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Inequality persistence through vertical vs. horizontal coalitions☆

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ABSTRACT

This paper aims to contribute to a better understanding of the observed high persistence of cross-country differences in inequality. It focuses on the interactions between inequality and the predominance of either horizontal coalitions (among individuals of similar economic status) or vertical ones (among individuals with different economic status). A model is proposed showing that the interactions between inequality and the type of coalition formed in a society can give rise to self-sustained social contracts where inequality persists. Key mechanisms of the model are illustrated using the transformation in inequality, redistribution and social relations in Modern England, as well as the "paternalist" system of the US South at the beginning of the XXth century.

1. Introduction

Differences in levels of inequality are remarkably persistent across countries and world regions. Latin America and Africa come to mind as traditionally high income inequality regions, compared to, say, Western Europe and South East Asia, and remain largely so today.[1] Latin America, for instance, consistently ranks among the most unequal regions in very different periods of time. At the beginning of the XXth century, land inequality in Latin America (as measured by the proportion of households owning land) was high relative to the US and Canada (Engerman and Sokoloff, 2002). In recent decades, from the 1970s to the 1990s, the average Gini coefficient for income in Latin America was 50.5, substantially higher than in Asia, the OECD and Eastern Europe, with figures of 40.5, 33 and 30.1, respectively (De Ferranti et al., 2003). Indeed, data recently compiled by Frankema (2006) on land inequality, stretching over the XXth century, show Latin American Gini coefficients (averaged over quarters of a century) ranging between 76.6 and 77.9, much larger than those for Asia, of 47.6 and 48.0.[2] The small across-time variation within regions contrasts strikingly with the wide differences across regions, revealing a substantial degree of inequality persistence.

Recent evidence on inequality extending far into the past for European countries also delivers a message of persistence. Ohlsson et al. (2007) (particularly their Fig. 8) show a striking continuity of high wealth inequality (measured by the top 1% share) in several European countries from the middle of the XVIIIth century up to the beginning of the XXth century. From even a broader perspective, estimates of inequality for preindustrial Europe stretching into medieval times show a remarkably consistent picture of high concentration for contemporary standards, at least for urban settlements (see Sussman, 2007).

The relationship between inequality and redistribution is a particularly relevant piece in the puzzle of inequality persistence: to the extent that inequality is negatively related to redistribution, inequality differences are likely to persist. This is not, however, the standard political economy view on this relationship. The standard story essentially argues that more unequal societies ought to redistribute more, since the median voter tends to be poorer relative to the mean (see, for instance, Meltzer and Richard (1981), Persson and Tabellini (1994) and Alesina and Rodrick (1994)). This view has been recently challenged for its lack of empirical support. Even if no consensus has yet emerged, empirical studies increasingly find that more unequal societies tend to redistribute less, not more, both when comparing across

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[1] See, for instance, De Ferranti et al. (2003) for Latin America and Milanovic (2003) for Africa.

[2] These figures come from own computations using the data in Frankema (2006).

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countries and over time (see Lindert, 2004; De Mello and Tiongson, 2003). As a result, several alternative mechanisms have been proposed in the literature, yielding a negative relationship between inequality and redistribution (Benabou, 2000; Saint Paul, 2001; Rodriguez, 2004, see also Saint Paul and Verdier, 1996).

This paper proposes a novel political economy mechanism that generates an essentially negative relation between inequality and redistribution and, in that way, can help explain why differences in inequality tend to be so persistent. The mechanism proposed is based on the type of coalitions different agents choose to form. In particular, it hinges on whether poor agents organize horizontally (i.e. among themselves) or form a coalition with the elite (i.e. a vertical coalition). The paper argues that high inequality will tend to lead to a "traditional" or a "paternalist" type of social contract where the poor are vulnerable and the elites can buy off cheaply their quiescence; redistribution thus remains low and inequality, high. Low inequality, in contrast, makes the poor less vulnerable and more ready to confront the elite for high levels of redistribution which, in turn, ensure that inequality remains low. A transition from the "traditional" to the "modern", low-inequality, social contract may occur as a result of an industrial revolution, where technological improvements make investment substantially more productive.

The importance of the type of coalition for the dynamics of inequality has been recently put forward in De Ferranti et al. (2003). Studying the reasons for the persistently high inequality observed in Latin America, the authors emphasize the prevalence of vertical coalitions in the region. Other studies hint at the likely relevance of these forces from a historical perspective. Acemoglu and Robinson (2000), Justman and Gradstein (1999) and Lindert (2004) emphasize the importance of political voice for the dynamics of redistribution and inequality. In particular, they argue that the transition towards the comparatively low degree of inequality observed in European countries starting around the beginning of the XXth century is related to the increasing political voice of the poor segments of society. To the extent that these, and other studies, link increasing political voice (particularly through franchise extension) to the revolutionary threats arising from working class movements, the importance of horizontal organization for redistribution and inequality is warranted.[3] All these studies thus point at the relevance of horizontal coalitions for explaining observed degrees of inequality. In order for this mechanism to account for its persistence, however, the (reverse) link between inequality and the type of coalition formed needs to be incorporated into the analysis.

This paper studies these two-way interactions between inequality and the choice of horizontal vs. vertical coalitions by developing a simple two-period model. The model focuses on a local, rural setting where the potential redistributive conflict is over land. This setting is a natural one when considering the role of social relations in preindustrial, industrializing or developing economies, and for the type of long-run evolutions of inequality this paper is concerned with.[4] In the model, there is a rich landlord family and some poor local laborers. All own some land and produce from it, save and consume the produce. The landlords are assumed to have access to a technology that yields positive returns to their savings.[5]

In this context, individuals may form horizontal or vertical coalitions. The poor can force redistribution of land from the landlords. To do so they need to form a horizontal coalition among themselves. This horizontal coalition poses collective action problems. As Olson (1965) argues, in such a local context, these problems can be dealt with through organization and coordination. Organizing and coordinating requires meeting, communicating, bargaining, agreeing on agendas, selecting leaders, devising strategies, etc. Thus, the model assumes that the horizontal coalition *takes time to build*.[6] In particular, a horizontal coalition represents a contest between the laborers and the landlords where the landlords have the upper hand as the poor remain unorganized in the first period, and the situation reverses in the second period as the poor become organized. This is modeled as a situation with exogenously given redistribution that is regressive in the first period and progressive in the second period. The rich can prevent this forced redistribution by proposing the poor to form a vertical coalition. In a vertical coalition, the landlords offer transfers to the poor in exchange for them not starting to organize. Since the vertical coalition in this context does not require collective action as the horizontal coalition does, these transfers can be implemented immediately.[7]

