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## ELECTORAL OSCILLATION IN ARGENTINA

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# Electoral Oscillations in Argentina..*

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**Abstract**

The mean voter theorem suggests that all parties should rationally converge to the electoral center. Typically this leads to an outcome which is unattractive to the rich. This paper develops a general stochastic model of elections in which the electoral response is affected by the *valence* (or quality) of the candidates. Contributions made by policy-motivated activists can influence valence, leading to the failure of the mean voter theorem. The model is then applied to the presidential elections in 1989 and 1995 in Argentina, to suggest why Carlos Menem, who won in 1989 with a populist platform, was able to win in 1995 with quite different policies that favored the upper middle class.

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# 1 Introduction

It has often been remarked that Latin America polities seem to swing in a random fashion between pro-market and anti-market democracies (Dominguez, 1998). When democracy returned to Latin America, in the 1980s, the governments in Argentina and Brazil resisted the so-called "market-oriented reforms". However, later, in the 1990s, Argentina, Brazil, Mexico, Uruguay, Chile and Peru all implemented fundamental economic reforms. The pendulum has swung again, and there is a move to the left (Castaneda 2006 and Vargas Llosa 2005). Because the literature generally provides only descriptive analysis, two important questions remain unanswered. First, what rationale explains a country's swing from left to right and back again? Second, is there some mechanism that causes swings in one country to infect its neighbours?

While these questions have an obvious intrinsic interest, they also pose a theoretical challenge for formal models of electoral competition.

Consider the first question about one country's oscilation between left and right. Such a phenomenon is very difficult to obtain using the standard model of political competition, principally because non-centrist policy platforms will generally not be in equilibrium, according to this model. Even if this problem is dealt with, it would still be necessary to relate the oscillations to changes in exogenous parameters. The only obvious way would be to assume that the electoral preferences or the institutional rules change radically for some

unexplained exogenous reason. In this paper, we offer a model that provides an endogenous reason for the afore-mentioned oscillations. Moreover, the case study presented here makes clear that the cause of this oscillation is not *directly* due to a change in electoral preferences.

Stokes (2001) suggests that policy switches are the result of politicians attempting to implement policies that they know are unpopular, they which they think are best for the general good.. This argument could be plausible in the the case, for Latin American polities, since the voters may greatly underestimate the relative effectiveness of market competition over state-intervention policies. However, there would seem to be two premises that are imbedded in this argument by Stokes:

(i) the assumption that voters are uncertain about the effect of policies on their welfare, and

(ii) the assumption that there is a prevalent single dimension in the polity, along which the voters have a common interest.[1].

Neither of these are particularly compelling.

Moreover, previous work (Schofield and Cataife, 2007) suggests that the understanding of Latin American polities may require (i) dealing with more than one policy dimension, and (ii) taking into account the heterogeneity of interests within the polity. Indeed, the work points out the importance of currency as a second policy-dimension, and focuses on the winners and losers created by specific policy positions on the currency dimension.

[1]See Harrington 1993 for a model based on similar premises.

To the best of our knowledge, the second question about the contagion mechanism operating across the region has not even been addressed in any formal model. Indeed, almost by definition, the standard spatial model is usually constructed with reference to a single polity, and is thus ill-equipped to deal with matters such as contagion.

Rather than discussing these questions abstractly, we consider the case of the Argentinean elections of 1989, 1995 and 1999. The study of a particular polity allows us to provide a better motivatation for the analysis as well as an evaluation of the empirical implications of our model. We study Argentina rather than one of the other polities in the region because the sequence of events in Argentina shows that the causal connection is from political strategies to voter preferences rather than from preferences to strategies, as is usual in formal models. Indeed, the analysis of the Argentinean elections of 1989 and 1995 suggests that political candidates do not simply respond to the wishes of the electorate. Instead, the incentives of the candidates themselves induce the oscillation between winning policies.

In the next two sections of the paper we give an account of these elections and their effects together with a suggestion about the role played by international financial institutions, as well as the US government. Section 4 presents an outline of the formal model (based on Schofield and Cataife, 2007), together with the reason why a simple one dimensional model is inadequate to explain this oscillation between left and right. Secton 5 gives a brief conclusion.

# 2 Argentina 1989: From Populist Promises to Neoliberal Policies

In 1989, Carlos Menem, the candidate of the PJ (Partido Justicialista), was elected President of Argentina with almost 50% of the votes. Menem's populist platform, which included a universal rise in salaries (*salariazo*) and a big push to the productive sector (*revolucion productiva*), was supported by the working class, and was the key to Menem's electoral victory. In contrast, the middle and upper class generally supported the historical rival of the PJ, namely the UCR (Union Civica Radical).

The Argentinean upper middle class probably regarded Menem as a demagogue from the countryside. From their perspective, Menem lacked both the values and the skills to lead a country that had suffered under a harsh military dictatorship (1976-1983) followed by an incompetent democratic government (1983-1989) whose economic mismanagement had brought about hyperinflation. It was believed that Menem's electoral promises, if implemented, would lead to a highly redistributive policy, with a strengthening of the labour unions and a weakening of private property.

Surprisingly, once in office Menem implemented policies that were opposite to his electoral promises. The new policies included the liberalization of trade and the labor market, and the privatization of several state companies.. More importantly, in 1991, Menem established a currency board that pegged the Argentinean peso to the dollar, by legally forcing the Central

Bank to hold dollar reserves to cover its Argentinean peso liabilities in a 1-to-1 ratio. Although this policy (soon known as the "Convertibility Plan") succeeded in controlling inflation, it led to three major problems. First, the financial system became very fragile, since the Central Bank lost its role of lender of last resort for the economy. Second, the government sacrificed its control over the real exchange rate. Third, the resulting monetary policy was not accompanied by any measure of fiscal discipline. This was because the discretionary allocation of fiscal resources by the federal government in Argentina was crucial for the manipulation of political and electoral support at the local level. These problems made the economy especially vulnerable to exogenous shocks, particularly those resulting from "contagion" from the international economy.

## 2.1 The Two Periods of the Convertibility Plan

As long as the value of the dollar did not appreciate with respect to Argentina's major commercial partners, and the government was able to finance itself either through foreign debt or counter cyclical funds, the economic plan succeed in providing the stability required for economic growth. Indeed, the absence of exogenous shocks in the period 1991-1995 provided Argentina with high rates of economic growth (over 8% on average between 1991 and 1994) and a widespread optimism both at home and among foreign investors.

As soon as the international conditions changed, Argentina's vulnerability to external shocks proved to be very high. The principal shocks were

the Tequila crisis in 1995, the East Asian crisis in 1997, the devaluation of the Brazilian real in 1998 and the appreciation of the dollar relative to the European currencies after 1995. An analysis of the consequences of each particular crisis on Argentina is beyond the scope of this article. It is enough to say that although the Convertibility Plan survived all these shocks, the cumulative effect was to make Argentina's economic scheme unsustainable.

