LIBERALISATION AND PRODUCTIVITY GROWTH: EXPERIENCE OF NEPALESE MANUFACTURING¹

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ABSTRACT Over the past two decades, there has been a move towards outwardorientation in developing countries. Although it is argued than an outward-oriented strategy improves efficiency through competition, large scale production and efficient utilisation of resources, doubts that liberalisation would not solve the problems of least developed countries (LDCs) remain strong. In this paper we shed light on this debate by examining the case of Nepalese manufacturing which has experienced liberalisation reforms since the mid 1980s. We observed an absolute fall in productivity in both the pre-and post-liberalisation periods, indicating that liberalisation reforms alone do not guarantee higher productivity in a LDC like Nepal, probably due to the shortage of skilled labour and poor physical infrastructure.

1. INTRODUCTION

Over the past two decades, there has been a shift in trade and industrial strategies in developing countries away from the import substitution (IS) policy towards an open and liberal regime. This move towards an outward-oriented regime was the direct outcome of the research undertaken under the auspicious of the Organisation for Economic Co-operation and Development (OECD), National Bureau of Economic research (NBER) and the World Bank². These studies have demonstrated poor macroeconomic performance and lower efficiency under the IS policy because of the bias against exports, inefficient utilisation of resources and rent seeking activities which has forced policy makers and planners to re-examine the incentive structure away from the IS strategy towards an export-oriented and liberal strategy.

It is often argued that an outward-oriented strategy promotes competition and encourages resource allocation in line with the nation's comparative advantages, leading to higher productivity performance. However, doubts that outwardorientation may not lead to higher productivity growth in LDCs remain strong due mainly to the shortage of skilled labour, and the lack of efficient institutions and adequate physical infrastructure (Mosley, 1993; Rodrik 1992a, 1992b). At the

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These studies have been published as Little *et. al* (1970), Bhagwati (1978) and Krueger (1978). Following these most influential studies, a large number of studies have been undertaken in recent years by individual researchers and the international organisations like the World Bank and IMF.

same time empirical findings of the studies examining the link between liberalisation and productivity growth are ambiguous (Bhagwati, 1988; Pack, 1988).

In this paper we shed light on this debate by examining the case of Nepalese manufacturing. As in many other developing countries, in Nepal the main purposes of liberalisation reforms were to arrest deteriorating macroeconomic condition and improve efficiency. Liberalisation package included a substantial cut in tariffs and removal of quantitative restrictions (QRs), liberalisation in investment policy, a real devaluation of the Nepalese currency and privatisation of state-owned enterprises (SOEs). Manufacturing output and exports responded positively to these reforms. The share of manufacturing output in GDP rose from about 5 per cent during 1980/81-1985/86 to over 7 per cent during 1986/87-1993/94. In the same period the share of manufactured exports in total exports increased from 36 per cent to 75 per cent. The central focus of this paper is not to outline these achievements of the liberalisation program but to investigate the impact on manufacturing productivity growth.

The paper is organised as follows. Section 2 briefly outlines policy regime in the past and recent reforms. In this section we estimate and present the level of protection and the real effective exchange rate (REER) index to see the nature of the policy regime. In Section 3, methodological issues in total factor productivity (TFP) growth estimates are discussed. In this section we also discuss database used for TFP growth estimates as productivity growth estimates are sensitive to the use of deflator and the quality of data. Productivity growth estimates are presented in Section 4. The paper concludes with concluding remarks in Section 5.

2. TRADE AND INDUSTRIAL STRATEGIES: PAST AND PRESENT

Nepal pursued the IS policy with the advent of the first development plan in 1956. The main objectives of the IS policy were to achieve self-sufficiency, reduce reliance on imports and improve current account position. To achieve these goals imports were controlled, industrial investments were regulated through a licensing system and the domestic currency was overvalued. By the mid 1980s, none of the objectives of the IS policy were achieved. In fact, IS policy produced a huge current account deficit because of the overvalued currency which encouraged imports and discouraged exports. The current account deficit increased from less than 1 per cent of GDP by the mid 1970s to 4 per cent of GDP by the mid 1980s. Manufacturing capacity was largely unutilised (about 23 per cent) due mainly to the small size of domestic market and the shortages of imported intermediate inputs caused by a fall in foreign exchange reserve. Meanwhile the government's budget deficit rapidly expanded (about 7 percent of GDP by the mid 1980s).

