Policy Uncertainty, Electoral Securities and Redistribution

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Abstract

The paper investigates how ex-ante uncertainty about a government policy with redistributive consequences will influence the proportion of agents in favor of it, if agents can trade policy contingent securities. If a subset of agents can insure against policy uncertainty, support for redistributive policies is always smaller than in a case where no insurance is available. Both the relation between initial inequality and redistribution and the inequality of the expected income distribution after policy uncertainty is resolved depend on the size of the insurance market. Suggestive evidence for the existence and the effects of a "political insurance market" for the US economy are provided.

1 Introduction

The relation between income distribution and citizens' demand for redistribution has received wide attention in the political economy literature. The seminal paper of Meltzer and Richard (1981) presented a simple though extremely powerful argument: the more left-skewed the distribution of income,

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the higher the political support for redistributive taxation. Unfortunately this argument is not supported by the data. Perotti (1996) finds no cross-country relation between pre-tax income inequality and adoption of redistributive policies. Moreover, as pointed out by Benabou (2000) among others, for advanced countries the relation may run in the opposite direction: more equal societies tend to redistribute more rather than less.

A largely unexplored issue that has only recently attracted some attention in the literature is whether citizens' reaction to policy uncertainty plays any role in understanding the relation between income distribution and the likelihood of adopting redistributive policies. Policy uncertainty may naturally arise because electoral candidates run on different platforms entailing different degrees of redistribution, and election results are uncertain (that is what happened, for example, in the 2000 Presidential election in the US). Furthermore, even if a politician has already won the election running on a given platform, there might still be uncertainty about the likelihood that he will be able to implement his electoral promises (this is the case, for example, with the health care reform that was at the center of Clinton's 1992 Presidential campaign but was defeated in Congress during his presidency). If agents are risk averse and markets can provide some form of insurance against political uncertainty, agents' reaction to uncertainty will be an important component of the equilibrium demand for redistributive policies, and, in turn, it will affect the ultimate success of these policies.

Musto and Yilmaz (forthcoming) derive an interesting result. If political insurance markets are complete, meaning that every agent can trade policy contingent securities, then people can perfectly hedge political uncertainty. Therefore agents will be indifferent between alternative policies and, as a consequence, the distribution of resources in the economy would not affect political support for redistribution. In other words, variation in the demand for redistribution would only be due to differences in ideological preferences. While theoretically elegant, this result raises a conundrum. Is it reasonable to think that the dramatic differences between redistribution levels in the US economy as compared to most Western European countries, or changes through time of US redistributive policies are solely driven by different ideological tastes? Moreover, how does one explain the negative relation between inequality and redistribution observed in the data?

In this paper we show that if participation in a political insurance market is restricted to relatively rich agents, the demand for redistribution is always smaller than in the case where no insurance is available. Both the

relation between initial inequality and redistribution and the inequality of the expected income distribution after policy uncertainty is resolved depend on the size of the insurance market. In an economy with a developed political insurance market, there is less demand for redistribution than in an economy without such a market, and demand for redistribution decreases as income inequality increases. Moreover, the existence of a large political insurance market increases future expected inequality even if a large proportion of agents are actually redistributing resources through private transfers. Therefore our model shows the role citizens' reactions to policy uncertainty plays in the demand for redistributive policies. Our analysis offers new insights on the relation between income distribution and support for redistributive policies and is consistent with the relation between income inequality and redistribution that characterizes advanced economies.

Two natural questions arise. First, do political insurance markets exist? In particular, do existing financial instruments allow agents to insure against policy uncertainty? Second, taking for granted that not all citizens have access to the stock market (e.g., because of credit constraints), is there an empirical relation between level of participation in the market and support for redistributive policies which is consistent with the predictions of the model?

To address the first question, we show that stocks currently traded on the market can actually be used to hedge policy risk. Focusing on the 2000 US Presidential campaign, we construct two "presidential portfolios" composed of selected stocks anticipated to fare differently under a Bush versus a Gore presidency. To construct these portfolios we use data on campaign contributions and select stocks of companies that made significant contributions to candidates' campaigns in the 2000 election cycle and whose contributions were concentrated on one particular candidate. We provide evidence, using daily observations for the five months before the election took place, that the excess returns of these portfolios with respect to overall market movements are related to changes in electoral polls.

To address the second question, we analyze the relation between participation in the stock market and support for redistributive policies both at an aggregate and individual level. First, we show that in a cross section of countries, there is a negative relation between aggregate stock ownership and support for redistribution. Second, focusing on recent US experience, we provide evidence of a relation between the increase in stock market participation over the last decade and the reduction of support for redistribution both in terms of adopted redistributive policies and in terms of electoral support for

the democratic party. Third, using micro data from the National Election Study for the period 2000-2002, we show that stock ownership is negatively related with preferences for redistribution after controlling for income, race, sex, age, and education.

Before turning to the description of the model, we briefly discuss the relation of our work to the existing literature. In addition to the paper of Musto and Yilmaz (forthcoming) we discussed earlier, another strand of literature that is related to our paper is Benabou (2000) and Roemer and Lee (1999). These models give different theoretical explanations for the fact that income inequality and redistribution can be negatively related. Benabou shows that if redistribution is ex-ante welfare improving the support for redistribution is U-shaped in inequality. Roemer and Lee show that public spending is not necessarily increasing in inequality when there are asymmetries across agents in the access to credit markets.

Celentani et al. (2003) analyze risk sharing and endogenous fiscal spending in the presence of complete markets. They show that if markets are sequentially complete, fiscal policy can be used to manipulate future security prices leading to inefficient equilibrium allocations.

From an empirical point of view, Knight (2003) is one of the few papers that investigates the relation between politics and the stock market. Unlike our paper, the focus of Knight's analysis is to test whether policy platforms are capitalized into equity prices, using data from the 2000 US Presidential election. He selects a sample of firms favored under the alternative policy platforms using reports from financial analysts, and shows that campaign platforms matter for firms' profitability.

Using data from 1992 US Presidential election, Ayers et al. (2003) study whether security prices reflect fiscal policy uncertainty. Feenberg and Poterba (1991), Slemrod and Greimel (1998), and Erikson, Goolsbee, and Maydew (2002) analyze the effect of fiscal policy uncertainty in the market for municipal bonds. Herron et al. (1999) study the effect of the 1992 US Presidential election outcome on the profitability of different economic sectors. Finally, Pantzalis et al. (2000) investigate the behavior of stock market indices for a cross section of countries in the period around national elections.

The remainder of the paper is organized as follows. Section 2 presents a simplified version of the model showing the main effect of the political insurance market on agents' behaviors. Section 3 contains the general equilibrium model. Section 4 deals with the effects of the political insurance market on the inequality of the expected income distribution after policy

uncertainty is resolved. Section 5 presents evidence for the hypothesis that election related portfolios can be constructed. Section 6 investigates the relation between participation in the stock market and support for redistributive policies. Conclusions and some avenues for further research are presented in section 7.

2 An Example

Consider a very simple one period model with three agents and logarithmic utility function over wealth. The initial endowments are $y = \{h, m, l\}$, with $h > m > l$, and $m < \frac{h+m+l}{3} = \bar{y}$. Agents have to choose between two different alternatives: the status quo, and a reform that taxes wealth proportionally at rate τ and redistributes $\tau\bar{y}$ to every agent. The reform will be adopted if the majority is in favor of it.

There is ex-ante uncertainty about the proportion of agents in favor of the reform and, following Roemer (2001) we assume that agents estimate this proportion with an additive error captured by the random variable ε. ε is distributed over $\left[-\frac{1}{2}, \frac{1}{2}\right]$, with symmetric density $g(\cdot)$ and distribution function $G(\cdot)$, such that $G(0) = \frac{1}{2}$. Given that $m < \bar{y}$, the only agent that is strictly worse off with the reform is $y = h$. Therefore, the expected probability q that the redistributive reform will be adopted is:

$$q = \Pr\left\{\frac{2}{3} + \varepsilon > \frac{1}{2}\right\} = 1 - G\left(-\frac{1}{6}\right)$$

Suppose now, that before voting over the reform a financial market is open. Agents can trade any quantity b_y of a financial security that pays 1 if the reform is implemented and 0 otherwise.[1] Let p be the price of the bond.

