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FINANCIAL INTERMEDIATION AND EMPLOYMENT

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Abstract

In our model, there are entrepreneurs and other agents. The latter have labour and capital, but no entrepreneurship. They are employed for a wage, or they are self-employed (which is inefficient). If they are employed for a wage, they invest their capital in financial assets. Otherwise, they take up self-employment, which requires capital and leaves little scope for buying financial assets. It can then be shown that investment in financial assets and *wage employment* are positively correlated. The model helps explain why a small financial system and low wage employment are observed in less developed countries that have high cost of financial intermediation.

Key words: Financial intermediation, employment, less developed country.

JEL Classification: G20, J23, O17.

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1 Introduction

This work is motivated by two stylized facts regarding less developed countries (LDCs), viz., poor financial development[2] and high self-employment[3]. The literature has, however, treated the two phenomena as if they are unrelated. We use a simple theoretical model to examine the linkages between these two aspects.

The positive correlation between income and financial development[4] is well known (Levine et al., 2000). Following Kuznets, it is also well known that there is a link between income and self employment. LDCs have much more self employment compared to developed countries. From these two stylized facts, one can conclude that there is negative correlation between financial development and self employment. This link is, however, through a third variable i.e. income. This paper will directly link self employment and financial development.

Broadly, we classify employment into two categories - self-employment and, what we may call, *wage employment* (an agent gets a job for a wage). Wage employment in many LDCs is low. This is usually attributed to factors like labour laws, scarcity of capital, and so on (Lewis, 1954). We will show that low wage employment can also be due to problems in the financial sector, e.g. due

[2]Private credit, for example, constitutes less than 25% of GDP in LDCs. In high income countries, the corresponding *minimum* figure exceeds 50% (World Bank, 2001).

[3]In India 52.9% of employment is of the self-employment category (Table 30, pp. 166, Gupta (2002)). On the other hand, in USA, about 12.5% of the male labour force and about 7% of the female labour force was self-employed around 1982 (Figure 1, Blau (1987)).

[4]Financial development may be measured by ratio of bank deposits to national income.

to a high cost of financial intermediation.

Self-employment is present almost all over the world. However, it is not very large in developed countries. To the extent that it exists, self-employment in these countries may be due to tax regime[5], or due to preferences and/or entrepreneurial abilities of agents who prefer self-employment to wage employment. In LDCs, on the other hand, there is considerable self-employment. It is important to distinguish between self employment and entrepreneurship. All the self-employed agents in LDCs may not be entrepreneurs. If they were, these economies would perhaps not be so poor in the first place. Lack of entrepreneurship amongst the self-employed agents can lead to low productivity by these agents or their 'firms'. This implies that if there is considerable self-employment, then it is possible that there is an inefficiency in the economy relative to the first best solution. Though considerable self-employment can be inefficient[6], it is, of course, better than unemployment, which is the only other alternative.

Our model is based on the idea that financial intermediation and wage employment are positively correlated. To see this intuitively, consider an economy with two kinds of agents - entrepreneurs (who are few in number) and other agents (who are the bulk of the labour force). Let us say that each of these other agents is endowed with labour and capital[7], but no entrepreneurship[8].

[5] See Robson and Wren (1999).

[6] For a different view, see Yamada (1996).

[7] This can vary across agents. For simplicity, we will assume that it is the same for all agents.

[8] This term is used in the sense in which it was used in Schumpeter (1961).

This agent would like to get a job, and invest her funds through the financial system. This will ensure that she gets income from both labour and capital. This is typically what is desired and is feasible in a developed economy. However, in an LDC, there may be a few jobs only. Those who get a job will indeed invest their funds in financial assets (primarily bank deposits in LDCs). But for those who do not get a job, there is a choice between unemployment and self-employment. If the perception is that jobs will be difficult to get even in future, then they opt for self-employment, using much of their wealth to set up an owner-managed enterprise. So they deposit a very small fraction of their wealth in banks as store of value. It follows from all this that (time) deposits in banks and wage employment are positively correlated. More generally, it can be a correlation between financial intermediation and wage employment. This is a direct linkage between financial intermediation and wage employment, and has, as far as we are aware, not been explored in the literature. Little wage employment and little financial intermediation go together.

Given the distinction between self-employment and entrepreneurship, the first best solution is that all entrepreneurs and only entrepreneurs are self-employed. Entrepreneurs run firms. All the economic activity is carried out in firms and there is no (inefficient) self-employment. This is under the assumption that cost of intermediation is effectively low (so that funds can be delegated to entrepreneurs through intermediaries), as is usually the case in developed countries. However, if the cost of financial intermediation is effectively high, as is usually the case in LDCs, then we can have an inefficient allocation. Part of the

labour force and part of the capital in the economy are used in owner-managed enterprises, which are run by self-employed agents who are not entrepreneurs. The remaining resources are used in firms (that are run by entrepreneurs). The part of resources used in owner-managed enterprises increases with the effective cost of financial intermediation.

