THE IMPACT OF TRADE, TRADE POLICY AND EXTERNAL SHOCKS ON THE PHILIPPINE ECONOMY BASED ON THE PIDS-NEDA MACROECONOMETRIC MODEL

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by

Winnie M. Constantino and Josef T. Yap**

This report analyzes the impact of the external sector and of some economic policies on the Philippine economy based on the results of the simulations suggested for this year's Model Comparisons Workshop. The simulations were done using the latest version of the PIDS-NEDA Annual Macroeconometric Model for the Philippines.

This report also describes how the simulations were carried out and what adjustments and assumptions were made. To allow a better appreciation and understanding of the results, a brief

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The views expressed in this study are those of the authors and do not necessarily reflect those of the Institute.

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description of the model structure is presented with particular emphasis on the external sector and its linkages with the real and financial sectors.

The baseline solution and the simulations were done for the period 1980-1986. No constant adjustments were incorporated and so the estimated values are not the same as the actual values, although they are reasonably close to each other.

STRUCTURE OF THE MODEL

The PIDS-NEDA model of the Philippine economy consists of four blocks covering the: (1) real sector, which determines output, employment, prices, and wage; (2) government sector, which determines government revenues and the budget deficit (government expenditures are exogenous); (3) financial sector, which determines money supply and its components; and (4) the external sector, from which the current account balance is derived together with the balance of payments, given the exogenously determined capital flows.

Output is determined from the supply side. Equations are estimated for the different components of aggregate expenditure. A statistical discrepancy which is derived as a residual is allowed as a way of closing the model. The model allows for a feedback mechanism from the expenditure to the supply side and vice versa.

The volume of exports and imports are determined in the real sector block. Total merchandise exports in real terms is a

function of the GNP of the U.S., where more than 60 percent of Philippine exports go, and of raw material imports. A major portion of Philippine manufactured exports, namely garments and electronics, is highly affected by export prices and the exchange rate in the current version of the model[1/]. Merchandise exports accounted for 15.53 percent of GDP during the 1980-86 period, increasing its share from 15.65 percent of GDP in 1980 to 17.27 percent in 1986. Of total merchandise exports, manufactured commodities comprised at least 48 percent.

Merchandise imports are disaggregated into four categories: raw materials, fuel, capital goods, and other imports. These are determined mainly by peso import prices (fuel and non-fuel), GNP, as an activity variable, and the availability of foreign exchange financing which is indicated by international reserves. The availability of imports particularly of capital goods affect investments.

Equations for exports and imports of nonfactor services are estimated separately.

Real exports and imports are translated into their dollar values using appropriate price deflators and the relevant

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1/ Under the current work on the model, exports have been disaggregated into the following categories: coconut, sugar, garments, semiconductors, other agricultural exports and other manufactured exports. Export prices and the exchange rate have been found to significantly affect garments, semiconductors, and other agricultural exports. The recently estimated equations have not yet been incorporated in the present model being used.

implicit exchange rate. These values then enter the external sector or BOP block.

Changes in the balance of payments affect money supply or total liquidity through its effect on net foreign assets. The money supply is also affected by changes in the government budget deficit, interest rates, and nominal GNP. Money supply or total liquidity affects GNP through private consumption expenditures and private construction investment, where it enters as an indicator of credit availability.

An increase in money supply or total liquidity results in higher prices. Domestic prices also rise with higher peso import prices (dollar price multiplied by the exchange rate). Higher prices tend to reduce real GNP. With government expenditures being exogenously determined and unless this is increased accordingly, a higher inflation rate reduces the real value of government expenditures, thus exerting a downward impact on GDP.

Exchange rate, interest rates and dollar export and import prices are exogenous in the model.

ALTERNATIVE 1

The first set of simulations calls for an increase in exports of manufactures equivalent to 1 percent of GDP in the baseline.

One of the limitations of the model is that the aggregate treatment of exports does not allow a distinction between the impact of a change in manufactured exports and a change in non-

Alternative 1-A : Increase in Merchandise Exports Equivalent to One Percent of GDP

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
REAL OUTPUT VARIABLES									
GDP	Gross Domestic Product	0.82	0.91	1.13	1.25	1.43	1.63	1.69	1.27
XAGR	Value Added in Agriculture	0.05	0.04	0.02	0.03	0.03	0.03	0.04	0.03
XIND	Value Added in Manufacturing	2.52	2.63	3.24	3.33	3.58	4.10	4.05	3.35
IF	Gross Investment (Public & Private)	0.24	0.51	1.28	1.86	4.22	5.52	4.98	2.66
WAGES AND PRICES									
PDGDP	Implicit GDP Deflator	3.54	1.37	-0.81	-0.30	-0.97	-2.02	-1.22	-0.06
PCPI	Consumer Price Index	3.70	1.42	-0.84	-0.30	-1.00	-2.06	-1.24	-0.05
WRN	Nominal Wage Rate (index)	2.60	1.17	-0.44	-0.08	-0.68	-1.63	-0.96	0.00
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ECONOMIC INDICATORS									
NEMT	Total Employment	0.18	0.23	0.18	0.27	0.23	0.24	0.31	0.23
GOVERNMENT BUDGET									
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	2.67	1.76	0.85	1.03	0.88	0.29	0.61	1.16
BD	Budget deficit (nominal)	-14.87	-5.94	-2.00	-9.57	-3.55	-1.31	-1.17	-5.49
FINANCIAL VARIABLE									
FM1	M1	5.29	1.66	-1.59	-0.70	-1.08	-2.33	-1.10	0.02
BALANCE OF PAYMENTS AND FOREIGN DEBT									
Own currency (real):									
TE	Exports of Goods & Services	5.72	5.44	5.81	5.25	4.92	4.40	3.88	5.06
TEBM	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.66	6.56
TM	Imports of Goods and Services	1.38	1.52	1.83	1.84	2.59	3.10	3.07	2.19
TMBM	Imports of merchandise	1.56	1.72	2.13	2.17	2.92	3.40	3.32	2.46
TB	Trade Balance (Merchandise)	23.31	24.02	21.55	15.33	163.39	30.97	107.58	55.16
US dollars:									
TE$	Exports of Goods & Services	5.05	4.65	4.61	4.36	4.17	3.64	3.24	4.25
TEBM$	Exports of merchandise	7.05	6.92	7.31	6.90	6.24	5.85	5.65	6.56
TM$	Imports of Goods and Services	1.22	1.30	1.48	1.52	1.93	2.26	2.17	1.70
TMBM$	Imports of merchandise	1.56	1.72	2.13	2.17	2.92	3.40	3.32	2.46
TB$	Trade Balance (Merchandise)	12.88	11.04	7.30	7.72	18.62	22.33	333.53	59.06
TBPCA$	Current Account Balance	13.37	11.72	6.06	6.74	11.05	58.62	8.76	16.62
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

manufactured exports. The specified increase in manufactured exports was accommodated in the simulation by making a corresponding increase in the output of the manufacturing sector such that the statistical discrepancy (which is the difference between the sum of the sectoral output and the sum of the expenditure components of (GDP) remains as in the baseline solution. If no corresponding adjustment in the supply side is done, part of the increase in exports, which does not fully translate in higher output, is offset by an automatic adjustment of the statistical discrepancy in the opposite direction. This indicates some weakness in the model, which is still not able to fully capture the feedback from the expenditure side to the supply side.