The Argentinean peso appreciated by 25% in real terms between 1990 and 1998 (the appreciation reached 32% by 2000), making Argentina an expensive country even by European and U.S. standards. Given that the Convertibility Plan outlawed the printing of money without dollar backing, the fiscal imbalances in Argentinean currency had to be financed through foreign debt. In addition, the appreciation of the currency magnified the levels of debt when denominated in dollars. Consequently, between 1991 and 2001, the public debt increased from U.S. $87 billion to U.S. $145 billion. Thus, the Convertibility Plan succeeded in controlling hyperinflation, but when the external conditions became unfavorable, it forced the government to replace monetary laxity with foreign debt. Of course, this strategy paid-off from an electoral point of view, at least as long as the government managed to refinance the short-term debt.

Argentina's economic performance over the 1990's could be said to have two different periods. The period 1991-1995 was characterized by sustainable fiscal deficits, high economic growth and a reasonable (although perhaps not competitive) real exchange rate. In contrast, the period 1995-2001 was

characterized by a much lower economic growth (indeed with economy contraction in 1995, 1999, 2000 and 2001), high unemployment rates, large fiscal imbalances and an increasing foreign debt. All of these were the product of the inflexibility of Argentina's economy. In retrospect, it seems clear that sooner or later a severe enough external shock would occur, forcing a political decision to abandon the Convertibility Plan and to allow the market to re-establish some sort of equilibrium. The longer the exchange rate correction was postponed, the greater the private and public sector dollar-denominated loans. In sum, postponing a devaluation would only increase the probability of default and bankruptcy of both sectors. It is hard to see, then, how the merits of the Convertibility Plan in 1991-1994 could be dissociated from its costs in 1995-2001. The seeds of the crisis of 2001 were already present in the early apparent success of the Plan.

## 2.2 Losers and Winners

We can easily determine who were the domestic winners and losers over the ten year cycle of the Plan.

Carlos Menem and his entourage were in office for these ten years. In this period, Menem managed to control a plurality in both chambers of Congress. By increasing the Supreme Court of Justice five to nine, and by maneuvering these appointments, he also obtained an "automatic majority" in the Court. This maneuver could guarantee immunity from later accusations of corruption over the U.S. $20 billion federal fund collected from privatizations.

In order to increase the real value of assets and profits, it was in the interest of the foreign companies hoping to acquire publicly owned companies that Argentina maintain an appreciated currency. Because the interests of the corrupt politicians were aligned with those of the foreign companies, they also wanted Argentina to stick to the Convertibility Plan.

The Argentinean upper-middle class also benefited from the economic scheme. After years of complete absence of credit (a consequence of a high-inflation and closed economy), the Convertibility Plan brought about a consumption boom of imported goods. Argentineans could be found among Japanese, European and American tourists traveling around the world. The political elite in office was perceived by the upper-middle class citizens to be corrupt itself and to condone corruption at all levels of government. Although this corruption violated the ethical standards that might have been dominant earlier, the benefits associated with the new consumption habits proved to be irresistible. In 1995, Menem was re-elected with a percentage of the votes similar to 1989. Although he lost 10% of the left votes to a new party, FREPASO (Frente Pais Solidario), he gained 10% of the center-right votes.

Despite their initial aversion, the upper-middle class felt more than satisfied with Menem's government. Indeed, Menem's policies created an excellent business environment, starting with economic stability and a regressive tax structure. Indeed, members of this class also became business partners in Argentina's modernization and infrastructure projects.

For the working class, the real wage remained practically unchanged from 1990 to 2000. On average, the unions had organized one general strike (across the different industrial sectors) every six months during the presidency of Raul Alfonsin of the UCR. Menem, Alfonsin's successor, avoided this problem by giving the union leaders control over the resources of the health plans of their respective industrial sectors. As a result, Menem only faced one general strike on average every fifteen months.

As a consequence of the Convertibility Plan, the per-capita public debt increased by U.S. $1750 in 1991-2001. This money would eventually have to be paid through taxes by the citizens. Any devaluation would make the burden of the foreign debt even heavier. Eventually Argentina defaulted on part of its debt (although not its debt with the international financial organizations). Two points need to be considered. First, the default was the product of the circumstances, not a plan devised ahead of time. Second, the country did have to pay the costs of the devaluation and default, and the ensuing crisis may well be considered the most profound that the country has had to face in recent history.

At least theoretically, the upper middle class was able to insure against the damages of an eventual devaluation, by saving in dollars and sending their money out of the country. Of course, although this strategy was in principle available to everyone, the working class was unable to use it. They received meager benefit from the consumption boom, and had to face the full consequences of the per-capita increase in the public external debt.

# 3 The Role of the IMF and the U.S. government

> Cavuto: What's the advice here? I mean does the United States stand by a strong dollar? That must be the consistent policy, but it's never consistently said.
>
> Brady:[2] But I think you've fallen into the trap, Neil, if I can say. It's not strong or weak. It's lower or higher against other currencies, and, if it is the largest reserve currency in the world, if it's the highest held currency by all central banks, it's got to be...
>
> Cavuto: Yes, but it's not the most happening currency right now.
>
> Brady: Now you're right. It is the largest one in reserves and all that. The euro has been gaining a considerable amount of steam. It's back to levels when it first started a few years ago.
>
> Cavuto: Many are saying that the dollar's days as the premier currency maybe a decade from now could be numbered.
>
> What do you think?
>
> Brady: I don't think so. I think if the country's strong, the dollar will be strong, too. It will fluctuate some, and the people that have the most to do with it are the central bankers in the world.[3]

Domingo Cavallo, Argentina's Economy Minister in 1991-1996, and architect of the Convertibility Plan, has stated (Cavallo (2004) that although some of the policies implemented by Menem and himself were aligned with the

[2] Nicholas F. Brady was U.S. Treasury Secretary in 1991, when Argentina implemented the Convertibility Plan.

[3] Partial transcript from *Your World with Neil Cavuto*, Fox News June 5, 2003. http://www.foxnews.com/story/0,2933,88801,00.html

so-called Washington Consensus (namely privatization, trade liberalization and deregulation), other recommendations of the Consensus (fiscal discipline, a competitive exchange rate, and tax reforms) were not. Cavallo mentions that, in the beginning, the technical staff of the IMF did not support Menem's package of policies, because they were not fully aligned with the Consensus. Nonetheless, adds Cavallo, the intermediation of Clinton's administration in favor of the Argentinean government induced the endorsement of the IMF. In other words, the initial support of the IMF for the Convertibility Plan was not due to the technical recommendation of the staff, but to pressure from the U.S. government. Later on in the 1990's, the IMF repeatedly supported Argentina's economic reforms and, in particular, asserted that Argentina's currency board was an example of a credible and viable regime. In the words of the Independent Evaluation Office of the IMF, "the IMF had been almost continually engaged through programs [with Argentina] since 1991" and "IMF resources were provided in support of Argentina's fixed exchange rate regime, which had long been stated by the IMF as both essential to price stability and fundamentally viable."(IMF, 2004).

