

Institution, foreign investment, and the resource curse: Do source countries' institutions matter?

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ABSTRACT

Resource abundance tends to be a curse for nations with poor institution. Most of resource-rich nations with weak institution are poor and lack of capital. They mainly rely on foreign investment for resource extraction. This paper develops a simple model by incorporating foreign investment into the resource curse literature. We argue that source countries' institutions of foreign investors do matter. The prevalence of foreign investors from countries with poor institutions may increase the rent seeking activities in host countries, which eventually reduce productive entrepreneurship and lower total income of host countries. Moreover, countries with larger resource suffer more from this negative impact.

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INTRODUCTION

While natural resource abundance have been traditionally emphasized by economic historian as blessings for nations, recent evidences have shown that countries with abundant natural resources tend to have lower welfare. For example, while such resource-rich nations as Angola, Indonesia, Nigeria, Saudi Arabia, Sierra Leone, Venezuela, and Zambia are stuck in a poverty trap, East Asian countries with fewer natural resources, namely, Hong Kong, Singapore, South Korea, and Taiwan have recently enjoyed much faster growth. This negative relationship is justified by a number of famous empirical researches including Sachs and Warner (1995, 1999, 2001), Auty (1995, 1997), and Gylfason (1999, 2001).

Gylfason (2001) explained that the adverse impact of natural resource abundance on economic income can be understood through four main channels of transmission: (1) the Dutch disease, (2) rent seeking, (3) overconfidence, and (4) neglect of education. The Dutch disease hypothesis emphasizes that resource booms, for example the boom in the price of raw material or primary products such as oils, minerals, agricultural products, fisheries and timbers... etc., will cause the real wage to rise. High demand for primary products will then hurt other sectors such as traded sector and manufacturing production due to higher input cost. Resource abundance shifts production factors from more productive manufacturing industries into backward industries with lower productivity, and thus decreases total productivity of an economy. Sachs and Warner (1999) studied such an adverse effect of resource booms on

productivity through the change in the production composition it generates in the big push model. In an economy with two types of sectors: increasing return to scale sector and constant return to scale sector, resource boom will reduce total output if increasing return to scale sector is the traded sector.

Secondly, the rents created by natural resource endowment provide incentives for the interest group to divert their time and efforts to capture these rents. This will result in misallocation of time and talents. Torvik (2002) developed a model to explain how rent seeking which is generated by resource abundance may lead to lower welfare. Larger amount of resource endowment or a resource boom raise profits of rent seekers and thus crowd out entrepreneurs from productive sectors into rent seeking activities. The effect of demand externality causes a lower total income for an economy as a whole since a fall in income from production is higher than an increase in income from natural resources.

Thirdly, governments of resource-rich countries tend to have a false sense of security and lose sight of the need for good and effective policy to promote economic growth (Sachs and Warner, 1999). Effort and incentive to formulate appropriate policy for economic growth tend to be discouraged by the ability and ease of creating wealth from natural resources.

Lastly, resource-rich nations mostly with overconfidence and reliability in their natural resource endowment tend to ignore the development of their human resources. Aldave and Garcia-Penalosa (2009) constructed a model to study how natural resource can reduce human capital investment. They explained that the resource boom increases the relative return to political investment over human resource investment. Through this mechanism, resource endowment reduces total income and growth. Empirical evidence also supports that natural resource endowment is negatively related with human capital accumulation (Gylfason, 2001).

Is natural resource always a curse? While it is obvious that many resource-rich countries, especially most of OPEC, tend to have lower income, it seems impossible to claim that rich nations such as United States, Australia, Norway and Sweden have developed their human capital and economy without the aid from their natural resources. In some cases, resource abundance stimulates growth and enhances welfare. In contrast to the claims of Sachs and Warner, some researchers have emphasized the roles of institutional arrangement in determining whether resource will be a curse or a blessing. As also emphasized by Gylfason (2001) who found evidence of negative impacts of natural resource on economic growth, it seems that natural resource abundance by itself does not directly deter economic growth, but what matters the most is how the countries manage and use those resources.

