Job security, attitude towards risk and preference for social insurance: A note on 'Earnings inequality and welfare spending' by Moene and Wallerstein[*]

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ABSTRACT

In a seminal 2003 article, Karl Moene and Michael Wallerstein show that richer citizens support higher spending in social policies targeting the unemployed, whereas they prefer lower spending in policies targeting the employed. This paper argues that this result is driven by two fundamental assumptions: citizens' coefficient of relative risk aversion (CRRA) is greater than one, and all citizens face the same probability of losing their jobs. By modelling the stylized fact that job security is positively correlated with income, we show that much higher levels of risk aversion may be needed for the rich to support higher spending in unemployment policy. Furthermore, a significant change in the distribution of job security – due to a sudden economic crisis, for example – may alter the way inequality affects preferences for social insurance, in such a manner that the rich switch to preferring lower spending in social policy than the poor.

Keywords: Risk aversion; job security; social insurance; economic inequality; economic shocks; preference ordering reversal.

I. INTRODUCTION

In a seminal paper published in World Politics in 2003, Karl Moene and Michael Wallerstein[1] present a political economy model of voting under uncertainty aimed at better understanding why

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[1] Moene and Wallerstein 2003, hereafter simply M&W.

there may be low support for welfare spending in a high-inequality society. That result contradicts the traditional theory on preferences for redistribution developed in the seminal papers by Thomas Romer and by Allan Meltzer and Scott Richard[2].

The theoretic result in M&W is especially important because it presents a situation where spending in social welfare policy may show "preference ordering reversal" in the sense that the richer a citizen is, the more he favors spending in welfare policy. The empirical consequence of this theoretic result is that as inequality increases and the median voter's income decreases with respect to mean income, a society may become less supportive of social welfare programs. In the words of M&W: "Instead of 'leaning against the wind,' a substantial share of welfare spending is better characterized as 'bending in the wind,' that is, declining as inequality increases."

M&W argue that the traditional literature focusses on pure redistribution, i.e., redistribution from the rich to the poor; however, a significant part of welfare policy provides insurance, i.e. protection against risk, rather than pure redistribution. The paper, then, extends the basic model of M&R to include insurance policy and obtains the new result.

M&W's important theoretic result hinges on two fundamental assumptions. First, it assumes that the coefficient of relative risk aversion (henceforth, CRRA) of citizens in greater than 1, which means that voters have high risk aversion. Second, it assumes that all citizens face the same probability of losing their jobs regardless of their income[3].

With respect to the first assumption, although somewhat controversial, there are, indeed, studies that estimate high values for the coefficient of relative risk aversion. Samih Azar and Vera Karaguezian-Haddad, for example, present estimates of CRRA values as low as 0.466 but also as high as 3.021. Nestor Gandelman and Rubén Hernández-Murillo use data form Gallup World Poll to estimate the CRRA for 75 countries and conclude that the values vary closely around one, supporting the seminal work of Kenneth Arrow. In his 1973 Econometrica paper, Shlomo Maital finds a range of evidence suggesting a CRRA around 1.5. Irwin Friend and Marshall Blume estimate it "on average well in excess of one and probably in excess of two". Similarly, Francesco Zanetti estimates values between 1 and 4 for the CRRA in a model where housing is an important

[2] Romer 1975; Meltzer and Richard 1981, hereafter simply M&R.

[3] Moene and Wallerstein 2001 present a model where there is heterogeneous risk of losing one's job in society. However, that variation is oversimplified, with the poor being permanently unemployed, the rich permanently employed, and the rest of society facing the same constant net probability of losing their jobs.

component of household consumption.[4]

Regarding the second assumption, however, there is clear empirical evidence that the probability of preserving one's job is positively related to wage. Indeed, the empirical literature on labor points to the stylized fact that higher wages correspond to more skilled tasks, which, in general, are scarcer, and, thereby, more stable. According to Francis Diebold, David Neumark, and Daniel Polsky, for example, "[…] retention rates have declined for high school dropouts and high school graduates relative to college graduates […]"[5]. More directly related to the present model, Philipp Rehm explains that "[…] the risk of unemployment and income level are negatively correlated (mainly because education determines both variables) […]"[6]. For Japan, Koji Takahashi classifies workers in two categories, the "regular employees", who typically enjoy the benefits of lifetime employment contracts and seniority-oriented pay systems and the "non-regular workers", who are employed under different terms. According to that research, non-regular workers receive lower wages and feel their jobs are less secure.[7]

The present paper further develops M&W's insights by including in the model this positive correlation between job security and wages, and analyses whether the richer citizens still prefer higher spending in unemployment insurance policies in this extended setup. The analysis shows, first, that if the CRRA is lower than 1, then citizens' preferences follow the typical M&R ordering, i.e., richer citizens prefer less social policy spending. This first result was anticipated in M&W's footnote 18, where the authors stress that the assumption of a CRRA greater than 1 is essential for their results. Second, and more importantly, our analysis also shows that the conventional M&R result may still hold for a CRRA greater than 1 when job security increases with income. An example illustrates that we may need a CRRA greater than 2 and as high as 6 for the rich to support

[4] Azar and Karaguezian-Haddad 2014, Gandelman and Hernández-Murillo 2015, Arrow 1971, pp. 97-98, Maital 1973, Friend and Blume 1975, Zanetti 2014. See also Chetty 2006, for estimations of CRRA around 1 based on labor supply elasticity estimates, with a median below one, and Choi and Menezes 1985, for an example of a value higher than 59. Also, see Kaplow 1996 for an extensive review of the literature on the estimation of relative risk aversion.

[5] Diebold et al. 1994.

[6] Rehm 2011. See also Faber 2011, Hall et al. 1970 and, Barth and Moene 2012.

[7] According to Takahashi 2015: "Non-regular workers face significant disparities between their working conditions and those of regular employees. Firstly, many non-regular workers feel that their jobs are not secure. In the Ministry of Health, Labor and Welfare's "General Survey on Diversified Types of Employment" (2010), the percentage of non-regular workers who responded that they were "satisfied" or "somewhat satisfied" with the "security of their employment" was 39.8% in comparison with 58.1% of regular workers. Secondly, there is a significant disparity in wages. The results of the 'Basic Survey on Wage Structure' (2014) by the Ministry of Health, Labour and Welfare reveal that while the average hourly wage of full-time regular employees who work for companies with ten employees or more is 1937.2 yen, the hourly wage for the non-regular workers of such companies in only 1228.8 yen."

higher spending in social insurance policy than the poor.

Therefore, our paper complements M&W suggesting that the conditions for the poor to support less unemployment insurance policies than the rich may be less likely to occur than originally thought. Furthermore, it highlights the fact that a reduction in support for welfare policy when inequality increases may not be due to the (ex post) targeting of the policy (the employed versus the unemployed citizens) but rather to the attitude towards risk in a society. The more risk-averse a society is, the more likely the "preference ordering reversal" occurs in that society.

