Barriers on Capital Flows and Growth

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Abstract

The lower barrier on capital mobility has stimulated capital flows across countries. Whether capital flows would promote economic growth is still not clear. This paper argues that whether the capital flow would promote growth depends crucially on three factors, the preferences of depositors, the relative technology level of domestic and foreign countries and the barrier of capital mobility in the foreign country. By extending the model of Chang (2005) and allowing for capital inflow and outflow, I find several interesting results. First, without capital flows, patient depositors would increase the loans available to the entrepreneurs, and promote economic growth. Second, with capital flows, whether the outflow capital would flow back to the economy would depend on the relative technology levels of two countries and the barrier of capital flows in the foreign country. If the technology of accumulating capital is higher in the foreign country, which does not have restrictions on capital flows, then the capital outflow caused by factory relocation may promote growth, because the capital accumulated in the foreign country may flow back and promote domestic economic growth. If the country which domestic capital has flowed to has high barrier on capital mobility, then it is more likely that capital outflow to that country has no contribution to domestic economic growth, and may also damage domestic growth.

Key words: technology, capital flows, economics growth.
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I. INTRODUCTION

There is no doubt that the low labor cost in developing countries has attracted labor intensive industries, such as manufacturing industry, in developed countries to relocate their factories. The most famous example in United States is the outsourcing customer service to India. The most recent example in New Zealand is the decision of Icebreaker factory relocation in China. The impacts of factory relocation in domestic countries have been widely discussed in general; however, there has not been much theoretical analysis to look insight how exactly the factory relocation affects economy and what to do to limit the negative impacts on domestic economy.

It is obvious that one complication in explaining the effect of capital flows on economic growth is from the two ways of capital flow. Therefore, to simplify the analysis, most research focus either capital inflow or capital outflow, but not both. For example, Chang (2005) concentrates on capital outflow and finds that if the capital outflow is caused by the factory relocation and can be overcome by a higher domestic capital accumulation, then the domestic economic growth could be promoted. However, one question arising from this finding is whether factory relocation would result in capital inflow followed by outflow. If so, how would this process affect the economic growth.

This paper focuses on the factory relocation and argues whether the capital flow would promote growth depends crucially on three factors: the preferences of depositors, the relative technology level across countries and the barrier of capital mobility in the foreign country. By extending the model of Chang (2005), I find several interesting results. First,

without capital flows, patient depositors would increase the loans available to the entrepreneurs, and promote economic growth. Second, with capital flows, whether the outflow capital would flow back to the economy would depend on the relative technology levels of two countries and the barrier of capital flows in the foreign country. If the technology of accumulating capital is higher in the foreign country, which does not have restrictions on capital flows, then the capital outflow caused by factory relocation may promote growth, because the capital accumulated in the foreign country may flow back and promote domestic economic growth. If the country which domestic capital has flowed to has high barrier on capital mobility, then it is more likely that capital outflow to that country has no contribution to domestic economic growth, and may also damage domestic growth.

The related literature, which motivates this work, includes Bencivenga and Smith (1991), which emphasizes the role of financial intermediaries in economic growth. Similar issues have been addressed by Ennis and Keister (2003, 2004), who combine the sunspot equilibrium and the endogenous growth model to analyze the effect of liquidity and investment decision, and by Dekle and Kletzer (2001), who use the endogenous growth solely to discuss the link between capital flow and bank debt. Moreover, Schreft and Smith (1998) introduce the idea of relocation to discover the effects of open market operations in economic growth as well as capital formation.

The paper is structured as follows. Section II describes the general model, whose results are shown in Section III. The discussion of the impact of early withdrawal caused by capital outflow is in Section IV, followed by concluding remarks and possible extension in Section V.

II. THE MODEL

The model is constructed so that financial intermediaries perform as a financial portfolio manager for depositors. It extends both Bencivenga and Smith (1991) and Chang (2005) to address how factory relocation affects capital outflow and inflow; and hence, the economic growth.

A. The General Environment

The economy consists of an infinite sequence of three-period-lived overlapping generations, young(Y), middle-aged (M), and old(O), plus an initial old generation and an initial middle-aged generation. In each period, the economy contains a continuum of agents and the population growth is assumed to be constant. Let t=0, 1, 2, and so on index time. Each of the initial old generation is endowed with an initial per capital stock k_0 units at t=0 while each of the initial middle-aged generation is endowed with an initial per capital stock k_1 units at t=1.

