Impact of the Afghan War on the Economy Options for Pakistan

Research Report No.41

December, 2001

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on the Economy
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Foreword

The international crisis following the events of September 11, 2001 and the ensuing US attack on Afghanistan caught Pakistan in the crossfire, with serious economic and political consequences for the country. A number of measures have been announced by different countries and international organizations to assist Pakistan. These range from the pledge of cash grants of several hundred million dollars to debt rescheduling of several billion dollars. Trade concessions in the form of improved access to market and other facilities are also included in the package. The actual value of these measures is yet to be established. This study makes a preliminary attempt to quantify different scenarios of the economic cost to Pakistan under certain assumptions and offers alternative options for dealing with the crisis. We hope the analysis will prove to be useful to all concerned in meeting with the actual situation as it arises.

Dr. Kaiser Bengali
Acting Managing Director

The Team

The SPDC Team (in alphabetical order)

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The events following September 11 have imposed severe costs on the Pakistan economy. This paper attempts to quantify the direct costs suffered, or expected to be suffered, as a consequence, thereof. A range of costs can be identified. Important among them are decline in export orders as foreign buyers seek to protect their supply-chains, decline in airline travel and tourist inflows, loss or deferment of foreign direct investment, etc.

Necessarily, the analysis is based on informed speculation, as it is too early to have precise data and, therefore, exact estimation is not possible. Nor is it possible, at this stage, to quantify indirect or secondary costs. Thus, the paper primarily attempts to quantify the costs as a consequence of export losses; defined as reduction in projected normal growth of exports. The direct costs covered in the analysis are:

(i)   Decline in projected normal export growth as a consequence of increased risk and uncertainty now surrounding the Pakistan economy,

(ii) Increase in the unit value of imports due to increased freight and insurance charges,

(iii) Disincentive to exporters due to the appreciation of Pakistan Rupee against the US dollar, as a result of increased inflows of US dollars into Pakistan amidst fears of a crackdown on hitherto safe banking havens abroad.

The analysis is based on SPDC's 257-equation Integrated Social Policy and Macroeconomic Planning Model for Pakistan (Appendix). The modeling approach enables the analysis to capture the direct and feedback effects of the change in a particular variable. Econometric simulations are performed on a baseline scenario, estimated over a time period of 28 years (1973-2001) under the assumption of 'business as usual', i.e., assuming that the September 11 events did not occur. The different simulations performed on the baseline are explained below.

Three possible export growth decline scenarios are considered; i.e., export growth declines are assumed at 10, 15 and 20 percent, respectively. Each of the three simulations also incorporate the following three scenarios[1].

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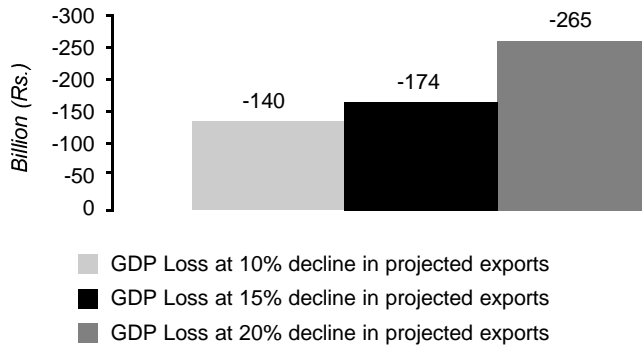**The SPDC Team (in alphabetical order)**

Qazi Masood Ahmed
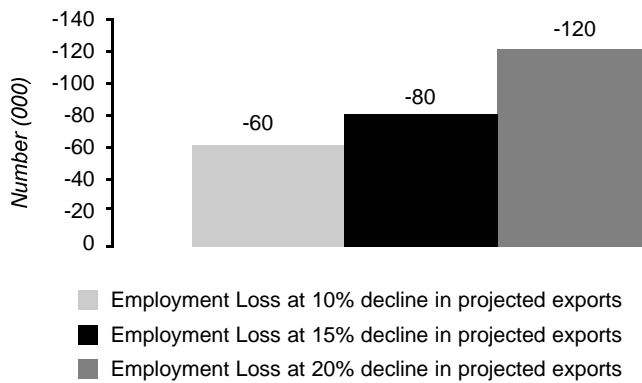Kaiser Bengali
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(a) The increase in freight-insurance charges are assumed to cause an increase in the unit value index of imports (in US $) by 3 percent.
(b) The real exchange rate of the Pakistan Rupee against the US dollar is assumed to appreciate by 5 percent.
(c) The dollar value of cash remittances are assumed to increase by 35 percent.

