed voting for the wrong party. If output is low or the worker votes for the left-wing party, the landlord will pay zero and fire the worker. We assume that if a worker is ever fired by a landlord he is never employed again by a landlord and is thus perpetually self-employed.

We focus here on the situation under which a worker is required by his landlord to vote for the right-wing party. Given his voting behavior, the worker will exert the optimal amount of effort if the following incentive compatibility condition is satisfied. Let $V_w(\varepsilon = e)$ be the value to the worker if he exerts effort, while $V_w(\varepsilon = 0)$ is the value if the worker shirks. The worker will exert effort if

$$V_w(\varepsilon = e) \geq V_w(\varepsilon = 0)$$

First consider the value from exerting effort which is,

$$(1) \qquad V_w(\varepsilon = e) = \gamma^h \left(w + \beta V_w(\varepsilon = e)\right) + (1 - \gamma^h) \left(\frac{\beta \left(\underline{w} + \mu W^L + \sigma^L \right)}{1 - \beta} \right) - e.$$

Here, with probability γ^h the realization of output is high, in which case at date t the worker receives the wage w and is not fired. In consequence the worker gets the continuation value $\beta V_w(\varepsilon = e)$. With probability $1 - \gamma^h$, even though the worker exerted effort, output is low. In this case the worker gets no wage and is fired at date t, never to be re-employed. In this case from date $t + 1$ on, the worker is self-employed getting an income of $\underline{w}$ in each period and also being able to freely sell his vote to whichever party he wishes. The utility from this latter action is $\max\{p_s^R, \sigma^L + p_s^L\}$, i.e. the self-employed agent can sell his vote to the right wing party and sacrifice the utility benefit of voting for his preferred party, or he can sell his vote to the left and get the utility benefit σ^L. Now in equilibrium we showed that $p_s^R \equiv \sigma^L + p_s^L \equiv \mu W^L + \sigma^L$ and this explains the formula in (1). We now consider the value of shirking, which is

$$(2) \qquad V_w(\varepsilon = 0) = \gamma^l \left(w + \beta V_w(\varepsilon = 0)\right) + (1 - \gamma^l) \left(\frac{\beta \left(\underline{w} + \mu W^L + \sigma^L \right)}{1 - \beta} \right)$$

The interpretation of (2) follows immediately from the discussion of (1), noting that now, since the worker is shirking, he does not incur any effort cost and high output arises with probability γ^l. Hence, solving for the value functions, exerting effort is optimal if

$$(3) \qquad w \geq \beta \left(\underline{w} + \mu W^L + \sigma^L \right) + \frac{(1 - \beta\gamma^l)}{\gamma^h - \gamma^l} e$$

Next there is the participation constraint which shows that the worker prefers accepting a contract to his outside option. This implies

$$(4) \qquad V_w(\varepsilon = e) \geq \frac{\underline{w} + \mu W^L + \sigma^L}{1 - \beta} \text{ or } w \geq \frac{\underline{w} + \mu W^L + \sigma^L + e}{\gamma^h}.$$

The two constraints are sufficient to define a contract eliciting high effort and voting behavior that will be accepted by a worker. Indeed, if this contract is

offered, the worker never chooses to vote against his landlord's wishes (whether with high or low effort), as this implies with certainty his getting a zero wage and being fired. This yields a utility to the worker that lies below his reservation utility, so that, ex ante, the worker is better off not accepting this contract. As a result, accepting the contract but voting freely is never chosen in equilibrium. Therefore, the only relevant constraints to the landlord's problem are (3) and (4). Note also that, to be optimal from the landlord's point of view, the contract must be such that one of these two constraints holds with equality.

We now explicitly define the labour rents that are attributable to the existence of a moral hazard problem in production. To do this, we consider the wage rate that would be offered by the landlord in a contract that stipulates the effort level, but not the voting behavior. In this contract, the efficiency wage under the incentive compatibility constraint would be

$$\tilde{w} = \beta \underline{w} + \frac{(1 - \beta\gamma^l)}{\gamma^h - \gamma^l} e. \tag{5}$$

We consider the situation under which, with this contract, the participation constraint is satisfied, that is:

$$\tilde{w} \geq \frac{\underline{w} + e}{\gamma^h}. \tag{6}$$

Moreover, to simplify the exposition, we assume that it is optimal to propose this contract which induces high effort by paying an efficiency wage even if it concedes rents to workers. We define r as the per period excess in expected utility compared to the reservation utility, that is the per period labour rent under the incentive contract:

$$r = \gamma^h \tilde{w} - e - \underline{w} = \left(\frac{\gamma^l}{\gamma^h - \gamma^l} e - \underline{w} \right) (1 - \beta\gamma^h),$$

by using equation (5). As can be inferred from condition (6), the participation constraint is satisfied if and only if $r > 0$ under the efficiency wage.

We need one more assumption before stating our main result.

Assumption 1: $\mu W^L > \gamma^h \beta \sigma^L / (1 - \gamma^h \beta)$.

Assumption 1, which comes from $\mu W^L > \gamma^h \beta(\mu W^L + \sigma^L)$, says that the value of a vote to the landlord must be large, relative to the ideological bias of the worker.

Proposition 0.2. *It is optimal for the landlord to also control the political behavior of his worker if and only if* $r > \sigma^L$.

Proof: First note that if the wage had to be increased by the full disutility of voting behavior being controlled, namely $\mu W^L + \sigma^L$, then it could never be profitable for the landlord to offer a contract which controlled voting. This is because expected output would be the same but a vote can only be sold for μW^L. The wage that has to be paid to deter cheating when the landlord decides to also control voting behavior must satisfy (3). Using (5), we can write:

$$(7) \qquad w - \tilde{w} \geq \beta(\mu W^L + \sigma^L)$$

This wage has also to satisfy the participation constraint (4) and, using (6), we obtain:

$$(8) \qquad w - \tilde{w} \geq \frac{\mu W^L + \sigma^L}{\gamma^h} - \frac{r}{\gamma^h}$$

Given that the contract must be optimal, one of those two conditions holds with equality.\ First consider the case where (7) holds with equality. Paying this wage is then profitable for the landlord if the expected increase in the wage is less than the benefit from controlling a vote μW^L, i.e.:

$$\mu W^L \geq \gamma^h(w - \tilde{w}) = \gamma^h \beta(\mu W^L + \sigma^L)$$

which holds by assumption. Consider the situation such that the participation constraint is binding, so that (8) holds with equality. Paying this wage is profitable to the landlord if :

$$\mu W^L \geq \gamma^h(w - \tilde{w}) = \mu W^L + \sigma^L - r,$$

which holds if and only if $r > \sigma^L$.

Intuitively, the simple fact that the labor market is plagued by moral hazard and that liability is limited implies that the landlord must concede rents to his workers. This occurs even though he is in a position to make take-it or leave-it offers to the latter. As long as the rents exceed the ideological bias, the increase in wages landlords must concede to their workers in order to also control their voting behaviour is lower than the price they receive for these votes from the parties.[13]

It is interesting to observe that if workers are unideological, so that $\sigma^L = 0$, as long as the political parties attach a positive value to votes and there are rents, Proposition 2 follows without any other assumptions. Note, however, in this case, equilibrium the price paid by the right-wing party for the vote of any rural agent is identical and therefore it is no longer true that it is strictly cheaper to buy votes through landlords. In contrast, the main result is sensitive to changes in the timing of the game. For instance, if voting occurs after output is observed, the landlord gets income from selling the vote with probability γ^h rather than with probability 1. Nevertheless, as long as the market for votes predates the actions taken by the worker, the above argument goes through with only a few changes in details. However, if the worker can sell his vote after observing the output shock, then to control votes landlords have to raise the wage by $\mu W^L + \sigma^L$ which cannot be profitable.

We now have to consider whether it is optimal for landlords to pay the efficiency wage w^* which satisfies both (3) and (4) with at least one equality. To understand this we first consider the optimal demand for labor in a farm of size l with n workers. Profits are,

$$(9) \qquad \gamma^h \theta g \left(\frac{l}{n}\right) n - \gamma^h w^* n + \mu W^L n$$

The first term in (9) is expected revenues, the second the expected wage bill, and the third the political rents that the landlord gets from selling the votes of his n workers at the price μW^L. The optimal demand for labor is determined by the

[13]The surplus thus given to the workers also yields a comparative advantage to the employer in other spheres, such as the credit market. This argument has been used in part of the literature on interlinked contracts.

first-order condition,

$$(10) \qquad \gamma^h \theta \left(g\left(\frac{l}{n}\right) - g'\left(\frac{l}{n}\right)\frac{l}{n} \right) - \gamma^h w^* + \mu W^L = 0$$

The equation (10) implicitly defines the optimal demand for labor as a function of parameters, which we write $n(l, \mu W^L, w^*)$.