It also highlights the role that a change in the overall economic conditions may play on the support for social insurance spending as inequality increases. Indeed, this paper presents evidence that a change in the distribution of job security may translate into a change in preference ordering for social insurance. More precisely, a society where jobs are relatively stable and, thereby the poor citizens are less concerned with supporting social insurance may switch to a typical society where the poor demand higher social insurance when stricken by an economic crisis. An example suggests that a society with the same level of risk aversion may change its reaction to increasing inequality depending on changes to the distribution of job security.

The remainder of this paper is organized as follows. Section 2 presents the political economy model and builds the optimization problem that yields a generic voter's ex-ante preferred level of expenditure for a social policy that could be either targeted to the employed or to the unemployed citizens. Section 3 solves that optimization problem for the case of a policy that exclusively targets the employed citizens, and shows that the typical preference ordering in which the poor want more public policy holds. Section 4 solves the optimization problem for the case of a policy that targets the unemployed, under different assumptions. The solutions highlight the importance of the distribution of unemployment risk in society and the attitude towards risk for citizens' preferences to display a preference ordering reversal. Section 5 discusses the role of sudden changes in the economic environment and shows that there may be a preference ordering reversal for the same unemployment policy and within the same society as a consequence of an economic shock. Finally, section 6 presents the main conclusions of the present research.

II. THE POLITICAL ECONOMY MODEL

THE PRIMITIVES OF THE MODEL

There is a continuum of citizens of mass one and two periods, 0 and 1. In period 0, citizens vote for a policy to be implemented in period 1. At the moment voter i takes his ballot, he holds a job that pays a wage ω_i. The distribution of wages among voters is described by a distribution function[8] $F(\omega_i)$. The mean wage value is $\omega = \int \omega_i \, dF_i$ and the maximum wage is $\widetilde{\omega}$.

In period 1, citizen i may keep his job or may lose it, in which case he receives no wage. The likelihood of keeping his job depends on the workings of the economy and on his own characteristics, such as health conditions, accidents, the type of job he holds or work performance. It is modelled here by a probability $\pi_i \in [0,1]$. Therefore, there is a probability $1 - \pi_i$ that citizen i will loose his job and receive zero wages in period 1[9]. There is no private unemployment insurance available[10].

The government collects taxes in period 1 and uses the collected resources to finance a public policy. In period 1 all citizens who maintain a job pay taxes according to the same tax rate $t \in [0,1]$. There is a deadweight loss of taxation that is modelled here as a function τ that reduces the amount of resources effectively available for public policy. Therefore, employed citizen i with income ω_i pays taxes $t\omega_i$ to the government but the effective amount that becomes available for public policy is $\tau(t)\omega_i$ where τ is a strictly concave twice differentiable function satisfying the following conditions[11]: $\tau(0) = 0; \tau'(0) = 1$ (there is no deadweight loss at $t = 0$); there exists $t_{max} < 1$ such that $\tau'(t_{max}) = 0$ (increasing the tax rate above t_{max} will only decrease government revenue[12]).

The total amount effectively collected by the government is used to fund the public policy, which is a lump sum transfer $s\omega, s \in [0,1]$, that could be targeted either to the employed citizens or to the unemployed ones. The policy targeting employed citizens is expected to mirror the typical

[8] M&W assume that the distribution of wages is log normal. No such assumption is needed in the present paper.

[9] As explained before, M&W assume that all citizens face the same probability of keeping their jobs, i.e., $\pi_i = \pi, \forall i$. This paper shows that changing that assumptions strongly affects the ordering of agents' preferences for social insurance policy according to their incomes.

[10] If there were private unemployment insurance opportunities, then one would expect the rich to be the most likely to use them and, therefore, one would expect the rich to be still less inclined to support a public unemployment insurance policy.

[11] The present paper borrows these assumptions from M&W in order to make the comparison between the two papers clearer. However, the sole effect of these hypotheses is to assure an internal solution for the citizen's preferred policy. An alternative, simpler way to model the deadweight loss of taxation is to apply a linear reduction factor $\delta \in (0,1)$, so that, if a citizen pays $t\omega_i$, only the amount $\delta t\omega_i$ becomes available for funding the public policy. All qualitative results in this paper remain true for the simplified modeling strategy.

[12] Note that, since τ is strictly concave, it is strictly increasing on $[0, t_{max}]$, the only relevant range of choices for t.

redistribution policies, whereas the policy targeting the unemployed is expected to reflect society preferences for social insurance[13].

Let δ be the Kronecker-type indicator function that takes value one if the policy is an insurance to the unemployed and zero if it is a redistribution to the employed citizens. A citizen i has von Neumann-Morgenstern utility function $u(w)$, where w is his wealth in period 1, which is a random variable assuming value $w = (1-t)\omega_i + (1-\delta)s\omega$ with probability π_i – when he maintains his employment – and value $w = \delta s\omega$ with probability $1-\pi_i$ – when he loses his job.[14] The utility $u(w)$ is assumed to be a twice continuously differentiable, strictly increasing and strictly concave function with $u(0) = 0$.

Therefore, if policy s is implemented in period 1, financed by the tax rate t, citizen i's expected utility is given below.

$$U_i(t,s) = \pi_i u((1-t)\omega_i + (1-\delta)s\omega) + (1-\pi_i)u(\delta s\omega) \qquad (1)$$

Knowing the policy type (i.e., $\delta = 1$ or 0), in period 0 each citizen votes for the size s of that policy that maximizes his expected utility, taking into consideration that the policy will be financed by income taxation. Equivalently, each citizen votes for the tax rate that maximizes his expected utility, taking into consideration that the collected tax will finance the policy benefits.

THE EXPECTED GOVERNMENT BUDGET CONSTRAINT

Since citizen i keeps his job with the probability π_i, the expected government revenue from taxes is given below.

$$\int \pi_i \tau(t)\omega_i dF_i = \tau(t) \int \pi_i \omega_i dF_i$$

Recall that $\omega = \int \omega_i dF_i$ is the average[15] income in the economy if there were no unemployment, i.e., in the hypothetical case of full employment. Naturally, $\omega > \int \pi_i \omega_i dF_i$, the

[13] The two policy types follow M&W's approach. In addition to these two possible policies, M&W also include a possible mix or the two policies, whereby one part of public resources would be transferred to the employed citizens and another part would be transferred to the unemployed citizens. However, their analysis of that policy is made only when the same amount is transferred to each citizen of each of the two categories, employed and unemployed. Therefore, this is precisely the universal redistribution case. We discuss that case in the online appendix.

[14] For simplicity, the model assumes away the possibility of transferring income from period 0 to period 1 and focuses on period 1.