This setting gives rise to insights of some generality. A vertical coalition may arise because the poor are willing to give up redistribution in exchange for smoothing consumption fluctuations over time. Redistribution is thus lower in a vertical coalition. Moreover, due to Decreasing Absolute Risk Aversion (DARA) utility, the poor are more vulnerable to consumption fluctuations the poorer they are. Thus, the rich are willing to engage in a vertical coalition only when the poor are sufficiently poor; i.e. when inequality is sufficiently high. In this way, the model captures neatly that the vertical coalition is an investment for the elite. The model is extended to account for inequality dynamics. Two stable inequality steady states may arise, capturing different types of social contracts: a "traditional social contract" characterized by a vertical coalition and high inequality, and a "modern social contract", characterized by a horizontal coalition and low inequality. The traditional social contract fails to exist if returns to alternative investments (here, returns to savings) are sufficiently high, as the investment in the vertical coalition becomes less attractive for the rich.

As argued in Acemoglu and Robinson (2006), commitment issues are crucial in political economy models of conflicts over redistribution. Social groups with political power may not be able to credibly commit to redistribute in the future. In this paper, it is assumed that the rich hold power unless the poor are organized. Holding power, the rich cannot commit to redistribute in the future and therefore need to implement the transfers of the vertical coalition in the first period. The poor, in contrast, do not face a commitment problem. They cannot take the transfers in the first period and simultaneously renege and start to organize because the rich could observe this and punish them.[8]

The key mechanisms of the model are illustrated using the West European transition from high to low inequality around the beginning of the XXth century, focusing on the experience of England. To that end, the transformations in social relations and redistribution in Modern England are addressed. In a similar vein, the "paternalist" social arrangement in the South of the US around the beginning of the XXth century is briefly discussed. In both cases, consistently with the model, a transition from a traditional to a modern social contract took place in the midst of substantial technological improvements that

[3] Besides the aforementioned studies, Conley and Tiemimi (2001) and Lagunoff and Jack (2004) also stress the importance of revolutionary threats by the poor for franchise extensions.

[4] The setting and the mechanism proposed in this paper would not be well suited for other types of relevant comparisons of inequality and redistribution such as those between the US and Europe.

[5] The fact that only the rich have access to this technology can be rationalized by fixed costs preventing the poor for undertaking the investment.

[6] That the poor need to coordinate in order to successfully contest the elite relates to the models in Acemoglu and Robinson (2006) and in Ghosal and Proto (2007). In these models, two equilibria may arise as each poor will join in the contest if it believes that the others will do so as well and vice versa. Generally, taking time to coordinate can be thought of a natural (if informal) way of selecting the better equilibrium.

[7] That unequal (vertical) arrangements do not require coordination/organization (unlike equal (horizontal) ones) echoes insights of the collective action literature (Olson, 1965; Bardhan et al., 2006). According to these studies, unequal groups essentially do not require coordination/organization to provide a collective good, because a sufficiently rich individual will have an interest in providing the good for herself.

[8] The local setting of the model makes credible that the landlord would have the information of the poor reneging on the vertical coalition and starting to organize in the first period.

made investment more productive. For these and other empirical cases the model could be applied to, it is however necessary to bear in mind that the model is highly stylized and focuses solely on the mechanism of co-optation. Other relevant factors, such as repression, which is another key aspect in the relation between inequality and poor people's organization, are left aside for simplicity.

The paper is organized as follows. Section 2 presents the model and derives the type of coalition chosen for different levels of inequality. The dynamics of inequality are subsequently analyzed. Section 3 discusses briefly the development of inequality and social relations in Western Europe, focusing on England, as well as in the American South. Finally, Section 4 provides some concluding remarks.

2. The model

2.1. Environment

Consider a rural village with a continuum 1 of agents. A proportion λ of these agents are poor local laborers and the remaining, $(1-\lambda)$ are a rich landlord family, with $1>\lambda\gg\frac{1}{2}$. Poor and rich individuals are endowed with l^P and l^R units of land, respectively, where $l^P<l^R$. The total amount of land is normalized, without loss of generality, to 1: Thus, $\lambda l^P+(1-\lambda)l^R=1$. On the basis of this normalization, the amount of resources of the poor, l^P, will be used as the measure of *equality* of the economy. l^P ranges from zero to one, zero representing minimal equality, and one total equality.

Agents live for two periods. In each period, land produces a consumption good y according to a linear technology, which is assumed to take the simple form $y^i=l^i$, for $i=P,R$. Production at the end of the first period can be saved or consumed. It is assumed that savings (S^i, $i=P,R$) yield higher returns for rich than for poor individuals. For simplicity, it assumed that returns for the rich equal $R>1$ while the poor can only store their savings (i.e. returns equal unity). This assumption can be thought of as capturing the presence of some fixed costs that prevent the poor from undertaking investment opportunities. Finally, individuals derive utility from consumption at the end of each period. For simplicity, the utility function is assumed to be logarithmic and the time discount factor is assumed to equal one.

The poor laborers have the opportunity to force redistribution of land. Doing so, however, requires building a coalition among themselves; i.e. a horizontal coalition. It is assumed that a horizontal coalition can only force land redistribution from the rich to the poor in the second period. This critical assumption captures the idea that horizontal organization takes time to form, possibly due to coordination problems. In the first period of a horizontal coalition, before the poor have organized, it is assumed that the rich are able to extract a proportion $1-\mu$ of the land of the poor. Once the poor are organized, in the second period, the total land is divided between the poor and the rich according to the proportions θ and $1-\theta$, respectively. It is sensible to consider that, for all levels of inequality, organization brings benefits to the poor and that, at most, equalizes resources: thus it is assumed that $\mu<\frac{\theta}{\lambda}\leq 1$.[9] With these considerations, the utility functions for the individuals in each group in case of a horizontal coalition, U_i^H, $i=P,R$ equal:

$$U_P^H = \log\left(\mu l^P - S^P\right) + \log\left(\frac{\theta}{\lambda} + S^P\right) \tag{1}$$

$$U_R^H = \log\left(l^R + \frac{\lambda}{1-\lambda}(1-\mu)l^P - S^R\right) + \log\left(\frac{1-\theta}{1-\lambda} + RS^R\right).$$

