E C O N O M I C S B U L L E T I N

Income inequality, redistribution and democratization

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Abstract

We consider that in a society, there are conflicts of income redistribution between the rich (class) and the poor (one), and the extent of income inequality creates conflict between these two groups in the society, bringing to a revolution aimed for more redistribution. In our model, we assume that there are two types of poor: weak and strong. The difference between the weak type and the strong type is that the later can win through a revolution, but the former can not. However, this is the private information of the poor and is not observed by the rich. When income inequality increases, with this asymmetry of information, the weak type of the poor is more likely to attempt a revolution. As a result, larger inequality results in higher probability of democratization.

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1 Introduction

The reasons some societies switch from nondemocracy to democracy are numerous. For example, the introduction of universal suffrage; certain ideological preferences over regimes (Diamond 1999); the importance of economic crises in triggering democratizations processes (Haggard and Kaufman 1995) and so on.

In this paper, we discuss the transitions from dictatorship to democracy when the income inequality of societies becomes high. Acemoglu and Robinson (2006) present the first systematic formal analysis framework of redistributive conflict, in which the poor can pose a revolutionary threat aiming for more redistribution and the rich choose between concessions and oppression. They conclude that under complete information (the types of the poor and the rich; the cost of revolution), there is an inverted U-shaped relationship between inter-group inequality and democratization.

The model explored in the present paper is based on Acemoglu and Robinson (2006). However, in this paper, we assume that the types of the poor (weak and strong) and the revolution cost are private information of the poor, that is, are not observed by the rich. In this framework, the rich will make concessions (i.e., promises) to avoid a revolution initiated by the poor. However, because the rich hold political power and, therefore, have the right to determine the level of taxes and transfers in the future, the promise of concessions may not be sufficiently credible. Therefore, if the poor have great certainty to believe that the rich would keep the promises, the poor will not initiate a revolution; if the poor anticipate that the nondemocratic regime will renege on its promises, they may initiate a revolution with strong probability. In fact, we will show that with asymmetry of information, an increase in inter-group equality may cause the weak type of the poor also initiate a revolution. As a result, there will be a great possibility for the transition from non-democracy to democracy.

The paper is organized as follows. In section 2, we present the fundamentals of the model; in section 3, we analyze the game of incomplete information; in section

4, we investigate the influence of the magnitude of inter-group income inequality on the probability of the rich creating a democracy; and section 5 concludes.

2 The Model

We assume that there are two types of poor actors, W(weak) and S(strong). The distinction between the two types is that when the type of the poor is W, the revolution will fail and when the type is S, the revolution will succeed. However, this is private information of the poor and is not observed by the rich. If the poor do not initiate a revolution, the rich will perform a redistribution. And if the poor initiate a revolution, the rich make a decision between oppression (denoted O) and full democratization (denoted D).

2.1 General Setting of the Model

We assume that in the population (normalized to unity) there exist two classes of individuals: the rich and the poor. A fraction $1-\delta > 1/2$ of the agents is poor (superscripted p), with identical income y^p. The remaining fraction δ is rich (superscripted r) from an oligarchy, with identical income y^r. The mean income is, $\bar{y} = \delta y^r + (1-\delta)y^p$, and, $y^p < \bar{y} < y^r$. The type of the poor is W (weak) with probability a and S (strong) with probability $1-a$. Our focus is on the distributional conflict, so here, we define income inequality, θ, as the share of total income accruing to the rich; In other words, we have:

$$y^p = \frac{(1-\theta)\bar{y}}{1-\delta}, \qquad y^r = \frac{\theta\bar{y}}{\delta}. \tag{1}$$

Notice that an increase in θ represents an increase in inequality and from (1), we obtain $\theta > \delta$.

The timing of events is as follows:

- The rich perform a redistributive policy to avoid revolution.
- Nature chooses the type of the poor ($t = W, S$), but this type is not observed by the rich.

- The poor move next and choose one of two actions: non-revolution (NR) or revolution (R).
- If the poor choose NR, the rich will perform the promised tax rate.
- If the poor choose R, then the rich decide whether to realize democratization (D) or initiate oppression (O).

If the poor choose R, the rich update their beliefs about the type of the poor. We denote the posterior beliefs of the rich that the weak type of the poor is p and the strong one is $1-p$, and the rich democratize with probability q and oppress with $1-q$.

Figure 1 (Appendix 1) presents the game tree. We consider that if the poor attempt a revolution, the payoff of the rich depends on the type of the poor. If the type of the poor is W, the revolution will fail; if the type is S, repression fails and democratization will be realized.