Against these backgrounds, the liberalisation programs was introduced in the mid 1980s. Since then there has been a substantial fall in tariffs and QRs, and investment policy has been substantially liberalised. A large number of SOEs have been privatised and a real devaluation of the Nepalese currency has taken place.

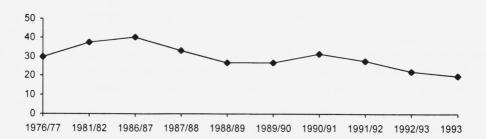


Figure 1. Trade Weighted Nominal Protection³



Rationalisation of import tariffs has contributed to a fall in trade weighted nominal rate of protection (NRP) from about 40 per cent by the mid 1980s to about 20 per cent by 1993/94.

In the process of streamlining export-import formalities, the deposit requirement for opening letter of credit was withdrawn, while the requirements to obtain approval for the exports of jewellery and some handicrafts were waived. Since the late 1980s, cash subsidies ranging between 10 to 35 per cent of fob value have been offered to a range of export items (namely, jute and jute products, lentils and leather and leather products), while carpets and readymade garments enjoy benefits under the generalised system of preferences (GSP) scheme.

Furthermore, requirement to secure a license for the establishment, expansion and modernisation of industries was eliminated from the early 1990s, with the exception of a few related with defence, public health and the environment. Effective from the early 1996, foreign investment below US\$ 300,000 does not need a license, while 'one window' sanctioning procedure has been introduced for facilitating foreign investment. A large number of SOEs have been privatised or liquidated, especially those which were burden on the government.

The real effective exchange rate (REER) index⁴ presented in Figure 2 indicates

$REER = \sum_{i} (RER - index)_{i} (W_{i})$

Where, RER-index refers to the Nominal Exchange Rate adjusted for price changes at home and in the major trading partners and divided by the base year exchange rate. W_i refers to trade weights of major trading partners which is sum to 1.

³ According to the Indo-Nepal trade agreements, imports from India are subject to a lower level of restrictions. Thus, they attract basic tariffs only, while imports from the rest of the world are taxed using the basic plus additional tariff. Thus, using the trade share of India and the rest of the world, we obtain a single trade weighted NRP.

⁴ REER index is calculated using the following formula:

some improvements in international competitiveness from the mid-1980s helped by the real devaluation of the Nepalese currency. Higher REER until the mid-1980s was due mainly to a rise in domestic price faster than the major trading partners and the appreciation of domestic currency under the IS regime.

Effective from February 1993, the Nepalese currency was made fully convertible for all current account transactions, and the commercial banks and financial institutions were given more freedom in their operations. In this paper we investigate the effects of these reforms on manufacturing productivity growth.

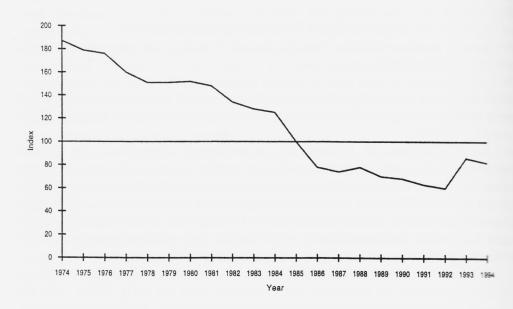


Figure 2. REER Index: 1974-94 (1985=100)

Note: An increase (decrease) in REER index implies appreciation (depreciation) of domestic currency in real terms.

Source: Estimated from data obtained from the IMF, 1993 and 1994.

