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Endogenous Sanctions, Foreign Investment, and Democratization

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Abstract

This paper establishes a sequential game-theoretical model of a dictatorship with two political arenas: an international politics of sanctions or foreign investment into the dictatorship's capital markets, and domestic politics of democratization between the Dictator and the Poor. In line with existing theory and empirics, the Dictator may open a dictatorship's capital markets to lower the redistributive pressures by the disenfranchised poor. Sanctions are more likely to occur as world interest rates rise.

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Ⅰ. Introduction

Under which conditions do dictatorships open or close their capital markets to foreign investment? Aidt and Gassebner (2010) provide theoretical and empirical evidence that dictatorships have lower trade volumes than democracies. While there are many studies that address on whether dictatorships choose to open their markets, both final output goods and capital, to the global economy, fewer studies deal with the question of why dictatorships open their markets in the

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first place. This paper looks at one key aspect of economic globalization within dictatorships, capital inflows, and the role of foreign capital in democratization. In particular, I develop a theoretical model on the conditions in which a dictator limits political freedom (such as voting rights to the majority of the population) while opening its capital markets for foreign competition.

The previous literature does not seriously consider the endogenous choice of dictatorships to opening capital markets. Acemoglu and Robinson (2006, Ch. 10) consider the effects of international trade and financial integration on democratization in a dictatorship, but do not endogenize the choice of the dictator whether to pursue such economic globalization. Myerson (2010) is an early study that considers the possibility of a dictator which expropriates foreign investors' capital into his own consumption. Freeman and Quinn (2012) provide empirical evidence that financially integrated autocracies were more likely to democratize than financially closed autocracies during the post-World War II period. Interestingly, Freeman and Quinn's empirical analysis agrees with Acemoglu and Robinson (2006, Ch. 10)'s theoretical predictions that financially closed autocracies exhibit a hump-shaped relationship between income inequality and democratization. However, for financially open autocracies, they argue that there is an upward relationship between income inequality and democratization. This paper intends to answer one of the questions proposed by Freeman and Quinn (2012): why do some autocracies (i.e. North Korea) close their financial markets from foreign capital, while others (i.e. Vietnam) open their financial markets altogether?

If, for whatever reason, a dictator is willing to preserve autarky and not open the dictatorship's capital markets, then sanctions make little practical sense as a deterrent against the Dictator's policies. For instance, North Korea is a widely mentioned example of a

dictatorship with almost no foreign trade or investment, except in illegal trade to procure raw materials such as uranium. Even with the Kaesong Industrial Complex, North Korea did not open much of its industries to foreign investment, and the industrial complex was even closed in 2015. However, as Kaempfer and Lowenberg (1988) emphasize, "the sanctions which are most likely to precipitate the desired political change in the target country are those which concentrate income losses on groups benefiting from the target government's policy," among other criteria. It remains to be seen when the political elite (alternatively called the "Dictator" in this paper) chooses to open its capital markets, and therefore when a dictatorship could be affected by sanctions in the first place. The theoretical model in this paper addresses these concerns by looking at an economically rational dictator's income-maximizing choice in a democratization game where he has the choice of taxation and opening capital markets. A new contribution to the model is the introduction of a superpower which can choose to do nothing against a dictatorship with closed capital markets, or invest into or sanction against a dictatorship with open capital markets.

This paper is structured as follows; Section 2 introduces the model, and Section 3 explains the theoretical results of the model. Section 4 discusses a real-life example and concludes the paper.

Ⅱ. Model

1. Economic Structure of the Dictatorship

I assume a world with two countries, a small dictatorship that follows world prices, and a Superpower (denoted as S) with foreign capital K_S. In a dictatorship, I assume two players; the first is a

Dictator (denoted as D) who owns exogenously given capital K_D. The second is a representative member of a homogeneous Poor class (denoted as P) which supplies labor L. In a population of mass 1, the Dictator has negligible mass such that the Poor class occupies at least 1/2 of the population. In a dictatorship with closed financial markets or a "closed" regime (denoted as C), the Poor produces output with the Dictator's capital K_D, and as a result are paid labor wages while the Dictator takes capital income. Assuming a Cobb-Douglas production function,[1] where α is the capital share of income, the output produced in a closed regime is Y_C, where

$$Y_C = F(K_D, L) = K_D^{\alpha} L^{1-\alpha} = f(k_D) \tag{1}$$

and where $k_D = K_D / L$, or the domestic capital stock per individual Poor worker. I assume that K_D is relatively scarce to labor compared to that of world capital markets, an important assumption in this model. The real interest and wage rates in a closed regime are equal to the marginal product of capital and labor respectively, as shown below:

$$r_C = f'(k_D) = \alpha k_D^{(\alpha-1)} \tag{2}$$

$$w_C = f(k_D) - k_D f'(k_D) = (1-\alpha) k_D^{(\alpha-1)} \tag{3}$$

By contrast, in an "open" regime (denoted as O), the Dictator allows the Superpower's capital to enter domestic production. I denote $k_S = K_S / L$ as the foreign capital stock per individual Poor worker in the dictatorship. In a dictatorship with open financial

1) I follow the assumption of the Cobb-Douglas function from Acemoglu and Robinson (2006) in analyzing the effects of globalization on dictatorships. Future research may weaken the assumption of perfectly competitive markets in dictatorships.

markets, the Dictator and the Superpower each receive their portion of the capital interest based on each player's portion of invested capital, whereas the workers still receive all of the labor wages. Due to the assumption that domestic capital is relatively scarce to labor as compared to world capital markets, there will be a net inflow of the superpower's capital into the dictatorship, and $K_S > 0$. This causes an open regime to have lower real interest rates and higher real wages than a closed regime, as such:

$$Y_O = F(K_D + K_S, L) = (K_D + K_S)^{\alpha} L^{(1-\alpha)} = f(k_D + k_S) \quad (4)$$

$$r_O = f'(k_D + k_S) = \alpha(k_D + k_S)^{(\alpha-1)} \quad (5)$$

$$w_O = f(k_D + k_S) - (k_D + k_S) f'(k_D + k_S)$$
$$= (1-\alpha)(k_D + k_S)^{(\alpha-1)} \quad (6)$$