Recent literature has focused on the interaction between institution and resource abundance. Resource boom results in more corruption and poor institution, while poor institution determines whether resource is the blessing that stimulates growth or the curse that induces poverty trap. Aldave and Garcia-Penalosa (2009) studied how the institution plays a role in the education investment channel through which resource endowment effects total outputs and growth. In their paper, corruption and education are interrelated and both are strongly influenced by natural resource abundance. Poor institution, which is favorable for rent capture, will encourage more political investment relative to human capital investment. Similarly, Wadho (2013) emphasized that resource abundance affects growth through its influence on incentives to invest in education and rent capture. They claimed that resource endowment may stimulate growth or induce a poverty trap depending on the institutional quality of the country, particularly inequality in access to education and political participation, and political participation cost. Moreover, generally it is the state that owns the natural resource and poor institution makes it easy for the politician in office to capture its rents. Robinson et al. (2006) argue that resource abundance increases the payoff of holding political

power, which provide the incumbent politician with incentives to choose inefficient public resource allocation and investment policy that may impede productive activities, but increase their chance of winning the election. On the other hand, in a non-democratic countries where election play no roles in the competition for power, the abundance of natural resources may cause fighting among political rivals to extract the rents.

Mehlum et al. (2006) study the role of the institutional quality on the resource curse literature in a model in which entrepreneurs can choose to be producers or rent grabbers. The profits and the equilibrium allocation of entrepreneurs between the two sectors are determined by the institutional arrangement which reflects the extent to which institution favors rent seeking (grabbing) versus production activities. It may be a producer friendly institution where production and rent appropriation are complementary, or a grabber friendly institution where production and rent appropriation are competing activities. They show that resource abundance is a curse for the countries with grabber friendly institutions, and is a blessing for the countries with producer friendly institutions. Mehlum et al. (2006) provide a good framework to understand how institutions play a role in the rent seeking channel of resource abundance effect on income. Based on Mehlum et al. (2006), resource abundance will be the blessing if an economy has better institution. Strong legal and democratic institutions ensure that the economy is free from corruption and rent grabbing activities, and that resource will be optimally extracted and used for development of an economy.

In addition to shortage of strong institution, it is widely known that most countries that suffer from the resource curse are poor and lacks of technology and capital. Extraction of some sort of natural resources, particularly oil and minerals, requires high technology and many capitals. Most resource rich countries cannot afford to do it by themselves and rely on foreign investment firms for extraction. Foreign investors will get some share of rents as return for their investment. Most investments are made by large multinational corporations (MNCs) from developed countries (known as the North), which have good institutional infrastructure. Such kind of investment is commonly known as North-South foreign direct investment (FDI). However, as discussed earlier, resource-rich nations tend to have weak legal and democratic institution, poor property right protection, less political stability, more corruption, and rent seeking activities. Such institutional environment will discourage North MNCs' investment. Investment in such environment involves higher risks and uncertainty. Moreover, engagement in corruption deal may deteriorate the image and good will of those North MNCs. However, investments from the North are not the only sources of foreign investment. Recent trends show an increase in foreign investment outflow by large MNCs from developing and transition economies (known as the South) whose institutional quality is as weak as the host countries. Such kind of investment is known as South-South FDI. For example, in 2010, 29 percent of global FDI outflows and six of the top-20 investors of global FDI were from the South (UNCTAD 2011). Unlike North MNCs that find it not profitable to invest in countries with poor institution, South MNCs may be able to capture profits from investment in such countries. The familiarity and experiences of operating in similarly corrupt and weak legal institution in their home countries provide them with more competitive advantages over North MNCs when investing in countries with poor institution. Cuervo-Cazurra (2006) and Cuervo-Cazurra and Genc (2008) provided empirical evidence that weak and corrupt institution of host countries will lower FDI from countries with good and strong institution, but results in more FDI inflow from the countries with poor and corrupt institutions. They emphasize that investors from corrupt home countries may not be discouraged by corruption abroad, but even seek to invest in corrupt countries where they can have competitive advantages over their North investor counterparts.

It can be obviously understood that the roles and behaviors of North and South MNCs in resource investment is crucial for understanding the resource curse phenomena in corrupt resource-rich countries who rely on foreign investment for resource extraction. However, the study of the roles of foreign investment in the resource curse literature has not yet done. In this paper, we incorporate foreign investment and institutional quality of the original countries of foreign investors into the resource curse literature. This allows us to be able to investigate the effect of foreign investment and institutional motivation of foreign investment on the total income of an economy through the rent-seeking channel of the resource curse literature.