Now we consider the situation that the rich perform a redistribution. The government(the rich) has a balanced budget that levies a proportional tax on income and performs a lump-sum transfer to all individuals equally. We assume that levying a redistributive tax rate τ increases the costs of taxation $C(\tau)$ where $C'(\cdot) > 0, C''(\cdot) > 0, C'(0) = 0$ and $C'(1) = 1$. Therefore, the payoffs of the poor and the rich are as follows: [1]

$$y^i(k) = \begin{cases} (1-\tau)y^i + (\tau - C(\tau))\,\bar{y} & \text{if} \quad \text{k = NR}, \\ (1-\tau^p)y^i + (\tau^p - C(\tau^p))\,\bar{y} & \text{if} \quad \text{k = D}. \end{cases} \tag{2}$$

where $i = \{p, r\}$.[2]

We know that under non-democracy, the tax rate, τ, is performed by the rich which is smaller than the equilibrium tax rate under democracy, i.e., most preferred by the poor, τ^p, (by Median Voter Theorem). Actually, by the F.O.C, we

[1] See Persson and Tabellini 2000, pp. 19-21.

[2] We can find equilibrium tax rate, τ^p, by maximizing the post-tax income of a poor agent. The F.O.C gives $-y^p + (1 - C'(\tau^p))\bar{y} = 0$. By (1), we can obtain $(\theta - \delta)/(1 - \delta) = C'(\tau^p)$.

know that τ^p is a function of (θ, δ). Next, we define the payoffs of the rich and the poor when the rich choose oppression depending on the type of the poor:

Definition 1.

$$y^r(O|j) = \begin{cases} y^r - \phi\mu\bar{y} & \text{if} \quad j = W, \\ 0 & \text{if} \quad j = S, \end{cases} \tag{3}$$

where μ is the destroyed fraction of the mean income of post-revolution, i.e. the revolution cost $(0 < \mu < 1)$, and ϕ is a parameter in $(0, 1)$.[3]

This means that if the rich choose oppression, their payoffs depend on the type of the poor. If the type of the poor is W, the oppression will succeed with a small loss of income; and if their type is S, the oppression will fail and the payoff of the rich is 0.

Definition 2.

$$y^p(O|j) = \begin{cases} y^p - \mu\bar{y} & \text{if} \quad j = W, \\ \dfrac{1-\mu}{1-\delta}\bar{y} & \text{if} \quad j = S. \end{cases} \tag{4}$$

This definition means that if revolution falls, it will cost the poor $\mu\bar{y}$ and if revolution succeeds, they get a payoff of $\frac{1-\mu}{1-\delta}\bar{y}$. (we assume $\mu > \delta$).

Next, we define the condition for the strong type of the poor to attempt a revolution since the revolution will surely succeed.

Definition 3. *We define a "revolution constraint": if $y^p(O|S) > y^p$, the poor may attempt a revolution, i.e.,*

$$\theta > \mu. \tag{5}$$

Therefore a greater inequality (i.e., higher θ) makes the "revolution constraint" more likely to bind. Since non-revolution and non-democratization are the best outcomes for the rich, therefore they will try to prevent a revolution by a redistributive policy if at all possible. Whether they can do this depends on the value

[3]In practice, any value, which is smaller than $y^r(D)$, will be reasonable. For simplicity, we assume that $y^r(O|S) = 0$.

they can promise to the citizens. Clearly, the most favorable tax rate they can offer to the poor is τ^p. However, this is not as good as offering τ^p for certain. That is to say, if the redistributive tax rate satifies $y^p(NR) \geq y^p(O|S)$, then such a concession would prevent a revolution attempt.[4] By (1), (2) and (4), we get

$$\mu \geq \theta - [\tau^p(\theta - \delta) - (1 - \delta)C(\tau^p)]\,. \tag{6}$$

If inequality is limited (i.e., θ is relatively low) or there is a high probability that the promise made by the rich will be upheld, then living under nondemocracy is not too bad for the poor, (6) will hold and even the strong type of poor will not revolt too.

To analyze the model, we determine a critical value of the revolution cost $\bar{\mu}$ such that (6) holds as an equality:

$$\bar{\mu} = \theta - [\tau^p(\theta - \delta) - (1 - \delta)C(\tau^p)]\,.$$

Then, when $\mu > \bar{\mu}$, (6) will hold. We can then know that if the rich perform a tax rate $\tau \leq \tau^p$ (i.e., by promising) such that $y^p(NR) = y^p(O|S)$, they can prevent a revolution attempt successfully. Therefore, τ satisfies

$$\mu = \theta - [\tau(\theta - \delta) - (1 - \delta)C(\tau)]\,. \tag{7}$$

However, because the cost of revolution is not observed by the rich, the redistributive tax τ can not always prevent a revolution attempt. And with the asymmetry of information, the poor of weak type may also attempt a revolution. Therefore if a revolution arises, what will the rich choose — democratization or oppression? We will present a solution to this question in the following analysis of the game.