[15] Here average income and total income are equivalent concepts because the population has mass 1.

average income of the actually employed citizens. Let $\Pi = \frac{\int \pi_i \omega_i dF_i}{\omega} = \int \pi_i \frac{\omega_i}{\omega} dF_i$, then $0 < \Pi < 1$. The parameter Π can be interpreted as the average probability of keeping a job in society, weighted by wage relative to average wage. Therefore, we can write $\Pi\omega = \int \pi_i \, \omega_i dF_i$ and the government's revenue can be simply rewritten as $\tau(t)\Pi\omega$.

Let now $\overline{\Pi} = \int \pi_i \, dF_i$ be the non-weighted average probability of keeping a job. Then, the expected government expenditure is:

$$(1-\delta)\int \pi_i s\omega dF_i + \delta \int (1-\pi_i)\, s\omega dF_i = (1-\delta)\overline{\Pi} s\omega + \delta\big(1-\overline{\Pi}\big)s\omega = \big[\delta - \overline{\Pi}(2\delta - 1)\big]s\omega$$

Therefore, the expected budget constraint of the government can be written as follows.

$$\tau(t)\Pi\omega = \big[\delta - \overline{\Pi}(2\delta - 1)\big]s\omega$$

Equivalently,

$$s = \frac{\Pi}{\delta - \overline{\Pi}(2\delta - 1)}\tau(t) \qquad (2)$$

A VOTER'S PREFERRED POLICY

Let $\lambda = \lambda\big(\delta, \Pi, \overline{\Pi}\big) = \frac{\Pi}{\delta - \overline{\Pi}(2\delta - 1)}$. Then, from expressions (1) and (2) voter *i*'s maximization problem can be written as below.

$$\max_{t,s} U_i(t,s) = \pi_i u((1-t)\omega_i + (1-\delta)s\omega) + (1-\pi_i)u(\delta s\omega)$$

subject to: $s = \lambda\tau(t)$

Plugging in s into the objective function yields the following reduced maximization problem.

$$\max_{t} U_i(t) = \pi_i u((1-t)\omega_i + (1-\delta)\lambda\tau(t)\omega) + (1-\pi_i)u(\delta\lambda\tau(t)\omega) \qquad (3)$$

Therefore, voter *i*'s preferred tax policy, t_i, is the tax rate t that solves equation (3). In order to analyze specifically each one of the policies, redistributive and insurance, let us consider separately the cases $\delta = 1$ and $\delta = 0$.

III. PREFERENCES FOR A POLICY TARGETING THE EMPLOYED CITIZENS

Suppose first that the policy targets exclusively the employed citizens. Then $\delta = 0$ and $\lambda = \lambda\left(0, \Pi, \overline{\Pi}\right) = \frac{\Pi}{\overline{\Pi}}$. Therefore, voter i's maximization problem becomes:

$$\max_t U_i(t) = \pi_i u\left((1-t)\omega_i + \frac{\Pi}{\overline{\Pi}}\tau(t)\omega\right) \tag{3'}$$

Since u is a strictly increasing function, this maximization problem is equivalent to:

$$\max_t \ (1-t)\omega_i + \frac{\Pi}{\overline{\Pi}}\tau(t)\omega$$

The solution to that problem is:

$$t_i^*(\omega_i) = (\tau')^{-1}\left(\frac{\overline{\Pi}}{\Pi}\frac{\omega_i}{\omega}\right)$$

Since $(\tau')^{-1}$ is decreasing, the higher i's income is, the lower is i's preferred tax rate.

This result is consistent with M&R and with M&W's Claim 1[16]. Therefore, the present paper supports the argument that, when a policy is typically redistributive, the richer a citizen is, the less spending in that policy he favors. This is, indeed, the traditional preference ordering in society where poorer citizens favor bigger governments and greater intervention in the economy.

However, one may find that such a policy, that would be redistributive but discriminatory against precisely the poorer citizens, i.e., those who lose their jobs, may not be such a reasonable model for real world policy. If one adopts the assumption that redistribution benefits all citizens equally, even the unemployed ones, then it can be proved that if the CRRA is high enough, then citizens with income above average do prefer higher expenditure in that policy as their income increase. This result is related to Claim 3 in M&W and the proofs are detailed in the Online Appendix.

The divergence between the present paper and M&W appears more clearly in their Claim 2 that refers to the unemployment insurance policy.

[16] Note that in M&W's Claim 1, since $\pi_i \equiv \pi, \forall i$, then $\Pi = \overline{\Pi}$ and those who have below average income prefer higher taxes and those with above average income prefer lower taxes.

IV. PREFERENCES FOR A POLICY TARGETING THE UNEMPLOYED CITIZENS

Suppose first that the policy targets exclusively the unemployed citizens. Then $\delta = 1, \lambda = \lambda\left(1, \Pi, \overline{\Pi}\right) = \frac{\Pi}{1-\overline{\Pi}}$. Therefore, voter i's maximization problem becomes:

$$\max_t U_i(t) = \pi_i u((1-t)\omega_i) + (1-\pi_i)u\left(\frac{\Pi}{1-\overline{\Pi}}\tau(t)\omega\right) \qquad (3")$$

Hence, voter *i*'s preferred tax rate must satisfy the following first order condition.

$$U_i'(t) = \pi_i(-\omega_i)u'((1-t)\omega_i) + (1-\pi_i)\frac{\Pi}{1-\overline{\Pi}}\tau'(t)\omega u'\left(\frac{\Pi}{1-\overline{\Pi}}\tau(t)\omega\right) = 0$$

That condition can be rewritten as:

$$\frac{\Pi}{1-\overline{\Pi}}\tau'(t)\omega u'\left(\frac{\Pi}{1-\overline{\Pi}}\tau(t)\omega\right) = \frac{\pi_i}{1-\pi_i}\omega_i u'((1-t)\omega_i) \qquad (4)$$

Therefore, voter *i*'s preferred tax policy, t_i, is the tax rate t that solves equation (4).

Note that, in addition to the tax policy t, the left-hand side of equation (4) depends exclusively on global, economy-wide parameters. However, the right-hand side depends on voter i's own characteristics π_i and ω_i. Our goal is to understand how the preferred policy t_i changes as voter i's characteristics change without affecting the aggregate parameters of the economy.

Define $h(\pi_i) = \frac{\pi_i}{1-\pi_i}$ and $f(\omega_i) = \omega_i u'\left((1-t)\omega_i\right)$. Then, equation (4) can be rewritten as:

$$\frac{\Pi}{1-\overline{\Pi}}\tau'(t)\omega u'\left(\frac{\Pi}{1-\overline{\Pi}}\tau(t)\omega\right) = h(\pi_i)f(\omega_i) \qquad (5)$$

This expression makes it clear that the right-hand side of equation (5) may change either due to a change in the voter's job security, π_i, or in the voter's income ω_i, or both parameters. We will analyze different possibilities for those changes, starting with the situation analyzed in M&W's Claim 2.

THE HOMOGENEOUS JOB SECURITY CASE WITH HIGH RISK AVERSION

Suppose first, in order to replicate M&W's Claim 2, that all citizens face the same probability of

being employed, i.e., $\pi_i =: \pi, \forall i$. In this case, $\Pi = \overline{\Pi} = \pi$ and $h(\pi_i) = \frac{\pi_i}{1-\pi_i} = \frac{\pi}{1-\pi}, \forall i$.