It is always profitable for the landlord to pay this efficiency wage contract if

$$(11) \qquad \left(\gamma^h - \gamma^l\right) \theta g\left(\frac{l}{n(l, \mu W^L, w^*)}\right) + \mu W^L \geq \gamma^h w^* - \underline{w}$$

We therefore assume that the expected increase in profit from workers exerting effort, evaluated at the efficiency wage, plus the rents from selling their votes must be greater than the expected increase in the wage bill.

The model has interesting implications for the price of land, denoted π. In the model landlords hold land while workers have no access to capital markets and cannot purchase land. Nevertheless, landlords could buy land from each other. The equilibrium price of a plot of land must now adjust so that profits are zero or,

$$(12) \qquad \left(\gamma^h \theta g\left(\frac{l}{n(l, \mu W^L, w^*)}\right) - \gamma^h w^* + \mu W^L\right) \frac{n(l, \mu W^L, w^*)}{l} = \pi$$

Equation (12) implies the following result.

Proposition 0.3. *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.

It follows from Proposition 2 that a political reform which stops landlords controlling the political behavior of their workers, such as the introduction of an effective secret ballot, removes the ability of landlords to sell their votes and has interesting comparative static effects.

Proposition 0.4. *The introduction of a secret ballot leads to a fall in the price of land and the vote share of the right-wing party.*

If all agents had access to capital markets then there would be no land concentration and all land would be farmed by smallholders with no workers getting rents. The fact that, with perfect capital markets, smallholders are always willing to outbid landowners for land follows from the fact that, through the participation constraint, the economic 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.[14]

The interaction of the market failures is crucial. Without moral hazard there are no rents and even with imperfect capital markets electoral corruption would not affect the price of land, as workers would then have to be fully compensated for the control of their votes. At the same time, with moral hazard but no capital market imperfections there is no inefficiency either.

We now proceed to develop an empirical test of part of Proposition 3. In particular, we focus on the impact of the introduction of the secret ballot in Chile in 1958 on the vote share of right-wing parties. In a companion paper, Jean-Marie Baland and James A. Robinson (2007), we investigate the impact of the same reform on the price of land.

IV. The political impact of the 1958 electoral reform in Chile: an overview

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. Universal literate male suffrage was introduced in 1874 but voting was not secret. Interestingly, the 1874 suffrage extension in Chile was opposed by

[14]The inefficiency here stemming from imperfections in the capital market is related to the results of Abhijit Banerjee and Andrew Newman (1993), Patrick Legros and Andrew Newman (1996), Dilip Mookherjee (1997) and Banerjee, Gertler and Ghatak (2002)

some more progressive Chileans as they "fully realized that in a predominantly rural society with traditional landlord-peasant ties, the Conservatives would overwhelm their opponents at the polls." (J. Samuel Valenzuela, 1985, see also Bauer, 1995, p. 30). The nineteenth century democracy collapsed in 1924 and the following period saw five military coups before democracy was restored in 1932. The intervening period was dominated by Colonel Carlos Ibáñez. After 1932 democratic stability was based on an explicit compromise between the growing power of urban groups and the power of the traditional landed elites. [15]

A. Mechanisms of Control of Rural Votes

"Throughout the history of the Republic, the political influence of the rural sector in Chile was disproportionately greater than its size relative to the urban sector. Congressional representation was heavily weighted in favor of rural districts where the peasantry historically formed a pliable and controllable mass base for conservative and reactionary groups" (Hellinger, 1978, p. 272). Landlords systematically controlled rural voting until the late 1950s. There is a consensus amongst historians, political scientists and sociologists about how this system functioned (see Robert E. Kaufman, 1972, Bauer, 1975, Loveman, 1976, James Petras and Maurice Zeitlin, 1968, and Scully, 1992, ch. 4): "There was an absolute control of peasants by their patrones, and elections in rural communes depended on the political preferences of the landowners" (René Carvacho Millar, 1981, p. 172). Large landlords usually registered all their employees, by teaching them how to sign their names (as literacy was a condition for vote registration). The day of the election, the employer would go vote with all their employees. "This type of control is pervasive ... The situation was publicly accepted, and it was even used as an argument in electoral legal complaints, particularly in order to show that any result against the preferences of the latifundistas was fraudulent, or to justify an unanimous electoral result in a rural locality" (Millar, 1981, p. 173). Part of the political pact which developed after the 1930s also involved the

[15]The Chilean pact is discussed in more detail in Arturo Valenzuela (1978), Ruth Berins Collier and David Collier (1991, pp. 565-73) and Scully (1992, pp. 108-109).

banning of agricultural unions, a policy which allowed severe labor repression to be carried on in the countryside, often backed by the police (Bauer, 1995, p.32).

In line with our model, the control of rural votes by landlords was made possible by the relatively good working conditions of the *inquilinos* compared to the possible alternatives: "They were free ... but they had no defence in the face of expulsion; indeed, the threat of being cast out into the subproletariat of migratory workers was the most powerful weapon at the landowner's disposal. Most *inquilinos* families undoubtedly judged their welfare on the estate superior to life outside or in the nitrate fields of the northern desert." (Bauer, 1995, p. 28). The patron-client relationship was very developed (see in particular Bauer, 1995). Thus, "anyone seen visiting the home of a resident laborer would be immediately approached and questioned by the owner, who reserved the right to expel him from the property" (Jeanine Swift, 1971, p. 37).

B. The political equilibrium in the 1950s

By the 1950s the political landscape in Chile was dominated by several main parties. There were the traditional nineteenth century parties, the Conservatives, Liberals and Radicals. The Conservatives and Liberals were furthest to the right and united in most things except in their attitudes to the Church (the Conservatives were closely associated with the Catholic Church). The Radicals were more towards the center politically and were strongly anti-clerical. Also in the center, though small in the 1950s, were the Christian Democrats. To the left were the Socialists and then the Communists (the latter were officially banned between 1948 and 1958 though they competed under different names). The landed oligarchy provided the traditional constituency of the two right-wing parties, the Conservative and the Liberal (see, e.g., Frederico G. Gil, 1966 and Steven W. Sinding, 1972). The existing party system was shocked however by the return from exile 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.

Chilean electoral institutions in this period were based upon the D'Hondt system of proportional representation for all elections, under the 1925 Constitution

(for more details, see Gil, 1966, Chapter 5, and Raul Morodo, 1968). The constituencies broadly coincided with the boundaries of Chile's provinces. Deputies were elected for four year terms, senators for eight with half of the Senate being replaced every four years. Prior to the reforms of 1958, parties issued their own ballot papers and a closed list system was used. Thus to vote for the Socialist party, a voter had to request the Socialist ballot which made it relatively easy to determine his voting behavior.[16] Until 1951 only literate males over the age of twenty-one could vote; of those eligible to vote, approximately 50 percent usually registered, and the vast majority of those registered cast ballots. Women were allowed to exercise the franchise in installments, first for municipal elections in 1935, then for congressional contests in 1951, and finally for presidential races in 1952.[17]

C. The introduction of the secret ballot in 1958

There were several important electoral reforms undertaken in Chile in the late 1950s and early 1960s. The most important was Law 12.889 promulgated on May 31st 1958, amending the basic electoral law of 1925 (see Jose Luis Castro, 1941, p. 35 and Ricardo Cruz Coke, 1984, pp. 27-29 for a discussion of this law) and its most important aspect was the introduction of the cédula única (the unified ballot). After 1958, the voter received a single, official ballot, which contained all party slates for any single type of election in his district and an open list system was adopted so that voters did not have to respect any official ordering of candidates. Another important law of 1958 banned electoral pacts between parties for deputies and councilmen (a 1962 electoral law extended this prohibition to senatorial elections).

The introduction of the secret ballot had an immediate impact on the balance of political power in Chile. Loveman (1976, p. 219) notes, "The introduction of a public ballot meant that landowners could no longer effectively control the

[16]Loveman (2001, pp. 222-3) provides a detailed discussion of how party provision of ballots before 1958 facilitated electoral corruption.

[17]Note that registration and vote turn-out are very close in Chile, since once an individual registers, voting is mandatory.

votes of rural labor. The electoral hegemony of the Right in the countryside thus gave way to forces that advocated social change in the rural areas ... In 1958 the performance of the FRAP (Socialists and Communists) in rural districts left little doubt that landowners' control over rural votes had considerably declined."