Throughout the crises induced by external contagion, the IMF backed Argentina in two ways. First, it provided the financial aid that would prevent a run on Argentinean financial resources. Second, it helped the Argentinean government cope with both short-term public debt and the pressure to devalue. Although from 1994 onwards, Argentina failed to accomplish the fiscal targets agreed with the IMF, this failure was systematically ignored so that

the country could receive extra financial aid. In the 1992-2001 period, the IMF granted loans of $22 billion. Indeed, in 2000, the IMF further approved what in Argentina became popularly known as *blindaje financiero* (financial shielding), namely a loan for $40 billion, which was composed of loans from the IMF (U.S. $14 billion), the World Bank and the IADB ($5 billion), the government of Spain ($1 billion) and a further $20 billion that came from the private sector. Needless to say, the crisis of 2001 was triggered despite the efforts of the IMF.

It seems natural to ask the following: why would the U.S. government support a package of reforms that did not fully comport with the technical recommendation of the IMF? The two recommendations (fiscal discipline and a competitive exchange rate) of the Washington Consensus that were neglected by Cavallo's plan seem to have had a key role in the collapse of the Argentinean economy. We can examine the consequences of these missing components.

The U.S. government followed an *official* policy of a "strong dollar" at least from 1995. Clinton's Treasury Secretary, Robert Rubin, was perhaps the main advocate of this U.S. policy. The benefits for the U.S. from a strong dollar are three-fold. First, it helps finance the large current account deficit by means of capital inflows. Second, it nurtures the U.S. stock market. Third, it reduces inflationary pressure. These benefits had been sought since the administration of Ronald Reagan, even though there was, on occasion, some concern about the undesired result of a strong dollar, namely the trade

consequences of a less competitive exchange rate.

A convenient strategy for the U.S. government at the time Argentina implemented its currency board would had been to attempt to appreciate the dollar without affecting the rate of exchange relative to key U.S. commercial partners, like Western Europe, China and Japan. In fact, this reasoning is in line with the thoughts of Nicholas F. Brady, U.S. Treasury Secretary during the time Argentina implemented the Convertibility Plan. As the earlier quotation suggests, the relevant questions are (i) whether the dollar is higher or lower with respect to other currencies and (ii) to what extent the dollar is held as a reserve currency.

We suggest that at the beginning of the 1990's there was an alignment of interests between the Argentinean upper middle class, the politicians of that country and the U.S. government. Several years of the Convertibility Plan were the product of this alignment. The evolution and effect of this alignment and its collapse can be presented briefly.

By 1989 the Argentinean state was bankrupted and forced to finance itself via a monetary laxity that produced hyperinflation. In order to enrich themselves, members of the political elite would first have to enrich the state, and the best way to achieve this was to privatize the publicly-owned companies. However, to make the bankrupted state companies attractive enough to foreign investors, the whole economy would require some modifications, beginning with macroeconomic stability and a strong currency.

This package of policies was beneficial to the Argentinean upper middle

class. Nonetheless, given Menem's party affiliation and personal background, he had no chance of being elected in 1989 by targeting this class. Instead, he targeted the working class with promises that, we suggest, he had little intention of implementing. Once in office, Menem needed the endorsement of the IMF. In this respect, the sole challenge was to get the support of the IMF for two mainstays of his plan, namely a loose fiscal discipline (helpful for political and electoral purposes) and a non competitive exchange rate (required to make privatization an attractive proposition for foreign firms). The remaining policies fitted with the Washington Consensus, and would therefore induce no opposition.

The currency board proposed by Cavallo happened to be in line with the interests of the U.S. Treasury. (The opinion of Nicholas F. Brady, U.S. Treasury Secretary at that time supports this view.) In turn, the support of the U.S. government would facilitate the endorsement of the IMF. Thus the Convertibility Plan could be implemented.

Five years later, Menem had the opportunity to try for the re-election. This time, the strategy of targeting a social class different from the one to be benefited was unnecessary. Menem's platform, as described above, was supported by a new electoral coalition that included the upper middle class and gave him the electoral victory. After ten years and a failed attempt by Menem to obtain a second re-election, a new President, Fernando De La Rua, was elected in 1999. Although De La Rua belonged to the opposition (UCR), in his electoral platform he committed himself to maintain the economic

scheme implemented by Menem. De La Rua kept this promise once in office. However, the negative consequences of the Convertibility Plan were so severe that they became impossible to ignore. The public debt was already too high, and the economy showed serious symptoms of high unemployment, fiscal imbalance and stagnation. The prestige of Cavallo, who had succeeded in the fight against hyperinflation, was so high among the electorate that the new administration was compelled to appoint him as Minister of the Economy in March 2001. Despite Cavallo's efforts, the Argentinean economy fell into crisis in December 2001. After the resignation of De La Rua and a chaotic sequence of interim presidents, Nestor Kirchner, candidate of the PJ with leftist leanings, was elected in May 2003.

The backlash to the crisis in Argentina may well be the reason there has been a strong move toward the left, together with a spread of anti U.S. sentiment, in many countries in Latin America.

The story that we have presented above leaves unexplained an important political question: by what mechanism was Menem able to desert the populists who supported him in 1989 and obtain the support of a new group of the upper middle class voters in 1995? It is improbable that an argument based on a median voter will suffice. It is possible that Menem was close to a median voter position on the left-right axis in 1989. However, the economic pain caused to populist voters by the Convertibility Plan, together with the benefits for the middle class voters from the same plan, both suggest that Menem's position in 1995 was not at the median. We present a formal model

of the election that posits that the Convertibility Plan induced a second dimension of policy, defined essentially by the hard currency position underlying the plan. We propose a stochastic model of the election, where the presidential election depends on two kinds of *valence.* The first is *exogenous* and characterizes the perceived quality of the candidates (Ansolabehere and Snyder, 2000). The second is *endogenous*, and is associated with the financial support by activists. In the model, this support provides the financial means by which the candidate affects the perception by the voters of the candidate's quality.[4]. Note that a candidate might also use these resources to influence the voters adversely about the opponent's quality.

# 4 A Formal Model of the Election: Local Nash Equilibrium with Activists and Vote Maximizing Parties

The electoral model presented here is an extension of the standard multiparty stochastic model (McKelvey and Patty, 2006), modified by inducing asymmetries in terms of valence. The justification for developing the model in this way is the extensive empirical evidence that valence is a natural way to model the judgements made by voters of party leaders (Schofield and Sened, 2006). The model focuses on *local pure strategy Nash equilibria* (LNE). From the

[4] Aldrich, 1983, Aldrich and McGinnis, 1989.

definitions of these equilibria it follows that a pure strategy Nash equiibrium (PNE) must be a LNE, but not conversely. A necesary condition for an LNE is thus a necesary condition for a PNE. A sufficient condition for an LNE is not a sufficient condition for PNE. Indeed, additional conditions of concavity or quasi-concavity are required to guarantee existence of PNE.