In order to prevent forced redistribution, the rich may offer the formation of a vertical coalition. In a vertical coalition, the rich offer resources in order to prevent the poor from organizing and hence limit the extent of future redistribution.[10] Crucially, a vertical coalition allows for an immediate transfer of resources where each poor receives $\frac{1}{2}T$. Due to commitment problems, however, transfers in a vertical coalition cannot be intertemporally tailored: all transfers need to be done in the first period. These transfers are kept for the two periods so that each poor effectively receives an amount T of transfers over her lifetime. Thus, the corresponding utility functions are:

$$U_P^V = \log\left[\left(l^P + \frac{T}{2}\right) - S^P\right] + \log\left[\left(l^P + \frac{T}{2}\right) + S^P\right] \tag{2}$$

$$U_R^V = \log\left[\left(l^R - \frac{\lambda}{1-\lambda}\frac{T}{2}\right) - S^R\right] + \log\left[\left(l^R - \frac{\lambda}{1-\lambda}\frac{T}{2}\right) + RS^R\right].$$

The timing of the model is as follows. First, the rich decide whether to offer or not the formation of a vertical coalition and, if so, the amount of transfers associated to it. Then, the poor decide whether to reject or accept the offer. The corresponding land transfers or (regressive) redistribution take place. Savings/consumption decisions are made, and the first period ends. In the second period, no decisions are taken: (progressive) redistribution occurs in the case of a horizontal coalition; the rich obtain the returns from their investment and, finally, agents consume everything and die.

Capital markets play a key role in this model in one single respect: it is assumed, plausibly, that in case of a horizontal coalition, borrowing against future redistribution is not permitted. Besides this case, all optimal savings decisions will be non-negative.[11]

It is worth stressing that redistribution in this model is restricted to land. In particular, savings and the income accruing from them are not subject to redistribution. In this sense, this model is well suited to analyze situations such as preindustrial or developing societies where the main distributional conflict is over land but where the elite is engaged additionally in mercantilist activities, or where the elite is able to invest abroad.

Notice, finally, that the poor in the model will not attempt to organize after receiving the transfers from the rich in the vertical coalition. In particular, the local rural setting of the model ensures that the poor are "locked-in" in a vertical coalition. Since organization takes time, building a horizontal coalition would require the poor to start to organize in the first period. Since information can be sensibly supposed to flow freely in a local setting, the landlords could observe it. Since the landlords would hold the power, the poor could then be punished. In effect, the landlords could essentially bring about the outcome of the horizontal coalition which is what, presumably, the poor wanted to avoid in the first place by accepting the vertical coalition.

2.2. Inequality, coalitions and redistribution

The model is solved by backward induction. In the second period, no decisions are taken. The solution starts thus with the savings decisions at the end of the first period. Second, the coalition choices of the poor are considered. Given the transfers offered by the rich, the poor decide whether to accept of reject the vertical coalition. This step of the solution yields the minimum level of transfers that make the poor accept the vertical coalition. On the basis of this, the rich choose whether or not to offer a vertical coalition to the poor, and in the case they offer a vertical coalition, the amount of transfers to offer.

[9] This assumption implies that, in a horizontal coalition, the poor always enjoy more resources in the second period than in the first period. Notice that, if $\theta=\lambda$, assets are completely equalized across the population in a second period with a horizontal coalition.

[10] Individual members of the elite may wish to free ride on the others. The local setting of the model (essentially a landlord family and the local laborers) implies that landlords will be so few so as to make free rider problems unimportant.

[11] This assumption arises naturally from the structure of the model. The only agents the poor could borrow from in this model are the rich. However, since in the case of a horizontal coalition the poor wield power in the second period, they cannot commit to pay back. Thus, the rich would be unwilling to lend them.

Consider first the options of the poor individuals. Their savings decisions are straightforward: In the vertical coalition, since income in the first and second periods is the same and since savings give return equal to unity, the optimal choice is to save exactly zero. In the horizontal coalition, in contrast, future redistribution gains make income higher in the second than in the first period. Thus, optimal savings, if unconstrained, would be negative. Since borrowing against future redistribution is not allowed by assumption, optimal savings will be also zero. The value functions (i.e. with the optimal savings) for the poor can thus be directly written by substituting S^P by zero in Eqs. (1) and (2).

$$V_P^H = \log \mu l^P \frac{\theta}{\lambda} \tag{3}$$

$$V_P^V = \log\left(l^P + \frac{T}{2}\right)^2. \tag{4}$$

The poor decide whether to accept or reject the vertical coalition by comparing value functions Eqs. (3) and (4). They will accept if the transfers are higher than a certain threshold $\tilde{T}$, obtained by equalizing the two value functions. After rearranging, the threshold $\tilde{T}$ has a simple interpretation:

$$\begin{aligned}\tilde{T} &= 2\sqrt{\mu l^P \frac{\theta}{\lambda}} - 2l^P \\ &= \left(\mu l^P + \frac{\theta}{\lambda} - 2l^P\right) - \left(\sqrt{\frac{\theta}{\lambda}} - \sqrt{\mu l^P}\right)^2\end{aligned} \tag{5}$$

The first term in the second line, $\left(\mu l^P + \frac{\theta}{\lambda} - 2l^P\right)$, is the total redistribution received by each poor agent in the event of a *horizontal* coalition. The second term, $\left(\sqrt{\frac{\theta}{\lambda}} - \sqrt{\mu l^P}\right)^2$, is the distance between consumption in the two periods in a horizontal coalition. Thus, the second term represents the costs of horizontal organization due to its lack of inter-temporal consumption smoothing.

Eq. (5) shows directly that the poor are willing to give up redistribution in order to smooth consumption. Additionally, the second term in the expression makes clear that the poorer they are (i.e. the higher is inequality), the more redistribution they are willing to give up in order to avoid consumption fluctuations *over time* — indeed, in the limit case where the poor own zero capital, transfers in a vertical coalition equal zero as well. This is because log utility exhibits Decreasing Absolute Risk Aversion, whereby aversion to additive fluctuations decreases with wealth. This feature of the utility function is broadly consistent with the observed attitudes towards risk (see Gollier, 2001) and captures the idea that poorer individuals are more vulnerable to consumption fluctuations.

