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Chapter 2

A Simulation Study of Changing External Trade Situations: Econometric Model for Indonesia

Iwan J. Azis and Erina Ekawati

1. INTRODUCTION

The Indonesian model presented here is constructed on the basis of its use for policy simulation, with emphasis on trade with other nations, particularly major trading partners. With some modification the model could also be utilised for short-term projection purposes. Since the specific goal of this study is to link the Indonesian model with the models of other ASEAN nations, Japan and other countries as well as to evaluate some policy simulations, no attempts were made to use the model for other purposes. Naturally, a disaggregated trade block is necessitated for purposes of this study. The disaggregation is based on the type of commodities and on the countries of destination. Various scenarios of changing external trade situations to be simulated are conceivable with such a disaggregation. In order to capture some significant shifts in policies and trends of the Indonesian economy after the second half of 1980, the baseline period used is 1977–88.

In the next section, the model structure and estimation results will be presented, followed by the model simulation to evaluate the quality of the model. In the section following it, the crux of the study (i.e., a policy simulation of changing, various external trade scenarios) is taken up. There are basically eight scenarios but they will be classified into five. The first is a 20 percent appreciation of the yen vis-à-vis the US dollar; the second, a 10 percent increase in Japan's imports, 10 percent decrease in US imports, 10 percent increase in EEC imports, and a combination of these three. The third simulation considers a 50 percent increase in intra-ASEAN trade, while the fourth pertains to an increase in direct foreign investments by 1 percent of nominal GDP. The last policy simulation is on a 50 percent (import) tariff reduction.

2. MODEL STRUCTURE AND ESTIMATION RESULTS

The Indonesian model consists of four blocks: aggregate demand, trade, fiscal and monetary. In the aggregate demand block, 13 endogenous variables are estimated, while in the trade block, which is the largest among the four, 21 endogenous variables are determined within the model. The monetary block is comprised of eight endogenous variables which basically represent the price levels of consumer goods (CPI), gross domestic product (DEF or GDP deflator), and export-import (MDEF, XNOGDEF and XDEF). The complete interconnection

those variables and the 15 exogenous variables is captured in a framework as en in Chart 1. Table 1 lists the endogenous and exogenous variables in the odel.

In the trade block, exports and imports are classified by group of commodities cording to 1-digit SITC: primary goods (SITC 0 to 4 except 3), oil and gas (SITC and manufactured products and the rest (SITC 5 to 8 plus 9). Furthermore, ports are also broken down by country-group of destination: ASEAN, Japan, S and EEC plus the rest of the world. A bottom-up approach is applied for ports, in which each category of commodity-group and country of destination independently estimated before total values of exports are obtained.

Various studies on factors affecting exports of non-oil and gas have shown that recent years (domestic) supply-side factors have at least been as equally impor- nt as demand factors. In addition to the standard external variables (e.g., ex- ange rates: YENUS and ER), the estimates for manufactured exports to ASEAN d the US in our model are also affected by domestic factors, the major one of hich is lagged private investments. Such an assumption relates to the fact that cently the orientation of most private investments in the country, both domestic d foreign, has been toward exports. However, to capture the different environ- ents prior to the period of export-oriented investments, some dummy variables e used to correct the estimated trend.

Primary exports have been set to be determined mainly by the estimated price vel (unit price), an assumption consistent with that being adopted by several udies on Indonesia's primary exports. In the case of oil and gas, the independent ariables are price of oil (POIL) and domestic production (PRODOIL). The only ception is in the estimate of oil and gas exports to ASEAN in which the level of SEAN's investments is also included as a determinant.

Beside the exchange rate, the price (unit value) of manufactured imports and the ominal GDP significantly affect the trend of imports. Meanwhile, the net exports services are estimated by taking into account the magnitude of the trade flows TOT and MTOT to capture nonfactor services) and the dollar values of lagged tal investments (as a proxy to reflect the trend of factor services).

In the monetary and price block, nominal (broad) money and its real values are timated independently in order to obtain values of the GDP deflator (DEF). As sual, the real money supply is estimated as a function of economic activity (Y), hereas its nominal values are determined by the size of base money (RM). The M is specified as a function of credit size (for the net domestic assets, NDA) and ports (for the net foreign assets, NFA). Price levels of exports and imports are sically affected by the exchange rates and import prices of commodity group MCON and POIL).

The specified model for estimating the consumer price index (CPI) deserves explanation. Historically, the CPI in Indonesia has been influenced strongly by e deliberate policy of government with respect to the level of rice price (RICEPR). lthough not as substantial as in the past, the share of rice price in the Indonesian PI has always been the largest. It is precisely for this reason that the RICEPR ariable is the most significant in explaining the movement of CPI. In addition, e effect of monetary phenomena on the CPI is reflected in the variable indicating e size of credit from the monetary authority (CREDIT) including the special irect credit and the recently phased out liquidity credit.