2. Domestic and International Politics of the Dictatorship

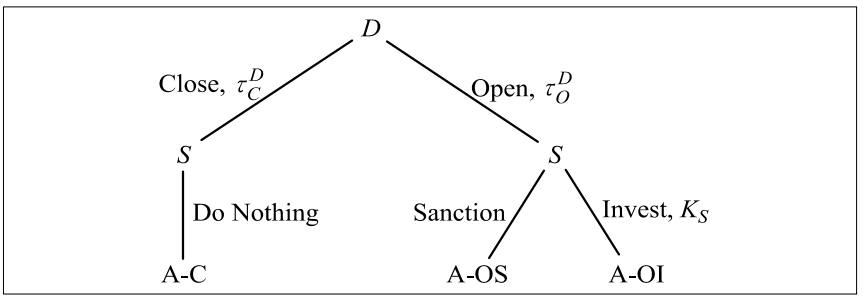
This brings us to the domestic and international politics of the dictatorship with a foreign investment policy. I assume a sequential game with perfect information with the three players being the Dictator, the Poor and the Superpower.[2)]

I first explain the international politics between the Dictator and the Superpower, described in Figure 1. In the first step, the Dictator chooses whether to 'Close' the regime's domestic capital markets

2) There is an implicit assumption here that all three players are expressed as single entities, when in reality all three players are groups of individuals making collective decisions. I assume, as in Acemoglu and Robinson (2006, p. 123-133), that all members of the Poor and the Superpower equally divide income payoffs amongst themselves, thereby assuming that there is no collective action problem for simplicity. The Dictator class, typically denoted in models such as Acemoglu and Robinson (2006) as the Rich class which holds the political power of taxation in a dictatorship, is also a single actor in this model.

from the Superpower's capital or 'Open' them. Then, the Dictator chooses an income tax rate, τ_{RC} in a closed regime and τ_{RO} in an open regime, to tax from both the Dictator and the Poor. Then, the Superpower chooses whether to 'Do Nothing' against a closed dictatorship, or 'Sanction' or 'Invest' into an open dictatorship. The Superpower, when choosing to 'Invest' in the open dictatorship, chooses the level of its capital, $K_s > 0$, which is then included in the dictatorship's economy during production. If the Superpower chooses to sanction an open dictatorship, it will receive a payoff of $\bar{r}K_s - c$, with c being the costs of sanctioning the dictatorship, as the Superpower can choose to invest its capital elsewhere in the world.

〈Figure 1〉 Sequential Game of the Dictator and Poor in a Dictatorship and a Superpower



After the initial decisions of the Dictator in the dictatorship and the Superpower, the Dictator collects tax revenue based on a linear income tax rate, then redistributes the revenue as a lump-sum transfer to the Poor. Due to the assumption of the Dictator having negligible but positive mass compared to the size of the Poor (normalized as 1), this is equivalent to assuming that the Dictator tax all taxable income and then give away all of the taxed income to the Poor.[3] To include distortionary effects of taxation on the economy

3) The results of this model do not qualitatively differ under the assumption of

and costs of bureaucracy, tax transfers are deducted by the cost of taxation function $C(\tau)$, leaving the total amount of transferred income as $(\tau - C(\tau))Y$. One specification of $C(\tau)$ that is used in this paper is to assume $C(\tau) = e\tau^2$, where e is the total distortionary effect of taxation on the economy and for simplicity, $e \in [0,1]$.

Given that the Poor are taxed of their income y^P and then are given a lump-sum transfer of $(\tau - C(\tau))y$ (where y is the total income or output of the dictatorship's economy), the Poor's post-taxation income equals $(1-\tau)y^P + (\tau - C(\tau))y$. Given the specification of $C(\tau)$ above and the fact that the Poor earn a labor income of $y^P = (1-\alpha)y$, the Poor get a total post-taxation income of $(1-\tau)(1-\alpha)y + (\tau - e\tau^2)y$. Therefore, the Poor's ideal tax rate τ^{P*} can be calculated by taking the first order condition of the Poor's post-taxation income with respect to the tax rate, or:

$$\tau^{P*} = \frac{\alpha}{2e} > 0 \tag{7}$$

Similarly, the Dictator get a post-taxation income of $(1-\tau)\alpha y$ and no lump-sum transfers, so the ideal tax rate of the Dictator is simply:

$$\tau^{D*} = 0 \tag{8}$$

In the dictatorship, the Dictator monopolizes political power, which means that the Dictator alone set the tax rate τ^D. However, in a democracy, the Poor also have the right to vote on the tax rate, and the Poor class clearly occupies more than 1/2 of the population. Therefore, the Median Voter Theorem easily tells us that the median voter is a member of the Poor, and therefore the Poor decide the tax

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a Dictator with positive mass (as opposed to being a negligible portion of the population, as it does in Acemoglu and Robinson (2006, Ch. 10).

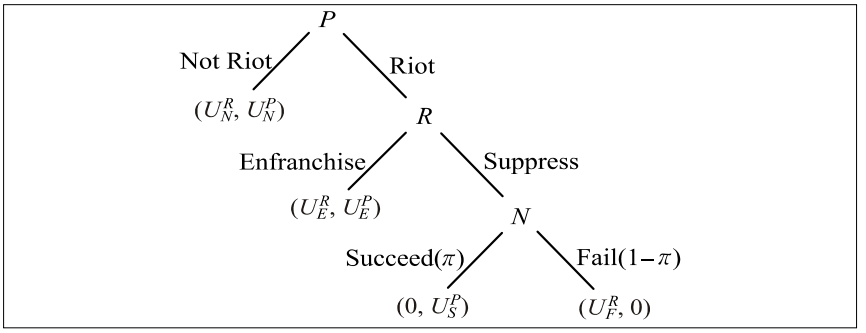
rate. As I will discuss later, while the Dictator's ideal tax rate of $\tau^{D*}=0$, this is not necessarily the tax rate in a dictatorship due to the sequential nature of this democratization game, which will be explained later in this section.