Foreseeing the actions of the poor, the rich decide whether to offer a vertical coalition to the poor or not. To do so, the rich compare the value they would obtain with each type of coalition, evaluated at the optimal savings; the vertical coalition is further evaluated at the minimum transfers the poor would accept: T. In this way, it is possible to derive the equilibrium coalition in this economy as a function of inequality. The following proposition states the corresponding results:

Proposition 1. *The equilibrium coalition depends on inequality in the following way:*

a) *if* $l^P < l^* \equiv \frac{\theta}{\lambda\mu}\frac{1}{R^2}$, *the vertical coalition is chosen*
b) *otherwise, the horizontal coalition is chosen.*

Proof. The value functions for the rich after solving for the standard optimal savings decision are:

$$V_R^H = \log\left\{\frac{1}{R}\left[\frac{1}{2}\left(\left(l^R + \frac{\lambda}{1-\lambda}(1-\mu)l^P\right)R + \frac{1-\theta}{1-\lambda}\right)\right]^2\right\}$$

$$V_R^V = \log\left\{\frac{1}{R}\left[\frac{1}{2}(1+R)\left(l^R - \frac{\lambda}{1-\lambda}\frac{T}{2}\right)\right]^2\right\},$$

Given the decisions of the poor, the rich need to decide whether to offer a vertical coalition and, if so, with which level of transfers T The choice of T is straightforward: since the utility of the rich is decreasing in T, it is optimal T to offer the lowest possible amount compatible with the poor accepting a vertical coalition: $\tilde{T}$. To decide whether to offer the vertical coalition to the poor or not, the rich then need to compare the value of the two coalitions, with the vertical one evaluated at $\tilde{T}$ in Eq. (5). Moreover, to obtain the equilibrium coalition as a function of inequality, l^R needs to be substituted by its value in terms of l^P (from $\lambda l^P + (1-\lambda)l^R = 1$ above), our measure of equality. These substitutions yield the following two value functions:

$$V_R^H = \log\left\{\frac{1}{R}\left[\frac{1}{2(1-\lambda)}\left(1 + R - \theta - \lambda R\mu l^P\right)\right]^2\right\} \tag{6}$$

$$V_R^V = \log\left\{\frac{1}{R}\left[\frac{1}{2(1-\lambda)}(1+R)(1-\lambda)\sqrt{\mu l^P \frac{\theta}{\lambda}}\right]^2\right\}, \tag{7}$$

The comparison of Eqs. (6) and (7) yields directly the result of the proposition. □

Proposition 1 makes two relevant points. First, in this model the vertical coalition arises when the economy is sufficiently *unequal* (l^P sufficiently low). The vertical coalition becomes more attractive to the rich as the poor become poorer since, in that case, they are willing to give up more redistribution.

A second set of relevant results from Proposition 1 regards the inequality thresholds separating each coalition. First, a vertical coalition is *less* likely the higher is the rate of return on savings R. In this model, a vertical coalition is, for the rich, an *investment*: it implies giving up resources now in the form of transfers in exchange for reductions in redistribution in the future. As the rate of return on other investment rises, savings in the first period become more valuable, and make the investment in the vertical coalition relatively less attractive. This insight can be relevant for the literature on co-optation, such as Bertocchi and Spagat (2001), and the broader studies on co-optation in authoritarian regimes, Wintrobe (1998) and Bueno de Mesquita et al. (2003). Making explicit how co-optation of the poor is an investment for the elite, and considering a more realistic concave utility function thus allows for relating co-optation naturally with macroeconomic variables such as the rate of return to alternative investments.

Second, a vertical coalition is *more* likely the more important worker organization is for redistribution. If the gains that the poor obtain in a horizontal coalition once they are organized (in the second-period) $\frac{\theta}{\lambda}$ rise relative to what they can keep while they are not (in the first period) μ, the vertical coalition becomes more likely. This is because the horizontal coalition becomes less attractive for the poor, since it worsens the inter-temporal consumption fluctuations it implies.

2.3. Inequality dynamics and steady states

The results above show an essentially negative relationship between inequality and redistribution through the type of coalition formed: high inequality – vertical coalition – low redistribution and vice versa. This negative relationship hints at the possibility of multiple steady states.

In order to cleanly illustrate the dynamics of inequality in this model, I consider the simplest possible inter-generational transmission of resources. In particular, each individual has one offspring, which inherits the land that her parent owned when old (i.e. in the second period). The inheritance of the next generation of rich and poor

depends on the type of coalition formed, as given by Proposition 1.[12] The land inherited by rich and poor individuals of generation $t+1$ are thus:

$$l^P_{t+1} = \begin{cases} l^P_t + \frac{T}{2} & \text{if } l^P_t < l^* \\ \frac{\theta}{\lambda} & \text{otherwise} \end{cases} \quad (8)$$

$$l^R_{t+1} = \begin{cases} l^R_t - \frac{\lambda}{1-\lambda}\frac{T}{2} & \text{if } l^P_t < l^* \\ \frac{1-\theta}{1-\lambda} & \text{otherwise} \end{cases}$$

Using again the land owned by a poor individual as the indicator for equality, Eq. (8) can be used to determine the dynamics of inequality in the model. Substituting $\tilde{T}$ for its value in Eq. (5) yields the following equation in differences:

$$l^P_{t+1} = f\left(l^P_t\right) = \begin{cases} \sqrt{\mu l^P_t \frac{\theta}{\lambda}} & \text{if } l^P_t < l^* \\ \frac{\theta}{\lambda} & \text{otherwise} \end{cases}. \quad (9)$$

The function $f(l^p_t)$ is a piece-wise defined function where each "piece" corresponds to the type of coalition emerging in the previous generation: the upper part in Eq. (9) corresponds to the vertical coalition and the lower part to the horizontal coalition. $f(l^p_t)$ thus makes clear how inequality in a generation, (l^p_t), determines inequality in the following generation, partly through the type of coalition chosen. Taking as given an arbitrary level of inequality at time zero $l_0 \neq 0$, this expression fully characterizes the dynamics of inequality in this model. The following proposition states the corresponding results.

Proposition 2.