A reversal in the trend has been taking place in the fiscal block, in which the are of government revenues from oil is no longer dominant. The shift began in 986, immediately after the implementation of tax reform. The shift in oil reve- ues (GRO) is set through the inclusion of a dummy variable D6. In the non-oil

CHART 1

ECONOMETRIC MODEL FOR INDONESIA: MODEL SCHEME

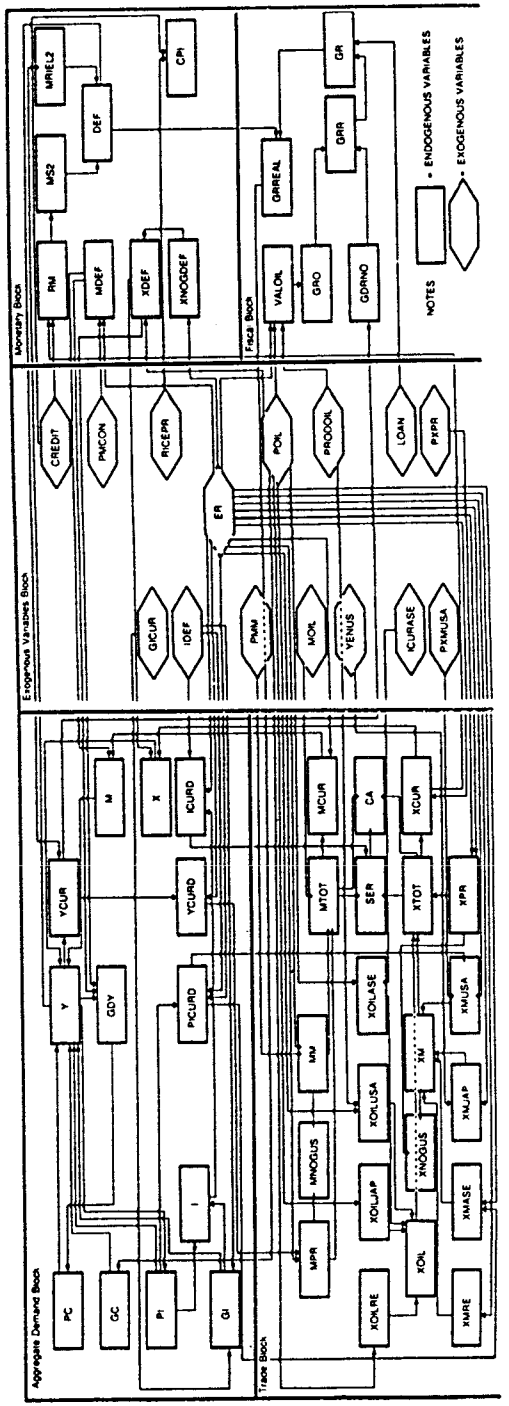


TABLE 1
THE VARIABLES OF THE INDONESIAN MODEL

\	Current Account at US$ current prices
'II	Consumer Price Index, 1983=100
REDIT	Credit from Monetary Authorities
:F	GDP Deflator, 1983=100
	Exchange Rate, annual average
AX	Adjustment Factors for Exchange Rate and Exports in Services
AM	Adjustment Factors for Exchange Rate and Imports in Services
	Government Consumption at Rp. 1983 prices
)RNO	Government Routine Revenues from Non-Oil and Gas at Rp. current prices
)Y	Gross Domestic Income at Rp. 1983 prices
	Government Investment at Rp. 1983 prices
CUR	Government Investment at Rp. current prices
	Total Government Revenues (Domestic and Foreign) at Rp. current prices
RO	Government Routine Revenues from Oil at Rp. current prices
RR	Total Government Routine Revenues at Rp. current prices
RREAL	Real Government Revenues (Total Government Revenues deflated by the GDP deflator)
	Total Investment at Rp. 1983 prices
JR	Total Investment at Rp. current prices
JRASE	Total Investment of ASEAN countries at US$ current prices
JRD	Total Investment at US$ current prices (ICUR/ER)
EF	Investment Deflator, 1983=100
FL	Annual Inflation Rate
)AN	Government Foreign Loan at Rp. current prices
	Total Imports of Goods and Services at Rp. 1983 prices
CUR	Total Imports of Goods and Services at Rp. current prices
)EF	Import Deflator, 1983=100
M	Imports of Manufactured Goods at US$ current prices
MOGUS	Non-Oil and Gas Imports at US$ current prices
)IL	Imports of Oil and Gas at US$ current prices
PR	Imports of Primary Goods at US$ current prices
RIEL2	Stock of Broad Money which is Narrow Money plus Savings and Time Deposit in real terms
S2	Stock of Broad Money which is Narrow Money plus Savings and Time Deposit in current terms
TOT	Total Imports at US$ current prices
	Private Consumption at Rp. 1983 prices
	Private Investment at Rp. 1983 prices
CURD	Private Investment at US$ current prices
MCON	Unit Value of Consumption Imports
MM	Unit Value of Manufactured Imports
)IL	Price of Oil (US$/barrel)
RODOIL	Oil Production
XMUSA	Unit Value of Manufactured Exports to USA
XPR	Unit Value of Primary Exports
ER	Net Export of Services at US$ current prices
VLOIL	Value of Oil Production (Rp.)
	Total Exports of Goods and Services at Rp. 1983 prices
CUR	Total Exports of Goods and Services at Rp. current prices
MOGDEF	Deflator for Non-Oil and Gas Exports, 1983=100
)EF	Export Deflator, 1983=100
MOGUS	Non-Oil and Gas Exports at US$ current prices
M	Exports of Manufactured Products at US$ current prices
MRE	Exports of Manufactured Products to Europe and the Rest of the World at US$ current prices
MASE	Exports of Manufactured Products to ASEAN at US$ current prices
MJAP	Exports of Manufactured Products to Japan at US$ current prices
MUSA	Exports of Manufactured Products to the US at US$ current prices