GDP LOSSES

GDP Loss at 10% decline in projected exports
GDP Loss at 15% decline in projected exports
GDP Loss at 20% decline in projected exports

EMPLOYMENT LOSSES

Employment Loss at 10% decline in projected exports
Employment Loss at 15% decline in projected exports
Employment Loss at 20% decline in projected exports

Simulations are carried out for each of the three export growth decline scenarios to determine as to at what compensation amount does the GDP loss and/or the employment loss is reduced to zero or near-zero. In all, seven cases emerge. Case 1 is the base condition where the full cost of export growth decline in terms of current account deficit, budget deficit, GDP and employment is recorded. Cases 2 and 3 depict the situation where an amount of compensation is required to offset the GDP and employment costs, respectively. Cases 4 and 5 depict the situation where an amount of compensation is required, subsequent to devoting 40 percent of the compensation amount to financing development expenditures, to offset the GDP and employment costs, respectively. And cases 6 and 7 depict the situation where a maximum amount of US$ 1 billion is available as compensation and intra-budgetary adjustments are required to offset the GDP and employment costs, respectively. Needless to say, the amount of compensation in all the cases is assumed to be additional to the normal economic assistance inflows from bilateral and multilateral sources.

SIMULATION RESULTS:

Scenario A: Decline in projected exports equal to 10 percent

A 10 percent decline in projected exports translates into an export receipts loss of US$ 1.1 billion and a rise in imports of US$ 0.5 billion, leading to an increase in the current account deficit of US$ 1.2 billion. On the domestic front, it results in a reduction of federal revenues of Rs 11.5 billion and an increase in the budget deficit of Rs 5.0 billion. Consequently, the GDP loss equals Rs 140 billion with a cost of 60,000 jobs. This represents Scenario A, Case 1.

Cases 2 and 3 specify the amount of compensation required to offset GDP and employment cost, respectively. Simulations show that:

Scenario A, Case 2:

A compensation package of US$ 1.0 billion is required to offset job losses, but will continue to impose GDP losses of Rs 113.0 billion[2]. Other variables - current account and budget deficits -- are likely to be affected only marginally.

SCENARIO - A
DECLINE IN PROJECTED EXPORTS EQUAL TO 10 PERCENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Compensation (billion US $)	zero	1	5.5	0.5	1.8	1	1
Change in:							
Export (billion US $)	-1.1	-1	-0.9	-1.1	-1	-1	-1
Import (billion US $)	0.5	0.6	0.9	0.6	0.8	0.6	0.8
Current Account Deficit (billion US $)	1.2	1.3	1.6	1.3	1.6	1.3	1.6
Federal Revenues (billion Rs.)	-11.5	-11	-8.6	-10	-5.3	-11	-4.5
Budget Deficit (billion Rs.	5	4.2	0.3	3	zero	4	zero
GDP (billion Rs.)	-140	-113	zero	-102	zero	-109	0.3
Employed Labor Force	-60,000	zero	250,000	zero	180,000	zero	160,000

(1) Economic cost of the crisis
(2) Impact of compensation sufficient to offset job losses
(3) Impact of compensation sufficient to offset GDP losses
(4) Impact of compensation sufficient to offset job losses, along with partial budgetary adjustment
(5) Impact of compensation sufficient to offset GDP losses, along with partial budgetary adjustment
(6) Impact of US $ 1.0 billion compensation, plus full budgetary adjustment to offset job losses
(7) Impact of US $ 1.0 billion compensation, plus full budgetary adjustment to offset GDP losses

Scenario A, Case 3:
A compensation package of US$ 5.5 billion is required to offset GDP losses, which will also create 250,000 additional jobs. Current account variables are likely to be affected only marginally, but the federal revenue loss is likely to be reduced from Rs 11.5 billion to Rs 8.6 billion and, consequently, the increase of Rs 5.0 in the budget deficit is likely to be reduced to near-zero

These compensation scenarios assume that Pakistan itself is not making any adjustments to meet the economic exigencies of the crisis. If such adjustments are made, the quantum of required compensation is reduced. While many possibilities exist, one such adjustment is to increase the share of state-sponsored development investment expenditure in total public expenditure. Alternative simulations, incorporating the assumption of 40 percent of compensation being devoted to financing development expenditure, show that:

Scenario A, Case 4:
A compensation package of US$ 0.5 billion will be required to offset job losses, but will continue to impose GDP losses of Rs 102 billion. Exports, imports current account deficit are likely to be affected marginally, but the federal revenue loss is likely to be reduced from Rs 11.5 billion to Rs 10.0 billion and the increase in the budget deficit is likely to be reduced from Rs 5.0 billion to Rs 3.0 billion.

Scenario A, Case 5:
A compensation package of US$ 1.8 billion is required to offset GDP losses, which will also create 180,000 additional jobs. Exports, imports and current account deficit are likely to be affected marginally, but the federal revenue loss is likely to be reduced from Rs 11.5 billion to Rs 5.3 billion and the increase in the budget deficit is likely to be reduced from Rs 5.0 billion to zero.

The earlier cases assume that the required level of compensation is likely to be forthcoming. This expectation may not be realizable. The *de facto* situation is that US $ 1.0 billion has been committed. If no further compensation is forthcoming, the entire burden of offsetting GDP and/or employment loss falls on domestic budgetary

adjustments. Cases 6 and 7 specify the extent of domestic budgetary adjustment, i.e., shift of current expenditure to development heads, that would be needed to offset GDP and employment losses, respectively. Cases 6 and 7 are simulated differently from Cases 2 to 5. In Cases 2 and 3, the simulations are carried out to estimate the quantum of compensation required to offset GDP and employment losses. In Cases 4 and 5, the simulations are carried out to estimate the quantum of compensation required to offset GDP and employment losses, subject to dedication of 40 percent of the compensation to development expenditures. In Cases 6 and 7, the simulations are carried out to estimate the extent of diversion of resources to development expenditures required to offset GDP and employment losses. The simulations show that:

Scenario A, Case 6:
A compensation package of US$ 1.0 billion, along with dedication of 20 percent of the compensation to development expenditure, is sufficient to offset the employment cost, but leaves a GDP loss of Rs 109 billion. Other variables are affected only marginally.

Scenario A, Case 7:
The GDP loss of Rs 109 billion, in spite of US$ 1.0 billion compensation, can be offset and 160,000 additional jobs created; provided 66 percent of the compensation is dedicated to development expenditures. In this scenario, exports, imports and current account deficit are affected marginally, but the loss in federal revenues is reduced from Rs 11.5 billion to Rs 4.5 billion and the increase in the budget deficit is reduced from Rs 5.0 billion to zero.

Scenario B: Decline in projected exports equal to 15 percent
A 15 percent decline in projected exports translates into an export receipts loss of US$ 1.4 billion and a rise in imports of US$ 0.4 billion, leading to an increase in the current account deficit of US$ 1.6 billion. On the domestic front, it results in a reduction of federal revenues of Rs 13.5 billion and an increase in the budget deficit of Rs 6.5 billion. Consequently, the GDP loss equals Rs 174 billion with a cost of 80,000 jobs. This represents Scenario B, Case 1.

SCENARIO - B
DECLINE IN PROJECTED EXPORTS EQUAL TO 15 PERCENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Compensation (billion US $)	zero	1.3	7	0.5	2.3	1	1
Change in:							
Export (billion US $)	-1.4	-1.4	-1.2	-1.4	-1.3	-1.4	-1.3
Import (billion US $)	0.4	0.6	1	0.5	0.9	0.6	0.8
Current Account Deficit (billion US $)	1.6	1.7	2.1	1.7	2.1	1.7	2
Federal Revenues (billion Rs.)	-13.5	-12.8	-9.8	-11.4	-5.7	-12.2	-4.6
Budget Deficit (billion Rs.	6.5	5.6	1	4.8	zero	5.6	zero
GDP (billion Rs.)	-174	-140	zero	-129	zero	-133	-0.3
Employed Labor Force	-80,000	zero	320,000	zero	220,000	zero	220,000

(1) Economic cost of the crisis
(2) Impact of compensation sufficient to offset job losses
(3) Impact of compensation sufficient to offset GDP losses
(4) Impact of compensation sufficient to offset job losses, along with partial budgetary adjustment
(5) Impact of compensation sufficient to offset GDP losses, along with partial budgetary adjustment
(6) Impact of US $ 1.0 billion compensation, plus full budgetary adjustment to offset job losses
(7) Impact of US $ 1.0 billion compensation, plus full budgetary adjustment to offset GDP losses

Cases 2 and 3 specify the amount of compensation required to offset GDP and employment cost, respectively. Simulations show that:

Scenario B, Case 2:
A compensation package of US$ 1.3 billion is required to offset job losses, but will continue to impose GDP losses of Rs 140.0 billion. Other variables - current account and budget deficits -- are likely to be affected only marginally, except that the increase in the Budget Deficit is likely to decline from Rs 6.5 billion to Rs 5.6 billion.

Scenario B, Case 3:
A compensation package of US$ 7.0 billion is required to offset GDP losses, which will also create 320,000 additional jobs. Current account variables are likely to be affected only marginally. However, the federal revenue loss is likely to be reduced from Rs 13.5 billion to Rs 9.8 billion and, consequently, the increase of Rs 6.5 billion in the Budget Dudget deficit is likely to be reduced to Rs 1.0 billion.

As stated above, these compensation scenarios assume that Pakistan itself is not making any adjustments to meet the economic exigencies of the crisis. If such adjustments are made, the quantum of required compensation is reduced. One such adjustment is to increase the share of state-sponsored development investment expenditure in total public expenditure. Alternative simulations, incorporating the assumption of 40 percent of compensation being devoted to financing development expenditure, show that:

Scenario B, Case 4:
A compensation package of US$ 0.5 billion will be required to offset job losses, but will continue to impose GDP losses of Rs 129 billion. Exports, imports and current account deficit are likely to be affected marginally. However, the federal revenue loss is likely to be reduced from Rs 13.5 billion to Rs 11.4 billion and the increase in the budget deficit is likely to be reduced from Rs 6.5 billion to Rs 4.8 billion.

Scenario B, Case 5:
A compensation package of US$ 2.3 billion is required to offset GDP losses, which will also create 220,000 additional jobs. The increase in imports is likely to more than double from US$ 0.4 billion to US$ 0.9 billion, resulting in the increase in the current account deficit from US$ 1.6 to US$ 2.1. The federal revenue loss is likely to be reduced from Rs 13.5 billion to Rs 5.7 billion and the increase in the budget deficit is likely to be reduced from Rs 6.5 billion to zero.

To repeat, the earlier cases assume that the required level of compensation is likely to be forthcoming. This expectation may not be realizable. The *de facto* situation is that US $ 1.0 billion has been committed. If no further compensation is forthcoming, the entire burden of offsetting GDP and/or employment falls on domestic budgetary adjustments. Cases 6 and 7 specify the extent of domestic budgetary adjustment, i.e., shift of current expenditure to development heads, that would be needed to offset GDP and employment losses, respectively. As stated earlier, Cases 6 and 7 are simulated differently from Cases 2 to 5. In Cases 2 and 3, the simulations are carried out to estimate the quantum of compensation required to offset GDP and employment losses. In Cases 4 and 5, the simulations are carried out to estimate the quantum of compensation required to offset GDP and employment losses, subject to dedication of 40 percent of the compensation to development expenditures. In Cases 6 and 7, the simulations are carried out to estimate the extent of diversion of resources to development expenditures required to offset GDP and employment losses. The simulations show that:

Scenario B, Case 6:
A compensation package of US$ 1.0 billion, along with dedication of 23 percent of the compensation to development expenditure, is sufficient to offset the employment loss, but leaves a GDP loss of Rs 133 billion. Other variables are also affected marginally, except that the loss in federal revenues is reduced from Rs 13.5 billion to Rs 12.2 billion and the increase in the budget deficit is reduced from Rs 6.5 billion to Rs 5.6 billion.

Scenario B, Case 7:
The GDP loss of Rs 133 billion, in inspite of US$ 1.0 billion compensation, can be offset and 200,000 additional jobs created; provided 82 percent of the compensation is dedicated to development expenditures. In this scenario, the increase in imports doubles from US$ 0.4 to US$ 0.8 and the increase in current account deficit rises further to US$ 2.0 billion. The loss in federal revenues is reduced from Rs 13.5 billion to Rs 4.6 billion and the increase in the budget deficit is reduced from Rs 5.0 billion to zero.

Scenario C: Decline in projected exports equal to 20 percent

A 20 percent decline in projected exports translates into an export receipts loss of US$ 2.2 billion and a rise in imports of US$ 0.3 billion, leading to an increase in the current account deficit of US$ 2.5 billion. On the domestic front, it results in a reduction of federal revenues of Rs 18.7 billion and an increase in the budget deficit of Rs 10.1 billion. Consequently, the GDP loss equals Rs 265 billion with a cost of 120,000 jobs. This represents Scenario C, Case 1.

Cases 2 and 3 specify the amount of compensation required to offset GDP and employment cost, respectively. Simulations show that:

Scenario C, Case 2:
A compensation package of US$ 2.0 billion is required to offset job losses, but will continue to impose GDP losses of Rs 211.0 billion. Other variables - current account and budget deficits -- are likely to be affected only marginally.

Scenario C, Case 3:
A compensation package of US$ 11.0 billion is required to offset GDP losses, which will also create 480,000 additional jobs. The increase in imports is likely to rise further from US$ 0.3 billion to US$ 1.3 billion and the increase in the current account deficit is likely to rise from US$ 2.5 billion to US$ 3.4 billion. The loss in federal revenues is likely to decline from Rs 18.7 billion Rs 13.0 billion and the increase in the budget deficit is likely to decline from Rs 10.1 billion to Rs 2.0 billion.

SCENARIO - C
DECLINE IN PROJECTED EXPORTS EQUAL TO 20 PERCENT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Compensation (billion US $)	zero	2	11	0.8	3.2	1	1
Change in:							
Export (billion US $)	-2.2	-2.2	-2	-2.2	-2.1	-2.2	-2.1
Import (billion US $)	0.3	0.5	1.3	0.5	1	0.5	0.9
Current Account Deficit (billion US $)	2.5	2.7	3.4	2.7	3.3	2.7	3.2
Federal Revenues (billion Rs.)	-18.7	-17.6	-13	-15.4	-6.6	-15.7	-4.6
Budget Deficit (billion Rs.	10.1	9	2	9	zero	8	zero
GDP (billion Rs.)	-265	-211	zero	-194	zero	-195	0.5
Employed Labor Force	-120,000	zero	480,000	zero	330,000	zero	280,000

(1) Economic cost of the crisis
(2) Impact of compensation sufficient to offset job losses
(3) Impact of compensation sufficient to offset GDP losses
(4) Impact of compensation sufficient to offset job losses, along with partial budgetary adjustment
(5) Impact of compensation sufficient to offset GDP losses, along with partial budgetary adjustment
(6) Impact of US $ 1.0 billion compensation, plus full budgetary adjustment to offset job losses
(7) Impact of US $ 1.0 billion compensation, plus full budgetary adjustment to offset GDP losses

To repeat again, these compensation scenarios assume that Pakistan itself is not making any adjustments to meet the economic exigencies of the crisis. If such adjustments are made, the quantum of required compensation is reduced. One such adjustment is to increase the share of state-sponsored development investment expenditure in total public expenditure. Alternative simulations, incorporating the assumption of 40 percent of compensation being devoted to financing development expenditure, show that:

Scenario C, Case 4:
A compensation package of US$ 0.8 billion will be required to offset job losses, but will continue to impose GDP losses of Rs 194 billion. All other variables are likely to be affected marginally.

Scenario C, Case 5:
A compensation package of US$ 3.2 billion is required to offset GDP losses, which will also create 330,000 additional jobs. The rise in imports is likely to more than triple from US$ 0.3 billion to US$ 1.0 and the increase in the current account deficit is likely to rise from US$ 2.5 billion to US$ 3.3 billion. The federal revenue loss is likely to be reduced from Rs 18.7 billion to Rs 6.6 billion and the increase in the budget deficit is likely to be reduced from Rs 10.1 billion to zero.

To repeat again, the earlier cases assume that the required level of compensation is likely to be forthcoming. This expectation may not be realizable. The *de facto* situation is that US $ 1.0 billion has been committed. If no further compensation is forthcoming, the entire burden of offsetting GDP and/or employment falls on domestic budgetary adjustments. Cases 6 and 7 specify the extent of domestic budgetary adjustment, i.e., shift of current expenditure to development heads, that would be needed to offset GDP and employment losses, respectively. As stated earlier, Cases 6 and 7 are simulated differently from Cases 2 to 5. In Cases 2 and 3, the simulations are carried out to estimate the quantum of compensation required to offset GDP and employment losses. In Cases 4 and 5, the simulations are carried out to estimate the quantum of compensation required to offset GDP and employment losses, subject to dedication of 40 percent of the compensation to development expenditures. In

Cases 6 and 7, the simulations are carried out to estimate the extent of diversion of resources to development expenditures required to offset GDP and employment losses. The simulations show that:

Scenario C, Case 6:
A compensation package of US$ 1.0 billion, along with dedication of 35 percent of the compensation to development expenditure, is sufficient to offset the employment cost, but leaves a GDP loss of Rs 195 billion. Other variables are affected only marginally, except that the loss in federal revenues is reduced from Rs 18.7 billion to Rs 15.7 billion and the increase in the budget deficit is reduced from Rs 10.1 billion to Rs 8.0 billion.

Scenario C, Case 7:
The GDP loss of Rs 195 billion on account of US$ 1.0 billion compensation can be offset and 280,000 additional jobs created; provided 120 percent of the compensation amount, i.e., the entire compensation amount as well as Rs 12 billion of existing current expenditures, is dedicated to development heads. In this scenario, the increase in imports triples from US$ 0.3 billion to US$ 0.9 billion and the increase in the Current Account Deficit rises further from US$ 2.5 billion to US$ 3.2 billion. The loss in federal revenues is reduced from Rs 18.7 billion to Rs 4.6 billion and the increase in the Budget Deficit is reduced from Rs 10.1 billion to zero.

CONCLUSIONS:

The study attempts to estimate the GDP and employment loss suffered/likely to suffer by Pakistan on account of the events following September 11, 2001. The study traces the losses caused as a result of the impact on exports. Simulations are carried out for three export decline scenarios to determine the compensation amount at which GDP and employment losses are reduced to zero or near-zero.

Three sets of simulations are carried out. The first set estimates the amount of compensation required to offset the GDP and employment losses. The second set estimates the amount of compensation required to offset GDP and employment losses,

subsequent to devoting 40 percent of the compensation amount to financing development expenditures. And the third set estimates the extent of domestic budgetary adjustment and the amount of domestic resources that will need to be devoted to development expenditures to offset GDP and employment losses.

The conclusions are fairly clear: development expenditures hold the key to offsetting the costs to the economy and to the labour force. Pakistan's case for compensation may or may not be strong; however, the likelihood of actually receiving the compensation may not be high. In the event, the burden of adjustment for ensuring that income and employment losses are minimal would lie on domestic budgetary realignments. The results once again strengthen the case for reviewing the policy of pursuing of stabilization objectives at the expense of growth objectives.

One caveat is necessary. The economic losses suffered/likely to suffer will be largely concentrated in the export sectors and the regions where such industry is located. It is unlikely that the compensation received or the additional development expenditures will benefit the same sectors or regions. In other words, the cost of income and employment losses is likely to be borne by the export sectors and exporting regions, but the income and employment generated by the expenditure of compensation/development funds is not necessarily likely to benefit the same sectors and regions. While this study does not cover distributional issues, they are nevertheless important and deserve the attention of the policy makers in designing expenditure policies.

ENDNOTES:

1. The assumptions for the scenarios are based on the following information:
    (a) Exports in October 2000 over September 2000 declined by 1.2 percent. By comparison, exports in October 2001 over September 2001 declined by 9.1 percent. According to export industry sources, however, the actual impact of decline in exports will be felt with a lag after current orders in the pipeline are executed.
    (b) Prior to September 11, 2001, freight rates of shipment to New York, USA, stood at between US $ 2100 per 20 foot container and US $ 3300 per 40 foot container. War risk insurance, levied after September 11, is of the order of US $ 150 for 20 foot containers and US $ 300 for 40 foot containers. The average increase in freight charges amounts to 8.3 percent. Given that freight charges for other destinatinos closer to Pakistan, i.e., Europe and Middle East, are lower, an increase of 3 percent is assumed.
    (c) The dollar-rupee exchange rate stood at about 1:67 prior to September 11, 2001 and has since changed to about 1:61; implying an approximately 10.0 percent nominal appreciation of the rupee. Read with the inflation rate of 5.4 percent, the real exchange rate appreciation amounts to about 4.5 percent. Exchange rate appreciation at 5 percent is assumed.
    (d) The increase in home remittances through official channels between September - October 2001 over the same period in 2000 is reported to be in the order of 76 percent, but has since tapered off. Moreover, State Bank of Pakistan's purchases also increased over the same period by 30 percent; which perhaps reflects the mopping up of unofficial remittances. Given the above, a growth in home remittances of 35 percent is assumed.

2. The fact that the GDP loss is greater than employment loss is indicative of the fact that a section of labour is moving from relatively higher wage export industry jobs to relatively lower wage occupations, i.e., hawking, peddling, and other informal sector jobs; leading, perhaps, to greater economic insecurity and impoverishment.