THE ECONOMY

We consider an economy which consists of 4 sectors: (1) resource extraction sector; (2) backward production sector with constant return to scale (CRS) technology; (3) modern manufacturing production sector with increasing return to scale (IRS) technology; and (4) public sector which is just the redistribution sector where no output is produced. The economy consists of L workers, the same number of goods and entrepreneurs, which are both normalized to one. Moreover, there are foreign investors who seek to invest in the resource extraction sector of the economy. Workers are employed in either backward production sector or modern manufacturing sector. Entrepreneurs may choose either to become producers in the modern production sector, or to become rent seekers in the public sector who seek to redistribute public income for their own favor by engaging in political competition, corruption and rent seeking activities. Modern producers will earn profits from production, while rent seekers will get rents from the country's resource extraction. We assume that the country lacks of strong democratic and legal institution, which allows rent seekers to capture all domestic share (excluding profit share of foreign investors) of resource extraction output. Entrepreneurs choose one of the two options so as to maximize their payoffs. We denote the number of entrepreneurs involving in rent seeking activities by N_R and those engaging in modern production by $(1 - N_R)$.

Next we discuss resource extraction sector and foreign investment. The economy is assumed to be endowed with a stock of natural resources, which can only be extracted by foreign investment firms. The number of foreign investment firms is denoted by N_I . The output of resource extraction is denoted by R and is a linear function of the number of foreign investment firms: $R = \mu N_I$ where $\mu > 0$ can be thought of as a parameter of resource endowment of the economy. Output from resource extraction will be shared between domestic rent seekers and foreign investors. Foreign investors need to involve with corruption and bribery to obtain the license for resource extraction. Foreign investors can be either large MNCs from developed countries with strong institutional infrastructure (known as North investors) or large MNCs from developing countries with corrupt and weak institution (known as South investors). All investors have the same productivity for resource extraction, but are different in their ability to capture output share from investment. The allocation share of profits from extraction is determined by the ability of foreign firms to deal with corrupt institution. Foreign firms, which have been exposed to corruption and rent seeking activities at home, are more effective in dealing with rent seekers in the host country. For example, they know better about the ranking structure of corrupt officials in the host country and efficiently bribe the key persons. Hence, they can manage to obtain more shares from resource extraction. Foreign investors from countries with good institution have relatively less knowledge about the

structure and behavior of corrupt officials in the host country, and find it more difficult to engage in corruption due to legal constraints in their home countries and fear of deterioration of good will and image of their firms. Hence, they can capture a relatively lower share of profits from resource investment. We denote $\lambda > 0$ which is exogenous in this model to reflect the difference in institutional quality of foreign investors' home country. λ can also be thought of as foreign investors' familiarity and ability to deal with corrupt institution and rent seeking activities. Higher value of λ implies that foreign investors know more about corruption and can get higher share from resource extraction.

We apply the contest success function, which is commonly used in rent seeking and the resource curse literature, for the sharing of profits between domestic rent seekers and foreign investors. The profit of each rent seeker is given by a factor s times $\frac{\mu N_I}{(N_R + N_I)}$

$$\Pi_R = s \frac{\mu N_I}{(N_R + N_I)} \quad (1)$$

On the other hand, the profit for each foreign investment firm is defined as

$$\Pi_R = s\lambda \frac{\mu N_I}{(N_R + N_I)} - cN_I \quad (2)$$

where cN_I is extraction cost and $0 < c < \mu$. The extraction cost is increasing in the number of foreign investment firms. More competitions in the resource extraction sector mean that each firm has to increase more inputs to be able to compete for extraction of the limited stock of resources.

The sum of share to both groups must be equal to one. Therefore, the following equality constraint must hold

$$\frac{sN_R}{(N_R + N_I)} + \frac{s\lambda N_I}{(N_R + N_I)} = 1 \quad (3)$$

From the above condition, we can derive the function of s with respect to λ

$$s = \frac{N_R + N_I}{(N_R + \lambda N_I)} \quad (4)$$

The factor s is decreasing in λ because the rent seekers will be able to capture less when foreign investors can manage to get more share of investment. On the other hand, $s\lambda$ must be increasing in λ as foreign investors will get more share, the higher λ .