The maximization problem that agents solve is:

$$\max_{b_y} q \ln\left(\left(y + b_y\left(1-p\right)\right)\left(1-\tau\right) + \tau\bar{y}\right) + \left(1-q\right)\ln\left(y - b_y p\right)$$

and market clearing requires:

$$b_l + b_m + b_h = 0$$

[1] Nothing will change if b pays 0 if the reform is implemented and 1 otherwise.

where b_y denotes the quantity of the security traded by the agent with income $y = \{l, m, h\}$. By taking first order conditions and using the market clearing condition we get[2]:

$$\begin{aligned} b_y^* &= (y - \bar{y}) \frac{\tau (1 - \tau q)}{1 - \tau} \\ p^* &= \frac{q (1 - \tau)}{1 - \tau q}. \end{aligned}$$

Notice that since the security is a fair insurance and every agent can access the financial market, in equilibrium the wealth in the two states has to be the same. Every agent will be indifferent and the final probability of adopting the reform will depend on the tie-breaking rule. Moreover, irrespective of whether or not the reform is implemented, the ex post wealth distribution will be:

$$y (1 - \tau q) + \bar{y} \tau q, \; y = \{h, m, l\}.$$

Therefore partial redistribution through private transfers will take place anyway. This is the main result of Musto and Yilmaz (2003).

Consider now the case in which access to the financial market is conditional on having a given positive amount a of initial endowment. For example assume that the poorest agent $y = l$ cannot participate in the electoral market ($l < a$). In this case the new equilibrium will be:

$$\begin{aligned} b_y^* &= \left(y - \frac{m + h}{2} \right) \frac{2}{m + h} \frac{\left(1 - \tau + \frac{2\tau\bar{y}}{m+h} (1 - q) \right) \tau \bar{y}}{\left(1 - \tau + \frac{2\tau\bar{y}}{m+h} \right) (1 - \tau)} \\ p^* &= \frac{q (1 - \tau)}{1 - \tau + \frac{2(\tau\bar{y}(1-q))}{m+h}} > \frac{q (1 - \tau)}{1 - \tau q}. \end{aligned}$$

It is immediate to verify that in equilibrium every agent that can access the market, namely $y = \{m, h\}$, will strictly prefer the status quo to the reform. Therefore, the proportion $\tilde{q}$ of agents that strictly prefer redistribution will be:

$$\tilde{q} = \Pr \left\{ \frac{1}{3} + \varepsilon > \frac{1}{2} \right\} = 1 - G \left(\frac{1}{6} \right).$$

[2] We assume $l > \frac{(m+h)(1-q)\tau}{3(1-q\tau)-(1-q)\tau}$, in order to rule out corner solutions.

Note that $\tilde{q}$ is strictly smaller than q.

To see the intuition behind this result notice that if everybody has access to the insurance market, the h agent can buy out m and l, by making them at most indifferent between the two policies. If the poor agent cannot access the market the resulting excess in demand will increase the equilibrium price. At the new price agent m is more than compensated by private transfers and therefore she strictly prefers the status quo scenario. When access to market is unrestricted all the risk is idiosyncratic and therefore insurable, whereas if agent l cannot insure herself part of the risk becomes systematic. In the redistribution state the l agent is extracting money form the two other agents that will therefore strictly prefer the status quo.

Suppose now that, taking the mean $\bar{y}$ constant, we decrease h to $h' < h$ and increase l to $l' > a > l$. Assume, moreover that if indifferent between the two states agents will toss a fair coin. It is immediate to realize that the probability of adopting the redistribution will increase even if, after the experiment, the initial distribution of endowments is more equal. Clearly, in this simple example, the result depends on the tie-breaking rule adopted.

In the following two sections we show that the conclusions obtained above hold in a more general environment and explore the relation between inequality and the adoption of redistributive policies.

3 The Model

There is a continuum of agents of measure one. Each agent is endowed with pre-tax income $y \geq 0$, that is an independent draw from a known distribution F, with density f and support Y. Let

$$\bar{y} = \int_Y y dF(y),$$

be the mean income.

Agents are called to vote on the adoption of a reform. Two alternatives are available: the status quo versus a policy (τ, T), where τ is a proportional tax on wealth and T is a lump sum transfer. We assume that the budget is balanced, that is $T = \tau\bar{y}$.

We use a (τ, T) policy as a convenient way to describe our results. The implications of our analysis are however more general and hold for a wide

class of policies which entail a conflict of interest between those who gain from a policy and those who are hurt by it.

Ex-ante uncertainty about the proportion of agents in favor of the reform is modeled as in the previous section. We further assume, without loss of generality, that ε is uniformly distributed in $\left[-\frac{1}{2}, \frac{1}{2}\right]$. The ex-ante probability of adopting the redistribution policy is:

$$q = \Pr\left\{F(\bar{y}) + \varepsilon > \frac{1}{2}\right\} = F(\bar{y}).$$

Before the election a financial market opens. Agents can trade any quantity b of a security that pays 1 in the case the reform is enacted and zero otherwise. Let p be the security price and $\gamma > 0$ be an exogenous threshold on pre-tax income above which agents have access to the market.[3] Finally, we assume that the utility function in wealth $U(x)$ is twice continuously differentiable, $U'(x)$ is homogeneous of degree r, and $U'(x) > 0$, $U''(x) < 0$. Homogeneity of $U'(x)$ is only a sufficient condition for uniqueness of the equilibrium. It can be easily shown that all the results hold for a much larger set of preferences including, for example, the class of constant absolute risk aversion (CARA) and constant relative risk aversion (CRRA) preferences.

The maximization problem that agents solve is:

$$\max_b qU\left(\left(y + b\left(1-p\right)\right)\left(1-\tau\right) + \tau\bar{y}\right) + \left(1-q\right)U\left(y - bp\right),$$

[3] Guiso et al. (2002) show that the proportion of US households investing in risky asset with gross financial wealth falling in the lowest quartile is 1.4%. This proportion is less than 1% for UK, Netherlands and Italy, and less than 3% for Germany. If we consider direct and indirect stockholding all figures are below 5%, with the unique exception of Germany at 6.6%.

and taking first order conditions we get[4]:

$$\frac{U'\left(\left(y+b\left(1-p\right)\right)\left(1-\tau\right)+\tau\bar{y}\right)}{U'\left(y-bp\right)}=\frac{\left(1-q\right)p}{q\left(1-p\right)\left(1-\tau\right)}.$$

Market clearing requires:

$$\int_{Y|y>\gamma} bdF\left(y\right)=0.$$

Therefore in the unique equilibrium

$$\begin{aligned} b^{*}\left(y\right) &= \left(y-\tilde{y}\right)\frac{\tau\bar{y}}{\left(1-\tau\right)\tilde{y}}\frac{1-q\left(1-\left(1-\tau\right)h^{r}\right)}{1-q\left(1-h^{r+1}\right)} \\ p^{*} &= \frac{q\left(1-\tau\right)h^{r}}{1-q\left(1-\left(1-\tau\right)h^{r+1}\right)} \end{aligned}$$

where

$$\begin{aligned} h &= \frac{\left(1-\tau\right)\tilde{y}+\tau\bar{y}}{\tilde{y}}<1 \\ \tilde{y} &= \frac{\int_{Y|y>\gamma} ydF\left(y\right)}{\int_{Y|y>\gamma} dF\left(y\right)}\geq\bar{y} \\ \tilde{y} &> \gamma. \end{aligned}$$

Notice from the first order conditions, that all agents that are active in the market strictly prefer the status quo if and only if:

$$p>\frac{q\left(1-\tau\right)}{1-q+q\left(1-\tau\right)}.$$

[4]Notice that we are not imposing any constraint on the maximization problem. This implies in principle that agents can sell an amount of securities greater than their pre-tax endowment ending up paying a negative tax. As long as γ is not too small this will never happen in equilibrium. A sufficient condition is

$$\gamma\geq\max\left(\frac{1-q}{2-q}\bar{y},\frac{1-q}{1-q\left(1-\frac{1}{2}^{r+1}\right)}\bar{y}\right),$$

for $\tau<\frac{1}{2}$.