Given the structure of the model, the impact of higher manufactured exports on GDP will consist of the direct effect through higher exports and output in manufacturing, and of the indirect effects -- working through the resulting changes in the money supply, prices, real interest rate (which will change due to a change in inflation, nominal interest rates are exogenous), and balance of payments and availability of foreign exchange to finance imports and investments.

An increase in exports will result in a more favorable balance of payments position, which in turn will increase the available foreign exchange to finance imports. Greater capacity to import will increase investments and therefore GDP growth.

Money supply can either expand or contract depending on the net impact of a higher BOP surplus (or a less BOP deficit) and of a lower budget deficit. In the model, an increase in real GNP and prices will reduce the budget deficit since government revenues will rise but government expenditures will remain constant. As indicated earlier, higher prices, however, will make the real value of these government expenditures lower, which in turn will make GDP lower than what it should be otherwise. Higher prices will also reduce the real rate of interest, which in turn will tend to increase investments and GDP.

The specified simulation under alternative 1A allows the normal operation of the model, which means that money supply and imports will be allowed to respond to the shock. However, since the exchange rate is exogenous, its value is the same in both the baseline and the shocked run.

The specified increase in exports results in an average increase of 1.27 percent in GDP over its baseline solution, with the impact increasing from 0.82 percent in the initial year to 1.69 percent in the seventh year. Much of this increase comes from an expansion in industrial output which averages 3.35 percent over the baseline solution for the period covered.

The current account and balance of payments positions improve. Both real imports and investments go up due mainly to higher GNP and to the greater availability of foreign exchange, by an average of 2.5 percent and 2.7 percent, respectively, over their baseline values.

Money supply increases in the first two years but declines thereafter. CPI moves in the same direction as the money supply. The decline in CPI in the latter years contributes to the rise in GDP due to its positive impact on real government expenditures.

Under alternative 1B, imports and money supply are restricted to their baseline values. This results in an average increase in GDP of 1.33 percent over the baseline solution and in a very minimal increase in prices over the whole period covered. The increase in GDP in the first four years is higher under this scenario than that under alternative 1A. This is again due to the impact of lower inflation on real government expenditures. In the succeeding years, the increase in GDP is less under alternative 1B due to lower investments, which in turn is due to import and money supply restrictions.

Alternative 1B results in a more favorable BOP and current account improvement than alternative 1A.

Alternative 1C involves a money supply response but with imports remaining restricted to its baseline values. This results in an increase in GDP, averaging 1.23 percent per year, increasing from 0.99 percent in 1980 to 1.39 percent in 1986. This increase, however, is lower than the GDP increase in alternative 1B due mainly to inflation, which is higher in 1C due to the positive money supply response. Real government expenditures are therefore lower under this scenario. Total investments are also lower, and they actually decline during the

Alternative 1-B : Increased Exports with Money Supply, Import Restrictions and Exchange Rate at Baseline Values

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE 80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	1.12	1.22	1.25	1.33	1.41	1.46	1.53	1.33
XAGR	Value Added in Agriculture	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.03
XIND	Value Added in Manufacturing	4.27	4.33	4.37	4.49	4.91	4.83	4.94	4.59
IF	Gross Investment (Public & Private)	0.13	0.16	0.16	0.22	0.44	0.53	0.52	0.31
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	0.20	0.28	0.30	0.29	0.40	0.32	0.05	0.26
PCPI	Consumer Price Index	0.21	0.29	0.31	0.30	0.36	0.33	0.05	0.26
WRN	Nominal Wage Rate (index)	0.29	0.36	0.39	0.40	0.43	0.38	0.14	0.34
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEMT	Total Employment	0.17	0.21	0.22	0.29	0.26	0.25	0.27	0.24
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	0.69	0.78	0.83	0.80	0.81	0.73	0.63	0.75
BD	Budget deficit (nominal)	-3.86	-2.63	-1.95	-7.44	-3.25	-3.26	-1.21	-3.37
	FINANCIAL VARIABLES								
FM1	M1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BALANCE OF-PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	5.72	5.44	5.81	5.25	4.92	4.40	3.88	5.06
TEBM	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.66	6.56
TM	Imports of Goods and Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TMBM	Imports of merchandise	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TB	Trade Balance (Merchandise)	31.91	34.30	33.41	25.52	312.91	65.91	252.81	108.11
US dollars:									
TE$	Exports of Goods & Services	5.04	4.65	4.61	4.36	4.17	3.64	3.24	4.25
TEBM$	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.65	6.56
TM$	Imports of Goods and Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TMBM$	Imports of merchandise	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TB$	Trade Balance (Merchandise)	18.47	17.01	13.30	14.42	40.50	61.51	801.38	138.09
TBPCA$	Current Account Balance	19.57	18.45	11.41	13.04	25.22	173.55	22.29	40.51
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alternative 1-C : Increase in Exports with Money Supply Response

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUPUT VARIABLES								
GDP	Gross Domestic Product	0.99	1.01	1.14	1.29	1.38	1.41	1.39	1.23
XAGR	Value Added in Agriculture	0.07	0.07	0.05	0.06	0.07	0.07	0.07	0.07
XIND	Value Added in Manufacturing	3.18	3.35	3.94	4.39	4.76	4.67	4.67	4.14
IF	Gross Investment (Public & Private)	-0.03	-0.29	-0.08	0.14	0.33	0.30	0.34	0.10
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	5.65	2.94	0.79	0.88	1.46	0.15	-0.64	1.60
PCPI	Consumer Price Index	5.91	3.05	0.82	0.90	1.49	0.16	-0.65	1.67
WRN	Nominal Wage Rate (index)	4.09	2.32	0.72	0.83	1.32	0.22	-0.48	1.29
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEMT	Total Employment	0.21	0.25	0.20	0.22	0.24	0.21	0.20	0.22
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	3.40	2.21	1.12	1.14	1.45	0.65	0.16	1.45
BD	Budget deficit (nominal)	-18.90	-7.44	-2.63	-10.56	-5.83	-2.90	-0.30	-6.94
	FINANCIAL VARIABLES								
FM1	M1	8.55	3.92	0.74	0.81	1.43	-0.19	-1.04	2.03
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	5.72	5.44	5.81	5.25	4.92	4.40	3.88	5.06
TEBM	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.66	6.56
TM	Imports of Goods and Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TMBM	Imports of merchandise	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TB	Trade Balance (Merchandise)	31.91	34.30	33.41	25.52	312.91	65.91	252.81	108.11
US dollars:									
TE$	Exports of Goods & Services	5.04	4.65	4.61	4.36	4.17	3.64	3.24	4.25
TEBM$	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.65	6.56
TM$	Imports of Goods and Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TMBM$	Imports of merchandise	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TB$	Trade Balance (Merchandise)	18.47	17.01	13.30	14.42	40.50	61.51	801.38	138.09
TBPCA$	Current Account Balance	19.57	18.50	11.41	13.04	25.22	173.55	22.29	40.51
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

first three years of the simulation period. With imports restricted, private investments show only a slight increase.