The key idea underlying the formal model is that party leaders (or candidates) attempt to estimate the electoral effects of party declarations, or manifestos, and choose their own positions as best responses to other party declarations, in order to maximize their own vote share. The stochastic model essentially assumes that party leaders cannot predict vote response precisely, but can estimate an expected vote share. In the model with valence, the stochastic element is associated with the weight given by each voter, $i$, to the average perceived quality or valence,$\lambda_{ij}$, of the party leader.

**Definition of the Stochastic Electoral Model with Activist Valence (SEMAV)**

The data of the spatial model is a distribution, $\{x_i \in X\}_{i \in N}$, of voter ideal points for the members of the electorate, $N$, of size $n$. We assume that $X$ is an open convex subset of Euclidean space, $\mathbb{R}^w$, with $w$ finite. Without loss of generality, we adopt coordinate axes so that $\frac{1}{n}\Sigma x_i = 0$. By assumption $0 \in X$, and this point is termed the *electoral mean*, or alternatively, the *electoral origin*. Each of the parties in the set $P = \{1, \ldots, j, \ldots, p\}$ chooses a policy, $z_j \in X$, to declare. Let $\mathbf{z} = (z_1, \ldots, z_p) \in X^p$ be a typical vector of party policy positions.

Given $\mathbf{z}$, each voter, $i$, is described by a vector

$$\mathbf{u}_i(x_i, \mathbf{z}) = (u_{i1}(x_i, z_1), \ldots, u_{ip}(x_i, z_p)), \text{where}$$

$$u_{ij}(x_i, z_j) = \lambda_j + \mu_j(z_j) - \beta||x_i - z_j||^2 + \epsilon_j = u^*_{ij}(x_i, z_j) + \epsilon_j. \qquad (1)$$

Here $u^*_{ij}(x_i, z_j)$ is the observable component of utility for voter $i$. The perception by $i$ of the *exogenous valence* of party $j$.is given by the term $\lambda_{ij} = \lambda_j + \epsilon_j$,where $\epsilon_j$ is the stochastic component of the distribution .The function $\mu_j(z_j)$ is the *endogenous* component of valence generated by activist contributions to agent $j$. This component of the model derives from Aldrich (1983a,b). The term $\beta$ is a positive constant, called the *spatial parameter*, giving the importance of policy difference defined in terms of a metric induced from the Euclidean norm, $||\cdot||$, on $X$. The vector

$$\epsilon = (\epsilon_1, ..., \epsilon_j, .., \epsilon_p)$$

is the stochastic error vector, whose mutivariate cumulative distribution will be denoted by $\Psi$.We adopt the assumption that $\Psi$ is the *Type I extreme value distribution* (or Gumbel distribution.), where $\Psi$ takes the closed form

$$\Psi(h) = \exp[-[\exp[-h]].$$

This assumption is the standard assumption for empirical multinomial con-

ditional logit models of elections.(See Dow and Endersby, 2004).

It is assumed that the exogenous valence vector

$$\boldsymbol{\lambda} = (\lambda_1, \lambda_2, .., \lambda_p) \text{ satisfies } \lambda_p \geq \lambda_{p-1} \geq \cdots \geq \lambda_2 \geq \lambda_1.$$

Voter behavior is modeled by a probability vector. The probability that a voter $i$ chooses party $j$ at the vector $\mathbf{z}$ is

$$\begin{aligned} \rho_{ij}(\mathbf{z}) &= \Pr[[u_{ij}(x_i, z_j) > u_{il}(x_i, z_l)], \text{ for all } l \neq j]. \quad (2) \\ &= \Pr[\epsilon_l - \epsilon_j < u^*_{ij}(x_i, z_j) - u^*_{il}(x_i, z_j), \text{ for all } l \neq j]. \quad (3) \end{aligned}$$

Here Pr stands for the probability operator generated by the distribution assumption on $\epsilon$. The *expected vote share* of agent $j$ is

$$V_j(\mathbf{z}) = \frac{1}{n} \sum_{i \in N} \rho_{ij}(\mathbf{z}). \quad (4)$$

The differentiable function $V : X^p \to \mathbb{R}^p$ is called the *party profile function.* □

A vector $\mathbf{z}^* = (z_1^*, \ldots, z_p^*)$ is a *strict local Nash equilibrium* (LSNE) *for the profile function* $V : X^p \to \mathbb{R}^p$ iff $z_j^*$ is a strict local maximum of $V_j$, holding $(z_1^*, \ldots z_{j-1}^*, z_{j+1}^*, z_p^*)$ fixed. This condition is equivalent to the condition that each, $z_j^*$ is a critical point of $V_j$, and moreover, the Hessian (or second differential ) of $V_j$, ) at $z_j^*$ has negative eigenvalues.

Using the Gumbel distribution Train (2003) shows that for each voter $i$, and party $j$, the probability that a voter $i$ chooses party $j$ at the vector $\mathbf{z}$ is

$$\rho_{ij}(\mathbf{z}) = \frac{\exp[u^*_{ij}(x_i, z_j)]}{\sum_{k=1}^{p} \exp u^*_{ik}(x_i, z_k)}. \tag{5}$$

Thus

$$\rho_{ij}(\mathbf{z}) = [1 + \Sigma_{k=\neq j}[\exp(f_k)]]^{-1} \tag{6}$$

where $f_k = \lambda_k + \mu_k(z_k) - \lambda_j - \mu_j(z_j) + \beta||x_i - z_j||^2 - \beta||x_i - z_k||^2$.

Schofield (2006) uses (5) to show that the first order condition for $\mathbf{z}^* =($ $,z^*_j,$ ..) to be a LSNE for the SEMAV is that it be a *balance solution, where each* $z^*_j$ solves the equation

$$z^*_j = \frac{1}{2\beta}\frac{d\mu_j}{dz_j} + \sum_{i=1}^{n} \alpha_{ij} x_i. \tag{7}$$

$$\text{Here } [\alpha_{ij}] = \left[\frac{\rho_{ij} - \rho^2_{ij}}{\Sigma_i(\rho_{ij} - \rho^2_{ij})}\right] \tag{8}$$

and $[\rho_{ij}] = [\rho_{ij}(\mathbf{z}^*)]$ is the matrix of probabilities given by (5) at the vector $\mathbf{z}^*$ The vector $\sum_i \alpha_{ij} x_i$ is a convex combination of the set of voter ideal points. This vector is called the *weighted electoral mean* for party $j$. Define

$$\frac{d\mathcal{E}^*_j}{dz_j} \equiv \sum_i \alpha_{ij} x_i. \tag{9}$$

Then the balance equation can then be expressed as

$$\left[\frac{d\mathcal{E}_j^*}{dz_j} - z_j^*\right] + \frac{1}{2\beta}\frac{d\mu_j}{dz_j} = 0. \tag{10}$$

The bracketed term on the left of this expression is termed the *marginal electoral pull of party* $j$ and is a gradient vector pointing towards the weighted electoral mean of the party. This weighted electoral mean is that point where the electoral pull is zero. The vector $\frac{d\mu_j}{dz_j}$ is called *the marginal activist pull for party* $j$.