Due to various reasons, the effective cost of financial intermediation in LDCs can be substantially higher than that in developed countries. Following Jensen and Meckling (1976), the problem of separation of ownership and management is well recognized in the literature in the context of the corporate sector. This includes private sector banking. In the context of public sector banks (PSBs)[9], the problem due to separation of ownership and management gets further aggravated. The reasons are as follows. *First*, monitoring of the bank managers in PSBs by the owner viz. the government is, *ceteris paribus*, weaker than in the case of the private sector. *Second*, bank managers are public sector officials who can rarely be dismissed. *Third*, in most LDCs, a borrower has, for all practical purposes, no access to the judiciary even if she can prove that she deserves to get a loan and has not got one (without effectively bribing the bank officials).

Our model also explains why the developed countries can be less vulnerable than the LDCs to a shock in the financial sector[10] (modeled here as a rise in

[9] See La Porta, et al. (2002).

[10] For example, in the 1980s, the USA went through the savings and loan crises but it did not significantly affect the economy. Again, in 1987, there was a stock market crash in the USA which hardly affected the economy. On the other hand, in the case of East Asia in late 1990s, the financial crises had considerable impact on the real sector.

cost of financial intermediation).

The plan of the paper is as follows. In the next section, we begin with the model, thereafter analyse allocation of labour and capital within an economy, and finally, make inter-country comparison. Section 2 has a discussion of the topic and related issues. We conclude in section 3.

2 The Basic Model

We consider a model with a single homogeneous output. The price of this good is normalized to 1.

There are 3 groups of agents: entrepreneurs, single agent households, and bank managers. The single agent households are either employed for a wage, or they are self-employed. These two types of employment may be referred to as wage employment and self employment respectively. There are four kinds of organizations - firms, owner-managed enterprises, commercial banks, and the government. Firms are run by entrepreneurs, owner-managed enterprises are run by self-employed agents, and commercial banks are run by professional managers. The terms 'entrepreneurs' and 'self-employed agents', as used in this paper, refer to two mutually exclusive groups of agents. The distinction between the two is that the former have entrepreneurial ability, whereas the latter do not have it. For simplicity, we will consider a single firm and a single bank. In our model, this means that there is one entrepreneur and one bank manager. In the case of an owner-managed enterprise, there is no separation of ownership

and management. In the case of a bank, there is a separation of ownership and management, and hence, there is a cost of delegation. Banks are owned by the government, which effectively acts as a passive monitor of management in banks. Bank managers maximize their own income. A firm obtains its funds from the representative bank. Accordingly, there is cost of separation of ownership and management in a firm. However, this cost is less than that in the case of a bank. For simplicity, we assume that the cost of separation between ownership and management in case of a firm is zero.

The entrepreneur can invest in either one of two projects - project G or project B, both requiring labour (L) and capital (K). Project returns are of two kinds, verifiable and non-verifiable. Project G yields a verifiable return of $gf(K, L)$ and no non-verifiable income, whereas project B yields a verifiable return of $qf(K, L)$ and a non-verifiable income of $pf(K, L)$. The amount $pf(K, L)$ represents the private benefit of the entrepreneur and can be interpreted as *tunneling* (see Johnson, et al. (2000)), i.e. the entrepreneur diverting a part of the output for private use.[11] The rationale for choosing project B will be explained a little later.

The entrepreneur has zero endowment of both labour and capital. Hence she must borrow funds and hire labour if she wants to start a project.

Project G (respectively B) is a good (respectively bad) project in the sense that, for any given K and L, the aggregate return from project G exceeds that

[11] Note that q and p are taken to be exogenous. It is possible to consider an alternative model in which q and p are endogenous. However, since this formulation does not add too much to the economics of the paper, we refrain from describing this case here.

under project B. Formally, we assume that $g > q + p$.

There is a continuum of households. The number of households is normalized to 1. Every household has an endowment consisting of 1 unit of labour and 1 unit of capital. Thus the total labour endowment, as well as the total capital endowment in the economy equals 1. Hence, factors of production used under the entrepreneur in the wage employment sector must satisfy the following feasibility condition:

$$0 \leq L, K \leq 1. \tag{1}$$

Every household has two options, either to work as a labourer with the entrepreneur and invest her capital optimally, or to work as self-employed, when she can run an owner-managed enterprise requiring 1 unit each of labour and capital. There is no part time job, and no part time self employment. Whenever both the input levels are at least 1, the net return from her owner-managed enterprise is s (> 0). Thus the total income to a household from operating the owner-managed enterprise is s.

