WORKSHOP 1

Sustainable and Inclusive Economic Growth: Challenges, Models and Pathways

10h00-12h00

WORKSHOP 1: Sustainable and Inclusive Economic Growth: Challenges, Models and Pathways

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Vietnam Policies for Prosperous Growth: Is Rapid and Sustainable Growth Possible?

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Challenges and Measures for Improving Productivity: State Owned Enterprises versus Private Firms

MINH KHUONG VU

Associate Professor National University of Singapor

Technology, Digital Revolution and Grow

OLIVIER BRECHARD

General Manager, WebForce3, Former Executive Director, World Innovation Summit for Education

Empowering Vocational Education and Training for Future Challenges

ANH-TUAN DINH XUAN

Professor and Medical Practitioners Hospitals of Paris

Medicine in the Modern Era: Changing Paradigm and Vision to Face New Challenges Related to Pollution and Climate Changes

RAO R. BHAVANI

Director AMMACHI Labs, UNESCO Chair on Gender Equality and Women's Empowerment

Diversity and Inclusive Development: from Policy to Successful Practice

Productivity and Performance of State Owned Enreprises (SOE) in Vietnam: a Note

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Motivation

In this note

- We emphasize on the importance of the productivity for a small country as Vietnam in the context of globalization
- We show that the hidden overhead in the SOE is harmful for the performance of these enterprises
- The hidden overhead system generates also high prices.
- Finally, we present an attempt to find out the hidden overhead rate. Using data of the SOEs in 2013, 2014, we obtain the values of the overhead rates.

Productivity?

What is the productivity of a firm?

Consider a firm F which produces a quantity Y (output) of a good by using, to make simple, two inputs: the physical capital (machines) K, and labour L. Usually people use two types of indicators to characterize the performance of the firm. The first one is called capital productivity which is the ratio $\kappa = \frac{Y}{K}$. The second one is the ratio $\lambda = \frac{Y}{L}$. We interpret as follows: to produce Y we require κ machines and λ labour. These indicators make sense if the production technology is Leontieff: in this technology, one unit of output requires fixed proportions of inputs K and L. But the reality is not so simple. For some technologies, inputs are substitutable. Some of them are capital intensive (use more capital than labor) and some are labor intensive (use more labor and capital). Then it is difficult to compare the performances of two heterogeneous firms, one being capital intensive, the other one being labor intensive.

What is the productivity of a firm

There are other ways to measure the producitivity of firms.
Consider one firm, and call it firm F_1. We can estimate, by using its data about outputs it produces, capital and labor it uses, the two factors:

- Elasticity of capital: 1% of capital increase induces α% of output increase
- Elasticity of labour: 1% of labor increase induces β% of output increase

These parameters α, β measure really the productivity of the capital and labor.

What is the productivity of a firm

However it is not the end of the story. We can observe that in presence of two firms having the same parameters α, β, when we increase both inputs by 1%, the increases of the outputs of the two firms differ. Something is missing? That is the Total Factor Productivity (TFP) which is roughly speaking the level of technical progress incorporated in their production function. This TFP depends on the quality of their machines (old/new, using obsolete/ New technologies), on the skill of their workers, on their motivation to work. Actually the labor is $L = hN\theta$, where N is the number of workers, h is an indicator of their skill, θ is the working time..

Why is productivity important for a small country in the context of globalization

Consider a global two-period economy (periods 0 and 1) with two countries H, F.
Each country has a representative consumer and a representative firm.
Each country has at period 0 an endowment of consumption good $\omega_0^i, i = H, F$ and a initial capital $\bar{k}^i, i = H, F$.
We use the consumption good as numeraire. There is no production in period 0. In period 1 country H produces the consumption good with a Cobb-Douglas production function $A_H k^\alpha, 0 < \alpha < 1$, while country F produces the consumption good with a production function $A_F k^\alpha, 0 < \alpha < 1$.
The parameters A_H, A_F are the Total Factor Productivity (TFP) parameters of Country H and Country F while α is the elasticity of the capital in the production function.
Each country, at period 0, invests in physical capital $k^i, i = H, F$ and borrows or lends a quantity bonds $B^i, i = H, F$.

Why is productivity important for a small country in the context of globalization

Country H, in order to determine its investment and consumption solves the problem

$$\begin{aligned} & \max_{c_0^H \geq 0, c_1^H \geq 0} u(c_0^H, c_1^H) \\ \text{s.t.} \quad & c_0^H + qk^H + B^H = \omega_0^H + q\bar{k}^H \\ & c_1^H = A_H (k^H)^\alpha + B^H(1+r) \end{aligned}$$

Here, q is the price (in term of consumption good) of the physical capital and r is the real interest rate.
Similarly, Country F solves the problem

$$\begin{aligned} & \max_{c_0^F \geq 0, c_1^F \geq 0} u(c_0^F, c_1^F) \\ \text{s.t.} \quad & c_0^F + qk^F + B^F = \omega_0^F + q\bar{k}^F \\ & c_1^F = A_F (k^F)^\alpha + B^F(1+r) \end{aligned}$$