If $\mathbf{z}^*$satisfies the balance equation for all $j$, then call $\mathbf{z}^*$ the *balance solution.* □

We now consider competition betweenthe two parties, labelled 1 (Partido Justicialista or PJ) and 2 (Union Civica Radical, or UCR), in a policy space with $w = 2$, where 1 has traditionally been on the left of the economic ($x$) axis, and 2 on the right of the same axis. To examine the effect of the second dimension of policy we develop an earlier model based on "ellipsoidal" utility functions of potential activist groups (Miller and Schofield, 2003, Schofield and Miller, 2007).

Consider the first order equations

$$\frac{d\mu_1}{dz} = 0, \frac{d\mu_2}{dz} = 0 \tag{11}$$

for maximizing the total valence of parties 1,2 when there are four activist groups, L, H, R, S whose preferred points are $L, H, R, S$ say, and whose utility

functions are $u_L$ , $u_H, u_R, u_S$. The contributions of the groups L, H to party 1 are $\Sigma_L$ and $\Sigma_H$., and the contributions $\Sigma_R$ $\Sigma_S$ of the groups, R and S are to party 2..In the application of the model to Agentina, L and R denote left and right on the economic ( or $x$ axis, while H and S stand for supporters of a "hard" currency and "soft" currency respectively on the currency (or $y$) axis. See Figure 1.

[Insert Figure 1 about here]

We make the following set of assumptions:

**Assumption on Activist Utility Functions;.**

We suppose that activist group L, situated on the left of the economic axis, with preferred point $L = (x_l, y_l)$ has a utility function $u_L(x, y)$ based on the "ellipsoidal cost function " of the form

$$A - \left( \frac{(x - x_l)^2}{a^2} + \frac{(y - y_l)^2}{b^2} \right). \tag{12}$$

Assuming that $a < b$ means that such an activist is more concerned with economic policy than with issues on the $y$ axis. Say the utility function assigns higher salence to the $x - axis$ than the $y - axis$ in the ratio $\frac{b}{a} > 1$. We also suppose that the activist group H with preferred point $H = (x_h, y_h)$ has a utility function $u_H(x, y)$ based on a cost function

$$E - \left( \frac{(x - x_h)^2}{e^2} + \frac{(y - y_h)^2}{f^2} \right). \tag{13}$$

Assuming that $f < e$ means that such an activist is more concerned with

"currency" policy on the $y$ axis, than with standard left right economic issues. Again, say the utility function assigns higher salence to the $y-axis$ than to the $x-axis$ in the ratio $\frac{f}{e}>1$.The contract curve generated by these utility functions is given by the equation

$$\left[\alpha_L \frac{du_L}{dz} + \alpha_H \frac{du_H}{dz}\right] = 0. \tag{14}$$

with $\alpha_L \geq 0, \alpha_H \geq 0, (\alpha_L, \alpha_H) \neq 0$. Note that $(\alpha_L, \alpha_H)$ can be interpreted as smooth functions of $z$. Using this expression we can show that the "contact curve" between the point $(x_l, y_l)$ and the point $(x_h, y_h)$, generated by these utility functions is given by the equation

$$\frac{(x-x_l)}{a^2}\frac{b^2}{(y-y_l)} = \frac{(x-x_h)}{e^2}.\frac{f^2}{(y-y_h)}. \tag{15}$$

This can be rewritten as

$$\frac{(y-y_l)}{(x-x_l)} = \gamma_1 \frac{(y-y_h)}{(x-x_h)} \text{ where } \gamma_1 = \frac{b^2}{a^2}\frac{e^2}{f^2} > 1. \tag{16}$$

This "contract curve" for party 1, associated with the two activist groups, centered at $L$ and $H$, is a *catenary*, whose curvature is determined by the "salience ratios" $(\frac{b}{a}\ ,\ \frac{e}{f})$ of the utility functions of the activist groups.

We also assume that there are two activist groups, R and S, for 2, centered at $R = (x_r, y_r)$ and $S = (x_s, y_s)$. As mentioned above, members of S support a soft or weak currency, that would allow for greater exports, and fewer

imports. In the same way we assume the utility function for R assigns higher salence to the $x-axis$ than to the $y-axis$ in the ratio $\frac{h}{g} > 1$, while the utility function for S assigns higher salence to the $y - axis$ than to the $x - axis$ in the ratio $\frac{r}{s} > 1$.

Then again, the "contact curve" between the point $(x_r, y_r)$ and the point $(x_s, y_s)$ is given by the equation

$$\frac{(y - y_r)}{(x - x_r)} = \gamma_2 \frac{(y - y_s)}{(x - x_s)} \tag{17}$$

where

$$\gamma_2 = \frac{h^2}{g^2} \frac{r^2}{s^2}. \tag{18}$$

**Assumption on Activist Gradient Functions.**

(i)The total activist valences for party 1 can be decomposed into two components

$$\mu_1(z_1) = \mu_L(\Sigma_L(u_L(z_1))) + \mu_H(\Sigma_H(u_H(z_1))). \tag{19}$$

where $\mu_L, \mu_H$ are functions of the contributions $\Sigma_L, \Sigma_H$, and these can be written as functions of the utilities of the activist groups, $u_L(z_1)$, $u_H(z_1)$ at $z_1$.

Note that there is no presumption that these functions are linear.

(ii) The gradients of the contribution functions for 1 are given by

$$\frac{d\Sigma_L}{dz} = \alpha_L^* \frac{du_L}{dz} \text{ and } \frac{d\Sigma_H}{dz} = \alpha_H^* \frac{du_H}{dz}, \tag{20}$$

where the coefficients $\alpha_L^*, \alpha_H^* > 0$, and are differentiable functions of $z$.