Under alternative 1D, the exchange rate is reduced by an average of 4.2 percent over its baseline values, in response to an improvement in the current account balance. This reduces the inflationary impact of higher money supply. Prices under this scenario increase by an average of only 0.3 percent over the baseline values as against an increase of 1.6 percent under alternative 1C. The lower inflation adds to the positive impact of higher exports in GDP. GDP under this run increases by an average of 1.85 percent over the baseline values, with its impact rising from 1.11 percent in 1980 to 2.58 percent in 1986. This is the highest GDP increase among all the first set of simulations.

Alternative 1E, which assumes an easing of import restrictions, pushes up GDP by an average of 1.5 percent, rising from 0.69 percent in 1980 to 1.94 percent in 1986. Due to eased import restrictions, investments are higher. Prices are lower because of the lower exchange rate and the absence of an inflationary impact from the BOP side (there is no improvement in the BOP because of the corresponding adjustment in imports). In spite of the lower inflation and larger increase in investments, the increase in GDP is less than in the previous simulation (1D). The lower money supply is contributing to this.

Comparing all the simulations, the positive impact of higher exports on GDP is greatest under alternative 1D, where money

Alternative 1-D : Increase in Exports with Money Supply and Exchange Rate Response

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	1.11	1.22	1.48	1.90	2.16	2.49	2.58	1.85
XAGR	Value Added in Agriculture	0.07	0.07	0.07	0.09	0.10	0.10	0.13	0.09
XIND	Value Added in Manufacturing	3.37	3.70	4.48	5.47	6.85	7.91	8.10	5.70
IF	Gross Investment (Public & Private)	0.17	0.06	0.47	1.11	1.93	2.31	2.08	1.16
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	5.27	2.52	0.85	0.30	-1.20	-4.23	-1.40	0.30
PCPI	Consumer Price Index	5.51	2.62	0.89	0.31	-1.23	-4.31	-1.43	0.34
WRN	Nominal Wage Rate (index)	3.84	2.05	0.83	0.48	-0.82	-3.51	-1.08	0.26
REXN	Nominal Exchange Rate (per US $)	-1.78	-2.20	-3.31	-5.48	-4.44	-4.69	-2.08	-3.43
	ECONOMIC INDICATORS								
NEMT	Total Employment	0.23	0.29	0.27	0.40	0.32	0.29	0.41	0.32
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	2.78	1.48	0.40	-0.45	-1.03	-2.72	-0.47	0.00
BD	Budget deficit (nominal)	-15.45	-4.99	-0.93	4.21	4.15	12.10	0.90	0.00
	FINANCIAL VARIABLES								
FM1	M1	9.48	5.13	3.54	4.55	1.73	-1.59	-0.20	3.23
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	5.72	5.44	5.81	5.25	4.92	4.40	3.88	5.06
TEBM	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.66	6.56
TM	Imports of Goods and Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TMBM	Imports of merchandise	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TB	Trade Balance (Merchandise)	31.91	34.30	33.41	25.52	312.91	65.91	252.81	108.11
US dollars:									
TE$	Exports of Goods & Services	5.03	4.64	4.60	4.35	4.16	3.64	3.23	4.24
TEBM$	Exports of merchandise	7.01	6.90	7.29	6.87	6.23	5.84	5.65	6.54
TM$	Imports of Goods and Services	-0.06	-0.07	-0.09	-0.13	-0.07	-0.06	-0.02	-0.07
TMBM$	Imports of merchandise	-0.07	-0.10	-0.14	-0.18	-0.10	-0.09	-0.04	-0.10
TB$	Trade Balance (Merchandise)	18.71	17.30	13.65	14.93	41.17	62.49	806.07	139.19
TBPCA$	Current Account Balance	19.84	18.78	11.72	13.52	25.65	176.43	22.43	41.20

Alternative 1-E : Increase in Exports with Money Supply and Exchange Rate Response with Eased Import Restrictions

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	0.69	1.13	1.41	1.62	1.77	2.07	1.94	1.52
XAGR	Value Added in Agriculture	-0.01	-0.01	0.01	0.03	0.03	0.03	0.07	0.02
XIND	Value Added in Manufacturing	1.30	2.16	2.65	2.70	3.77	4.87	4.17	3.09
IF	Gross Investment (Public & Private)	1.51	2.61	3.21	3.83	5.91	6.23	5.12	4.06
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	-1.31	-1.40	-1.16	-1.40	-3.76	-5.75	-2.01	-2.40
PCPI	Consumer Price Index	-1.37	-1.45	-1.20	-1.44	-3.85	-5.86	-2.04	-2.46
WRN	Nominal Wage Rate (index)	-0.82	-0.84	-0.61	-0.81	-2.92	-4.82	-1.61	-1.78
REXN	Nominal Exchange Rate (per US $)	-1.78	-2.20	-3.31	-5.48	-4.44	-4.69	-2.08	-3.43
	ECONOMIC INDICATORS								
NEHT	Total Employment	0.10	0.23	0.29	0.50	0.31	0.29	0.41	0.30
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	0.56	0.51	0.48	-0.32	-1.25	-2.51	0.12	-0.34
BD	Budget deficit (nominal)	-3.14	-1.73	-1.13	2.99	5.04	11.17	-0.23	1.85
	FINANCIAL VARIABLES								
FM1	M1	-0.81	-0.58	0.72	2.39	-1.06	-2.81	-0.10	-0.32
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	5.72	5.44	5.81	5.25	4.92	4.40	3.88	5.06
TEBM	Exports of merchandise	7.03	6.92	7.31	6.90	6.24	5.85	5.66	6.56
TM	Imports of Goods and Services	4.38	4.24	4.04	4.01	4.68	4.82	5.12	4.47
TMBM	Imports of merchandise	4.96	4.82	4.70	4.73	5.29	5.29	5.55	5.05
TB	Trade Balance (Merchandise)	4.45	5.61	7.22	3.27	42.36	11.59	10.27	12.11
US dollars:									
TE$	Exports of Goods & Services	5.03	4.64	4.60	4.35	4.16	3.64	3.23	4.24
TEBM$	Exports of merchandise	7.01	6.90	7.29	6.87	6.23	5.84	5.65	6.54
TM$	Imports of Goods and Services	3.81	3.55	3.16	3.17	3.42	3.45	3.60	3.45
TMBM$	Imports of merchandise	4.88	4.72	4.56	4.54	5.19	5.19	5.51	4.94
TB$	Trade Balance (Merchandise)	0.74	0.66	0.41	0.32	1.60	1.62	25.02	4.34
TBPCA$	Current Account Balance	0.05	0.01	-0.08	-0.21	0.04	-2.11	-0.16	-0.35
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

supply and the exchange rate are allowed to respond but imports are restricted. (Please see summary table below.) This scenario has the highest money supply but its price increase is very minimal due to the downward impact of the lower exchange rate. GDP benefits from a high money supply and at the same time, a low inflation.