3 Analysis of the Game

Since the type of the poor and the revolution cost are not observed by the rich, the poor of weak type may take advantage of the asymmetry of information to attempt a revolution. There exists the following perfect Bayesian equilibria:

[4] In this framework, we assume that the purpose of the poor is only to aim for more redistribution and they have no ideological preferences over regimes.

Proposition 1.

- *If (5) does not bind, both types of the poor choose NR and the rich choose O, with beliefs $p \in [\bar{p}, 1]$; the rich redistribute with $\tau = 0$. And even if the rich redistribute with any $\tau \in (0, \tau^p)$, the equilibrium does not change.*
- *If (5) binds but $\mu \geq \bar{\mu}$, the rich redistribute with τ which satisfies (7); both types of the poor choose NR and the rich choose O, with beliefs $p \in [\bar{p}, 1]$. And if τ does not satisfy (7), the strong type of the poor choose R, the weak type of the poor choose NR and the rich choose O, with beliefs $p \in [\bar{p}, 1]$ off the equilibrium path.*

This proposition means that if the "revolution constraint" does not bind, a revolution would not be attempted by any type of the poor, so the rich do not perform any redistribution; and even if the "revolution constraint" binds, the rich can also prevent the revolution by redistribution.

However, when the "revolution constraint" binds and the cost of revolution is small, there will be the following two equilibria:

Proposition 2.

- *When (5) binds and $\mu < \bar{\mu}$,*
  - *A semi-pooling equilibrium: the strong type of the poor always choose R and the weak type of the poor choose R with probability r and NR with probability $1 - r$, where $r = \frac{\bar{p}(1-a)}{a(1-\bar{p})}$; the rich democratize with probability $\bar{q}$ and oppress with probability $1 - \bar{q}$ with beliefs $\bar{p}$. If the rich choose D, then both types of the poor choose R and the equilibrium redistributive tax rate (ERTR) is τ^p; and if the rith choose O, then the weak type of the poor choose NR.*
  - *A pooling equilibrium: both types of the poor will initiate R and the rich will choose D, with beliefs $p = a \in [0, \bar{p}]$; the ERTR is τ^p. And if $\tau < \tau^p$, the strong type of the poor choose R, the weak type of the poor choose NR, the rich choose O, with beliefs $p = a \in [0, \bar{p}]$ off the equilibrium path.*

(See Appendix 2).

First note that revolution is a dominant strategy for the strong type of the poor. Then the nature of equilibrium hinges on whether the weak type of the poor chooses revolution or not. There is always a semi-pooling equilibrium in which the weak type of the poor is indifferent between choosing revolution and non-revolution and the rich are indifferent between democratization and oppression. However, in the semi-pooling equilibrium, the weak type of the poor attempt a revolution with probability r and hence this behavior would raise the probability of democratization.

More important for this paper is the pooling equilibrium. With asymmetric information, when the poor stage a revolution the rich have to democratize. The reason is that if the type of the poor is strong, the oppression fails and the payoff of the rich would be 0. This is the worst outcome for the rich, in consequence democratization would be realized with a greater possibility.

4 Concluding Remarks and Futher Research

We have provided a framework in which an income inequality increase gives the opportunity to the poor, due to asymmetric information, of initiating a revolution and particularly, if the cost of oppression becomes higher (i.e., criticism from the international society), there would be a greater possibility for the rich to democratize. And another important point is that once democracy is created, the problem of how to consolidate it is left. In particular, the threaten from a coup undertaken by the rich. We will investigate this in a future work.

