Xenophobia and the Size of the Public Sector in France: A Politico-economic Analysis

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Anti-immigrant feeling (xenophobia) among voters was a key factor in the second-place victory of Jean Le Pen's National Front Party in the 2002 French national election. Here, we study the effect of anti-immigrant sentiment on the equilibrium position of political parties on the economic issue, which we take to be the size of the public sector. We model political competition among three parties (Left, Right, and Extreme Right) on a two-dimensional policy space (public sector size, immigration issue) using the PUNE model. We calibrate the model to French data for the election years 1988 and 2002, and show that politics have changed significantly over this period, from being centered primarily on economic issues, to non-economic issues such as immigration and security/law-and-order. We estimate that in 2002, the effect of voter xenophobia was to reduce the voters' choice of public-sector size between 11% and 28% of one standard deviation of the population's distribution of public-sector size ideal points, from what it would have been, absent xenophobia.

Keywords: xenophobia, racism, distribution, political equilibrium, public sector.

JEL Classification: D3, D72.

1 Introduction

The 2002 French presidential election[1] led to an expected (and, to many, appalling) run-off election between Jacques Chirac – the conservative

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1 The French presidential election is a two-round vote. If a candidate wins at least 50% of the votes in the first round, he or she is elected. Otherwise, the first two candidates meet in a second round.

incumbent – and Jean-Marie Le Pen, leader of the "Front National", a nationalistic and xenophobic law-and-order movement. Lionel Jospin, socialist and former prime minister, placed third on the first round and was eliminated.

Many explanations were offered ex post to account for the presence of an Extreme-Right candidate on the second round of the French presidential election. Some referred to the very high number of candidates – sixteen were vying for the presidency – that made coordination among voters (which might have prevented the Le Pen debacle) more difficult. Most commentators advanced the traditional parties' failure to respond adequately to the increasing anti-immigrant sentiment among the native citizenry, and to their expectations in terms of law-and-order policies, together with a general mistrust towards older traditional parties.

Our concern in this article is with the effect that increasing French anti-immigrant sentiment among voters will have on the size of the welfare state, as the latter is determined through political competition. For the purposes of this article, we will often describe anti-immigrant feeling as xenophobia. Ours is not a sociological or psychological investigation; we observe the distribution of xenophobic views based on voter survey data, and do not inquire into their causes or possible justifications. We will argue that the size of the welfare state and the government's position on immigration are among the most important issues in contemporary French politics. Political parties put forward positions on both these issues, and voters choose among parties based on their preferences on the two issues. We will model the political game among these parties, and then ask: How would the equilibrium values of the parties' positions on the size of the public sector change, were voters less xenophobic? We will attempt to answer the question by computing what the equilibrium in political competition would deliver, with regard to the size of the public sector, were the distribution of voter xenophobic attitudes different from what it is.

It is conceptually useful to distinguish between two ways in which anti-immigrant voter sentiment can alter the equilibrium party platforms on the issue of public-sector size. First, there is a direct effect which we call the *anti-solidarity effect* (ASE)*:* to the extent that voters dislike immigrants, and believe that immigrants exploit the welfare state, they may desire to decrease the generosity of state benefits. A similar argument is put forward by Alesina et al. (2001)

to explain large differences in welfare programs between the US and Europe: in the US, racism and prejudices against the Black minority may reduce the demand for redistribution expressed by white citizens.

The second effect is indirect. Suppose that a voter is very xenophobic, although quite moderate on the issue of public sector size: she may vote for a xenophobic party if the immigration issue is sufficiently important for her, even if that party is more right-wing on the size of the public sector than she is. If there are many voters of this kind, then parties that want large cuts in the size of the public sector may gain large support. We call this the *policy-bundle effect* (PBE). It is a political portfolio effect, a consequence of the bundling of issues.

Our analysis will enable us to decompose the total effect of xenophobia on equilibrium values of party policy on public-sector size into these two effects.

The present paper is part of a larger project – including also Woojin Lee – which aims to study the potential impact of xeno-phobia or racism on distribution in a number of countries and to draw some international comparisons. For results on the US, see Roemer and Lee (2004); for results on Denmark, see Roemer and Van der Straeten (2004a). This project is part of the emerging liter-ature linking distribution to racial or immigration issues, see, for example, Alesina et al. (2001), Austen-Smith and Wallerstein (2003), and Ortega (2004a; 2004b).

Before turning to a description of our data and of the major political issues in the campaigns, we briefly present below the vari-ous political parties competing in the presidential elections, together with their vote shares. Tables A.1, A.2 and A.3 in the Appendix present a full description of the results of the French presidential elections for years 1988, 1995, and 2002. We will describe French politics in terms of broader coalitions: Left, Right and Extreme Right. The composition of the coalitions is given in the Appendix tables referred to above. We compute the broader parties' vote shares by summing the vote shares on the parties forming the coalition; see Table 1.

The Extreme Right movement, whose main leader is Jean-Marie Le Pen, increased its vote share by almost 6 percentage points between 1988 and 2002, whereas the Left coalition lost about 6 percentage points.

Table 1. Coalitions' vote shares

	1988	1995	2002
L	49.0	40.6	42.9
R	36.5	44.2	37.9
ER	14.4	15.3	19.2

Our data consist of micro-data from the Post-Electoral Survey 1988, the Post-Electoral Survey 1995, and French Electoral Panel 2002.[2] These surveys include

– demographic questions: age, sex,..,
– questions about social and financial position: marital status, income, labor status,
– questions about voting behavior, party preferences, determinants of the vote, ... ,
– questions about economic or social issue: taxation, economic policies, law and order, immigration....

In order to assess the relative importance of the various issues in explaining voters' choice of a party on election day, we first present an

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2 The CEVIPOF post electoral survey 1988 was produced by the CEVIPOF, and carried out by SOFRES. It took place just after the 1988 presidential election, between May 9th and May 20th, and includes 4,032 respondents representative of the French population above 18 (non-registered voters were excluded). The CEVIPOF post electoral survey 1995 was produced by the CEVIPOF, and carried out by SOFRES. It took place just after the 1995 presidential election, between May 8th and May 23rd, and includes 4,078 respondents representative of the French population above 18 and registered on electoral lists. The data of the French electoral panel 2002 (PEF2002) were produced by the CEVIPOF, the CIDSP, the CECOP with the support of the ministry of Interior, the FNSP, and the University of Montreal. This electoral study took place in three waves between April and June 2002 carried out by TN-SOFRES. It includes 10,138 interviews, 4107 in the first wave carried out before the first round of the presidential election between April 8th and April 20th, 4017 interviews after the second round between May 15th and May 31st, and 2013 after the legislative elections between June 20th and 28th. All these data are available at the Socio-Political Data Archive (CIDSP). The results and interpretation in the current paper are the sole responsibility of the authors.

Table 2. The most important problems, 1995

	Score 9–10	Score 0–2	Mean	Std. Dev.	Obs.
Unemployment	72.9	2.5	8.9	2.0	3897
Education of the youth	56.8	2.9	8.3	2.2	3881
Social protection	49.1	3.0	8.0	2.2	3892
Exclusion	49.3	4.2	7.9	2.4	3853
Purchasing power and wages	46.1	3.8	7.8	2.3	3883
AIDS	48.3	9.1	7.5	2.9	3848
Corruption	46.1	7.5	7.5	2.7	3843
Security of persons	37.3	7.3	7.2	2.7	3885
Environment	26.9	6.2	6.8	2.5	3865
Sharing of working time	29.1	9.2	6.7	2.7	3829
Immigration	30.6	13.0	6.5	3.0	3864
Place of France in the world	21.5	9.7	6.4	2.7	8600
European construction	20.1	11.5	6.2	2.7	3827

overview of the 1995 and 2002 electoral campaigns, focusing on the issues perceived as the most important by the voters.[3]

For the year 1995, we rely on the following question:

Question: Here are a number of problems that France has to face nowadays. On a scale from 0 to 10, could you give a score to each of these problems, according to their importance in determining your vote in the first round of the presidential election? The place of France in the world, security of persons, social protection, immigration, purchasing power and wages, education of the youth, unemployment, sharing of working time, European construction, environment, AIDS, corruption, exclusion.

Table 2 reports the answers. The first column reports the percentage of respondents who give each mentioned issue one of the two highest values on the 0–10 scale; the second column reports the percentage of respondents who give one of the lowest three values. The third column gives the average score, and column 4 the standard deviation. Problems are ranked by average score.

Unemployment appears to be the most important issue, with an average score of 8.9; almost three quarters of the respondents give it a score of 9 or 10. Education of youth, social protection, and exclusion come next. Immigration appears only in the bottom half of the table.

For year 2002, we use the following question.

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3 Unfortunately, no such questions are available in the 1988 survey.

Table 3. The most important problems, 2002

	#1	#2	#3	All
Unemployment	33.4	16.8	10.8	61.0
Delinquency	19.6	22.3	14.8	56.7
Social inequalities	14.0	14.7	9.9	38.6
Immigration	6.5	6.2	5.7	18.4
Pensions	5.5	8.8	12.7	27.0
Pollution	5.4	5.5	7.1	18.0
Schools	3.4	6.0	6.6	16.0
Tax cuts	3.1	5.6	9.5	18.2
Fight against terrorism	2.8	4.6	7.5	14.9
Political scandals	2.1	3.3	4.4	9.8
European construction	2.0	3.0	5.1	10.1
Sovereignty of France	1.1	1.2	2.0	4.3
Do not answer	1.3	2.0	3.9	7.2

Note: Problems are ranked by number people who rank this specific problem as the single most important problem. Total number of observations: 4,107.

Question: Among the following problems, which will be the most important when you decide how to vote? Pollution, unemployment, immigration, social inequalities, political scandals, delinquency, conditions in schools, pensions, European construction, fight against terrorism, sovereignty of France, tax cuts. Which is the second most important problem, third most important problem?

Table 3 shows that the single most important problem is unemployment: one third of the respondents rank it as the most important problem, and almost two thirds of the respondents rank it as one of the three most important problems. The second most often cited problem is delinquency, the third is social inequality. Immigration appears fourth: it is mentioned by 18% of the respondents as one of the three most important problems.

Thus, as in 1995, unemployment is still the most important issue; however, law and order and immigration issues have become more salient to voters over the period.

Assuming that unemployment, education and social inequalities are mainly questions about the size of the public sector, modeling political competition as focusing upon the two issues of public-sector size and immigration/law-and-order issues appears to be an acceptable abstraction.

The plan of the paper is the following. In Sect. 2, we describe the electoral competition model; in Sect. 3, we present the theory of the PBE

and ASE. We then turn to estimation and computation. In Sect. 4, we estimate the parameters that will be used to calibrate the electoral competition model and define counterfactual preferences. In Sect. 5, we give the numerical prediction of the two-dimensional model. In Sect. 6, we compute the ASE and PBE. Section 7 concludes.

2 Political Equilibrium: Theory

We propose that the spectrum of political parties can be captured, for our purposes, with a model that postulates three parties: a Left, a Right, and an Extreme Right. The Left party of the model will correspond to the union of four or six parties; the Right will correspond to the union of three parties; the Extreme Right will correspond to either one or two parties (see Tables A.1, A.2, and A.3.) We propose in this section a model of political equilibrium in which three parties compete on a two-dimensional policy space, which, in our application will be the *size of the public sector* and the *policy towards immigrants*.

The model is an extension of *party unanimity Nash equilibrium with endogenous parties* (PUNEEP) as defined in Roemer (2001, chap. 13).

The data of the model consist of the information (H, F, T, v, n) where:

– H is a space of *voter types* equipped with a probability distribution F;
– $v(\cdot, h)$ is the utility function of a voter type h defined on the policy space T, and
– n is the number of parties.

The equilibrium will consist in a tuple $(L, R, ER, \tau^L, \tau^R, \tau^{ER})$ where:

– (L, R, ER) is a partition of the set of voter types into *party memberships* or *constituencies:*
– $L \cup R \cup ER = H$, $L \cap R = \emptyset$, $L \cap ER = \emptyset$, $R \cap ER = \emptyset$,
– $\tau^J \in T$ is the equilibrium platform of party J, for J=L, R, ER.