Therefore, voter i's first order condition may be rewritten as:

$$\tau'(t)\omega u'\left(\frac{\pi}{1-\pi}\tau(t)\omega\right) = f(\omega_i) \qquad (5')$$

Suppose, furthermore, that voters' von Neumann-Morgenstern utility u has (constant) coefficient of relative risk aversion (CRRA) greater than one. Then, function f is strictly decreasing[17] in ω_i.

Now, suppose there is an increase exclusively in voter i's wage ω_i, that does not affect the aggregate parameters of the economy π and ω. Then, the right-hand side of equation (5') decreases. Since u is a strictly concave function, u' is strictly decreasing, and it must be the case that the preferred taxation $t_i^* = t(\omega_i)$ increases.

Therefore, the richer the voter, the more he favors expenditure in public policy. We say that in this case there is a "preference ordering reversal" in the sense that support for public expenditure in welfare policy switches from the typical ordering in which the poorer the citizen is, the more of it he wants, to the reverse ordering in which the poorer a citizen is, the less of it he wants.

Regardless of the preference ordering reversal, the Median Voter Theorem applies, and the policy preferred by the median voter is a Condorcet winner. In particular, if inequality increases and the median voter's income reduces relatively of the mean voter's income, then society as a whole will favor lower spending in the unemployment insurance policy in a voting equilibrium.

This result opposes the traditional M&R outcome and corresponds to Claim 2 in M&W. However, the clear-cut result hinges on two important assumption, the assumption of homogeneous job security and the assumption that voters' utilities have CRRA greater than one[18].

Next we explore briefly what happens when the CRRA is lower than 1. In that case, f becomes strictly increasing in ω_i. Then, by a completely symmetric argument, we conclude that the

[17] Indeed, $f'(\omega_i) = u'\big((1-t)\omega_i\big) + (1-t)\omega_i u''\big((1-t)\omega_i\big)$. Therefore, $f'(\omega_i) < 0$ if and only if: $-\frac{(1-t)\omega_i u''\big((1-t)\omega_i\big)}{u'\big((1-t)\omega_i\big)} = CRRA\left(\big(1-\tau(t)\big)\omega_i\right) > 1$.

[18] M&W make clear the need for a greater than one CRRA is footnote 18. Moreover, the paper highlights in page 495 that the preference ordering reversal depends on the homogeneous job security hypothesis.

preferred taxation $t_i^* = t(\omega_i)$ is decreasing in income. Therefore, when voters risk aversion is below 1, then the conventional M&R preference ordering in society is recovered, i.e., the poorer citizens favor higher spending in unemployment insurance policy.

Next section relaxes the homogeneous job security hypothesis.

THE HETEROGENEOUS JOB SECURITY CASE

Return now to the general model where a voter i remains employed with probability π_i. Considering the evidence discussed in the introduction[19], assume that $\pi_i = \pi(\omega_i)$ is an increasing function of wage. Then, the function $h(\pi_i) = h\big(\pi(\omega_i)\big)$ is itself an increasing function of income.

Recall the first order condition (5):

$$\frac{\Pi}{1-\overline{\Pi}}\tau'(t)\omega u'\left(\frac{\Pi}{1-\overline{\Pi}}\tau(t)\omega\right) = h\big(\pi(\omega_i)\big)f(\omega_i) = \frac{\pi_i}{1-\pi_i}\omega_i u'((1-t)\omega_i) \qquad (5)$$

Suppose, first, that voters' utilities have CRRA lower that one. Then, as seen before, $f(\omega_i)$ is an increasing function. Therefore, the right-hand side of (5) increases with income. But then, by a similar argument, we conclude that the preferred taxation $t_i^* = t(\omega_i)$ in decreasing in wage. Therefore, the traditional preference ordering in which poorer citizen favor more public policy remains true when job stability is positively correlated with wage.

Suppose now that voters' utilities have CRRA greater than one. Then, the right-hand side of (5) is a product of two functions of wage, one increasing (h) and the other one decreasing (f). The composed effect of an increase in wage is not clear. However, the analysis of the homogeneous job security, where the function h is constant, shows that it is a higher degree of risk aversion that causes the preference ordering reversal: when risk aversion is small (CRRA lower than one), then poorer citizens want more spending in unemployment insurance, whereas when risk aversion is sufficiently high (CRRA higher than 1), then poorer citizens favor less spending in that policy.

Now, the function h bends towards the traditional preference ordering. Therefore, we may expect that still higher degrees of risk aversion will be needed in order to obtain a preference ordering reversal. The following numerical example is compatible with that expectation.

[19] And also acknowledged in page 495 of M&W: "[…] the probability of being laid-off is higher for low-wage workers".

A NUMERICAL EXAMPLE

Consider the following parameterization of the primitives of the model.

Citizens' utilities are given by $u(\omega_i) = \frac{1}{1-R}\omega_i{}^{1-R},\ R > 1$.The parameter R is precisely the Arrow-Pratt coefficient of relative risk aversion of the citizen, as it can easily be verified.

Citizens' probabilities of keeping their jobs are given by $\pi_i = \alpha\frac{\omega_i}{\widetilde{\omega}}$, where $\widetilde{\omega}$ is the highest wage in society and the parameter $\alpha, 0 < \alpha < 1$ is the probability of securing the highest paid job, the highest possible value for π_i. Therefore, no job in 100% secure in this society, although the closest the parameter α is to 1, the more secure jobs are in general.

Under this parameterization, the right-hand side of equation (5) can be rewritten as below.

$$RHS(\omega_i) = (1-t)^{-R}\frac{\alpha\omega_i{}^{2-R}}{\widetilde{\omega} - \alpha\omega_i}$$

We wish to determine under which conditions $RHS(\omega_i)$ is an increasing function of ω_i and under which conditions it is decreasing. Taking derivatives with respect to ω_i yields:

$$RHS'(\omega_i) = (1-t)^{-R}\alpha\omega_i{}^{1-R}\frac{(2-R)(\widetilde{\omega} - \alpha\omega_i) + \alpha\omega_i}{(\widetilde{\omega} - \alpha\omega_i)^2}$$

Therefore, the sign of $RHS'(\omega_i)$ is exactly the sign of $(2-R)(\widetilde{\omega} - \alpha\omega_i) + \alpha\omega_i$. Hence, we can easily check that following statements.

(i) If $1 < R < 2$, $RHS(\omega_i)$ is increasing in ω_i and society preferences display the traditional M&R's ordering, so that the richer a citizen is, the less he supports social policies.