If the lack of secret balloting had played an important role in guaranteeing democratic stability in Chile since the 1930s, why was the secret ballot introduced in 1958? Though this issue appears not to have been researched by political scientists, the most plausible reason for this is a deliberate attempt to disrupt the existing political equilibrium. As we noted above, the election of Ibáñez in 1952 was based on a heterogenous coalition and an 'anti-politics' platform.[18] Ibáñez intended to forge a new political movement and though he failed in this, it seems likely that the introduction of the secret ballot, with its easily anticipated effects on voting in the countryside, was a calculated gamble. It may also have been part of a deal which he made with some of his key supporters, the Agrarian Labor party (Agrario Laboristas) and the Popular Socialist party (Partido Socialista Popular) both of which would have had an interest in mobilizing rural voters.

Interestingly however, despite these changes, the Conservative Jorge Alessandri won the presidential election in 1958, principally on a platform emphasizing conservative monetary policies which were a response to the populism of the Ibáñez regime.[19] Under Ibáñez per-capita GDP had fallen by 2 percent and inflation had averaged 45 percent, peaking at an annual rate of 76 percent in 1955 (see Ffrench-Davis, 1973, p. 242 and Table 35). However, the right began to disintegrate during the 1960s with the rise of the centrist Christian Democratic Party (Partido Demócrata Cristiano–PDC), founded in 1957 with the merger of three conservative elements: the National Falange, founded in 1938; the Social Christian Conservative Party; and the remnants of the Agrarian Labor Party that had backed Ibáñez. In the 1960s, the Christian Democrats became more progressive, and espoused reformist Catholic doctrines, which appealed strongly to the middle

[18]His campaign was based on the symbol of a "broom" with which he promised to "sweep" away political corruption and bad governments...

[19]Though he polled only 33,416 votes (out of 1,235,552 cast) more than Salvador Allende, the candidate for the Socialist and Communist alliance. Antonio Zamorano, a leftist defrocked priest, deprived Allende of a victory by gaining 41,304 (3.3%) left-wing votes.

class, women and rural voters. In 1966 the Conservatives and Liberals merged to form the National Party. The Christian Democrat candidate, Eduardo Frei, won the presidency in 1964, and in 1970 the Christian Democrats provided support to Allende, in exchange of his guaranteeing strict adherence to democratic procedures.

D. Agrarian relations and electoral results across provinces

We collected data from the 1949, 1953, 1957, 1961 and 1965 electoral registries, the agricultural census of 1935, 1955 and 1965 (see the Appendix) and the population censuses of 1930, 1940, 1952, 1960 and 1970. The data were collected at the *communa* (municipality) level, which corresponds to the lowest level of electoral district as well as the smallest administrative unit. As census units do not always strictly match the electoral districts, and changed definition over time, we had to exclude all the *communas* for which we could not be certain of the correspondence, which left us with a sample of 246 *communas* (out of 295). The variables used throughout the analysis are described in the Appendix (table A1).

Our main results are mostly based on the 1957 and the 1965 parliamentary (all of the congress and half of the senate) elections, as they allows a direct comparison of the consequences of the introduction of the secret ballot in 1958, but also because those two election years are the closest to the corresponding agricultural census data (1955 and 1965) from which we have information on the occupational division of the population at the level of the municipality. We describe in Table 1 the main trends at the level of the provinces. In the table, we report the information over the three Central Valley regions, its two neighboring regions, the Frontier and the Little North, and the other regions.

INSERT TABLE 1 HERE

The relationship between agrarian relations and electoral outcomes is striking. In 1957, the landed oligarchy in Chile dominated the Urban and the North Central Valley provinces: the proportion of *inquilinos* in the number of registered voters in 1957 is 18.9 percent in the North Central Valley, and 17.2 in the Urban Central Valley, but 11.2 in the Frontier and Little North, and 8.2 in the other provinces.

Unsurprisingly, the share of right-wing votes in 1957 in the North Central Valley was 50.0 percent, and 40.8 percent in the Urban Central Valley, much higher than in the other provinces.[20]

After 1958, the fall in the right-wing votes occurs in provinces with a larger proportion of *inquilinos* per worker (across provinces, the correlation coefficient between the two is equal to -0.67). The fall in right-wing votes is dramatic in the Central Valley provinces. Even the absolute number of right-wing votes fell in those areas, in spite of an increase in registered voters. The fall is very pronounced in some provinces, such as Colchagua (-48.1 percent) from an absolute majority of 70.2 percent of the votes in 1957 to barely 22.5 percent in 1965.

V. The political impact of the 1958 electoral reform: a test

A. *The empirical strategy*

The empirical strategy pursued in this paper can be described as follows. Before the 1958 reform, the share of right-wing votes should be higher in *communas* with more *inquilinos* since their votes are then controlled. However, after the reform, the influence of *inquilinos* on electoral results should disappear, so that the difference in voting patterns across the two types of *communas* should disappear. In table 2 below, we report the electoral results in 1957 and 1965 for *communas* with less and more *inquilinos* than the median.

INSERT TABLE 2 HERE

Over the period, right-wing votes in *communas* with less *inquilinos* fell by -16.2 percent while it fell by -30.3 percent in *communas* with more *inquilinos*. The impact of the loss of control over *inquilinos* votes on the fall in right-wing votes corresponds to the difference between these two figures, -14.1 percent. The model below aims at estimating this impact more precisely.

In Figure 1, we present simple OLS scatter plot of the relationship between right-wing votes and the proportion of *inquilinos* in each *communa*. The pattern is

[20]The relationship between right-wing votes in the 1957 elections and land concentration is less clear however. This is due to the fact that in the arid, semi-arid and infertile provinces to the north and to the south of the Central Valley (including the Frontier), land concentration tends also to be high, as a result of the technological constraints on agriculture in these provinces (ranching instead of farming).

striking, as the impact of *inquilinos* on right-wing votes is significantly diminished after 1958.

INSERT FIGURE 1 HERE

B. The empirical models

Two major limitations constrain our empirical strategy: first, we do not have information on voters by occupation category in a municipality. In other words, we do not know the number of *inquilinos* or other agricultural workers who actually voted in a particular municipality in a particular election. For each municipality, we know the total number of *inquilinos* (and of other agricultural workers), and we know the total number of valid votes in a particular election. We therefore have to assume a specific relationship between the distribution of the population across occupations and the distribution of voters across occupations in a particular municipality. Moreover, as we already noted above, the occupational division of a municipality's population is available only through the agricultural censuses, which were administered in 1935, 1955 and 1965. This explains our emphasis on the 1957 and 1965 elections, even though we will also provide results for all congressional elections between 1949 and 1965.[21]

We first present the models underlying our empirical analysis. We let $RV_{i,t}$ represent the number of votes cast in favor of the right-wing party, $V_{i,t}$, the total number of voters, and $V^h_{i,t}$, the total number of voters of type h at time t in *communa* i. Voters can be of three different types: $h = inq$ if the voter is an *inquilino*, $h = agr$ if the voter is not an *inquilino* but works in agriculture, and $h = na$ if he is not an agricultural worker. We can then write:

$$(13) \qquad RV_{i,t} = (\theta_i + \rho_{I,t} + \tau_t^{inq}) V_{i,t}^{inq} + (\theta_i + \rho_{I,t} + \tau_t^{agr}) V_{i,t}^{agr} + (\theta_i + \rho_{I,t} + \tau_t^{na}) V_{i,t}^{na} + \varepsilon_{i,t} V_{i,t}$$

where θ_i is a *communa* specific fixed effect, which represents the time-invariant propensity to vote for the right-wing party in that *communa*, $\rho_{I,t}$ is a provincial level fixed effect at each time period which represents the propensity to vote

[21] We decided not to investigate elections before 1949 as women were enfranchised only in 1948.

for the right-wing party in province I at time t, and τ_t^h represents the specific propensity for a voter of type h to vote for the right-wing party at time t. The error component, $\varepsilon_{i,t}$, satisfies the usual conditions. Rearranging equation (13) above, and using the fact that $V_{i,t} = V_{i,t}^{inq} + V_{i,t}^{agr} + V_{i,t}^{na}$, we obtain:

$$RV_{i,t} = (\rho_{I,t} + \tau_t^{na})V_{i,t} + (\tau_t^{inq} - \tau_t^{na})V_{i,t}^{inq} + (\tau_t^{agr} - \tau_t^{na})V_{i,t}^{agr} + (\theta_i + \varepsilon_{i,t})V_{i,t}.$$

Dividing both sides of the equation by $V_{i,t}$, one gets:

$$\frac{RV_{i,t}}{V_{i,t}} = \rho_{I,t} + \tau_t^{na} + (\tau_t^{inq} - \tau_t^{na})\frac{V_{i,t}^{inq}}{V_{i,t}} + (\tau_t^{agr} - \tau_t^{na})\frac{V_{i,t}^{agr}}{V_{i,t}} + \theta_i + \varepsilon_{i,t}, \tag{14}$$

that can potentially be directly estimated. However, we do not have information on the number of voters per category of occupation, $V_{i,t}^h$. Moreover, even between 1957 and 1965, the number of registered voters in the population varied.