1) *If $\mu R^2 < 1$, inequality converges to a unique steady state where the coalition is vertical and where the degree of equality is $l^P = \mu\frac{\theta}{\lambda}$.*
2) *If $\mu R < 1 < \mu R^2$, there are two stable steady states, one where the coalition is horizontal, with the degree of equality $l^P = \frac{\theta}{\lambda}$ and another one where the coalition is vertical, with a degree of equality $l^P = \mu\frac{\theta}{\lambda}$. Inequality is higher in the latter. Furthermore,*
   i) *if $l_o > l^*$, l^P_t converges to $\frac{\theta}{\lambda}$ and,*
   ii) *otherwise, l^P_t converges to $\mu\frac{\theta}{\lambda}$.*
3) If $\mu R > 1$, inequality converges to a unique stable steady state where the coalition is horizontal and where the degree of equality l^P equals $\mu\frac{\theta}{\lambda}$.

Proof. Results concerning the horizontal coalition steady state are straightforward. The right-hand piece of $f(l^P_t)$, $\frac{\theta}{\lambda}$, has its fixed point precisely at $l^P = \frac{\theta}{\lambda}$. The steady state is stable, for the slope of the function equals $0 \in (-1,1)$. For the vertical coalition, the left-hand of $f(l^P_t)$ has its fixed point at l^P such that $\sqrt{\mu l^P \frac{\theta}{\lambda}} = l^P$, which solves into $l^P = \mu\frac{\theta}{\lambda}$. This steady state is stable, for the derivative of $f(l^P_t)$ with respect to l_t: $f'(l^P_t) = \frac{1}{2}\sqrt{\frac{\mu\theta}{\lambda l^P_t}}$, evaluated at the steady state $\mu\frac{\theta}{\lambda}$, equals $\frac{1}{2} \in (-1,1)$.

The ranking of inequality between the two steady states is unambiguous. Since, $\mu < 1$, the horizontal coalition is more equal ($l^P = \frac{\theta}{\lambda}$) than the vertical coalition ($l^P = \mu\frac{\theta}{\lambda}$).

The vertical (horizontal) coalition steady state exists if $f(l_t)$ evaluated at l^* corresponding to the vertical (horizontal) coalition is lower (higher) than l^*. The vertical coalition steady state thus exists if $\sqrt{\mu\frac{\theta}{\lambda}\frac{\theta}{\lambda\mu}\frac{1}{R^2}} < \frac{\theta}{\lambda\mu}\frac{1}{R^2}$, which simplifies into $\mu R < 1$. The horizontal coalition steady state exists if $\frac{\theta}{\lambda} > \frac{\theta}{\lambda\mu}\frac{1}{R^2}$, which simplifies into $\mu R^2 > 1$. Since, $R > 1$, $\mu R^2 > \mu R$, and the two steady states can coexist. □

[12] For simplicity, it is assumed that each generation is required to organize anew if a horizontal coalition is chosen. This, however, does not matter in equilibrium, for if a generation chooses the horizontal coalition, all subsequent ones will as well.

Proposition 2 states that there can be one or two stable steady states, depending on the parameters of the model. One steady state is characterized by a vertical coalition with high inequality. This steady state captures a "traditional social contract". The other steady state implies a horizontal coalition with low inequality: a "modern social contract". The traditional social contract exists only when the rate of return is sufficiently low, and the poor suffer sufficiently high losses in the first period of the horizontal coalition (μ low). In that case, the poor are willing to give up all redistribution in the vertical coalition while the rich find it worth to sacrifice the higher investment opportunities associated with the horizontal coalition. The modern social contract is assured to exist in the reverse case. There are configurations of the parameters (when $\mu R < 1 < \mu R^2$), where the two steady states coexist. Fig. 1 plots the function $f(l^P_t)$ depicting the three types of situation. The middle panel shows the case with the two steady states.

It is of particular interest to study the ways in which the traditional social contract may break, paving the way for a transition towards a modern one. There are two particularly interesting cases in which this may occur in this model, which are depicted in Figs. 2 and 3.

Fig. 2 considers the effect of an increase in the rate of return R. Suppose the initial situation is the vertical coalition steady state, denoted by point A in the figure. If the rate of return increases, the threshold l^* shifts leftwards. The elite breaks the vertical social contract in order to exploit the benefits from the higher investment returns that the horizontal coalition enables. In that way, the traditional social contract is ended abruptly, leading the poor to organize (point B). The generation that is prompted to organize suffers a painful transition in the process, but eventually reaps the benefits from organization, achieving a lower degree of inequality, which remains thereafter (new steady state C).

Fig. 3 depicts, in contrast, the effect of an increase in μ *and* θ, of the same proportion. Starting again in the vertical coalition steady state A, as the figure shows, the transition in this case is different: The threshold l^* does not move, but the function $f(l^P_t)$ shifts upwards. This type of increase captures a situation here the elite has been weakened for exogenous reasons, so that a horizontal coalition brings more benefits to the poor in the two periods. The poor, in that way, are able to extract more transfers from the rich while remaining in the vertical coalition (points B, C, and D). These transfers, however, make their offsprings richer so that consumption fluctuations become less painful and the horizontal coalition increasingly attractive. Thus, the transition in this case is smooth, and ends when, eventually, the horizontal coalition is worth undertaking for the poor and inequality becomes permanently reduced (points E, and F).

3. Empirical illustrations

This section illustrates key mechanisms of the model using some stylized historical developments concerning inequality and coalitions. It discusses, first, some elements of the social transformation occurring in Western Europe around the XIXth century, focusing particularly on England. Secondly, in a similar vein, it briefly considers social relations in the American South.

3.1. Modern England

Recent studies have provided evidence on inequality and redistribution in England from the XVIIIth to the XXth centuries (see Lindert (2004) for redistribution and Lindert (2000) for a review of the studies on inequality). Some controversy remains in the assessment of the trends in inequality, particularly, regarding whether inequality (of earnings as well as of income and wealth) rose or not before the end of the XIXth century. What seems uncontroversial is that both income and wealth inequality gradually fell from the beginning of the XXth century onwards (see Lindert, 2000).[13] This gradual fall in inequality coincides

[13] Up to, obviously, the well documented rise in inequality during the 1980s.