(ii) If $R > 2 + \frac{\alpha}{1-\alpha}$, then $RHS(\omega_i)$ is decreasing in ω_i and there is preference ordering reversal in society, so that the richer the citizen is, the more he favors social policies. For example, if $\alpha = 0.8$, i.e., the richest citizen has a probability of 80% of keeping his jobs, then, the richer citizens favor higher spending in unemployment insurance if $R > 6$. If α reduces to 0.5, then it is sufficient that $R > 3$ for that result to hold.

(iii) If $2 < R < 2 + \frac{\alpha}{1-\alpha}$, then there exists $\widehat{\omega} = \frac{1}{\alpha}\frac{R-2}{R-1}\widetilde{\omega}$ such that:

If $\omega_i < \widehat{\omega}$, then $RHS'(\omega_i) < 0$ (locally reversed ordering)

If $\omega_i = \widehat{\omega}$, then $RHS'(\omega_i) = 0$.

If $\omega_i > \widehat{\omega}$, then $RHS'(\omega_i) > 0$ (locally traditional ordering).

Therefore, for intermediate values of risk aversion, then low-income citizens ($\omega_i < \widehat{\omega}$) still prefer less public policy as their income increase whereas high-income citizens prefer more public policy as their income increase, i.e., there is preference ordering reversal only for the richer citizens.

In conclusion, in this simple parameterized model, the higher the agents' relative degree of risk aversion is, the more likely the richer voters will support higher unemployment benefit policies. However, our parametrization suggests that risk aversion in society needs to be quite high, with CRRA higher than 3 even when there is a probability of 50% that the high-income citizen will lose his job, for a preference ordering reversal to occur.

This parametrization also highlights the intricated relationship between the distribution of job security, attitude towards risk and preference ordering reversal. It suggests that a change in the distribution of job security due, for example, to a sudden crisis, may affect how society behaves towards unemployment insurance policy. Next section extends this original analysis to generate more insights on that relationship.

V. ECONOMIC SHOCKS AND PREFERENCE-ORDERING REVERSAL

The present model adds to the literature on preferences for public policy the possibility of reversed preference ordering in the sense that poorer citizens prefer less insurance compensation than richer ones. The main rationale for that outcome resides in the risk aversion of agents. Indeed, richer citizens may need higher compensations in order to smooth consumption throughout the different states of nature (employed & unemployed). Therefore, the unemployment risk structure in a society may affect and, at the end of the day, define the ordering of preferences in that society.

In our model, the parameter that incorporates risk is the probability of keeping one's job, π_i. Furthermore, the way to introduce an economic shock in the model is to change the distribution of risk $\{\pi_i\}$ in society. The purpose of this section is to investigate how changes on the distribution of risk $\{\pi_i\}$ may affect the preference ordering for unemployment insurance. We start, in the next section, analyzing the equilibrium effect of a global shock to job security. Then we show, by means of an analytic example, how such a shock may bring about a reversal of preference ordering.

THE ROLE OF AGGREGATE CONSUMER CONFIDENCE

So far, this article's analyses focused on individual preferences, and the effect on preferences for unemployment policy of changes in income. In certain situations, however, there may be aggregate shocks that affect the entire society. The 2008 financial crisis, for example, reduced overall world trade, affecting job prospects for all individuals, most especially in countries that depended heavily on exports. This section aims at studying such a situation in which the entire society becomes less (or more) confident in the future of the economy.

The solution to a voter's problem in the more general case where job security is positively correlated with wage highlighted a possible tension where a function $h(\pi(\omega_i))$ was increasing in wage and another function $f(\omega_i)$ was decreasing when the voter's CRRA was greater than 1. However, if that tension results in a monotonic product $h\big(\pi(\omega_i)\big)f(\omega_i)$, as in the parametrization used in the previous section, then the Median Voter Theorem still applies, so that the policy t_M preferred by the citizen with median wage ω_M is a Condorcet winner. The Condorcet winner policy t_M is the solution t to the following equation, where we replaced ω_i with the median salary, ω_M, and π_i with the corresponding median probability of keeping one's job, π_M, in equation (5).

$$\frac{\Pi}{1-\overline{\Pi}}\tau'(t)\omega u'\left(\frac{\Pi}{1-\overline{\Pi}}\tau(t)\omega\right) = h\big(\pi(\omega_M)\big)f(\omega_M) = \frac{\pi_M}{1-\pi_M}\omega_M u'((1-t)\omega_M) \qquad (5")$$

Suppose now that the entire society suffers a confidence shock so that, although higher paid workers retain higher probabilities of keeping their jobs, there is an overall reduction in job stability. This would happen, for example, during a sudden world crisis that affects an entire country's economic prospects. In the present framework, this could be modeled, for instance, by an overall shift in π_i, for example to $\pi_i' = \pi_i(1-\varepsilon)$, for every citizen i, where $0 < \varepsilon < 1$ measures the magnitude of the shock. More generally, one could have heterogeneous effects of the shock on citizens, $\pi_i' = \pi_i(1-\varepsilon_i)$, as long as ε_i is nonincreasing in income ω_i, i.e., lower paid jobs are more heavily affected by the shock. Suppose this shock affects only consumer confidence, i.e., the probabilities π_i, but do not affect the (ex ante, full employment) distribution of income, $F(\omega_i)$.

In that case, if the right-hand side of equation (5") is still monotonic, the median voter theorem applies and the median income citizen still determines the Condorcet winning policy according to (5"). However, the overall reduction in economic confidence changed some of the parameters in

equation (5”).

The lower economic confidence does not affect $\omega = \int \omega_i \, dF_i$, however, it does reduce $\Pi = \int \pi_i \frac{\omega_i}{\omega} dF_i$ and $\overline{\Pi} = \int \pi_i \, dF_i$. Therefore, it reduces $\frac{\Pi}{1-\overline{\Pi}}$.

Let $g(\theta) = \theta u'(\theta\tau(t))$. Then, it can easily be seen that the hypothesis of high relative degree of risk aversion implies that g is a decreasing function. But the left-hand side (LHS) of equation (5”) is precisely $\tau'(t)g\left(\frac{\Pi}{1-\overline{\Pi}}\omega\right)$. Therefore, the LHS of (5”) increases as overall economic confidence decreases. Therefore, the FOC can be rewritten as:

$$\tau'(t)g\left(\frac{\Pi}{1-\overline{\Pi}}\omega\right) = \frac{\pi_M}{1-\pi_M}\omega_M u'((1-t)\omega_M)$$

Consider now the equilibrium policy τ_M that solves equation (5”) after a decrease in $\frac{\Pi}{1-\overline{\Pi}}$. Since the LHS increased, τ_M cannot remain constant. If τ_M were to decrease, then the LHS would further increase, whereas the RHS would decrease, which is a contradiction. Therefore, τ_M must increase for (5”) to hold.

Therefore, if overall consumer confidence deteriorates, then society wants to increase taxation financing of unemployment benefits. Conversely, it is straightforward to check that if overall consumer confidence improves, then society unambiguously wants to reduce taxation financing of unemployment benefits. Note that these results are true regardless of the original ordering of society’s preferences.