To address these two issues we have to make assumptions in order to determine the proportion of voters per occupation. In Model 1, we assume that:

(1) the number of voters per occupation increased at the same rate for all occupations in a given *communa*: $(V_{i,t} - V_{i,t_0})/(V_{i,t_0})$ is common across all occupations in *communa* i;

(2) at time t_0, the probability that an *inquilino* is registered as an elector, $(V_{t_0}^{inq})/(N_{t_0}^{inq})$, is the same across all *communa*s (but can be greater than $(V_{t_0}^{agr})/(N_{t_0}^{agr})$), where $N_{i,t}^{inq}$ represent the number of *inquilinos* in *communa* i at time t .

Note that assumption (1) does not require the growth of voters to be identical across *communas*: $(V_{i,t})/(V_{i,t_0})$ is specific to *communa* i. Assumption (2) is needed to identify the impact of the prevalence of *inquilinos* in the electorate: if the proportion of *inquilinos* voting in 1957 is arbitrary, identification becomes impossible as the impact of the electoral reform on the 1965 electoral results can always be explained by differences in the registration rates of *inquilinos* in 1957 across *communa*s. We have:

$$\frac{V_{i,t}^{inq}}{N_{i,t}^{inq}} = \frac{V_{i,t}}{V_{i,t_0}}\frac{V_{t_0}^{inq}}{N_{t_0}^{inq}} \Leftrightarrow \frac{V_{i,t}^{inq}}{V_{i,t}} = \left(\frac{V_{t_0}^{inq}}{N_{t_0}^{inq}}\right)\frac{N_{i,t}^{inq}}{V_{i,t_0}}.$$

We make a similar assumption for the other agricultural workers (though our main tests do not require this), where $N_{i,t}^{agr}$ represents the number of agricultural workers (other than *inquilinos*) in *communa* i at time t:

$$\frac{V_{i,t}^{agr}}{V_{i,t}} = \frac{V_{t_0}^{agr}}{N_{t_0}^{agr}} \frac{N_{i,t}^{agr}}{V_{i,t_0}}.$$

Using these two expressions in equation (14), and rearranging terms, we obtain:

$$\frac{RV_{i,t}}{V_{i,t}} = \rho_{I,t} + \tau_t^{na} + \left((\tau_t^{inq} - \tau_t^{na}) \frac{V_{t_0}^{inq}}{N_{t_0}^{inq}} \right) \frac{N_{i,t}^{inq}}{V_{i,t_0}} + \left((\tau_t^{agr} - \tau_t^{na}) \frac{V_{t_0}^{agr}}{N_{t_0}^{agr}} \right) \frac{N_{i,t}^{agr}}{V_{i,t_0}} + \theta_i + \varepsilon_{i,t}, \tag{15}$$

which represents the basic equation to be estimated. For further interpretation, it is convenient to rewrite the latter by considering only two time periods, 1957 and 1965, as well as by introducing explicitly provincial dummies, D_I, (which is equal to 1 if *communa* i belongs to province I and zero otherwise) and a time dummy t_{65} corresponding to year 1965. We then have:

$$\begin{aligned} \frac{RV_{i,t}}{V_{i,t}} &= \left(\theta_i + \sum_I \rho_I D_I + \tau^{na} \right) + \sum_I \Delta\rho_I D_I t_{65} + \Delta\tau^{na} t_{65} \\ &\quad + \beta \frac{N_{i,t}^{inq}}{V_{i,57}} + \Delta\beta \frac{N_{i,t}^{inq}}{V_{i,57}} t_{65} + \gamma \frac{N_{i,t}^{agr}}{V_{i,57}} + \Delta\gamma \frac{N_{i,t}^{agr}}{V_{i,57}} t_{65} + \varepsilon_{i,t}, \end{aligned} \tag{16}$$

where $\theta_i + \sum_I \rho_I D_I + \tau^{na}$, represents the (total) *communa* fixed effect. $\Delta\rho_I = \rho_{I,1965} - \rho_{I,1957}$ represents time-varying provincial fixed effects, in order to reflect possibly changing state policies that affect provinces differently (for instance, between cattle-raising and grain-growing areas). $\beta = (\tau_{1957}^{inq} - \tau_{1957}^{na})(V_{1957}^{inq})/(N_{1957}^{inq})$ represents the propensity in 1957 of *inquilinos* to support right-wing parties more than other voters, and particularly more than the other agricultural workers: we expect $\beta > 0$ and $\beta > \gamma$. Similarly, $\Delta\beta = \left[(\tau_{1965}^{inq} - \tau_{1965}^{na}) - (\tau_{1957}^{inq} - \tau_{1957}^{na}) \right] (V_{1957}^{inq})/(N_{1957}^{inq})$ represents the change in the *inquilinos*' voting behaviour that followed the introduction of the secret ballot. After the electoral reform, *inquilinos* can vote freely and we therefore expect $\Delta\beta < 0$. We also expect *inquilinos* in 1965 to vote like the other agricultural workers, so that $\beta + \Delta\beta = \gamma + \Delta\gamma$ (and $= 0$ if we believe that they do not vote differently than the non-agricultural social classes).

Model 2 assumes that, across all *communas* and across time, the proportion of voting *inquilinos* in the *inquilino* population remains constant:

$$\frac{V_{i,t}^{inq}}{N_{i,t}^{inq}} = \frac{V_{t_0}^{inq}}{N_{t_0}^{inq}} \Leftrightarrow \frac{V_{i,t}^{inq}}{V_{i,t}} = \left(\frac{V_{t_0}^{inq}}{N_{t_0}^{inq}}\right) \frac{N_{i,t}^{inq}}{V_{i,t}}$$

This assumption implies that the increase in the proportion of registered voters between 1957 and 1965 took place exclusively among non-*inquilinos*. Under this assumption, we neglect the potential difference in voting behavior between the two other classes, the explicit incorporation of which requires additional assumptions to determine which classes benefitted most from the increase in registration. (In effect, we therefore assume that the other agricultural workers do not vote differently from the other non-agricultural classes.) Note that we still assume that, at time t_0, the probability that an *inquilino* is registered as an elector, $(V_{t_0}^{inq})/(N_{t_0}^{inq})$, is not *communa*-specific.

The number of registered voters changed over the years. Model 1 assumes that, within a *communa*, the increase in registration is identical across all social classes, which can bias our estimates if non-*inquilinos* are more likely to be registered in 1965 than in 1957. In this case the 1965 effect we are capturing may simply be the effect of an increase in registration that is biased against *inquilinos*.[22] Model 2 is based on the opposite assumption where the increases in registration rates entirely took place among non-*inquilino*s. One can instead assume that, given the proportion of *inquilino*s in a municipality, registration rates are themselves endogenous. To fix ideas, consider a very simple model where (i) right-wing votes depend on the number of voting *inquilino*s (before 1958) $(RV_{i,t})/(V_{i,t}) = f\left(V_{i,t}^{inq}/V_{i,t}\right)$, and (ii) the proportion of *inquilino*s in the voting population is a function of the number of *inquilino*s in the population: $(V_{i,t}^{inq})/(V_{i,t}) = g\left(N_{i,t}^{inq}/N_{i,t}\right)$where $N_{i,t}$ represents the total population in *communa* i at time t. If we use a model where the proportion of right wing votes is a function of the proportion of *inquilino*s in the population, we actually estimate the linearized reduced form of the structural

[22]Note however that what this argument points out is that the effect of the electoral reforms on the 1965 elections may be over-estimated. But it leaves unbiased the coefficients associated with the *inquilinos* before the reform.

model composed of the two equations above. We therefore estimate the impact of *inquilino*s' presence on right-wing votes through the combined effect of their higher propensity to be registered and their higher propensity to vote for the right-wing parties before 1958. These two effects disappear in 1965 as *inquilino*s vote freely and registration rates need not be biased in their favor with the introduction of the secret ballot. Model 3 is given by equation (16) where $(N_{i,t}^{inq})/(V_{i,57})$ and $(N_{i,t}^{agr})/(V_{i,57})$ are replaced by $(N_{i,t}^{inq})/(N_{i,t})$ and $(N_{i,t}^{agr})/(N_{i,t})$ respectively.[23]

It can be argued that, within a *communa*, the number of *inquilino*s is itself endogenous. In model 4, we explore this issue by reestimating model 3 using the proportion of *inquilinos* in the population of a municipality that prevailed in 1935. Such a measure is less susceptible to possible endogeneity biases since it predates the elections under study.