After output production, taxation and income transfers, the Poor decide whether to 'Not Riot' or 'Riot'. In this static extensive game with perfect information, the game ends at one of four possible outcomes; the Poor can choose to 'Not Riot', which maintains the dictatorship and income is redistributed according to the Dictator's tax rate. In this case, the Dictator and the Poor receive income payoffs U_N^D and U_N^P. If the Poor choose to 'Riot, the Dictator can choose to 'Enfranchise' or to 'Suppress'. If the Dictator chooses to 'Enfranchise' the Poor, the dictatorship becomes a democracy and the median voter in a democracy, namely a member of the Poor class, decide the tax rate. The Dictator and Poor in an enfranchised democracy receive payoffs U_E^D and U_E^P.

However, if the Dictator chooses to 'Suppress', then a fourth player, 'Nature', decides randomly whether the now violent riot succeeds with probability $\pi\in[0,1]$, or fails with probability $1-\pi$. If Nature chooses 'Succeed', the Poor receive an income payoff of U_S^P and the Dictator receive no income. If Nature chooses 'Fail', the Dictator receives an income payoff of U_F^D and the household receives no income. In other words, the winning side of an insurrection receives all of the remaining national income that is not destroyed during the insurrection. This level of destruction is denoted as $\mu\in[0,1]$. The same description applies in parallel in an open regime, although in this case the Superpower also receives interest from foreign capital K_s, minus taxation. This democratization subgame described above, which I call "Subgame A" in Figure 1, is described in Figure 2. For the purposes of analysis for the repeated game

version of this model, I assume that the game ends for the Dictator in a dictatorship when the game ends in an enfranchised democracy or in either a successful riot or a failed one, and continues to the next period only when the Poor choose to "Not Riot".

〈Figure 2〉 Democratization Subgame ("Subgame A")



Now I describe each of the income payoffs in Figure 2 depending on the outcome of the international politics between the Dictator and the Superpower. First consider that the Dictator closes the country's capital markets from the Superpower and that the Poor choose to 'Not Riot'. The Dictator effectively taxes himself at a tax rate τ_C^D and distributes it to the Poor. In that case, the Dictator earn $(1-\tau_C^R)r_C K_D$ and the Poor, with the lump-sum transfers, earn $(1-\tau_C^D)w_C L + (\tau_C^D - C(\tau_C^D))(r_C K_D + w_C L)$. The same logic applies in the enfranchised democracy outcome where the Poor riot and the Dictator enfranchise the Poor, although in this case the Poor set the tax rate τ_C^P. In the case of the violent riot, where the Dictator chooses to Suppress, a portion μ of the national output gets destroyed, thereby causing the total payoffs U_S^P and U_F^R to be $(1-\mu)(r_C K_D + w_C L)$. Table 1 summarizes the income payoffs of the Dictator, the Poor and the Superpower in a closed regime, given the four outcomes N (No Riot), E (Enfranchisement), S (Successful Riot) and F (Failed Riot).

Note that due to the Cobb-Douglas production function, $r_C K_D = \alpha Y_C$ and $w_C L = (1-\alpha) Y_C$ in a closed dictatorship. As said before, since S incurs a positive sanction cost, the assumptions of this model result in the Superpower always choosing to "Not Sanction" against a closed dictatorship.

〈Table 1〉 Income Payoffs for Closed Dictatorship

Payoffs	Not Riot	Enfranchisement	Successful Riot	Failed Riot
R	$U_R^N = (1-\tau_C^R) r_C K_D$ $= (1-\tau_C^R) \alpha Y_C$	$U_R^E = (1-\tau_C^P) r_C K_D$ $= (1-\tau_C^P) \alpha Y_C$	$U_R^S = 0$	U_R^F $= (1-\mu) Y_C$
P	$U_P^N = (1-\tau_C^R) w_C L$ $+ (\tau_C^R - C(\tau_C^R))$ $\times (r_C K_D + w_C L)$ $= (1-\tau_C^R)(1-\alpha) Y_C$ $+ (\tau_C^R - e(\tau_C^R)^2) Y_C$	$U_P^E = (1-\tau_C^P) w_C L$ $+ (\tau_C^P - C(\tau_C^P))$ $\times (r_C K_D + w_C L)$ $= (1-\tau_C^P)(1-\alpha) Y_C$ $+ (\tau_C^P - e(\tau_C^P)^2) Y_C$	U_P^S $= (1-\mu) Y_C$	$U_P^F = 0$
S (Do Nothing)	$U_S^{C,NS} = \bar{r} K_s$	$U_S^{C,NS} = \bar{r} K_s$	$U_S^{C,NS} = \bar{r} K_s$	$U_S^{C,NS} = \bar{r} K_s$

Now I turn to the political game in the case where the Dictator chooses to "Open" the economy with a tax rate τ_O^D. Now the Superpower has two options; the first is to "Sanction" the open dictatorship's economy, thereby incurring the same investment with the world interest rate and sanction costs as before. In this case, the Superpower's income payoff is simply $U_S^S = \bar{r} K_s - c$. Sanctions by the Superpower essentially closes the capital markets of the dictatorship and output production occurs only with the Dictator's domestic capital K_D, and the results are the same as Table 1 except that the tax rate is now τ_O^R. The income payoffs are summarized in Table 2.