In order to formalize the idea that the owner-managed enterprise is inefficient compared to the firm, we assume that $gf(1, 1) > s$. This is consistent with the view that a professional entrepreneur has a comparative advantage in business over ordinary households (Schumpeter (1961)).

Because of various costs, households cannot lend directly to the entrepreneur. Thus in case an agent is engaged in wage employment, she earns a wage of w, and, by depositing her one unit of capital in the bank, a rental income of r (> 0),

yielding her a total income of $w + r$.[12]

In order to ensure that the equilibrium involves some of the households in self-employment, we assume that $s > r$.

The households have neither any disutility from working, nor any utility from leisure. Thus for a household agent, her utility maximization exercise simplifies to income maximization. Hence, her individual labour supply[13] is given by

$$\begin{cases} 0, & \text{if } s > w + r, \\ x, & \text{if } s = w + r, \\ 1, & \text{if } s < w + r. \end{cases}$$

where $x \, \epsilon \, \{0, 1\}$. Given that the number of households is normalized to 1, the aggregate labour supply for wage employment (L) is 0, if $s > w + r$, and 1, if $s < w + r$. If $s = w + r$, then the aggregate labour supply can take any value in the interval $[0, 1]$. In that case the actual wage employment will be determined by the level of demand.

Note that the households who are engaged in wage employment are the only source of capital for the entrepreneur who borrows from the bank. The capital of the self-employed households are used up in their own owner-managed enterprises. Since there are no other sources of capital, the supply of deposits (D) is given by

$$D = L, \tag{2}$$

[12]Thus the implicit assumption is that the household sector does not have a storage technology for capital, or, if such a technology exists, then the return is lower compared to r.

[13]For a relationship between labour supply of self-employed workers, and wage uncertainty, see Parker, et al. (2005).

given that each agent has 1 unit of labour and 1 unit of capital (that can be deposited in the bank). Since the cash reserve ratio of the bank is zero by assumption, and the entrepreneur can not borrow more than the deposits of the bank, it follows that $K \leq D$.

There are a number of identical public sector banks. We consider one representative bank. For simplicity, the rate of interest r is given exogenously.

The bank is run by a manager, whose objective is to maximize her own income. In case the entrepreneur opts for project B, the bank management obtains a part of the private benefit $(1-\alpha)pf(K, L)$, while the entrepreneur obtains $\alpha pf(K, L)$, where α is an index of the bargaining power of the entrepreneur, and $0 < \alpha < 1$.[14] In case project G is chosen, however, the bank management does not obtain any private benefit.

The problem of 'bad' banking arises since the bank manager, in her own interest, has an incentive to make the entrepreneur choose the bad project. This is possible since, as the only source of capital, the bank manager has considerable bargaining power vis-a-vis the entrepreneur.

The representative bank and the bank manager are distinct and separate entities. The bank makes some minimum profit (otherwise the owner i.e. the government will start seriously monitoring the banks) and the bank manager gets positive income (due to bargaining power with the (local) entrepreneur). For simplicity, we will consider the minimum profit in the bank to be zero.

[14]The exact value of α would depend on various things, e.g. the nature of the bargaining process, the nature of the technology, the social norms etc. For simplicity we assume that α is exogenously given.

2.1 Allocation between wage employment and self employment

Let us first consider the first best outcome. Clearly, under the first best outcome the whole of the capital must be invested, and all labour must be utilized. Moreover, project G must be chosen in the wage employment sector. Since L denotes the employment level in the wage employment sector, the volume of labour engaged in self-employment must be $(1 - L)$. Given the technology, the output in the self-employment sector is $(1 - L)s$. Moreover, the amount of capital employed in the self-employment sector is exactly equal to employment in the self-employment sector, i.e. $1 - L$. Thus, in the wage employment sector $L = K$. Given (1), the first best solves the following program:

$$\max_{L,K} \quad gf(K, L) + (1 - L)s \quad \text{subject to} \quad K = L \leq 1. \tag{3}$$

Let (L^g, K^g) denote the first best solution.

Next, we consider the market equilibrium. Note that the interaction between the bank management and the entrepreneur involves a bilateral monopoly like situation. The bank management, as the monopoly supplier of the capital, has some bargaining power. On the other hand, given that the bank management has a positive payoff only if the entrepreneur chooses project B, the entrepreneur also has some bargaining power. As is well known, under bilateral monopoly, the equilibrium is indeterminate. Hence in order to pin down the solution, we assume that the market equilibrium involves the following features:[15]

[15]Of course, one can use a somewhat different set of assumptions while pinning down the

(i) The entrepreneur selects project B, which allows the bank management to earn a positive income.