DISTRIBUTION OF RISK AND PREFERENCES FOR REDISTRIBUTION

This section explores the effect of the distribution of risk in society on the preference ordering for unemployment insurance, by means of a specific parameterization of our model. Suppose, as we did in the previous example, that citizens’ utilities are given by $u(\omega_i) = \frac{1}{1-R}{\omega_i}^{1-R}, R > 1$, where R is the common Arrow-Pratt coefficient of relative risk aversion.

Suppose, however, that the risk structure in the economy is given by the more general form $\pi_i(\beta) = \alpha\left(\frac{\omega_i}{\widetilde{\omega}}\right)^{\beta}$, where $\widetilde{\omega}$ is the income of the richest citizen and $\beta \geq 0$.

The parameter β reflects the level of risk inequality in society. The extreme case where $\beta = 0$ is homogeneous job security that we studied in the beginning of section 4, with all citizens keeping

their job with the same probability α. As β increases, so does risk inequality. Indeed, the ratio of the expected income of a citizen with income ω_i to the expected income of the richer citizen[20] is $\frac{\pi_i \omega_i}{\tilde{\pi}\,\tilde{\omega}} = \frac{\alpha\left(\frac{\omega_i}{\tilde{\omega}}\right)^{\beta}\omega_i}{\alpha\tilde{\omega}} = \left(\frac{\omega_i}{\tilde{\omega}}\right)^{1+\beta}$, which converges to 0 as β increases. The parameter β represents a shock in the distribution of risk inequality in society. If $\beta = 1$, then there is no shock and the distribution of risk remains the same before and after the "shock": $\pi_i(1) = \alpha\frac{\omega_i}{\tilde{\omega}} = \pi_i$. If $\beta > 1$ there is a negative shock (economic crisis) that increases risk inequality and if $\beta < 1$ there is a positive shock (sustained growth) that decreases risk inequality in society.

Figure 1 presents a graphic illustration of parameter β's effect on the distribution of risk. The X-axis displays ex-ante wages, which vary from 0 to $\tilde{\omega}$. The Y-axis displays the corresponding expected ex-post wages, which vary from 0 to $\alpha\tilde{\omega}$. The case $\beta = 1$ corresponds to the absence of shock, so that the original distribution of risk is maintained. For $\beta > 1$ there is an increase in risk inequality and that increase is the more pronounced the higher β is. We interpret that situation as a negative economic shock. Conversely, for $\beta < 1$ there is a decrease in risk inequality, which is the more pronounced the smaller β is. We interpret that situation as a positive economic shock. The extreme case where $\beta = 0$ corresponds to the (theoretic) situation where all agents face the same probability $\pi_i = \alpha$.

Consider now the first order condition (5). Given the current parameterization, we can write its RHS as:

$$RHS(\omega_i) = h\big(\pi(\omega_i)\big)f(\omega_i) = (1-t)^{-R}\frac{\alpha{\omega_i}^{1+\beta-R}}{\tilde{\omega}^{\beta} - \alpha\omega_i^{\beta}}$$

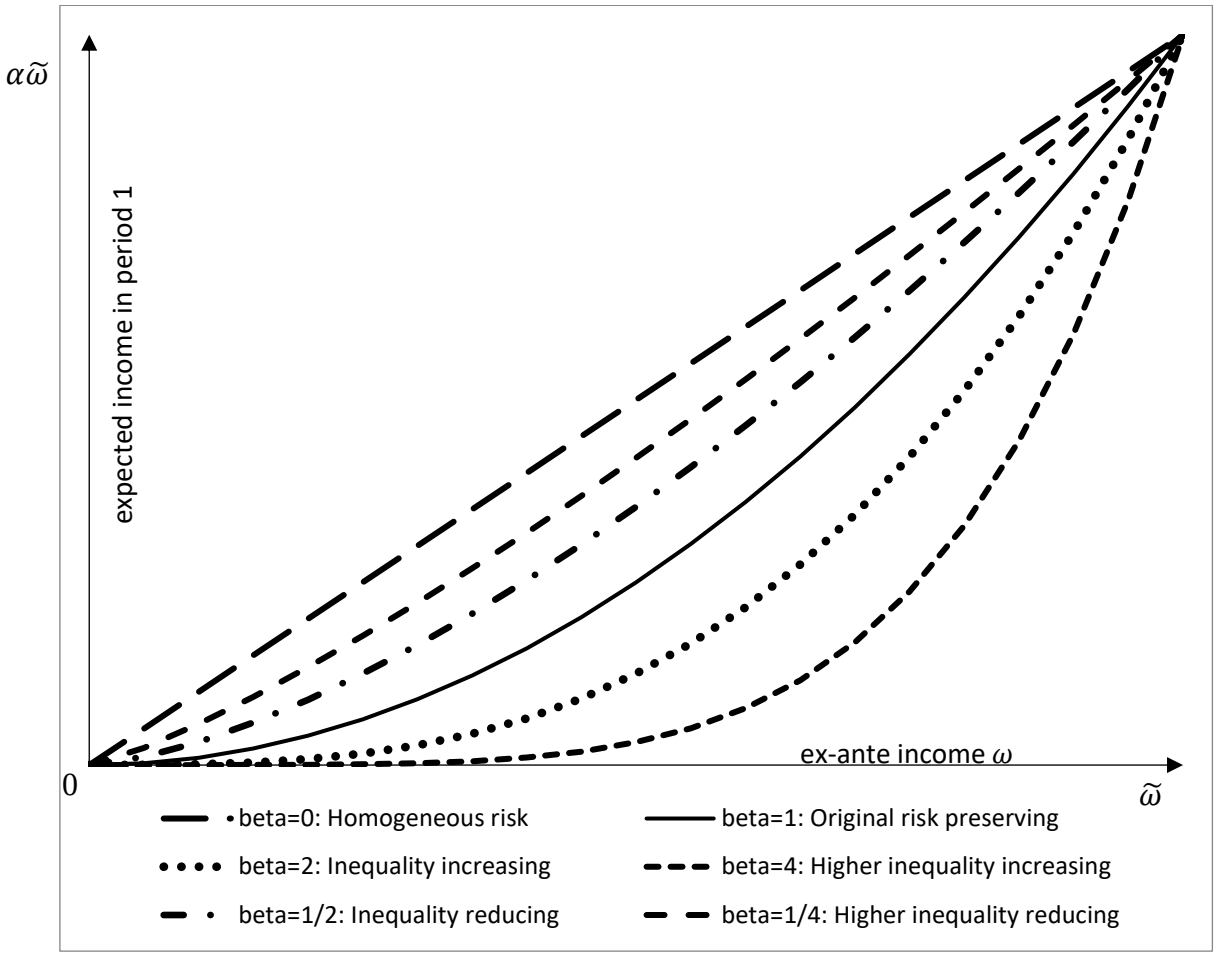
Taking derivatives with respect to y_i yields:

$$RHS'(\omega_i) = (1-t)^{-R}\alpha{\omega_i}^{\beta-R}\frac{(1+\beta-R)\left(\tilde{\omega}^{\beta} - \alpha\omega_i^{\beta}\right) + \alpha\beta\omega_i^{\beta}}{(\tilde{\omega} - \alpha\omega_i)^2}$$

Therefore, the sign of $RHS'(\omega_i)$ is the same as the sign of $(1+\beta-R)\left(\tilde{\omega}^{\beta} - \alpha\omega_i^{\beta}\right) + \alpha\beta\omega_i^{\beta}$.

