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Abstract

Economic Reforms towards economic liberalization and privatization is a good prescription to attract FDI in productive sectors. In 1990, Nepal liberalized her economy to create investment environment and destination of FDI by minimizing structural and institutional barriers and constraints for promoting TFP of productive sectors. This study investigates empirically what is TFP growth of FDI 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 mostly positive TFP growth of FDI firms in Nepal. Few cases were influenced by political and security disturbances. Almost positive TFP growths have increasing productivity but there are still lower than expectation. There are still problems of massive inferior labor, no significant technological and financial transfer and poor business environment. Issues of continuity and stability between two periods indicate unpredictable situation of productivity.

Key Words: FDI, TFP growth, economic reform, liberalization, etc.

1. Introduction

Economic Reform to Nepal was as per a strong prescription of World Bank and IMF in 1992 (Bista, 2004, Bista, 2005a, Bista, 2005b, Bista, 2005c, Bista, 2009, Bista, 2008, Bista, 2011, Bista, 2011a, Bista, 2011b & Bista, 2016). Nepal initiated it as a key economic policy trust responding key macroeconomic issues: poverty, unemployment and lower economic growth rate, along with following the people's

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aspiration and desires of big shock and development miracle (NPC, 1992). Foreign Direct Investment and Technological Transfer Policy (1992) opened all sectors (industry, agriculture and service sector) for private investment(PI) and FDI, along with the FDI friendly sector policies related to industry, agriculture, service, tourism and trade(Bista, 2004, Bista, 2005a, Bista, 2005b, Bista, 2005c, Bista, 2009, Bista, 2008, Bista, 2011, Bista, 2011a, Bista, 2011b & Bista, 2016 & HMG, 1993). As supplementary and complimentary to economic reform, the government reformed fiscal and monetary measures, policies and institutions towards transparent, simple, scientific and accountable fiscal and monetary measures to minimize barriers and constraints. Its examples are the introduction of Value Added Tax (VAT) and computerization system, processes, information and databases Bista, 2008, Bista, 2011, Bista, 2016 & MoF, 1995) and the simplification of import and export higher tariff rates and of administrative procedural barriers (MoI, 1993).

The expectations of economic reforms was to attract FDI and PI, to accelerate the transfer of technology and knowledge and to promote fair and competitive financial and product market, import substitution and export promoting industries, technological productivity and efficiency, massive employment generation and the growth of industrial production and productivity (Bista, 2004, Bista, 2005a, Bista, 2005b, Bista, 2005c, Bista, 2009, Bista, 2008, Bista, 2011, Bista, 2011a, Bista, 2011b. & MoI, 1996). MoF (2018) shows its effectiveness in terms of FDI inflow at some extent on the comparative advantage areas, primarily on hydropower, manufacturing sectors, tourism sectors, service sectors etc. Still, FDI inflow size in Nepal is less than South Asian FDI inflow size in average. However, Bista(2004), Bista (2005a), Bista(2005b), Bista,(2005c) Bista (2017) and Bista (2018) have indicated their immediate positive impacts on employment generation, export growth, revenue generation and corporate social responsibility. In addition, there have been the expected positive impacts on Firm's total factor productivity (FTFP). The issue of FTFP is a key expected issue dealt in this paper.

The broad objective of this paper is to analyze the performance of FDI firms in Nepal by measuring total factor productivity (TFP) growth of FDI firms from 1990 to 2018. This study employs Solow Growth model based econometric models to estimate TFP of FDI firms by using three factors (capital, labor and technology).