(ii) The entrepreneur chooses a level of capital $K = D$, i.e. all funds are borrowed by the entrepreneur. Since $D = L$, it follows that $K = L$.[16]

(iii) The entrepreneur chooses K, L and w so as to maximize her profit, subject to conditions (i) and (ii), and other feasibility conditions (e.g. the households' participation constraint).[17]

We can now write down the market equilibrium condition more formally. The market equilibrium consists of a vector (w, K, L) that solves the following problem:

$$\max_{L,K,w} \quad (q + \alpha p) f(K, L) - wL - rK, \text{ subject to}$$

$$K = L \leq 1, \tag{4}$$

$$w + r \geq s. \tag{5}$$

(5) represents the participation constraint of the representative household/agent who is engaged in wage employment.[18]

outcome. That, however, would not change our results qualitatively.

[16]The bank management would have an even greater incentive to impose the condition that $K = D$, in case the government imposes a no profit condition for the bank, i.e. $r(K - D) = 0$, where it is assumed that the lending rate and the borrowing rate are equal.

[17]Given that the entrepreneur acts as a monopolist in the wage employment sector, it is natural to assume that she can select the level of w as well.

[18]In fact, we shall argue that in equilibrium, (5) is satisfied with an equality, so that $w + r = s$. Hence the households are indifferent between working in the two sectors. Thus employment in the wage-employment sector is determined from the demand side. Hence we refrain from introducing any additional notations for the demand of labour.

Let (L^b, K^b, w) denote the equilibrium outcome. Note that in equilibrium the participation constraint of the household must be satisfied with an equality, i.e. $w + r = s$. Suppose to the contrary that $w > s - r$. If the entrepreneur announces a wage rate of $w - \epsilon \geq s - r$, then, for the same value of L^b, the entrepreneur's profit will be strictly higher, which is a contradiction.[19]

The market equilibrium problem simplifies to the following:

$$\max_{L} \quad (q + \alpha p) f(L, L) - sL, \text{ subject to } L \leq 1. \tag{6}$$

Next, define $\hat{\alpha}$ by the condition[20]

$$(q + \hat{\alpha} p)[f_L(1, 1) + f_K(1, 1)] = s. \tag{7}$$

Clearly, the solution is given by

$$L^b = \begin{cases} 1, & \text{if } \alpha \geq \hat{\alpha} \\ \hat{L}, & \text{if } \alpha < \hat{\alpha}, \end{cases} \tag{8}$$

where $\hat{L}$ is the interior solution, given implicitly by the condition[21]

$$(q + \alpha p)[f_L(L, L) + f_K(L, L)] = s, \quad \alpha < \hat{\alpha}. \tag{9}$$

[19] One implication of the above result is that the level of w, though endogenous, is, in equilibrium, always set equal to $s - r$.

[20] From (7), it follows that

$$\hat{\alpha} = \frac{s - q[f_L(1, 1) + f_K(1, 1)]}{p[f_L(1, 1) + f_K(1, 1)]}.$$

Clearly,

$$0 < \hat{\alpha} < 1 \Leftrightarrow q[f_L(1, 1) + f_K(1, 1)] < s < (q + p)[f_L(1, 1) + f_K(1, 1)].$$

[21] This equation follows from the first order condition after using $L = K$. Note that for $\alpha \geq \hat{\alpha}$, $L = 1$, i.e. self-employment is zero and all employment is in the wage employment sector.

Let x^b and x^g denote the aggregate output under bad banking and the first best outcome respectively. Since $(q + \alpha p) < (q + p) < g$, it follows from (3) and (6), that the market equilibrium is different from the first best i.e. $x^b < x^g$. Observe that $L^b \leq L^g$, where $L^b = L^g$ if the constraint $L \leq 1$ is binding. We have, thus, established

Proposition 1. *The market equilibrium is sub-optimal i.e.* $x^b < x^g$, *and the equilibrium level of employment in the wage employment sector is less than or equal to that under the first best outcome i.e.* $L^b \leq L^g$.

Since aggregate output is the sum of output produced in the formal sector and that produced in the informal sector, we have

$$x^b = (q + p)f(K^b, L^b) + (1 - L^b)s < gf(K^g, L^g) + (1 - L^g)s = x^g. \qquad (10)$$

In some ways, the wage employment sector in our model is comparable to the formal sector in the literature. The small size of the formal sector is sometimes attributed to the legal and other costs of working in the formal sector[22]. Our model presents a different picture. The allocation between the two sectors depends on the nature of the financial system. This will become clearer in the next subsection, where we compare two economies. One of these has a better financial system than the other.

[22]See Straub (2005).

2.2 Cross-country Comparison

We may interpret $(1-\alpha)$ as *the cost of financial intermediation*. If $(1-\alpha) > (1-\hat{\alpha})$, then part of the labour force is self-employed. For reasons that will become clear soon, we interpret $(1-\hat{\alpha})$ as *the threshold of vulnerability*.