In the unique equilibrium we have that

$$p^* > \frac{q(1-\tau)}{1-q+q(1-\tau)}$$

if and only if

$$h < 1.$$

Therefore, we have the following Lemma:

Lemma 1 *For any continuous distribution $F(y)$, all active agents on the market ($y \geq \gamma$) strictly prefer the status quo.*

Figure 1 depicts the demand schedule $b^*(y)$ as a function of y, in the case of $U(x) = \frac{x^{1-\alpha}-1}{1-\alpha}$, $\alpha = 2$, $\tau = \frac{1}{2}$, $y \sim U[0,1]$ and $\gamma = \left\{0, \frac{1}{4}\right\}$. It shows how agents react to policy uncertainty: rich(poor) agents buy(sell) a positive amount of securities. $\tilde{y}$ is the mean of the income distribution truncated at γ and, in equilibrium, is equal to the income level of the indifferent agent on the market. Also notice that an increase in γ induces a reduction, in equilibrium, of the total amount of securities traded and therefore a reduction of the size of the market.

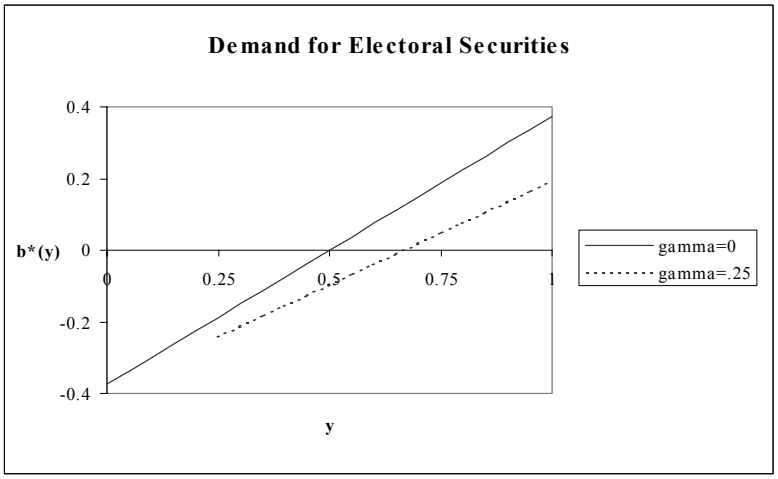

Figure 1:

If individuals whose incomes are in the left tail of the distribution cannot access the market the resulting excess in demand will increase the security

price. At the new price agents with income below the mean are more than compensated by private transfers and therefore they strictly prefer the status quo scenario. The utility ratio between redistribution and status quo does not depend on the income level and, since $\tilde{y} > \bar{y}$, all voters for which $y \geq \gamma$ vote for the status quo.

Figure 2 depicts the difference DU in utility between the status quo and the redistribution state as a function of y, using the same parametrization of Figure 1. Notice that when γ is set equal to $\frac{1}{4}$, $DU > 0$ for $y > \frac{1}{4}$. The chosen parametrization affects the shape of DU, but not its quasi-monotonicity property.[5] The resulting end of period probability $\tilde{q}$ of implementing the

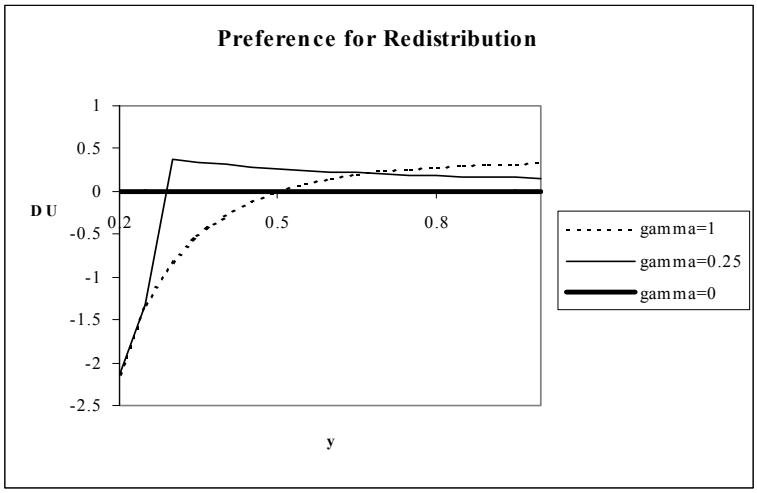

Figure 2:

redistributive policy will be:

$$\tilde{q} = \Pr\left\{\min\left\{F\left(\gamma\right), F\left(a\right)\right\} + \varepsilon > \frac{1}{2}\right\} = \min\left\{F\left(\gamma\right), F\left(a\right)\right\} \leq q.$$

Therefore, we have the following Lemma:

[5]For example in the case of

$$U\left(x\right) = \ln x,$$

DU is flat for $y > \gamma$.

Lemma 2 *For any continuous distribution $F(y)$, the ex-post probability $\tilde{q}$ of voting against the status quo is weakly smaller than the ex-ante probability q, and an increase in the size of market (a decrease in γ) weakly decreases the support for the reform.*

In the appendix I show that the ex-post probability $\tilde{q}$ of voting against the status quo is strictly smaller than the ex-ante probability q when we explicitly consider the existence of individual budget constraints on the amount of securities that can be traded.

To analyze the effect of the initial income distribution on $\tilde{q}$, assume that income is drawn from a Pareto distribution with parameters $c > 0$ and $\Delta < 1$.[6]

Under these assumptions:

$$F(y) = 1 - \frac{c^{\frac{1}{\Delta}}}{y}$$
$$\frac{\bar{y}}{y_{med}} = \frac{1}{(1-\Delta)\,2^{\Delta}}$$
$$Gini\ index = \frac{\Delta}{2-\Delta}.$$

In the case in which we shut down the political insurance market, the probability of adopting the reform is given by:

$$q = 1 - (1-\Delta)^{\frac{1}{\Delta}}.$$

An increase in Δ, that increases the Gini index as well as the ratio between mean and median income, unambiguously increases q. This is what a standard median voter type of model would have predicted. A reform with asymmetric benefit will be more popular the more polarized is society provided that a majority of voters was already in favor of it.

The comparative statics of the model are quite different if we consider the role of the market. Indeed, the end of period probability of implementing

[6] The same analysis holds if we assume instead a log normal distribution. Both the Pareto and the log normal distributions are reasonable approximations of the US empirical distribution of income and have particularly useful properties. See Lee and Roemer (2001) and Benabou (2000).

the reform for $\gamma > c$, is now given by the following expression:

$$\tilde{q} = \begin{cases} 1 - \left(\frac{c}{\gamma}\right)^{\frac{1}{\Delta}} & \gamma < \frac{c}{1-\Delta} \\ 1 - (1-\Delta)^{\frac{1}{\Delta}} & \gamma > \frac{c}{1-\Delta} \end{cases} .$$

The effect of increasing inequality on the final probability of adopting the reform will be:

$$\frac{d\tilde{q}}{d\Delta} = \begin{cases} \frac{\left(\frac{c}{\gamma}\right)^{\frac{1}{\Delta}}}{\Delta^2} \ln \frac{c}{\gamma} < 0 & \gamma < \frac{c}{1-\Delta} \\ (1-\Delta)^{\frac{1-\Delta}{\Delta}} \frac{(1-\Delta)\ln(1-\Delta)+\Delta}{\Delta^2} > 0 & \gamma > \frac{c}{1-\Delta} \end{cases} .$$

Increasing inequality has two distinct effects on the actual support for redistribution : it changes the relative position of the median voter with respect to the mean voter and, for given γ, it changes the proportion of agents active in the market. In the case in which the existence of the market reduces the proportion of agents in favor of redistribution (i.e. $\gamma < \frac{c}{1-\Delta} = \bar{y}$) an increase in inequality decreases the likelihood of adopting the reform.

4 Expected Income Distribution

An important feature of this model is that private redistribution takes place before the election, even in the case in which the reform is ultimately not implemented. The objective of this section is to analyze the effect of the political insurance market on the inequality of the expected income distribution after policy uncertainty is resolved. To avoid unnecessary complication we will focus on the case of logarithmic utility.