〈Table 2〉 Income Payoffs for Open and Sanctioned Dictatorship

Payoffs	Not Riot	Enfranchisement	Successful Riot	Failed Riot
R	$U_R^N=(1-\tau_O^R)r_CK_D$ $=(1-\tau_O^R)\alpha Y_C$	$U_R^E=(1-\tau_O^P)r_CK_D$ $=(1-\tau_O^P)\alpha Y_C$	$U_R^S=0$	U_R^F $=(1-\mu)Y_C$
P	$U_P^N=(1-\tau_O^R)w_CL$ $+(\tau_O^R-C(\tau_O^R))$ $\times(r_CK_D+w_CL)$ $=(1-\tau_O^R)(1-\alpha)Y_C$ $+(\tau_O^R-e(\tau_O^R)^2)Y_C$	$U_P^E=(1-\tau_O^P)w_CL$ $+(\tau_O^P-C(\tau_O^P))$ $\times(r_CK_D+w_CL)$ $=(1-\tau_O^P)(1-\alpha)Y_C$ $+(\tau_O^P-e(\tau_O^P)^2)Y_C$	U_P^S $=(1-\mu)Y_C$	$U_P^F=0$
S (Sanction)	$U_S^{O,S}=\bar{r}K_s-c$	$U_S^{O,S}=\bar{r}K_s-c$	$U_S^{O,S}$ $=\bar{r}K_s-c$	$U_S^{O,S}$ $=\bar{r}K_s-c$

The Superpower's second option is to "Invest" in the open dictatorship, thereby injecting the Superpower's own capital into the dictatorship's output production and earning post-taxation income in the form of capital returns. The sharing of capital interest between the Dictator and the Superpower will be important later in the theoretical analysis. Similar to the closed dictatorship's economy, $r_O(K_D+K_S)=\alpha Y_O$ and $w_OL=(1-\alpha)Y_O$ in an open regime. I denote the ratio of the dictator's capital to total capital in the dictatorship's economy, $d=K_D/(K_D+K_S)$, to indicate that $r_OK_D=\alpha d Y_O$ and $r_OK_S=\alpha(1-d)Y_O$.

〈Table 3〉 Income Payoffs for Open Dictatorship with Foreign Investment

Payoffs	Not Riot	Enfranchisement	Successful Riot	Failed Riot
R	$U_R^N=(1-\tau_O^R)r_OK_D$ $=(1-\tau_O^R)\alpha Y_O$	$U_R^E=(1-\tau_O^P)r_CK_D$ $=(1-\tau_O^P)\alpha Y_O$	$U_R^S=0$	$U_R^F=(1-\mu)$ $\times(1-\alpha$ $+\alpha d)Y_O$
P	$U_P^N=(1-\tau_O^R)w_OL$ $+(\tau_O^R-C(\tau_O^R))$ $\times(r_C(K_D+K_S)+w_CL)$ $=(1-\tau_O^R)(1-\alpha)Y_O$ $+(\tau_O^R-e(\tau_O^R)^2)Y_O$	$U_P^E=(1-\tau_O^P)w_CL$ $+(\tau_O^P-C(\tau_O^P))$ $\times(r_C(K_D+K_S)+w_CL)$ $=(1-\tau_O^P)(1-\alpha)Y_O$ $+(\tau_O^P-e(\tau_O^P)^2)Y_O$	$U_P^S=(1-\mu)$ $\times(r_CK_D+w_CL)$ $=(1-\mu)$ $\times(1-\alpha+\alpha d)Y_O$	$U_P^F=0$
S (Invest)	$U_S^{O,I}=(1-\tau_O^R)r_OK_s$ $=(1-\tau_O^R)\alpha(1-d)Y_O$	$U_S^{O,I}=(1-\tau_O^P)$ $=\alpha(1-d)Y_O$	$U_S^{O,I}$ $=\alpha(1-d)Y_O$	$U_S^{O,I}$ $=\alpha(1-d)Y_O$

Ⅲ. Theoretical Results

1. Domestic Politics

In this section, I solve the subgame perfect equilibrium of the extensive game described above using backward induction. I assume all players in the democratization game are risk-neutral to simplify the analysis. First, I look at the conditions in which the Dictator chooses to 'Enfranchise' or to 'Suppress' in a closed regime. If the Dictator chooses to 'Enfranchise' and let the Poor choose their preferred taxation rate of τ_C^P, then the Dictator will earn less income under the enfranchised democracy. In other words, there is a threshold level of taxation by the Poor in an enfranchised democracy that makes the Dictator chooses 'Suppress' over 'Enfranchise'. Given that the fourth player, Nature, randomly chooses the success or failure of a violent riot, the expected income payoff of the Dictator during a violent riot is $(1-\pi)U_D^F+\pi U_D^S=(1-\pi)U_D^F=(1-\pi)(1-\mu)Y_C$ (because $U_D^S=0$). Let the threshold level of taxation by the Poor in an enfranchised democracy with closed financial markets be τ_C^{P*}, and that in the enfranchised democracy with open financial markets as τ_O^{P*}. Then, the Dictator chooses to Suppress in a closed regime when Inequality 9 is satisfied:

$$(1-\pi)(1-\mu)Y_C=(1-\pi)U_D^F \geq U_D^E=(1-\tau_C^{P*})\alpha Y_C \tag{9}$$

Solving Inequality 9:

$$\tau_C^{P*} \geq 1-\frac{(1-\pi)(1-\mu)}{\alpha} \tag{10}$$

Alternatively, if Inequality 10 is not satisfied, then the Dictator

chooses to 'Enfranchise' the Poor. There are several reasons on why this can happen, even when holding the technology of output production (in this case, α) fixed. First, it is possible that the exogenous probability of a successful riot (π) is high enough to make the Dictator fear more from suppression. Second, the proportion of output destroyed during a violent riot, or μ, could be high enough to make the Dictator expect lower income payoffs even from a violent riot. For these two reasons, the Dictator chooses to enfranchise the Poor and democratize instead of suppressing the riot. In other words, the Poor can get away with demanding a higher tax rate and consequently more redistribution when either π or μ increases. This leads to Remark 1 below:

Remark 1: An increase in the probability of a successful riot or an increase in the proportion of output destroyed during a riot increases the likelihood of enfranchisement by the Dictator. More formally, the Dictator chooses to 'Enfranchise' in a dictatorship with closed capitail markets under either of these two conditions:

a. If $\tau_C^{P*} = \frac{\alpha}{2e} < 1 - \frac{(1-\pi)(1-\mu)}{\alpha}$, and the Poor set their ideal tax rate, $\tau_C^P = \tau_C^{P*}$.
b. If $\tau_C^{P*} \geq 1 - \frac{(1-\pi)(1-\mu)}{\alpha}$, but the Poor set their tax rate as $\tau_C^P = \tau_C^D$ to prevent the Dictator from choosing to 'Suppress'.

