Liberalization and Productivity Growth in Nepal: A case of FDI firm

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Abstract

This study investigates empirically what is TFP growth of FDI firms in Nepal in 1990 after economic liberalization process. We use econometric model based on Cobb Douglas production function and theoretical model of TFP growth accounting method. The econometric and non parametric TFP estimation provides negative TFP growth of FDI firms in Nepal. The result indicates negative effect of inferior labor (lower quality labor), under utilization of FDI capacity, no significant technology and financial transfer and poor business environment on TFP growth in FDI firms.

1. Introduction

Since 1990, Nepal has initiated economic reform as major economic policy paradigm and philosophy for addressing major economic issues: lower growth, resource constraint, livelihood issue and unemployment (NPC, 1992). Sector Liberalization (industry, agriculture and service sector) for private investment and FDI was major component of the economic reform through Industrial and Foreign Direct Investment (FDI) Policy of 1992(HMG, 1993). As component of industrial liberalization, fiscal reform was made through the introduction of Value Added Tax (VAT) for removing discriminatory policy behavior (MoF, 1995). Similarly, trade liberalization was followed from simplification of import and export tariff restriction (MoI, 1993). The premise of Industrial liberalization was attracting *inflow financial resource, transfer of technology and knowledge* for improving *industrial productivity, technological efficiency, market competitiveness and export trade*. Ex ante of the industrial liberalization has become an interesting question to be known how far the industrial liberalization has contributed on industrial productivity growth from the inflow of FDI firm. This paper deals on this issue.

The paper has main objective to estimate total factor productivity (TFP) growth of FDI firm from 1990 to 2004. In other words, the paper is to assess performance of FDI firm in Nepal for understanding as effect of Industrial liberalization. This is followed by theoretical and econometric models to TFP and utilization of resources (capital, labor and technology).

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2. Effect of Industrial Liberalization and Inflow of FDI

Industrial Liberalization is expected positive effect on the inflow of FDI in manufacturing sector. There are many reasons behind it: a) FDI gets comparative advantage of cheapest labor, b) FDI gets favorable fiscal provision and convertibility facility, c) there is no restriction on share equity in FDI firm, d) all economic sectors are liberalized for FDI except national importance sensitive, e) there is no restriction on nature of investment, f) there are various resource potential areas for investment, g) there is national priority on FDI, h) there is national committed for good business environment, i) there is no environmental rule and regulation, j) there is accessible big Indian market(NPC, 1997). In addition, there is an expected positive effect of FDI inflow in industrial productivity. There are the following reasons: a) industrial firm can easily access to new technology, knowledge, brand and investment, b) industrial firm will focus on improving competitive capacity under FDI's competitive pressure, c) they can explore new export market and access at lower transaction cost, d)industrial firm will improve scale of production for competition, e) industrial firm will think about industrial productivity and efficiency, f) cost of operation will be cheaper in the free flow of intermediate goods, capital and technology, g) industrial firm will get liberal good, labor and money market(NPC, 1997). The policy as such can contribute in Industrial sector by attracting FDI firm.

Theory of production explains that firm behaves profit maximization and cost minimization which may be indication of positive effect, if there is fair and competitive market. Otherwise, firm behaves like monopolist. In case of FDI firm, there are vast literatures indicating *profit and market driven* character. Some literatures argue FDI firm as manipulator poising industrial environment without corporate social responsibility(CSR) and tax eroding because FDI firm is large and powerful than the government. Bista(2005) examined effects of FDI in Nepal through case study method. His result was positive effect of FDI on employment, local development, CSR and economic growth, despite small inflow of FDI. The study had not dealt with FDI's effect on Industrial productivity. Dahal(2005) finds poverty linkage of FDI. Similarly, Rana and Pradhan(2005) suggested the requirement of FDI performance measurement. Thus, these few studies of FDI effect have not dealt on FDI productivity growth.

This study differs with them in the aspect of productivity. The study provides FDI performance from industrial productivity growth aspect. The analysis of FDI firm productivity is undertaken by using theoretical and econometric model using secondary data sources of FDI industry.