We can compare the degree of inequality of different income distributions using the concept of second order stochastic dominance. F_x, is more unequal than F_y if F_x is a mean preserving spread of F_y. More formally, let X be the common support of F_y and F_x, then F_x, is more unequal than F_y if:

$$\int_X x dF_x = \int_X x dF_y,$$

and

$$\int_{x_{\min}}^{x} (F_x - F_y)\, ds \geq 0 \text{ for all } x \in X, \tag{1}$$

where $x_{\min}$ is the lower bound of X. The equality of means implies that:

$$\int_X F_x = \int_X F_y.$$

Hence if F_x and F_y cross only once (1) is satisfied.

Let z be the expected income after elections without market.

$$z = q\tau\bar{y} + (1 - q\tau)\, y.$$

By using the convolution formula we have that:

$$F_z = \begin{cases} F\left(\frac{z - q\tau a}{1 - q\tau}\right) & \text{for } z \geq q\tau\bar{y} + (1 - q\tau)\,\underline{\mathrm{y}} \\ 0 & \text{otherwise} \end{cases},$$

where $\underline{\mathrm{y}}$ is the lower bound of Y. Since F and F_z have the same mean, $F\left(\underline{\mathrm{y}}\right) > F_z\left(\underline{\mathrm{y}}\right) = 0$, and they cross only once, F is a mean preserving spread of F_z. We will use F_z as a benchmark to evaluate the effect of the market in terms of expected income distribution.

We have to consider two cases:

- case 1: $\gamma \geq \bar{y}$

In this case the electoral market does not affect the probability of adopting the reform. Let z_{mkt} be the expected income after elections with market, and $F_{z_{mkt}}$ be the expected income distribution.

Lemma 3 *If $\gamma \geq \bar{y}$, the introduction of the electoral market decreases expected income inequality for any continuous initial distribution F.*

The proof can be found in the appendix. Figure 3 provides the intuition. $F_{z_{mkt}}$ and F_z have the same support, and are identical for $y < \gamma$. Since they have the same mean, areas A and B are equivalent. But this implies that F_z is a mean preserving spread of $F_{z_{mkt}}$.

- case 2: $\gamma < \bar{y}$

In this case the effect of the electoral market is twofold: it redistributes income through private transfers before the reform takes place, and it affects the probability of adopting the reform.

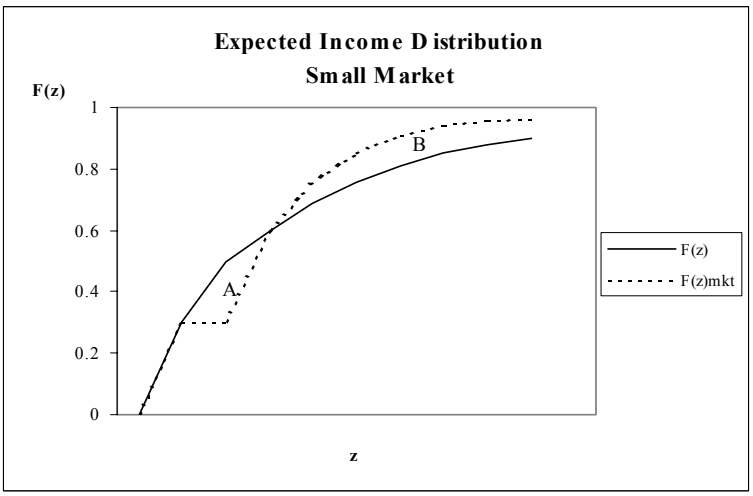

Figure 3:

Lemma 4 *If $\gamma < \bar{y}$, there exists a $\gamma^* \in (0, \bar{y})$, such that if $\gamma \leq \gamma^*$ the introduction of the electoral market increases expected income inequality for any continuous initial distribution F.*

The proof is in the appendix. Figure 4 provides a graphical intuition in the case of $\gamma \leq \gamma^*$. If $\gamma \leq \gamma^*$, it is possible to show that $F_{z_{mkt}}$ and F_z cross only once. Since they have the same mean we can conclude that $F_{z_{mkt}}$ is a mean preserving spread of F_z. For $\gamma \in (\gamma^*, \bar{y})$, $F_{z_{mkt}}$ and F_z cross twice, hence they cannot be compared using the second order stochastic dominance criterion.

When the financial market is widely accessible, a large redistribution is actually taking place before the election and, as we showed above, this maps in a smaller support for the redistribution state. Therefore we should expect a positive effect of the political insurance market on expected inequality. The lesson we get from this section is that this might not be the case. Even if a large proportion of agents are moving resources from one state to the other, as long as the lower tail of the distribution is still completely exposed to the electoral risk, the gap between losers and winners widens and, moreover, we are shifting probability mass on the status quo. When the political insurance market is large, agents' reaction to electoral uncertainty leads, in expectation, to a distribution even less equal.

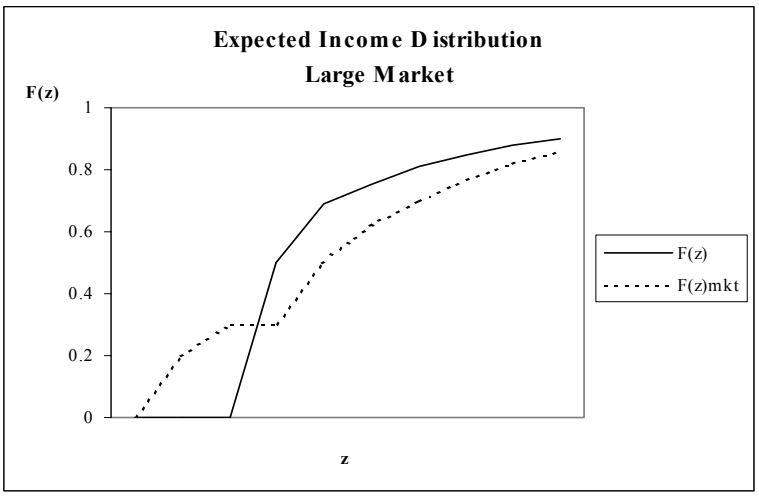

Figure 4:

The main lesson we learned from the theoretical model is that if markets provide insurance against political uncertainty, agents' reaction to uncertainty will be an important component of the equilibrium demand for redistributive policies. The natural question that arises is: do political insurance markets exist? This is the focus of the next section.

5 Presidential Portfolios

The 2000 US Presidential election provides a natural opportunity to study the existence of a political insurance market for several reasons. First, it was a very close election with no incumbent. Uncertainty about the identity of the winner lasted until mid December and George W. Bush's final victory was determined by a handful of votes.[7] Second, the expected policies of the two candidates were clearly different on crucial issues like fiscal policy, and defense and drug administration policies.[8] Finally, the press for the first time

[7]The Supreme Court's final decision about Florida recount was taken on December 12th.

[8]Based on proposed income tax policies, Deloitte and Touche calculated that a four-member family with annual income of $30,000 ($50,000) was expected to get approximately $123 more ($1682 less) in case of a Gore victory with respect to a Bush victory.

devoted large attention to the issue of election related investing strategies.

We construct presidential portfolios composed by selected stocks that can be anticipated to fare differently under the alternative candidates and investigate to what extent the price movements of these portfolios are correlated with electoral polls in the period before the elections are held. We expect that if agents react to electoral uncertainty by trading electoral securities, we should observe a correlation between portfolios' excess returns and changes in the expected probability of a Bush victory. How do we select the stocks to be included in each presidential candidate portfolio? The strategy we follow to construct these portfolios is to use data about campaign contributions and select stocks of firm that satisfy three conditions: i) they made significant contributions to candidates' campaign in the 2000 election cycle, ii) the contributions were concentrated on one candidate in particular, iii) firm's stocks were traded on the NYSE during year 2000. We considered both hard money and soft money contributions. The well-known problem that arise when using soft money contribution data is that is not easy to distinguish between funds that are used to finance the presidential campaign and funds used for other party expenditures. Nonetheless, since our main interest is to select firms with a strong preference for one policy platform with respect to the other, we believe that the choice of considering total party contributions is a plausible approximation.[9] Table 1 lists the top ten contributors for each party that gave more than $\frac{2}{3}$ of their total contributions to a single party.