2. LITERATURE REVIEW

Nepal has a big expectation in the ex-ante economic reform to attract FDI in industrial sectors and its positive spillover effects on the growth of industrialization and export trade growth. Bista (2005) provided reasons behind it: a) Nepalese cheap labor has a higher comparative advantage, b) water resources and natural beauties are unique higher comparative advantage, c) Favorable and competitive special fiscal and monetary packages are available to FDI, d) FDI has not restriction on share equity and nature of investment, e) FDI is open to all economic sectors, except national sensitive areas(security and media), f) Nepalese policy gives top priority on FDI, and g) there is accessible to Chinese and Indian Market(NPC, 1997 and MoF, 1998). Further, Bista (2005), Bista(2009) & Bista(2017) has expected positive impact of FDI on TFP of Firm with the following reasons: a) Nepal opens new technology, brand, investment and knowledge to FDI firms, b) firms are free to improve the scale of competitiveness, c) firms can explore international market for export promotion, d) the lower transaction cost is supplement, e) market is liberal for fair competition and f) all markets are liberal(NPC, 1997). Therefore, the economic reform can contribute to attract FDI and to improve TFP of FDI firm.

A large literature mentions simply FDI firm profit and market driven. However, Regmi (2004) claims foreign capital as an important investment in the GDP growth of Nepal because Poudyal (1987) stresses a high investment ratio as an important determinant of economic growth likes as the classical theories of growth. Further, he contends empirically tested the relationship between investment and growth in the Harrod-Domar Growth Model. Bista (2004) trials empirically the relationship between FDI and real GDP in which he found positive relationship in Nepal, despite small size of FDI, like as De Mello(1991), Balasubramanyam, Salisu and Spasford (1996) and Majagya(2003) and Furthermore, Bista (2005) explored FDI as nominal contributor to GDP and then local economy.

FDI firm carries investment multiplier to accelerate the industrialization process and propels industrial growth induced economic growth. Hymer (1976) elucidate FDI firm as vehicle to transfer capital, management and new technology having positive effects on production and productivity. Differently, IMF explains it as acquisition of substantial ownership in the firm in a foreign country. Therefore, such categorical FDI firm has been roaming comparative advantage and profitable locations in the world. Nunnenkamp (2002) explicates FDI firm as multinational enterprises increasingly considering these host countries having profitable investment locations.

Chakrabarti (2003) illustrates FDI inflow depending primarily on the size of market and a country's openness to trade. Bista (2004) explores FDI in Nepal for Indian giant markets along with domestic market. Bista (2005) indicate FDI inflow depending on the country's liberalization and fiscal benefit schemes. These handful empirical literatures specify liberal policy, fiscal benefit package, cheap labor and big market in Nepal as major determinants of FDI.

Another school of literatures claim FDI firms having hidden interest and agenda of tax evasion and no corporate social responsibility making least cost for super normal profit making 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 at some extents, 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. Bista (2005) has dealt this issue but its database was only from 1990 to 2004. There is a sufficient scope to be dealt on this issue. This study will be relevant in the aspect of TFP of FDI firm. The study covers time series database of FDI firms from 1992 to 2018.

3. MODEL

The model relates to Solow Growth model related to total factor productivity growth accounting based on technology, labor and capital. At the firm level, Ahuluwalia, 1991; Balkrishna and Pushpangadan, 1994; Goldar, 2002; Rao, 1996, Trivedi, *et al* 2000 and Bista, 2005 have applied this theoretical model to account TFP of industrial sector at the firm level through parametric and non-parametric approach and econometric models. It is not different with above these studies but different is only country, database and characteristics of FDI firms. This paper employs the econometric model based on Solow Growth model.

3.1. Econometric Model

Let us suppose FDI firms investing two inputs capital (K) and technology transfer (A) in Nepal from their home countries, mean while they assume labor input as comparative advantage and employ labor of Nepal (L) as input in their production and outcomes. The expectation is their valuable productive contributions on GDP.

Let us present such relationship in Cobb- Douglas production function for such FDI firms as

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

From Eq(1), taking log then,

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

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 $0<\beta_1<1$,

$\alpha = \text{In} A$, $Y^{*} = \text{In } Y$, $\beta K^{*} = \theta \text{ In } K$, $\beta_1 L^{*} = (1-\theta) \text{ In } L$

e= error term which is random variable.