TABLE 1
THE VARIABLES OF THE INDONESIAN MODEL
(Continued)

XPR	Exports of Primary Goods at US$ current prices
XOIL	Exports of Oil and Gas at US$ current prices
XOILASE	Exports of Oil and Gas to ASEAN at US$ current prices
XOILUSA	Exports of Oil and Gas to the US at US$ current prices
XOILJAP	Exports of Oil and Gas to Japan at US$ current prices
XOILRE	Exports of Oil and Gas to Europe and the Rest of the World at US$ current prices
XTOT	Total Exports at US$ current prices
Y	Gross Domestic Product at Rp. 1983 prices
YCUR	Gross Domestic Product at Rp. current prices
YCURD	Gross Domestic Product at US$ current prices (YCUR/ER)
YENUS	Exchange Rate of Yen per US$, annual average
RM	Reserve Money
ADJM	Adjustment Factors for Imports
ADJX	Adjustment Factors for Exports

component (GDRNO), the jump has been observed since 1985, and therefore the dummy variable being used is D5.

The complete set of equations is presented in Table 2.

TABLE 2
INDONESIA MACROECONOMETRIC MODEL

AGGREGATE DEMAND BLOCK :

PC = 1477.33 + 0.4857 PC(–1) + 0.3237 GDY
(1.344) (3.79) (4.31)

R2 = 0.9874
DW = 2.797

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

PI = –4094.88 + 0.1787 Y + 17.576 D6
(–4.618) (11.99) (2.05)

R2 = 0.9527
DW = 1.724

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

GC = 125.298 + 0.6758 GC(–1) + 0.16 GRREAL
(0.5803) (4.815) (2.384)

R2 = 0.9863
DW = 2.353

TABLE 2
INDONESIA MACROECONOMETRIC MODEL
(Continued)

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

ADE BLOCK:

IASE = –254.763 + 0.400241 ER + 49.6982 PICURD(–1)
(–3.38) (31.68) (5.99)

R2 = 0.9071
DW = 1.8054

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

IUSA = –437.051 + 0.613235 ER + 35.784 PXMUSA
(–8.236) (5.25) (4.21)

+ 19.56 PICURD(–3) + 1.40165 D7
(2.40) (1.71)

R2 = 0.9919
DW = 1.978

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

IJAP = –131.175 + 94.8746 (ER/YENUS)
(–7.746) (42.113)

R2 = 0.9717
DW = 1.8728

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

IRE = –436.04 + 1.3612 ER + 9.6804 D8
(–14.19) (38.97) (15.172)

R2 = 0.9957
DW = 1.394

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR

TABLE 2
INDONESIA MACROECONOMETRIC MODEL
(Continued)

PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

XOILRE = –454.988 + 84.2846 POIL
(–2.2649) (8.9788)

R2 = 0.8417
DW = 2.6036

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

XOILUSA = –5142.93 + 98.1761 POIL + 10.3888 PRODOIL
(–7.66427) (11.0328) (7.8314)

R2 = 0.8964
DW = 1.4015

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

XOILASE = –649.079 + 47.489 POIL + 39.6723 ICURASE
(–3.2839) (3.3672) (2.5703)

–9.82581 D4
(–5.9824)

R2 = 0.9419
DW = 1.7742

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

XOILJAP = 492.314 + 287.785 POIL
(0.9419) (11.7834)

R2 = 0.9151
DW = 1.10

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

TABLE 2
INDONESIA MACROECONOMETRIC MODEL
(Continued)

PR = −185.512 + 1.9642 ER + 15657.8 PXPR
(−0.4802) (12.1497) (7.149)

R2 = 0.8664
DW = 1.9224

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

MM = −7229.78 + 0.4748 MM(−1) + 11254 PMM − 3.28086 ER
(−3.0968) (3.6388) (3.8627) (−3.942)

R2 = 0.9115
DW = 1.9577

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1976 – 1988

MPR = 572.125 + 18.294 YCURD − 0.5043 ER + 7.1747 D7
(3.688) (6.294) (−2.316) (3.187)

R2 = 0.8523
DW = 2.1655

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

SER = −792.634 − 0.08389 (XTOT + MTOT) − 179.835 ICURD(−1)
(−1.6086) (−2.613) (−4.51)

R2 = 0.9233
DW = 1.622

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1975 – 1988

MONETARY AND PRICE BLOCK:

MS2 = −184.002 + 0.8059 RM + 0.9094 MS2(−1)
(−0.751) (2.6) (7.46)

+ 11.5246 D5 + 35.1116 D5
(1.536) (2.596)

TABLE 2
INDONESIA MACROECONOMETRIC MODEL
(Continued)

R2 = 0.9987
DW = 2.592

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

MRIEL2 = −1275.9 + 0.09926 Y + 0.5941 MRIEL2(−1) + 25.285 D8
(−1.478) (2.819) (3.82) (2.755)