The production side of the economy follows Murphy et al. (1989). Firms in backward production sector use only workers as production input, and one unit of labor can produce one unit of any good. In the modern sector, modern firm is established by one entrepreneur with the fixed cost of F unit of labors and marginal cost of β , where $\beta > 1$. We assume that $F < L$. The consumers are assumed to have Cobb-Douglas utility with inelastic demand and equal expenditure share in consumption, which mean that consumption is allocated equally for

each good. Hence, each good will be produced in equal quantity. We denote Q as the quantity of each good. Modern firms compete with the fringe competitors, which are the CRS firms in backward production sector using Bertrand price competition. This implies that each good is either entirely produced by one single modern firm or by the fringe. Moreover, the modern firms will charge the highest possible price, which is equal to one, the price that is charged by the fringe competitors. The wage paid to each worker is also equal to one, which is the worker's outside option in backward production sector.

The profit of each entrepreneur who choose to become a modern producer is the total output from production minus total production cost

$$\Pi_P = \left(1 - \frac{1}{\beta}\right)Q - F \quad (5)$$

EQUILIBRIUM

There are three necessary conditions needed for the economy to be in equilibrium. First, foreign investors will enter the resource extraction sector until investment profits become zero. By using equation 2, 4 and the condition that $\Pi_I = 0$, we can derive the equilibrium number of foreign investors as a function of N_R

$$N_I(N_R) = \frac{\mu}{c} - \frac{N_R}{\lambda} \quad (6)$$

Second, the total supply must be equal to the total demand or income. We consider the GNP of an economy and thus exclude foreign investors' profits. We assume that foreign investors bring all their profits back to their home countries. We denote Y as the total supply of the economy, which is equal to the sum of the total production output and resource extraction output excluding resource output allocated to foreign investors. The total income is equivalent to the sum of worker's income, producers' profits, and rent seekers' profits. The second equilibrium condition is therefore

$$Y = Q + \frac{sRN_R}{(N_R + N_I)} \equiv L + (1 - N_R)\Pi_P + N_R\Pi_R \quad (7)$$

By using equation 1, 2, 4, 5 and 7, we can solve for the equilibrium total quantity of production output as the function of the number of rent seekers:

$$Q(N_R) = \frac{\beta[L - (1 - N_R)F]}{1 + N_R(\beta - 1)} \quad (8)$$

We assume that $Q(0) = \beta(L - F) > Q(1) = L$ to ensure that production output in an economy with full modern firms is higher than that in an economy with complete backward production firms. This requires that the marginal productivity of modern firms is high enough

$$\beta > \frac{L}{L-F} \quad (9)$$

It should be noted that R does not appear in equation 8. Natural resource does not directly affect production output. This is because natural resource contributes equally to both demand and supply, but it indirectly affects production through its effects on N_R .

Next, we insert equation 8 into 5 to derive the payoff function of each producer

$$\Pi_P(N_R) = \left(1 - \frac{1}{\beta}\right) \frac{\beta[L - (1 - N_R)F]}{1 + N_R(\beta - 1)} - F \quad (10)$$

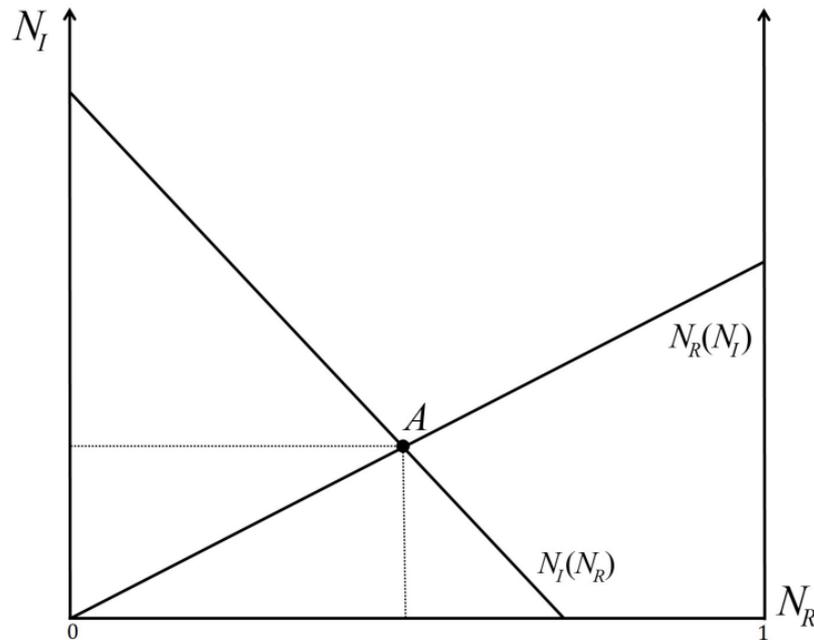
The third equilibrium condition is to ensure that no entrepreneurs will move between production and rent seeking activities. This requires that the payoffs for each producer must equal to the payoffs for each rent seeker