There will be no confusion if we refer to a *party* and its *constituency* by the same variable: e.g., ER for Extreme Right.

For our application, a voter's type will be an ordered pair (π, ρ) where ρ is the voter's ideal public sector size (which we sometimes call, for

short, her "tax rate") and ρ is her position on the immigration issue. The policy space T is a set of ordered pairs (t, r), which we may take to be the real plane, where t is a party's policy on the size of the public sector and r is its policy on immigration. The utility function of the polity is a function $v : T \times H \to R$ given by

$$v(t, r; \pi, \rho) = -(t - \pi)^2 - \gamma(r - \rho)^2. \qquad (2.1)$$

We refer to γ as the *relative salience of the immigration issue*, and assume it is the same for all voters.

Given three policies $(\tau^L, \tau^R, \tau^{ER})$ proposed by the parties, we define $\varphi^J(\tau^L, \tau^R, \tau^{ER})$, for $J = L, R, ER,$ as the fraction of the polity who prefer the policy of party J to the other two policies. In our model, if the policies are distinct, then the set of voters indifferent between two policies will always have F-measure zero, and so, in the case of distinct policies, these three fractions sum to unity.

Unlike the model of Downs, in our model, parties will generically propose distinct policies in equilibrium.

We briefly review the concept of party unanimity Nash equilibrium (PUNE). A party possesses *entrepreneurs* or *organizers,* and *members* or *constituents.* The members of a party are citizens who, in equilibrium, prefer that party's policy to the policies of the other parties. The party will also *represent* its members, as we describe below. The entrepreneurs are professional politicians who make policy in the party. Think of them as a very small group of individuals, who are not identified with citizens characterized by a type. (Their type is irrelevant.) We will assume that the organizers of the Left and Right parties are each divided into two factions – an Opportunist faction and a Militant faction. The Opportunist faction wishes, in the party competition game, to propose a policy that will maximize the party's vote share. The Militant faction wishes to propose a policy that will maximize the average welfare of the party's constituency.

The proposal that parties consist of bargaining factions captures the view that parties have conflicting goals: to represent constituencies, and to win office, or, more generally, to maximize vote share. Mathematically, the virtue of the factional model of parties is that it engenders the existence of political equilibria when policy spaces are multi-dimensional.

We will assume that the Extreme Right party is a passive member of the party competition game: it proposes a fixed policy, which could be

viewed as the ideal policy of its organizers. Modeling the Extreme Right in this way is less than ideal: we would have preferred to model it as a party with factions that behave in the manner of the other two parties. Doing so, however, immensely complicates the computation of equilibrium – already a time-consuming task – and so we have elected to treat the policy it proposes as exogenously given. Its *membership,* however, will be endogenous.

Without loss of generality, we could postulate a third faction in each of the L and R parties – a Reformist faction, whose members desire to maximize the average *expected* welfare of the party's constituency. (The expectation comes about because there is uncertainty concerning which party will win the election. Of course, in a three-party model, there is also uncertainty concerning the government coalition.) As is shown in Roemer (2001), the set of equilibria will not change with this additional faction: in an appropriate sense, the Reformists are a "convex combination" of the other two factions. Therefore we have dispensed with it, and also with having to define the probability of victory, which would be essential, were we have to discuss expected utility of voters, something of concern to Reformists. We mention the Reformists because postulating their existence adds an important element of realism to the model, although, it turns out, it does not alter the model's equilibria. Thus, from the formal viewpoint, we may ignore Reformists.[4]

The idea of PUNE is that parties compete against each other *strategically*, as in Nash equilibrium, and factions *bargain* with each other, inside parties. At an equilibrium, each party's platform is a best response to the other parties' platforms in the sense that it is a *bargaining solution* between the party's factions, given the platforms proposed by the other parties. In our application, this will be the case for the L and R parties.

Suppose the members of a party consist in all citizens whose types lie in the set $J \subset H$. We define the *average welfare function* for this party as a function mapping T into the real numbers defined by:

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4 The reader may be puzzled that adding the Reformist faction does not change the equilibrium set. Adding them does change something, however: the interpretation of the bargaining powers of the factions associated with particular equilibria. Thus, we do not say that Reformists do not matter: it is just that they do not matter for the present analysis.

$$V^J(\tau) = \int\limits_{h \in J} v(\tau; h)dF(h). \qquad (2.2)$$

That is, $V^J(\tau)$ is just (a constant times) the average utility of the coalition J at the policy τ. For (2.2) to make sense, we must assume that the utility functions v are unit-comparable.

Definition: A *party unanimity Nash equilibrium* (PUNE) *for the model* (*H, F, T, v, 3*) *at the exogenous* ER *policy* τ^{ER} is:

(a) a partition of the set of types $H = L \cup R \cup ER$, possibly ignoring a set of measure zero;
(b) a pair of policies (τ^L, τ^R)

such that:

(1a) Given (τ^L, τ^{ER}) there is no policy $\tau \in T$ such that:

$$V^R(\tau) \geq V^R(\tau^R) \text{ and } \varphi^R(\tau^L, \tau, \tau^{ER}) \geq \varphi^R(\tau^L, \tau^R, \tau^{ER})$$

with at least one of these inequalities strict;

(1b) Given (τ^R, τ^{ER}) there is no policy $\tau \in T$ such that:

$$V^L(\tau) \geq V^L(\tau^L) \text{ and } \varphi^L(\tau, \tau^R, \tau^{ER}) \geq \varphi^L(\tau^L, \tau^R, \tau^{ER})$$

with at least one of these inequalities strict;
(2) for $J = L, R, ER$, every member of coalition J prefers policy τ^J to the other two policies, that is $h \in J \Rightarrow v(\tau^J, h) > v(\tau^{J'}, h)$ for $J' \neq J$.

   Condition (1a) states that, when facing the policies τ^{ER} and τ^L, there is no feasible policy that would increase both the average welfare of party R's constituents and the vote fraction of party R. Thus, we may view policy τ^R as being a *bargaining solution* between party R's two factions when facing the oppositions' policies, as the Militants' desire to maximize the average welfare of constituents, and the Opportunists desire to maximize vote share. All we employ here is the assumption that a bargain must be Pareto efficient for the two players in the bargaining game. Condition (1b) similarly states that policy τ^L is a

bargaining solution for party L's factions when facing the policies τ^{ER} and τ^R. Condition (2) states that the endogenous party memberships are stable: each party member prefers her party's policy to the other parties' policies.

There are two "free" parameters in this equilibrium concept: one might think that the relative strength of the Militants with respect to the Opportunists in a party is an important variable, in determining where on the mini-Pareto frontier of the factions the bargaining solution lies. There is one such parameter for each party L and R. Thus, we can expect that, if there an equilibrium, there will be a two-parameter manifold of equilibria, where the elements in this manifold are associated with different pairs of relative bargaining strengths of the pairs of factions in L and R. This indeed turns out to be the case, as we will see below.

With differentiability, we can characterize a PUNE as the solution of a system of simultaneous equations. Denote by $\nabla_J \varphi^J (\tau^L, \tau^R, \tau^{ER})$ the gradient of the function φ^J with respect to the policy τ^J. Denote by ∇V^J the gradient of V^J. Then, we can write the necessary conditions for a PUNE where τ^L and τ^R are interior points in T as:

(1a) there is a nonnegative number x such that $-\nabla_L \varphi^L (\tau^L, \tau^R, \tau^{ER})$
      $= x \nabla V^L (\tau^L)$
(1b) there is a nonnegative number y such that $-\nabla_R \varphi^R (\tau^L, \tau^R, \tau^{ER})$
      $= y \nabla V^R (\tau^R)$.

$\left.\right\}$FOC

Condition (1a) says that the gradients of the vote share function and the average welfare function for party L point in opposite directions at the solution, and so, assuming local convexity, there is no direction in which the policy of the party can be altered so as to increase both the party's vote share and the average welfare of the party's constituents. Thus conditions (1a) and (1b) correspond exactly to the conditions (1a) and (1b) in the definition of PUNE. (All policies are interior in our application, since T is an open set.)

Our next task is to characterize PUNE as a system of equations, which requires us to formulate precisely the party constituencies. Denote the set of types who prefer a policy $\tau^a = (t^a, r^a)$ to policy $\tau^b = (t^b, r^b)$ by $\Omega(\tau^a, \tau^b)$, and compute that

$$\Omega(\tau^a, \tau^b) = \begin{cases} \{(\pi, \rho)|\rho < \psi(\tau^a, \tau^b, \pi) & \text{if } r^a < r^b \\ \{(\pi, \rho)|\rho > \psi(\tau^a, \tau^b, \pi) & \text{if } r^a > r^b \end{cases}, \qquad (2.3)$$

where

$$\psi(\tau^a, \tau^b, \pi) = \frac{t^{b^2} - t^{a^2} + 2\pi(t^a - t^b) + \gamma(r^{b^2} - r^{a^2})}{2(r^b - r^a)}. \qquad (2.4)$$

We will specify the value of the policy r so that larger r means more xenophobic (anti-immigrant). Thus, at equilibrium, we will expect that $r^L < r^R < r^{ER}$. For an equilibrium with this characteristic, it follows from (2.3) that the constituency L will be precisely:

$$L = \{(\pi, \rho) \in H|\rho < \min[\psi(\tau^L, \tau^R, \pi), \psi(\tau^L, \tau^{ER}, \pi)]\},$$

for these are the types who will prefer policy τ^L to both other policies. In like manner, we have:

$$ER = \{(\pi, \rho)|\rho > \max[\psi(\tau^{ER}, \tau^R, \pi), \psi(\tau^{ER}, \tau^L, \pi)]$$

and R, of course, comprises the remaining types (except for a set of measure zero). In short-hand, if we define:

$$m(\tau^L, \tau^R, \tau^{ER}, \pi) = \min[\psi(\tau^L, \tau^R, \pi), \psi(\tau^L, \tau^{ER}, \pi)],$$
$$M(\tau^L, \tau^R, \tau^{ER}, \pi) = \max[\psi(\tau^{ER}, \tau^R, \pi), \psi(\tau^{ER}, \tau^L, \pi)]$$

and we denote the vector consisting of all three policies as τ, then we have:

$$L = \{(\pi, \rho)|\rho < m(\tau, \pi)\}, \quad R = \{(\pi, \rho)|m(\tau, \pi) < \rho < M(\tau, \pi)\},$$
$$ER = \{(\pi, \rho)|\rho > M(\tau, \pi)\}. \qquad (2.4a)$$

Assuming the support of the distribution F is the real plane, we can therefore write:

$$\varphi^L(\tau) = \int\limits_{-\infty}^{\infty} \int\limits_{-\infty}^{m(\tau, \pi)} dF(\pi, \rho), \qquad (2.5a)$$

where the inside integral is over ρ and the outside integral is over π, and in like manner:

$$\varphi^R(\tau) = \int\limits_{-\infty}^{\infty} \int\limits_{m(\tau,\pi)}^{M(\tau,\pi)} dF(\pi,\rho), \quad \varphi^{ER}(\tau) = \int\limits_{-\infty}^{\infty} \int\limits_{M(\tau,\pi)}^{\infty} dF(\pi,\tau). \quad (2.5b)$$

Similarly, we can write:

$$\begin{aligned} V^L(\tau^L) &= \int\limits_{-\infty}^{\infty} \int\limits_{-\infty}^{m(\tau,\pi)} v(\tau^L;\pi,\rho)dF(\pi,\rho), \\ V^R(\tau^R) &= \int\limits_{-\infty}^{\infty} \int\limits_{m(\tau,\pi)}^{M(\tau,\pi)} v(\tau^R;\pi,\rho)dF(\pi,\rho). \end{aligned} \qquad (2.6)$$

The corresponding average-welfare function for the *ER* is irrelevant, because the *ER* plays a fixed policy.

Now we substitute these expressions into the first-order conditions (FOC), and we have fully modeled PUNE – that is, condition (2) of the definition of PUNE holds by construction.

The first-order conditions now comprise four equations in six unknowns – the four policy unknowns of the Left and Right parties, and the two Lagrangian multipliers x and y. If there is a solution, there will (generically) be, therefore, a two-parameter family of solutions. As we described above, the points in this family or manifold can be viewed as corresponding to equilibria associated with different relative bargaining strengths of the pairs of factions in the parties L and R.