In models 5 and 6, we further explore the robustness of our estimates by using alternative measures of the proportion of voting *inquilino*s in the voting population. As in models 1 and 2, we assume that registration rates per occupation are not specific to a particular municipality. Model 5 requires that the proportion of voting *inquilino*s in the voting population is constant across time:

$$\frac{V_{i,t}^{inq}}{V_{i,t}} = \frac{V_{i,t_0}^{inq}}{V_{i,t_0}} = \frac{V_{t_0}^{inq}}{N_{t_0}^{inq}} \frac{N_{i,t_0}^{inq}}{V_{i,t_0}}, \frac{V_{i,t}^{agr}}{V_{i,t}} = \frac{V_{i,t_0}^{agr}}{V_{i,t_0}} = \frac{V_{t_0}^{agr}}{N_{t_0}^{agr}} \frac{N_{i,t_0}^{agr}}{V_{i,t_0}}.$$

This model still allows *inquilinos* to be over-represented in 1957, but implies that the increase in registration rates that occurred between 1957 and 1965 took place entirely among the other occupations. In model 6, the number of voting *inquilinos* remains constant:

$$\frac{V_{i,t}^{inq}}{V_{i,t}} = \frac{V_{i,t_0}^{inq}}{V_{i,t}} = \frac{V_{t_0}^{inq}}{N_{t_0}^{inq}} \frac{N_{i,t_0}^{inq}}{V_{i,t}}.$$

This implies that all increases in the number of registered voters took place among non-*inquilinos*. (An extreme version of this model assumes that, in 1957, all *in-*

[23] It is possible to re-interpret the coefficients estimated by Models 3 and 4 as a direct measure of voting behaviour, along the lines of equation (5.6). To this end, we have to assume that the registration rate of an occupation is proportional to its share in the population of the municipality: Registration rates are communa specific, however. We then have: $(V_{i,t}^{inq})/(V_{i,t}) = (N_{i,t}^{inq})/(N_{i,t}), (V_{i,t}^{agr})/(V_{i,t}) = (N_{i,t}^{agr})/(N_{i,t})$.

quilinos were registered, $(V_{t_0}^{inq})/(N_{t_0}^{inq}) = 1$, with the same specification as above.) Model 5 and 6 are both based on more extreme assumptions on the evolution of registration rates among *inquilino*s and, in the following, we use them essentially as robustness checks.

The most relevant models for our analysis are Models 1 and 2, as they allow us to identify changes in voting behaviour across occupations. Models 3 and 4 are more flexible as they do not require specific assumptions about the registration process, but provide reduced form estimates which capture both the change in voting behaviour as well as the indirect effect working through changes in registration per occupation.

C. The basic results

The information we have on *inquilinos,* total population, and the agricultural labor force in a municipality comes from the two agricultural censuses of 1955 and 1965. For the elections of 1965, we used the information from the 1965 census, while for the elections of 1957, we computed the corresponding figures, using linear interpolation between 1955 and 1965.[24]

The results of the panel estimations are given in Table 3 below. Column (1) of Model 1 corresponds to equation (16) above, with a *communa* fixed effect but without the province*year dummies. We therefore impose that the evolution of the votes are the same across provinces (controlling for *inquilino*s), thereby assuming that: $\Delta\rho_I = 0$, $\forall I$.

In column (2), we also include provincial effects interacted with time. This partly affects the significance of some of our estimates, because of the provincial pattern in the prevalence of the *inquilino* system.[25] We also add the following additional controls: total population and the proportion of land under large farms in the municipality. Column (3) presents the same specification as in column (1), but using pooled OLS with a province fixed effect.

[24]Estimations made using the 1955 data on *inquilinos* instead of the 1957 data obtained by interpolation yield almost identical results.

[25]As can be expected, the estimation results tend to be stronger in the absence of communa fixed effects (using pooled OLS) or in the absence of province*time dummies.

The results obtained with Model 2 is given in columns (4) and (5), with similar specifications as in columns (1) and (2). The corresponding estimates derived from Models 3, 4, 5 and 6 are given in columns (6)-(14).

INSERT TABLE 3 HERE

The results are striking, as they strongly support the hypotheses outlined above. First, *communas* with more *inquilinos* display a stronger support in favor of right-wing parties in 1957. Thus, from column (1), a *communa* in 1957 where the share of *inquilinos* in the number of voters is greater by one standard deviation (0.14) exhibits a 6.1percent higher share of votes for right-wing parties. This represents a 15 percent increase in the average proportion of right-wing votes. It is worth noting that the coefficient estimated for *inquilinos* in 1957 differs significantly from that estimated for the other agricultural workers, confirming our hypothesis that the voting behaviors of the two classes are completely distinct (and in many cases, $\beta > 0$ and $\gamma < 0$).

Moreover, the political distinctiveness of *inquilinos* disappears by 1965. The coefficient estimated, $\Delta\beta$, is negative, very significant and of a similar magnitude to β in absolute value: $\beta + \Delta\beta$ does not differ from $\gamma + \Delta\gamma$, the corresponding coefficients for the other agricultural workers, nor from 0 which corresponds to the voting behavior of the non-agricultural classes. The imposition of secret ballot therefore had an important and significant effect, as the correlation between the presence of *inquilinos* and right-wing votes vanishes in the 1965 elections.[26]

The results are consistent and remarkably stable across the alternative specifications even in Model 4 where we used the proportion of *inquilinos* in the population of a municipality in 1935.[27] The main coefficients of interest always have the anticipated sign and comparable significance across all regressions. They are

[26] Although not reported here, the provincial dummies attached to the 'oligarchic' provinces of O'Higgins, Aconcagua and Colchagua are always significant for the 1965 elections (equal to -0.16, -0.19 and -0.26 respectively, all significant at the 1% level). (While we cannot estimate the provincial fixed effect for 1957 with the panel regressions, the corresponding estimates obtained with the pooled OLS for 1957 are 0.15, 0.27 and 0.33, all significant at the 1% level).

[27] With a municipality fixed effect, we cannot estimate the coefficients attached to variables which remain constant over time, in particular the ones related to the 1957 elections. They are estimated using pooled OLS in column (8).

slightly weaker in Model 6, which is however based on the least plausible identification assumptions.

To further test the robustness of the above results, we ran similar regressions using other indicators of the strength of patron-client relationships and of political control by a traditional landed oligarchy. Instead of using the proportion of voters of different types in the voting population, we used the proportion of *inquilinos* in the agricultural labour force in 1957 and 1965 as a measure of the intensity of the patron-client relationships in the *communa*, and a measure of land concentration, the share of area owned by farms larger than 200 hectares in the total agricultural area of the *communa*.[28] We report the results of these estimations in table 4 below. The estimates are again consistent with our main hypotheses, though they are less precise than in the basic model. This can be partly attributed to the multicollinearity between the provincial dummies interacted with time and changes in the proportion of *inquilino*s or in land concentration, but also to the less precise nature of the indicators used. Interestingly, when we run a regression using both the proportion of *inquilinos* and the measure of land concentration as in column (17), the latter looses all significance, contrary to the former. This suggests that land concentration had less implications for the political outcome of a municipality than the intensity of the patron-client relationship, which is perfectly consistent with our model.[29]

INSERT TABLE 4 HERE

The above estimates excluded the 1949, 1953 and 1961 elections. The major problem comes from the fact that the number of *inquilinos* per municipality were observed only in the three census years, 1935, 1955 and 1965. We cannot therefore estimate Models 1, 2 and 3 as they need a time-varying measure of population per occupation. We focus instead on Models 4, 5 and 6. Model 4 uses the number

[28] Again the 1957 figures were obtained by linear interpolation between 1955 and 1965. These land concentration measures are imprecise however, as the censuses only report at the *communa* level the number of farms per size category. By taking the median of each size class, we computed an estimate of the areas, that we used to compute the shares in area.

[29] Note that large farms were also found in cattle-raising areas in the North and in the South of Chile, where few *inquilinos* were found. The correlation between land concentration and the proportion of *inquilinos* in the agricultural labour force is only 0.22.

of *inquilino*s in the population in 1935 and we also propose a variant using the number of *inquilino*s in the population in 1957. Model 5 uses the number of *inquilino*s in 1957 (obtained by linear interpolation between 1955 and 1965) and the number of voters in 1957 while Model 6 divides the number of *inquilino*s in 1957 by the number of voters at time t. Using data on two additional pre-1958 election years allows us to test whether the 1957 elections followed a pattern that was not exceptional as it was also present in the two preceding elections. Similarly, after 1958, the change in electoral pattern highlighted for the 1965 elections should also be present for the 1961 elections. We do not however necessarily expect the change in 1961 to be as pronounced as in 1965 since the 1961 elections were closer to the electoral reform and all political adjustments might not be instantaneous. Taking the 1949 elections as a baseline, we therefore expect: $\beta_{1949} > 0$ and $\Delta\beta_{1953} = \Delta\beta_{1957} = 0$, and $0 > \Delta\beta_{1961} \geq \Delta\beta_{1965}$. The results are presented in Table 5 below.