3.2. Productivity Growth Accounting Method

Let us suppose the simple Production function of FDI firm is $Y = A\, f(K, L)$---------(4)

From differentiating equation (1), finally we get

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

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

4. DATA AND METHODOLOGY

This section illustrates data and methodology employed in this study. Under analytical cum empirical research design, this study was quantitative nature. In this quantitative nature, time series data was secondary nature. The time series data of FDI, Real GDP and Labor from 1992 to 2018 was 16 years long. There were FDI and labor data sets collected from Department of Industry, Nepal Government and GDP from Economic Survey, Ministry of Finance, Nepal Government. Their validity and reliability were tested by using Federation of Nepal Chamber Commerce of Industry, (FNCCI), Confederation of Nepalese Industry (CNI) and Nepal Rastriya Bank (NRB) websites as supplementary sources of FDI, real GDP and Labor.

The study employed excel sheet to insert all databases of FDI, Labor and real GDP for exporting SPSS. In the excel sheet, the study estimated Total Factor Productivity by using above Total Factor Productivity Accounting Method. In the SPSS, the study run simple regression to estimate coefficient mentioned below.

4.1. Estimates

4.1.1. 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- θ) 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.

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

5. EMPIRICAL ANALYSIS

This section presents empirical results, analysis and discussion into two heads: results and discussion below.

5.1. 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	1992-2018
Real GDP(Y)	5.38(1.28)
FDI(K)	3.40(0.96)
Labor(L)	3.12(0.75)

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)			
Regressor	1	2	3
Constant	0.24(0.32)		
FDI(K)		0.27 (0.12)	
Labor(L)			1.34 (0.16)

Table-3 reveals the results of TFP growth in FDI firms from 1992 to 2018. 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, 1992-2018

Year	TFP Growth Rate(% per annum)
1992	3.12
1993	7.20
1994	3.25
1995	-9.12
1996	2.19
1997	1.34
1998	-1.25
1999	5.71
2000	0.42
2001	0.11
2002	3.33
2003	4.19
2004	-0.25
2005	-0.94
2006	3.06
2007	-95.21
2008	3.57
2009	3.52
2010	3.19
2011	-4.86
2012	3.61
2013	5.11
2014	-92.82

2015	16.88
2016	12.83
2017	3.12
2018	7.20

Histogram

Dependent Variable: LnGDP

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: LnGDP
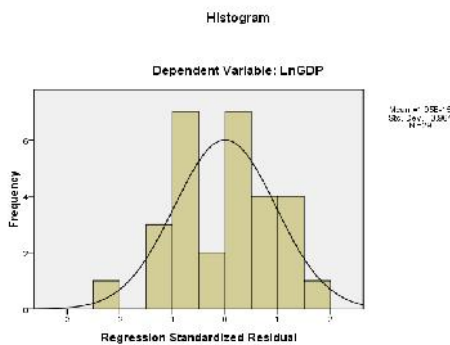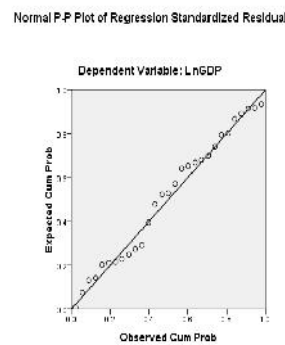
5.2. Discussion

The estimated results of log econometric model offer strong evidence on input share of FDI (K) and Labor (L) in the production function of the FDI firm. In linear econometric model, the estimation of input shares in FDI firm explicates perfect substitutability. The estimates of log econometric model differ with the estimation of the linear econometric model. Its evidence is 17.6 percent FDI input share and 82.4 percent labor input share in the linear econometric model meanwhile 27 percent FDI input share and 134 percent labor input share in the log econometric model. The model shows positive relationship between labor and output in production. In the result of regression, R^2 value is 0.91. It explains GDP (Y) only by 91 percent from independent variables: FDI (K) and Labor (L). It means 9 percent error term, which may be different unobserved variables such as weak doing business environment, policy fluctuation and inconsistency, insecurity turbulence and skill and knowledge of labor etc.

Above results of average TFP growth in FDI firms from 1992 to 2018 is -4.87 percent per annum but if we include FDI firms from 1991 to 2018, its average was 25.5 percent. This estimated TFP growth shows positive signed growth of TFP in FDI firms per annum. Except 1995, 1998, 2004, 2005, 2007, 2011 and 2014, the TFP

growth of remaining years from 1991 to 2018 is estimated positive signed growth greater than one.

In the starting year of new democratic government, TFP growth in 1992 is estimated 3.12. In 1995, the Maoist insurgents started the people's movement having negative implication on TFP that is -9.12. Similarly, expanding the people's war in 1998 has -1.25 TFP. In 2004 and 2005, Maoist aggression period made -0.24 and -0.25 TFPs respectively. Then after, Maoist and Seven Parties alliance movement in 2007 is -95.27 percent TFP. The period from 2011 to 2014, political instability, ethnic movements, earthquake and economic blockade has -4.86 and -92.82 TFP respectively.

In the remaining years, the estimated TFP growths are positive but are greater than one. In 1992, TFP growth was 3.42 percent. It indicates the positive impact of the economic reform on Nepalese economy because of the higher growth of private and FDI investment on different economic sectors. It was continuous to successive two years 1993 and 1994 with 7.20 and 3.25 TFG respectively. Then after, the swing of TFP growth was -9.12 in 1995. Interestingly, the successive years 1996 and 1997 had slightly positive 2.19 and 1.34 TFG respectively. When the people's war was intense, TFG was -1.25 in 1998. In the remaining years, there are positive TFPs and greater than one. In the years of 1999, 2000, 2001, 2002 and 2003 there are slightly increments with 5.71, 0.42, 0.11, 3.33 and 4.19 TFPs till 2003. After 2003, TFPs had -0.25 TFG in 2004 and -0.94 TFG in 2005. In 2006, TFP was 3.06. In 2007, it was -95.21. Its trend was positive and better for later four years till 2010. In 2011 and 2016, its result was negative. Currently, TFP of FDI has been positive since 2017.

These results raise questions: why is TFP growth in FDI firms from 1992 to 2018 positive but fluctuation, except few cases? Why is negative TFP growth in FDI firms in these exceptional years (1995, 1998, 2004, 2005, 2007, 2011 and 2014)? Was there other reasons?

Theoretically and empirically, FDI inflow is determined by degree of liberalization, comparative benefits (resources, market and labor), and investment friendly business environment. In Nepal, the economic reform in 1992 had contributed to create investment friendly business environment. Despite small market, FDI firms had seen prospects of comparative benefits from cheap labor. In the subsequent years, such initiation could not be observed. Then after, investment friendly business environment and policy environment was eroded. Growing risk of investment to FDI firms was observed. The growth of non-economic and invisible variables cost was also found. In addition, Nepalese labor was only cheap but unskilled, unorganized and unprofessional. Comparative benefit became critical.

When we talk about negative TFPs, there were affected by transitional and instable politics and conflict disturbed investment friendly and business environment. In that condition, the operated 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. In addition, the comparative benefit signals of the operated FDIs to potential FDIs was not good to motivate and encourage to come in Nepal. Political instability, poor, and weak political will power of the government and party induced Industrial policy instability and reliability, along with exogenous variable's intensity were demotivation factor to FDI and private sector. In addition, policy behavior and faith of the political actors was shifting towards socialism instead of globalization, privatization and liberalization. Its negative factor was discouraging to FDI and private sector to invest further.

6. CONCLUSION

Total Factor Productivity Growth is an important measurement to measure FDI firm's productivity as measurement of FDI firm's effectiveness and value addition in Nepalese economy. Based on TFP growth and performance, FDI firm could be observed, along with investment environment and the effectiveness of FDI policy. Later, its contribution and linkage with economic growth rate of the economy.

Above results is evidence of positive TFP growth, except few negatives. Based on positive TFP growth results, we conclude that TFP growth in FDI firms is unexpectedly satisfactory 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 positive effect falls on Industrial growth of Nepal and then GDP growth, except few cases.

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