Using campaign contributions as a selection criterion has two nice features: it exploits the firm expectations about the future states, and makes the selection possible from an ex-ante point of view, using information readily available to the general public. It is worth noticing that the stocks selected are roughly a subset of the so called "Bush Stocks" and "Gore Stocks" that Prudential Securities and Lehman Brothers, among others, picked during the 2000 US presidential election campaign. They are also part of the basket options issued by the Swiss firm Vontobel the day after the elections.

As a proxy for the probability of each candidate being elected we use lagged daily data from the Iowa Political Stock Market. The IPSM is an experimental market operated by the University of Iowa. In the "winner-take-all market" internet traders can buy or sell candidate shares that pay

[9] A possible alternative is to distinguish between soft money contributions to Party National Committees and other contributions. This strategy addresses the problem only partially and requires an additional amount of information that is not readily available to the general public.

$1 if the candidate wins and zero otherwise. The Iowa Political Stock Market has not only been shown to be particularly accurate in predicting the election outcome but also has been already used in several empirical studies as poll proxy.[10] We use the daily closing price of the Bush contract, normalized to eliminate the effect of third candidates running.

We construct two weighted portfolios composed by the stocks listed in Table 1. Each index is an average of the daily closing price of ten stocks traded on NYSE. Weights are constructed using the number of outstanding shares. Figure 5 plots the series of the two presidential indexes for the period 5/1/2000 to 11/6/2000. Both series are normalized to unity in date 5/1/2000. Figure 6 plots the Iowa Political Stock Market closing price of a Bush contract for the same time period. Two observations can be derived from simple inspection of Figures 5 and 6. First, the two presidential portfolios are negatively correlated, in particular from September 2000 to the election day. Second, there is evidence of non-stationarity of the series. The results of the ADF tests showed in Table 2 in the appendix suggest that we can deal with the non-stationarity issue by considering rate of returns.

The rates of return of the Bush and Gore indexes in the period 5/1/2000-11/6/2000 were respectively 4.6 percent and -4.6 percent. In the same period the S&P500 index fell by 2.5 percent. On August 18th, one day after Al Gore's speech at the Democratic National Convention in which he accused the major pharmaceuticals firms of overcharging the public, the Bush index fell by 1.7 percent and Pfizer alone fell by 2.9 percent. On December 12th, when all uncertainty was finally resolved, the Bush index rose by 0.8 percent while the Gore index fell by 0.7 percent.

To test whether the daily returns of presidential portfolios are correlated with changes in the expected probability of a Bush victory we estimate a simple CAPM model of the form:

$$P_t = \alpha + \beta_1 SP_t + \beta_2 PROB_{t-1} + \varepsilon_t,$$

where all variables are expressed in natural logarithm of daily returns, and:

$$\begin{aligned} P &= \text{daily return of presidential portfolio} \\ SP &= \text{daily return of Standard \& Poor 500} \\ PROB &= \text{daily return of the probability of a Bush election (IPSM).} \end{aligned}$$

[10] See Forsythe et al. (1991, 1992) for the anatomy of the IPSM.

Given the short time span we can assume a constant risk-free asset return that will be captured by the intercept α. We included the daily return of Standard & Poor 500 in order to control for factors that affected overall returns. Moreover, because of the fact that the IPSM is open for trading 24 hours a day, we considered one period lagged daily changes of the Bush contract closing price.

Tables 3 and 4 in the Appendix show the results of the estimates for each portfolio. We estimate the equation both by OLS and, to reduce the effect of possible outliers given the small sample, by LAD (least absolute deviations). Analysis conducted on the residuals show no evidence of serious misspecification problems.[11] The coefficient of $PROB$ is significant and has the expected sign for both portfolios. This suggests that as the likelihood of a Bush victory increases the return of the Bush portfolio is increasing as well while the return of the Gore portfolio is decreasing.

There is an important caveat in interpreting our results. A positive correlation between a Bush victory and the Bush portfolio's return is only a necessary condition to conjecture that agents are hedging political risk. The same correlation would be observed if agents are simply betting on the winner. What we have shown is that stocks currently traded on the market can actually be used to hedge policy risk without the need of resorting to particularly sophisticated financial instruments. Moreover, the selection strategy suggested is a particularly intuitive and simple one. As long as this kind of political securities can be constructed we are in a world similar to the one described in the previous sections.

We now focus our attention to explore empirically some of the predictions of our theoretical model.

6 Financial Market Participation and Support for Redistributive Policies

Based on the model presented in this paper and the evidence we have shown in the previous section, it is our claim that the level of participation in the stock market should be negatively related to support for policies with redistributive content. The purpose of this section is to explore this relation

[11] There is some evidence of heteroskedasticity in the Gore regression. Nonetheless, by using a White estimator, the coefficient of $PROB$ is still significant at the 10 percent level.

and provide some suggestive evidence both at an aggregate and individual level that corroborates our claim.

Figures 7 depicts a cross-country scatter plot of the relation between proportion of households owning stocks in 1998, and social security transfers to households (Sst) as a share of the GDP, for all countries where individual stock ownership data exist. The sample includes the US and six European countries that account for 90% of overall EU financial wealth in year 2000.[12] Not surprisingly, European countries are characterized by smaller participation in the stock market and larger redistributive transfers with respect to the US. What is more interesting is that there is evidence of a negative relation between stock market participation and redistribution.[13] If we consider only redistribution to elders (old age public pensions), the negative relation is even more stark, as shown in Figure 8.[14] Clearly, these figures should be interpreted with a grain of salt, but are still suggestive of the fact that economies' financial structure appears to be correlated with the policy choices of a country.[15]

One possible explanation for the observation that households' stockholding is larger in economies where the social security system is less generous has to do with the demographic transition experienced by European countries. The idea is that the stock market provides a substitute for smaller social security benefits expected in the future. Our point is that this kind of mechanism may be only one side of the story. As long as agents realize that policy platforms with different redistributive content are reflected in stock market returns, their reaction to future uncertainty endogenously makes public redistribution less appealing.

If we focus on the recent US experience, we can see that the proportion of US households owning stocks has increased dramatically in the last decade. Data from Surveys of Consumer Finances show that direct ownership increased from 16.2 percent of households in 1989 to 21.3 percent in

[12] We consider both direct ownership and stocks owned through mutual funds or individual retirement accounts. In the case of Germany, only direct ownership data are available. Sst/GDP is an average for the period 1995-1999. Data are taken form OECD Economic Outlook and Guiso et al. (2002, 2003).

[13] The relation exists in spite of the presence of a clear outlier, represented by Sweden.

[14] Old age public pensions (Oapp)/GDP is an average for the period 1995-1997.

[15] We have comparable data for only seven economies and the countries selected are particularly different in their electoral system. As Persson , Roland and Tabellini (2000) show, there is a close relation between countries' electoral systems and the size of the public sector.

2001, mutual fund ownership increased from 7.1 percent in 1989 to 27.7 percent in 2001, and in 2001, 52.2 percent of US households had a tax-deferred retirement account. As a result, the proportion of US households owning stocks directly or indirectly (through mutual funds or retirement accounts) rose from 31.6 percent in 1989 to 51.9 percent in 2001. Even if ownership has always been very concentrated in the upper tail of both income and wealth distributions, the median income of stock owners has decreased by more than 9 percent in the period 1989-1998 and there is evidence of a shift in portfolios' composition towards more diversification.[16]

Table 5 reports the share of social security transfers over GDP for the US in the period 1990-2000. The amount of resources devoted to social security spending has been constantly decreasing since 1992. A similar picture emerges if we consider broader aggregates that include transfers to households and subsidies. Moreover, taking for granted the conventional wisdom that democratic platforms tend to carry more redistributive spending, the share of democratic votes in House elections decreased from 52 percent in 1990 to 47 percent in 2000. Given that the 90's were also characterized by increasing inequality in income distribution, the combination of increasing stock market participation and decreasing support for redistribution suggests that the mechanism described in our theoretical model may be actually at work.