A SUMMARY OF THE SIMULATION RESULTS UNDER ALTERNATIVE 1
(Average Percent Change from Baseline)

	A	B	C	D	E
GDP	1.27	1.33	1.23	1.85	1.52
Fixed Investment	2.66	0.31	0.10	1.16	4.06
GDP Deflator	-0.06	0.26	1.60	0.30	-2.40
Money Supply (M1)	0.02	1.21	2.03	3.23	0.32

The next highest impact on GDP is obtained under alternative 1E where all the variables, including the exchange rate are allowed to respond. This scenario has the lowest inflation and the largest increase in investment.

On the other hand, the lowest impact on GDP is obtained under alternative 1C where imports and the exchange rate are restricted but money supply is allowed to respond. This scenario has the highest inflation and the lowest increase in investment.

ALTERNATIVE 2

In this set of simulation exercises, the impact on the domestic economy of changes in the world economic environment is measured. Alternative 2A assumes a growth in the world economy of 1 percent more per year over the baseline figures. In the

Alternative 2-A : Additional One Percent Growth Rate in World Economy

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLE								
GDP	Gross Domestic Product	0.15	0.17	0.23	0.25	0.30	0.35	0.35	0.26
XAGR	Value Added in Agriculture	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01
XIND	Value Added in Manufacturing	0.43	0.50	0.67	0.67	0.76	0.82	0.80	0.66
IF	Gross Investment (Public & Private)	0.03	0.08	0.25	0.37	0.86	1.13	1.02	0.54
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	0.76	0.27	-0.16	-0.08	-0.12	-0.18	-0.12	0.05
PCPI	Consumer Price Index	0.80	0.28	-0.17	-0.08	-0.12	-0.18	-0.12	0.06
WRN	Nominal Wage Rate (index)	0.56	0.23	-0.09	-0.03	-0.07	-0.13	-0.09	0.06
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEHT	Total Employment	0.04	0.05	0.04	0.05	0.05	0.06	0.07	0.05
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	0.55	0.35	0.17	0.20	0.25	0.21	0.21	0.28
BD	Budget deficit (nominal)	-3.07	-1.17	-0.40	-1.84	-0.99	-0.93	-0.41	-1.26
	FINANCIAL VARIABLES								
FM1	M1	1.13	0.26	-0.32	-0.16	-0.12	-0.35	-0.14	0.04
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	1.18	1.08	1.18	1.05	1.10	1.08	0.98	1.09
TEBM	Exports of merchandise	1.45	1.38	1.48	1.38	1.39	1.44	1.43	1.42
TM	Imports of Goods and Services	0.27	0.30	0.37	0.37	0.56	0.68	0.65	0.46
TMBM	Imports of merchandise	0.30	0.34	0.43	0.44	0.64	0.75	0.70	0.51
TB	Trade Balance (Merchandise)	4.91	4.77	4.40	3.05	36.99	8.59	33.37	13.73
US dollars:									
TE$	Exports of Goods & Services	1.04	0.93	0.94	0.87	0.93	0.90	0.82	0.92
TEBM$	Exports of merchandise	1.45	1.38	1.48	1.38	1.39	1.44	1.43	1.42
TM$	Imports of Goods and Services	0.24	0.26	0.30	0.31	0.42	0.50	0.46	0.35
TMBM$	Imports of merchandise	0.30	0.34	0.43	0.44	0.64	0.75	0.70	0.51
TB$	Trade Balance (Merchandise)	2.71	2.19	1.49	1.53	4.25	6.57	103.86	17.52
TBPCA$	Current Account Balance	2.83	2.33	1.24	1.33	2.53	17.59	2.78	4.38
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

context of the PIDS-NEDA model, this is equivalent to increasing the Gross National Product of the United States (GNPUS), which appears as an explanatory variable in the equation for merchandise exports.

An increase of 1 percent in the growth rate of GNPUS translates into an average increase of 1.42 percent over the baseline solution for merchandise exports for the period 1980-86. This, of course, results in an improvement in GDP but at a more modest level of 0.26 percent since merchandise exports comprise only about 15.53 percent of GDP. Because of the nature of the manual adjustments made, the industrial sector absorbs much of the increase in GDP. This is consistent, however, with the fact that manufactured exports have a greater income elasticity as compared to primary commodity exports.

The rise in exports leads to an improvement in the current account which in turn results in an expansion in the money supply. The additional liquidity in the system causes prices to rise in the initial years. There is a countervailing effect though as the improvement in the budget deficit, due to increased revenues, causes a contraction in the money supply. The latter effect dominates in the last five years and consequently prices decline during this period. The fall in prices increases the real value of government expenditures and this can be observed in the discrete jump in the percent change in GDP from 1981 to 1982.

In Alternative 2B the rise in merchandise exports is matched with a rise in merchandise imports to maintain the current

Alternative 2-B : Additional One Percent Growth Rate in World Economy with Eased Import Restrictions

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLE								
GDP	Gross Domestic Product	0.03	0.07	-0.06	-0.02	0.01	0.09	0.11	0.03
XAGR	Value Added in Agriculture	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00
XIND	Value Added in Manufacturing	0.07	0.18	-0.02	-0.11	0.20	0.36	0.40	0.15
IF	Gross Investment (Public & Private)	0.09	0.09	-0.52	-0.11	0.23	0.20	0.34	0.05
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	-0.31	-0.10	0.01	-0.04	-0.28	-0.15	0.18	-0.10
PCPI	Consumer Price Index	-0.32	-0.10	0.01	-0.04	-0.29	-0.16	0.19	-0.10
WRN	Nominal Wage Rate (index)	-0.21	-0.06	0.00	-0.03	-0.23	-0.13	0.16	-0.07
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEHT	Total Employment	0.00	0.01	-0.01	0.00	0.00	0.01	0.01	0.00
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	0.15	0.22	0.22	0.14	0.05	0.20	0.33	0.19
BD	Budget deficit (nominal)	-0.82	-0.74	-0.52	-1.30	-0.22	-0.87	-0.64	-0.73
	FINANCIAL VARIABLES								
FM1	M1	-0.48	-0.20	-0.05	-0.11	-0.44	-0.35	0.04	-0.23
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	1.08	1.04	1.25	0.79	0.67	0.89	0.76	0.93
TEBM	Exports of merchandise	1.33	1.32	1.58	1.04	0.85	1.18	1.12	1.20
TM	Imports of Goods and Services	0.89	0.77	0.74	0.50	0.68	0.93	0.76	0.75
TMBM	Imports of merchandise	1.01	0.88	0.86	0.59	0.77	1.02	0.83	0.85
TB	Trade Balance (Merchandise)	0.45	1.32	2.42	1.06	3.38	2.81	13.68	3.59
US dollars:									
TE$	Exports of Goods & Services	0.95	0.89	1.00	0.66	0.57	0.74	0.64	0.78
TEBM$	Exports of merchandise	1.33	1.32	1.58	1.04	0.85	1.18	1.11	1.20
TM$	Imports of Goods and Services	0.79	0.66	0.60	0.41	0.51	0.68	0.54	0.60
TMBM$	Imports of merchandise	1.01	0.88	0.86	0.59	0.77	1.02	0.83	0.85
TB$	Trade Balance (Merchandise)	-0.17	0.21	0.44	0.33	-0.21	0.64	41.13	6.06
TBPCA$	Current Account Balance	0.33	0.10	0.30	0.24	-0.27	0.50	1.02	0.32
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