R2 = 0.9942
DW = 1.707

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

RM = 449.793 + 0.3842 CREDIT + 0.1476 XCUR
(1.623) (2.572) (2.983)

R2 = 0.9458
DW = 1.4805

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

CPII = 1.70248 + 0.8973 RICEPR + 0.001874 CREDIT
(1.163) (24.0355) (3.639)

− 0.0916 D6
(−3.857)

R2 = 0.9975
DW = 1.2692

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

XDEF = −0.14889 + 0.4975 XNOGDEF + 0.017472 POIL
(−2.1084) (27.2223) (6.596)

R2 = 0.9618
DW = 2.0558

TWOSLS INSTRUMENTS:

TABLE 2
INDONESIA MACROECONOMETRIC MODEL
(Continued)

Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

NOGDEF = –0.43741 + 0.001646 ER
(–9.879) (45.042)

R2 = 0.9792
DW = 2.249

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

DEF = –0.2397 + 0.00112 ER + 0.001765 PMCON
(–3.878) (11.817) (2.8945)

–0.00350 D5
(–4.06)

R2 = 0.964
DW = 2.064

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1987

SCAL BLOCK:

RO = –363.348 + 0.69055 VALOIL + 9.1329 D6
(–1.337) (21.65) (1.857)

R2 = 0.9734
DW = 2.606

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

DRNO = 181.17 + 0.01886 YCUR + 0.72726 GDRNO(–1)
(1.3022) (2.285) (5.5235)

+ 18.2526 D5
(4.5338)

R2 = 0.9925
DW = 2.979

TABLE 2
INDONESIA MACROECONOMETRIC MODEL
(Continued)

TWOSLS INSTRUMENTS:
Constant ER BANK CREDIT POIL PMM PXPR
PRODOIL PXMUSA I GICUR PMCON YENUS MOIL
LOAN IDEF

PERIOD OF ESTIMATION = 1970 – 1988

IDENTITIES:

Y	=	PC + GC + PI + GI + X – M
YCUR	=	Y * DEF
YCURD	=	YCUR/ER
GDY	=	Y + ((XDEF/MDEF)–1) * X
GI	=	GICUR/IDEF
PICURD	=	(PI*IDEF)/ER
ICURD	=	((PI + GI) * IDEF)/ER
XTOT	=	XOIL + XM + XPR
XM	=	XMUSA + XMJAP + XMASE + XMRE
XOIL	=	XOILUSA + XOILJAP + XOILASE + XOILRE
XCUR	=	(XTOT * ER) * ERAX
X	=	XCUR/XDEF
XNOGUS	=	XPR + XM
MTOT	=	MOIL + MM + MPR
MCUR	=	(MTOT * ER) * ERAM
M	=	MCUR/MDEF
MNOGUS	=	MPR + MM
CA	=	(XTOT * ADJX) – (MTOT * ADJM) + SER
INFL	=	(CPII/CPII(–1))/CPII(–1)
DEF	=	MS2/MRIEL2
GR	=	GRR + LOAN
GRR	=	GDRNO + GRO
GRREAL	=	GR/DEF
VALOIL	=	POIL * PRODOIL * ER

3. MODEL SIMULATION

The standard procedure for model simulation is conducted for the period 1977–88. There are six indicators to reflect the quality of the model (predicted values compared to the actual ones): the correlation coefficient (CC), the root mean square error (RMSE), the mean absolute error (MAE), the mean error (ME), the regression coefficient of actual on predicted values (RCAP), and the Theil Inequality Coefficient (Theil). Values of these indicators for each endogenous variable are shown in Table 3.

It is quite clear from the table that the variations of each variable are predicted by the model in a fairly satisfactory manner, with those in the trade block being the best among the four blocks. A trend in which the predicted values are larger than the actual (RCAP > 1) has been derived in seven out of nine cases within the aggregate demand block, eight out of 21 cases in the trade block, one out of four in the fiscal block, and three out of six within the monetary block. However, an explosive pattern is nonexistent. In fact, from the allocated number of Gauss-iteration (200), only 16 to 17 are actually required on average.

Charts 2 to 10 display the trend of actual and fitted values of each component in the aggregate demand. Notice once again that the model performance in the trade block is, in general, most satisfactory.