$$\Pi_R = \Pi_P \quad (11)$$

From equation 1, 4, 10, and 11, the equilibrium number of rent seekers can be written as the function of N_I

$$N_R(N_I) = \frac{N_I[\mu - \lambda(\beta(L-F) - L)]}{\beta(L-F) - L - \mu N_I(\beta - 1)} \quad (12)$$

By using equation 9, it can be shown that $N'_R(N_I) > 0$. The higher number of foreign investors increases profits for each domestic rent seeker, which in turn leads to an increase in N_R . Moreover, from equation 6, it can be seen that $N'_I(N_R) < 0$. More domestic rent seekers means that the resource output will have to be shared with more people, and thus lower profit for each foreign firm. This results in lower number of foreign investment firms. $N_R(N_I)$ -curve and $N_I(N_R)$ -curve will cross each other and determine the equilibrium number of rent seekers and foreign investors. This equilibrium point is illustrated by point A in Figure 1.

Figure 1: Equilibrium N_R and N_I

South Foreign Investors and Rent Seeking

Next we investigate the effect of the prevalence of South foreign investors instead of North foreign investors on rent seeking activities. In this model, this effect can be reflected by an increase in λ . It can be noted from equation 6, that $N_I(N_R)$ -curve shift upward to the right with an increase in λ , and equation 12 and 9 implies that $N_R(N_I)$ -curve shift backward to the left when λ is larger. In the new equilibrium, an increase in λ will always leads to larger N_I , but the effects of an increase in λ on N_R is ambiguous. The positive relation of λ and N_I is straightforward, higher share of resource output to investors will encourage more investors. On the other hand, there are two opposing effects of an increase in λ on N_R . The first one is the *share effect*. Higher λ means lower share of profits to rent seekers and thus lower N_R . On the one hand, larger λ implies more investment in the resource sector and higher output from resource extraction to be shared. This is called the *size effect*.

In short, N_R is increasing (decreasing) in λ if the *size effect* is larger (smaller) than the *share effect*. Since λ itself is the parameter of the share of resource output, one can expect that the *size effect* is more important than the *share effect* when λ is very small. Indeed, one can show that when λ is very small and close to zero, N_R is increasing in λ . This result can be shown by inserting equation 6 into 12 to derive the following result:

$$\lim_{\lambda \rightarrow 0} N'_R(\lambda) = \frac{\mu}{c} > 0 \quad (13)$$

Figure 2 shows the three possible new equilibrium numbers of N_R and N_I when λ is increasing. New equilibrium point B corresponds to the case where λ is very small. All the results discussed above are summed up in the following proposition.

Proposition 1: *An increase in λ always leads to larger N_I . On the other hand, the effect of λ on N_R is ambiguous. However, one can show that for some small values of λ , N_R is increasing in λ .*