Indeed, we now construct an internal bargaining game between party factions and show how to compute the relative bargaining powers of the factions at a PUNE. Denote a PUNE by $(L, R, ER, \tau^L, \tau^R, \tau^{ER}, x, y)$, where, recall, (x, y) are the Lagrange multipliers displayed in eqns. (1a,1b) above. We construct a Nash bargaining game. Suppose that the impasse situation for party L (should its factions fail to come to an agreement concerning the policy L announces) is that party R wins for sure and L does not participate in the election. Then party L wins a zero vote share and the constituents of party L endure an average welfare of $V^L(\tau^R)$. Then the Nash bargaining game of the Opportunist and Militant

factions in L involves choosing a policy τ to maximize the Nash product

$$\left(V^L(\tau) - V^L(\tau^R)\right)^{\alpha}\left(\varphi^L(\tau, \tau^R, \tau^{ER}) - 0\right)^{1-\alpha},$$

where α and $1 - \alpha$ are the bargaining powers of the Militants and Opportunists in Left, respectively. The first-order conditions for this maximization at its solution τ^L can be written as:

$$\frac{(1-\alpha)\nabla_L\varphi^L(\tau^L, \tau^R, \tau^{ER})}{\varphi^L(\tau^L, \tau^R, \tau^{ER})} + \frac{\alpha V^L(\tau^L)}{V^L(\tau^L) - V^L(\tau^R)} = 0.$$

But Condition (1a) in the definition of PUNE says that $-\nabla_L\varphi^L$ $(\tau^L, \tau^R, \tau^{ER}) = x\nabla V^L(\tau^L)$; substituting, we solve for α:

$$\alpha = \frac{x(V^L(\tau^L) - V^L(\tau^R))}{x(V^L(\tau^L) - V^L(\tau^R)) + \varphi^L(\tau^L, \tau^R, \tau^{ER})}. \tag{2.7}$$

In like manner, the bargaining power for the Militants in Right at a PUNE is given by:

$$\beta = \frac{y(V^R(\tau^R) - V^R(\tau^L))}{y(V^R(\tau^R) - V^R(\tau^L)) + \varphi^R(\tau^L, \tau^R, \tau^{ER})}. \tag{2.8}$$

We shall use these formulae below.

3 The Policy Bundle and Anti-solidarity Effects: Theory

Our strategy to compute the two effects of voter xenophobia on the size of the public sector will be to estimate the above PUNE model, and then to run two counterfactual experiments, which we describe below.

   We first summarize the values of the "tax policy" t that parties propose in equilibrium in the above PUNE full model by one *average expected policy,* that we will define later, which we will denote t^{exp}. Our concern is with the effect of xenophobia on the size of public sector (tax policy).

   In the first counterfactual experiment, we assume that *immigration policy(r) is not an issue* in the election. Parties compete, that is, over the single issue of public-sector size, t. Voters, however, continue to possess exactly the distribution of preferences on public sector size as described

by (the marginal distribution of) F. Since those preferences are influenced by their views on immigration, it continues to be the case, in this counterfactual contest, that voters' views on immigration will *indirectly* affect the political equilibrium, via their effect on preferences over size of the public sector. We summarize the tax-policy equilibria of the set of PUNEs for this counterfactual election by one policy, $t_I^{\exp}$. We compute PUNEs for a model with *two parties*. We choose a two-party model for the counterfactual, because, first, it would be computationally difficult to find equilibria for three *endogenous parties* (in the counterfactual model, we have no way to set the policy of the ER party exogenously). Secondly, were politics indeed unidimensional, it is questionable that an ER party would receive an appreciable vote share, so a two-party model is a reasonable counterfactual.

We restrict to PUNEs in the counterfactual for which the distance from the ordered pair of bargaining powers in the counterfactual PUNEs lies within a circle of radius 0.05 about the ordered pair of bargaining powers of the PUNEs, on average, of the full model.

To compute these equilibria, we exogenously specify a fixed value for the r issue. (It does not matter what that value is.) This counterfactual election is equivalent to an election in which voter preferences are altered by setting γ equal to zero. Thus the difference $t_I^{\exp} - t^{\exp}$ is exactly a measure of the policy-bundle effect: for in this election, there is no portfolio problem for the voter, as immigration policy is not an issue. Nevertheless, a voter's xenophobia will still cause her to vote for a lower size of the public sector than otherwise, if she does not wish to support immigrants with public funds: so the anti-solidarity effect is still active.

Next, we estimate (to be described in Sect. 4) a distribution of *racism-free demands for the public sector*. That is, we estimate what the distribution of preferences over public-sector size would be, were all voters non-xenophobic. Call this distribution G. We next run a second unidimensional election with two parties, on public-sector size, where we assume the distribution of voter preferences on the tax issue is given by G. The results of this election will be sterilized of both the policy-bundle and the anti-solidarity effects. We summarize the policy of the PUNEs here calculated by $t_{II}^{\exp}$. We again restrict to PUNEs for which the ordered pair of bargaining powers of the opportunists in the two parties lies within a circle of radius 0.05 about the ordered pair of bargaining powers of the PUNEs, on average, of the full model.

The anti-solidarity effect is $t_{II}^{\exp} - t_I^{\exp}$; the total effect of xenophobia is $t_{II}^{\exp} - t^{\exp}$.

4 Estimation of Model Parameters

4.1 Distribution of Voter Traits

4.1.1 Description of the Questions and Distribution of Answers

In the equilibrium model, parties propose platforms consisting of an economic issue (amount of social expenditures) and an immigration policy. We select some questions allowing us to estimate voters' preferences on these two types of issue. Ideally, we would like to use identical questions for all three years to see how voters' opinions on these issues have evolved. Unfortunately, very few questions are asked all three years.

The economic issue:

Question: Can you tell me if the word "privatization" has a rather positive or negative connotation for you?

Figure 1 presents the distribution of answers. Respondents are quite evenly split into two groups: those with a positive opinion about privatization, and those with a negative opinion, the former being slightly more numerous. The distribution is quite stable through time, with only a small shift towards more negative feelings.

This question is an indicator of general economic liberalism. To construct an index of voters' preferences on the economic issue, we also want to integrate more specific questions about welfare programs and social security. Unfortunately, no such questions were asked in all three years.

For 1988, we use the question: "Do you agree with the following statement? The state should guarantee a minimum revenue to all households." For 1995 and 2002, we use the question: "Can you tell me if the word 'solidarity' has a positive or negative connotation for you?"

The distribution of answers is displayed in Fig. 2. The distributions of answers is similar for all three years. One might be concerned that the questions used for the year 1988 on the one hand (support for a minimum income for all) and 1995 and 2002 on the other hand (connotation of the word solidarity) describe quite different feelings. In particular, the
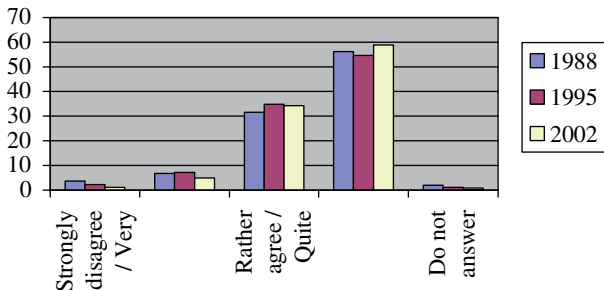
Connotation of the word "privatization"
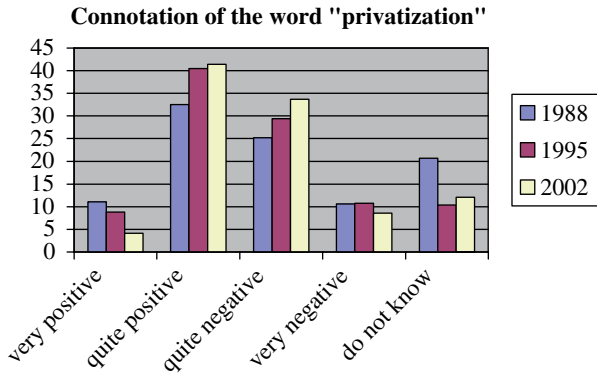
Fig. 1. Connotation of the word "privatization". Distribution of answers

scope of the latter question seems broader, as solidarity need not mean only economic solidarity. Yet, we probably do not err when we take the answers to these two questions as describing the same kind of opinion, as we will argue below. For the time being, we assume that the answers to these questions are a satisfactory proxy for support for state welfare programs.

We define voters' preferences on the economic issue as being some aggregate of general economic anti-liberalism and support for welfare programs, as characterized by the questions described. More precisely, we choose to give each answer a score on the 0–3 scale (on the anti-privatization scale, the value 0 means a positive connotation of the word privatization, and the value 3 means a negative connotation; on the pro

State should provide minimum income for all (1988)
Connotation of the word "Solidarity" (1995; 2002)

Fig. 2. "The State should provide minimum income for all" (1988) / Connotation of the word "solidarity" (1995; 2002). Distribution of answers

welfare scale, 0 means the lowest possible support, and 3 means the highest possible support). We take the economic view as being the sum of these two scores.

Neglecting respondents who do not answer either question that is used to construct the index, we summarize the results in Fig. 3.

The distribution of views is quite stable through time, with a slight shift in favor of a larger public sector.
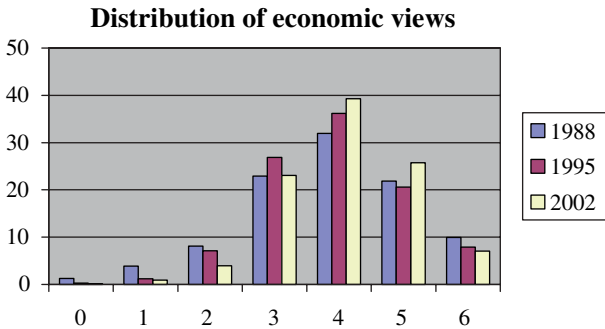
The immigration issue:

Question: There are too many immigrants in France.

The distribution of answers is shown in Fig. 4. A large majority of respondents think that there are too many immigrants in France. The distribution of views is quite stable through time, with a peak of anti-immigrant feeling in 1995.

Question: Nowadays we do not feel as much at home as we used to.

The distribution of answers is shown in Fig. 5.

We use these two questions to define voters' preferences on the immigration issue. More precisely, here again we choose to give each answer a score on the 0–3 scale (on both the ''Too many immigrants'' scale and the ''Do not feel at home'' scales, the value 0 means that the respondent strongly disagrees with the statement, and the value 3 means

**Fig. 3.** Distribution of economic views
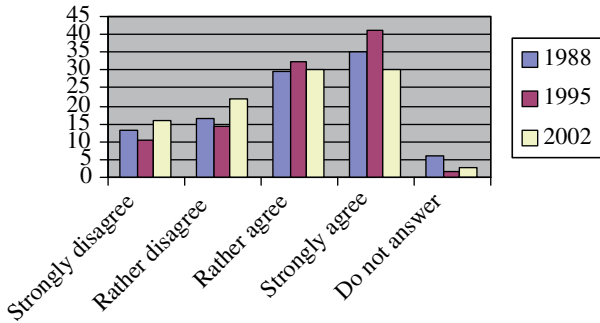
Fig. 4. "There are too many immigrants in France." Distribution of answers

that he/she strongly agrees). We take the immigration view as being the sum of these two scores.

Neglecting respondents who do not answer either question, the distribution of this index is given in Fig. 6. The distribution of views is quite stable through time, with a peak of anti-immigration feeling in 1995.