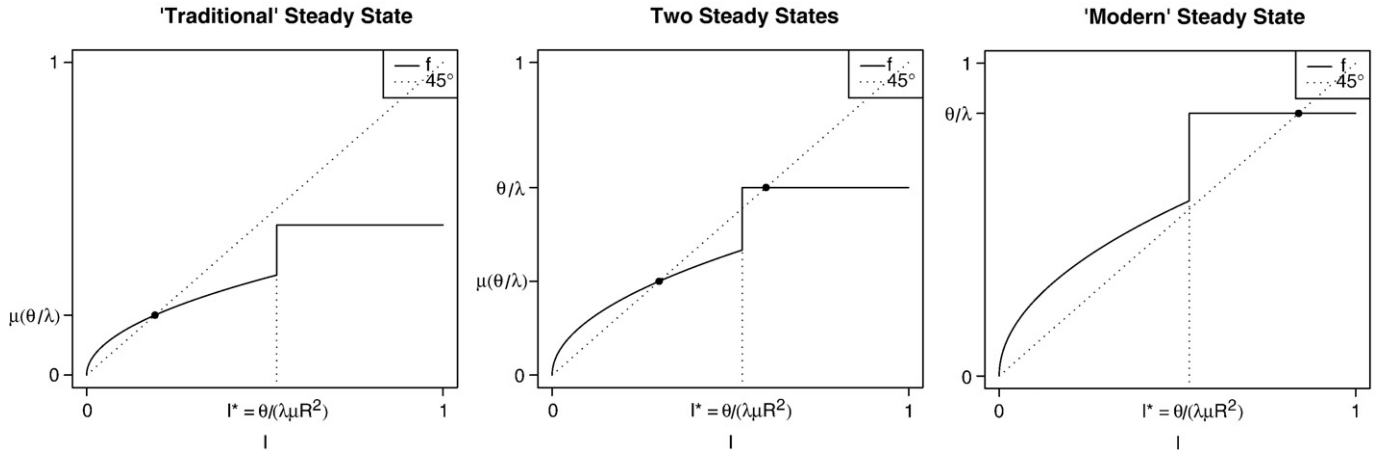

Fig. 1. Steady state configurations.

with the start of a substantial upward trend in redistribution. Besides a particular episode at the beginning of the XIXth century, social spending in England had been essentially negligible up to the end of the XIXth century (Lindert, 2004). From then on, matters started to change. As mentioned in Acemoglu and Robinson (2000), the share of taxes in GDP rose dramatically towards the end of the XIXth century and so did its progressivity. Moreover, it is precisely around this period where the educational system became open to the masses and public expenditures per pupil started to accelerate (Lindert, 2004).

How these trends came into being is obviously the consequence of the interplay of many forces. Here, some forces are isolated that highlight key mechanisms of the model. Up to the XIXth century, a social contract whereby the elite insured the poor and transferred a modest amount of resources was in place. This social contract took the form, among others, of customary rights of the poor (Quigley, 1996; Hobsbawm and Rude, 1969), of price controls of bread in order to isolate the poor from variable food prices (Davies, 2004; Thompson, 1971) and of old poor laws which, to a certain extent, assured the survival of the poor. These measures aimed partly at maintaining the existing social order. For instance, Van Leuween (1994), discussing the role of poor relief in preindustrial Europe, argues: Socially, European elites endeavored to stabilize the existing social order by means of poor relief. […] the well to do were under an obligation to assist the poor and the latter had a duty to accept the world as it was (p. 593). This system of duties and obligations sensibly corresponds to the "traditional social contract" of the model. Indeed, while this system was in place, the poor remained unorganized.

The beginning of the XIXth century witnessed the culmination of the process of deterioration of the traditional social contract. Key protecting laws were definitively repealed. The enclosure movement was at its heights bringing forward the process of privatization of the commons which, by 1832, was completed. Crucially, the poor relief system was transformed by the New Poor Law, enacted in 1834. The New Poor Law centralized the administration of relief, made conditions of eligibility more stringent and set up mechanisms in order to deter demand for relief. Meanwhile, spending in poor relief fell substantially (Lindert, 2004). Polanyi (1954) considered the enactment of New Poor Law in 1834 as the symbol of the demise of the traditional social contract and this view appears to be largely shared by more recent studies (Dunkley, 1981; Mandler, 1987).

This same time period, the late XVIIIth and early XIXth century, is precisely the one chosen by Thompson in his influential work on *The*

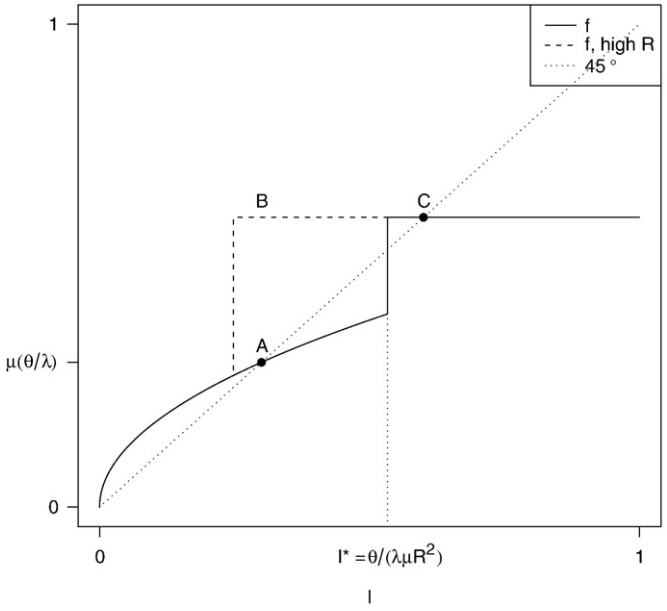

Fig. 2. Effect of an increase in *R*.