Note that selection of currencies is based on the multilateral trade weights using 1985 trade figures. However, if trade weights have changed significantly, which is unlikely, than this could affect our REER index. The following currencies are included in the REER estimates: Indian rupees, Japanese yen, US dollar, German mark, British pound and Singapore dollar.

3. METHODOLOGICAL ISSUES IN TFP GROWTH ESTIMATE AND DATABASE

3.1 Methodology

Total factor productivity growth is defined as output growth minus weighted average inputs growth, where the weights are the value shares of each input. Thus, it captures not only technical efficiency but also improvements in capacity utilisation, better management practices, improvements in the work place environment, training and learning by doing. Although it is a common practice to estimate TFP growth either in value added terms or in gross output terms, we chose the latter approach in which intermediate inputs are treated as a separate factor of production. This is important because Nepal, like many LDCs, relies extensively on imported intermediate inputs whose availability (or scarcity) substantially influences capacity utilisation and hence productivity growth. During the restrictive trade and payment regime, imports of intermediate inputs were regulated through a licensing system. Often firms were not allowed to import as per their requirements, leading to a lower level of output and poor capacity utilisation. Thus, TFP growth estimates based on gross output terms seems more appropriate in the Nepalese context.

To estimate TFP growth, a production function for each manufacturing industry specified in which output is the function of labour (L), capital (K) and intermediate inputs (M) and time (Gollop and Jorgenson, 1980). TFP growth is defined using the Tornquist index number formula, with:

$$V \stackrel{i}{T} = \{ In Y_i(T) - In Y_i(T-1) \} - \{ V \stackrel{i}{L} [In L_i(T) - In L_i(T-1)] + V \stackrel{i}{K} [In K_i(T) - In K_i(T-1)] + V \stackrel{i}{M} [In M_i(T) - In M_i(T-1)] \}$$
(1)
(i = 1,2......n)

mhere:

T = total factor productivity growth in *i* th industry

 $\mathbb{I} = \text{total output in } i \text{ th industry}$

L =total labour input in *i* th industry

 \mathbb{K} = total capital input in *i* th industry

M = total intermediate inputs in *i* th industry

T = time

VL =average value share of labour in *i* th industry

VM = average value share of intermediate inputs in *i* th industry

VK = average value share of capital in *i* th industry

n = number of subsectors

The above estimation procedure assumes constant returns to scale and competitive equilibrium⁵

3.3 Database

The main sources of data are the Manufacturing Census and the Annual Survey of Manufacturing Establishments conducted by the Central Bureau of Statistics (CBS). These Censuses and Surveys cover establishments employing ten or more people and report data on the value of production, number of people employed intermediate inputs used, stock of fixed capital, depreciation and the wage bill. We made, however, some adjustments to the database. First, the Manufacturing Census of 1972/73, 1976/77 and 1981/82 present data according to the Principal Economic Activity (PEA). They were converted to the four digit Nepal Standard Industria Classification (NSIC) for consistency reasons, because from 1986/87 onwards manufacturing data are available according to the NSIC classification at the four digit. Second, the 1986/87 census data which are reported in ratio and percentage terms were converted to nominal values.

The manufacturing price index was derived from the national consumer price index (CPI), as the more appropriate wholesale price index (WPI) is not available in Nepal nor can be constructed due to unavailability of data. The available CPI and aggregate GDP delator are not suitable deflators, because the former does not show price movements in intermediate inputs and capital goods, while the latter includes price movements in the non-tradeable sector as well. Thus, manufacturing price index, derived from the traded good sub-indices of the CPI, is used as a deflator.

The output of each four digit sector was deflated by the relevant price index and then the output growth rate was estimated. Output data includes: the total value of shipments (sale of products), receipts from industrial and other services.

⁵ Although our methodology imposes the constant returns to scale assumption, it would have little bias in our estimates. This is due to the fact that labour intensive technologies are widely used in a LDC like Nepal where returns to scale appear to be constant. Therefore, we can expect little, if any, linearity bias in our estimates due to imposition of this assumption. Using data from Indian manufacturing Ahluwalia (1991) has shown that the Translog production function which imposes constant returns to scale performs better than the other alternative specifications of production function in estimating total factor productivity growth.

and the change in the value of stock of finished goods. The values of intermediate inputs were deflated using the 'overall manufacturing price index' and growth rate was then estimated. The rationale for using the 'overall manufacturing price index' instead of the sector specific price is based on the fact that intermediate inputs in any industry come from the different sub-sectors. Intermediate inputs data include: cost of raw materials, utilities, industrial and other services, and the change in the value of input inventories⁶.

Labour input is measured in terms of the number of workers who work in the establishment and receive payment in cash or in kind. The ideal measure of labour input is hours worked by each category of labourers, their sex, age and education level rather than number of workers because hours worked by a worker could vary from industry to industry. Furthermore, the labour input growth rate should be obtained by aggregating the weighted continuous growth rates of labourers of different quality using the wage bill for each category as weights. However, as labour input data are not available in such a disaggregated form, we chose to use the total number of paid workers as a proxy for labour input and the growth in labour input is calculated on this basis. It should be mentioned, however, that our measurement of labour input might suffer from errors of aggregation from two sources: (i) it assumes that different kinds of labour work the same number of hours a day, and (ii) it combines different categories of labour into one category. If the skill composition has changed over time then our measurement of labour input prowth rate will be biased.

There is no universal method of estimating capital stock. Capital stock data used in this study represents the end of year capital stock and includes: land, building and structure, machinery and equipment, vehicles as well as furniture and fixture. Capital stock is deflated using the 'overall manufacturing price index'. The value shares (weights) of each factor input was obtained as follows: the weight of intermediate inputs was computed by dividing the value of intermediate inputs by the value of output. The weight of labour input was obtained by dividing expenditure on labour (i.e., wages and salaries) by the value of output. Wages and salaries data included all payments in the form of wages and salaries, employers' contribution to social security, pension and other welfare expenses. Wages and salaries were deflated by the CPI. The weight of capital input was defined as one minus the weights of intermediate inputs and labour input.

PRODUCTIVITY PERFORMANCE IN THE PRE- AND POST-REFORM PERIODS

For the comparison of total factor productivity growth in the pre- and postberalisation periods we use the initial and terminal year observations. Our choice

In the absence of disaggregated intermediate inputs data according to their sourcesdomestic vs imported- we are unable to determine which intermediate inputs contributed the most to TFP growth.

	Reform reformance		
	TFP Growth in Pre- Reform Period (%)	TFPGgrowth in Post- Reform Period (%)	Improvement (+) or Falls-) in TFP Growth
Dairy Products	2.2	0.5	· · · · · · · · · · · · · · · · · · ·
Canning and preserving Fruits	-24.1	7.0	+
Vegetable Fats	-2.9	7.5	+
Grain Mill Products	-1.1	2.7	+
Bakery Products	-0.5	1.6	+
Sugar	0.1	-0.2	
Cocoa & Confectionary	2.2	-1.4	
Mfg. of Food Products, nec	5.5	5.4	•
Animal feeds	-3.6	-1.6	+
Distilleries	0.3	4.9	+
Beer	na	2.3	na
Soft Drinks	na	-3.9	na
Bidi Manufacturing	-0.8	0.3	+
Cigarette Manufacturing	na	0.6	na
Tobacco Manufacturing	na	-3.0	na
Spinning, Weaving and Textile	1.1	-0.1	
Non-wearing Textile	na	-1.5	na
Knitting Mills	-0.1	3.8	+
Carpet and Rugs	3.8	-5.1	
Jute Manufacturing	1.5	-5.3	
Wearing apparel, except Footwear	11.3	-4.3	
Leather and Leather Products	na	2.1	na
Footwear Manufacturing	0.3	7.1	+
Saw Mills	0.0	11.1	+
Wood Cork Products, nec	na	7.8	na
Wooden Furniture	-4.6	-1.6	+
Paper and Paper Products	1.7	7.8	+
Printing	-2.7	-0.1	+
Drug and Medicine	-6.2	0.8	+
Soap	6.7	-4.8	-
Chemical Products, nec	3.8	-9.6	
Rubber Products	-4.7	1.1	+
Plastic Products	2.5	0.2	•
Structural Clay	-3.2	2.3	+
Cement	11.3	-4.8	-
Non-metallic Mineral Products	na	7.8	na
Iron and Steel	3.0	1.7	
Metallic Furniture	-2.5	-6.0	•
Structural Metal Products	na	-3.8	na
Non-machinery Fabricated Metal	0.2	0.8	+
Radio and TV	na	7.2	na
Electric Apparatus	na	6.2	na
Jewellery	-9.4	5.0	+
Other Manufacturing, nec	-5.3	-2.1	+
Manufacturing Total	-1.0	-0.4	+