This brings us to the Poor's decision between 'Riot' and 'Not Riot', which depends on the Dictator's choice of tax rate in a closed dictatorship, τ_C^R. Intuitively, the lower the Dictator chooses the tax rate in a dictatorship, the more likely the Poor's income payoffs from choosing to 'Riot' would be relatively greater, and therefore will be more likely to choose to 'Riot'.

With this in mind, the Poor choose to 'Not Riot' in two scenarios,

given certain parameter levels. If the Dictator cannot credibly threaten to 'Suppress' and lead to output destruction on both sides, the first scenario is for the Dictator to concede preemptively to a high level of taxation and redistribution, or $\tau_C^D \geq \tau_C^{P*}$. While this leaves the Poor with no incentive to choose to 'Riot' in the first place, the Dictator earns at most the same income payoff as in an enfranchised democracy.

The second scenario occurs when, given certain parameter values, the Dictator can credibly threaten to 'Suppress' whenever the Poor choose to 'Riot', thereby leading to a violent riot with output destruction. In this case, if the Poor expect a lower payoff from the violent riot than from preserving the dictatorship, the Poor will instead choose to 'Not Riot'.

Translating the above scenarios into the terminology of our formal model, the first scenario occurs when $U_D^E \geq (1-\pi)\,U_D^F$ and $U_P^N \geq U_P^E$, or:

$$(1-\tau_C^P)\alpha\, Y_C \geq (1-\pi)(1-\mu)\, Y_C \tag{11}$$

$$(1-\tau_C^D)(1-\alpha)\, Y_C + (\tau_C^D - e\,(\tau_C^D)^2)\, Y_C \geq (1-\tau_C^P)(1-\alpha)\, Y_C + (\tau_C^P - e\,(\tau_C^P)^2)\, Y_C \tag{12}$$

Similarly, the second scenario occurs when $U_R^E < (1-\pi)\,U_R^F$ and $U_P^N \geq \pi\, U_P^S$, or:

$$(1-\tau_C^P)\alpha\, Y_C < (1-\pi)(1-\mu)\, Y_C \tag{13}$$

$$(1-\tau_C^R)(1-\alpha)\, Y_C + (\tau_C^R - e\,(\tau_C^R)^2)\, Y_C \geq \pi(1-\mu)\, Y_C \tag{14}$$

After algebraic manipulation, the two scenarios can be summarized into Proposition 1 below.

Proposition 1: In a closed dictatorship, the Poor choose to 'Not Riot' when either of these conditions are satisfied:

a. $\tau_C^{P*} \leq 1 - \frac{(1-\pi)(1-\mu)}{\alpha}$ and the Dictator sets the tax rate as $\tau_C^D = \tau_C^{P*}$.

b. $\tau_C^{P*} > 1 - \frac{(1-\pi)(1-\mu)}{\alpha}$ and the Dictator sets the tax rate to satisfy the inequality $1 - \alpha + \alpha\tau_C^D - e(\tau_C^D)^2 \geq \pi(1-\mu)$.

Note that in Proposition 1, solving the inequality $1 - \alpha + \alpha\tau_C^D - e(\tau_C^D)^2 \geq \pi(1-\mu)$ leads to

$$\frac{\alpha}{2e} - \sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e} + \frac{\alpha^2}{4e^2}} \leq \tau_C^D \leq \frac{\alpha}{2e} + \sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e} + \frac{\alpha^2}{4e^2}} \quad (15)$$

But since the Dictator is trying to minimize the level of redistribution or taxation, he will set the tax rate at the minimum possible value $\tau_C^D = \frac{\alpha}{2e} - \sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e} + \frac{\alpha^2}{4e^2}}$ if the Poor cannot credibly threaten to 'Riot', and $\tau_C^D = \tau_C^{P*} = \frac{\alpha}{2e}$ if the Poor can. Note that even though the Dictator's ideal tax rate is $\tau_C^{D*} = 0$, constraints make it impossible for the Dictator to impose their ideal tax rate. Also, since there is no guarantee that $(1-\alpha) \geq \pi(1-\mu)$, and the actual tax rate set by the Dictator is at least 0, this leads to a modified Proposition 1-1.

Proposition 1-1: In a closed dictatorship, the Dictator always chooses a tax rate less than the Poor's ideal tax rate, or $\tau_C^R \geq \tau_C^{P*}$. More specifically, the Poor choose to 'Not Riot' when either of these

conditions are satisfied:

a. $\tau_C^{P*} = \frac{\alpha}{2e} \geq 1 - \frac{(1-\pi)(1-\mu)}{\alpha}$ and $\tau_C^R = \tau_C^{P*}$.

b. $\tau_C^{P*} < 1 - \frac{(1-\pi)(1-\mu)}{\alpha}$ and

$$\tau_C^R = \max\left(0, \frac{\alpha}{2e} - \sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e} + \frac{\alpha^2}{4e^2}}\right) < \tau_C^{P*} = \frac{\alpha}{2e}.$$

I explain briefly on the case when the Dictator chooses to 'Open' the dictatorship's capital markets but the Superpower chooses to 'Sanction'. The only difference between an open but sanctioned dictatorship and a closed dictatorship is that the tax rate in the former regime is τ_{OS}^R, whereas in the latter regime is τ_C^R. For this reason, I refrain from repeating Proposition 1-1 in the case of the open and sanctioned dictatorship.