account balance at the baseline level. The movements in the majority of variables are negligible except of course for the export and import variables and for blips due to approximation errors. The slight change in total revenues, however, is significant because of the increase in tariff revenues.

Alternative 2C involves a 10 percent increase in the prices of primary traded commodities. Since primary commodity exports and imports are not modelled separately in the PIDS-NEDA model, the export and import price indices were increased by 10 percent multiplied by the share of primary products to total exports and total imports, respectively.

The increase in the prices of traded commodities has very little effect on the level of real peso exports which can be attributed to the absence of a price variable in the export equation. Real peso imports decline as expected but the average change is only -0.5 percent which reflects the price inelasticity of the demand for imports. It is worth noting that the effect on the dollar values of the trade variables is greater relative to the peso values and the effect is in the opposite direction (which follows from the low or zero price elasticities). In general, the increase in dollar exports is greater than the increase in dollar imports, hence the improvement in the current account. The latter should cause money supply to rise by adding to the net foreign assets of the Central Bank. While this is true for the first year, the countervailing effect of the improvement of the budget deficit dominates again in the later

Alternative 2-C : Ten Percent Increase in Prices of Traded Primary Commodities

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	-0.19	-0.28	-0.25	-0.30	-0.40	-0.47	-0.59	-0.35
XAGR	Value Added in Agriculture	-0.37	-0.32	-0.29	-0.27	-0.26	-0.19	-0.21	-0.27
XIND	Value Added in Manufacturing	0.15	-0.02	0.22	-0.05	-0.49	-0.81	-1.12	-0.30
IF	Gross Investment (Public & Private)	-0.45	-0.65	-0.50	-0.44	-0.76	-0.94	-0.98	-0.67
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	2.30	1.03	-0.34	0.47	1.05	0.98	1.42	0.99
PCPI	Consumer Price Index	2.41	1.07	-0.35	0.49	1.07	1.00	1.45	1.02
WRN	Nominal Wage Rate (index)	1.53	0.66	-0.37	0.24	0.77	0.78	1.18	0.69
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEMT	Total Employment	-0.07	-0.11	-0.16	-0.23	-0.17	-0.15	-0.18	-0.15
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	1.94	1.27	0.56	0.99	1.32	1.13	1.35	1.22
BD	Budget deficit (nominal)	-10.78	-4.27	-1.31	-9.17	-5.29	-5.03	-2.59	-5.49
	FINANCIAL VARIABLES								
FM1	M1	1.28	-0.82	-2.70	-1.55	-1.06	-1.39	-0.96	-1.03
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	0.04	-0.03	-0.04	-0.03	-0.05	-0.09	-0.11	-0.04
TEBM	Exports of merchandise	-0.06	-0.13	-0.13	-0.13	-0.14	-0.18	-0.22	-0.14
TM	Imports of Goods and Services	-0.37	-0.49	-0.53	-0.41	-0.49	-0.66	-0.54	-0.50
TMBM	Imports of merchandise	-0.42	-0.55	-0.62	-0.49	-0.55	-0.72	-0.58	-0.56
TB	Trade Balance (Merchandise)	2.04	2.64	2.87	1.80	21.06	5.39	15.62	7.34
US dollars:									
TE$	Exports of Goods & Services	4.64	3.84	3.24	3.22	2.87	2.39	2.19	3.20
TEBM$	Exports of merchandise	6.48	5.71	5.14	5.09	4.30	3.84	3.83	4.91
TM$	Imports of Goods and Services	2.40	2.20	1.98	2.09	1.93	1.83	1.89	2.05
TMBM$	Imports of merchandise	3.07	2.93	2.86	3.00	2.93	2.75	2.90	2.92
TB$	Trade Balance (Merchandise)	5.89	3.91	1.29	1.38	5.99	8.71	134.82	23.14
TBPCA$	Current Account Balance	5.78	3.81	0.83	0.91	3.19	21.04	3.30	5.55
FDEBT	Foreign Debt, end of year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

years. Similar to Alternative 2A, increased revenues account for this decline in the budget deficit and the sources for this increase can be traced to higher tariff collections and higher nominal GDP. The increase in nominal GDP implies that the percentage increase in the general price level is greater than the percentage decrease in real GDP.

The rise in the general price level is another important consequence of higher import prices. The year 1983 is an exception though as it is during this time that the drop in money supply is the greatest at 2.7 percent. The increase in the price level has a depressing effect on GDP.

ALTERNATIVE 3

A 10 percent devaluation of the exchange rate has stagflationary effects on the domestic economy. The contraction in GDP is more severe in the case when there is no money supply response. This is directly related to the higher price level in alternative 3A, which can be explained as follows.

The devaluation leads to an improvement in the current account which has a positive effect on money supply. This increase, however, is more than offset by a downward push due to an improvement in the budget deficit which as usual results from increased revenue collections which in turn is caused by a higher nominal GDP. The net decline in money supply has a simultaneous negative effect on the price level. If this negative effect is not allowed to operate (i.e., there is no money supply response) the price level should then be higher. The difference can be

Alternative 3-A : Ten Percent Exchange Rate Devaluation Without Money Supply Response