The correlation between the views on the size of the public sector and the immigration issue will play an important part in our analysis. The graphs below depict for years 1988 and 2002 the distribution of Pro Public Sector views, partitioned by answers to the immigration question. The percentage of respondents in the first three categories of the pro Public Sector index is small, and so we merge these three categories on the graphs. See Figs. 7 and 8.
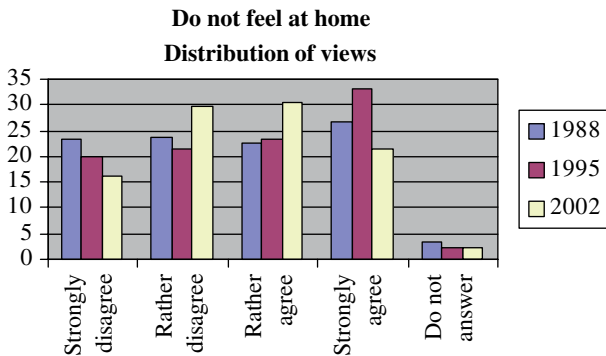
Fig. 5. "We do not feel as much at home as we used to." Distribution of answers

It appears that there is globally a U-shaped relationship between pro-public sector opinions and anti-immigration views. People with extreme views on the immigration issue (either very negative or very positive) also tend to support higher levels of public spending. When we consider the first five types of immigration view (from 0 to 4), we observe a negative relationship between anti-immigrants feelings and pro public sector views. Then the relationship goes the other way. Yet, some striking differences are to be noted between 1988 and 2002. In 2002 the negative relationship appears to be much more important than in 1988. This is confirmed by the observation of average economic view by immigration type for both years, see Fig. 9.

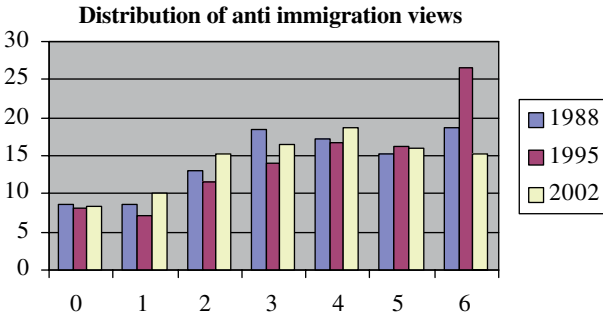**Distribution of anti immigration views**

Fig. 6. Distribution of anti-immigration views

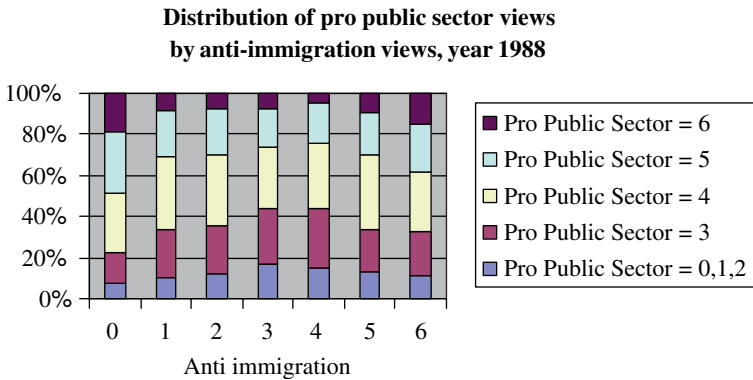**Distribution of pro public sector views by anti-immigration views, year 1988**

Fig. 7. Distribution of pro public sector views by anti-immigration view, 1988
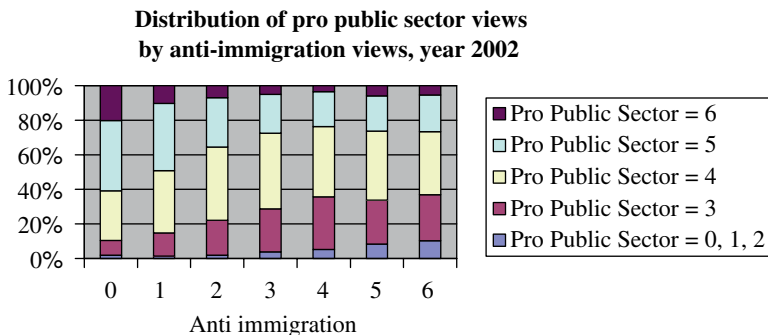
When we consider the evolution of the joint distribution of economic opinions and immigration related feelings, the main findings are the following:

(1) The marginal distributions are quite stable through time. One can note a peak in anti-immigration feeling in 1995, and a slight increase in the support for a larger public sector, yet these shifts over time are quite small.
(2) The correlation between these two opinions has changed. In 2002, the globally negative relationship is much stronger than in 1988.

4.1.2 Interpretation of the Variables

To construct voters' preferences we rely on a small number of questions only, whereas in the survey more questions are available regarding individuals' opinions on economic policy or immigration policy (recall our choice was constrained, because, to the extent possible, we tried to select questions available for all three years). To understand better exactly what these variables mean, we check the correlation of our selected variables with other related variables.

In particular, one might be concerned about the changes reported between 1988 and 2002 in the correlation between economic views and immigration views. One could argue that this relationship is spurious, and mainly caused by the change in the definition of the

Distribution of pro public sector views by anti-immigration views, year 2002

Legend:
- Pro Public Sector = 6
- Pro Public Sector = 5
- Pro Public Sector = 4
- Pro Public Sector = 3
- Pro Public Sector = 0, 1, 2

Anti immigration

Fig. 8. Distribution of pro public sector views, by anti-immigration view, 2002

**Average pro public sector view
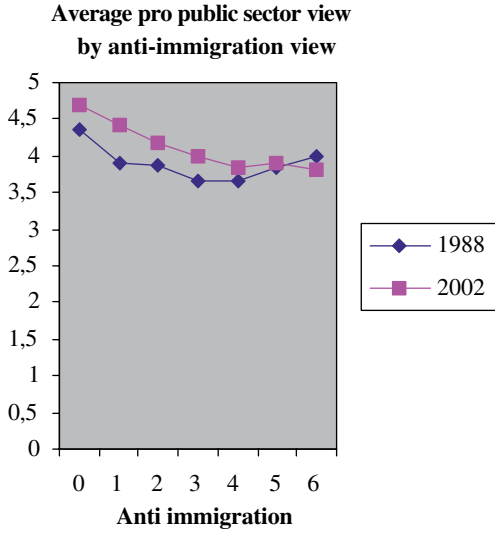by anti-immigration view**

Fig. 9. Average pro public sector view by anti-immigration view

economic index. As we said, it is possible that the word solidarity has a broader sense than just economic solidarity, and that people who resent the presence of two many immigrants will tend to have negative feelings towards the word solidarity if it is understood as a feeling of fraternity for all residents of France. Yet, as we will show, other questions in the survey provide further evidence for the strong negative correlation in 2002 between anti-immigrant feelings and support for welfare programs. Indeed, in the 2002 survey, we have the following question about welfare programs:

Question: As far as the "Revenu Minimum d'Insertion" is concerned (the RMI is the main welfare program in France), would you rather say that

(1) people may tend to be happy with it and not look for work.
(2) it helps people get through hard times.

Fifty-seven percent of the respondents (of those who answered the question) selected the first answer. A majority of people tend to think that welfare programs create strong disincentives to work, and that people living on welfare do not try to re-enter the labor market. The correlation

between answers to this question and opinions on the immigration issue is very large, as shown in Fig. 10.

Among people with the most negative feelings towards immigrants, about 75% tend to have a low opinion of people living on welfare, whereas this percentage drops to less than 45% in the three most immigrant-friendly groups. This is to be compared with the distribution in 1988 as shown in Fig. 11.

In 1988 on the contrary, there is rather a positive – although weak – relationship between anti-immigrant feelings and support for welfare programs. (For further evidence on the interpretation of this relationship, see the working paper by J. E. Roemer and K. Van der Straeten, 2004b.)

4.1.3 Construction of a Continuous Joint Distribution

Confident that the two variables selected in the first sub-section are good indicators of the preferences we want to estimate, we proceed to construct a joint distribution of voters' traits, which we approximate as a bivariate normal density with parameters reported in Table 4. Figures 3 and 6 suggest that a normal approximation is adequate for the distribution of economic views; for the distribution of immigration views, the normal fit is not so good for 1995.

**Opinions on welfare programs
by anti-immigration type, year 2002**
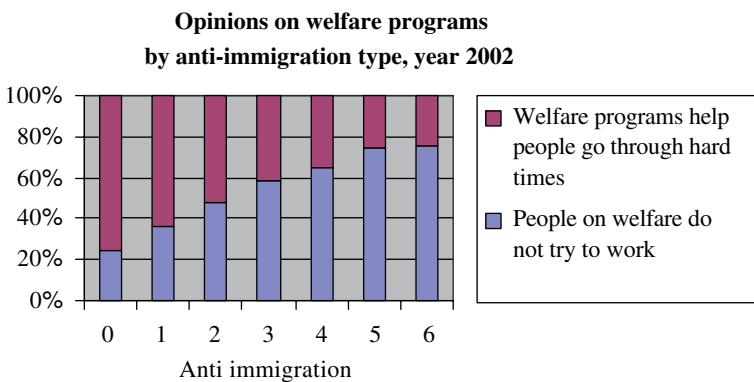
Fig. 10. Opinions on welfare programs by anti immigration type, 2002

The State should provide income for all
Distribution of answers by anti-immigration type,
year 1988
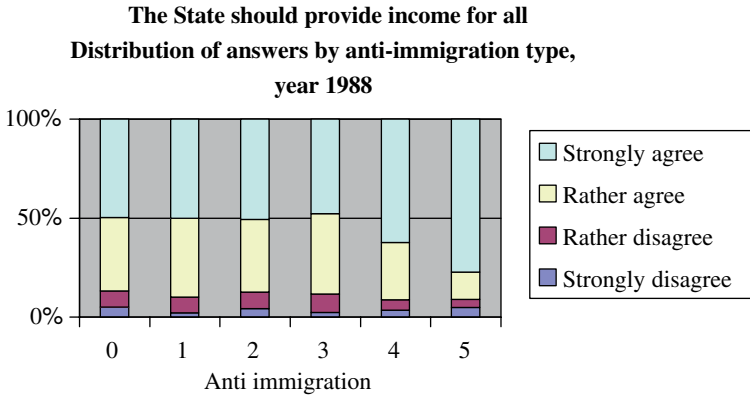
Fig. 11. "The State should provide income for all." Distribution of answers
by anti-immigration type, year 1988

4.2 Average Position by Constituency

In the survey, respondents are also asked which party they voted for in the
various elections. This allows us to compute the average views on both
issues by constituency, as defined by the broad coalitions presented
above. These average values, which can be interpreted as the equilibrium
ideal position of the Militants in each party, are reported in Table 5, for
years 1988 and 2002.

The Extreme Right voters are the most extreme on the immigration
issue, but they have moderate views on the economic issue, although they
are closer to Right voters than to Left voters on that issue. The main
differences between 2002 and 1988 are that the *L* and *R* electorates tend
to be closer to one another on the economic issue in 2002, and that the
ER and the *L* electorates tend to be further apart on the immigration issue
in 2002.

Table 4. Parameters of the joint distribution of voters' views

	1988		1995		2002	
	Mean	St Dev	Mean	St Dev	Mean	St Dev
AntiImmigrant	3.48	1.87	3.79	1.93	3.36	1.84
ProPubSector	3.86	1.31	3.91	1.10	4.06	1.01
Correlation	−0.05		−0.25		−0.25	

Table 5. Voters' average views by constituency

	L voters	R voters	ER voters	All
1988				
Mean *ProPublicSector*	4.30	3.16	3.62	3.86
Mean *AntiImmigrants*	2.93	3.75	4.99	3.48
2002				
Mean *ProPublicSector*	4.48	3.66	3.84	4.06
Mean *AntiImmigrants*	2.25	3.28	5.04	3.36

4.3 Estimation of Counterfactual Preferences

As we described in Sect. 3, we want to construct counterfactual xeno-phobia-free economic preferences, that is, views on the size of the public sector that would be observed were hostility towards immigrants and refugees not to reduce the feeling of solidarity. There is no unique pro-cedure for constructing such preferences. Our approach depends upon how we interpret the large correlation between opinions on the size of the public sector and on the immigration issue, on which we have provided evidence (see Figs. 7 and 8).

We cannot expect, given the available data, to provide definitive evi-dence that xenophobia indeed *causes* a decrease in the support for the public sector, or to give a definitive answer as to the exact size of this effect. Our goal in this section is less ambitious: it is to provide some weak evidence that this correlation remains even when we control for demographic factors, and to provide a range of values for the effect.