The last case to consider is the dictatorship with open capital markets where the Superpower chooses to 'Invest' a level of its capital $K_S > 0$. Given that the value of K_S is given for the Poor and the Dictator during the domestic phase of the democratization game, I first consider the Dictator's decision to 'Enfranchise' or 'Suppress'. The Poor's ideal tax rate in the open dictatorship, τ_O^{P*}, is determined in the same way as in the closed dictatorship, by finding the tax rate that maximizes the Poor's income in the enfranchised democracy, or $U_P^E = (1-\tau_O^P)(1-\alpha)\,Y_O + (\tau_O^P - e(\tau_O^P)^2)\,Y_O$. In this model, I find through the first order condition for τ_O^P that the ideal tax rate of the Poor is the same in the open dictatorship as it is in the closed dictatorship, or:

$$\tau_O^{P*} = \frac{\alpha}{2e} = \tau_C^{P*} \tag{16}$$

Therefore, using the logic that led to Remark 1 in the case of the

closed dictatorship, I derive Remark 2:

Remark 2: The Dictator chooses to 'Enfranchise' in the dictatorship with open capital markets and foreign investment under either of these two conditions:

a. If $\tau_O^{P*} = \frac{\alpha}{2e} < 1 - \frac{(1-\pi)(1-\mu)(1-\alpha+\alpha d)}{\alpha d}$, and the Poor set their ideal tax rate, $\tau_O^P = \tau_O^{P*}$.
b. If $\tau_O^{P*} \geq 1 - \frac{(1-\pi)(1-\mu)(1-\alpha+\alpha d)}{\alpha d}$, but the Poor set their tax rate as $\tau_O^P = \tau_O^R$ to prevent the Dictator from choosing to Suppress'.

Now I look at the previous stage of the sequential game, where the Poor choose whether to 'Not Riot' or to 'Riot' in an open dictatorship with foreign investment. Using similar logic as in the closed dictatorship, Proposition 2 can be derived.

Proposition 2: In an open dictatorship with foreign investment, $\tau_O^R > \tau_O^{P*}$. More specifically, the Poor choose to 'Not Riot' when either of these conditions are satisfied:

b. If $\tau_O^{P*} \leq 1 - \frac{(1-\pi)(1-\mu)(1-\alpha+\alpha d)}{\alpha d}$ and the Dictator sets the tax rate as $\tau_O^R = \tau_O^{P*} = \frac{\alpha}{2e}$.
b. If $\tau_O^{P*} > 1 - \frac{(1-\pi)(1-\mu)(1-\alpha+\alpha d)}{\alpha d}$ and the Dictator sets the tax rate to satisfy the inequality $1-\alpha+\alpha\tau_O^R - e(\tau_O^R)^2 \geq \pi(1-\mu)(1-\alpha+\alpha d)$. Solving this inequality yields $\tau_O^R = \max\left(0, \frac{\alpha}{2e} - \sqrt{\frac{(1-\alpha)-\pi(1-\mu)(1-\alpha+\alpha d)}{e} + \frac{\alpha^2}{4e^2}}\right) < \tau_C^{P*}$.

Since $\alpha(1-d) > 0$ or $1-\alpha(1-d) = 1-\alpha+\alpha d < 1$, through algebraic manipulation, Inequality 17 is derived:

$$\frac{\alpha}{2e}-\sqrt{\frac{(1-\alpha)-\pi(1-\mu)(1-\alpha+\alpha d)}{e}+\frac{\alpha^2}{4e^2}}$$
$$<\frac{\alpha}{2e}-\sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e}+\frac{\alpha^2}{4e^2}} \qquad (17)$$

Note that the left term of Inequality 17 is the maximum value of the tax rate in a closed dictatorship, while the right term is that in an open dictatorship. Therefore, the Dictator's choice of tax rates in both types of dictatorships can be compared. We find that if the Dictator can maintain the dictatorship, the Dictator will set a lower tax rate in an open dictatorship than in a closed one, the conditions of which are summarized in Proposition 3. The intuition of Proposition 3 is that given labor's share of income $(1-\alpha)$ is greater than the expected income from a violent riot $(\pi(1-\mu))$, the Dictator can charge his ideal tax rate and the Poor would still earn enough to choose to 'Not Riot', and so on.

Proposition 3: In a dictatorship, $\tau_C^R \geq \tau_O^R$. More specifically,

a. If $1-\alpha \geq \pi(1-\mu)$, then $\tau_C^R = \tau_O^R = 0$.

b. If $\pi(1-\mu)(1-\alpha+\alpha d) \leq 1-\alpha < \pi(1-\mu)$, then

$$\tau_C^R = \frac{\alpha}{2e}-\sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e}+\frac{\alpha^2}{4e^2}} \text{ and } \tau_O^R = 0.$$

c. If $1-\alpha < \pi(1-\mu)(1-\alpha+\alpha d)$, then

$$\tau_C^R = \frac{\alpha}{2e}-\sqrt{\frac{(1-\alpha)-\pi(1-\mu)}{e}+\frac{\alpha^2}{4e^2}} \text{ and}$$

$$\tau_O^R = \frac{\alpha}{2e}-\sqrt{\frac{(1-\alpha)-\pi(1-\mu)(1-\alpha+\alpha d)}{e}+\frac{\alpha^2}{4e^2}}.$$

Proposition 3 shows one of the main results from this model, that also agrees with previous theoretical literature. A dictatorship, by opening its capital markets, can lower the tax rate in the open

dictatorship, while still managing to placate the Poor by increasing their income through foreign investment and increased output.