There are two goods in the economy: a consumption good and a capital good. It requires both capital and labor to produce the consumption good. The capital good is assumed to depreciate in one period.

B. Agents

All agents are assumed to be identical ex ante, and are engaged in different activities at each stage of age, which are described as follows:

- Young period (age 1): the young generation is identical to begin with. That is, each is endowed with a unit of labor, which is supplied inelastically. The young generation, however, does not value consumption; therefore, they would save all their income in the financial intermediaries.
- Middle-aged period (age 2): at the beginning of age 2, two statuses will be

realized: (i) whether they are the entrepreneurs at age 3; (ii) if they are, whether to be relocated at age 3. Since the middle-aged and the old has no labor endowment, the realizations cause agents to behave differently in terms of when to withdraw. More specifically, the future entrepreneurs value age-2 consumption, C_2, and age-3 consumption, C_3, equally, and will not withdraw their deposit until age 3, while non-entrepreneurs do not care about age-3 consumption, and hence, will withdraw their deposit at age 2.

- Old period (age 3): all entrepreneurs withdraw their deposit and relocation occurs. All entrepreneurs will use the capital goods out of the repayment from the financial intermediaries to produce. While non-relocated entrepreneurs make production domestically, the relocated entrepreneurs would make the production in the foreign land. After the production takes place, the relocated entrepreneurs decide whether to transfer their output back to consume.

  [The details of the timing is depicted in Figure 1.]

Let β denote the probability for an agent to become an entrepreneur at age 3, and let $\$$ denote the probability for an entrepreneur to be relocated at age 3. So after realizing statuses at age 2, there are three types of agents: (i) the relocated entrepreneurs (RE), with probability $\beta\$$; (ii) the non-relocated entrepreneurs (NE) with probability $\beta(1-\$)$; (iii) the non-entrepreneurs with probability $(1-\beta)$. Since the relocated entrepreneurs may or may not transfer their production back to the domestic country, and domestic consumption and foreign consumption are assumed to be imperfect substitutes, the utility function of the young generation can be written as:

$$u(c_1,c_2,c_3;\phi,\sigma) = -\frac{\left[c_2+\phi(c_3+\sigma\, c_3^{*})\right]^{-\gamma}}{\gamma}, \qquad (1)$$

where (> -1 represents the elasticity of the substitution of intertemporal consumption, F < 1 shows the imperfect substitution between domestic and foreign consumption, and N represents an individual-specific variable, which reflects an individual weight at age-3 consumption relative to age-2 consumption, and has the probability distribution as follows:

$$\phi = \begin{matrix} 0 & \textit{with probability } (1-\pi) \\ 1 & \textit{with probability } \pi \end{matrix} \qquad (2)$$

Note that age-1 consumption does not enter the utility function of all young generations; hence, all wage income received at age-1 will be saved. This saving decision will not be influenced by the financial structures.

C. Production Function and Labor Market

Production requires both capital goods and labor. The labor input comes from the young generation, but capital goods is not endowed by any one, except for the initial old and initial middle-age generations. The resource of the capital good comes from the illiquid investment, and agents will own capital goods only if they withdraw two periods after making a deposit. Therefore, the economy capital is owned by a subset of the old generations. The old generation with capital goods will use capital goods in production. It is assumed that the capital owned by each old agent is enough for production; hence, no loan finance is needed, and there is no rental market for capital.

Domestic Production

Let k_t denote the capital owned by an individual entrepreneur at date t. While the average capital stock per entrepreneur without relocation at date t is $\bar{k}_t$, the average capital stock held per entrepreneur after relocation is $(1-\pi\beta)\bar{k}_t$. Since all entrepreneurs would withdraw at age 3, after withdrawal, the relocated entrepreneurs will consume the goods domestically and take the capital goods to relocate. This lowers the average domestic capital stock held per entrepreneur to $(1-\pi\beta)\bar{k}_t$. In order to produce consumption goods, the entrepreneur has to employ L_t units of labor. Given the average capital stock, the capital which the entrepreneur owns, and the labor he hires, the production function can be written in the form of:

$$Y_t = (1-\pi\beta)\bar{k}_t^{\delta} k_t^{\theta} L_t^{1-\theta}, \tag{3}$$

where $\theta \in [0,1]$, and $\delta = 1-\theta$ represents the scale effect, which implies that the social capital level could have positive externality in individual production.