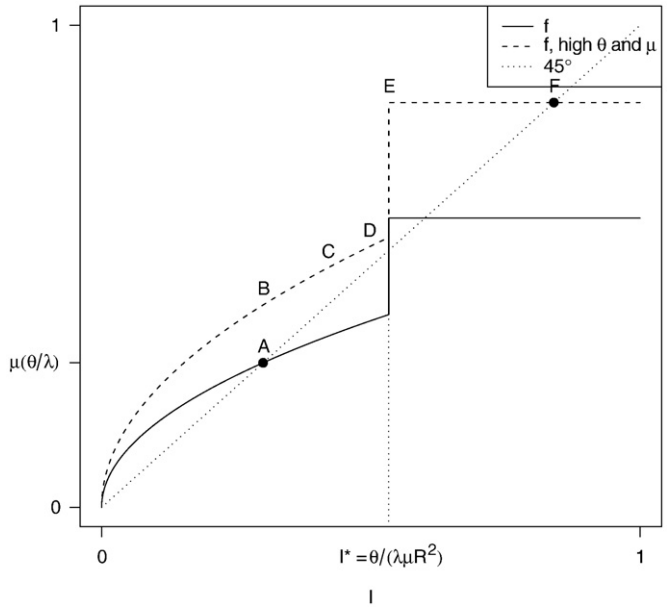

Fig. 3. Effect of weakening the elite.

Making of the English Working Class (1979). Thompson studies the variety of factors and experiences leading to the configuration of the English working class. The importance attributed to the collapse of the traditional social contract for this *making* is best illustrated by the figure of William Cobbett, a radical journalist who later got elected to parliament. His pamphlets and newsletters had remarkably high circulation from the end of the Napoleonic Wars until the 1830s. Indeed, he is considered to have been a key figure in bringing about a Radical consensus (Thompson, 1979). The radical criticism of Cobbett turned heavily against Old Corruption (the political elite of the time) and in defense of the *traditional* rights of laboring people. On these latter, it is worth quoting him extensively:

> Among these rights was, the right to live in the country of our birth; the right to have a living out of the land of our birth in exchange for our labor duly and honestly performed; the right, case we fell into distress, to have our wants sufficiently relieved out of the produce of the land, whether that distress arose from sickness, from decrepitude, from old age, or from inability to find employment. […] For a thousand years, necessity was relieved out of the produce of the Tithes. When the Tithes were taken away by the aristocracy, and by them kept to themselves, or given wholly to the parsons, provision was made out of the land, as compensation for what had been taken away. That compensation was given in the rates as settled by the poor-law. The taking away of those rates was to violate the agreement, which gave as much right to receive in case of need, as it left the landowner a right to his rent.[14]

This quote is enlightening in several respects. First, it highlights the centrality of the Old Poor Laws in the traditional social contract. Second, it points at the contemporary view among the poor and their leaders that the traditional social contract had been broken by the rich. Finally, and most importantly, it puts into question the property rights of landowners *as a direct consequence* of the rich breaking this social contract. It can be argued that the interpretation of the past this quote suggests is highly idealistic. What is important to note here is that these ideas did connect with the experiences of laboring people and that it appears to have been relevant for the formation of a genuinely horizontally organized (working class) movement (Thompson, 1979).

In the late 1830s, soon after the New Poor Law was enacted, came into being what is regarded as the first organized English working class movement, Chartism. It did not demand the return to a traditional social order, but parliamentary reform, including universal suffrage. Although the movement failed in the mid-century, it is considered to have set the stage for future working class organized movements and demands. An important part of these demands were eventually met and became law. Notably, the franchise was gradually extended and, by 1884, already included substantial working class representation. From that point, the degree of redistribution did not take long to rise and the level of inequality, to decrease (see Acemoglu and Robinson, 2000; Lindert, 2004).

The above quote of William Cobbett illustrates well the contemporary view that the "traditional social contract" had been broken by the elite, by failing to honour the obligations it imposed on them. In that respect, it is interesting to notice that this occurred in the midst of the industrial revolution, where technological improvements made investments more profitable. This transformation, hence, illustrates well the role of the rate of return in the model. An alternative way in which the demise of the "traditional social contract" gives way to worker organization in the model can be illustrated by contrasting the English experience with that of Germany. In Germany, the Napoleonic occupation and the 1848 March revolution (both absent in England), eroded the legitimacy and the power of the elite. After unification, power was centralized and the state grew stronger. Junkers and heavy industrialists did benefit from the state intervention, but their "marriage of iron and rye", seems to have been overplayed, and the chancellor did indeed use "divide and rule" strategies over the elite (Blackbourn, 1997). The insights of the model can thus be linked to the well known instauration of a social security system in the 1880s that aimed to halt the labor movement, but patently failed to do so. In that way, the relative weakness of the elite in Germany may help explain its different paths towards working class organization compared to that of England.

These insights can be relevant for the emerging literature on franchise extension, particularly for those studies emphasizing the threat of revolution in the extension of the suffrage, mentioned in the introduction. The important contribution of Acemoglu and Robinson (2000) hinges crucially on the assumptions that revolutionary opportunities for the poor are temporary and that these opportunities arrive exogenously. In that setting, they derive a "political Kuznets curve" on the basis of revolutionary threats of the poor and the possibility of franchise extension. Inequality keeps on rising due to technologies with fixed costs essentially until the exogenous arrival of revolutionary threats combines with sufficiently high inequality to make the prospect of revolution feasible and attractive for the poor. Beyond that point, either transfers from the rich or the policy chosen with universal suffrage make inequality fall. The idea of a Kuznets curve over a long span of time, however, is put into question by the available empirical evidence mentioned above, that suggests that inequality in preindustrial Europe was particularly high. Moreover, if that was the case, the explanation for the particular timing of the decrease in inequality hinges solely on the exogenous arrival of revolutionary threats. As the authors themselves acknowledge, the arrival of these opportunities are related to, among others, the level of organization of civil society. The present paper, while not considering franchise extension as such, yields additional insights into the problem by "endogeneizing" the emergence of these revolutionary threats through the choice of organization of the poor. In that way, this paper gives a rationale for the emergence of revolutionary threats during the XIXth century, as the traditional social contract was then broken by the rich. Additionally, the model in this paper implies inequality dynamics more consistent with the long run empirical evidence: with inequality in preindustrial European societies remaining high while the traditional social contract is in place, and falling permanently as the poor are led to organize.

3.2. The US South[15]

Social relations in the American South provide a second illustration of the workings of key mechanisms of the model, namely, that vertical coalitions are sustained by poverty and that one way to end the traditional social contract is through alternative investment opportunities. The work by Alston and Ferrie (1999) shows the importance of "paternalism" in the relations between the Southern rural elite and the rural laborers. This system, which can be likened to the "traditional social contract" in this paper, emerged after the American Civil War and lasted until around the 1960s.