INSERT TABLE 5 HERE

The results are very close to our former estimations. The coefficients (and their standard errors) associated with the 1957 and 1965 elections are almost identical to those presented in Table 3. Again, Model 6, which is used as a robustness check, provides less satisfactory results, and we will ignore them in the following discussion.

As expected, the coefficients associated with the 1961 election are smaller (in absolute value) than the corresponding ones in 1965 but are systematically negative and almost everywhere significant. Moreover, there is no discernible trend in the electoral pattern before the elections: the presence of *inquilino*s has the same impact on the election outcomes in 1949, 1953 and 1957. This is all the more remarkable given that the 1953 congressional and senatorial elections were particular, with the rise of the populist party supporting Carlos Ibáñez and the creation of a number of small parties at the expense of the traditional conservative parties.[30]

[30] After the election to the presidency of Carlos Ibáñez in 1952, the 1953 elections saw a transient collapse in the right-wing vote in the face of the Ibáñista bandwagon. Scully (1992, p. 126) notes "The disruption of familiar patterns of party competition was also reflected in the extreme fragmentation by the party system in the congressional elections of 1953. In

D. Christian Democratic votes

We ran similar regressions using the vote share of the Christian Democratic party as the dependent variable. One can argue that, after the introduction of the secret ballot, *inquilinos* are more likely to vote for that party than for any other party. (We also ran similar regressions grouping the socialist and the Christian Democratic parties together, with very similar results.) The focus on the Christian Democratic party follows from the fact that, historically, peasants constituted their political base, while the socialist party drew more support from men and blue collar workers.

The estimates are given in table 6 below, where we followed the specification used in the six models above. The results are once again supportive of our hypothesis. While, before 1958, the *communas* with a higher proportion of *inquilinos* tend to vote less in favor of the Christian Democratic party, this impact completely disappears in 1965. The estimates are consistent across the various specifications, but sometimes not significant, particularly when provincial dummies interacted with time are used.

INSERT TABLE 6 HERE

VI. Conclusions

In this paper we have investigated how the employment relationship, if it generates rents, may allow employers to control the political behavior of their workers. The salient example of this is voting behavior when there is no secret ballot, so that political behavior is observable. Interestingly, the rents conceded by employers to workers gives the former a comparative advantage in controlling the political activities of the latter, relative to political parties. We showed that this helps to explain one of the big stylized facts about polities with endemic electoral

that year, 25 party organizations presented candidates, and 19 achieved representation. Party proliferation weakened Chile's traditional parties. Whereas in the congressional elections of 1949 the Conservative, Liberal, and Radical parties combined received more than 60% of the vote, in 1953 they received barely one third." This was just a temporary phenomena however. Scully goes on to add (1992, p. 126) "Though Ibáñez had put the leadership of traditional parties on the defensive in 1953, the situation was reversed between 1953 and 1957."

corruption, namely that employers supply votes to parties rather than the parties buying most votes separately from individuals. The ability to sell votes increases the demand for labor and generates an added incentive to own land, driving up its price.

We test some of the predictions of the model by examining in detail the effects of the introduction of the secret ballot in Chile in 1958. We show that, consistent with our theory, the political reforms led to large changes in voting behavior. Before the reforms, localities with more pervasive patron-client relationships tend to exhibit a much stronger support for the right-wing parties, traditionally associated with the landed oligarchy. After the reform however, this difference across localities completely disappeared. In Baland and Robinson (2007) we show that land prices in the same areas were significantly higher prior to 1958 and then fell afterwards.

These findings suggest to us that electoral corruption, and the economic and political incentives that it created, is an important part of the story for why inequality has been so high historically in Latin America and possibly also an important part of the story about why long-run economic performance in Latin American has been so disappointing (on which see Engerman and Sokoloff, 2005, and Eduardo Posada-Carbó, 2000, who argue for the central importance of electoral corruption in Latin American political history). Though our analysis focused on vote buying, this can be thought of as a metaphor for a wide variety of political favors or policies that transfer rents to the landlords. Moreover, the political control that rents allow employers to exercise applies much more generally, even in situations where there is an effective secret ballot. Any type of observable political activity, collective actions, demonstrations, trade unionism, political activism, can all be controlled by the threat of losing one's employment and the rents that it provides.

*Baland: CRED, Department of Economics, Facultes Universitaires Notre-Dame de la Paix, 8 Rempart de la Vierge, B-5000 Namur, Belgium (e-mail: jean-marie.baland@fundp.ac.be). Robinson: Department of Government, IQSS,

Harvard University, 1737 Cambridge St., Cambridge MA02138 (e-mail: jrobinson@gov.harvard.edu). The authors are grateful to María Angélica Bautista, Mauricio Benitez-Iturbe and Sebastián Mazzuca for their outstanding research assistance. Their greatest debt is to Jonathan Conning who persevered through at least three previous versions. They have also benefitted from the suggestions and advice of Daron Acemoglu, Siwan Anderson, Arnold Bauer, Samuel Bowles, Michael Carter, Eduardo Fajnzylberg, Jeffry Frieden, Tu Jarvis, Sebastian Laurent, François Maniquet, Dina Mesbah, Sripad Motiram, Andrew Newman, Thomas Piketty, Timothy Scully, William Summerhill, Werner Troesken, numerous seminar participants, particularly Timothy Besley, Alberto Diaz-Cayeros, Esther Duflo, Jim Fearon, Dilip Mookherjee, Jeffrey Nugent, T.N. Srinivasan and Barry Weingast and two anonymous referees for helpful comments. Jean-Marie Baland would like to thank the MacArthur network on Inequality and Economic Performance, the CRED, the Programme d'Actions de Recherches Concertees (Communaute Francaise de Belgique) and the Belgian Program on Inter-University Poles of Attraction (Prime Minister's office, Science Policy Programming) for financial support.

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Appendix Sources and methodology and description of variables used

'Agricultural workers' and '*inquilinos*' are the total number of agricultural workers and the total number of *inquilinos* working in the agricultural sector in 1935, 1955 and 1964-5 respectively. Source:II Censo Nacional Agricola Ganadero, 1935, Vol. 1-6, Servicio Nacional de Estadistica y Censos, Republica de Chile; 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. Population figures came from the 1930, 1940, 1952, 1960 and 1970 Censo de Poblacion, Centro Latinamericano de Demografia. '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 1949, 1953, 1957, 1961, and 1965 respectively; 'christian democrat' is the proportion of valid votes in favor of the 'Falangia Nacional', the 'Agrario Laboristas' and 'Partido Social Christiano Conservador' in 1957 and the 'Democrata Christiano' party for the years 1961, 1965 and 1969. The 'left' includes the proportion of valid votes in favor of the 'Communista', 'Socialista' and 'Socialista Popular' parties in 1957, 1961 and 1965 respectively. The regrouping of the political parties was made according to the methodology followed by Valenzuela (1978). The number of voters is the number of valid votes in the 1949, 1953, 1957, 1961 and 1965 elections. We chose parliamentary elections only because of their comparability across years and the stability of the major parties over the years. Presidential and Municipal elections in those years followed very closely the pattern followed by the parliamentary elections. Sources: Direccion del Registro Electoral, Election ordinaria de senadores y diputados al Congreso Nacional (periodo constitucional1949-53, 1953-7), Chile; Direccion del Registro Electoral, Variacion Porcentual de los Partidos Politicos, 1957-1971, Chile.