TABLE 3
SOME INDICATORS OF THE QUALITY OF THE MODEL

riables	CC	RMS	MAE	ME	RCAP	Theil
GREGATE DEMAND BLOCK						
	0.9091	6234.170	4757.870	2301.300	1.0029	0.0409
DY	0.9290	6252.090	4516.550	1291.940	1.0286	0.0423
CUR	0.9925	4768.160	3505.600	1487.040	1.0027	0.0293
CURD	0.9594	4.801	3.761	1.575	0.9117	0.0310
C	0.9451	4032.530	2922.650	286.301	1.1501	0.0433
C	0.9842	409.147	311.069	233.940	1.0996	0.0266
	0.8954	1560.430	1399.200	451.995	1.0638	0.0762
	0.9356	1560.430	1399.200	451.995	1.0226	0.0440
URD	0.9338	1.616	1.444	0.453	0.9921	0.0440
ADE BLOCK						
TOT	0.9871	697.141	498.795	−17.878	0.9714	0.0185
CUR	0.9947	888.454	568.245	67.286	1.0006	0.0223
NOGUS	0.9877	351.938	297.361	84.753	0.9819	0.0283
PR	0.9132	354.154	296.493	53.963	0.9082	0.0472
M	0.9969	137.245	99.935	30.791	1.0139	0.0251
MASE	0.9329	114.444	95.539	19.469	1.0405	0.0894
MUSA	0.9920	43.953	37.689	4.317	1.0146	0.0450
MJAP	0.9848	59.629	44.021	−0.934	0.9821	0.0618
MRE	0.9980	48.861	43.777	7.938	0.9853	0.0209
OIL	0.9831	834.805	671.244	−102.631	0.9880	0.0313
OILRE	0.9032	326.983	260.935	8.565	0.9985	0.0976
OILUSA	0.9646	226.539	186.167	−7.871	0.9707	0.0400
OILASE	0.9692	196.970	131.246	15.633	0.9409	0.0685
OILJAP	0.9714	587.170	451.992	−118.956	0.9989	0.0391
TOT	0.9811	754.235	595.114	−193.824	1.1074	0.0314
CUR	0.9895	1224.210	858.336	−269.108	1.0008	0.0334
NOGUS	0.9645	754.253	595.114	−193.825	1.1399	0.0371
PR	0.8236	164.377	147.049	47.066	0.7661	0.0499
M	0.9613	757.681	635.812	−240.891	1.1712	0.0444
ER	0.9462	454.609	386.184	−22.473	0.9412	0.0352
A	0.9529	1047.230	837.116	255.018	0.7842	0.1547
SCAL BLOCK						
DRNO	0.9962	372.315	335.361	184.885	0.9882	0.0285
RO	0.9644	804.696	655.696	6.795	1.0079	0.0512
RR	0.9878	952.210	783.540	191.680	0.9884	0.0339
R	0.9936	952.210	783.540	191.680	0.9895	0.0266
ONETARY BLOCK						
S2	0.9989	752.123	533.291	36.573	1.0415	0.0184
RIEL2	0.9908	1398.420	1192.630	150.109	1.1744	0.0404
DEF	0.9841	0.065	0.053	0.000	1.0365	0.0375
DEF	0.9823	0.067	0.047	0.130	0.9801	0.0358
NOGDEF	0.9889	0.103	0.076	0.012	0.9875	0.0402
PII	0.9971	2.366	1.842	0.142	0.9922	0.0119

lossary:

C = Correlation Coefficient
MSE = Root Mean Square Error
AE = Mean Absolute Error
E = Mean Error
CAP = Regression Coefficient of Actual on Predicted
heil = Theil Inequality Coefficient