As a first approach to computing the potential magnitude of this effect, we begin with the most obvious analysis, which is to consider the dis-tribution of economic preferences by *AntiImmigration* view. Table 6

Table 6. Parameters of the distribution of economic views for different levels of xenophobia

ProPublicSector	1988			2001		
	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
AntiImmigration =0	4.35	1.25	291	4.68	0.96	308
AntiImmigration =1	3.90	1.26	267	4.43	0.90	360
AntiImmigration =2	3.86	1.22	395	4.18	0.91	541
AntiImmigr =0,1,2	4.02	1.26	953	4.38	0.93	1209
All	3.86	1.31	3156	4.06	1.01	3602

**Average economic and immigration
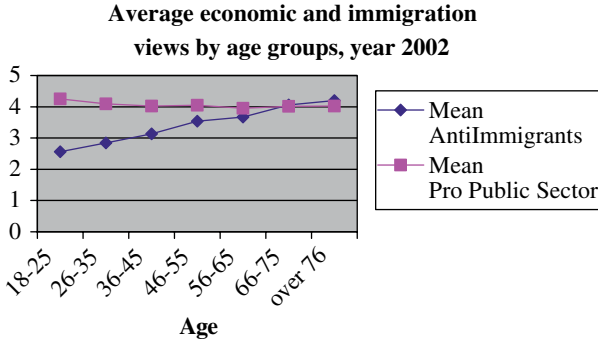views by age groups, year 2002**

Fig. 12. Average economic and immigration views by age groups, 2002

presents the mean and standard deviation for various distributions among those whom we class as not xenophobic.

Using *AntiImmigration = 0* as the reference non-racist group is probably too extreme. The choice of *AntiImmigration = 1* or *AntiImmigration ≤ 2* seems more reasonable.

Table 6 only reports cross-tabulations. It might be argued that this correlation is the indirect result of the existence of a common determinant of immigration and economic views. For example, in 2002, age is negatively correlated with anti-immigrant feeling and (slightly) positively correlated with support for a larger public sector; see Fig. 12.

It might be argued that young people tend to be more educated and more open-minded, hence less influenced by negative stereotypes, which would explain the strong positive relationship between age and xenophobia. As to economic views, young people – who are severely hurt by unemployment – support a slightly higher level of the public sector than older people. On the other hand, some other variables are negatively (or positively) correlated with both anti-immigrant and pro public sector views – for example, household income. See Fig. 13.

There is a very strong negative relationship between income and xenophobia. Several explanations have been put forward to account for this relationship. First, poor workers potentially suffer more from competition on the job market with low skilled immigrants (or so they perceive) and live in the same urban neighborhoods. Second, poor individuals have lower education; higher levels of education tend to diminish negative stereotypes about foreigners or immigrants. As far as

**Average economic and immigration
views by income groups**

House hold income group
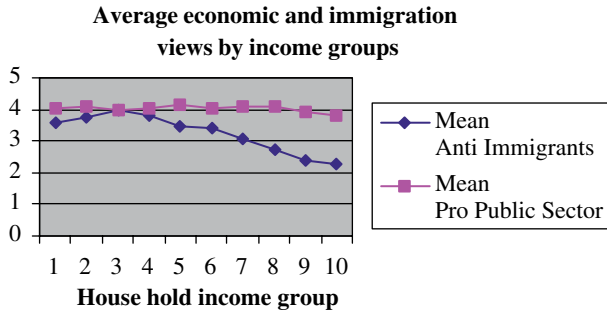
Fig. 13. Average economic and immigration views by income groups,
figure 232002

the income variable is concerned, note there is only a small negative
correlation between income and economic views: richer individuals tend
to be less favorable to a large public sector, but the relation is weak.
Views on the size of the public sector depend much more on values and
opinions about justice than on economic variables.

To check whether the negative correlation between anti-immigrant
feeling and support for public sector still obtains when we control for
demographic variables, we run multivariate regression analysis. See
Table 7, columns 1 and 3.

In columns 1 and 3, the *AntiImmigration* variable is significant and
attracts the expected negative sign. The coefficient is much larger (in
absolute value) in 2002 than in 1988. Young, female respondents tend to
support a larger public sector. Note that, somewhat surprisingly, in 2002,
opinions about the size of the public sector do not depend on income,
once all other variables are taken into account.

So far, we have only controlled for demographic variables such as
gender and age. But subjective opinions might also be important in
determining economic views, in particular opinions that people are lazy
and do not try hard enough, or that financial incentives are important. In
columns 2 and 4 of Table 7, we also control for these opinions. Unsur-
prisingly, respondents who think that people are lazy and that monetary
incentives are important tend to favor lower tax rates.

There is no clear-cut decision as to the exact set of the variables that
should appear on the right-hand side of the regression. Should we add the
variable measuring views on "people are lazy/people on welfare do not
try hard enough", which is highly correlated with anti-immigrant views?

The answer depends on how we interpret the correlation between
AntiImmigration and this variable. If we believe that hostility towards
immigrants and a negative opinion of those who live on welfare are both
determined by the same psychological or social traits (e.g., some intrinsic
general distrust), then the variable should be added. On the other hand, it
might be argued that people who have a rather low opinion of those who
live on welfare do so precisely because ethnic minorities are over-
represented among the unemployed and the poor. In that case, including
this variable on the right-hand side of the equation is likely to induce
some under-estimation of the direct influence of *AntiImmigration* on
support for a larger public sector. The question does not have a clear
answer.

The figures in Table 7 suggest that an increase of 1 point (on the 0 to 6
scale) in the level of xenophobia reduces the *ProPublicSector* by a
constant between 0.03 and 0.08 in 1988 and by a constant between 0.10
and 0.15 in 2002. We use this estimator to construct what we will define
as "racism-free demands for public sector". We next describe our pro-
cedure.

(1) We select a critical level of *AntiImmigration* ρ_{ref} that will be con-
    sidered as the non-xenophobic threshold.
(2) For all individuals with *AntiImmigration* less than or equal to this
    critical level ρ_{ref}, we assume that there is no ASE at play, and con-
    sider that their observed preferences for the public sector are also the
    ASE-free economic preferences.
(3) For all individuals with *AntiImmigration* greater than this critical
    level ρ_{ref}, we assume that there is some ASE at play, and define
    their ASE-free economic preferences as those that they would
    have, were their *AntiImmigration* preferences the critical value
    specified.

More specifically, consider an individual with observed ideal policy π_i
and ρ_i. We define his racism-free demand for public sector by:

$$\pi_i \quad \text{if } \rho_i \leq \rho_{ref},$$

$$\pi_i + \delta(\rho_i - \rho_{ref}) \quad \text{if } \rho_i \geq \rho_{ref},$$

Table 7. Dependent variable: *ProPublicSector*, OLS estimation

	1988		2002			
	(1)	(2)	(3)	(4)	(5)	(6)
Anti Immigrants	-0.032**	-0.079***	-0.034***	-0.138***	-0.151***	-0.103***
	(0.013)	(0.014)	(0.014)	(0.009)	(0.010)	(0.012)
Household income		-0.142***	-0.123***		-0.010	-0.010
		(0.016)	(0.016)		(0.009)	(0.009)
Female		+0.112**	+0.101**		+0.060*	+0.051
		(0.049)	(0.049)		(0.033)	(0.035)
Education		-0.060***	-0.057***		-0.019***	-0.017**
		(0.011)	(0.011)		(0.007)	(0.008)
Age		-0.005***	-0.004***		-0.010*	-0.013**
		(0.0015)	(0.001)		(0.006)	(0.006)
Age squared					+0.00010*	+0.00013**
					(0.00006)	(0.00006)
French people are lazy (1988) / People on welfare do not try to work (2002)			-0.273***		-0.259***	
			(0.025)		(0.038)	
Money incentives are important to make people work (1988) / Financial helps should be withdrawn from families where children are delinquent (2002)			-.137***			-0.0891***
			(0.023)			(0.018)
Constant	3.970***	5.150***	5.941***	4.514***	4.839***	4.763***
	(0.049)	(0.151)	(0.161)	(0.034)	(0.146)	(0.156)
Obs.	2971	2715	2569	3475	3475	3182
R-squared	0.0022	0.0661	0.1271	0.0621	0.0674	0.0889

Table 8. Parameters of the distributions of counterfactual xenophobia-free economic preferences, based on multivariate regression analysis

	1988		2002	
	Mean	Std. Dev.	Mean	Std. Dev.
Option 1, $\delta = 0.03$ in 1988 /$\delta = 0.10$ in 2002	3.91	1.30	4.22	1.00
Option 1, $\delta = 0.08$ in 1988 /$\delta = 0.15$ in 2002	3.99	1.31	4.30	0.99
Option 2, $\delta = 0.03$ in 1988 /$\delta = 0.10$ in 2002	3.93	1.30	4.25	0.99
Option 2, $\delta = 0.08$ in 1988 /$\delta = 0.15$ in 2002	4.06	1.30	4.42	0.98
Observed preferences	3.86	1.31	4.06	1.01

where δ is the decrease in the support for public sector generated by an increase of one point on the xenophobia scale.

We will consider two different values for ρ_{ref} : $\rho_{ref} = 1$ (option 1), $\rho_{ref} = 2$ (option 2). For each option we present the estimate for two values of δ.

Table 8 presents the mean and standard deviation of the racism-free economic preferences for the two options defined above, and the two years under study. The last line also presents the figures for observed preferences.

As observed earlier, the ASE effect is much stronger in 2002 than in 1988. Note that the values obtained are similar to those obtained with the simpler analysis summarized in Table 6.

The conclusion of this section is that a reasonable set of distributions of the "racism-free demand for the size of the public sector" for both years are normal distributions with characteristics presented in Table 9.[5]

5 Political Equilibrium: Observation and Prediction

We computed PUNEs for both 1988 and 2002 for many values of γ. We report the results for $\gamma = 0.35$ in 1988, and $\gamma = 0.40$ in 2002: these values gave us a very good fit of the model to the data. We chose the distribution of types (π, ρ) to be a bivariate normal distribution whose parameters are given in Sect. 4. Almost the entire support (.998) of the distribution lies in

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5 We chose the standard deviations in Table 9 to be slightly smaller than observed values because we are suppressing some heterogeneity in immigration views by combining the three lowest categories.

Table 9. Parameters of the distributions of counterfactual xenophobia-free economic preferences

| ProPubSector	1988		2002	
	Mean	Std. Dev.	Mean	Std. Dev.
Observed	3.86	1.31	4.06	1.01
Counterfactual	3.90	1.25	4.15	0.90
	4.00	1.25	4.30	0.90
	4.10	1.25	4.45	0.90
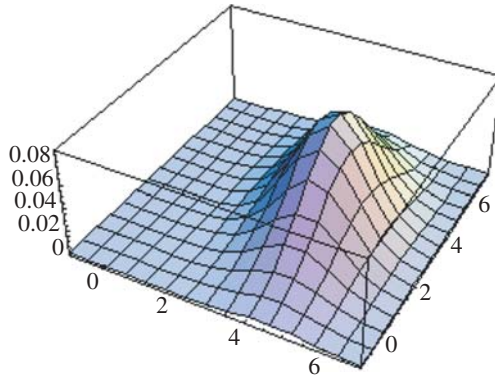
Fig. 14. Bivariate-normal density of voter types, 2002,
on the square $[-1,7] \times [-1,7]$

the square $[-2, 10] \times [-2, 10]$. Figure 14 plots the density function for 2002. (The horizontal axis in the figure is π.)

We describe the computation of equilibrium PUNEs. We set the ER policy at the average value, for each dimension, of voters who identified with the ER party. For each value of γ, we computed many (approximately twenty) PUNEs.[6] Recall that to compute a PUNE, we must solve four simultaneous equations in six unknowns, such that two of the unknowns, the Lagrangian multipliers, are nonnegative. We indeed find many PUNEs, as predicted by the theory.