Figure 1: Right-wing votes and the ratio of *inquilinos* to registered voters in 1957 and 1965
(scatter plot and simple regression line)

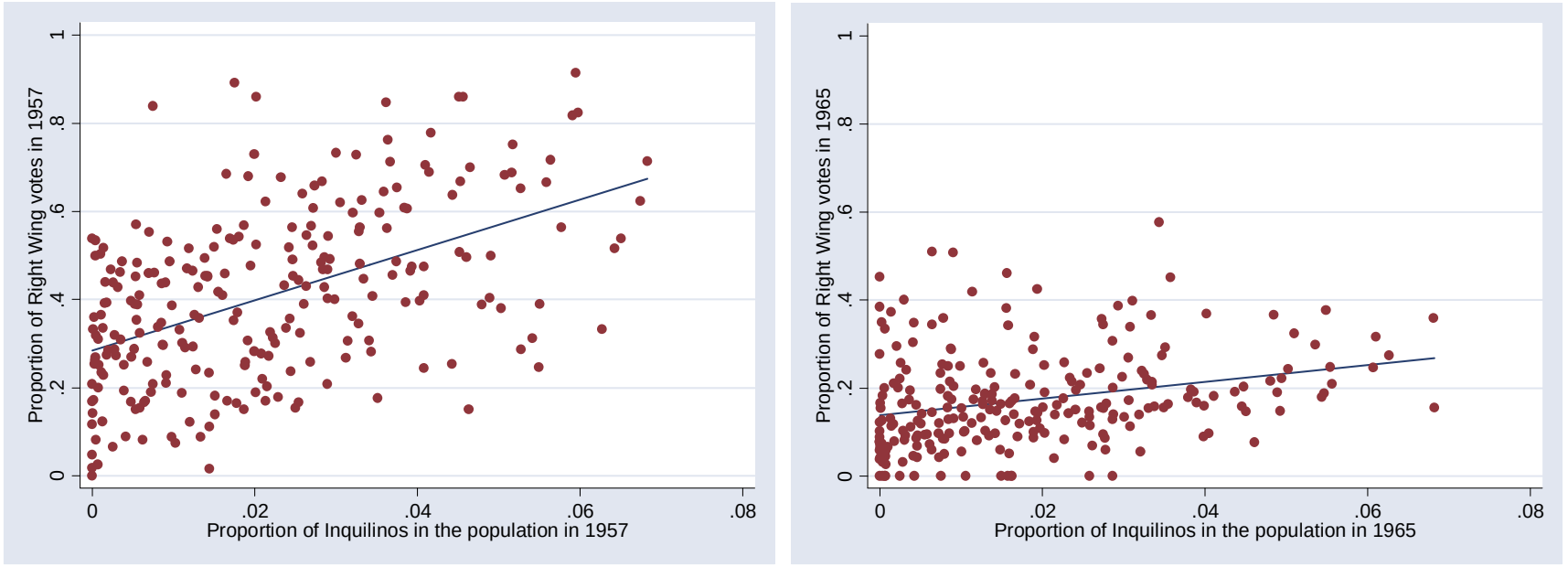

Table 1: Agrarian relations, land concentration and electoral results in Chile

Region	Proportion of inquilinos in the population in 1935 (percent)	Proportion of inquilinos in the agricultural labour force in 1955 (percent)	Proportion of inquilinos in the number of registered voters (1955-57) (percent)	Proportion of right-wing votes in 1957 elections (percent)	Proportion of right-wing votes in 1965 elections (percent)	Proportion of christian-democratic votes in the 1957 elections (percent)	Proportion of christian-democratic votes in the 1965 elections (percent)	Share of total area operated by farms over 200 has in 1955 (percent)
North Central Valley (O'Higgins, Colchagua, Curico, Talca)	4.8	19.6	18.9	50.0	17.3	4.8	40.8	75.7
Urban Central Valley (Valparaiso, Santiago, Aconcagua)	3.8	19.1	17.2	40.8	16.0	8.6	47.1	88.5
South Central Valley (Maule, Linares, Nuble)	4.5	12.7	14.6	40.5	17.2	4.9	39.0	60.1
All Central Valley Provinces	4.3	17.4	17.1	44.4	16.9	6.0	42.1	74.9
Frontier and Little North Provinces (Concepcion, Bio-bio, Arauco, Malleco, Cautin, Atacama, Coquimbo)	3.2	10.8	11.2	31.2	11.8	7.4	33.7	68.9
All other provinces (Valdivia, Osorno, Llanquihue, Chiloe, Aysen, Magallanes, Tarapaca, Antofagasta)	3.0	5.7	8.2	26.6	15.1	14.7	29.6	69.4
Chile (average across all provinces)	3.8	11.8	12.6	35.0	14.8	8.7	35.8	71.4

Note: For the Santiago province, we excluded the four exclusively urban districts of the city of Santiago.

Table 2: Impact of agrarian relations on right-wing votes before and after the 1958 electoral reform

	1957	1965	Difference 65-57
Ratio of inquilinos to the number of registered voters in 1955 below median (<0.134)	0.321	0.159	-0.162
Ratio of inquilinos to the number of registered voters in 1955 above median	0.491	0.188	-0.303
Difference	0.170	0.029	**-0.141**

Table 3: Impact of inquilinos on right-wing votes in 1957 and 1965

The dependent variable is the proportion of right-wing votes in the 1957 and 1965 parliamentary elections

	Model 1			Model 2		Model 3	
	inquilino/voter = inquilinos at time t/voters in 1957			inquilino/voter= inquilinos at time t/voters at time t		inquilino/voter= inquilinos at time t/population at time t	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Inquilino/voter	0.438**	0.259*	0.451***	0.424***	0.353**	3.533***	2.095*
	(0.173)	(0.153)	(0.072)	(0.144)	(0.124)	(1.306)	(1.188)
1965*Inquilino/voter	-0.435***	-0.294***	-0.278***	-0.369**	-0.203	-4.705***	-3.034***
	(0.082)	(0.090)	(0.986)	(0.144)	(0.136)	(0.688)	(0.801)
Other agricultural workers/voter	-0.102***	-0.016	-0.006	___	___	-0.644***	0.032
	(0.031)	(0.030)	(0.010)			(0.232)	(0.240)
1965*Other agric. workers/voter	0.047***	0.005	0.001	___	___	0.364**	-0.076
	(0.012)	(0.013)	(0.013)			(0.112)	(0.141)
Time dummy:1965	-0.197***	-0.156***	-0.157***	-0.168***	-0.141***	-0.182***	-0.121**
	(0.019)	(0.047)	(0.056)	(0.016)	(0.048)	(0.021)	(0.050)
1965*Province	___	Yes	Yes	___	Yes	___	Yes
Other controls	___	Yes	Yes	___	Yes	___	Yes
Communa fixed effect	Yes	Yes	No (pool. OLS)	Yes	Yes	Yes	Yes
Provincial dummies	___	___	Yes	___	___	___	___
Number of observ.	492	492	492	492	492	492	492

Table 3 (ctd): Impact of inquilinos on right-wing votes in 1957 and 1965

The dependent variable is the proportion of right-wing votes in the 1957 and 1965 parliamentary elections

	Model 4			Model 5		Model 6	
	inquilino/voter= inquilinos in 1935/population in 1935			inquilino/voter= inquilinos in 1957/voters in 1957		inquilino/voter= inquilinos in 1957/voters at time t	
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Inquilino/voter	1.970***	___	___	___	0.448***	0.734***	0.592***
	(0.385)				(0.072)	(0.200)	(0.185)
1965*Inquilino/voter	-1.561***	-1.793***	-1.357***	-0.303***	-0.304***	-0.065	-0.022
	(0.515)	(0.459)	(0.440)	(0.082)	(0.098)	(0.172)	(0.172)
Other agricultural workers/voter	___	___	___	___	-0.006	___	___
					(0.010)		
1965*Other agric. workers/voter	___	___	___	0.003	0.000	___	___
				(0.012)	(0.014)		
Time dummy:1965	-0.174***	-0.167***	-0.145***	-0.158***	-0.155***	-0.168***	-0.167***
	(0.059)	(0.021)	(0.051)	(0.046)	(0.056)	(0.016)	(0.045)
1965*Province	Yes	___	Yes	Yes	Yes	___	Yes
Other controls	Yes	___	Yes	Yes	Yes	___	Yes
Communa fixed effect	No (pooled OLS)	Yes	Yes	Yes	No (pool. OLS)	Yes	Yes
Provincial dummies	Yes	___	___	___	Yes	___	___
Number of observ.	422	422	422	492	492	492	492

Note: Standard errors under brackets, ***indicates significance at the 1 percent level, ** at the 5 percent level and * at the 10 percent level. The additional controls for equations (2), (3), (7), (11) and (12) are the proportion of land under large farms and the population in the municipality; for equations (5), (8), (10) and (14), they also include the agricultural labour force. For the fixed effect estimates, the within R-square ranged between 0.69 and 0.84, while the between R-square ranged between 0.02 and 0.26. For equations (1), (8) and (12), the adjusted R^2 were between 0.67 and 0.69.