Consider two countries, A and B, which are identical in every respect except the cost of financial intermediation, $1-\alpha$. In what follows, α^i will refer to α in country i.[23] Let country A (respectively B) be characterized by $1-\alpha^A$ (respectively $1-\alpha^B$). Suppose that $\alpha^A > \widehat{\alpha} > \alpha^B$. Thus country B has a greater cost of financial intermediation. Note that, in country A, the whole of the labour force is employed for a wage, whereas, in country B, it is divided among the wage employment and the self-employment sectors. It immediately follows that the welfare level in country A is greater than that in B, i.e. $x^A > x^B$.

It is often suggested that LDCs tend to be more vulnerable to deterioration in the financial sector as compared to developed countries. Why? In the context of our model, in country A, if $(1-\alpha^A)$ increases (up to a point i.e. $1-\hat{\alpha}$), output is not affected. But in country B, a rise in $1-\alpha^B$ affects output adversely. We will use $-\frac{\partial x}{\partial(1-\alpha)}$ as the measure of vulnerability of an economy to a deterioration in financial intermediation. Formally, $-\frac{\partial x^B}{\partial(1-\alpha^B)} > -\frac{\partial x^A}{\partial(1-\alpha^A)} = 0$. So country B is not only poor, but it is also vulnerable to deterioration in financial intermediation. Thus despite both the countries having the same endowment and technology, greater cost of financial intermediation in country B implies that it is poorer, as well as more vulnerable as compared to country A.

[23] For other variables we follow a similar notation.

Next, we consider comparative statics on s. What is the effect of a change in s on the vulnerability of the economy in country B? If $f(K,L) = (KL)^{\frac{1}{4}}$ then, it is easy to check that $-\frac{\partial^2 x^B}{\partial s \partial(1-\alpha^B)} < 0$. In other words, the magnitude of vulnerability $(-\frac{\partial x}{\partial(1-\alpha)})$ decreases as s increases. The intuition is straightforward. A shock in the financial sector adversely affects the economy. It results in a shift of allocation from the (efficient) wage employment sector to the (inefficient) self-employment sector. In such a situation, it helps to have high productivity in the self-employment sector. The higher is s, the less is the impact of a deterioration in financial intermediation.

Summarizing the above discussion, we have

Proposition 2. *Consider countries A and B which are identical in every respect except that* $\alpha^A > \widehat{\alpha} > \alpha^B$.

(i) Then $x^A > x^B$. *Moreover, while country B is vulnerable to an increase in the cost of financial intermediation, i.e.* $-\frac{\partial x^B}{\partial(1-\alpha^B)} > 0$, *country A is not, i.e.* $-\frac{\partial x^A}{\partial(1-\alpha^A)} = 0$.

(ii) If $f(K,L) = (KL)^{\frac{1}{4}}$ then, *vulnerability of B decreases as the productivity of the self-employment sector rises, i.e.* $-\frac{\partial^2 x^B}{\partial s \partial(1-\alpha^B)} < 0$.

The formal proof of Proposition 2 is given in the Appendix.

Proposition 2 suggests that developed countries are not vulnerable to financial shocks unless these are very large (i.e. $1-\alpha^A$ increases beyond $1-\hat{\alpha}$ if we identify country A with a developed country[24]). For example, in the context of

[24]It is true that even in developed countries, self-employment is not negligible (Blau (1987)). The self-employment in many developed countries is, however, more comparable with the

the Great Depression of 1930s, Bernanke (1983) suggests that the weaknesses in the financial sector were large enough to affect the real sector in USA.

3 Discussion

In this paper, we have classified employment into two categories - wage employment and self employment. Similarly, we have classified capital into two categories - capital that is delegated through the financial system, and capital that is used in owner-managed enterprises. We have shown that an increase in wage employment has a positive effect on the amount of delegated capital. As far as we know, this relationship has not been explored in the literature so far.

It is true that the standard neoclassical textbook theory of demand for factors of production shows how the demand for labour depends not only on wages but also on the quantity of capital used in production. If we take wages on the y-axis and labour on the x-axis, then the effect of an increase in capital on employment is shown as a rightward shift[25] of the demand curve for labour. So, for a given wage rate, an increase in capital employed increases the demand for labour. Similarly, we can analyze the effect of an increase in labour on the demand for capital for a given rental rate. Let us call this *the textbook effect*

self-employment of the entrepreneur in our model (in the sense that the productivity of the self-employed agents in the developed countries is quite high) than with the self-employment of households in LDCs.

[25]This is typically the case taken in basic textbooks. In general, of course, we can have a positive effect, zero effect, or negative effect of an increase in one factor on demand for the other factor.

of an increase in one factor on the demand for the other factor. In our paper too we are concerned with the effect of an increase in employment on capital. However, our analysis is different from the above textbook story.