ote: Simulation Period = 1977 – 1988

CHART 2
ACTUAL AND SIMULATED VALUES OF REAL GROSS DOMESTIC PRODUCT

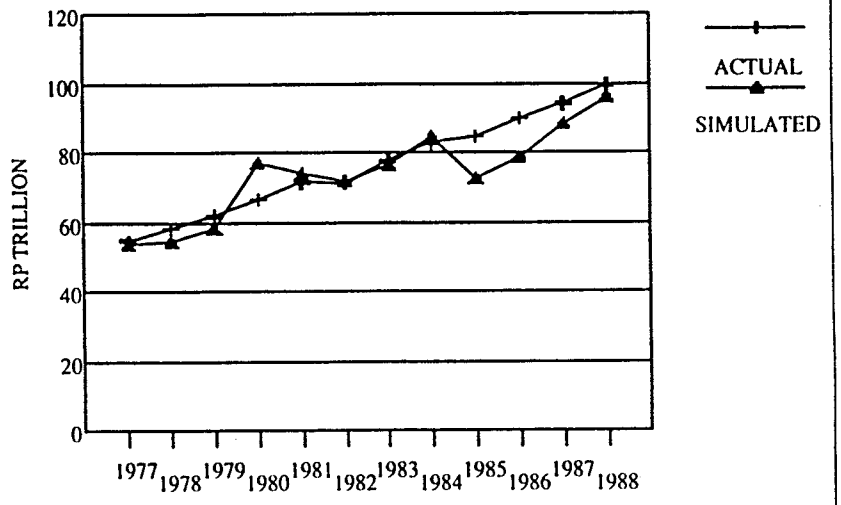


CHART 3
ACTUAL AND SIMULATED VALUES OF TOTAL EXPORTS

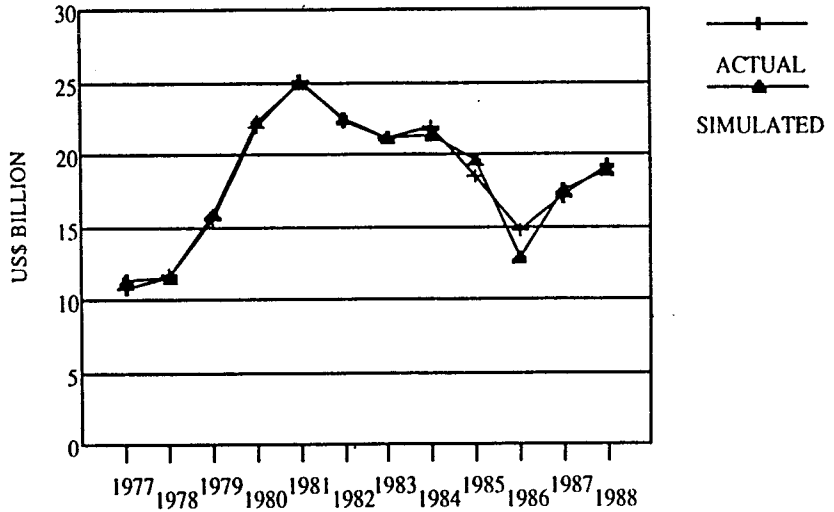


CHART 4
ACTUAL AND SIMULATED VALUES OF
NON-OIL AND GAS EXPORTS

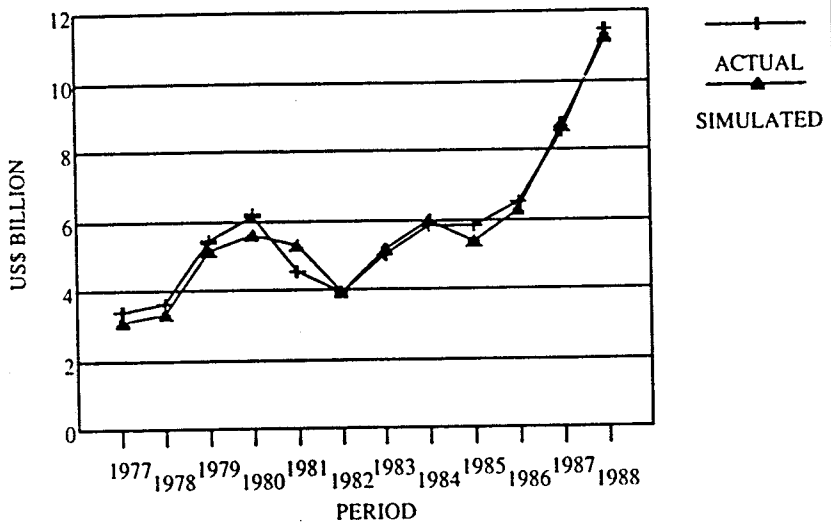


CHART 5
ACTUAL AND SIMULATED VALUES OF
MANUFACTURING EXPORTS

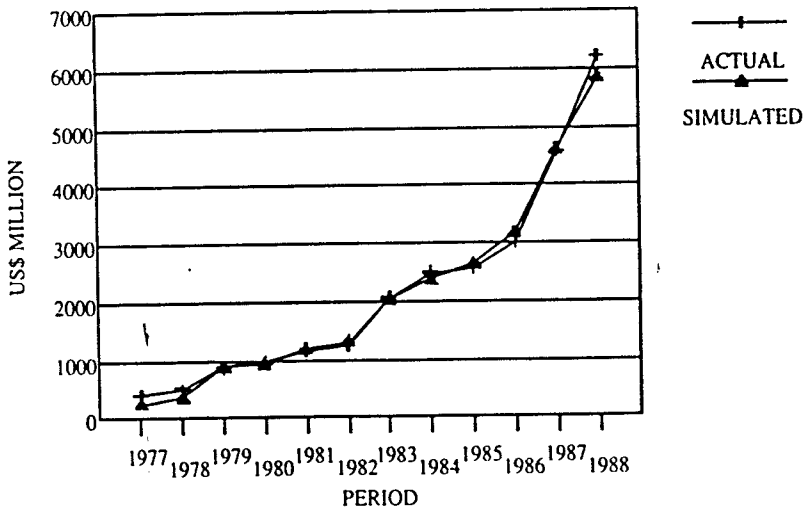