 Table 1. Productivity Growth in Nepalese Manufacturing: Pre- and Post-Reform Performance

Source: Estimated based on the data from the CBS. na = not available

of using the initial and terminal year observations from the both sub-periods was mainly guided by the nature of data. For the pre-reform period manufacturing data are available every five years, while for the post-reform period these data are available annually except for 1992/93. Thus, for the comparison of TFP growth between these two sub-periods we decided to use initial and terminal year data. The average of the factor shares in the first and the last year of the period under consideration was used to obtain the weighted average growth in factor inputs⁷. The estimates of TFP growth for the pre-reform (1972/73-1986/87) and post-reform (1987/88-93/94) periods are presented in Table 1.

As shown in Table 1, overall manufacturing productivity declined by 1 per cent per annum (p.a.) in the pre-reform period. However, productivity growth was not negative across all industries. There were fifteen industries which reported an absolute fall in productivity growth during this period. With the exception of knitting and jewellery which are produced mainly for export markets, all were IS industries and managed by the private sector. As the shortage of foreign exchange emerged, these IS industries operated in the private sector were hard hit by the import restrictions. But poor TFP growth during this period should not be attributed solely to the restricted policy regime. The two oil price shocks as well as frequent shortages of electricity supply probably contributed to poor capacity utilisation, leading to lower productivity. An increase in oil prices and shortages of electricity supply are likely to have affected modern industries more than the traditional industries such as carpets and rugs, garments and jewellery.

Even after the liberalisation reforms manufacturing productivity did not improve substantially, although the decline was somewhat controlled (1 per cent p.a. vs 0.4 per cent p.a.). As shown in the third column of Table 1, 19 out of 33 industries experienced an improvement in productivity growth in the post-reform period. With the exception of knitting and jewellery, all were IS industries. Despite an impressive growth in manufactured exports in the post-reform period, major export-oriented industries, namely carpet and wearing apparel which contribute about 70 per cent to manufactured exports, recorded an absolute fall in productivity growth. Within IS industries, productivity growth was higher in those industries which were protected the least in the earlier sub-period, with the exception of canning and preserving fruits, and distilleries, while lower in the

To test the robustness of our results, we also estimated TFP growth for both sub-periods, based on the growth rates obtained from two alternative techniques. We obtained growth rates from *(i) logarithmic time trend estimated using OLS*, which uses all available observations, and also from *(ii) the average of the first and the last two year observations*. Our TFP growth estimates, based on the growth rates obtained from the initial and terminal rear observations, do not significantly deviate from those obtained from methods (i) and (ii), indicating that our results are robust. These alternative estimates are not reported in this paper, but can be obtained from the author.

highly protected industries, including SOEs⁸. Within SOEs only drug and medicine, which earlier received relatively low level of protection, recorded an improvement in productivity. Productivity improved by 7 per cent p.a. in the privatised industry (footwear manufacturing), which was previously a loss making public enterprise due to over-staffing, excessive government interventions and the lack of competitiveness. Thus, our results appear to be consistent with the notion that the public sector interventions and high protection could lead to poor TFP growth in developing economies.