[20] A similar expression holds for the comparison between two citizens with respective incomes ω_i and ω_j.

Figure 1: The effect of economic shocks on the distribution of risk in society



Source: Authors' calculations.

Hence,

(i) If $1 < R < 1 + \beta$, then $RHS(\omega_i)$ is increasing in ω_i and society preferences display the traditional M&R (1981)'s ordering, so that the richer a citizen is, the less he supports social policies.

(ii) If $R > 1 + \beta + \beta\frac{\alpha}{1-\alpha}$, then $RHS(\omega_i)$ is decreasing in ω_i and there is preference ordering reversal in society, so that the richer the citizen is, the more he favors social policies.

(iii) If $1 + \beta < R < 1 + \beta + \beta\frac{\alpha}{1-\alpha}$, then, there exists $\widehat{\omega} = \left[\frac{1}{\alpha}\frac{R-(1+\beta)}{R-1}\right]^{\frac{1}{\beta}}\widetilde{\omega}$ such that:

If $\omega_i < \widehat{\omega}$, then $RHS'(\omega_i) < 0$.

If $\omega_i = \widehat{\omega}$, then $RHS'(\omega_i) = 0$.

If $\omega_i > \widehat{\omega}$, then $RHS'(\omega_i) > 0$.

Alternatively,

(i) If $\beta > R - 1$, then we have the traditional ordering where the richer a citizen is, the less unemployment policy he prefers.

(ii) If $\beta < (1-\alpha)(R-1)$, then we have the reversed ordering where the richer a citizen is, the more unemployment policy he favors.

(iii) If $(1-\alpha)(R-1) < \beta < R-1$, then there exists $\widehat{\omega} = \left[\frac{1}{\alpha}\frac{R-(1+\beta)}{R-1}\right]^{\frac{1}{\beta}}\widetilde{\omega}$ such that:

If $\omega_i < \widehat{\omega}$, then $RHS'(\omega_i) < 0$ and there are locally reversed preferences.

If $\omega_i = \widehat{\omega}$, then $RHS'(\omega_i) = 0$.

If $\omega_i > \widehat{\omega}$, then $RHS'(\omega_i) > 0$ and there are locally traditional preferences.

Therefore, depending of the relationship between the shock β and the CRRA R, society may display the traditional preference ordering for unemployment policy, the reversed preference ordering or social preferences may not be fully ordered, so that for poorer citizens the reversed ordering holds, whereas for richer citizens the traditional ordering remains true.

Now recall that the higher β is, the more inequality-increasing is the unemployment risk "technology". Therefore, the more inequality-increasing the distribution of risk in society is, the more likely society favors high expenditure in unemployment insurance, the traditional preference ordering.

We are now able to evaluate the role of economic shocks. Suppose society is in a relative homogeneous risk situation at the outset. This may be due to a prolonged period of economic growth that reduced overall unemployment risk, for example. In the present model, this corresponds to smaller values of β compared to R. Then, it is likely we are in case (ii) above, i.e., that society displays inversed preference ordering, so that the median voter favors less unemployment insurance than the rich citizens. In that society, an increase in inequality that does not affect the distribution of unemployment risk makes the median voter support lower levels of unemployment insurance.

Suppose, furthermore, that the country is hit by a negative shock, which corresponds to an

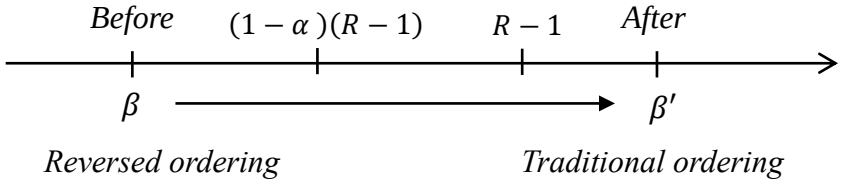
increase in β to $\beta' > \beta$. If β' is large enough, then it may be the case that $\beta' > R - 1$, so that society may turn back to the traditional preference ordering, in which case the median voter values more government spending in unemployment insurance. In that society, a subsequent increase in inequality that does not affect the distribution of unemployment risk makes the median voter prefer higher spending in the unemployment policy.

Therefore, a negative shock may generate a preference reversal, in such a way that before the shock the richer citizens supported higher unemployment insurance whereas after the shock the biggest supporters for unemployment insurance are the poorer citizens. Figure 2 below illustrates that situation.

Note that a symmetrical situation may arise in the case of a positive shock. In that case, the economic recovery may produce a reversal from a situation where the poorer citizens were the highest supporters of unemployment insurance towards a situation where the richer citizens become the highest supporters.

Finally, it may also be the case that the shock is not strong enough to produce any preference ordering reversal. Therefore, in addition to the preference ordering at a given point in time, also the dynamics of preference ordering becomes a matter of empirical research. In order to illustrate these static and dynamic issues, the following sections analyze preference-ordering dynamics for the case of Brazil, based on LAPOP's social values surveys.

Figure 2: The effect of negative economic shocks on preference for redistribution ordering



Source: Authors' calculations.

The present paper's findings suggest a new interpretation of Brazil recent history. By the turn of the century Brazil experienced high and sustainable growth. Expectations were very positive, and experts advanced the hypothesis that Brazil would be one of the few nations "likely to grow into a developed economy because it is in the process of becoming an open, inclusive and fiscally

sound society"[21]. However, the 2008 Financial Crisis reached the country (with a delay) with successive GDP depressions or stagnation, leading to the impressive spontaneous mass street demonstrations of 2013[22]. The interpretation of that situation in the light of the present model is that before 2008, the sustained economic growth was a positive shock that produced the reversed preference ordering, so that the median voter was less favorable to social policy. However, the 2008 International Financial Crisis was a negative shock on the distribution of job risk that induced the poorer citizens to favor more government spending. Unfortunately, the government did not anticipate this change in preference ordering that led, initially, to the street protests and, ultimately, to the impeachment of president Dilma Rousseff. A detailed econometric case study based on the Latin American Public Opinion Project (LAPOP), Vanderbilt University, is presented in the *Online Appendix* of this paper.

VI. CONCLUSION

The present article aims at understanding, from a theoretic point of view, the delicate relationship between attitude towards risk, employment security, economic shocks and preferences for government unemployment insurance.