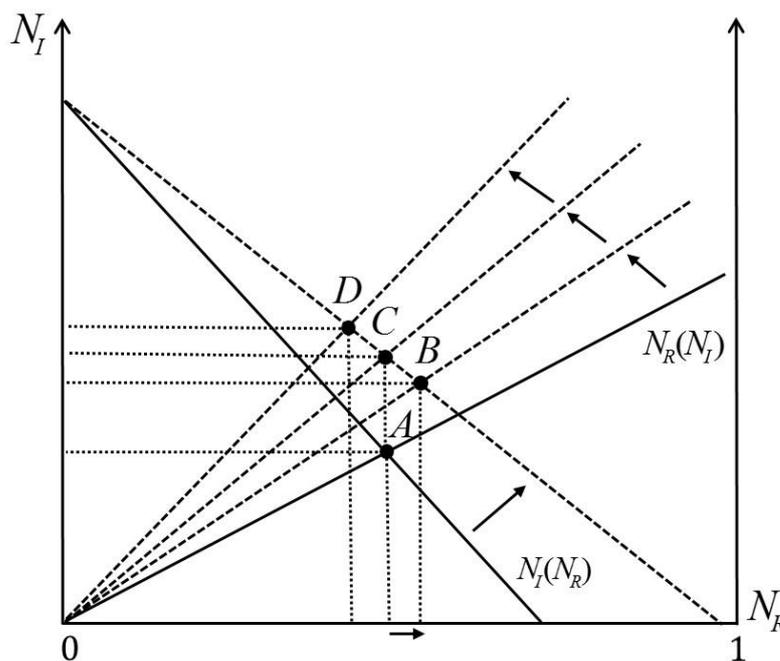


Figure 2: The effect of an increase in λ on rent seeking

The economy with corrupt institution that allows rent seekers to capture much of the output from resource investment may discourage North foreign investors from countries with better institution who see no hope of earning profits from investment. The existence of South foreign investors who are more familiar with corrupt environment and thus can capture more return from the investment can be substitute source of foreign investment in an economy. However, the prevalence of South investors may eventually increase the rent seeking activities in the economy. The above proposition clearly emphasizes that foreign investors who are more familiar with corrupt institutions may become complementarity of domestic rent seekers.

Income Effect

To see if this complementarity is harmful to an economy, we turn to investigate the effect of an increase in λ on the total income of an economy. From equation 9 and 10, one can show that $\Pi'_p(N_R) < 0$. Moreover, by using equation 1, 4 and 6, the profit of each rent seeker can be written as a function of N_R

$$\Pi_R(N_R) = \frac{\mu\lambda - N_R c}{\lambda^2} \tag{14}$$

It can be clearly seen that $\Pi'_R(N_R) < 0$. Both $\Pi_R(N_R)$ -curve and $\Pi_P(N_R)$ -curve are decreasing in N_R . The profit for each producer is decreasing in the number of rent seekers due to demand externality effect. More rent seekers lead to fewer number of modern firms, which in turn results in lower income and demand, and thus lower sale and profits for the remaining modern firms. The profit of each rent seeker is decreasing in N_R because larger N_R implies a lower share of given rents to each rent seeker.

In the following discussion, we will focus on the case where λ is very small and close to zero. In this case, the equilibrium with complete rent seekers or complete producers will never exist, and $\Pi_R(N_R)$ -curve will cross $\Pi_P(N_R)$ -curve from above determining the stable equilibrium number of producers and rent seekers and their equilibrium profits. Such equilibrium is illustrated by point E in Figure 3. An increase in λ will shift $\Pi_R(N_R)$ -curve upward to the right resulting in new equilibrium point with larger N_R and lower profits for both producers and rent seekers. This also implies that the total income of an economy will also decrease. The new equilibrium is shown by point E' in Figure 3. We sum up the above result in proposition 2.

Proposition 2: Consider a case with some small values of λ , an increase in λ will lead to lower profits for both producers and rent seekers and thus lower total income of an economy.

This proposition clearly shows that the fact that South foreign investors become complementarity of domestic rent seekers can be harmful to the welfare of the host country.