As stated before, in the post-reform period most industries that recorded an improvement in productivity growth were IS industries. This could be attributed to the elimination of import controls which increased access to imported intermediate inputs, leading to an improvement in capacity utilisation⁹, though capacity utilisation remained low due largely to a shortage of electricity¹⁰. Furthermore, the liberalisation policy also seems to have created competition in the domestic market added to which there may also be a 'learning effect' operating over this period. Only two export-oriented industries, namely knitting and jewellery, experienced TFP growth in the letter period. Poor productivity performance of the major export-oriented industries (carpet and wearing apparel) appears to be linked with the shortage of semi-skilled labour¹¹ caused by the boom in carpet and garment exports the demand for semi-skilled labour increased but in the absence of appropriate

⁸ The SOEs are: cement, dairy, sugar, footwear, spinning, weaving and textile, jute manufacturing, drug and medicine, and cigarette manufacturing. Note that due to data unavailability we do not have TFP growth estimates for cigarette manufacturing for the pre-reform period.

⁹ Kwon (1986) notes that in developing countries an improvement in capacity utilisation is a source of TFP growth that is too significant to be ignored. However, to date very little effort has been made to explain the role of capacity utilisation as a possible source of TFP growth.

¹⁰ Although manufacturing capacity utilisation increased from 23 per cent in 1983/84 to 49 per cent in 1993/94, shortage of electricity supply has not permitted an efficient utilisation of the installed capacity. As liberalisation took place some new industries came into operation and capacity utilisation of the existing industries improved which increased the demand for electricity. However, supply has not increased relative to total demand. This has not only hindered capacity utilisation in the existing industries but also has discouraged new investment in manufacturing.

¹¹ The Department of Labour focuses on vocational training such as plumbing, welding, electrical wiring, hair cutting and dressing, and operating simple machines. While the Department of Cottage and Small Scale Industry and the Cottage and Small Scale Industry Development Board focuses on training programs generating income especially in rural areas. The Small Business Promotion Project offers training in the field of entreprenurship development, marketing and accounts. Thus, it is obvious that labour market training programs have not been directed towards the needs of the organised manufacturing sector, leading to the shortages of semi-skilled and skilled workers.

labour market training programs the increased demand was met mainly through the use of unskilled labour, especially female labour, who did not have the basic skills. Thus, export increased despite a fall in productivity growth due mainly to the export incentives.

5. CONCLUSION

Nepal pursued the liberalisation program from the mid-1980s with a view to arrest deteriorating macroeconomic condition and improve productivity growth. In this paper we have investigated the effect of liberalisation on manufacturing productivity. Although the overall productivity growth was negative in both the pre- and post-liberalisation periods (-1 per cent vs -0.4 per cent p.a.), the rate of decline was controlled in the latter period. The fact that the productivity growth is continued to be negative even after the liberalisation reforms indicates that adequate physical infrastructure and the availability of skilled labour are also crucial for a rapid growth in productivity.

In the post-liberalisation period, 17 out of 19 industries that recorded an improvement in productivity growth were IS industries. Better productivity performance among the IS industries appears to be linked with the elimination of import restrictions which increased their access to imported intermediate inputs and improved capacity utilisation. Liberalisation also seems to have introduced a high degree of competition from abroad, thus forcing IS industries to revert to more competitive behaviour, such as quality improvement, competitive pricing, cost cutting and increasing managerial efforts.

Major export-oriented industries (namely carpet and wearing apparel) experienced a fall in productivity growth in the post-liberalisation period due mainly to the shortage of semi-skilled labour and lucrative export incentives. However, despite a fall in productivity exports of carpet and garments grew rapidly due mainly to lucrative export incentives under the GSP scheme. Nepalese experience, therefore, suggests that liberalisation appears to improve efficiency but herative export incentives, lack of adequate physical infrastructure and the shortage of skilled labour may not permit a rapid growth in productivity. Thus, industry specific incentives must be selective and the emphasis must also be placed on the development of physical infrastructure and manpower if liberalisation is to be efficient.

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