We make a distinction between wage employment and self employment. Similarly, we make a distinction between capital that is delegated through the financial system and capital that is used in owner-managed enterprises. There are two channels through which there will be effects of an increase in employment on capital demanded. First is the above mentioned textbook effect[26]. Second channel is as follows.

Let us assume that all agents have some endowment of labour and capital[27]. Those who are employed for a wage can not use their capital themselves. The reason is simple. They are occupied with their job and obviously do not have the time[28] to run an owner-managed firm in which they can use their own capital. So they invest their endowment in a firm or set of firms through the financial system. This implies that delegated capital increases with wage employment.

Observe that this effect is different from, what we have called, the textbook effect. There are three differences. First, in the textbook model, theoretically the effect of an increase in employment on capital can be positive, zero, or neg-

[26] We discussed this above in the context of amount of labour and amount of capital rather than in the context of proportion of the factors used in the two sectors, as is the case in the formal model in this paper. But the above textbook effect can be suitably modified in the context of proportion of factors used in the two sectors.

[27] For simplicity, in this paper we have assumed that all households have equal amounts of labour and capital.

[28] This is under the assumption that those who are employed have full time jobs.

ative. In our model, the effect of an increase in wage employment on delegated capital is positive. Second, in the textbook story, an increase in labour increases the marginal product of capital, and hence the demand for capital. This is, what we may call, a demand side story. In our paper, an increase in wage employment leads to an increase in the supply of capital through the financial system. This is, what we may call, supply side story. Note that this does not refer to total capital (which is given) but to capital delegated through the financial system. Third, the textbook effect is, what we may call, a microeconomic effect (this is subject matter of microeconomics in textbooks). In contrast, in our model, the effect of an increase in wage employment on delegated capital may be viewed as a macroeconomic[29] effect in a simple two sector aggregative model. Our model shows how we can determine the allocation of labour and capital between two sectors - the wage employment sector and the self-employment sector.

This paper has shown that there is positive correlation between wage employment and size of the financial system (as measured, for example, by the degree to which use of capital is delegated through the financial system). So clearly, a bad financial system implies low wage employment. Observe that this can happen even though there are no labour market imperfections. So the recent emphasis somewhat exclusively on making labour markets more flexible and on expansion of employment guarantee schemes is inadequate. To bring about improvement in employment, we need to take a holistic approach. In this

[29]The term macroeconomics can be used in two contexts - in the context of analyzing aggregative models and in the context of explaining underutilization. Here we are using the term macroeconomic in the former context.

context, there is a need to improve the financial system not just to improve the allocation of capital, but also to increase wage employment.

Another implication of the positive correlation between wage employment and size of the financial system is as follows. In an economy with low wage employment, we can increase the size of the financial system only up to a point. If the labour market is 'bad', then there are few jobs. Implication is high self-employment and use of capital in owner-managed enterprises, given that economic agents have both labour and capital. This means that little capital is delegated through the financial system. So if the labour market is 'bad', the size of the financial system can not be increased beyond a point.

Raghuram G. Rajan and other members of the Committee on Financial Sector reforms (Government of India, 2008) have discussed reforms in the financial sector. The broad objective of financial sector reforms is to improve the allocation of capital. The list of reforms in the report is quite comprehensive. However, it does not include labour sector reforms. This can reflect the view that we do not need labour reforms to bring about improvements in the allocation of capital. Our paper suggests otherwise. An increase in the size of the financial sector also requires an increase in wage employment, as our paper has shown. One reason why the allocation of capital is inefficient in practice in a less developed economy is that a large fraction of capital gets invested directly by households (typically with little expertise) instead of getting routed through a 'good' financial system. Why do people invest directly? One reason is that they do not have jobs. Typically in developed countries this may be taken to

imply that such people are unemployed. But typically in LDCs, this implies that they are self-employed. In other words, they operate their own enterprises. These are what we have been calling owner managed enterprises.

We have just discussed how wage employment can be a constraint on expanding the financial sector. The relationship holds the other way round too. In other words, it is possible that the financial system acts as a constraint on expanding wage employment. To see this, consider a (single agent) household with some endowment of labour and capital. Suppose such a household or agent has no access to a safe bank (or a safe financial market). This household has two alternatives. First, it can forget about taking a job (even where it is available), and instead work and invest in an owner-managed enterprise. Second, it can in an extreme case forget about its wealth (since there is no safe outlet by assumption), and just take up a job. If wages are very high and the amount of wealth is small, then this may well be worthwhile (think of labour that migrates for high wages abroad, and leaves its land holding vulnerable to encroachment). The second alternative may not be relevant for a large proportion of the people. They would more possibly be restricted to the first choice i.e. operate an owner-managed enterprise and get self-employed. This is a case in which the financial system acts as a constraint on wage employment.