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	-0.64	-1.06	-1.38	-1.67	-1.88	-2.23	-2.59	-1.62
XAGR	Value Added in Agriculture	0.04	0.03	0.01	-0.02	-0.05	-0.08	-0.11	-0.03
XIND	Value Added in Manufacturing	-1.26	-2.24	-2.95	-3.38	-4.33	-5.42	-6.35	-3.70
IF	Gross Investment (Public & Private)	-1.15	-1.97	-2.53	-2.74	-4.98	-5.72	-5.25	-3.48
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	4.95	5.22	5.21	5.68	6.41	7.21	7.30	6.00
PCPI	Consumer Price Index	5.18	5.43	5.43	5.84	6.57	7.35	7.42	6.17
WRN	Nominal Wage Rate (index)	3.37	3.66	3.60	4.19	5.06	5.99	6.17	4.58
REXN	Nominal Exchange Rate (per US $)	10.00	10.00	10.00	10.00	10.00	10.00	10.09	10.01
	ECONOMIC INDICATORS								
NEMT	Total Employment	-0.06	-0.16	-0.20	-0.52	-0.40	-0.48	-0.67	-0.36
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	4.64	4.63	4.30	4.81	5.09	5.16	5.22	4.84
BD	Budget deficit (nominal)	-25.83	-15.62	-10.09	-44.64	-20.47	-22.97	-10.03	-21.38
	FINANCIAL VARIABLES								
FM1	M1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	-0.32	-0.47	-0.67	-0.64	-0.78	-0.80	-0.79	-0.64
TEBM	Exports of merchandise	-0.39	-0.60	-0.85	-0.83	-1.00	-1.07	-1.15	-0.84
TM	Imports of Goods and Services	-0.88	-1.27	-1.64	-1.58	-2.17	-2.50	-2.58	-1.80
TMBM	Imports of merchandise	-0.99	-1.44	-1.91	-1.87	-2.46	-2.75	-2.80	-2.03
TB	Trade Balance (Merchandise)	3.73	5.62	6.75	5.69	75.64	16.17	70.77	26.34
US dollars:									
TE$	Exports of Goods & Services	-0.23	-0.37	-0.50	-0.51	-0.65	-0.65	-46.58	-7.07
TEBM$	Exports of merchandise	-0.32	-0.54	-0.80	-0.80	-0.97	-1.05	-1.14	-0.80
TM$	Imports of Goods and Services	-0.48	-0.80	-1.07	-1.11	-1.49	-38.54	-52.45	-13.70
TMBM$	Imports of merchandise	-0.61	-1.06	-1.55	-1.59	-2.27	-2.58	-2.64	-1.76
TB$	Trade Balance (Merchandise)	1.36	2.34	2.92	3.23	10.67	18.64	210.44	35.66
TBPCA$	Current Account Balance	1.53	2.70	2.65	3.09	7.06	55.92	6.26	11.32

Alternative 3-B : Ten Percent Exchange Rate Devaluation with Money Supply Response

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	-0.46	-0.83	-0.99	-1.22	-1.69	-2.30	-2.70	-1.46
XAGR	Value Added in Agriculture	0.01	-0.01	-0.05	-0.08	-0.08	-0.07	-0.13	-0.06
XIND	Value Added in Manufacturing	-0.37	-1.31	-1.43	-2.01	-4.13	-6.30	-6.61	-3.16
IF	Gross Investment (Public & Private)	-0.90	-1.42	-1.68	-1.98	-3.83	-5.30	-5.81	-2.99
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	2.08	2.35	0.96	1.71	6.57	10.64	6.12	4.35
PCPI	Consumer Price Index	2.18	2.45	1.00	1.76	6.73	10.85	6.23	4.46
WRN	Nominal Wage Rate (index)	1.39	1.59	0.52	1.10	5.27	9.00	5.16	3.43
REXN	Nominal Exchange Rate (per US $)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	ECONOMIC INDICATORS								
NEHT	Total Employment	-0.06	-0.15	-0.22	-0.43	-0.25	-0.35	-0.60	-0.29
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	3.30	3.22	2.26	2.68	5.25	7.14	4.49	4.05
BD	Budget deficit (nominal)	-18.33	-10.85	-5.31	-24.87	-21.12	-31.80	-8.63	-17.27
	FINANCIAL VARIABLES								
FM1	M1	-4.21	-4.08	-5.81	-4.91	0.23	3.87	-1.24	-2.31
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	-0.27	-0.41	-0.55	-0.57	-0.69	-0.76	-0.86	-0.59
TEBM	Exports of merchandise	-0.33	-0.52	-0.69	-0.75	-0.87	-1.02	-1.25	-0.77
TM	Imports of Goods and Services	-0.84	-1.17	-1.57	-1.52	-1.90	-2.29	-2.80	-1.73
TMBM	Imports of merchandise	-0.95	-1.33	-1.83	-1.79	-2.14	-2.51	-3.04	-1.94
TB	Trade Balance (Merchandise)	3.75	5.32	7.05	5.67	65.76	14.34	77.16	25.58
US dollars:									
TE$	Exports of Goods & Services	-0.19	-0.31	-0.40	-0.45	-0.57	-0.62	-0.70	-0.46
TEBM$	Exports of merchandise	-0.27	-0.46	-0.64	-0.71	-0.85	-1.00	-1.23	-0.74
TM$	Imports of Goods and Services	-0.44	-0.71	-1.02	-1.06	-1.29	-1.56	-1.88	-1.14
TMBM$	Imports of merchandise	-0.56	-0.95	-1.47	-1.51	-1.95	-2.34	-2.88	-1.67
TB$	Trade Balance (Merchandise)	1.35	2.14	2.99	3.18	9.11	16.48	231.27	38.07
TBPCA$	Current Account Balance	1.51	2.46	2.70	3.04	6.03	49.50	6.88	10.30

observed when comparing 3A and 3B. It should be noted that in both cases the price level is higher than the baseline solution as a result of the increase in import prices. The upward movement in the price level causes a reduction in the real value of government expenditures which is the primary cause of the decline in GDP.

The stagflationary effect of a devaluation has been a topic of theoretical interest for several authors notably Krugman and Taylor, van Wijnbergen, and Rivera-Batiz.

ALTERNATIVE 4

In Alternative 4A, it is assumed that the government provides a subsidy to exporters. In the model this is interpreted to be equivalent to a 10 percent rise in merchandise exports accompanied by an increase in nominal government operating expenditures equal to the change in exports multiplied by the implicit export price deflator.

The immediate effect of this policy alternative is an increase in GDP accompanied by a deterioration in the budget deficit. The latter leads to an expansion in money supply which in turn translates into a large increase in the price level (an average of close to 10 percent over the 7 year simulation period). The upward movement in money supply is further fueled by the increase in foreign reserves which is a result of the improvement in the current account due to the increase in exports. The percentage increase in GDP in alternative 4C is