Clearly, any relation between stock market participation and preference for redistribution we can infer from aggregate data may very well turn out to be spurious and due to a variety of other phenomenon. To explore this issue further, we therefore focus on micro level data from the National Election Study (NES). The 2000-2002 waves of the NES contain individual level information about stock market participation. Respondents were asked: "*do you personally, or jointly with a spouse, have any money invested in the stock market right now either in an individual stock or in a mutual fund*?". In order to measure preferences over redistribution we use an index variable that summarizes individual preferences on whether the government should increase or decrease the amount of spending on Welfare programs like social security.[17] We construct a dichotomous variable equal to 1 if respondent

[16] See Bertaut and Starr-McCluer (2002).

[17] Alternatively, one could look at preferences revealed by the vote cast in the election. There are two problems in using this alternative approach. First, one should take into account the selection bias due to the choice of voting versus abstention in the election. Second, it is not clear which type of election one should focus on, and how incumbency effects should be treated. Since our theoretical model does not address the choice of

prefers less than or equal social security spending with respect to the status quo, and equal to 0 otherwise.

Given the positive correlation between stock ownership and income, we try to separate the two effects by grouping respondents by income quintiles. Table 6, reports the proportion of respondents in the sample that prefer less than or equal federal spending in social security with respect to the status quo by income quintiles and stock ownership status. Notice that in every quintile the proportion of stock owners is systematically higher than the proportion of those without stocks. The same picture emerges if we consider different measures of preference for redistribution like preference for reduction of services and spending.

In order to distinguish the effect that market participation has on preference for redistribution from other socioeconomic characteristics, we estimate a probit model that controls for income, sex, race, age and education. The results of the estimates are in Table 7. Stock ownership increases the probability that an individual will prefer a lower or equal level of redistribution in the form of social security spending by 5 percentage points in the 2000 sample and, by almost 10 percentage points in the 2002 sample. Since the 2002 wave contains a subsample of individuals that were already present in the 2000 wave, we can get additional evidence by exploiting the panel dimension of the data set. For example, in the subset of individuals that reported no stock in 2000 and become stock owners in 2002, 73 percent of individuals did not change their preference for redistribution. Among the remaining 27 percent, almost three quarter of individuals switched their preference toward less redistribution. The opposite happens if we focus on individuals that were stock owners in 2000 and reported no stock in 2002. The results of the estimates of a random effects probit model that incorporate the panel dimension are shown in Table 8. The coefficient of stock ownership has the expected sign, and it is significant at the 5 percent level. In general, the results are very similar to those obtained by estimating separate regressions.

7 Conclusion

Our model shows the role citizens' reactions to policy uncertainty plays in the demand for redistributive policies. We show how ex-ante uncertainty

turning out to the poll, we choose to focus on variables that are not directly related to the elections.

about a government policy with redistributive consequences will influence the proportion of agents in favor of it, if a subset of agents can trade policy contingent securities. In an economy with a political insurance market, there is less demand for redistribution than in one without such a market, and demand for redistribution decreases as income inequality increases. We provide conditions under which the existence of a political insurance market increases future expected inequality even if a large proportion of agents is redistributing resources through private transfers.

We show that stocks currently traded on the market can actually be used to hedge policy risk, and we provide preliminary evidence for the existence of an empirical relation between participation in the stock market and support for policies with redistributive content.

Our future research agenda has to address two important questions. First, do people hedge policy risk? Second, does the structure of political institutions affect the likelihood that a political insurance market exists?

Given that in the US the majority of stock owners participate in the market through their mutual fund holdings, a promising avenue for addressing the first question is to explore the CDA Spectrum database. This database provides information on each stock owned by mutual funds for each calendar quarter.[18] As an example, it is possible to see that before the 2000 Presidential election the Vanguard Health Care fund, a five star rating fund from Morningstar.com, decreased by 6765001 units its stock holdings of Pfizer but then after the election bought back 1750000 stocks. It is interesting to note that Pfizer was a "Bush stock", and the performance of pharmaceuticals-oriented funds would presumably have been harmed by a Gore presidency.

The second question to explore has to do with the fact that a political insurance market is more likely to be sustainable in a political system where the different policy options and their consequences are clearly identifiable ex-ante. This is more likely in political systems where, for example, bargaining over government formation is minimal or absent, as in the US system. As a result institutional design may have an indirect effect on which policy will ultimately be adopted, a consequence completely novel to the findings of the existent literature on comparative political institution and redistribution.

[18] One problem of using the Spectrum database is the so called "window-dressing" practice. Since the information available is only a snapshot every quarter, funds managers might choose to readjust their portfolio holdings just before data are released.

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8 Appendix

In the paper all the results were derived in the case of exogenously restricted access to market and without taking into account the possibility that agents' budget constraint was binding. Here we show that, under some assumptions, the results derived in the previous sections are robust to the introduction of a budget constraint when we set $\gamma = \underline{y}$ (i.e. unrestricted access to the financial

market). We restrict attention to the case of $y \sim U[0,1]$, and logarithmic utility function. We finally assume $\tau \leq \frac{1}{2}$.[19]

Given that income is distributed uniformly, q is equal to $\frac{1}{2}$. The new problem that agents solve is:

$$\max_b \frac{1}{2}\left(\ln\left(\left(y+b\left(1-p\right)\right)\left(1-\tau\right)+\frac{\tau}{2}\right)+\ln\left(y-bp\right)\right)$$
$$\text{s.t. } y+b\left(1-p\right)\geq 0,$$

and market clearing requires:

$$\int_0^1 b dy = 0.$$

In equilibrium:

$$b^* = \begin{cases} \frac{\left(\left(\tau^2-4(1-\tau)s\right)y-s\tau\right)\tau^2}{4(1-\tau)s(\tau^2-2(1-\tau)s)} & y > \frac{s}{\tau} \\ -\frac{y\tau^2}{\tau^2-2(1-\tau)s} & y < \frac{s}{\tau} \end{cases}$$
$$p^* = \frac{2\left(1-\tau\right)}{\tau^2}s$$
$$s = \left(1-\sqrt{1-\tau}\right)^2.$$

Is a matter of simple algebra to check that all agents with income $y > \frac{\tau^2-2s(1-\tau)}{2\tau}$, will prefer the status quo outcome. Therefore the support for redistribution will be:

$$\tilde{q} = \frac{\tau^2-2s\left(1-\tau\right)}{2\tau},$$

always smaller than $q = \frac{1}{2}$.

Notice that the above exercise implicitly assume that agents take q as given. If agents can perfectly anticipate the effect of the financial market they will consider the expected $\tilde{q}$ in the maximization problem. Nonetheless,

[19] If τ is close to one there are two equilibrium prices that clear the market. Since the qualitative results are going to be the same irrespective of the equilibrium selected, we restrict attention to the case of $\tau \leq \frac{1}{2}$.

when $\tau \leq \frac{1}{2}$, it can be shown that a unique equilibrium exists in which the proportion of agents in favor of redistribution is always strictly smaller than in case the in which agents cannot react to electoral uncertainty.

Proof of Lemma 1

Let z_m be the expected income after elections with market, and F_{z_m} be the expected income distribution.