APPENDIX : AN INTEGRATED SOCIAL POLICY AND MACROECONOMIC PLANNING MODEL

The need for an Integrated Model

Historically, Pakistan's development planning models have not explicitly recognized the interdependence between social sector development, intergovernmental revenue-sharing transfers and the macroeconomy. The macroeconometric model of the Pakistan Institute of Development Economics was developed primarily to address the policy issues facing the macroeconomy and was updated in 1992 to include 97 equations. The model, developed by the Applied Economics Research Centre, explicitly incorporates linkages between federal and provincial governments, but its scope is limited to resource mobilization.

Recognizing this reality, the Social Policy and Development Centre (SPDC) has identified a pressing need for Pakistan to develop a macroeconomic model that explicitly incorporates the impact of public expenditure, which is close to 25% of the GDP. SPDC has been working diligently over the past few years to develop just such a model.

Structure and Linkages of the Model

The Social Policy and Development Centre has developed a unique economic model which can be used as an effective planning tool for social sector development. This model integrates the social, public finance and macroeconomic dimensions of the economy under one interrelated system.

Called the Integrated Social Policy and Macroeconomic (ISPM) Planning model, the model provides the basic framework for analyzing the implications of SAP and numerous other economic and non-economic policy decisions on the long-term development of Pakistan's social sectors.

The model is highly disaggregated and covers all three levels of government. It is capable of predicting outcomes in great detail, even at the level of individual social service provision. Such a disaggregation of the model at the provincial level in terms of revenues and expenditures on social services (e.g., schools,

hospitals, doctors, teachers, enrolments, etc.) is required to analyze the impact of SAP on the macroeconomy.

The model is based on consistent national level data from 1973 onwards and is estimated by single equation regression techniques. It consists of 265 equations, of which 129 are behavioural and the rest are identities. These equations are subsumed into 22 interrelated blocks. All the blocks, along with their size in terms of equations and identities, are listed in **table A-1**.

TABLE A-1
INTEGRATED SOCIAL POLICY AND MACROECONOMIC (ISPM) MODEL

		Total Number of Behavioural Equations	Total Number of Identities	Total Number of Equations
A	Macroeconomic Production Block	6	14	20
B	Macro Input Demand Block	7	10	17
C	Macroeconomic Expenditure Block	10	10	20
D	Federal Revenue Block	5	7	12
E	Federal Expenditure Block	9	8	17
F	Federal Deficit Block	1	3	4
G	Provincial Revenue Block	7	5	12
H	Provincial Expenditure Block	12	5	17
I	Provincial and Total Budget Deficit	0	3	3
J	Local Revenue Block	3	4	7
K	Local Expenditure Block	10	6	16
L	Trade Block	5	4	9
M	Monetary Block	1	1	2
N	Price Block	4	5	9
O	Human Capital Index Block	27	27	54
P	Public Health Index Block	12	11	23
Q	Index of Economic Infrastructure Block	0	4	4
R	Index of Fiscal Effort Block	0	4	4
S	Poverty	2	3	5
T	Gender Inequality	1	1	2
U	Educated Unemployment	6	0	6
V	Malnutrition	1	1	2
	TOTAL	**129**	**136**	**265**

Although the model is broadly Keynesian in spirit, the specification of individual blocks and equations is based on a pragmatic approach. It captures the reality and non-market clearing aspects of Pakistan's economy. Thus, the macroeconomic block is essentially supply driven. In addition, the social sector indicators are also resource determined.

The model is both dynamic and rich in specification. The nature of linkages across the model varies. In some cases, the linkage is simultaneous, in which equations in a block are not only determining equations in another block, but are also determined by them. Examples include the linkages between the macro production and input block, the production and macro expenditure blocks and the fiscal revenues and expenditure blocks. These simultaneous equations may be behaviourally determined or may just be identities. The broad links **(see chart A-1)** of the model can be traced as follows.

CHART A-1
BASIC STRUCTURE OF THE ISPM MODEL
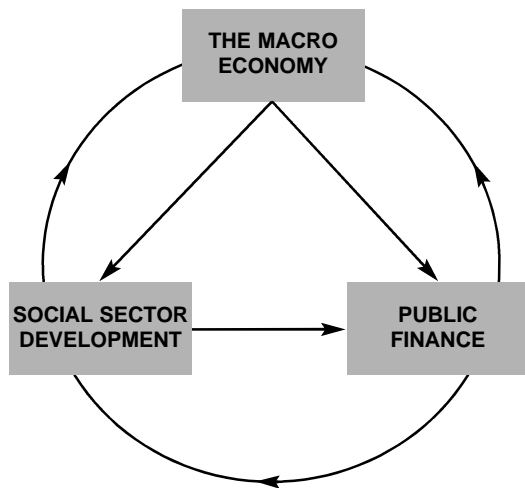
Macro —> Public Finance
The key link there is that developments in the macroeconomy influence the growth of the tax bases (including divisible pool taxes) and thereby affect the fiscal status of different governments. Also, the overall rate of inflation in the economy affects the growth of public expenditure.