In Figs. 15 and 16, we graph these PUNEs for 1988 and 2002. The space of the figure is (t,r); consult the legend of Fig. 15. Recall, we fix

6 We do not compute more PUNEs because even this computation requires about twelve hours of computer time, for each value of γ. And we tried many more variations of the model than we report here.
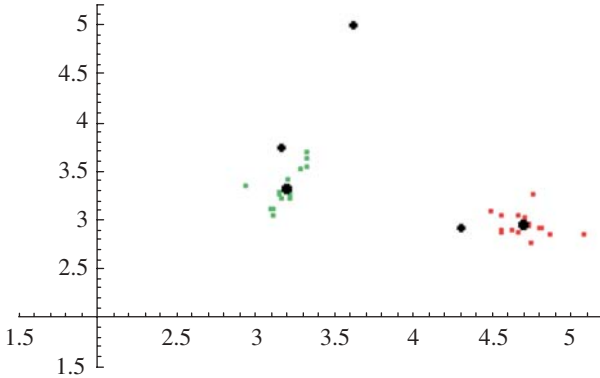
Fig. 15. 1988 PUNEs. The green dots are Right, the red dots are Left, the three small black dots are the average policies of the observed party constituencies, and the two larger black dots are the weighted average values of the PUNEs of Right and Left
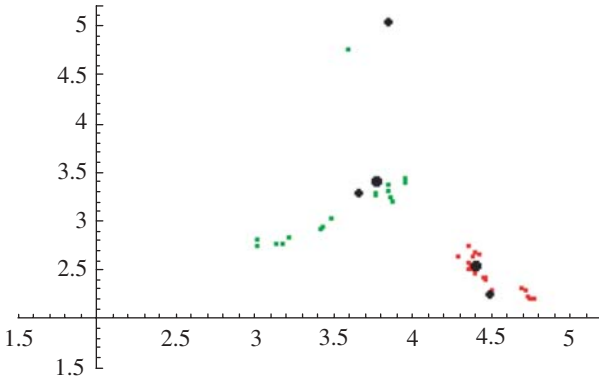
Fig. 16. 2002 PUNEs. See the legend of Fig. 15 for interpretation

the ER PUNE policy at its observed value. Note that the figures display the *weighted average PUNE* for each of Right and Left, as well as the average ideal policy of the constituencies of the three parties. (We describe the weights below.)

We note that the weighted average PUNEs of the *L* and *R* parties are quite close in the policy space to the observed ideal policies of the constituencies of those parties. This suggests that the model is fitting the data well. If the Militants had all the bargaining power in their

expected parties, then we would predict that the L and R parties propose in equilibrium exactly the average ideal policies of their constituencies.

Nevertheless, the fits are imperfect. In 1988, note that in PUNEs, Left is more extreme on the public-sector policy than its membership. On the immigration issue, the Left in the average PUNE has the same policy as its membership. Right is less extreme on the immigration issue than its membership (which could be accounted for by Opportunists in Right trying to take votes away from Left); it plays the same policy on the economic issue as its membership's.

In 2002, the observed average policy positions of the L and R memberships are so close to the weighted average PUNE values that we hesitate to attribute any significance to the differences. The parties seem to be very close to their members' views in this year.

We remind the reader that our utility function has only one degree of freedom, γ; thus, it seems quite remarkable that the model appears to fit the data as well as Figs. 15 and 16 show.

The set of PUNEs computed for these values of γ are presented in Tables 10 and 11. The second and third columns, labeled "α" and "β", present the relative bargaining power of the Militants at the PUNE, in the L and R parties, respectively, as computed from equations (2.7) and (2.8). A relative bargaining power of 0.5 means the factions are equally strong in the bargaining game. When the relative bargaining power is greater (less) than 0.5, then the Militants (Opportunists) are more powerful in the party in question.

The observed vote shares in the 1988 election were (0.49, 0.365, 0.144) respectively for $L,R,$ and $ER.$ The average shares of the parties in the PUNEs in the above table are (0.39, 0.35, 0.26). Thus, we predict that the Left should receive fewer votes, and the Extreme Right more votes, than they did in reality.

In 2002, the observed vote shares were for L, R, and ER were (0.429, 0.379, 0.192). Compared with 1998, the Left lost substantially and the Extreme Right gained substantially. The average shares in the PUNEs reported in Table 11 for L, R, and ER are (0.42, 0.27, 0.31). This time, we correctly predict Left's share, but we predict that ER should have more, and R fewer votes than they did in reality. The common factor of these two election years is that we predict the ER should have had a larger vote share than it did, and the two major parties in total should have a smaller vote share.

Table 10. PUNEs computed for 1988

γ	α	β	t^L	t^R	t^{ER}	r^L	r^R	r^{ER}	φ^L	φ^R	φ^{ER}
0.35	0.626846	0.387777	4.79084	3.15463	3.62	2.91875	3.28249	4.99	0.37652	0.358075	0.265405
0.35	0.371024	0.254882	4.48383	3.22086	3.62	3.0907	3.21553	4.99	0.399552	0.338762	0.261686
0.35	0.462882	0.314609	4.54797	3.32994	3.62	2.88078	3.6334	4.99	0.406229	0.34345	0.250321
0.35	0.495333	0.13208	4.61195	3.28994	3.62	2.90314	3.52743	4.99	0.396421	0.349836	0.253744
0.35	0.577923	0.394746	4.72764	3.16847	3.62	2.97413	3.22861	4.99	0.380607	0.35374	0.265653
0.35	0.554547	0.263442	4.69514	3.20867	3.62	2.91469	3.41683	4.99	0.388134	0.354522	0.257344
0.35	0.316010	0.731904	4.00449	3.00601	3.62	2.67900	3.7995	4.99	0.400000	0.240015	0.310600
0.35	0.681671	0.38232	4.85378	3.2085	3.62	2.85134	3.34515	4.99	0.366993	0.366802	0.266205
0.35	0.652836	0.622694	4.74963	2.93558	3.62	3.27459	3.35596	4.99	0.40628	0.352203	0.241517
0.35	0.529179	0.162548	4.65119	3.28817	3.62	2.88577	3.53458	4.99	0.392618	0.353702	0.25368
0.35	0.451543	0.638124	4.5537	3.32204	3.62	2.90356	3.55191	4.99	0.401345	0.344381	0.254274
0.35	0.639991	0.398798	4.80648	3.14636	3.62	2.91288	3.27565	4.99	0.37516	0.358619	0.266221
0.35	0.624887	0.127152	4.7356	3.32733	3.62	2.77768	3.68933	4.99	0.387395	0.362839	0.249765
0.35	0.42736	0.259017	4.55347	3.21439	3.62	3.04315	3.2742	4.99	0.396726	0.343428	0.259846
0.35	0.857579	0.603632	5.073	3.11373	3.62	2.8647	3.04136	4.99	0.340254	0.370726	0.28902
0.35	0.552794	0.443253	4.69564	3.10865	3.62	3.02188	3.1251	4.99	0.385243	0.346722	0.268034
0.35	0.507579	0.427087	4.65179	3.09531	3.62	3.04635	3.11021	4.99	0.390095	0.343031	0.266874
0.35	0.40574	0.289254	4.04959	3.94274	3.62	2.5202	3.51336	4.99	0.369129	0.284688	0.346183
0.35	0.571692	0.324584	4.72248	3.19126	3.62	2.93525	3.33452	4.99	0.383193	0.355509	0.261299
0.35	0.806905	0.268395	4.97488	3.32449	3.62	2.70871	3.60777	4.99	0.354579	0.38634	0.259081

Table 11. PUNEs computed for 2002

γ	α	β	t^L	t^R	t^{ER}	r^L	r^R	r^{ER}	φ^L	φ^R	φ^{ER}
0.4	0.679803	0.65597	4.74075	3.42673	3.84	2.21941	2.95304	5.04	0.370829	0.289801	0.33937
0.4	0.283534	0.0764118	4.37288	3.85196	3.84	2.50409	3.24671	5.04	0.405383	0.268469	0.326148
0.4	0.345788	0.633118	4.3749	3.21688	3.84	2.64825	2.8353	5.04	0.43918	0.232558	0.328262
0.4	0.704447	0.892428	4.70381	3.17947	3.84	2.30018	2.7821	5.04	0.394564	0.257269	0.348167
0.4	0.548245	0.000891854	4.27677	3.59661	3.84	2.65213	4.7433	5.04	0.562005	0.238308	0.199686
0.4	0.678406	0.912822	4.67544	3.13383	3.84	2.32696	2.77771	5.04	0.402875	0.249547	0.347578
0.4	0.362391	0.152243	4.44802	3.75736	3.84	2.42069	3.25981	5.04	0.400812	0.278084	0.321105
0.4	0.375953	0.141278	4.4505	3.84514	3.84	2.40169	3.36443	5.04	0.40084	0.282705	0.316456
0.4	0.700826	0.676349	4.75946	2.42004	3.84	2.20439	2.93263	5.04	0.367829	0.290817	0.341354
0.4	0.316936	0.0936083	4.39559	3.84471	3.84	2.48107	3.31508	5.04	0.407281	0.272604	0.320115
0.4	0.399608	0.866907	4.34291	3.01149	3.84	2.7413	2.82303	5.04	0.46428	0.213092	0.322628
0.4	0.277229	0.0838577	4.34981	3.95084	3.84	2.56771	3.40132	5.04	0.417505	0.264603	0.317892
0.4	0.418626	0.886693	4.40941	3.02194	3.84	2.65717	2.75062	5.04	0.451834	0.271391	0.330775
0.4	0.427318	0.887986	4.38973	3.02018	3.84	2.68338	2.76027	5.04	0.455086	0.216013	0.328901
0.4	0.292731	0.8979	4.36396	3.95251	3.84	2.54918	3.41617	5.04	0.415957	0.267488	0.316555
0.4	0.435106	0.188009	4.49715	3.94635	3.84	2.29341	3.44459	5.04	0.386729	0.299435	0.313836
0.4	0.261411	0.0623887	4.35563	3.86613	3.84	2.52177	3.21243	5.04	0.404499	0.265784	0.329717
0.4	0.646508	0.581963	4.71846	3.48323	3.84	2.22346	3.02089	5.04	0.371642	0.294191	0.334167
0.4	0.369003	0.1612	4.45282	3.7645	3.84	2.41829	3.2085	5.04	0.401303	0.278951	0.319746
0.4	0.0728585	0.664841	4.24668	3.05439	3.84	2.46226	2.46732	5.04	0.444384	0.192958	0.362658

We now describe how we computed the average PUNE policies of the parties L and R from the computed part of the PUNE manifold. We did not simply average the observed PUNEs. Rather, we view the PUNE manifold as being parameterized by the ordered pairs (α, β), that is, the relative bargaining powers of the Militants in L and R at the PUNE. This parameterization corresponds to our view that the *missing data,* which, if we knew it, would fix a particular PUNE, are these relative bargaining powers.

Thus, our first step was to estimate a density function of the two relative bargaining powers from the computed bargaining powers that we found. We used kernel density estimation. Figure 17 shows the kernel density function derived from the observed bargaining powers of the Militants in Left in the 1988 PUNEs, and Fig. 18 shows the analogous kernel density for Right. The modes of these density functions are 0.56 and 0.34 for Left and Right, respectively, indicating that the Militants are "usually" more powerful in Left than in Right. (We do not know whether this corresponds to real perceptions.) We next weighted each PUNE tax rate (for Left and Right) by a factor proportional to the estimated frequency of that PUNE, as measured by the kernel density of its bargaining power. It is the weighted average of the tax rates, so computed, that determines what we call the *weighted average PUNE,* and the corresponding large black points, plotted in Figs. 15 and 16. The average vote shares for the three parties are also computed using this weighting technique.
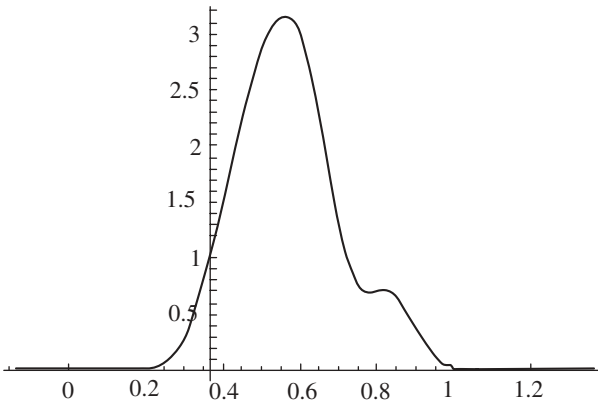
Fig. 17. Kernel density function of the value α for Left in 1988 PUNEs
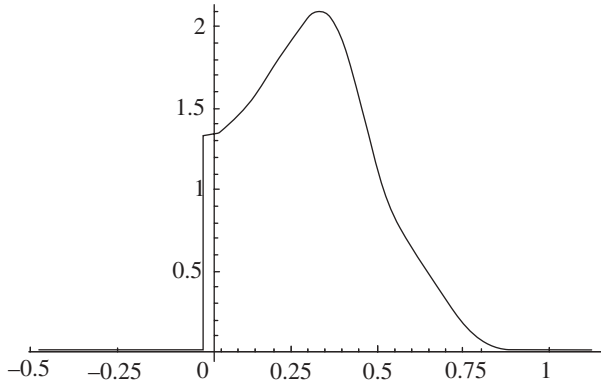
Fig. 18. Kernel density function of the value β for Right in 1988 PUNEs

We present these weighted average policies in Table 12.