Why is productivity important for a small country in the context of globalization

In each country firms maximize their profits.
In country H:

$$\max_{k^H \geq 0} \{A_H k^H)^\alpha - q(1+r)k^H\}$$

And in country F:

$$\max_{k^F \geq 0} \{A_F k^F)^\alpha - q(1+r)k^F\}$$

We obtain the demands for capital of these firms:
for firm H

$$k^H = \left(\frac{\alpha}{q(1+r)}\right)^{\frac{1}{1-\alpha}} A_H{}^{\frac{1}{1-\alpha}} \tag{1}$$

and for firm F

$$k^F = \left(\frac{\alpha}{q(1+r)}\right)^{\frac{1}{1-\alpha}} A_F{}^{\frac{1}{1-\alpha}} \tag{2}$$

Why is productivity important for a small country in the context of globalization

At equilibrium we have

$$c_0^H + c_0^F = \omega_0^H + \omega_0^F$$
$$k^H + k^F = \bar{k}^H + \bar{k}^F$$
$$B^H + B^F = 0$$

Let $\bar{k} = \bar{k}^H + \bar{k}^F$. At equilibrium, using (1) and (2), we get

$$k^F = \frac{\bar{k}}{\left[1 + \frac{A_H^{\frac{1}{1-\alpha}}}{A_F^{\frac{1}{1-\alpha}}}\right]}$$

We see that if A_H is very small compared to A_F then k^F is almost equal to $\bar{k}$. In other words, in the context of globalization, a small country will produce nothing if its productivity is very small compared to the one of the rest of the world. All its capital stock moves abroad.

Labour Productivity, Capital Productivity and Economic Growth

How to have good Labour Productivity? Suppose the working time θ is fixed by the government. In this case, to have high TFP, the workers must be (i) well educated (hence the importance of appropriate teaching, of teachers of good quality, and also it is important to know the demands of types of workers from the firms to form students in adequacy with these demands), (ii) to involve the workers in the firms with adequate salaries.

What is the relationship with economic growth? What is the role of the capital?

The capital differs from the labor because it results from an accumulation process over time of investments. Physical investment of today will be added to the capital on hand to give the capital of tomorrow. This one will be used in the production process of tomorrow. If we devote expenditures to purchase new technology to incorporate in the investment (new capital), the final capital we get will be more efficient (than the one without investment in new technology), more productive. The problem turns out to find an optimal share between the purchases of machines with new technology, the expenditures for training, education,

Hidden Overhead

People complaint: SOE= lack of efficiency but backed up by public investment (40 %)
But: **Can we correctly measure their efficiency in presence of 'hidden' overhead ?**
Hidden Overhead and the Evaluation of the TFP of SOEs
Suppose a fraction $\sigma \in [0, 1)$ of the capital K is diverted. Firm will pay qK but uses $(1 - \sigma)K$.
The output will be $Y' = (1 - \sigma)^{\alpha} AK^{\alpha}$ while the output without overhead was $Y = AK^{\alpha}$.
The productivity of firm becomes $A(1 - \sigma)^{\alpha} < A$.
We say the firm is not efficient. But that is "unfair" because its true productivity still is A. In general, σ is unknown. Hence it is very difficult to measure correctly the productivity of the SOEs.

Hidden Overhead and Deficits of SOEs

The initial profit is $\pi = pAK^{\alpha} - qK$. Now, the profit becomes $\pi' = p(1-\sigma)^{\alpha}AK^{\alpha} - qK < \pi$. If firm wants to have the same profit as before it must increase the price p to $p' = \frac{p}{(1-\sigma)^{\alpha}} > p$. But if this SOE competes with private firms which propose lower prices p (because private firms have no overhead), the SOE must take the price p (if not, nobody will buy its output) and makes deficit in order to exist. In some sense, to make losses in the SOE is a consequence of the hidden overhead system.

Hidden Overhead and Prices

Suppose in the economy there are two kinds of firms, SOE and Private Firm. SOE has a production function $Y_s = A_s K^\alpha$, Private Firm: $Y_p = A_p K^\alpha$. Since we want to study the impact of their TFP on the economy, we suppose, for simplicity, that the two firms have the same elasticity of the capital in their production functions. We suppose the price of the capital q is fixed and SOE faces an overhead on the capital with a rate $\sigma \in [0, 1)$. These firms maximize their profits. We suppose the supply of the capital is elastic, i.e., unlimited. The demands for capital are as follows.