$$z_m = \begin{cases} \left(y\left(\tilde{y}\left(1-\tau\right)+\tau\bar{y}\left(1-q\right)\right)+\tilde{y}q\tau\bar{y}\right)\frac{q\tau\bar{y}+\tilde{y}(1-\tau q)}{(\tau\bar{y}+\tilde{y}(1-\tau))\tilde{y}} & \text{for } y \geq \gamma \\ q\tau\bar{y}+\left(1-q\tau\right)y & \text{otherwise,} \end{cases}$$

$$F_{z_m} = \begin{cases} F\left(\frac{z_m\frac{(\tau\bar{y}+\tilde{y}(1-\tau))\tilde{y}}{q\tau\bar{y}+\tilde{y}(1-\tau q)}-\tilde{y}q\tau\bar{y}}{\tilde{y}(1-\tau)+\tau\bar{y}(1-q)}\right) & z_m \geq \bar{z} \\ F\left(\gamma\right) & z_m \in \left[q\tau\bar{y}+\left(1-q\tau\right)\gamma, \bar{z}\right) \\ F\left(\frac{z_m-q\tau\bar{y}}{1-q\tau}\right) & z_m \in \left[q\tau\bar{y}+\left(1-q\tau\right)\underline{y}, q\tau a+\left(1-q\tau\right)\gamma\right) \\ 0 & z_m < q\tau\bar{y}+\left(1-q\tau\right)\underline{y}, \end{cases}$$

where $\bar{z} = \frac{(\gamma(\tilde{y}(1-\tau)+\tau\bar{y}(1-q))+\tilde{y}q\tau\bar{y})(\tau\bar{y}q+\tilde{y}(1-\tau q))}{(\tau\bar{y}+\tilde{y}(1-\tau))\tilde{y}}$. Notice that for $y < \gamma$, F_z and F_{z_m} are identical. For $y \geq \gamma$, they cross ones in $y = \tilde{y}$ and, $F_z\left(\bar{z}\right) > F_{z_m}\left(\bar{z}\right) = F\left(\gamma\right)$. Since the existence of the market does not affect the mean of the income distribution:

$$\int_{\gamma} F_z = \int_{\gamma} F_{z_{mkt}},$$

but this implies that:

$$\int_{\underline{y}}^{y} \left(F_z - F_{z_{mkt}}\right) ds \geq 0 \text{ for all } y \in Y.$$

Proof of Lemma 2

Let z'_m be the expected income after elections with market , and $F_{z'_m}$ be the expected income distribution when $\gamma < \bar{y}$. In this case the end of period probability of implementing the reform $\tilde{q}$ is a function of the size the market, i.e. $\tilde{q} = F\left(\gamma\right) < F\left(\bar{y}\right) = q$. Hence we have:

$$z'_m = \begin{cases} \left(y\left(\tilde{y}\left(1-\tau\right)+\tau\bar{y}\left(1-q\right)\right)+\tilde{y}\tau\bar{y}q\right)\frac{\tau\bar{y}\tilde{q}+\tilde{y}(1-\tau\tilde{q})}{(\tau\bar{y}+\tilde{y}(1-\tau))\tilde{y}} & \text{for } y \geq \gamma \\ \tilde{q}\tau\bar{y}+\left(1-\tilde{q}\tau\right)y & \text{otherwise.} \end{cases}$$

$$F_{z'_m} =$$
$$\begin{cases} F\left(\frac{z'_m \frac{(\tau\bar{y}+\tilde{y}(1-\tau))\tilde{y}}{\tilde{q}\tau\bar{y}+\tilde{y}(1-\tau\tilde{q})} - \tilde{y}q\tau\bar{y}}{\tilde{y}(1-\tau)+\tau\bar{y}(1-q)}\right) & z'_m \geq \bar{z}' \\ F(\gamma) & z'_m \in [\tilde{q}\tau\bar{y} + (1-\tilde{q}\tau)\gamma, \bar{z}') \\ F\left(\frac{z'_m - \tilde{q}\tau\bar{y}}{1-\tilde{q}\tau}\right) & z'_m \in \left[\tilde{q}\tau\bar{y} + (1-\tilde{q}\tau)\underline{y}, \tilde{q}\tau\bar{y} + (1-\tilde{q}\tau)\gamma\right) \\ 0 & z'_m < \tilde{q}\tau\bar{y} + (1-\tilde{q}\tau)\underline{y}, \end{cases}$$

where $\bar{z}' = \frac{(\gamma(\tilde{y}(1-\tau)+\tau\bar{y}(1-q))+\tilde{y}q\tau\bar{y})(\tau\bar{y}\tilde{q}+\tilde{y}(1-\tau\tilde{q}))}{(\tau\bar{y}+\tilde{y}(1-\tau))\tilde{y}}$. In this case $F_{z'_m} > F_z$ in the left tail of the distribution since $\tilde{q} < q$. Moreover, $F_z(\bar{z}') > F_{z'_m}(\bar{z}')$. To get the desired result we have to check whether the two distribution functions cross only ones. A necessary and sufficient condition for single crossing is:

$$\tilde{q}\tau\bar{y}(1-q) - \tilde{y}(q-\tilde{q})(1-\tau) \leq 0.$$

Let

$$Q(\gamma) = \tilde{q}\tau\bar{y}(1-q) - \tilde{y}(q-\tilde{q})(1-\tau),$$

and notice that:

$$Q(\bar{y}) = q\tau\bar{y}(1-q) > 0$$
$$\lim_{\gamma \to \underline{y}} Q(\gamma) = -\bar{y}q(1-\tau) < 0$$
$$\frac{dQ(\gamma)}{d\gamma} = \frac{f(\gamma)}{1-\tilde{q}}\left((1-\tilde{q})\tau\bar{y}(1-q) + (\gamma(q-\tilde{q}) + \tilde{y}(1-q))(1-\tau)\right) > 0.$$

Therefore there exists a unique γ^* such that for $\gamma < \gamma^*$, F_z is a mean preserving spread of $F_{z_{mkt}}$.

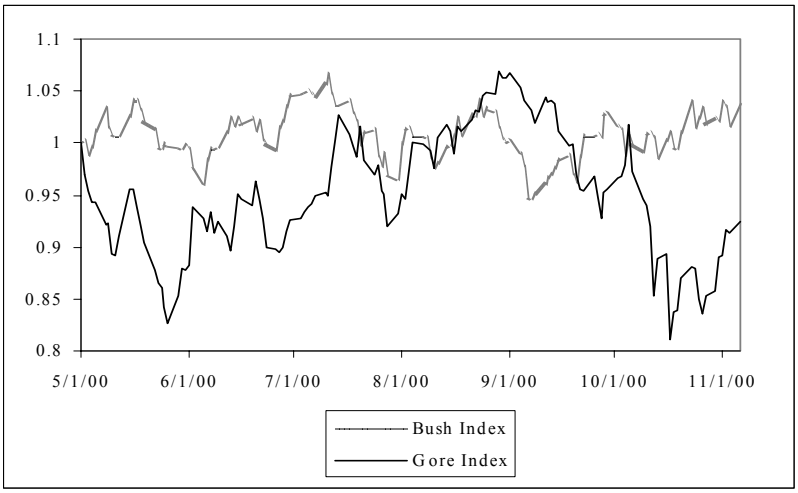

Figure 5:

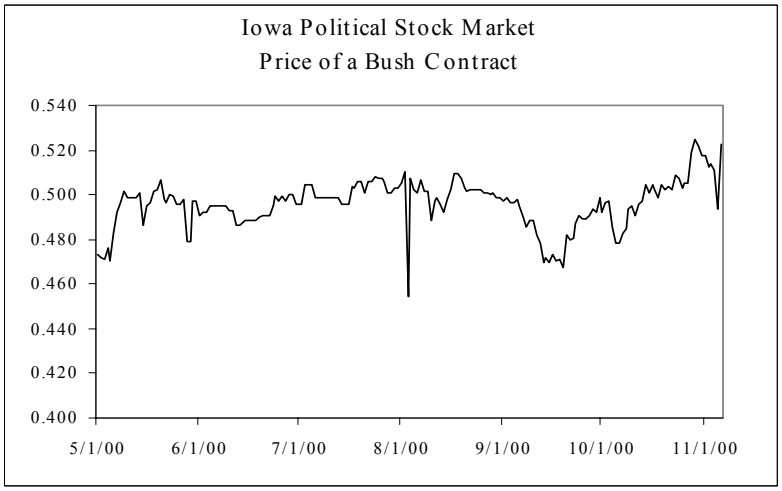

Figure 6:

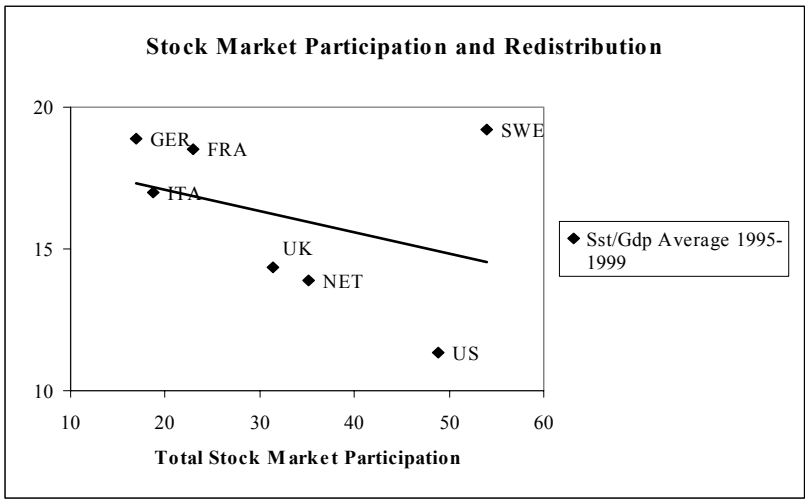

Figure 7:

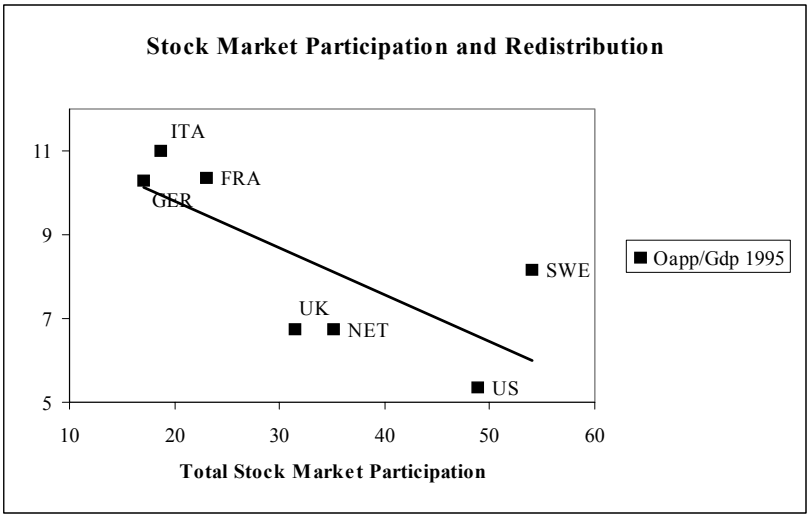

Figure 8:

Table 1. Campaign Contributions

Republicans		Democrats	
Philip Morris	$ 3,814,051	Goldman Sachs	$ 4,337,167
United Parcel Service	$ 2,918,969	Time Warner	$ 2,352,205
Enron Corp	$ 2,500,058	Loral Space & Communications	$ 1,528,200
Pfizer Inc	$ 2,472,166	FleetBoston Financial	$ 1,353,225
Bristol-Myers Squibb	$ 2,364,412	Vyyo Inc	$ 1,339,000
Union Pacific Corp	$ 1,858,194	Slim-Fast Foods/Thompson Medical	$ 1,196,950
GlaxoSmithKline	$ 1,796,893	Bear Stearns	$ 1,190,879
WorldCom Inc	$ 1,786,370	Cablevision Systems	$ 1,022,604
UST Inc	$ 1,605,652	Vivendi Universal	$ 985,730
Southern Co	$ 1,405,316	Viacom Inc	$ 960,075

Note: Top ten campaign contributors with stock publicy traded on NYSE, that gave more than two thirds of total contributions to one party.
Source: ICPRS and Common Cause 2000 Election Cycle

Figure 9:

Table 2. Augmented Dickey-Fuller Test for Unit Root

Variable	No Drift Included	Drift and Trend Included
Bush Portfolio Index		-3.03
Ln(Bush Index return)	-5.79**	
Gore Portfolio Index		-2.15
Ln(Gore Index return)	-11.5**	
Standard & Poor 500		-2.19
Ln(Standard & Poor return)	-5.04**	
Iowa Political Stock Market		-0.76
Ln(Iowa PSM return)	-11.8**	

Lag selection based on AIC. ** (*) indicates rejection of the null of nonstationarity at the 1% (5%) level.

Figure 10:

Table 3. Regressions for Bush Portfolio Index Return		
	OLS	LAD
SP	0.13353	0.15981
	[1.350]	[1.06]
PROB(t-1)	0.05821	0.07714
	[2.739]**	[2.58]*
Constant	0.00002	-0.00053
	[0.001]	[-0.31]
No. Obs.	131	131
R2	0.067	
Prob(F-statistics)	0.01150	
Jarque-Bera Prob	0.81	
t-statistics are reported in brackets. ** (*), indicates that the coefficient is statistically different from zero at the 1%(5%) level.		

Figure 11:

Table 4. Regressions for Gore Portfolio Index Return		
	OLS	LAD
SP	1.26586	1.35093
	[9.787]**	[10.27]**
PROB(t-1)	-0.0705	-0.0588
	[-2.537]*	[-2.21]*
Constant	0.00026	-0.00021
	[0.176]	[-0.15]
No. Obs.	131	131
R2	0.445	
Prob(F-statistics)	0.00000	
Jarque-Bera Prob	0.14	

t-statistics are reported in brackets. ** (*), indicates that the coefficient is statistically different from zero at the 1%(5%) level.

Figure 12:

Table 5. Redistribution in the US 1990-2000		
year	Social Security Transfers/Gdp	Share of democratic vote
1990	0.100	0.520
1992	0.118	0.500
1994	0.117	0.450
1996	0.117	0.480
1998	0.110	0.470
2000	0.107	0.470

Figure 13:

Table 6. Preference for Redistribution

Year	2000		2002	
Stock Ownership	0	1	0	1
I Income Quintile	24.49	41.38	24.21	26.32
II Income Quintile	25.33	33.8	26.74	35.51
III Income Quintile	29.11	33.33	26.74	41.38
IV Income Quintile	33.02	40.86	30.38	43.93
V Income Quintile	26.47	55.96	40	54.59

Note: proportion of respondents that prefers less than or equal federal spending on social security with respect to the status quo by income quintiles and stock ownership status. Stock ownership is equal to 1 if respondent has any money invested in the stock market either in an individual stock or in a mutual fund.

Figure 14:

Table 7. Probit Regressions: Preference for Redistribution		
	2000	2002
Stock Owner	0.0565	0.0963
	[0.0305]*	[0.0335]***
II Income Quintile	-0.0348	0.0214
	[0.0431]	[0.0599]
III Income Quintile	-0.365	0.0423
	[0.0494]	[0.0640]
IV Income Quintile	0.0099	0.0623
	[0.0472]	[0.0630]
V Income Quintile	0.0983	0.1474
	[0.0552]*	[0.0684]**
Male	0.1144	0.0275
	[0.0258]***	[0.0285]
White	0.1057	0.1157
	[0.0303]***	[0.0344]***
Age	0.0006	-0.0003
	[0.0008]	[0.0009]
High School	0.0019	-0.0898
	[0.0471]	[0.0593]
College	0.1306	0.043
	[0.0538]**	[0.0640]
No. Obs.	1473	1260
Pseudo R2	0.0599	0.0522
LR Chi2 (10)	115.01	87.9

Note: Independent variable is equal to 1 if respondent prefers less than or equal federal spending on social security with respect to the status quo. The coefficients indicate the change in the probability for an infinitesimal change in each independent, continuous variable and the discrete change in the probability for dummy variables.
Standard errors are in brackets. * (**, ***) indicates that the coefficient is statistically different from zero at the 10% (5%, 1%) level.

Figure 15:

Table 8. Probit Panel: Preference for Redistribution	
	Random Effects Probit
Stock Owner	0.2768
	[0.1190]**
II Income Quintile	0.1177
	[0.1927]
III Income Quintile	0.2816
	[0.2147]
IV Income Quintile	0.3757
	[0.2093]*
V Income Quintile	0.6962
	[0.2284]***
Male	0.2847
	[0.1095]***
White	0.5392
	[0.1516]***
Age	0.0045
	[0.0036]
High School	-0.2149
	[0.2183]
College	0.3591
	[0.2330]
Constant	-1.7536
	[0.3391]***
No. Obs.	1696
No. Groups	848
Wald Chi2 (10)	92.16
Note: Independent variable is equal to 1 if respondent prefers less than or equal federal spending on social security with respect to the status quo, and equal to 0 otherwise. Standard errors are in brackets. * (**, ***) indicates that the coefficient is statistically different from zero at the 10% (5%, 1%) level.	

Figure 16: