Deliverable 5

Draft

Macroeconomic Impact on Pakistan of the Newly Liberalized Indo-Pak Trade

Authors:

Dr. Hafiz Ahmed Pasha
Muhammad Imran

Institute of Public Policy
Beaconhouse National University, Lahore

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CHAPTER 1
INTRODUCTION

The TOR for this deliverable is as follows:

The short and long term macro economic impact on income and revenue of Pakistan post trade liberalization measures. This study would aim to provide quantitative estimation of the short term and long term impact of Pak-India trade liberalization (removing tariff and non-tariff barriers) on the national income (GDP) of Pakistan and employment.

The following tasks will be completed to produce this deliverable.

1. Based on earlier studies, especially related to deliverable two to four, derive estimates for short run and medium run of the following.
    - Quantum of trade creation due to imports from India, implying reduction in domestic production and incomes.
    - Quantum of net expansion in exports of Pakistan due to relaxation of NTBs by India leading to higher production.
    - Impact on unit value imports due to trade diversion to India, and implication of cheaper intermediate inputs on competitiveness of Pakistani manufacturers.
2. Use of IPP macroeconomic model to estimate the trade multiplier for Pakistan given the expected change in the real balance of trade, drive the impact of opening up trade with India on GDP and employment in Pakistan.
3. Quantify the impact of government revenues of trade liberalization with India.
4. Project the impact of opening up of Pakistan to imports from India on the balance of trade between the two countries and thereby on the global balance of trade of Pakistan.
5. Determine the impact on the domestic price level of lower cost goods as well as raw materials from India and quantify the magnitude of resulting consumer welfare gains.
6. Results of earlier studies on the quantification of informal trade will be updated.

The short-term and long-term macro economic impact will be determined under different scenarios.

CHAPTER 2
THE MACROECONOMIC MODEL

The Institute of Public Policy has built a Macroeconomic model for Pakistan. The key features of this model are described in section 1 of the chapter. Section 2 then presents the 'base scenario' for Pakistan for the period, 2012-13 to 2014-2015, in the absence of liberalization of trade between India and Pakistan. Section 3 estimates the trade multiplier for Pakistan on the basis of a simulation of the model.

2.1. The IPP Macroeconomic Model

The IPP macroeconomic model is one of the few operative macroeconomic models of Pakistan. The model is Keynesian in character. Key features of the model include the following.

i) The model has **seven** modules, including modules on the expenditure components of the GDP, price level, fiscal sector, debt, monetary sector, balance of payments, and employment and poverty.

ii) There are 48 equations in the model. As such, there are 48 variables which are endogenously determined by the model. The number of exogenous variables which derive the model is 17, including the dollar unit value index of imports and exports, net non-debt creating inflows from abroad, level of external assistance, etc.

Of direct relevance to studying the impact of trade liberalization is the balance of payments module, especially the specification of the equations on trade in goods and services.

The imports equation is specified as follows:

$$M = M\left(Y_M, R, \frac{UVIM}{EXR}, \frac{EXR}{PD}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (i)$$

And exports as

$$X = M\left(Y_W, R, \frac{UVIM}{EXR}, \frac{EXR}{PD}, Q_c\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (ii)$$

Where,

M = imports of goods and services

X = exports of goods and services

Y_m = real income (domestic)

Y_w = real world income

UVIM = unit value index of imports

UVIX = unit value index of exports

EXR = exchange rate

PD = domestic price level

The specification of all equations in the model and the list of endogenous and exogenous variables is given in Technical Annex-I.

2.2. The Base Scenario

The 'base scenario' is the medium-run projection of the Pakistan economy up to 2014-15 by the model. The scenario is based on the following assumptions

(i) The trade relations between India and Pakistan remain unchanged, that is no granting of MFN status to India, no implementation of tariff reductions under SAFTA and no major relaxation of NTBs.

(ii) Elections are held in the second part of 2012-13 and the new Government that is inducted in takes major steps to stabilize the economy and revive growth.

(iii) Pakistan returns to IMF for a new program early in 2013-14 to prevent further hemorrhaging of its foreign exchange reserves in the presence of large external debt repayments, especially to the IMF.

(iv) The world economy starts showing visible signs of recovery from 2013-14 onwards.

The 'base scenario' is admittedly a somewhat optimistic scenario. Unless the above assumptions are valid, especially (i) to (iii), there is the danger that Pakistan could plunge into a financial crisis by the end of 2012-13 and modeling would no longer be feasible.

Based on the assumptions made above, the projected magnitudes of the macroeconomic variables from 2012-13 to 2014-15 are given in Table 2.1.

Salient features of base scenario are as follows:

(i) The economy maintains a growth rate of less than 5%.

(ii) Private investment continues to decline in 2012-13 due to political uncertainty prior to the elections and enhanced macroeconomic instability. It starts rising form 2013-14 onwards once political and economic risks are reduced.

(iii) The rate of inflation falls to single-digit during 2012-13 and 2013-14 in the presence of relatively stable international prices and less inflationary pressure at home. Already, the rate of increase in CPI has fallen to single-digit. There is some upsurge anticipated in the

rate of inflation in 2014-15 as the process of revival of economy gets underway and there is significant depreciation of Pakistani rupee.

(iv) Exports remain flat in 2012-13 due to recessionary conditions in the world economy, especially in Europe. As the world economy revives, exports start growing once again.

(v) Imports remain depressed in 2012-13, especially due to fall in capital goods imports in the presence of shy private investment and significant anticipated depreciation of the Pakistan rupee. A jump in imports only takes place in 2014-15 as aggregate demand rises in the economy.

Table 2.1
The Base Scenario of the Economy of Pakistan 2012-13 to 2014-15

	Unit	2011-12	2011-13	2011-14	2011-15
GDP growth Rate	%	3.7	4.3	4.1	4.5
Private Investment Growth Rate	%	-13.0	-8.4	6.5	14.2
Rate of Inflation	%	11.0	9.7	9.5	10.8
Employment Growth	%	1.8	2.1	2.0	2.2
Export Growth	%	-4.9	0.0	7.8	7.0
Import growth	%	10.1	-3.2	1.5	6.0
Current Account Deficit	%	2.0	1.6	1.1	1.4
Revenues	%	12.4	12.5	13.0	13.5
Expenditures	%	20.4	20.8	20.0	19.0
Budget Deficit	%	8.0	8.3	7.0	5.5
Source: IPP Macro Economic Model					

(vi) The current account deficit in the balance of payments remains relatively low throughout the period at below 2% of the GDP.

(vii) On the fiscal side, a significant improvement is anticipated in the size of the fiscal deficit, as implementation of conditionalities under a new Fund program lead to major reforms and containment of expenditures.

2.3. The Trade Multiplier

The model has been used to derive the magnitude of the trade multiplier for Pakistan. Within the Keynesian framework, the multiplier captures the second and subsequent round impacts on income of a rise initially in exports.

Within the model, the trade multiplier can be approximated by the following expression:

$$\frac{TM}{\Delta X} = \frac{1}{1-c-i+m} \quad \text{.....(I)}$$

Where

TM= trade multiplier

ΔX = 'exogenous' shock to exports

C = short-run marginal propensity to consume (private) out of additional income

i= short-run increase in investment out of 1 Re of additional income

m = marginal propensity to import out of additional income

The above parameters in the model are as follows:

C = 0.358, m = 0.082 , .i = 0.158

Therefore, the magnitude of the short-run trade multiplier is close to **1.8** in Pakistan. In fact, the long-run trade multiplier is somewhat larger due to lagged response of private consumption expenditure. The projected magnitudes from the model are given below in table 2.2 with an exogenous jump in exports of about 12.5%. (One eighths).

Table 2.2
Impact of Increase in Exports in 2012-13
(Rs in Billion at constant prices)

Exports of Goods and Services	**2012-13**	
• Base Scenario	874	
• With exogenous shock to exports	984	
• Change	**110**	
GDP		
• Base Scenario	6678	
• With exogenous shock to export	6876	
• Change	**198**	Trade = 198/110 = 1.8 Multiplier
Imports of Goods and Services		
• Base Scenario	846	
• With exogenous shock to export	863	
• Change	**17**	
Source: Simulation of IPP Macroeconomic Model		

A similar magnitude of the trade multiplier is derived with respect to an increase in real imports, although the sign is reversed. A rise in imports leads to fall in GDP.

The magnitude of the trade multiplier provides an initial idea of likely impact of the liberalization of trade between India and Pakistan.

2.4. Magnitude of Key Parameters

We now undertake a simulation of the model in presence of trade liberalization between India and Pakistan which involves granting of MFN status to India, implementation of SAFTA and substantial relaxation of non-tariff barriers along with measures for trade facilitation.

Simulation of the model will help us capture not only the first round impact of opening up of trade between the two countries but also the subsequent impacts via the trade multiplier.

The previous chapter has yielded the first round impacts, which are presented below in percentage terms:

Table 2.3
First Round Impact of Indo-Pak Trade Liberalization by 2014-15

Impact on	**% change in relationship to base scenario**
Exports*	4.0
Imports	2.8(3.5**)
Tax Revenues	1.5
Unit Value Index of Imports	-1.7***

*On the assumption that higher exports to India are additional in nature and not diverted from other markets or there is no constraint exercised by load shedding
**Including informal imports currently that shift to the formal channel
***due to diversion to cheaper imports from India

CHAPTER 3
MACRO-ECONOMIC IMPACT OF INDO-PAK TRADE LIBERALIZATION

The previous chapter has given the estimated first round (primary) impact of trade liberalization between India and Pakistan on the volume of exports and imports, unit value index of imports and tax revenues. Section 1 of this chapter describes the nature of the subsequent round (secondary) impact on some key macroeconomic variables. This is followed is section 2 by quantifying the overall change in these variables up to 2014-15 in relation to the projected magnitudes in the base-scenario. An attempt is made to highlight the implications of these changes. Finally, in section 3 we undertake sensitivity analysis using different scenarios.

3.1 Nature of Impacts

A key macroeconomic variable in the model is level of GDP. This is given by the following identity:

$$Y = C_p + \overline{C_G} + I_p + \overline{I_G} + X - M + \Delta S \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (2)$$

Where,

Y = GDP

C_p = Private consumption expenditures

$\overline{C_G}$ = Public consumption expenditures (exogenous)

I_p = Private investment

$\overline{I_G}$ = Public investment (exogenous)

X = Exports

M = Imports

ΔS = change in stocks

If the primary impact of trade liberalization is such that

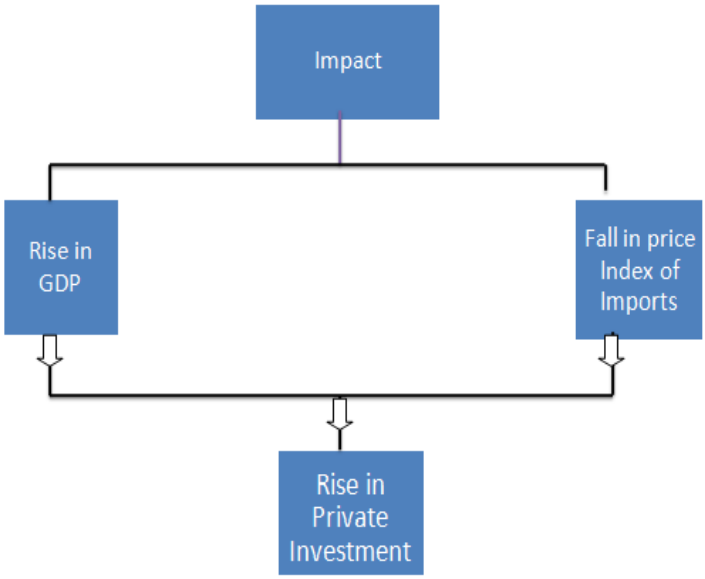
$$\Delta X > \Delta M$$

Where ΔX is the increase in exports by Pakistan to India and ΔM is the quantum of trade creation[1] in Pakistan by Indian exports, then the GDP, Y, increases and this sets in the dynamics of the trade multiplier.

[1] The change is only due to trade creation. There is no change in volume of imports due to trade diversion.

What is likely to happen to private investment? This is stimulated by changes in two variables as shown in Figure 3.1. The first is the rise in GDP and the second is lower cost of investments in relation to the base scenario. Both these factors lead to rise in private investment.

Figure 3.1
Impact of Private Investment



The secondary impacts on exports and imports are presented in figure 3.2. Imports rise beyond the primary impact because of the rise in GDP. Exports are stimulated further by the lower price (domestic) level, due to the lower unit value of imports. This reduces costs of intermediate goods in export production thereby increasing competitiveness and also increases the relative profitability of selling abroad.

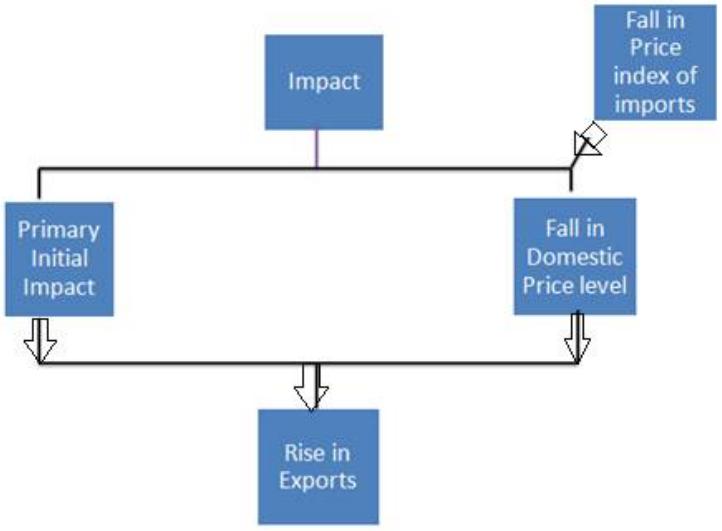
Similarly, there are secondary impacts on other macroeconomic variables which are captured by the model.

3.2. Modeling the Impact

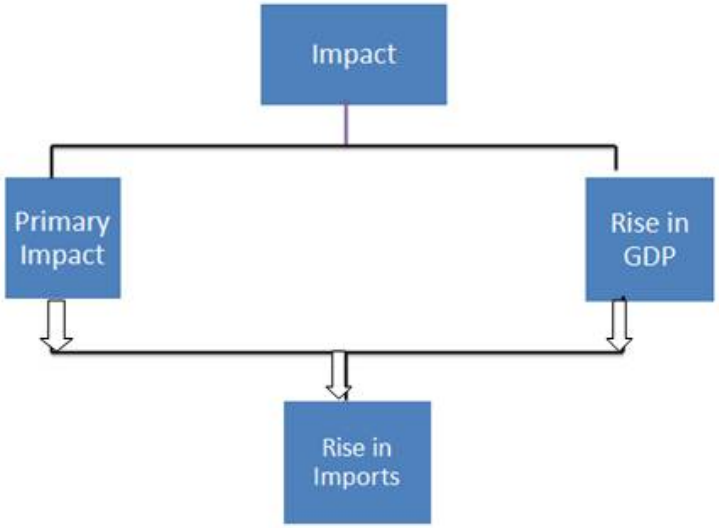
The primary impact of trade liberalization is assumed to be spread from the second half of 2012-13 to the end of 2014-15 in line with the likely staggering of the relaxation of NTBs and implementation of measures of trade facilitation to be spread, as follows:

	% of Primary Impact	
	Exports	**Imports**
2012-13	25	25
2013-14	50	100
2014-15	100	100

Figure 3.2
Impact on Exports



Impact on Imports



It is assumed that Pakistan's exports to India rise somewhat less rapidly, due to supply-side constraints, than trade creation by Indian exports in Pakistan.

Based on the above pace of adjustment and the earlier stated magnitudes of primary (first round) impacts, a simulation (referred to henceforth as Indo-Pak scenario) is carried out of the IPP macroeconomic Model to identify the magnitude of change in relation o the base scenario (BS) the results are shown in Table 3.1 and discussed below:

Table 3.1 Difference in Macroeconomic Variables in the BS and IPS Scenario			
	2012-13	**2013-14**	**2014-15**
GDP (Rs in billion at constant prices)			
Base	6677.9	6954.5	7270.8
IPT	6683.2	6987.4	7381.0
% of diff	**0.079%**	**0.47%**	**1.52%**
Private Investment (Rs in Billion at Constant Prices)			
Base	464.9	495.1	565.2
IPT	470.7	508.9	588.9
% of diff	**- 1.25%**	**2.78%**	**4.20%**
Exports ($ Million)			
Base	28886	31129	44286
IPT	29173	118.0	35348
% of diff	**1.00%**	**2.67%**	**6.19%**
Imports ($ Million)			
Base	46458	47343	51943
IPT	47091	48012	52974
% of diff	**1.36%**	**1.34%**	**1.92%**
Current Account Deficit ($ Million)			
Base	4975	2357	3416
IPT	5321	2192	2382
% of diff	**6.95%**	**-7.00%**	**-30.26%**
Exchange Rate (Rs/$)			
Base	97.2	117.8	145.7
IPT	97.0	6987	146.0
% of diff	**- 0.02%**	**0.17%**	**0.20%**
Tax Revenues (Rs in Billion)			
Base	2248	2792	3327
IPT	2277	2831	3397
% of diff	**1.29%**	**1.40%**	**2.10%**
Fiscal Deficit (Rs in Billion)			
Base	1868	1805	360.7
IPT	1823	1731	1760
% of diff	**-2.48%**	**-4.10%**	**- 6.81%**
Employment (000s)			
Base	57577	59182	60708
IPT	57584	59229	60877
Change	7	47	169
% of diff	**0.01%**	**0.07%**	**0.28%**

GDP: The positive impact happens slowly with the GDP increasing, by only 0.08% in 2012-13 to a significant magnitude of 1.51% in 2014-15, as shown in table. The GDP is expected to be Rs 111 billion higher at constant prices of 1999-2000and Rs 396 billion at current prices. Given the projected exchange rate in 2004-15 this is equivalent to $ 2.7 billion. Therefore, inclusive of the multiplier effects, the increase in average household income is Pakistan is projected to be of the order of $ 84 per annum.

Private Investment: Private investment is expected to be over 4% higher by 2014-15. In absolute terms, the magnitude is about $ 580 million.

Level of Employment: private gains accrue gradually in line with the rate of expansion in exports. Initially, the gain is restricted to 7000 additional jobs only in 2012-13, which rises to 169,000 by 2014-15.

Price Index: as highlighted earlier, the primary reasons for a lower price level domestically than in the base scenario is the lower unit value index of imports. This leads to a lower level by about 0.9% by 2014-15.

Current Account Deficit: Both imports and exports are higher and the overall current account deficit is expected to be smaller by about $ 1 billion in 2014-15. This will represent a substantial improvement of over 30 percent at a time when Pakistan's balance of payments are expected to be under severe pressure. Therefore, contrary perhaps to perceptions, enhanced trade with India will significantly improve the global balance of trade of Pakistan.

Revenues: revenues (primarily for taxes) could rise to Rs 4070 billion in 2014-15, Rs 60 billion in excess of the projected outcome in the base scenario. The increase is attributed to two factors. First, almost one-thirds of the higher revenues are due to the reduction of informal trade with India which shifts to the formal channel. The remaining two-thirds is the net effect of a larger import tax base and lower revenues from imports at lower prices from India plus the loss of revenues due to some displacement of domestic industry.

Expenditure: public expenditure is expected to be lower by Rs 60 billion than in base scenario in 2014-15, due primarily to lower price level.

Fiscal Deficit: overall, the fiscal deficit is the IPS is projected at Rs 1770 billion is 2014-15, equivalent to 6.7% of the GDP as compared to 7.2% of the GDP in the base scenario.

In summary, the full macro-economic impact by 2014-15 (somewhat rounded off) of liberalization of Indo-Pak trade is as follows:

- GDP higher by 1.5%
- Private investment higher by 4%
- Additional employment of 170,000
- Price level lower by about 1%
- Improvement in current account deficit by 0.5% of the GDP

Therefore, given estimates of impact as indicated above, it appears to be in Pakistan's interest to liberalize trade with India by granting MFN status and in return getting tariff reductions under SAFTA, while working towards a mutual relaxation of non-tariff barriers and facilitation of trade.

We now finally undertake sensitivity analysis by changing the assumptions under different scenarios.

3.3 Sensitivity Analysis

There is some uncertainty about the extent of increase in Pakistan's exports due to presence of severe supply side constraints, like power and gas shortages. As such, we undertake modeling of a scenario , which can be considered as **worst case** scenario, assuming that there is no increase in Pakistan's exports to India while the extent of trade creation by Indian exports in Pakistan are the same magnitude as estimated above.

Results of this simulation are given in Statistical Annex. Table 3.2 makes a comparison of the macroeconomic outcomes in 2014-15 in different scenarios. How does the worst case scenario compare with base scenario?

(i) The GDP is lower in the first two years that is, in 2012-13 and 2013-14. But surprisingly its is slightly larger (by 0.2 percent) in 2014-15. The displacement of economic activity due to higher imports is compensated for in the third year by the increase in private investment due to lower unit value index of imports.

(ii) Consistent with difference in GDP in the two scenarios, employment is lower in comparison to the base scenario by about 50,000 in 2013-14 but becomes positive by 70,000 in 2014-15. This is again a somewhat unexpected conclusion.

(iii) The major negative outcome is that in the absence of gains in exports there is a major worsening in the current account deficit by 2014-15 of $ 447 million. This tantamount to increase in the deficit by 13%.

At the other extreme, it is possible that our estimates of the primary (first round) impact may be on the conservative side. As such, we carry out modeling of **best case** scenario in which the impact of trade liberalization is 50% more than the magnitudes given Table 2.3.

The results of this simulation are as follows:

(i) The GDP gain is over 2% in 2014-15 in relation to base scenario. This is equivalent to Rs 560 billion or $ 3.8 billion.

(ii) The level of employment is significantly higher and additional 325,000 jobs are created.

Table 3.2
Difference in Outcomes in Different Scenarios in 2014-15

	Base Scenario	Trade Liberalization Scenario	Sensitivity Analysis I[a]	Sensitivity Analysis II[b]
GDP (at constant prices)	**7270.8**	**7381.0**	**7287.6**	**7426.9**
(% difference [a])		(1.52)	(0.23)	(2.14)
Private Investment(at constant prices)	565.2	588.9	577.9	593
(% of difference)		(4.19)	(2.24)	(5.00)
Exports of Goods and Services	892.6	947.9	897.7	976.6
(% of difference)		(6.20)	(0.57)	(9.41)
Imports of Goods and Services	900.8	928.0	912.2	939.4
(% of difference)		(3.11)	(1.27)	(4.29)
Level of Employment (000)	60708	60938	60742	61032
(difference 000)		(230)	(34)	(325)
Domestic Price Level (1999-2000=100)	360.7	357.5	360.2	357.9
(% of difference)		(-0.89)	(-0.14)	(-0.78)
Exports of Goods and Services ($ mill)	33286	35348	33475	36417
(difference $ mill)		(2062)	(189)	(3131)
Imports of Goods and Services($ mill)	51943	52974	52579	53616
(difference $ mill)		(1031)	(636)	(1673)
Current Account Deficit ($ mill)	3416	2385	3863	1958
(difference $ mill)		(-30.2)	(13.1)	(-42.7)
Total Revenue (Rs in Billion)	4010	4070	4064	4105
(difference, Rs in Billion)		(60)	(54)	(95)
Total Expenditures (Rs in Billion)	5900	5840	5891	5848
(difference, Rs in Billion)		(-60)	(-9)	(-52)
Fiscal Deficit (Rs in Billion)	1890	1770	1827	1743
(difference, Rs in Billion)		(-120)	(-63)	(-147)

[a] **Sensitivity Analysis I:** No increase in exports of Pakistan
Increase in imports from India at
Projected level due to trade creation

[b] **Sensitivity Analysis II:** Increase in Exports of Pakistan
and imports from India at 50%
above the projected level

(iii) There is a sizeable improvement in the current account deficit of almost $ 1.5 billion, equivalent to a reduction of over 42% in the deficit projected in the base scenario in 2014-15. Therefore, if this optimistic scenario materializes then it could make a quantum contribution to improving the balance of payments position at a time when it is likely to be under considerable stress.

3.4. Conclusions

Overall, the extensive research undertaken as part of this project on Impact of Trade Liberalization with India yields the important conclusion that this process could lead to a favorable macroeconomic outcome for the country within next three years in terms of a higher national income and employment, coupled with reduction in macroeconomic balances, especially in the size of the current account deficit in the balance of payments. Of course, the gains could be even larger if India could open up more its market for agriculture and textile imports from Pakistan.

But a note of caution is also in order here. Achievement of the gains from trade with India could be retarded by the severe supply –side constraints, especially in the form of power and gas shortages, which characterize the economy today. Pakistani authorities will have to focus on eliminating these constraints on a top-priority basis so that the opportunities that open up in the process of bilateral trade liberalization are fully exploited.

List of Variables in the Model

Including endogenous and exogenous variables, there are a total of 61 variables in the model (44 endogenous and 17 exogenous). Total number of equations in the model is 47: 16 behavioural equations and 31 accounting identities. The lists of endogenous and exogenous variables are given below:

List of Endogenous Variables

BUDG	Fiscal Deficit
CAD$	Current Account Balance (in dollars)
CAD%	Current Account Balance (as percentage of GDP)
C_P	Private Consumption Expenditure
DEFX	Defence Expenditure
DEVEX	Development Expenditure
DMS	Change in Money Supply
EDEBT	External Debt without IMF
EDEBT2	External Debt with IMF

EMP	Level of Employment
EXR	Exchange Rate, average of the period (rupees per dollar)
EXR2	Exchange Rate, at the end of the period (rupees per dollar)
FR$	Foreign Exchange Reserves (in dollars)
GAX	General Administration Expenditure
IDEBT	Domestic Debt
INF	Inflation Rate
INTDD	Interest Payment on Domestic Debt
INTED	Interest Payment on External Debt
I_P	Private Investment
M	Real Imports of Goods and Services
M$	Imports of Goods and Services in dollars
MM	Money Supply
NIR	Nominal Interest Rate
PD	Domestic Price Level
PDEF	GDP Deflator
PF	Food Price Level
R	Real Interest Rate
RATIO	Foreign Exchange Reserves (Months of Imports)
SSEX	Social Expenditure
SUBS	Subsidies
TDEBT	Total Debt without IMF
TDEBT2	Total Debt with IMF
TEX	Government Total Expenditure
TREV	Total Government Revenue
TXREV	Government Tax Revenue
UVICM	Unit Value Index of Capital Imports
UVIM	Unit Value Index of Imports
UVIX	Unit Value Index of Exports
X	Real Exports of Goods and Services
X$	Exports of Goods and Services in dollars
Y_D	Disposable Income
Y_M	Real Income
Y_W	World Income Level

List of Exogenous Variables

ΔS	Change in Stocks

C_G	Government Consumption Expenditure
Cotton	Cotton Production
DT	Level of Direct Taxation
FDI$	Foreign Direct Investment (in dollars)
I_G	Public Investment
IMF$	Lending from IMF under the SBA Programme
NFA$	Net Foreign Assistance (in dollars)
NFI	Net Factor Income from Abroad
NTXREV	Government Non-Tax Revenue
POLRT	Monetary Policy Rate
POP	Population
PROC	Procurement Prices
RW	Real Wage Rate
UVICM$	Unit Value Index of Capital Imports (in dollars)
UVIM$	Unit Value Index of Imports (in dollars)
UVIX$	Unit Value Index of Exports (in dollars)

Note: Variables are arranged in alphabetic order.

TECHNICAL ANNEXURE
SPECIFICATION OF THE IPP's MACROECONOMETRIC MODEL

I. THE REAL SECTOR

1. The Basic Keynesian Identity

$$Y_M = C_P + C_G + I_P + I_G + X - M + \Delta S$$

where,

Y = Gross Domestic Product

C_P = Private Consumption Expenditure

C_G = Government Consumption Expenditure

I_P = Private Fixed Investment

I_G = Public Fixed Investment

X = Expenditure on Exports of Goods and Services

M = Expenditure on Imports of Goods and Services

ΔS = Change in Stocks

2. Private Consumption Expenditure

$$C_P = C_P[(Y_M + \overline{NFI} - DT), R, C_{P-1}]$$

3. Public Consumption Expenditure

$$C_G = \bar{C}_G$$

4. Private Investment

$$I_P = I_P\left(Y_M, R, \frac{UVICM}{PD}, \bar{I_G}\right)$$

5. Public Investment

$$I_G = \bar{I}_G$$

6. Expenditure on Exports of Goods and Services

$$X = X\left(Y_w, \frac{UVIX}{PD}, Cotton, X_{-1}\right)$$

7. Expenditure on Imports of Goods and Services

$$M = M\left(Y_M, R, \frac{UVIM}{EXR}, \frac{EXR}{PD}\right)$$

8. Change in Stocks

$$\Delta S = \overline{\Delta S}$$

II. THE PRICE LEVEL BLOCK

9. The Domestic Price Level

$$PD = PD\left(\frac{MM}{Y_M}, UVIM, PD_{-1}\right)$$

10. The Food Price Level

$$PF = P(PD, PROC)$$

11. GDP Deflator (PDEF)

$$PDEF = P(PD)$$

III. THE FISCAL SECTOR BLOCK

12. Government Total Revenue (TREV)

$$TREV = TXREV + \overline{NTXREV}$$

13. Government Tax Revenue (TXREV)

$$TXREV = TXREV\left(Y_M \cdot \frac{PDEF}{100}\right)$$

14. Non-Tax Revenue

$$NTXREV = \overline{NTXREV}$$

15. Total Government Expenditure (TEX)

$$TEX = TEX[(\overline{C_G} + \overline{I_G}) \cdot PD/100]$$

16. Development Expenditure (DEVEX)

$$DEVEX = DEVEX_{-1} \cdot \left[\frac{(IG \cdot PD)}{(IG \cdot PD)_{-1}}\right]$$

17. Defence Expenditure (DEFX)

$$DEFX = DEFX_{-1} \cdot IDEFX$$

18. Subsidies (SUBS)

$$SUSB = SUSB_{-1} \cdot ISUBS$$

19. General Administration Expenditure (GAX)

$$GAX = GAX_{-1} \cdot IGAX$$

20. Social Expenditure (SSEX)

$$SSEX = SSEX\big(TEX - (INTDD + INTED + DEVEX + SUSB + GAX)\big)$$

21. Fiscal Deficit (BUDG)

$$BUDG = TEX - TREV$$

IV. THE DEBT BLOCK

22. Interest Payment on Domestic Debt (INTDD)

$$INTDD = INTDD[IDEBT_{-1}, (R + INF) \cdot IDEBT_{-1}]$$

23. Interest Payment on External Debt (INTED)

$$INTED = INTED(EDEBT_{-1} \cdot EXR)$$

24. Inflation Rate (INF)

$$INF = \left[\frac{PD - PD_{-1}}{PD_{-1}}\right] \cdot 100$$

25. External Debt without IMF (EDEBT)

$$EDEBT = EDEBT_{-1} + (NFA\$ - IMF\$)$$

26. Domestic Debt (IDEBT)

$$IDEBT = IDEBT_{-1} + [BUDG - (NFA\$ - IMF\$) \cdot EXR2]$$

27. Total Debt without IMF (IDEBT)

$$TDEBT = IDEBT + EDEBT \cdot EXR2$$

28. External Debt with IMF (EDEBT2)

$$EDEBT2 = EDEBT2_{-1} + NFA\$$$

29. Total Debt with IMF (IDEBT)

$$TDEBT2 = IDEBT + EDEBT2 \cdot EXR2$$

V. THE MONETARY SECTOR BLOCK

30. Change in Money Supply (DMS)

$$DMS = DMS(NIR, Y_M \cdot PD/100)$$

31. Money Supply (*MM*)

$$MM = DMS + MM_{-1}$$

32. Nominal Interest Rate (NIR)

$$NIR = NIR[POLRT, \text{BUDG}/(\text{YM}/\text{PDEF}/100)]$$

33. Real Interest Rate (R)

$$R = NIR - INF$$

VI. THE BALANCE OF PAYMENTS BLOCK

34. Exchange Rate Equation (EXR)

$$\frac{EXR}{PD} = F\left[\left(\frac{FR\$(-1)}{M\$}\right), \left(\frac{FR\$(-1)}{M\$}\right)^2, \left(\frac{EXR}{PD}\right)_{-1}\right]$$

35. Exchange Rate at the End of the Period (EXR2)

$$EXR2 = EXR \cdot \left(1 + \frac{GEXR}{2}\right)$$

36. Growth Rate of Exchange Rate (GEXR)

$$GEXR = \frac{EXR - EXR_{-1}}{EXR_{-1}}$$

37. Unit Value Index of Exports (*UVIX*)

$$UVIX = \frac{\overline{\quad}}{UVIX\$} \cdot \frac{EXR}{\overline{EXR}}$$

38. Unit Value Index of Imports (*UVIM*)

$$UVIM = \frac{\overline{\quad}}{UVIM\$} \cdot \frac{EXR}{\overline{EXR}}$$

39. Unit Value Index of Capital Imports (*UVICM*)

$$UVICM = \frac{\overline{\quad}}{UVICM\$} \cdot \frac{EXR}{\overline{EXR}}$$

40. Expenditure on Imports of Goods and Services (in dollars) (*M*$)

$$M\$ = \frac{M \cdot (UVIM/100)}{EXR}$$

41. Expenditure on Exports of Goods and Services (in dollars) ($X\$$)

$$X\$ = \frac{X \cdot (UVIX/100)}{EXR}$$

42. Current Account Deficit (in dollars) ($CAD\$$)

$$CAD\$ = M\$ - X\$ - \overline{NFI}\$$$

43. The Current Account (as percentage of GDP) ($CAD\%$)

$$CAD\% = \frac{X \cdot UVIX - M \cdot UVIM + \overline{NFI} \cdot \frac{PD}{100}}{Y_M \cdot \frac{PD}{100}}$$

44. Changes in Foreign Exchange Reserves ($\Delta FR\$$)

$$\Delta FR\$ = -CAD\$ + \overline{NFA}\$ + \overline{FDI}\$$$

45. Foreign Exchange Reserves ($FR\$$)

$$FR\$ = FR\$(-1) + \Delta FR\$$$

46. Foreign Exchange Reserves (Months of Imports) (RATIO)

$$RATIO = \left(\frac{FR\$_{-1}}{M\$}\right) \cdot 12$$

VII. EMPLOYMENT AND POVERTY BLOCK

47. Level of Employment (EMP)

$$EMP = EMP(Y_M, \overline{RW}, EMP_{-1})$$

Statistical Annexure-I

Outcomes in different scenario Higher exports of Pakistan and higher imports of India			
	2012-13	**2013-14**	**2014-15**
1.GDP (at constant prices)			
BS	6677.9	6954.5	7270.8
SA- III	6684.3	6998.4	7426.9
% of diff	**0.09**	**0.63**	**2.15**
2.Private Investment(at constant prices)			
BS	464.9	495.1	565.2
SA- III	970.8	509.7	593.5
% of diff	**1.27**	**2.95**	**5.00**
3.Exports of Goods and Services(at constant prices)			
BS	874.4	897.4	892.6
SA- III	887.4	933.9	976.6
% of diff	**1.49**	**4.07**	**9.41**
4.Level of Employment (000)			
BS	57577	59182	60708
SA- III	57602	59368	61360
Difference (000)	**25**	**186**	**652**
5.Domestic Price Level (1999-2000=100)			
BS	297.4	3256	360.7
SA- III	296.4	323.9	357.9
% of diff	**-2.4**	**-0.52**	**-0.78**
6.Imports of Goods and Services (at constant prices)			
BS	846.5	841.6	900.8
SA- III	861.3	869.5	9394
% of diff	**1.74**	**3.31**	**4.29**

Scenario			
	2012-13	**2013-14**	**2014-15**
Current Account of BOP			
6.Exports of Goods and Services ($ mill)			
BS	28886	31129	33286
SA- III	29318	32396	36417
(difference $ mill)	**432**	**1267**	**3131**
7.Imports of Goods and Services($ mill)			
BS	46458	47343	51943
SA- III	47308	48466	53616
(difference $ mill)	**850**	**1123**	**1673**
8.Current Account Deficit ($ mill)			
BS	4975	2357	3416
SA- III	4893	1713	1760
(difference $ mill)	**-82**	**-644**	**- 6.81%**
FISCAL			
9.Revenues (Rs in Billion)			
BS	2813	3414	4010
SA- III	2443	3459	4105
difference (Rs in Billion)	**30**	**45**	**95**
10.Expenditure (Rs in Billion)			
BS	4618	5219	5900
SA- III	4667	5188	5848
difference (Rs in Billion)	**-14**	**-31**	**-52**
11.Fiscal Deficit (Rs in Billion)			
BS	1868	1805	1889
SA- III	1824	1729	1742
difference (Rs in Billion)	**-44**	**-76**	**- 147**

Statistical Annexure-II

Outcomes in different scenario Scenario: No Increase in Exports to India; but Increase in Imports from India			
	2012-13	**2013-14**	**2014-15**
1.GDP (at constant prices)			
BS	6677.9	6954.5	7270.8
SA- I	6677.5	6943.1	7287.6
% of diff	**-0.01**	**-0.17**	**0.23**
2.Private Investment(at constant prices)			
BS	464.9	495.1	565.2
SA- I	469.3	504.3	577.9
% of diff	**0.94**	**1.86**	**2.25**
3.Exports of Goods and Services (at constant prices)			
BS	874.4	897.4	892.6
SA- I	874.4	897.4	897.7
% of diff	**0.00**	**0.00**	**0.57**
4.Level of Employment (000)			
BS	57577	59182	60708
SA- I	57574	5913	60778
% of diff	**-3**	**-51**	**70**
5.Domestic Price Level (1999-2000=100)			
BS	297.4	325.6	360.7
SA- I	296.7	324.3	360.2
% of diff	**-0.24**	**-0.40**	**-0.14**
6.Imports of Goods and Services (at constant prices)			
BS	846.5	841.6	900.8
SA- I	855.9	855.5	912.2
% of diff	**1.11**	**1.65**	**1.27**

	2012-13	2013-14	2014-15
Current Account of BOP			
6.Exports of Goods and Services ($ mill)			
BS	28886	31129	33286
SA- I	28886	31132	33475
(difference $ mill)	**0**	**3**	**189**
7.Imports of Goods and Services($ mill)			
BS	46458	47343	51943
SA- I	47019	47694	52079
(difference $ mill)	**561**	**351**	**136**
8.Current Account Deficit ($ mill)			
BS	4975	2357	3416
SA- I	5537	2705	3362
(difference $ mill)	**562**	**348**	**- 54**
FISCAL			
9.Revenues (Rs in Billion)			
BS	2813	3414	4010
SA- I	2438	3441	4064
difference (Rs in Billion)	**25**	**27**	**54**
10.Expenditure (Rs in Billion)			
BS	4618	5219	5900
SA- I	4667	4196	5819
difference (Rs in Billion)	**-14**	**-23**	**-9**
11.Fiscal Deficit (Rs in Billion)			
BS	1868	1805	1889
SA- I	1829	1755	1827
difference (Rs in Billion)	**-39**	**-50**	**- 62**