2. International Politics – When Do Sanctions Occur?

Now I begin looking at the conditions in which a Superpower would impose sanctions on an open dictatorship. Since the closed dictatorship in this model only leads to one rational response by the Superpower to 'Do Nothing', I look at the open dictatorship case to look at the decision of the Superpower to impose sanctions by closing down the dictatorship's capital markets. The Superpower chooses to sanction the dictatorship if the following inequality holds:

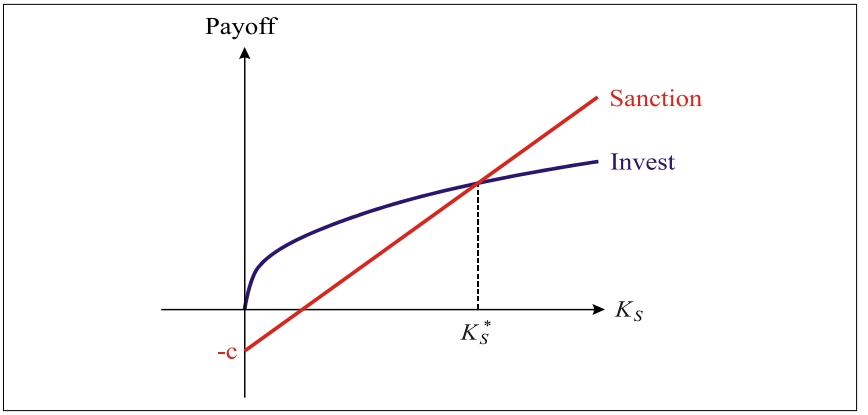
$$\bar{r} K_S - c \geq (1-\tau_O^R) r_O K_S \tag{18}$$

Note that $(1-\tau_O^R) r_O K_S = (1-\tau_O^R) \cdot \alpha (K_S + K_D)^{\alpha-1} L^{1-\alpha} \cdot K_S$, so the right-hand side of Inequality 20 is a monotonically increasing, concave function with respect to K_S, and necessarily passes through $K_S = 0$. The left-hand side of Inequality 20 is an increasing linear function with respect to K_S, so the two sides intersect at a unique solution K_S^*, the equilibrium level of foreign capital that enters the dictatorship's market. This insight is shown in Figure 3.

The Superpower decides whether to 'Sanction' or 'Invest' in an open dictatorship according to the bold line in Figure 3. The slope of the red Sanction line in Figure 3 is the world interest rate, so an increase in the world interest rate would shift K_S^* to the left or decrease it. An increase in cost of sanctions (c) shift K_S^* to the right or increase it. Finally, an increase in the open dictatorship's tax rate as set by the Dictator (τ_O^R) shifts K_S^* to the left. As I have defined before, the equilibrium ratio between the domestic capital to total

capital in the open dictatorship is $d^* = \frac{K_D}{K_D + K_S^*}$, so I conclude the following observations as listed in Proposition 3.

〈Figure 3〉 The Superpower's Decision to Sanction or Invest in an Open Dictatorship



Proposition 4:

a. If the Superpower has more foreign capital than the threshold level of foreign investment (K_S^*), the Superpower chooses to sanction the open dictatorship, and vice versa.

b. An increase in the world interest rate decreases K_S^*, and increases the ratio of domestic capital to total capital (d^*).

c. An increase in sanction costs increases K_S^* and decreases d^*.

d. An increase in the open dictatorship's tax rate decreases K_S^* and increases d^*.

Finally, for the Dictator to open its capital markets, further observation is needed on whether the Dictator obtains higher payoffs in the closed or open dictatorship, given that they can maintain the dictatorship in the first place. If $(1-\tau_C^R)\alpha Y_C \leq (1-\tau_O^R)\alpha d Y_O$, then the Dictator chooses to open capital markets and accept foreign

investment. Equation 18 is helpful in comparing between income payoffs of closed and of open dictatorships.

$$\frac{Y_C}{Y_O} = \frac{K_D^{\alpha} L^{1-\alpha}}{(K_D + K_S)^{\alpha} L^{1-\alpha}} = d^{\alpha} \tag{18}$$

Recalling that d is the proportion of domestic capital to total capital in the open dictatorship's economy, Proposition 4 is derived:

Proposition 5: The Dictator will open the dictatorship's capital markets only if Inequality 19 holds, and vice versa:

$$\frac{1-\tau_C^R}{1-\tau_O^R} < d^{1+\alpha} \tag{19}$$

For instance, if $1-\alpha \geq \pi(1-\mu)$, such that $\tau_C^R = \tau_O^R = 0$ by Proposition 3a, Inequality 19 is always false, a low enough probability of a successful riot (π) or a high enough proportion of destroyed output during the violent riot (μ) contributes towards the Dictator to close the dictatorship's capital markets.

Ⅳ. Extension into a Repeated Game

One potential extension of this model is to analyze how the sanction behavior of the Superpower changes over time. This requires the transforming of the above one-period game into a repeated game. Suppose the Superpower, in periods $t > 0$, chooses to invest K_S according to the tax rate in the dictatorship or a democracy after a violent and successful riot. By Proposition 2, a

democracy with a Poor median voter will have a comparatively higher tax rate than a dictatorship with the tax rate set by the Dictator. Therefore, the Superpower will choose a lower level of K_S and raise the real interest rate in the enfranchised democracy. One way that the Superpower could gain more income payoffs from the dictatorship is to choose K_S such that the Poor prefer to riot and the Dictator is forced to either enfranchise the Poor or begin a violent riot.

Let us consider one example, where the Superpower investing in an open economy can use its capital to incur democratization. Of course, the Superpower need not include any measure of democracy as an argument in its utility function, and indeed, I use the same utility function of the (economically rational) Superpower as before. Consider a Superpower with discount rate $\beta \in (0,1)$ which chooses to invest K_S at period $t=0$ against an open dictatorship. If the open dictatorship enters a violent riot, with probability π, the revolution succeeds and the Poor control the government for all periods $t>0$. With probability $1-\pi$, the riot fails and the Dictator controls the government for all subsequent periods.