A first theoretic result shows that this relationship is not straightforward and depends basically on two aspects of an individual's preferences: the individual probability of keeping one's job and the degree of risk aversion.

When we posit the usual hypothesis that the probability of keeping one's job is positively correlated with income, then if risk aversion is low in society (i.e. the coefficient of relative risk aversion, CRRA, is below 1, as it is often suggested by the labor literature), then preferences for public unemployment insurance follows the typical redistribution model of Allan Meltzer and Scott Richard[23], i.e., the poorer a citizen is, the more he favors public expenditure.

On the other hand, in an environment with higher risk aversion (i.e. CRRA above 1, as sometimes suggested in the finance literature) there may be a different preference ordering in society where the richer citizens are the ones who prefer higher expenditure in unemployment

[21] From the book review Weller 2017. See also Fishlow 2011 and Alston et al. 2017.
[22] Bugarin and Silva 2014.
[23] Meltzer and Richard 1983.

insurance policy, a result compatible with a claim made by Karl Moene and Michael Wallerstein[24]. We say, in this case, that there is "preference ordering reversal". However, contrary to that paper's claim, it is not enough to have a CRRA higher than 1 for the preference reversal to be obtained. Indeed, depending on the relationship between wage and the probability of losing a job in society, the CRRA needed to produce a preference reversal may be as high as 6, even in the context of the pure job unemployment insurance policy, i.e., when welfare policy targets exclusively the unemployed.

Therefore, this paper challenges Karl Moene and Michael Wallerstein's argument that suggests that it *who* the policy is targeting (either the employed or the unemployed) that determines whether an increase in inequality that preserves mean income will imply higher or lower social support for welfare policy. Indeed, we argue here that it is the degree of risk aversion and the distribution of unemployment risk in society that determine that support in the case of unemployment policy.

This interpretation leads naturally to inquiring on how a change in the distribution of job security, due to a sudden economic shock, for example, may affect society's preference ordering for unemployment policy. This paper shows that society may display a switch in citizens' preference ordering due to unexpected external shocks.

One clear policy implication of the present paper's findings regards how governments should react to an increase in inequality. Indeed, if the economic environment suggests that preferences are reversed – due for example to a long period of economic growth – then the government should not react to an increase in inequality by expanding unemployment policies, as this may, actually, reduce the median voter's support. On the other hand, an increase of inequality in contexts where society most likely displays the traditional preference ordering – due to a sudden economic crisis, for example – must be dealt with by the government increasing unemployment policy funding. A natural consequence of that policy implication is an additional support to the well-known need for a long-term perspective in managing the government budget, saving in prosperous times in order to be able to increase welfare spending when crises hit the country.

This research can be extended in several directions. First, one would like to check the effect of an unemployment policy that depends also on past wages. Second, a more complete model would consider the possibility of a private unemployment insurance system. The rich people would

[24] Moene and Wallerstein 2003, Claim 2.

probably be the most interested in this private system and its existence may reduce the likelihood of preference ordering reversal. Most fundamentally, one could explore the composed effect of pure redistribution and unemployment policy. Indeed, since the poor are the highest beneficiaries of a pure redistribution policy that distribute the same amount of resources to all members of society, the very existence of such universal redistribution scheme may reduce further the poor citizens' interest for unemployment policies, increasing the likelihood of preference ordering reversal. These extensions are left here as suggestions for future research.

REFERENCES

Arrow, Kenneth. 1971. *Essays in the Theory of Risk-Bearing*. Chicago: Markham Publishing Co.

Alston, Lee J., Marcus Andre Melo, Bernardo Mueller, and Carlos Pereira. *Brazil in transition: beliefs, leadership, and institutional change*. Princeton: Princeton University Press, 2016.

Azar, Samih A., and Vera Karaguezian-Haddad. 2014. "Simulating themarket coefficient of relative risk aversion." *Cogent Economics & Finance* 2, n.1: 990742.

Barth, Erling, and Karl O. Moene. 2012. "The Equality Multiplier." Discussion Paper n. 6494. Bonn: IZA Institute of Labor Economics.

Bugarin, Mauricio, and Jose R. C. Silva. 2014. "From the *Diretas Já* to the *Passe Livre* street demonstrations: 30 years of citizen-led institutional consolidation in Brazil." *Iberoamericana* 36, n.1: 9–26.

Chetty, Raj. 2006. "A New Method of Estimating Risk Aversion." *American Economic Review* 96, n. 5: 1821-1834.

Choi, E. Kwan, and Carmen F. Menezes. 1985. "On the Magnitude of Relative Risk Aversion." *Economics Letters* 18, n. 2-3: 125–128.

Diebold, Francis X., David Neumark, and Daniel Polsky. 1994. "Job Stability in the United States." Working Paper no. 4859. Cambridge: National Bureau of Economic Research.

Friend, Irwin, and Marshall E. Blume. 1975. "The Demand for Risky Assets." *American Economic Review* 65, n. 5: 900–922.

Fishlow, Albert. 2011. *Starting over: Brazil since 1985*. Washington, DC: Brookings Institution Press, 2013.

Gandelman, Nestor, and Rubén Hernández-Murillo. 2015. "Risk aversion at the country level."

Federal Reserve Bank of St. Louis Review 97, n. 1: 53–66.

Hall, Robert E., Robert Gordon, and Charles Holt. 1970. "Why Is the Unemployment Rate So High at Full Employment?" *Brookings Papers on Economic Activity* 1970, n. 3: 369–410.

Kaplow, Louis. 1996. "The optimal supply of public goods and the distortionary cost of taxation." *National Tax Journal* 49, n. 4: 513–533.

Maital, Shlomo. 1973. "Public Goods and Income Distribution: Some Further Results." *Econometrica* 41, n. 3: 561-568.

Meltzer, Allan H., and Scott F. Richard. 1981. "A Rational Theory of the Size of Government." *Journal of Political Economy* 89, n. 5: 914–927.

Moene, Karl O., and Michael Wallerstein. 2003. "Earnings inequality and welfare spending – A disaggregated analysis." *World Politics* 55, n. 4: 485–516.

Moene, Karl O., and Michael Wallerstein. 2001. "Inequality, Social Insurance, and Redistribution." *American Political Science Review* 95, n. 4: 859–874.

Rehm, Philipp. 2011. "Social Policy by Popular Demand." *World Politics* 63, n. 2: 271–299.

Romer, Thomas. 1975. "Individual welfare, majority voting and the properties of a linear income tax." *Journal of Public Economics* 4, n. 2: 163–188.

Takahashi, Koji. 2015. "The Work and Lives of Japanese Non-Regular Workers in the 'Mid-Prime-Age' Bracket (Age 35-44)." *Japan Labor Review* 12, n. 3: 100–123.

Weller, Leonardo. 2017. *Review: Brazil in Transition: Beliefs, Leadership, and Institutional Change*. EH.net.

Zanetti, Francesco. 2014. "Housing and relative risk aversion." *Economics Letters* 123, n.1: 23-25.