Is this situation applicable to India? Possibly not to a great extent, with the spread of the banking system and post offices (which act like banks) in many parts of India. But in some parts of Africa, this may well be the case. Even in India, banks and post offices are accessible and safe up to a point only. Even

where they are accessible, they may not be very user friendly, particularly in the case of illiterate and 'backward' people. Even where they are safe, this safety is only in the context of nominal value of the principal amount. The real value can hardly be considered safe, given inflation. Interest rates on deposits have been administered for a long time and do not always adjust for inflation. The real rate of return on deposits has not been attractive (interest rates on savings accounts (and current accounts) are still administered and kept low).

Theoretically, in general, we may say that improvement in allocation of capital requires not only a good financial system, through which funds are routed to entrepreneurs, but also an increase in wage employment. Similarly, improvement in allocation of labour requires not only a flexible and possibly government supported labour market, but also an increase in the role of the financial system in the economy.

While the role of financial intermediation and that of labour reforms for economic development is well understood separately, the link between the labour market and the financial system is, as far as we know, missing. To see this, consider two factors of production viz., labour and capital. If there are imperfections in the capital markets and in the banking system, then capital is used up in, what we may call, owner-managed enterprises. This has an obvious corollary. On one hand, entrepreneurs, especially the potential entrepreneurs (those who would rely on banks) do not have access to capital, and so are not able to offer jobs. On the other hand, since there are few jobs, some members of the labour force who are non-entrepreneurs become self-employed and

use their capital themselves. So there is less financial intermediation and more self-employment than is optimal. One weakness reinforces another weakness. Therefore, there is a need for banking reforms for two purposes. First, as is obvious, this will improve the allocation of capital. Second, this will increase wage employment. Similarly, there is a need for labour reforms for two purposes. First, this will, as is obvious, improve allocation of labour. Second, this will increase the proportion of capital that is routed through the financial system.

There are two parts of the financial system - financial markets and financial intermediaries. A country like India has witnessed more improvements in the financial markets than in financial intermediaries. An important part of the financial intermediaries is the commercial banking system. This sector is stifled with many regulations, which are unwarranted from the view point of efficiency or stability. One possible reason why these regulations persist is that these help the government in financing its fiscal deficits. A high statutory liquidity ratio (and to some extent even a high cash reserve ratio) can be explained by the government's weak financial condition. The government uses banks to finance its fiscal deficits. Some of these unwarranted regulations can be removed if the government's fiscal condition is improved. Another reason for delay in banking reforms can be an old mind set. There seem to be apprehensions of banking crisis and misallocation of credit in the absence of active state intervention. While these are valid concerns, it is possible that they are exaggerated.

High self employment is inefficient if all those who are self-employed are not necessarily entrepreneurs. There is, however, another reason why high self em-

ployment needs to be discouraged. Self-employment goes along with investment of funds in owner-managed enterprise. If an agent does well, there is no problem. However, if an agent performs badly, there are low returns from both labour and capital. In contrast, under wage employment, if an agent loses a job, this by itself does not endanger the capital (which is delegated to entrepreneurs through the financial system). If an agent chooses a diversified portfolio, then the risk in returns on capital can be kept low. In case of self-employment and owner-managed enterprise, typically in case of ordinary households, there is hardly any diversification in use of funds (most funds need to be deployed in the enterprise, given difficulties of borrowing and the need to have some minimum amount of capital). Moreover, the returns to labour too are correlated with returns on capital. So an ordinary self-employed household is quite prone to risk. So self-employment is risky. This is an added problem to what we formally discussed in our paper. In our model, we abstracted from any uncertainty and focused on inefficiency due to the fact that agents who are not entrepreneurs become self-employed.

4 Conclusion

In this paper we demonstrate that an increase in the cost of financial intermediation may result in a shift of factors away from the (efficient) wage employment sector to the (inefficient) self-employment sector. This misallocation of resources

may possibly be as serious as the more familiar banking crises problem,[30] the problem of non-performing assets, or the moral hazard problem arising from deposit insurance.

We have argued that the small size of the wage employment sector in most LDCs can be linked to an apparently unrelated factor, viz. financial intermediation. In the literature, however, the small size of the wage employment sector is often attributed to labour laws which make employing labour in the formal sector relatively unattractive. In our model, there is no difficulty due to labour laws. Yet, wage employment is low. This is due to bad banking. From a policy perspective, our analysis suggests that apart from other considerations, governance in the banking sector needs to be improved to tackle the problem of low wage employment in less developed countries.