Slightly abusing the notation, the Superpower earns $\bar{r}K_S^S$ (without taxation) after the successful revolution at $t=0$ and earns $(1-\tau_O^P)r_O^P K_S^P$ in the democracy led by the Poor at all subsequent periods. After the failed riot, the Superpower earns $\bar{r}K_S^S = \bar{r}K_S^F$, the same payoff as in the successful riot (as shown in Table 3) at $t=0$ and earns $(1-\tau_O^R)r_O^R K_S^R$ in the dictatorship led by the Dictator at all subsequent periods. If the Superpower only invests in the open dictatorship and does not alter K_S to affect domestic politics, the Superpower earns $(1-\tau_O^R)r_O^R K_S^N$ for all periods $t \geq 0$. In this case, the Superpower chooses to change its level of foreign investment to maximize its present-value total payoff if:

$$\pi\left(\bar{r}K_S^S+\beta\left(\frac{1}{1-\beta}\right)(1-\tau_O^P)r_O^P K_S^P\right)$$
$$+(1-\pi)\left(\bar{r}K_S^F+\beta\left(\frac{1}{1-\beta}\right)(1-\tau_O^R)r_O^R K_S^R\right)$$
$$\geq\left(\frac{1}{1-\beta}\right)(1-\tau_O^R)r_O^R K_S^R \qquad (20)$$

where K_S^P is the level of foreign investment by the Superpower in a democracy led by the Poor after a successful riot, and K_S^R is the same for a dictatorship led by the Dictator either before or after a failed revolution. We also use the fact that $\bar{r}K_S^S=\bar{r}K_S^F$ from Table 3 to solve Inequality 20, and that the Superpower always prefers to invest K_S until the after-taxation real interest rate (either $(1-\tau_O^P)r_O^P$ or $(1-\tau_O^R)r_O^R$) is equal to the world interest rate $\bar{r}$. The result is simplified into Inequality 21:

$$(1-\beta)K_S^S+\beta(\pi K_S^P+(1-\pi)K_S^R)\geq K_S^R \qquad (21)$$

Solving for K_S^R, I obtain Inequality 22:

$$K_S^R\leq\left(\frac{1-\beta}{1-\beta\pi}\right)K_S^S+\left(\frac{\beta\pi}{1-\beta\pi}\right)K_S^P \qquad (22)$$

where K_S^i is the equilibrium level of the Superpower's foreign investment in the dictatorship if $i=R$, in the dictatorship under a violent riot if $i=S$, and in a democracy after a violent riot if $i=P$. If the equilibrium level of foreign investment in the dictatorship is low compared to that in democracy, the Superpower can invest more in the democracy after a violent riot and earn the same real interest rate as the world interest rate. This is the intuition behind Proposition 6.

Proposition 6: If in equilibrium Inequality 22 is satisfied, then the Superpower's equilibrium choice of K_S^S and K_S^P will cause the dictatorship to undergo a violent riot.

I finally note that in the open dictatorship, the Superpower's optimization of capital income can cause the Poor to undergo revolutions toward democratization without the Superpower even intending to do so. Of course, this only works if the Superpower actually has enough capital to alter the real interest rate in the dictatorship's economy.

Ⅴ. Discussion and Conclusion

This paper sets a sequential game-theoretical model of a dictatorship which chooses whether to open its capital markets to outside investors. I derive a series of propositions concerning the decision of sanctions and foreign investment in international politics between the Superpower and the Dictator, as well as democratization in domestic politics. Interestingly, as predicted in Acemoglu and Robinson (2006, Ch. 10), the Dictator in a dictatorship choose to open capital markets to relieve the redistributive pressures by the Poor.

This model also has implications on the capital market policy of democracies; the Dictator in dictatorships already opens capital markets to potentially increase the incomes of both the Dictator and Poor classes and relieve redistributive pressures by the Poor due to low income. Therefore, in democracies established through revolutions or through concessions in enfranchisement by the Dictator, the Poor would already earn more income from open capital markets and net capital inflows in a former dictatorship with a low capital-to-labor ratio. Therefore, these newly formed

democracies would choose to open or keep open their capital markets.

To conclude this paper, I take the example of Vietnam for comparison between my theoretical results and history. The Communist regime underwent the Doi Moi economic reforms starting from 1986. While the Vietnamese economy, under the sole control of the Vietnamese Communist Party, grew by an average of 6% per year from 1981 to 1985, annual inflation also reached between 50% and 100% in the same period. Hyperinflation decreased the purchasing power of even the state employees (Steinfeld and Thai, 2013), causing the Vietnamese people to ask for more redistribution. As the model in this paper predicts, along with other theoretical literature, the Vietnamese Communist Party began a series of reforms known as Doi Moi ("Revolution" in English). One of the first reforms were the passing of the Foreign Investment Law in December 1987, allowing for 100% foreign ownership of entities and profit repatriation. This reform towards a market economy, presumably exhibiting a Cobb-Douglas production function, led to high capital inflows into Vietnam; foreign direct investment and other capital inflows from abroad increased from 11.6% of GDP in 1986 to 29% in 1997 (Dinh, 2000). Vietnamese economic growth soon followed, and with the pronounced shift to a more market-oriented economy, the Communist government remains in Vietnam to this day. As the model shows, Vietnam's shift to an open market policy ironically led to placating the redistributive pressures of the people, thereby allowing the Vietnamese Communist Party to maintain one-party rule.

The model discussed in this paper can be improved in several ways. Most importantly, it can be integrated with theories of international trade, thereby relaxing the assumption that all output from the dictatorship is only consumed within the dictatorship. Also,

there could be additional study at the dynamics of sanctions over time or look at what happens when two superpowers (such as the United States and China) can choose whether to invest in the dictatorship. This could lead to a more realistic model where the first superpower sanctions the dictatorship but the second superpower actually invests in the same dictatorship and weakening the sanctions of the first one. Finally, this line of research could elicit optimal international sanction or investment policies to foster democratization or at least extension of the voting franchise in dictatorships.

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논문초록

본 논문은 내생적 금융통합을 고려하는 독재주의 국가를 단계적 게임이론 모형으로 표현한다. 독재주의 국가는 강대국과의 제재와 해외자본투자 유치를 정하는 국제적 정치와 빈곤층과의 민주화를 정하는 국내적 정치게임을 거친다. 독재자은 재분배 요구를 억제하기 위해 자본시장을 개방하며, 이 결과는 기존 이론과 실증적 연구와 같은 결과를 도출한다. 세계이자율이 높아질수록 강대국이 금융시장을 제재할 가능성이 높아진다.

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