(iii) The gradients of the two valence functions satisfy

$$\frac{d\mu_L}{dz} = \alpha_L^{**} \frac{d\Sigma_L}{dz} \text{ and } \frac{d\mu_H}{dz} = \alpha_H^{**} \frac{d\Sigma_H}{dz}, \tag{21}$$

where again the coefficients $\alpha_L^{**}, \alpha_H^{**} > 0$, and are differentiable functions of $z$.□

Under these assumptions, the first order equation $\frac{d\mu_1}{dz} = 0$ becomes

$$\begin{aligned} \frac{d\mu_1}{dz} &= \frac{d\mu_L}{dz} + \frac{d\mu_H}{dz} = \alpha_L^{**} \frac{d\Sigma_L}{dz} + \alpha_H^{**} \frac{d\Sigma_H}{dz} && (22) \\ &= (\alpha_L^{**}.\alpha_L^*) \frac{du_L}{dz} + (\alpha_H^{**}.\alpha_H^*) \frac{du_H}{dz} && (23) \\ &= \left[ \alpha_L \frac{du_L}{dz} + \alpha_H \frac{du_H}{dz} \right] = 0 && (24) \end{aligned}$$

where $\alpha_L, \alpha_H > 0$. We can extend this locus by making the natural assumption that $\alpha_L = 0$ iff $\frac{du_S}{dz} = 0$ and $\alpha_H = 0$ iff $\frac{du_L}{dz} = 0$. Then the equation $\frac{d\mu_1}{dz} = 0$, with $\alpha_L, \alpha_H \geq 0$, $(\alpha_L, \alpha_H) \neq (0, 0)$ coincides with the contract curve for the utility functions $(u_L, u_H)$ of the activist groups.

Notice here that if the functions $(\alpha_L, \alpha_H)$ are not specified, but merely assumed to be differentiable functions of $z$, then the solution of (24) gives

a smooth one-dimensional closed locus. Once the functions $(\alpha_L, \alpha_H)$ are specified, and additional concavity assumptions imposed on the functions implicit in (24) then the solution to the equation $\frac{d\mu_1}{dz} = 0$ will be a single point.

Similarly, we assume that

$$\mu_2(z_2) = \mu_R(\Sigma_R(u_R(z_2))) + \mu_S(\Sigma_S(u_S(z_2))), \tag{25}$$

where $u_R(z_2)$ and $u_S(z_2)$ are the utilities of the activist groups at $z_2$. Similar gradient assumptions gives the first order equation for 2:

$$\frac{d\mu_2}{dz} = \left[\alpha_R \frac{du_R}{dz} + \alpha_S \frac{du_S}{dz}\right] = 0.\square \tag{26}$$

These assumptions are quite natural. They posit that the gradient of each contribution function is dictated by the utility gradient of the activist group, and this gives the direction of most rapidly increasing valence for the relevant party..

We therefore identify the contract curves for the activist groups in support of 1 and 2 as the loci of points that satisfy the first order conditions for maximizing $\mu_1$ and $\mu_2$ respectively. We therefore call the loci of points satisfying the first order conditions *the activist catenaries for 1 and 2 respectively.* While a position of candidate $j$ on the $j^{th}$ activist catenary satisfies the first order condition for maximizing the total valence function, $\mu_j$, it need not maximize vote share,$V_j$. This requires considering the marginal electoral

effect. It follows from (10) that the first order conditions are given by the *balance equations* for 1 and 2:

$$\left[\frac{d\mathcal{E}_1^*}{dz_1} - z_1^*\right] + \frac{1}{2\beta}\left[\alpha_L(z_1^*)\frac{du_L}{dz_1} + \alpha_H(z_1^*)\frac{du_H}{dz_1}\right] = 0, \tag{27}$$

$$\left[\frac{d\mathcal{E}_2^*}{dz_2} - z_2^*\right] + \frac{1}{2\beta}\left[\alpha_R(z_2^*)\frac{du_R}{dz_2} + \alpha_S(z_2^*)\frac{du_S}{dz_2}\right] = 0. \tag{28}$$

The coefficients in these equations depend on the varous gradient coefficients introduced above. We write them explicitly as functions of $z_j^*$. The locus of points satisfying the equation for party $j$ is called the *balance locus for* $j$. Again, if the coefficients are not specified, then the balance loci for $j$ is also a one-dimensional smooth catenary.□

For example, the balance locus for party 1 it is obtained by shifting the contract curve for the activists centered at $L$ and $H$ towards the weighted electoral mean of 1. Figure 1 gives an illustration of the balance loci for the two parties.

Notice, for example, that if $\alpha_H^*$, the willingness of the activist group, H, to contribute to party 1, is higher than $\alpha_L^*$, then this group will have a greater influence on the position of 1, so that $z_1^*$ will be closer to $H$.

Obviously, maximizing vote shares by solving (27) and (28) depends on the second order condition on the Hessian of the vote functions $\{V_j : .j = 1, 2\}$.

**Concavity Assumption on the Hessians of Activist Functions.**

Because the utility functions of the activist groups for both 1 and 2 are

concave in $z$, we can expect the contribution functions, $\Sigma_L$, $\Sigma_S$ for 1 to be concave in $z_1$, and the contribution functions $\Sigma_R, \Sigma_C$ for 2 to be concave in $z_2$. Moreover, contributions can be expected to exhibit decreasing returns. We therefore assume that the valences $\mu_L, \mu_S$ are concave functions of $\Sigma_L$, $\Sigma_S$ respectively, and the valences $\mu_R, \mu_C$ are concave functions of $\Sigma_R$, $\Sigma_C$

These assumptions imply that the total activist valence functions

$$\mu_1(z_1) = \ = \mu_L(\Sigma_L(u_L(z_1))) + \mu_H(\Sigma_H(u_H(z_1))) \tag{29}$$

and

$$\mu_2(z_2) = \mu_R(\Sigma_R(z_2)) + \mu_S((\Sigma_S(z_2)). \tag{30}$$

are concave functions of $z_1$, $z_2$, respectively. □

Note also that the weighted electoral mean of party $j$depends on the weighted electoral mean $\frac{d\mathcal{E}_j^*}{dz_j}$ and thus on the valence functions as well as the location of the opposition candidate, $k$.

We can use the condition that the Hessians of these valence functions with respect to $z_1$, $z_2$ respectively, have negative eigenvalues of high modulus. This gives a sufficient condition for existence of Pure Strategy Nash Equilibrium for the vote maximizing game..

The term *balance solution* is used for a pair of positions $(z_1^*, z_2^*)$ satisfying both balance equations. We also use the notation $(z_1^*(z_2^*), z_2^*(z_1^*))$ where $z_1^*, z_2^*$ are mutual local best response functions.

Obviously we can perform the same reasoning when there are more than

two activist groups for each candidate.

[Insert Figure 2 about here.]

Figure 2 shows the balance solutions and weighted electoral mean for party PJ. This figure also shows the contract curve for the PJ ( between the economic left at L and the hard currency supporters at H) The equilibrium position for a candidate for PJ will depend on the difference between exogenous valences of the PJ candidate and the UCR candidate, as well as the position adopted by the UCR candidate. We suggest that the exogenous valence of Menem in 1995 was higher than that of the competing candidate, Massaccesi of the UCR, because of the residual sentiments associated with Peronism in the working class. Even though Menem's move to the right on the economic axis (as illustrated in Figure 1) lost him votes, he gained from the increased resouces made available from the new activist group at the hard currency position.

Support for this two dimensional model of party positioning is provided by Figure 3, which gives an estimate of the elctoral distribution of voter preferred positions derived from a sample survey.[5]

[Insert Figure 3 about here.]