Appendix 1

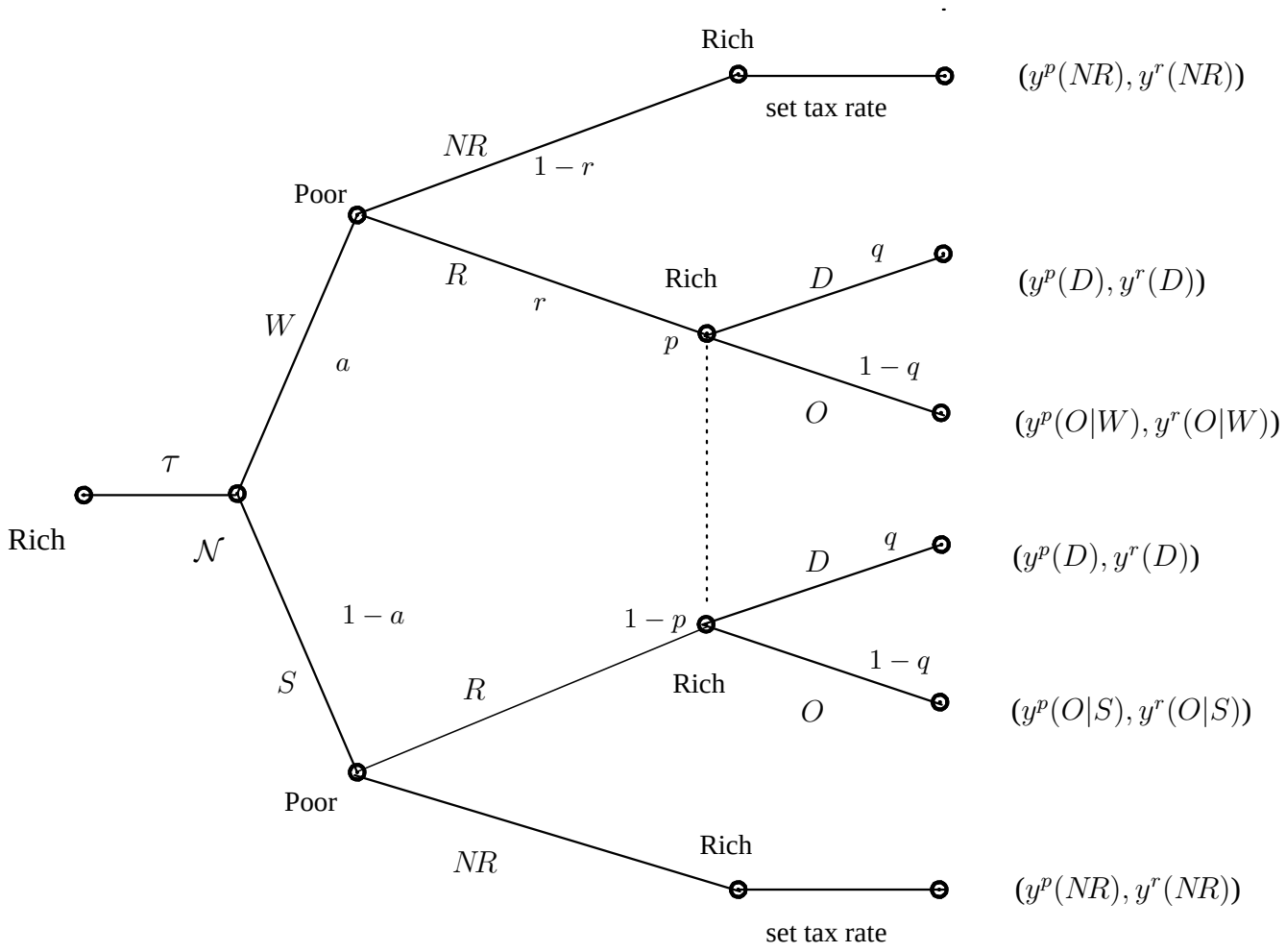

Figure 1: The Game Tree

Appendix 2

We define the posterior beliefs of the rich, p, that if $p = \bar{p}$, then the rich would be indifferent between D and O. Since their expected payoff from D is $py^r(D) + (1-p)y^r(D)$, and their expected payoff from O is $py^r(O|W) + (1-p)y^r(O|S)$, the critical level of their posterior is defined as

$$\bar{p} = \frac{y^r(D)}{y^r(O|W)} \in (0,1). \tag{8}$$

If $p < \bar{p}$, the rich will democratize. In contrast, if $p > \bar{p}$, the rich will initiate oppression.

We also define $\bar{q}$ as the probability of democratization by the rich following a revolution that will make the weak type of the poor indifferent between choosing R and NR. This is given by $qy^p(D) + (1-q)y^p(O|W) = y^p(NR)$, where the left side is the payoff from revolution and the right side is the payoff from NR. It is defined by

$$\bar{q} = \frac{y^p(NR) - y^p(O|W)}{y^p(D) - y^p(O|W)} \in (0,1). \tag{9}$$

When the rich choose D with probability $q > \bar{q}$, the weak type would initiate a revolution with probability 1. In contrast, if $q < \bar{q}$, R would not arise. If the type of the poor is S, the poor will always choose a revolution.

In a word, when $q > \bar{q}$, any type of the poor will initiate a revolution and the probability of the poor's type being W is given by p equals to a by Bayes' rule. In contrast, if $q < \bar{q}$, the weak type chooses NR and the strong one initiates a revolution. It means $p = 0$ but it is contradictory to $p = \bar{p}$. When $q = \bar{q}$, the strong type initiates a revolution and the weak one plays a local strategy. Here, we define the probability that the weak type initiates a revolution as r. From Bayes's rule,

$$r = \frac{\bar{p}(1-a)}{a(1-\bar{p})}. \tag{10}$$

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