Public Finance —> Social Sector Development
The availability of resources, both external and internal, determines the level of development and recurring outlays to social sectors by different levels of government, especially provincial and local.

Social Sector Development —> Macroeconomy
Higher output of educated workers and their entry into the labour force raises the human capital stock and could contribute to improvements in productivity and a higher growth rate of output in the economy. Similarly, an improvement in public health standards may also have a favourable impact on production.

Public Finance —> Macroeconomy
The level of government expenditure could exert a demand side effect on national income, while the size of the overall budget deficit of the federal and provincial governments (combined) influences the rate of monetary expansion and consequently the rate of inflation in the economy.

Social Sector Development — Public Finance
A vital link in the model is between the rate of social sector development and the state of public finances, especially of provincial governments, in terms of implications for the level of debt servicing and recurring expenditures.

Macroeconomy —> Social Sector Development
Demographic and other socio-economic changes affect the demand for social sector facilities such as schools and hospitals, and thereby influence the level of social sector outputs.

Linkages within macroeconomics, fiscal and social sector blocks

Apart from these broad linkages among different modules, there are also links between different blocks within each module.

An example of a major linkage within the macro module is the two-way linkage to and from the macro production block and macro input blocks. This link is due to the dependence of sectoral value added on the factors of production and input demand functions on the value of production. Macro production determines macro expenditure, as private consumption is influenced by income.

The two-way link between the macro production block and the trade block is due to the fact that the value of imports and exports determines and is determined by economic production activity. The trade gap affects the level of money supply.

Important linkages in the fiscal module consist of the simultaneous dependence of revenues of various levels of government and their expenditures. Non-tax receipts of governments have been made a function of the recurring expenditure on particular services via cost-recovery ratios. Similarly, the level of government expenditure is affected by the government's level of resource generation.

Important vertical links between levels of government include fiscal transfers in the form of divisible pool transfers and non-development grants (in line with the feasible level of decentralization) from provincial to local governments. The link between the budget deficits of the federal and provincial governments and their revenues and expenditures is obvious.

Forecasting and Policy Analysis Tool

Given the richness in structure and the complex web of interrelationships and interactions embodied within it, the ISPM model can be used first as a forecasting tool, both for the medium- and long-term, and, second, for undertaking policy simulations to analyze the consequences of particular policy actions by the federal or other levels of government.

For example, if the federal government decides to pursue a policy of higher tax mobilization and opts for a rigorous fiscal effort, the model can forecast the impact, not only on federal finances, but also

on the fiscal status of the provincial governments. In this scenario, it could also forecast key macroeconomic magnitudes such as growth in the gross domestic product and the inflation rate. With respect to other specific policy issues, the model can also:

o   provide projections of the quantum of revenue transfers to the provincial governments by the federal government, both short term and medium term, under different scenarios;

o   determine the impact of different rates and patterns of economic growth on provincial tax bases and revenues;

o   determine the impact of changes in provincial expenditure priorities on fiscal status, levels of service provision and the overall macroeconomy;

o   determine the impact of education expenditures by provincial governments on sectoral inputs (schools, teachers), enrolments, outputs, entry into the labour force and literacy rates;

o   determine the impact of health expenditures by provincial governments on sectoral inputs (beds, rural health centres, doctors, nurses, paramedics) and on the health status of the population;

o   determine the impact of higher levels of resource mobilization by provincial governments on federal transfers, sectoral levels of expenditure and fiscal status; and

o   determine the impact of SAP-type programmes on the level and quality of service provision and on the financial position of provincial governments.

Looking Ahead

The ISPM model is a rich and complex analytical tool for assessing the implications of wide-ranging economic, fiscal and social policy interventions. It was formally introduced to the Planning Commission of Pakistan in January 1997. It has contributed significantly to the development of various planning scenarios for the Ninth Plan. Its completion by the Social Policy and Development Centre is a first step in the evolutionary process of attempts to model and stylize the intricate real-world linkages and working of the Pakistan economy. Work continues on developing the ISPM model further.

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