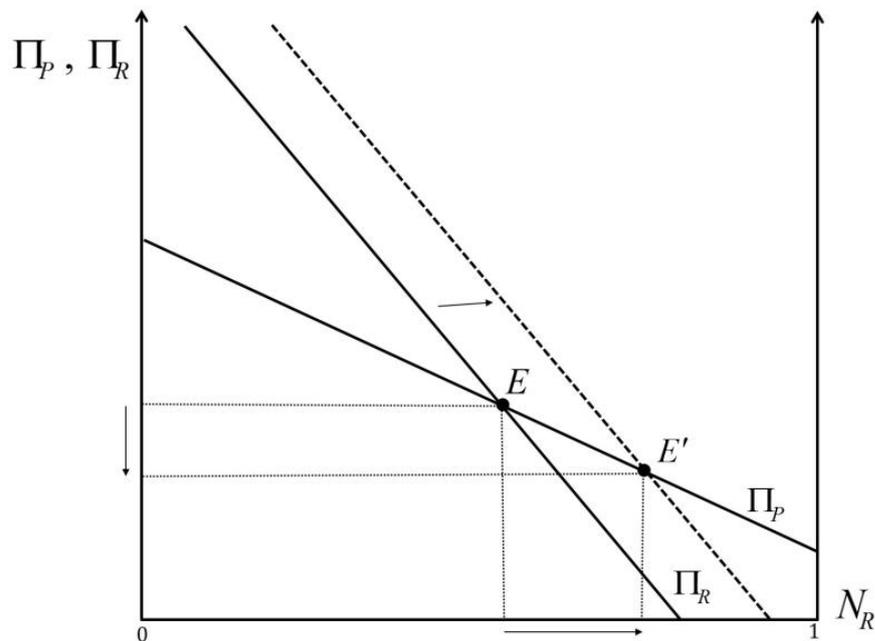


Figure 3: Income effect of an increase in λ

Resource Boom

Note from equation 13, it is straightforward to show that

$$\lim_{\lambda \rightarrow 0} \frac{\partial^2 N_R(\lambda, \mu)}{\partial \lambda \partial \mu} = \frac{1}{c} > 0 \quad (15)$$

This can be implied that the resource boom in an economy, or economy with larger resource magnify the positive impact of South FDI prevalence on rent seeking activities. This is because a rise in μ increases the *size effect* of λ on N_R in relative to its *share effect*. Resource boom or larger resource endowment, *ceteris paribus*, means larger size of resource output to be captured which directly makes rent seeking more attractive than production. Moreover, larger μ also means larger profits from resource investment and thus larger N_I which also leads to larger N_R through the *size effect* mechanism. Although, a rise in μ increases the positive impact of λ on N_R , its effect on the positive impact of λ on N_I is neutral. This is because larger N_R as a result of a rise in μ also has opposing negative impact on N_I . Indeed, by inserting equation 12 into 6, one can show that

$$\lim_{\lambda \rightarrow 0} \frac{\partial^2 N_I(\lambda, \mu)}{\partial \lambda \partial \mu} = 0 \quad (16)$$

Using a similar analysis as in section 3.2, it can also be concluded that an increase in μ magnifies the negative impacts of an increase in λ on the profits for both producers and rent seekers, and the total income of an economy. We summarize the results in the following proposition.

Proposition 3: Consider a case with some small values of λ , an increase in μ magnifies the positive impacts of λ on N_R and its negative impacts on the profits for both producers and rent seekers, and on the total income of the economy. An increase in μ has neutral impacts on the positive effect of λ on N_I .

When rent seeking exists in the economy, and South FDI becomes the complementarity of domestic rent seekers, an economy with a larger resource endowment or the resource boom will suffer more from the negative impacts of the complementarity between South FDI and rent seeking activities. Indeed, Proposition 3 clearly predicts the resource curse phenomena that may result in a case where the existence of South FDI becomes the complementarity of domestic rent seeking activities.

CONCLUSION

A simple model is developed to investigate the effect of the institutional quality of home countries of foreign investors on the total income of an economy through the lens of rent seeking channel in the resource curse literature. Recent literature argue that resource tends to

be a curse for the countries with poor institution. Countries that suffer from the natural resource curse are poor and lack of high technology and capital, and have to rely heavily on foreign investment firms to extract their natural resource. However, such economies are always seen to be related to weak legal and democratic institution, corruption and rent seeking activities, which are obstacles for them to attract foreign investment at least from developed countries. If resource-rich countries must have good institution to be able to attract foreign investment. One can expect that the resource curse problem may be reduced in economies that depend on foreign investment for resource extraction. However, the prevalence of foreign investors who are less likely to be deterred by such poor institution due to their exposure and familiarity with such environment in their home countries may become a substitute source of foreign investment into those resource-rich economies. We show that the prevalence of such foreign investors may become complementarity of domestic rent seeking activities, and crowd out entrepreneurs from the productive sector, which eventually induce an economy to suffer from the resource curse. A larger natural resource or the resource boom in an economy magnifies these negative impacts.

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