Table 4: Impact of inquilinos on right-wing votes in 1957 and 1965: alternative measures

The dependent variable is the proportion of right-wing votes in the 1957 and 1965 parliamentary elections

	(15)	(16)	(17)	(18)	(19)
Inquilinos/total agricultural workers	1.063***	0.425*	___	___	0.447*
	(0.260)	(0.250)			(0.251)
1965*Inquilinos/total agricultural workers	-1.023***	-0.292	___	___	-0.421*
	(0.210)	(0.226)			(0.260)
Proportion of land under large farms	___	___	0.228*	0.046	0.034
			(0.120)	(0.105)	(0.104)
1965*Proportion of land under large farms	___	___	-0.181***	0.010	0.059
			(0.051)	(0.051)	(0.059)
Time dummy:1965	-0.112***	-0.157***	-0.097**	-0.203***	-0.190***
	(0.021)	(0.051)	(0.039)	(0.061)	(0.061)
1965*Province	___	Yes	___	Yes	Yes
Other controls	___	Yes	___	Yes	Yes
Communa fixed effect	Yes	Yes	Yes	Yes	Yes
Number of observ.	492	492	492	492	492

Notes: Standard errors under brackets, ***indicates significance at the 1percent level, ** at the 5percent level and * at the 10percent level. The additional controls for equation (16) were the agricultural labour force, the proportion of land under large farms and the population; for equations (18) and (19), the agricultural labour force and the population. For the fixed effect estimates, the within R-square ranged between 0.65 and 0.84, while the between R-square ranged between 0.02 and 0.24.

Table 5: Impact of inquilinos on right-wing votes in 1949, 1953, 1957, 1961 and 1965

The dependent variable is the proportion of right-wing votes in the 1949, 1953, 1957, 1961 and 1965 parliamentary elections

	Model 4 inquilino/voter= inquilinos in 1935/population in 1935			Alternative measure: inquilino/voter= inquilinos in 1955/population in 1955		Model 5 inquilino/voter= inquilinos in 1957/voters in 1957		Model 6 inquilino/voter= inquilinos in 1957/voters at time t	
	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Inquilino/voter	1.904***	___	___	4.105***	___	0.488***	___	0.270***	0.129***
	(0.446)			(0.723)		(0.081)		(0.034)	(0.046)
1953*Inquilino/voter	-0.227	0.058	-0.059	0.725	0.215	0.118	0.090	0.085	0.037
	(0.616)	(0.435)	(0.449)	(1.000)	(0.733)	(0.113)	(0.082)	(0.063)	(0.050)
1957*Inquilino/voter	-0.003	0.031	0.323	0.099	0.619	-0.028	-0.004	0.165**	0.073
	(0.614)	(0.435)	(0.453)	(1.001)	(0.733)	(0.113)	(0.082)	(0.076)	(0.068)
1961*Inquilino/voter	-1.180*	-1.111**	-0.708	-1.579	-1.413*	-0.201*	-0.164*	0.149	0.011
	(0.615)	(0.435)	(0.463)	(1.001)	(0.734)	(0.114)	(0.083)	(0.098)	(0.098)
1965*Inquilino/voter	-1.589***	-1.762***	-1.007**	-2.614***	-2.396***	-0.330***	-0.280***	-0.007	-0.189
	(0.617)	(0.435)	(0.473)	(1.002)	(0.748)	(0.114)	(0.084)	(0.129)	(0.138)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year*province dummies	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Communa fixed effect	No (pooled OLS)	Yes	Yes	No (pooled OLS)	Yes	No (pooled OLS)	Yes	No (pooled OLS)	Yes
YearDumy*Other agric. workers/voter	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observ.	1034	1034	1034	1224	1224	1224	1224	1165	1165

Notes: Standard errors under brackets, ***indicates significance at the 1percent level, ** at the 5percent level and * at the 10percent level. The within R-square ranged between 0.54 and 0.71, while the between R-square ranged between 0.13 nd 0.27. For equations (20), (23) and (25), the adjusted R^2 were between 0.59 and 0.61. The additional controls for equations (23)-(26) are the proportion of land under large farms and the population; for equations (20), (22), (27) and (28), they also include the agricultural labour force.

Table 6: Impact of agrarian relations on votes for the Christian-Democratic parties

The dependent variable is the proportion of votes for the Christian-Democratic parties in the 1957 and 1965 parliamentary elections

	Model 1		Model 2		Model 3	Model 4	Model 5	Model 6
	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
Inquilino/voter	-0.268**	-0.123	-0.238**	-0.189**	-0.881	___	___	-0.286**
	(0.125)	(0.101)	(0.104)	(0.083)	(0.795)			(0.125)
1965*Inquilino/voter	0.403***	0.224***	0.356***	0.089	1.927***	0.514*	0.190***	0.004
	(0.059)	(0.060)	(0.104)	(0.091)	(0.536)	(0.297)	(0.055)	(0.114)
Other agricultural workers/voter	0.016	-0.010	___	___	-0.109	___	___	___
	(0.023)	(0.020)			(0.161)			
1965*Other agric. workers/voter	-0.030***	-0.011	___	___	-0.090	___	-0.142*	___
	(0.008)	(0.009)			(0.094)		(0.008)	
Time dummy:1965	0.286***	0.284***	0.253***	0.264***	0.280***	0.281***	0.280***	0.273***
	(0.015)	(0.031)	(0.011)	(0.032)	(0.033)	(0.034)	(0.031)	(0.030)
1965*Province	___	Yes	___	Yes	Yes	Yes	Yes	Yes
Other controls	___	Yes	___	Yes	Yes	Yes	Yes	Yes
Communa fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observ.	492	492	492	492	492	422	492	492

Note: Standard errors under brackets, ***indicates significance at the 1percent level, ** at the 5percent level and * at the 10percent level. The within R-square ranged between 0.88 and 0.95, while the between R-square ranged between 0.01 and 0.11. The additional controls are as in Table 3.

Table A1: Description of the main variables used

Variable	# obs.	Mean	Standard Dev.	Minimum	Maximum
Right-wing votes in 1949	246	0.481	0.215	0	0.953
Right-wing votes in 1953	246	0.327	0.181	0	0.860
Right-wing votes in 1957	246	0.407	0.195	0	0.914
Right-wing votes in 1961	246	0.352	0.160	0	0.846
Right-wing votes in 1965	246	0.174	0.111	0	0.577
Christian-Democrat votes in 1957	246	0.069	0.144	0	0.736
Christian-Democrat votes in 1965	246	0.371	0.111	0	0.629
Proportion of inquilinos in 1957 to the number of registered voters in 1957	246	0.165	0.144	0	0.832
Proportion of inquilinos in 1965 to the number of registered voters in 1965	246	0.083	0.084	0	0.449
Proportion of inquilinos in 1957 in the agricultural labour force in 1957	246	0.162	0.104	0	0.552
Proportion of inquilinos in 1965 in the agricultural labour force in 1965	246	0.088	0.059	0	0.327
Proportion of inquilinos in 1935 in the population in 1935	211	0.038	0.025	0	0.136
Proportion of inquilinos in 1957 in the population in 1957	246	0.021	0.017	0	0.068
Proportion of inquilinos in 1965 in the population in 1965	246	0.018	0.017	0	0.086
Proportion of other agricultural workers in 1957 to the number of registered voters in 1957	246	1.368	1.019	0.005	6.874
Proportion of other agricultural workers in 1965 to the number of registered voters in 1965	246	1.066	0.866	0.002	5.066
Proportion of other agricultural workers in 1957 to the population in 1957	246	0.167	0.099	0.000	0.563
Proportion of inquilinos in 1957 in the agricultural labour force in 1957	246	0.117	0.065	0	0.298
Proportion of inquilinos in 1965 in the agricultural labour force in 1965	246	0.078	0.049	0	0.246
Share of total area operated by farms over 200 hectares in 1957	246	0.741	0.213	0	0.997

Share of total area operated by farms over 200 hectares in 1965	246	0.706	0.223	0	0.998
Number of inquilinos in 1935	211	449	333	0	1770
Number of inquilinos in 1955	246	305	290	0	1758
Number of inquilinos in 1965	246	275	275	0	1669
Number of other agricultural workers in 1955	246	2008	1621	2	10338
Number of other agricultural workers in 1965	246	3063	2275	102	17934
Population in 1930	216	14250	13722	1565	106025
Population in 1940	215	17433	17433	614	215614
Population in 1952	246	19406	25153	1255	223598
Population in 1960	246	25026	36059	1092	259549
Population in 1970	246	31338	49212	814	319767
Number of votes in 1949	246	1404	2010	31	21397
Number of votes in 1953	246	2418	3394	0	33594
Number of votes in 1957	246	2876	4054	65	43599
Number of votes in 1961	246	4299	5470	131	34901
Number of votes in 1965	246	7248	11440	76	86664

Note: Population, occupation and land concentration figures for 1957 were obtained by linear interpolation from the 1955 and the 1965 agricultural censuses and the 1952, 1960 and 1970 population censuses. Population in 1935 was calculated by linear interpolation from the 1930 and 1940 population censuses.