[5]The factor anaysis was based on a survey . *Politics and the Presidential Election*, Romer & Associates, Survey -TOP045: Roper Center Databank.

## 4.1 Limitations of the Standard Model without Activists.

To illustrate the limitation of the standard electoral model, consider the 1989 election on the assumption of a single dimensional polity. Suppose that the exogenous valences of the candidates for the two parties are $\lambda_{PJ}, \lambda_{UCR}$ respectively,.with $\lambda_{PJ} > \lambda_{UCR}$, and ignore activist valence for the moment. Schofield (2007) has shown that both parties converge to the origin if and only if $\beta \leq \beta_0$, where

$$\beta_0 \equiv \frac{[\exp(\lambda_{PJ} - \lambda_{UCR}) + 1]}{2v^2[\exp(\lambda_{PJ} - \lambda_{UCR}) - 1]}. \tag{31}$$

and $v^2$ is a measure of the variance of the electoral distribution of preferred positions. If $\beta > \beta_0$ then the vote maximizing positions of the PJ and UCR will lie on opposite sides of the electoral origin, with the higher valence candidate nearer to the origin. If we add in activist valence then the candidates must balance what we have termed the activist and electoral pulls. See Figure 4 for an illustration. However, it is obvious that in one dimension, the activist group, L, must prefer support for populist measures. It is thus implausible that the activist influence would cause a candidate for the PJ to adopt strategies that benefit the upper middle class. It is for this reason that we have posited that Menem's policy with regard to the Convertibility Plan should be located in a two dimensional policy space, as suggested by the electoral data in Figure 3.

[Insert Figure 4 about here.]

# 5 Conclusion

While it is very common to construct one dimensional empirical and formal models of elections, these ignore the fact that the electorate will often be concerned about policies defined by economic and political choices that are external, in some sense, to the standard policies of taxes and the labour market. For example, a recent analysis of British elections (Schofield, 2005) suggests that the second "external" dimension concerns attitudes to the European Union. Although the second dimension in US politics is usually considered to be defined in terms of civil rights, the election of November 7, 2006 in the United States suggests that it was actually an external policy, namely the situation in Iraq, that concerned voters (Schofield and Miller, 2007).

We suggest that in the Latin American polities, the second electoral dimension is defined in terms of the "external" issues of the exchange rate, debt, and the relationship with the United States. The oscillation in one polity follows naturally from this two-dimensionality of the policy space, as activist groups are brought into prominence as a result of the links between choices made in the internal and external dimensions. As the Argentinean case illustrates, the form of the support provided by both internal activists (large companies, syndical leaders, etc.) and external activists (multilateral organisms, US or European business interests or policy makers) may vary,

but the ultimate goal is to contribute to the success of candidates supporting policies favourable to the activist groups. External conditions are crucial because they influence the responses of the various activist groups, and thus the strategic respnses that the political candidates.

Clearly, as it is sometimes suggested, political choices in one polity, like Argentina, may trigger a demonstration effect, or belief cascade, in other polities of the region. We thus have a simple reason for the possibility of "contagion" from one polity to another. Our model provides another, more direct, form of contagion, rooted in the democratic process. This form of contagion stems from external activist groups. Supporting similar policies across polities induces a high correlation between the electoral swings of the countries in the region. In other words, when a hegemonic power makes a policy choice on issues such as the exchange rate, savings level, openess of the market, etc., then it has an incentive to try to influence the policy of foreign countries,through support for any candidate are willing to implement the preferred policy. However, the support of activists for the hegemon can induce counter-response by (usually leftist) activists. These changes in the electoral equilibriia make it appear *as if* the domestic electoral preferences change temporally or geographically in a chaotic fashion across the region.

Our analysis suggests that this is a chimera. What drives the electoral swings is not a change in preferences, but a change in the distribution of perceptions that the electorate has of the quality of candidates of left and right. Because these perceptions result from the actions of activists who

respond to influences from the hegemon, we see that the electoral equilibria in Latin American polities ( and possibly in other regions),are dependent on the electoral choices made in those hegemonic powers playing the game of empire.

We offer this model of electoral choice as a step towards the analysis of this more general game.

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# Figure 1:Argentinean Presidential Elections 1989-1995