3. Total Factor Productivity and FDI Firm

3.1. Model

There are huge literatures (Ahuluwalia, 1991; Balkrishna and Pushpangadan, 1994; Goldar, 2002; Rao, 1996 and Trivedi, *et al* 2000) that estimates total factor productivity of industrial sector at different industrial or firm level through parametric and non parametric approach and econometric models. This study is similar with these literatures in total factor productivity growth aspect but is different in country and character of industry respect. This paper uses econometric model based on Cobb Douglas Production Model and theoretical Growth model based on Solow Growth.

3.1.1. Econometric Model

FDI firms invest two inputs capital (K) and transfer (A) in Nepal from their home countries, mean while they uses comparative advantage input labor of Nepal(L) for their outcome. These three inputs will affect on GDP. Cobb- Douglas production function can be expressed for FDI firms as

$$Y = A f (K^{\theta}, L^{1-\theta})\text{-----------------------}(1)$$

From Eq(1), taking log then,

$$\ln Y = \ln A + \theta \ln K + (1-\theta) \ln L + e\text{----}(2)$$

Making Linear equation (2)

$$Y^* = \alpha + \beta K^* + \beta_1 L^* + e\text{----------------}(3)$$

Where, α , β and β_1 are parameters which are $\alpha > 1$, $0 < \beta < 1$ and $0 < \beta_1 < 1$,
   $\alpha = \ln A$, $Y^* = \ln Y$, $\beta K^* = \theta \ln K$, $\beta_1 L^* = (1-\theta) \ln L$
   e= error term which is random variable.

3.1.2. Productivity Growth Accounting Method

Simple Production function of FDI firm is $Y = A f (K, L)\text{---------}(4)$

From differentiating equation (1), finally we get

$$\acute{A}/A = \acute{Y}/Y - (s_k \acute{K}/K + s_L \acute{L}/L) \text{---------}(5)$$

$\acute{A}/A$ refers to total factor productivity growth of FDI firm. From Solow growth perspective, it is measurement of total factor productivity growth.

3.2. Data Sources

This study used secondary data source of FDI manufacturing sector and Labor from News letter published by Ministry of Industry and Investment Department, Nepal Government and also of GDP from Economic Survey published by Ministry of Finance, Nepal Government. This time series data from 1990 to 2004 was used for the study. For supplementary secondary information, FNCCI and CNI websites were used. A recent year data source was unclear because of political instability cause. In order to minimize error, recent data was not included in the study.

3.3. Estimates

3.3.1.Estimates of Input Coefficient "θ"

Data set of econometric models includes three variables in which GDP(Y) is dependent variable and FDI (K) and labor (L) are independent variables. The relationship between GDP, FDI and Labor (number of people employed in FDI firm) was curiosity. In this study, we had focused two questions:

- What would FDI firm output contribute on GDP of the country?
- What would be input share (θ) of capital and ($1 - \theta$) of Labor in FDI firm?

We used time series aggregate data of GDP, FDI and labor. We quantitatively answer the first question from econometric model. From this model, we could interpret the estimated input share values of capital and labor for total factor productivity growth accounting of FDI firms.

3.3.2. Estimates of TFPG

Data set of theoretical model based on Solow Growth model includes three variables GDP(Y), FDI (K) and labor (L). Theoretical production function defines Y as dependent and K and L as independent. In the estimation of TFPG, there was modified these variables in

terms of growth of these variables, along with unknown productivity variable (A). In this study, we focused only one question:

- What would be unknown FDI productivity?

We used simple algebraic method to calculate it by using the estimated input shares. Thus, from simple calculation, we could interpret the answer of above productivity growth question of FDI firm.

3.4. Results

Table-1 presents mean and standard deviation of key variables in C-D econometric model estimation. In column 1, there are three key variables such as GDP(Y) as dependent variable and FDI (K) and Labor employed in FDI firms (L) as independent variables. Standard deviation of these variables from mean is no so far significant. Thus, mean of these variables represents properly times series data of GDP(Y), FDI (K) and Labor (L) collected from secondary source.