We next display the predicted partition of the space of voter types into the three party memberships at the average of the PUNEs in Tables 10 and 11. Note from Eqs. (2.3) and (2.4) that the set of types that prefer one policy to another is the set of types below or above a piece-wise linear graph in (π, ρ) space. In Figs. 19 and 20, we present the partition of voter types into the three party memberships for the average of the PUNEs of Tables 10 and 11. The figures present three regions drawn over a density plot of the distribution of voter types: in the density plot, light color means high density. The space is (π, ρ). All types to the right of the light (green) line comprise Left; all types to the Left of the green line comprise Right; all types in the upper region of the figures comprise Extreme Right.

We remark upon these two figures. In 1988, for voters whose value of ρ is less than 3.5, we observe *class politics*: these voters choose between the L and R parties, and their choice is determined very sharply by their position on the size of the public sector (those for whom $\pi < 4$ choose Right and those for whom $\pi > 4$ choose Left. On the other hand, those

Table 12. Weighted average policies of L and R, and observed average policies of ER, 1988 and 2002

(t,r)	1988	2002
L	(4.69, 2.95)	(4.40, 2.53)
R	(3.20, 3.32)	(3.78, 3.39)
ER	(3.62, 4.99)	(3.84, 5.04)
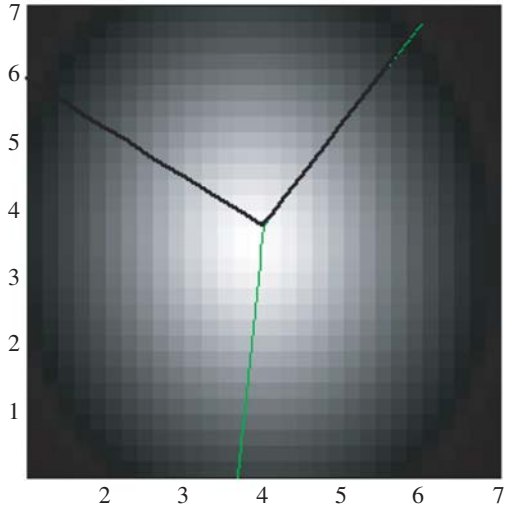
Fig. 19. Partition of the type space into party memberships, average PUNE, 1988. The three regions, reading from the left and proceeding counter-clockwise, are Right, Left, and Extreme Right
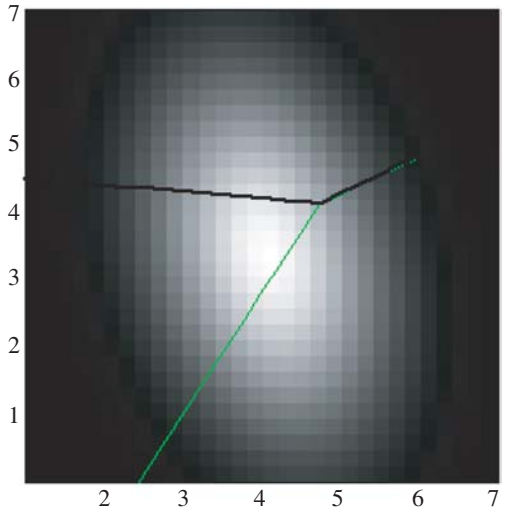
Fig. 20. Party partition, 2002 PUNEs. See legend of Fig. 19

who are xenophobic ($\rho > 3.5$) choose either between Right and Extreme Right or between Left and Extreme Right, depending on their view on the economic issue. Interestingly, the most xenophobically moderate voters who belong to Extreme Right are those whose positions on the size of the public sector are *moderate*: this is because Le Pen proposes a moderate position on the size of the public sector. Thus, as a voter's position becomes more extreme on public-sector size (either more Right or more Left) he or she has to have more incentive to vote for *ER*. That incentive must be an increasingly radical xenophobic position.

In 2002, however, we observe a quite different equilibrium structure of party constituencies. First we no longer have such clear class politics for those who are moderate on the immigration issue. For voters for whom $2.5 < \pi < 5$, we must know both their position on immigration and on the public sector to predict whether they identify with Left or Right, where the Right attracts the more xenophobic voters. (That is, the green line has a significantly positive slope in Fig. 20.) Second, we observe *immigration politics* in the sense that whether a voter chooses *ER*, on the one hand, or one of the moderate parties, on the other, is quite precisely predicted by his view on immigration: if and only if $\rho > 4$, the voter chooses Extreme Right.

Thus, the important change that we observe, between 1988 and 2002, is the increasing salience of the non-economic issue in French politics, and in particular of the immigration issue. Our model probably captures a broader change to a concern with non-economic issues such as security or law-and-order, as well as immigration. Indeed, voters' views on the immigration issue and on the law-and-order issue are strongly correlated. Recall from the introduction that the law-and-order and immigration issues became prominent in the 2002 election campaign; compare the ranking of the "security" and "immigration" issues in Table 2 (for 1995) and Table 3 (for 2002).

Next, we decompose the vote share going to the three parties, as a function of the voters' view on the economic question, from the observed data, and from the model. In 1988, Fig. 21 decomposes the share of the vote going to *L*, *R*, and *ER* for five values of the public-sector question: $\pi \in \{0, 1, 2\}, \pi = 3, \pi = 4, \pi = 5,$ and $\pi = 6$. Table 13 shows the predicted vote shares computed from the average PUNE according to the same partition of public-sector views.

The predicted and observed shares show a decrease in the *R* share and increase in the *L* share as π increases, although predicted changes are more extreme than they are in the data. The predicted table also shows a
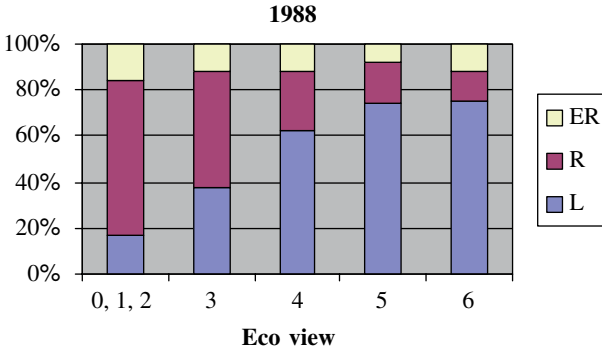
Fig. 21. Distribution of vote share according to public-sector view, observed

Table 13. Distribution of vote share according to public-sector view, predicted from PUNE, 1998

Ideal t	Left	Right	Extreme Right
0+1+2	−0.00130378	0.811742	0.189562
3	−0.00141619	0.682287	0.319129
4	0.392168	0.219349	0.388483
5	0.819256	0.	0.180744
6	0.955244	0.	0.0447565

decrease in the share of the *ER* as π increases, something which is not perfectly true in the observed data.

Figure 22 and Table 14 present the same information for 2002.

In 2002, we predict an increase in the Left vote and a decrease in the Right and Extreme Right vote as π increases, patterns which also appear in the observed data.

Overall, we believe the model performs well, especially given the fact that there is only one parameter, γ, which we can choose to achieve a good fit. The main error the model makes is its prediction of too large a vote share for the *ER* party. This, however, is not surprising, for two reasons. First, many voters are strategic[7], and hence voters who actually prefer the policy of *ER* may vote for either *R* or *L* so that their vote will count (in the sense that *ER* will surely be the third party). Second, many

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7 Our PUNE analysis assumes voters are sincere. We chose not to try to model strategic voting at this stage of the work.
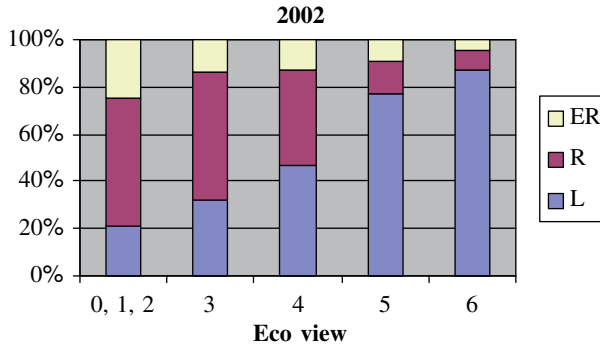
Fig. 22. Party vote shares by economic view, observed

Table 14. Party vote shares by economic view, predicted from PUNE, 2002

Ideal t	Left	Right	Ext Right
0+1+2	0.00468154	0.522186	0.473133
3	0.0796293	0.527036	0.393335
4	0.381704	0.293586	0.32471
5	0.749344	0.0138493	0.236806
6	0.889189	0.	0.110811

voters follow family tradition in their party identification, and the Le Pen party is a relatively new phenomenon. On this count, our predicted vote shares may be closer to what vote shares will be as time passes, and family traditions change.

It should also be pointed out that our choice of a two-dimensional space of types, H, is a limitation. Ideally, we would like to differentiate voters as well according to the salience they assign to the immigration issue; this would require a three-dimensional type space, where a voter's type would be (π, ρ, γ). While the theory of PUNEs on such a type space is no more complicated than on the two-dimensional type space, the computational problems become forbidding, because the equation-solving required for computing PUNEs would involve computing three-dimensional numerical integrals, instead of two-dimensional integrals. Given the existing *Mathematica* software, this is, for all practical purposes, infeasible. We estimate that computing solutions with this specification would increase our computation time by an order of magnitude. As well, we would need reliable data to estimate voters' saliences, which we do not possess.

6 The Policy Bundle and Anti-solidarity Effects: Computation

As we described earlier, to compute the ASE and PBE, we perform two counterfactual computations.

In the first counterfactual, we compute PUNEs for a model with *two parties,* in which the policy space is uni-dimensional , as described in Sect. 3. We restrict to PUNEs for which the ordered pair of bargaining powers of the opportunists in the two parties lies within a circle of radius 0.05 about the ordered pair of bargaining powers of the PUNEs, on average, of the full model. We then take as the summary statistic the average of weighted tax policies found in these PUNEs. Denote this value $t_I^{\exp}$.

For the *second counterfactual,* which computes the anti-solidarity effect, we changed the distribution of voter types to the estimated racism-free distribution, *G,* described in Sect. 4. In 1988, we took the racism-free distribution to be a normal distribution on π with standard deviation 1.25 and mean in the set $\mu^* \in \{3.90, 4.0, 4.10\}$. In 2002, we took the standard deviation to be 0.90, and the mean to lie in the set $\mu^* \in \{4.15, 4.30, 4.45\}$. Thus, we ran three versions of the second counterfactual for each year. For each counterfactual, we again restrict to PUNEs for which the ordered pair of bargaining powers of the Opportunists in the two parties lies within a circle of radius 0.05 about the ordered pair of bargaining powers of the PUNEs, on average, of the full model and we again take the summary statistic for expected policy on the size of the public sector as the appropriate weighted average over all PUNEs found. Denote this value by $t_{II}^{\exp}(\mu^*)$.

In the unidimensional models, it remains the case that there is a two-manifold of PUNEs. The policy equilibria live, now, in a two-dimensional space (one dimension for each party), and so the PUNEs pave a region in the plane. We computed approximately 200 PUNEs for each version of the counterfactual models.