Alternative 4-A : Export Subsidy

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	0.91	0.77	0.83	1.24	1.42	1.55	1.63	1.19
XAGR	Value Added in Agriculture	0.15	0.18	0.18	0.18	0.22	0.24	0.23	0.20
XIND	Value Added in Manufacturing	1.74	1.26	1.44	2.66	2.51	2.52	2.83	2.14
IF	Gross Investment (Public & Private)	-0.06	-0.64	-0.01	1.11	3.45	4.61	4.01	1.78
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	13.49	10.97	7.72	7.18	10.52	10.78	8.33	9.86
PCPI	Consumer Price Index	14.12	11.40	8.03	7.38	10.78	10.99	8.48	10.17
WRN	Nominal Wage Rate (index)	9.47	8.13	5.77	5.80	8.82	9.38	7.38	7.82
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEHT	Total Employment	0.15	0.24	0.27	0.20	0.32	0.26	0.11	0.22
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	10.01	8.87	7.45	9.93	11.76	11.13	9.08	9.75
TX	Total Taxes & Receipts (nominal)	7.99	7.15	5.59	5.71	8.38	8.36	7.17	7.19
BD	Budget deficit (nominal)	21.25	14.69	11.83	49.08	25.31	23.49	12.73	22.63
	FINANCIAL VARIABLES								
FM1	M1	21.31	16.24	11.24	9.32	13.05	12.56	9.71	13.35
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	8.13	7.86	7.95	7.61	7.89	7.51	6.87	7.69
TEBM	Exports of merchandise	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
TM	Imports of Goods and Services	2.00	1.99	2.35	2.54	4.28	4.61	4.07	3.12
TMBM	Imports of merchandise	2.26	2.26	2.74	3.00	4.84	5.07	4.41	3.51
TB	Trade Balance (Merchandise)	32.89	36.10	30.46	22.89	253.98	60.65	254.23	98.74
US dollars:									
TE$	Exports of Goods & Services	7.17	6.73	6.31	6.33	6.68	6.23	5.72	6.45
TEBM$	Exports of merchandise	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
TM$	Imports of Goods and Services	1.77	1.70	1.90	2.10	3.19	3.37	2.88	2.41
TMBM$	Imports of merchandise	2.26	2.26	2.74	3.00	4.84	5.07	4.41	3.51
TB$	Trade Balance (Merchandise)	18.09	16.77	10.48	11.63	28.67	46.81	796.26	132.67
TBPCA$	Current Account Balance	18.83	17.85	8.73	10.19	16.96	125.57	21.47	31.37

smaller than that of Alternative 1A (1.19 percent versus 1.27 percent) despite the larger increase in merchandise exports in the former case. This result can be traced to the higher price level in Alternative 4C which, not unlike the previous exercises, exerts a downward impact on real government expenditures.

The effect of an imposition of tariffs on imports of manufactures is simulated in Alternative 4B. Since the model has no explicit variable on import duties, the peso import price index was reduced by 10 percent multiplied by the share of manufactured imports to total merchandise imports. Unlike the case of Alternative 2C, however, adjustments had to be made such that the dollar import price index was left unaffected.

An increase in import prices due to the imposition of tariffs elicits only a small response in import demand, which is enough though to improve the current account. A similar result was obtained in Alternative 2C. However, in this case the higher import prices lead to an unequivocal rise in the domestic price level. Consequently, there is a reduction in the real value of government expenditures and this leads to a fall in GDP. The latter is exacerbated by the decline in investment expenditures which is caused mainly by the decrease in imports of capital goods and a contraction in the supply of liquidity.

Alternative 4C involves a direct reduction in the volume of manufactured imports. This has a minimal effect on exports as the latter relies more heavily on imports of raw materials. Investment expenditures, however, which depend on imports of

Alternative 4-B : Increase in Tariff Rates by Ten Percent

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	-0.35	-0.64	-0.75	-0.86	-0.98	-1.13	-1.32	-0.86
XAGR	Value Added in Agriculture	0.01	0.00	-0.02	-0.04	-0.06	-0.07	-0.09	-0.04
XIND	Value Added in Manufacturing	-0.46	-1.18	-1.35	-1.62	-2.08	-2.52	-2.93	-1.73
IF	Gross Investment (Public & Private)	-0.79	-1.27	-1.47	-1.54	-2.57	-2.86	-2.74	-1.89
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	1.88	1.85	1.44	1.78	1.79	2.20	2.60	1.93
PCPI	Consumer Price Index	1.96	1.93	1.49	1.83	1.83	2.24	2.65	1.99
WRN	Nominal Wage Rate (index)	1.27	1.26	0.93	1.24	1.35	1.79	2.18	1.43
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEHT	Total Employment	-0.04	-0.11	-0.14	-0.27	-0.22	-0.23	-0.30	-0.19
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	2.39	2.23	1.96	2.20	2.23	2.18	2.31	2.21
BD	Budget deficit (nominal)	-13.29	-7.54	-4.60	-20.36	-8.96	-9.71	-4.43	-9.84
	FINANCIAL VARIABLES								
FM1	M1	-1.55	-1.70	-2.21	-1.93	-2.36	-2.31	-1.96	-2.00
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	-0.13	-0.25	-0.30	-0.32	-0.33	-0.35	-0.36	-0.29
TEBM	Exports of merchandise	-0.16	-0.31	-0.38	-0.42	-0.42	-0.46	-0.52	-0.38
TM	Imports of Goods and Services	-0.60	-0.81	-0.87	-0.84	-0.99	-1.26	-1.33	-0.96
TMBM	Imports of merchandise	-0.68	-0.92	-1.01	-0.99	-1.12	-1.39	-1.45	-1.08
TB	Trade Balance (Merchandise)	3.02	3.95	3.93	3.07	36.50	9.07	39.76	14.18
US dollars:									
TE$	Exports of Goods & Services	-0.12	-0.21	-0.24	-0.27	-0.28	-0.29	-0.30	-0.24
TEBM$	Exports of merchandise	-0.16	-0.31	-0.38	-0.43	-0.41	-0.46	-0.53	-0.38
TM$	Imports of Goods and Services	-0.53	-0.69	-0.70	-0.69	-0.74	-0.92	-0.94	-0.75
TMBM$	Imports of merchandise	-0.68	-0.92	-1.01	-0.99	-1.12	-1.39	-1.45	-1.08
TB$	Trade Balance (Merchandise)	2.03	2.42	2.17	2.16	5.72	11.16	128.78	22.06
TBPCA$	Current Account Balance	2.26	2.76	1.96	2.06	3.77	33.27	3.81	7.13