CHART 6
ACTUAL AND SIMULATED VALUES OF
NET EXPORTS OF SERVICES

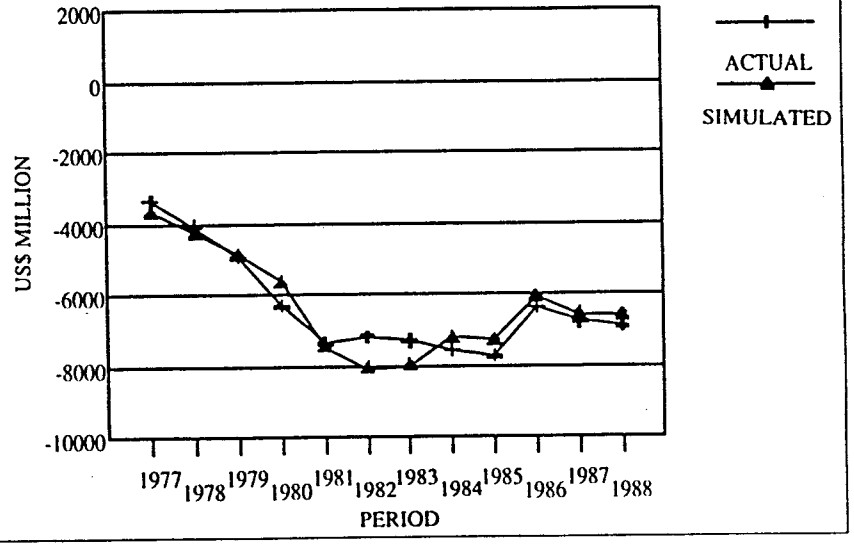


CHART 7
ACTUAL AND SIMULATED VALUES OF
TOTAL IMPORTS

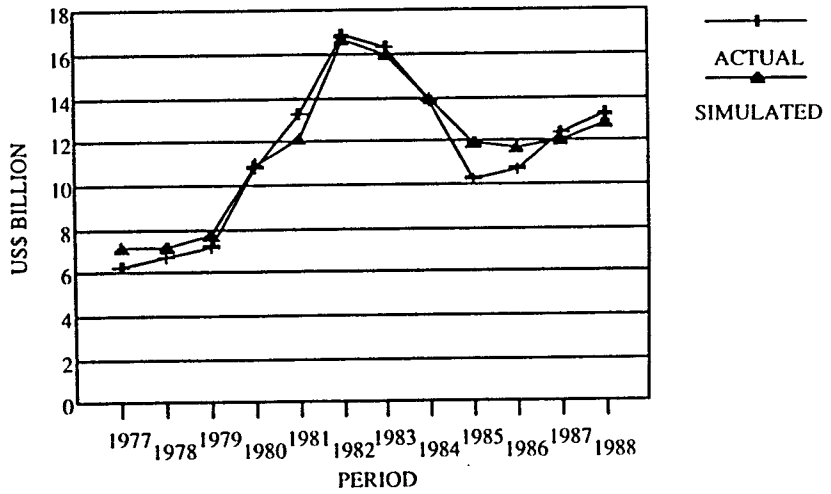


CHART 8
ACTUAL AND SIMULATED VALUES OF
REAL PRIVATE INVESTMENTS

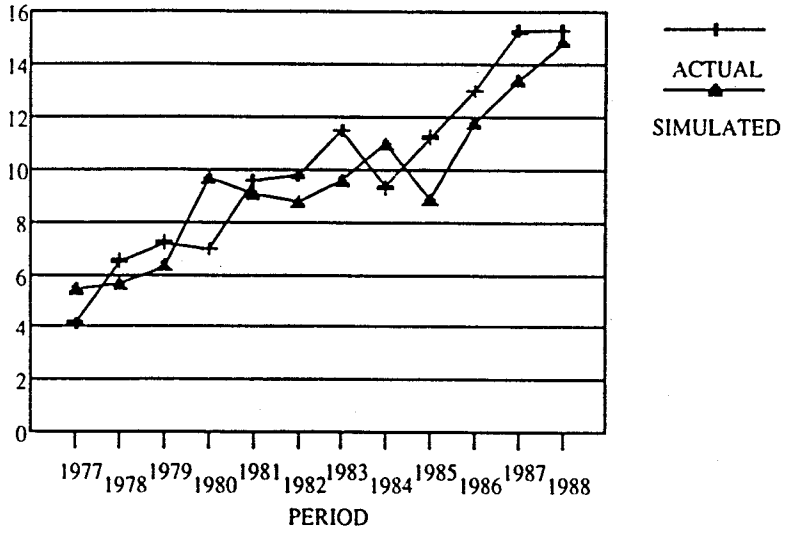


CHART 9
ACTUAL AND SIMULATED VALUES OF
REAL PRIVATE CONSUMPTION

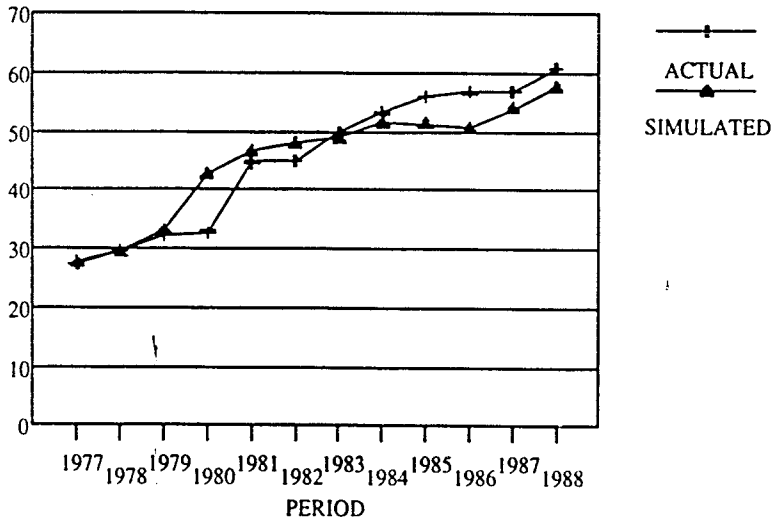
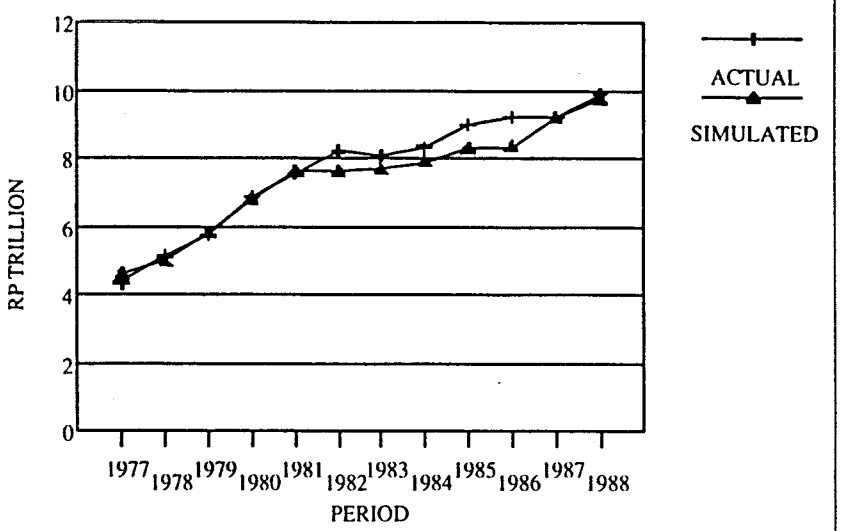