Ours is a static model. In particular, we have studied the allocation of a given amount of capital between owner-managed enterprises and firms. In a dynamic model that allows for savings and capital formation, the implications of our model for efficiency can be stronger. Not only is the current stock of capital inefficiently allocated, but the additions to capital stock also keep getting inefficiently allocated. This may explain why the size of the corporate sector in a country like India has grown considerably relative to the size of the 'unorganized sector' since independence.

Appendix

[30] This has received considerable attention following Diamond and Dybvig (1983).

Proof of Proposition 2. For expositional reasons, in what follows we do not explicitly write that $f(.)$, $f_L(.)$, $f_K(.)$, $f_{KK}(.)$, $f_{LL}(.)$ and $f_{LK}(.)$ are all functions of $L^b(\alpha)$ and $K^b(\alpha)$.

From (8) and (9), the following comparative statics result follows:

$$\frac{\partial L^b}{\partial \alpha} = \begin{cases} 0, & \text{if } \alpha \geq \hat{\alpha} \\ \frac{-p(f_L+f_K)}{(q+\alpha p)(f_{LL}+2f_{LK}+f_{KK})} > 0, & \text{if } \alpha < \hat{\alpha}. \end{cases} \tag{11}$$

From (10),

$$\frac{\partial x^b}{\partial \alpha} = \left[(q+p)(f_L+f_K) - s\right]\frac{\partial L^b}{\partial \alpha}, \tag{12}$$

after using $K^b = L^b$. Hence, from (11) and (12), we have

$$\frac{\partial x^b}{\partial \alpha} = \begin{cases} 0, & \text{if } \alpha \geq \hat{\alpha} \\ \frac{-[(q+p)(f_L+f_K)-s]p(f_L+f_K)}{(q+\alpha p)(f_{LL}+2f_{LK}+f_{KK})}, & \text{if } \alpha < \hat{\alpha}. \end{cases} \tag{13}$$

If $f(K,L) = (KL)^{\frac{1}{4}}$, then from (13), we get

$$\frac{\partial x^b}{\partial \alpha} = \frac{p(q+p)(L^b)^{\frac{1}{2}}}{q+\alpha p} - \frac{2sp}{q+\alpha p}L^b, \ \forall \alpha < \hat{\alpha}.$$

Next, using (8) and (9), we obtain

$$\frac{\partial x^b}{\partial \alpha} = \frac{p^2(1-\alpha)}{2s}, \ \forall \alpha < \hat{\alpha}.$$

This implies that $\frac{\partial^2 x^b}{\partial s \partial \alpha} < 0$, $\forall \alpha < \hat{\alpha}$. ■

References

Bernanke, B., 1983. Non-monetary Effects of the Financial Crisis in the Propagation of the Great Depression. American Economic Review 73, 257-276.

Blau, D.M., 1987. A Time Series Analysis of Self-Employment in the United States. Journal of Political Economy 95, 445-467.

Diamond, Douglas W., and Philip H. Dybvig, 1983. Bank Runs, Deposit Insurance and Liquidity. Journal of Political Economy 91, 401-19.

Government of India, 2008, A Hundred Small Steps - Report of the Committee on Financial Sector Reforms, Planning Commission, New Delhi.

Gupta, S.P., 2002. Report of the Special Group on Targeting Ten Million Employment Opportunities per Year Over the Tenth Plan Period, Planning Commission, Government of India.

Jensen, M.C., Meckling, W.H., 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. Journal of Financial Economics 3, 305-360.

Johnson, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2000. Tunneling. American Economic Review Papers and Proceedings 90, 22-27.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, 2002. Government Ownership of Banks. Journal of Finance LVII(1), 265-297.

Levine, R., Loayza, N., Beck, T., 2000. Financial Intermediary, Development and Economic Growth: Causality and Causes. Journal of Monetary Economics 46, 31-77.

Lewis, W.A., 1954. Economic Development With Unlimited Supply of labour. The Manchester School of Economic and Social Studies 22, 139-191.

Parker, Simon C., Yacine Belghitar, and Tim Barmby, 2005. Wage Uncertainty and the Labour Supply of Self-Employed Workers. The Economic Journal

115, C190 - C207.

Robson, Martin T., and Colin Wren, 1999. Marginal and Average Tax Rates and the Incentive for Self-Employment. Southern Economic Journal 65(4), 757-773.

Schumpeter, J.A., 1961. Capitalism, Socialism and Democracy. Ninth edition. George Allen & Unwin Ltd.

Straub, Stephane, 2005. Informal Sector: The Credit Market Channel. Journal of Development Economics, 78, 299-321.

World Bank, 2001. Finance for Growth - Policy Choices in a Volatile World. A World Bank Policy Research Report, A co-publication of the World Bank and Oxford University Press.

Yamada, Gustavo, 1996. Urban Informal Employment and Self-Employment in Developing Countries: Theory and Evidence. Economic Development and Cultural Change 44(2), 289-314.