We now define the PBE and the ASE:

$$PBE = t_I^{\exp} - t^{\exp},$$
$$ASE(\mu^*) = t_{II}^{\exp}(\mu^*) - t_I^{\exp}.$$

Clearly the total effect of xenophobia on the size of the public sector is:

$$TOT(\mu^*) = PBE + ASE(\mu^*) = t_{II}^{\exp}(\mu^*) - t^{\exp}.$$

Table 15a. Policies and bargaining powers in the full model and counterfactuals, 1988

	Full	Counter 1	Counter 2i	Counter 2ii	Counter 2iii
BPL	0.538	0.539178	0.535575	0.527455	0.562463
BPR	0.278	0.295237	0.308694	0.307125	0.303448
tL	4.626	4.91747	4.87538	4.96183	5.1376
tR	3.326	3.82404	3.2087	3.91661	4.06393
RL	2.896	NA	NA	NA	NA
RR	3.417	NA	NA	NA	NA
tAVE	3.9054	4.20471	4.20059	4.29563	4.43359
φL	0.38618	0.348334	0.360044	0.362708	0.344431

Table 15b. The policy bundle and anti-solidarity effects, 1988

Party	PBE	ASE i	ASE ii	$\frac{TOT\ i}{s.d.}$	$\frac{TOT\ ii}{s.d.}$
Left	.291	−.042	.044	19.0%	25.6%
Right	.498	−.0032	.093	37.8%	45.1%
Average	.299	−.004	.091	22.5%	29.8%

We also report the PBE and ASE for each party.

Tables 15a, b and 16a, b report the results. The "a"-tables report average PUNEs and bargaining powers for the three models (full and two counterfactuals), and the "b"-tables report the PBE and ASE.

As we said, one appropriate way to measure the size of these effects is in comparison to the standard deviation of the distribution of ideal public–sector values, which is 1.31 in 1988 and 1.01 in 2002. By definition,

Table 16a. Policies and bargaining powers in the full model and counterfactuals, 2002

	Full	Copunter 1	Counter 2i	Counter 2ii	Counter 2iii
BPL	0.431	0.418765	0.432912	0.429829	0.425752
BPR	0.455	0.465856	0.454574	0.437726	0.446092
tL	4.396	4.4348	4.66542	4.82857	4.95977
tR	3.776	3.54138	3.55682	3.74001	3.86676
RL	2.533	NA	NA	NA	NA
RR	3.395	NA	NA	NA	NA
tAVE	4.05738	4.0132	4.12522	4.28952	4.42651
φL	0.421869	0.528327	0.512391	0.505015	0.511694

Table 16b. The policy bundle and anti-solidarity effects, 2002

Party	PBE	ASE i	ASE ii	$\frac{TOT\,i}{(s.d.)}$	$\frac{TOT\,ii}{(s.d.)}$
Left	.039	.231	.394	26.7%	27.5%
Right	−.235	.015	.199	−21.7%	−3.6%
Average	−.044	.112	.276	6.7%	23.0%

the PBE is invariant with respect to changes in μ^*. In 1988, it appears to be large, about one-fourth of the above standard deviation for the average policy. The ASE is insignificant in 1988. In 2002, however, the PBE is insignificant, but the ASE is strongly positive. Evidently, the anti-solidarity effect has increased substantially in this period and the policy bundle effect has decreased significantly.

We believe these results are intuitively sensible. In 1988, redistribution was viewed by most French citizens as helping the poor, who were not perceived as being very different from the rest of the population: hence, the small anti-solidarity effect. By 2002, however, many viewed the poor as primarily immigrant, and the anti-solidarity effect is significant. In 2001, 73 percent of survey respondents thought that the majority of immigrants came to France to take advantage of the country's social benefits. Le Pen's accusation that immigrants deliberately abused France's welfare state had thus started to stick and his party's "national preference" proposals to exclude immigrants from most public services has most likely contributed to the increasing anti-solidarity effect.

7 Conclusion

Our model of party unanimity Nash equilibrium (PUNE) conceptualizes party competition in a fashion that produces political equilibria when the policy space is multi-dimensional, and, moreover, predicts that parties propose different policies in equilibrium. By virtue of these features, it is superior to the Downsian model of purely opportunist politics, in which equilibria rarely exist if the policy space is multi-dimensional, and to other models of political equilibrium with multi-dimensional policy spaces (e.g., the models of Coughlinn, 1992, and Lindbeck and Weibull, 1987), which predict that parties propose the same policy in equilibrium. The PUNE model conceptualizes the

decision makers in parties as having varied interests, concerning winning versus representation, and that the factions organizing these disparate interests bargain with each other when facing the opposition parties' platforms.

Like all equilibrium models, ours is best viewed as one that describes a political system in which preferences of voters are stable. In periods when voter preferences are in flux, we cannot expect the PUNE model to give perfect predictions. With stable constituencies, party entrepreneurs will come to know their constituencies' interests well, and we can expect that those entrepreneurs who wish to represent constituents will do so with more precision than when voter preferences are unstable and constituencies are shifting. The evolutionary mechanism by which this occurs may well be that those Militants who rise within the party structure *are* ones who best represent the constituents' interests. Once ensconced, however, a particular Militant will have a career within the party that may last for years or decades. Thus, in periods of voter-preference flux, the established Militants in a party may cease to represent its evolving constituency.

We believe this may be the case in France, and so our calculations concerning the effect of voter xenophobia on the size of the public sector are ones we would expect to hold in the future, if voter preferences remain as they are now, and parties adjust to them over time. We note that, nevertheless, the PUNEs calculated are on average quite close, for each party grouping Left and Right, to the average policies of voters who identify with these groups. What is not so well replicated by the model are the vote shares accruing to the three party groupings: we predict that the Extreme Right should receive more votes, based upon reported voter types. We conjecture that this discrepancy is due to strategic voting and to traditional family identification with the two well-established "parties" of Left and Right.

Our *policy space* is only two dimensional. In actual politics, the policy space has many more dimensions. In particular, it is possible, in reality, to differentiate public-sector policy towards immigrants from policy towards natives: for example, immigrants may receive less favorable treatment with regard to transfer payments than natives, a policy advocated by Le Pen. To represent this possibility in our model would require a third policy dimension. With such a third dimension, both the anti-solidarity and policy-bundle effects should decrease, because presumably parties could then propose to retain high

public-sector benefits for natives, while reducing them for immigrants.[8]
We cannot, therefore, predict that the *total* size of the welfare state will
radically fall in France.[9]

Indeed, this point illustrates the necessity for political economists to
model political competition as occurring over multi-dimensional policy
spaces. Our work begins this task, although, as we have just noted, it
still falls short of what is desirable. The binding constraints, at this
point, are the difficulty of computing equilibria in real time, when the
dimension of the type space and/or policy space is larger than two, and
the availability of data sets that measure voter opinion in a sufficiently
refined way.

Given these limitations, our main conclusions are tentative. They are
that:

– the immigration issue influences equilibrium on the economic issue
  (public sector size) in a significant way;
– French politics have manifested a significant increase of the salience of
  non-economic issues – and of the immigration issue in particular – in
  the period 1988–2002;
– due to Le Pen's moderate position on the economic issue, there is at
  present an insignificant policy bundle effect in France;
– while the anti-solidarity effect reduced the equilibrium "expected tax
  rate" (that is, public sector size) by a small amount in 1988 (be-
  tween 0% and 5% of one standard deviation of the distribution of
  voter views on public sector size), by 2002, it reduced the equi-
  librium size of the public sector by between 11% and 27% of one

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8 We commented earlier on the computational and data problems associated
with increasing the dimension of the *type* space. Both kinds of problem also exist
with respect to increasing the dimension of the *policy* space. Moving from our
present 2×2 model to a 3×3 would require both better opinion data than we
have, and faster computers.

9 We contrast this with the United States, where voter racism is directed
primarily towards African-Americans, who, as citizens, cannot be legally
discriminated against, as can aliens. Thus, we would expect the size of the
welfare state to be more affected by voter racism in the US than by voter
xenophobia in France. See Lee and Roemer (2005, in press) for further
analysis.

standard deviation on the distribution of public-sector size ideal points;

– however, these effects will be reduced by the possibility of differentiating benefits provided by the state to immigrants and to citizens.

Table A.1. Results of the 1988 presidential election

	First round April, 24th 1988		Second round, May, 8th 1988	
Number of registered voters	38,179,118		38,168,869	
Total number of ballots	31,059,300		32,085,071	
Number of valid ballots	30,436,744		30,923,249	
Abstention (in percentage)	18.6%		15.9%	

	First round		Second round		Coalition
	# voters	% of total	#voters	% of total	
F. Mitterand (Parti Socialiste)	10,381,332	34.1	16,704,279	54.0	L
J. Chirac (Rassemblement Pour la République)	6,075,160	20.0	14,218,970	46.0	R
R. Barre (Union pour la Démocratie Française)	5,035,144	16.5			R
J.-M. Le Pen (Front National)	4,376,742	14.4			ER
A. Lajoinie (Parti Communiste)	2,056,261	6.7			L
A. Waechter (Verts)	1,149,897	3.8			L
P. Juquin (Parti Communiste Diss.)	639,133	2.1			L
A. Laguiller (Lutte Ouvrière)	606,201	2.0			L
P. Boussel Parti des Travailleurs)	116,874	0.4			L

Table A.2. Results of the 1995 presidential election

	First round, April, 23th 1995	Second round, May, 7th 1995
Number of registered voters	39,993,954	39,976,944
Total number of ballots	31,346,960	31,845,819
Number of valid ballots	30,464,552	29,943,671
Abstention (in percentage)	21.62	20.34

	First round		Second round		Coalition
	No. voters	% of total	No. voters	% of total	
L. Jospin (Parti Socialiste)	7,098,191	23.30	14,180,644	47.4	L
J. Chirac (Rassemblement Pour la République)	6,348,696	20.84	15,763,027	52.6	R
E. Balladur (Union pour la Démocratie Française)	5,658,996	18.58			R
J.-M. Le Pen (Front National)	4,571,138	15.00			ER
R. Hue (Parti Communiste)	2,632,936	8.64			L
A. Laguiller (Lutte Ouvrière)	1,615,653	5.30			L
P. de Villiers (Mouvement pour la France)	1,443,235	4.74			R
D. Voynet (Verts)	1,010,738	3.32			L
J. Cheminade (Solidarité et progrès)	84,969	0.28			ER

Table A.3. Results of the 2002 presidential election

	First round, April, 22th 2002	Second round, May, 5th 2002
Number of registered voters	41,194,689	41,191,151
Total number of ballots	29,495,733	32,831,501
Number of valid ballots	28,498,471	31,066,781
Abstention (in percentage)	28.40	20.29

	First round		Second round		Coalition
	No. voters	% of total	No. voters	% of total	
J. Chirac (Rassemblement Pour la République)	5,665,855	19.88	25,540,874	82.21	R
J.-M. Le Pen (Front National)	4,804,713	16.86	5,525,907	17.79	ER
L. Jospin (Parti Socialiste)	4,610,113	16.18			L
F. Bayrou (Union pour la Démocratie Française)	1,949,170	6.84			R
A. Laguiller (Lutte Ouvrière)	1,630,045	5.72			L
J.-P. Chevènement (Mouvement des Citoyens)	1,518,528	5.33			L
N. Mamère (Verts)	1,495,724	5.25			L
O. Besancenot (Ligue Communiste Rév.)	1,210,562	4.25			L
J. Saint-Josse (Chasse Pêche Nature et Tradition)	1,204,689	4.23			R
A. Madelin (Démocratie Libérale)	1,113,484	3.91			R
R. Hue (Parti Communiste)	960,480	3.37			L
B. Mégret (Mouvement National Républicain)	667,026	2.34			ER
C. Taubira (Parti Radical de Gauche)	660,447	2.32			L
C. Lepage (CAP 21)	535,837	1.88			R
C. Boutin (Union pour la Démocratie Française)	339,112	1.19			R
D. Glückstein (Parti des Travailleurs)	132,686	0.47			L

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