Alternative 4-C : Ten Percent Reduction in Manufactured Imports

MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986	AVERAGE '80 - '86
		Percentage Change from Baseline Solution							
	REAL OUTPUT VARIABLES								
GDP	Gross Domestic Product	-0.05	-0.63	-0.80	-0.66	-0.50	-0.41	-0.25	-0.47
XAGR	Value Added in Agriculture	0.07	0.07	0.06	0.05	0.04	0.03	0.01	0.05
XIND	Value Added in Manufacturing	0.64	-0.52	-0.54	0.18	0.54	0.61	1.22	0.31
IF	Gross Investment (Public & Private)	-2.45	-4.52	-5.23	-5.39	-7.63	-7.02	-5.47	-5.39
	WAGES AND PRICES								
PDGDP	Implicit GDP Deflator	5.79	4.09	2.61	2.41	1.75	0.80	0.45	2.56
PCPI	Consumer Price Index	6.06	4.25	2.71	2.48	1.80	0.82	0.45	2.65
WRN	Nominal Wage Rate (index)	4.03	2.90	1.76	1.73	1.33	0.60	0.33	1.81
REXN	Nominal Exchange Rate (per US $)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ECONOMIC INDICATORS								
NEHT	Total Employment	0.03	-0.08	-0.15	-0.31	-0.21	-0.20	-0.17	-0.16
	GOVERNMENT BUDGET								
GCE	Total Govt. Expenditure (nominal)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TX	Total Taxes & Receipts (nominal)	1.75	0.68	-0.27	-0.25	-0.43	-0.71	-0.76	0.00
BD	Budget deficit (nominal)	-9.75	-2.30	0.64	2.35	1.72	3.17	1.46	-0.39
	FINANCIAL VARIABLES								
FM1	M1	9.07	5.94	3.58	2.91	1.68	-0.14	-0.78	3.18
	BALANCE OF PAYMENTS AND FOREIGN DEBT								
Own currency (real):									
TE	Exports of Goods & Services	0.06	-0.19	-0.26	-0.17	-0.04	-0.05	0.01	-0.09
TEBM	Exports of merchandise	0.07	-0.25	-0.33	-0.22	-0.06	-0.07	0.02	-0.12
TM	Imports of Goods and Services	-3.69	-4.07	-4.00	-4.06	-3.93	-3.73	-3.86	-3.91
TMBM	Imports of merchandise	-4.18	-4.62	-4.65	-4.79	-4.44	-4.10	-4.18	-4.42
TB	Trade Balance (Merchandise)	23.51	26.30	24.44	21.70	224.08	41.28	183.50	77.83
US dollars:									
TE$	Exports of Goods & Services	0.05	-0.17	-0.21	-0.14	-0.04	-0.04	0.01	-0.08
TEBM$	Exports of merchandise	0.07	-0.25	-0.33	-0.22	-0.06	-0.07	0.02	-0.12
TM$	Imports of Goods and Services	-3.27	-3.48	-3.23	-3.35	-2.93	-2.72	-2.73	-3.10
TMBM$	Imports of merchandise	-4.18	-4.62	-4.65	-4.79	-4.44	-4.10	-4.18	-4.42
TB$	Trade Balance (Merchandise)	15.37	15.37	12.53	14.34	32.88	46.44	590.64	103.94
TBPCA$	Current Account Balance	16.93	17.36	11.19	13.50	21.29	136.30	17.08	33.38

capital goods, fall quite substantially and this offsets any positive effect the reduction of imports has on GDP. The decline in GDP in Alternative 4C is smaller though than that in Alternative 4B (an average of -0.47 percent as compared to -0.86 percent).

The improvement in the current account has an expansionary effect on the money supply which overcomes the contractionary influence of the improvement in the budget deficit. The net increase in the money supply leads to a rise in the general price level. The increase in the price level, however, tapers off as the increase in foreign exchange reserves causes an increase in primary commodity imports which mitigates the improvement in the current account. Eventually the other components of monetary base swamp the effects of the expansion in net foreign assets leading to a contraction in money supply.

BASELINE SIMULATION FOR SELECTED VARIABLES

CODE	MNEMONIC	VARIABLE	1980	1981	1982	1983	1984	1985	1986
		REAL OUTPUT VARIABLES							
E	B GDP	Gross Domestic Product	91779.89	95482.49	97045.06	100249.13	93462.20	90630.20	93064.84
E	B XAGR	Value Added in Agriculture	23414.02	24378.05	24808.09	25727.75	25772.73	25743.00	26379.64
E	B XIND	Value Added in Manufacturing	23113.00	23912.02	24146.55	24840.85	22739.88	22227.18	23181.92
E	B IF	Gross Investment (Public & Private)	26782.87	27258.96	25706.75	24652.07	13619.67	11789.53	14531.97
		WAGES AND PRICES							
E	B PDGDP	Implicit GDP Deflator	272.74	320.11	306.53	434.75	506.33	619.04	704.38
E	B PCPI	Consumer Price Index	284.51	336.21	321.39	461.33	539.45	662.46	755.61
E	B WRN	Nominal Wage Rate (index)	151.93	170.34	163.99	211.57	237.46	277.50	308.17
X	B REXN	Nominal Exchange Rate (per US $)	7.51	7.90	8.54	11.11	16.70	18.61	20.39
		ECONOMIC INDICATORS							
E	B NRUT	Unemployment Rate	10.68	10.58	11.35	12.62	13.79	16.14	17.67
E	B NEHT	Total Employment	15620.60	16138.76	16542.12	16592.49	17092.33	17270.07	17564.01
		GOVERNMENT BUDGET							
X	B GCE	Total Govt. Expenditure (nominal)	38118.00	48079.00	52610.00	53063.00	66689.00	80148.00	105429.00
E	B TX	Total Taxes & Receipts (nominal)	32309.87	37085.35	36880.74	47897.34	53401.91	65449.54	69331.03
E	B BD	Budget deficit (nominal)	5808.13	10993.65	15729.26	5165.66	13287.09	14698.46	36097.97
		FINANCIAL VARIABLES							
E	B FM1	M1	22262.24	23637.22	20036.67	36606.80	30864.68	34822.95	53578.81
X	B FRMS	Short Term Interest Rate	12.14	12.55	13.79	14.23	27.16	19.65	14.42
X	B FRML	Long Term Interest Rate	14.00	16.00	17.13	21.28	39.10	28.30	15.50
		BALANCE OF PAYMENTS AND FOREIGN DEBT							
		Own currency (real):							
E	B TE	Exports of Goods & Services	16482.83	17992.54	17283.41	19381.47	19409.82	20752.09	23743.80
E	B TEBM	Exports of merchandise	13174.00	13905.00	13546.00	14481.00	15048.00	15345.00	16054.00
E	B TM	Imports of Goods and Services	18203.71	18969.40	19195.60	21714.68	17341.38	15367.32	17011.12
E	B TMBM	Imports of merchandise	16073.11	16710.36	16508.84	18396.10	15348.13	13982.82	15694.89
E	B TB	Trade Balance (Merchandise)	-2899.11	-2805.36	-2962.84	-3915.10	-300.13	1362.18	359.11
		US dollars:							
E	B TE$	Exports of Goods & Services	7468.58	8504.48	7799.66	8230.67	7651.15	8406.77	8709.80
E	B TEBM$	Exports of merchandise	5246.85	5607.52	4826.37	5106.76	5009.17	5132.32	4890.20
E	B TM$	Imports of Goods and Services	9822.03	11122.08	11438.12	11457.72	9302.20	8962.27	7886.09
E	B TMBM$	Imports of merchandise	7241.41	7886.42	7476.89	7548.49	5781.38	5620.52	4855.71
E	B TB$	Trade Balance (Merchandise)	-1994.56	-2280.90	-2650.52	-2441.73	-772.21	-488.20	34.49
E	B TBPCA$	Current Account Balance	-1919.45	-2145.60	-3152.46	-2755.04	-1265.05	-178.50	1264.70
*	B FDEBT	Foreign Debt, end of year	17.25	20.89	24.68	24.82	25.42	26.25	28.26

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