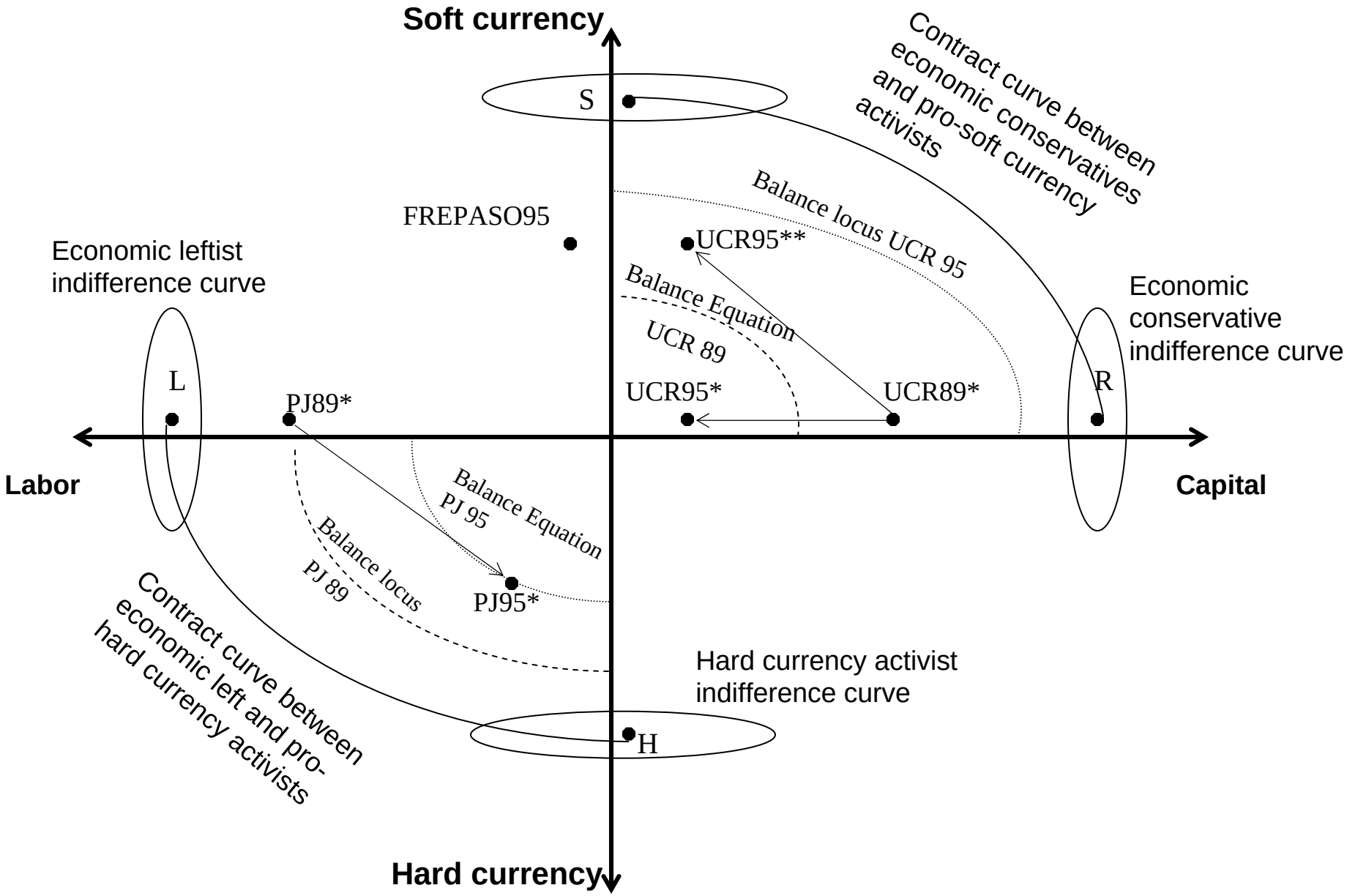

Figure 2. The Balance Locus and weighted electoral mean

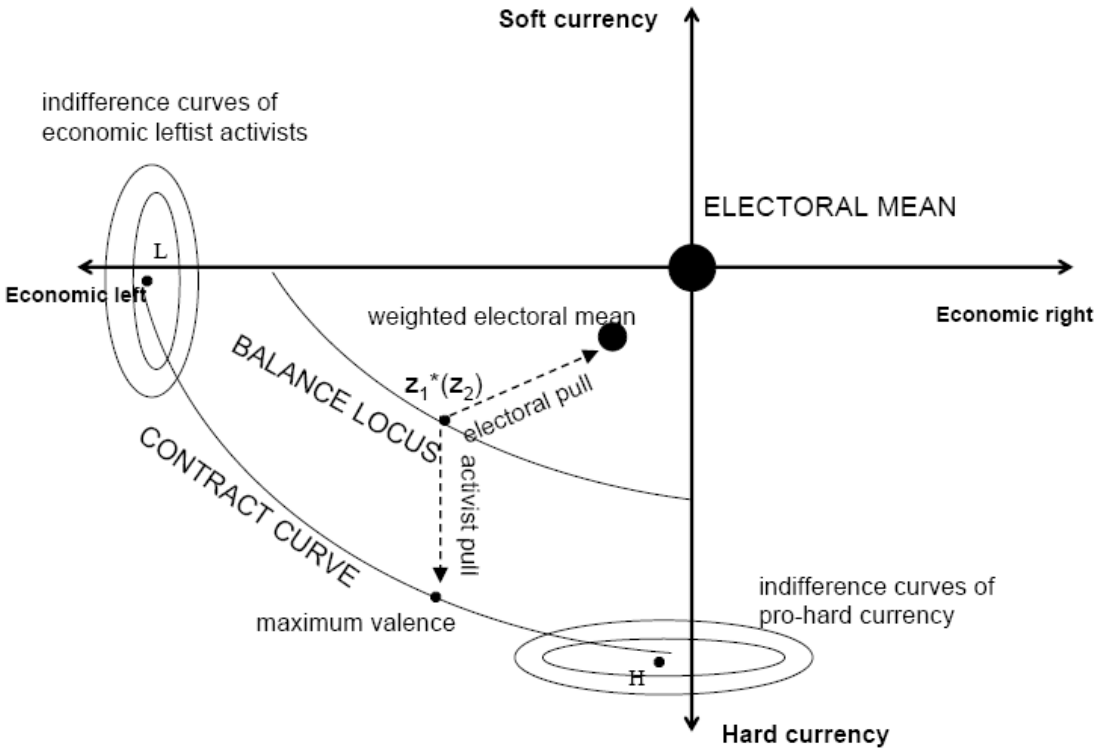

Figure 3. Highest density contours of the Electoral Distribution, in Argentina in a two dimensional policy space in 1995, at the 10, 50 and 75 per cent levels.

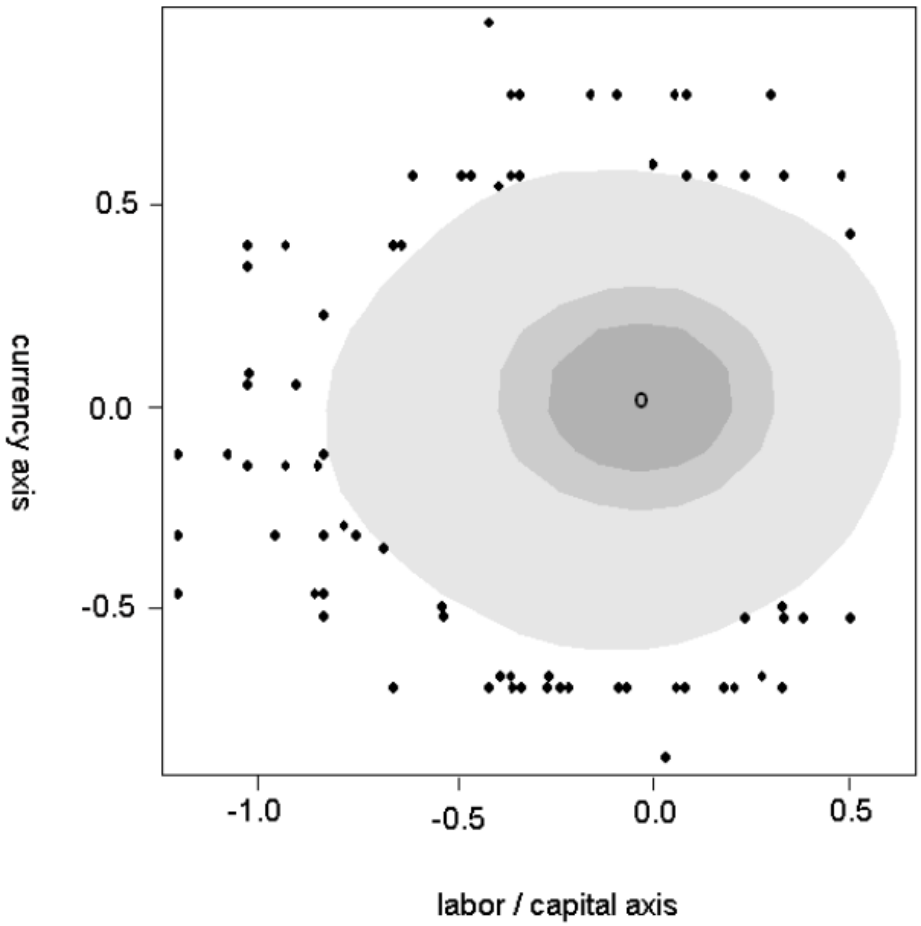

Figure 4. Party Positions in one dimension