The defeat of the South in the Civil War and the end of slavery required a recasting of social relations in the South. The system was partly based on intimidation and violence against blacks. Nevertheless, as Alston and Ferrie (1999) argue, the system also displayed an important component of paternalistic-type of social relations, where the landlords and laborers had specific duties of obligations, much as was the case in preindustrial Europe. Unlike in preindustrial Europe, racial divisions in the American South implied that one of the key services provided by the landlord under this social contract was protection against violence. However, the landlords also offered "old age assistance, unemployment

[14] Cited in EP Thompson (1979), pp. 836–837.

[15] I would like to thank an anonymous referee for suggesting to consider this case. All errors are, of course, mine.

insurance of a sort […], medical care, intercession with the authorities, recreational amenities, […], credit, […], and aid in terms of emergencies, among others." (Alston and Ferrie (1999) p. 13). The laborers, in exchange, were supposed to show deference and to accept social hierarchies.

Indeed, the arrangement can serve to illustrate the traditional social contract in the model. As Gilmore (2008) shows, some courageous cases notwithstanding, poor people in the South remained largely unorganized. The South was the least unionized part of the country. American Communists, in spite of considering the South crucial, never had much penetration there.[16] In the midst of the Great Depression, where the Communists were becoming more active, the possibility of a mass conversion of blacks to Communism was seen as "remote and improbable" (quoted in Gilmore (2008), p. 132). Interestingly, the observer argued that such a conversion, were it to happen, would "cause an immediate change in race relations". The system was indeed consistent with high levels of inequality. For instance, the proportion of households owning land, a crude measure of land equality, was lower in the South than in the North of the US in the early 1900s (Engermann and Sokoloff, 2002).

A key insight of Alston and Ferrie's work is that Southern elites successfully opposed federal social welfare legislation, notably during the New Deal, considering a threat to the paternalist system. They feared that social welfare legislation, by empowering the poor, would render them less willing to accept the current social contract. In this way, the perceptions of the elite regarding the role of poverty for the social contract correspond to the insights of the model. Thus, the Social Security Act of 1935 was watered down to exclude agricultural workers from old-age and unemployment insurance programs. The Farm Security Administration, a New Deal agency with the objective of reducing rural poverty, was likewise brought to a halt by the opposition of the Southern elite.

Indeed, the traditional social contract in the American South did not unravel through the gradual empowerment of the laborers, as was suggested for the German case mentioned above. Instead, its demise came from mechanization and technological progress in agriculture during the 1950s and 1960s. With mechanization, the paternalist system became too expensive too maintain. As Alston and Ferrie (1999) argue, the demise of the system was rather due to "supply-side" forces rather than to "demand-side" ones. As suggested above for the case of England, it was the elite that broke the social contract upon the penetration of technological improvements that raised the rate of return to investment. Although their link with the model would be highly speculative, it is worth noting the developments of poor people's organization and of inequality happening concurrently. Indeed, the period coincides with the height of the Civil Rights movement and the success of welfare and civil rights legislation of the Kennedy and Johnson years, which led to a substantial decrease in poverty and substantial narrowing of the black-white wage gap in the 1960s and 1970s (for poor people's movements, see Piven and Cloward and Piven (1977); for poverty, see US Census Bureau[17]; and for the wage gap see Card and DiNardo (2002)).

4. Concluding remarks

This paper shows that the interactions between inequality and the dominant type of coalition in a society can give rise to self-sustained social contracts where inequality persists: because the poor need time to organize, when inequality is high, the poor are vulnerable to consumption fluctuations and are willing to give up substantial redistribution in order to be protected from these fluctuations. This mechanism complements the work of De Ferranti et al. (2003) and Lindert (2004) on long run inequality by showing that, not only does the lack of poor people's organization discourage redistribution, but also high inequality discourages poor people's organization. In that respect, the type of social contracts in this paper can be a relevant factor for understanding the persistent inequality differences across regions of the world as well as the remarkable evolution of inequality in Western Europe.

In the model, the "traditional social contract" is an investment for the rich. If the rate of return to alternative investments rises substantially or the elite becomes weakened, this traditional social contract may break, paving the way for working class organization and a permanent decrease in inequality. The transition towards the modern social contract is abrupt in the former case and gradual in the latter. These results relate to the study of land reform dynamics of Horowitz (1993), which shows that, and rationalizes why, some land reforms have proceeded gradually. The present paper provides an additional explanation for this gradualism of the reform process: If elite becomes weaker for exogenous reasons the elite needs to increase their resources to prevent a horizontal coalition. As the poor gain resources, however, the consumption fluctuations associated with the horizontal coalition become less painful and the rich need to increase their transfers even more. In this way, the path towards equalization proceeds gradually.

The insights of this paper were shown using a simple model. For the sake of tractability and clarity, several simplifying assumptions were made. Indeed, a full understanding of the complexities of social contracts was well beyond the scope of this paper. It is worth mentioning certain elements not considered in the model that stand out for their importance, and that deserve (and are indeed receiving in the literature) further attention. First, individual heterogeneity was restricted to two types of individuals holding different amounts of wealth. In further research, the important role of the middle classes for the type of coalition formed (stressed, for instance, in Luebbert (1987) for the interwar period in Europe), needs to be addressed. Second, the model has focused on co-optation, leaving aside the other crucial element used by elites and rulers to maintain the existing social order: repression. Finally, as the case of England shows, insurance is a particularly important element of traditional social contracts. Acknowledging the role of insurance can help shed light into another important component in the transformation of the social contract in Europe related to the type of protest: from riots to organized protest. As certain authors have noted (Thompson, 1971; Rude, 1964), riots can be understood as ways for the poor to enforce the traditional social contract. Studying theoretically all these mechanisms at a moment where efforts are being made to gather empirical evidence on inequality back into the distant past (Piketty, 2005; Bourguignon and Morrison, 2002) will greatly enhance our understanding of the dynamics of inequality over the long haul.

[16] Black people in the South were supposed by Communists to be full of revolutionary potentially. However, in the first congress of the official black Communist organization (ANLC), in 1925, "the absence of black southern farmers and sharecroppers left an embarrassing void at the conference" (Gilmore, 2008, p. 53).

[17] http://www.census.gov/hhes/www/poverty/histpov/hstpov13.html, accessed June 2008.

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