Each entrepreneur would choose an employment level to maximize the profit:

$$\underset{L_t}{Max} \quad \{(1-\pi\beta)\bar{k}_t^{\delta} k_t^{\theta} L_t^{1-\theta} - w_t L_t\}, \tag{4}$$

which gives labor demand of each entrepreneur:

$$L_t = k_t \left[\frac{(1-\theta)(1-\pi\beta)\bar{k}_t^{\delta}}{w_t}\right]^{\frac{1}{\theta}}. \tag{5}$$

To simplify the model, we assume full employment, so the labor supply to each entrepreneur can be written as:

$$L_t = \frac{1}{\pi(1-\beta)}. \tag{6}$$

Since after relocation agents move out, the capital goods are owned only by non-relocated entrepreneurs, who will hire young agents to produce. Thus, given equation (5) and (6), the labor market clearing condition determines the market wage rate:

$$w_t = (1-\theta)(1-\pi\beta)\left[\pi(1-\beta)\right]^{\theta}\bar{k}_t. \tag{7}$$

According to the production function, the capital return for a domestic entrepreneur is:

$$\theta(1-\pi\beta)\left[\pi(1-\beta)\right]^{\theta-1}k_t \equiv \theta\psi(1-\pi\beta)k_t, \tag{8}$$

where $\psi \equiv \left[\pi(1-\beta)\right]^{\theta-1}$.

Foreign Production

It is assumed that the foreign region, where is the destination of domestic relocated entrepreneurs, is symmetric to the domestic region. The only difference is that none of its entrepreneurs will be relocated. Let superscript * denote all variable of this foreign region. So k^*_t presents the capital owned by a foreign entrepreneur at date t. The average capital stock per foreign entrepreneur before be relocated at date t is $\bar{k}_t^*$. After the relocated entrepreneurs arrive, the average capital stock held per foreign entrepreneur is ($\bar{k}_t^* + \pi\beta\bar{k}_t$), where the second term comes from the relocated entrepreneurs. Similar to domestic entrepreneurs, each foreign entrepreneur will employ L_t^* units of labor to produce.

Therefore, the production function is in the form of: $Y_t^* = \left[(\bar{k}_t^*)^{\delta^*} + \pi\beta(\bar{k}_t)^{\delta^*}\right](k_t^*)^{\theta^*}(L_t^*)^{1-\theta^*}$, where $\theta^* \in [0,1]$, and $\delta^* = 1 - \theta^*$.

Assume that at date t, the average capital stock in the foreign region is the same as the domestic region, $\bar{k}_t^* = \bar{k}_t$, then the production can be written as:

$$Y_t^* = (1+\pi\beta)(\bar{k}_t^*)^{\delta^*}(k_t^*)^{\theta^*}(L_t^*)^{1-\theta^*}. \tag{9}$$

So the profit function is given by:

$$\underset{L_t^*}{Max} \quad \{(1+\pi\beta)(\bar{k}_t^*)^{\delta^*}(k_t^*)^{\theta^*}(L_t^*)^{1-\theta^*} - w_t^* L_t^*\}, \tag{10}$$

which gives labor demand of each entrepreneur:

$$L_t^* = k_t^* \left[\frac{(1-\theta^*)(1+\pi\beta)(\bar{k}_t^*)^{\delta^*}}{w_t^*}\right]^{\frac{1}{\theta^*}}. \tag{11}$$

To simplify the model, we assume full employment, so the labor supply to each entrepreneur can be written as:

$$L_t^* = \frac{1}{\pi^* + \pi\beta}. \tag{12}$$

Since after relocation agents move out, the capital goods are owned only by non-relocated entrepreneurs, who will hire young agents to produce. Thus, given equation (5) and (6), the labor market clearing condition determines the market wage rate:

$$w_t^* = (1+\pi\beta)(1-\theta^*)(\bar{k}_t^*)(L_t^*)^{-\theta^*}, \tag{13}$$

which provides an entrepreneur capital return:

$$\theta^*(1+\pi\beta)\left[\pi^* + \pi\beta\right]^{\theta^*-1} k_t^* \equiv \theta^*\psi^*(1+\pi\beta)k_t^*, \tag{14}$$

where $\psi^* \equiv \left[\pi^* + \pi\beta\right]^{\theta^*-1}$

Capital Inflow

The relocated entrepreneurs have two choices after receiving the capital return from production. They can either transfer the capital return back to the domestic region or consume it in the foreign region. Given foreign consumption is imperfect substitute of domestic consumption, the entrepreneurs would have incentive to transfer the capital return back to the domestic region. It is assumed that each transfer would cost $\mathbf{J}$, which is an exogenous sunk cost. The condition that determines whether there will be capital inflow is:

Condition 1:

The relocated entrepreneurs will transfer capital return back to domestic region only if $\theta^*\psi^*(1+\pi\beta)k_t^* - \tau > \sigma\theta^*\psi^*(1+\pi\beta)k_t^*$, *which can be rewritten as*

$$\theta^*\psi^*(1+\pi\beta)k_t^* > \frac{\tau}{1-\sigma}. \tag{15}$$

Condition 1 implies that the threshold of capital stock, $\hat{k}_t = \frac{\tau}{(1-\sigma)\theta^*\phi^*(1+\pi\beta)}$. If $k_t^* > \hat{k}_t$, then relocated entrepreneurs will transfer their capital return back the domestic region, and the transferred amount is $\theta^*\psi^*(1+\pi\beta)k_t^* - \tau$; otherwise, nothing will be transferred.

D. Investment

It is assumed that the economy has two types of investment, a liquid and an illiquid investments, which are available for the financial intermediaries only. The financial intermediaries would collect savings from the young generation and allocate them to liquid

and illiquid investment. The return of the liquid investment is n>0 units of consumption good at either t+1 or t+2 for each unit of consumption good investing at t. The return of the illiquid investment is R units of capital goods at t+2 for each unit of consumption good investing at t. Any early liquidation from illiquid investment at t+1 will result in **P** units of consumption good, and 0#**P**<n.

E. Financial Intermediaries

Let z_t O[0, 1] denote the fraction of each unit of deposit placed in liquid assets, and let q_t O[0, 1] denote the fraction of each unit of deposit placed in illiquid assets. Since the liquid investment in the model serves as a reserve, the sum of z_t and q_t must be one, $z_t + q_t = 1$. As soon as the financial intermediaries receive the deposit from the young generation, they allocate the deposit to either the liquid or the illiquid investment.

Some agents may withdraw one period after making a deposit, and some may not withdraw until two periods after making a deposit. The financial intermediaries, therefore, would set the promised payment to depositors, which depends on the withdrawal time. In particular, the repayment for the withdrawal one period after making the deposit is r_{1t} units of consumption goods for each unit of deposit and the repayment for the withdrawal two periods after making the deposit is r_{2t} units of capital goods and $\tilde{r}_{2t}$ units of consumption goods for each unit of deposit. Note that the In order to meet the repayment to the depositors at various times, the financial intermediaries must allocate the portfolio properly.

Let α_{1t} denote the fraction of the liquid investment, which will be liquidate one period after investment, and let α_{2t} denote the fraction of illiquid investment, which will be

liquidated two periods after investment. The budget constraints of the financial intermediaries at period one and two can be written as:

$$(1-\pi)r_{1t} = \alpha_{1t} z_t n + \alpha_{2t} q_t \chi, \tag{16}$$

$$\pi r_{2t} = (1-\alpha_{2t}) R q_t, \tag{17}$$

$$\pi \tilde{r}_{2t} = (1-\alpha_{1t}) z_t n, \tag{18}$$

where equation (16) is the constraint for one period after investment, and equations (17) and (18) are the constraints for two periods after investment. While equation (17) is the constraint for capital goods, equation (18) states the constraints for consumption good. The promised repayment to the agents one period after deposit, r_{1t}, requires the financial intermediaries to liquidate enough investment, both liquid and illiquid investment, as shown on the right-hand-side of equation (16), to fulfill the obligation. At the 2nd period after deposit, all entrepreneurs will withdraw their deposit and the repayment includes both capital goods and consumption goods, whose resource are described in equation (17) and (18), respectively.

- *Financial Intermediaries? Problem*

The financial intermediary system is assumed to be a competitive market, which implies zero profit. Therefore, they will choose the variable set $\{ z_t, q_t, \alpha_{1t}, \alpha_{2t}, r_{1t}, r_{2t}, \tilde{r}_{2t} \}$ to maximize the expected utility of a representative agent. Although it is public information that a fraction **B$** of agents are relocated entrepreneurs, each individual type of whether to be relocated is private information. Therefore, the repayment to people withdrawing at age 3

will be identical. Assume that the probability for $k_t^* > \hat{k}_t$ is Δ, which indicates the probability for the relocated entrepreneurs to transfer capital returns back to the domestic region. So the problem of the financial intermediaries becomes:

$$\begin{aligned} \underset{\{\xi_t q_t \alpha_{1t} \alpha_{2t} r_{1t} r_{2t} \tilde{r}_{2t}\}}{Max} \quad & -\left(\frac{1-\pi}{\gamma}\right)\left(r_{1t} w_t\right)^{-\gamma} - \frac{\pi(1-\beta)}{\gamma}\left[\theta\psi(1-\pi\beta) r_{2t} w_t + \tilde{r}_{2t} w_t\right]^{-\gamma} \\ & -\frac{\pi\beta}{\gamma}\left\{\tilde{r}_{2t} w_t + \rho\left[\theta^*\psi^*(1+\pi\beta) r_{2t} w_t - \tau\right] + (1-\rho)\sigma\left[\theta^*\psi^*(1+\pi\beta) r_{2t} w_t\right]\right\}^{-\gamma} \end{aligned} \tag{19}$$

where the first term represents the utility of the non-entrepreneurs, the second term is the utility of the non-relocated entrepreneurs, and the third term is the expected utility of the relocated entrepreneurs. Since caring only about the age-2 consumption, a non-entrepreneur would withdraw and consume all his deposit at age 2, which gives $r_{1t} w_t$. An entrepreneur, however, cares both consumption at age 2 and age 3. If the repayment at age 3 from deposit is higher than age 2, given the individual utility function, the entrepreneurs would prefer to withdraw at age 3. That implies that the repayment for the entrepreneurs from deposit is $(r_{2t} + \tilde{r}_{2t}) w_t$. Note that $r_{2t} w_t$ is paid in capital goods, which will be used in production and provide capital returns $\theta\psi(1-\pi\beta) k_{t+2}$ units of consumption goods to domestic entrepreneurs and $\theta^*\psi^*(1+\pi\beta) k_t^*$ to the relocated entrepreneurs. With probability Δ, the relocated entrepreneurs would transfer their capital return back to the domestic region to consume by paying the transaction costs Γ; otherwise, they will consume their capital return in the foreign

region. Then the financial intermediaries will choose the variable set to maximize equation (19), subject to equations (16)-(18).

III. Equilibrium

As the only institutions having the access to asset investments, the financial intermediaries would act as financial portfolio managers. The asset portfolio is between the liquid and illiquid investment. The return of the liquid investment is n units of consumption goods while the return of the illiquid investment is R units of capital goods, which in turn will give $\theta\psi(1-\pi\beta)R$ units of consumption goods for domestic entrepreneurs, and $\theta^*\psi^*(1+\pi\beta)R$ units of consumption goods for relocated entrepreneurs. By comparing the returns of both investments, the financial intermediaries may make the following decisions.

Proposition 1 (Portfolio Decision)

If $\theta\psi(1-\pi\beta)R \geq n > 0$ *and* $\theta^*\psi^*(1+\pi\beta)R \geq n > 0$, *financial intermediaries would choose* $\alpha_{1t} = 1$, $\alpha_{2t} = 0$, $\tilde{r}_{2t} = 0$; *therefore,* $q_t = \dfrac{\Phi}{1+\Phi}$ *and* $\square_t = \dfrac{1}{1+\Phi}$, *where*

$$\Phi = \left(\frac{\pi}{1-\pi}\right)\left\{\frac{n^{\gamma/(1+\gamma)}}{\left\{(1-\beta)\left[\theta\psi(1-\pi\beta)R\right]^{-\gamma} + \beta\left[\theta^*\psi^*R(1+\pi\beta)(\rho+\sigma(1-\rho))\right]^{-\gamma}\right\}^{-1/(1+\gamma)}}\right\}.$$

$$r_{1t} = \frac{n}{(1-\pi)(1+\Phi)}, \text{ and } r_{2t} = \left(\frac{R}{\pi}\right)\left(\frac{\Phi}{1+\Phi}\right).$$

Proposition 1 shows that if the rate of return of the illiquid investment is larger than that of the liquid investment, the financial intermediaries would prefer not to liquidate any illiquid

investment prematurely, $\alpha_{2t} = 0$, but liquidate all liquid investment at age 2, $\alpha_{1t} = 1$ since the return is the same at any period. Therefore, at age 3, there is no repayment in consumption goods, $\tilde{r}_{2t} = 0$; all will be paid in capital goods. After solving optimization problems (equations (16)-(19) of financial intermediaries, the optimal fraction investing in illiquid asset is $q_t = \frac{\Phi}{1+\Phi}$, and the optimal fraction investing in liquid assets is $z_t = \frac{1}{1+\Phi}$. In turn, the repayment for age-2 (one period after deposit) and age-3 (2 periods after deposit) withdrawals are $r_{1t} = \frac{n}{(1-\pi)(1+\Phi)}$ and $r_{2t} = \left(\frac{R}{\pi}\right)\left(\frac{\Phi}{1+\Phi}\right)$, respectively.