For SOE:

$$K_s(\sigma) = \left[\frac{p}{q}(A_s\alpha)(1-\sigma)^\alpha\right]^{\frac{1}{1-\alpha}}$$

For Private Firm where $\sigma = 0$:

$$K_s(0) = \left[\frac{p}{q}(A_p\alpha)\right]^{\frac{1}{1-\alpha}}$$

Hidden Overhead and Prices

Their output supplies are respectively:

$$Y_s(\sigma) = (1-\sigma)^{\frac{\alpha}{1-\alpha}} A_s^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{p}{q}\right)^{\frac{\alpha}{1-\alpha}}$$

$$Y_p(0) = A_p^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{p}{q}\right)^{\frac{\alpha}{1-\alpha}}$$

Suppose there exists a demand function $D(p)$ decreasing in p. At equilibrium we have:

$$(1-\sigma)^{\frac{\alpha}{1-\alpha}} A_s^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{p}{q}\right)^{\frac{\alpha}{1-\alpha}} + A_p^{\frac{1}{1-\alpha}} \alpha^{\frac{\alpha}{1-\alpha}} \left(\frac{p}{q}\right)^{\frac{\alpha}{1-\alpha}} = D(p)$$

It is very simple to prove that the equilibrium price p^* is an increasing function of σ.

Hidden Overhead and Prices

Roughly speaking, we are in presence of an economic system which generates high prices through the hidden ' overhead' ($\sigma > 0$).
How to lower themn? We can observe that by decreasing the price q, i.e. the nominal interest rate, we can have $p^*(\sigma) = p^*(0)$. This result is quite counter intuitive. Generally, one would say the government should increase the interest rate. Actually, the interest rate has been artificially augmented, for SOE, with σ. The invest cost passes from q to $\frac{q}{(1-\sigma)^\alpha} > q$. Hence, to bring the price p^* to its initial value we have to decrease q. That is also an indirect subsidy from the State.

An attempt to find out the hidden overhead rate σ

We assume the SOEs have a Cobb-Douglas production function $Y = F(K, L) = AK^{\alpha}L^{1-\alpha}, 0 < \alpha < 1$. The parameters A, α are the technology parameters of the function F.
We suppose there is a hidden overhead rate $\sigma \in [0, 1)$ for the capital they receive, i.e., they use $(1 - \sigma)K$ instead of K. However, if q is the real price of the capital, they must pay qK while they use only $(1 - \sigma)K$. Let L be the labour.
We assume at the beginning, the SOEs do not know the rate σ. To know their demand in capital and labor they maximize their profits

$$\max_{K,L}\{AK^{\alpha}L^{1-\alpha} - qK - wL\}$$

The FOC are:

$$A\alpha K^{\alpha-1}L^{1-\alpha} = q \quad (3)$$

$$A(1-\alpha)K^{\alpha}L^{-\alpha} = w \quad (4)$$

An attempt to find out the hidden overhead rate σ

From (4) we get

$$\frac{K}{L} = \left(\frac{w}{A(1-\alpha)}\right)^{\frac{1}{\alpha}} \tag{5}$$

But the SOEs discover that they actually get $K(1-\sigma)$ and will produce

$$\tilde{Y} = A\left[(1-\sigma)K\right]^{\alpha} L^{1-\alpha}$$

An attempt to find out the hidden overhead rate σ

We use the data of 2834 SOEs in Vietnam obtained from Enterprise Census 2014 conducted by the General Statistics Office of Vietnam. We obtain the data on K, L, w (the SOEs must declare they have received K). By running regression we obtain α and $\tilde{A}$ which equals $A(1-\sigma)^{\alpha}$. From (5) we obtain A (the parameter α cannot change because it is a characteristics of the production technology).
We compare with $\tilde{A}$ obtained by regression.
We the deduce σ by the formula

$$A(1-\sigma)^{\alpha} = \tilde{A}$$

We obtain $\sigma = 0.23$ for 2013 and 0.30 for 2014.

'Hidden' overhead is harmful

To summarize, the 'hidden' overhead consists in diverting part of the national saving and using it as personal income. More importantly, the rate of overhead is an 'unknown' parameter.
First, diverting the saving diminishes the resources for investment and training to improve the skill of workers.
Second, since the overhead is 'hidden' the investors will face unexpected costs and may have no incentive to invest. It is better to make transparent this overhead. The investors know in advance these costs and decide to invest if they think that is worthwhile to do that.
A parenthesis: the Vietnamese governement worries about the level of the external debt, 70% GDP. If the numbers of overhead rates we found are correct, around 17% GDP are diverted for the personal use of some individuals. And the Vietnamese population pays for this evasion.

Suggestions

Summing up, an agenda of research coud be as follows:

- Investigate the demands of firms for the types, the skills of workers
- Investigate the demands of firms for new technology
- Reform the education system in adequacy with the demands for labor of the firms, administrations, the production of new technology...
- How much the workers should be paid for each type of firms (using high/low technology)?
- Make transparent the overhead in order to correctly measure the productivities of the firms: is it possible?
- If the transparency of the overhead is a too sensitive problem, privatize all the State Owned Enterprises: but what will be the values of these firms?

Thank you!