Table No-1:-Mean and Standard Deviations: C-D econometric model estimation

Variables	1992-2004
Real GDP(Y)	5.3858 (0.07360)
FDI(K)	3.1514 (0.25930)
Labor(L)	3.6449 (0.27008)

Table-2 provides the results of regression of dependent variable, GDP(Y) on two independent variables, FDI (K) and labor (L). There are two parameters: β and β_1. In the results of regression, parameter (β) represents marginal change of FDI (K), which explains how much increase of FDI is needed to change 1 percent GDP growth in industrial liberalization condition. Similarly, parameter (β_1) denotes marginal change of labor (L), which describes how much labor input is necessary to get 1 percent GDP growth.

Table No-2: Results of Regressions of Real GDP(Y), FDI (K), Labor (L)

Dependent variable: Average Real GDP(Y)			
Repressor	1	2	3
Constant	5.563(0.222)		
FDI(K)		0.176 (0.060)	
Labor(L)			-0.201 (0.057)

Table-3 reveals the results of TFP growth in FDI firms from 1992 to 2004. There is calculated TFP growth of FDI firms from GDP, FDI and Labor along with share of inputs in production behavior of FDI firms. In column 1, there is years and column 2 represents TFP growth in FDI firms per annum in percentage. If there is positive sign in TFP growth, it indicates occurrence of positive performance of FDI firms in national economy. Otherwise, it indicates occurrence of negative performance.

Table No-3: TFP growth in FDI firm, 1992-2004

Year	TFP Growth Rate(% per annum)
1992	-0.034
1993	-0.119
1994	0.021
1995	-0.293
1996	0.158
1997	-0.450
1998	0.019
1999	-0.114
2000	0.445
2001	-0.090

2002	-0.010
2003	-0.061
2004	-0.018

4. Discussion and Conclusion

Considering above results of log econometric model, they provide sufficient and necessary evidence on input share of FDI (K) and Labor (L) in FDI firm production. Estimation of input shares in FDI Firm in linear econometric model provides perfect substitutability but in log econometric model gives different input shares. In accordance with linear econometric model, FDI input share is 17.6 percent meanwhile labor input is 82.4 percent. However, log econometric model offers FDI input share is 17.6 percent meanwhile labor input is -21 percent. In general, the relationship between labor and output in production is positive but here is negative that indicates inferior labor (unskilled labor). In the result of regression, R^2 value is 0.58. It explains GDP (Y) only by 58 percent from independent variables: FDI (K) and Labor (L). It means 42 percent error term which include different unobserved variables such as instable business environment, policy instability, insecurity disturbance and capacity and quality of labor etc.

Above results of average TFP growth in FDI firms from 1992 to 2004 is -0.039 percent per annum. This TFP growth estimates explains negative growth in TFP in FDI firms per annum. Except 1994, 1996, 1998 and 2000, the TFP growth of remaining years from 1992 to 2004 is estimated negative growth. These exceptional years TFP growth are estimated positive but are less than one. For example: the estimated TFP growths in FDI firms are 0.021 percent in 1994, 0.158 percent in 1996, 0.019 percent in 1998 and 0.445 percent in 2000. It cannot be said satisfactory and encouraging positive growth in TFP in FDI firms.

These results raise questions: Why TFP growth in FDI firms from 1992 to 2004 was negative? Why TFP growth in FDI firms in the exceptional years (1994, 1996, 1998 and 2000) were negligible positive growth? Was there other reasons? If we talk industrial liberalization, there is a key policy gate to attract the inflow of FDI. The effect of industrial liberalization on FDI inflow was positive effect. In case of positive TFP growth 1994 and 1996, there might be reason of US quota facility for garment product. In 1996, Nepalese product access to Indian market was made by Indian flexibility. Its effect cannot be seen in 1998 and 2000. There was reason of instable and volatility business environment due to the growth of conflict trap (insecurity risk) and political instability. In that situation, FDI firms could not behave normally as required for production behavior and decision and for smooth trade flow inside and outside the country because of growing risk aversion cost and transaction cost. Otherwise, cheapest labor of Nepalese might be a cause because they had lower capacity in

terms of skill and knowledge meanwhile small size of FDI and technological transfer might be causes. We conclude that TFP growth in FDI firms is unexpectedly unsatisfactory not only for GDP growth but also for FDI firm's performance in terms output but also utilization inputs share contributions such as FDI, technology and labor. Its negative effect falls on Industrial growth of Nepal and then GDP growth.

5. Reference

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