Condition 2:

The non-relocated entrepreneurs will always withdraw at age 3, if the condition,

$$\left(\frac{\theta\psi(1-\pi\beta)R}{\pi}\right)\left(\frac{\Phi}{1+\Phi}\right) > \left(\frac{n}{1-\pi}\right)\left(\frac{1}{1+\Phi}\right), \text{ holds.} \quad \text{(C2)}$$

Condition 3:

The relocated entrepreneurs will always withdraw at age 3, if the condition,

$$\left(\frac{\theta^*\psi^*(1+\pi\beta)R}{\pi}\right)\left(\frac{\Phi}{1+\Phi}\right) > \left(\frac{n}{1-\pi}\right)\left(\frac{1}{1+\Phi}\right), \text{ holds.} \quad \text{(C3)}$$

These two conditions imply that the entrepreneurs will always withdraw at age 3 if the capital return gained by late withdraw is higher than the repayment of early withdrawal. The left-hand-side of the condition is the capital gain from withdrawal at age 3, which provides C_3, and the right-hand-side is the repayment from withdraw at age 2, which provides C_2. Since

weighting C_2 and C_3 equally, the entrepreneurs will withdraw at age 3, if capital return is higher than repayment at age 2.

The analysis of economic growth is similar to Bencivenga and Smith (1991), and Chang (2005). The amount of capital used in production is from the repayment by the financial intermediaries at age 3, which implies $k_{t+2} = r_{2t} w_t = \frac{Rq_t}{\pi} w_t$. By imposing equation (13), the economic growth can be defined as:

$$\mu \equiv R(1-\theta)(1-\pi\beta)\pi^{\theta-1}(1-\beta)^{\theta}\left(\frac{\Phi}{1+\Phi}\right), \tag{20}$$

where $\Phi = \left(\frac{\pi}{1-\pi}\right)\left\{\frac{n^{\gamma/(1+\gamma)}}{\left\{(1-\beta)\left[\theta\psi(1-\pi\beta)R\right]^{-\gamma} + \beta\left[\theta^{*}\psi^{*}R(1+\pi\beta)(\rho+\sigma(1-\rho))\right]^{-\gamma}\right\}^{-1/(1+\gamma)}}\right\}$.

By deriving the comparative statics of equation (20), one can find that the parameters, θ^{*}, ψ^{*}, which solely help foreign capital returns have negative impact on domestic economic growth. That is because although a higher capital return may increase the capital returns of the relocated entrepreneurs to flow output back, and increase the possibility for the capital return to pass the threshold stated in Condition 1, but it decreases the fraction of illiquid investment by the financial intermediaries. Thus, the repayment to deposit at age 3 is lower, which hurts domestic economic growth. The negative impact of $\mathbf{D}$ on economic growth lies in the same category since it does not help domestic capital to grow to help domestic production. The value of $\mathbf{F}$, however, reflects the degree of imperfect substitutes between domestic foreign consumption. When $\mathbf{F}$=1, domestic and foreign consumption are

perfect substitutes, so given the fixed transaction cost **J**, the relocated entrepreneurs would have no incentive to transfer any of their output back to the domestic region.

IV. CONCLUSION & EXTENSIONS

The purpose of this exercise is to illustrate how the capital flows affect the payment. The results are quite interesting. First, without capital flows, patient depositors would increase the loans available to the entrepreneurs, and promote economic growth. Second, with capital flows, whether the outflow capital would flow back to the economy would depend on the relative technology levels of two countries and the barrier of capital flows in the foreign country. If the technology of accumulating capital is higher in the foreign country, which does not have restrictions on capital flows, then the capital outflow caused by factory relocation may promote growth, because the capital accumulated in the foreign country may flow back and promote domestic economic growth. If the country which domestic capital has flowed to has high barrier on capital mobility, then it is more likely that capital outflow to that country has no contribution to domestic economic growth, and may also damage domestic growth.

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Figure 1: Timing