CHART 10
ACTUAL AND SIMULATED VALUES OF
REAL GOVERNMENT CONSUMPTION



4. POLICY SIMULATION

In this section, five policy simulations are attempted with no changes being made in the structure of the model. The baseline values are those generated by the model under no policy changes. It is by itself a separate scenario.

4.1 Appreciation of the Yen Against the US Dollar (YENUS) by Twenty Percent

The variable YENUS is precisely the one to alter under the present policy simulation. This variable has affected the trade variables both directly and indirectly. The direct effects are set to take place on the manufactured exports to Japan, while the indirect effects of changes in YENUS would be transmitted through changes in the rupiah-US dollar exchange rates. Despite some changes in the policy pertaining to the exchange rate determination, historically a 20 percent appreciation of YENUS will depreciate the rupiah-US dollar rate (ER) by 10.5 percent. Thus, the 20 percent appreciation of YENUS will be combined simultaneously with the 10.5 percent depreciation of ER.

The percentage deviation from the baseline for selected endogenous variable is presented in Table 4 and Appendix (see page 55).

Among export variables, it is exports of manufactured goods to Japan that would increase the most from such a simultaneous occurrence. By 1988, the percentage deviation of this variable had reached more than 40 points. Manufactured exports to the US, ASEAN and EEC plus the rest of the world went up at lower rates, i.e., 14 percent, 12.8 percent and 8.6 percent, respectively. The outcome for

TABLE 4
THE IMPACT OF VARIOUS SCENARIOS ON SELECTED VARIABLES
(Percentage Deviation from Base Solutions)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
WENTY PERCENT APPRECIATION OF THE YEN AGAINST US$									
	6.89	8.44	9.66	10.6	10.97	17.77	16.68	18.06	18.39
T	1.7	1.53	1.81	2.69	3.05	3.61	7.22	6.92	7.04
GUS	6.76	7.25	10.36	11.11	10.83	13.14	14.84	13.89	11.74
	26.39	21.09	20.68	18.72	18.48	18.02	20.91	18.87	16.63
	2.79	3.2	5.22	6.08	5.84	8.41	8.58	8.27	6.44
SA	38.33	29.79	32.76	16.41	15.37	16.14	15.62	11.89	14.03
AP	76.37	73.89	79.72	59.77	56.16	54.31	46.66	43.47	42.67
SE	8.37	4.5	6.21	8.54	9.57	9.12	16.49	12.3	12.77
E	21.57	21.42	20.47	16.28	15.34	14.82	14.06	13.1	8.56
	−4.88	−4.59	−3.72	−5.06	−6.36	−7.27	−8.27	−10.21	−10.3
	−4.65	−4.3	−4.53	−5.84	−6.5	−2.69	−4.87	−4.04	−3.34
T	−4.07	−3.89	−3.02	−3.83	−5.15	−5.93	−7.09	−8.33	−8.48
	−1.71	−2.42	−1.91	−1.68	−1.07	−1.07	1.5	0.78	1.67
	26.35	179.76	−17.98	−20.17	−71.39	−64.86	−27.22	−285.93	−597.01
	11.09	11	11.07	10.99	10.91	10.92	9.68	10	9.92
NO	4.29	5.08	5.49	5.78	5.85	5.66	5.47	5.77	6.22
	8.24	8.19	7.83	7.8	7.59	7.03	5.69	5.94	5.51
	6.67	7.09	7.1	7.41	7.4	7.11	7.01	7.45	6.99
F	8.18	7.15	7.34	8.78	8.95	9.21	12.01	11.02	11.31
GDEF	18.31	18.22	17.64	14.9	14.23	13.87	13.3	12.58	12.52
F	11.76	10.49	10.94	11.25	10.84	14.88	12.64	13.91	13.51
NCREASE IN FOREIGN INVESTMENT BY ONE PERCENT OF NOMINAL GDP									
	4	4.98	5.86	6.39	6.68	8.02	7.81	7.63	7.54
T	0.26	0.36	0.49	0.59	0.6	0.72	1	0.71	0.66
GUS	1.04	1.7	2.8	2.42	2.15	2.62	2.06	1.43	1.1
	6.19	7.5	8.41	6.08	5.44	5.33	4.06	2.7	2.12
	0.07	0.17	0.16	−0.01	−0.23	1.6	1.81	1.26	1.68
T	0.01	0.03	0.02	0	−0.03	0.2	0.21	0.19	0.25
	3.04	3.63	4.24	4.47	4.8	5.33	5.8	4.88	5.06
	−3.05	−30.56	4.25	3.82	10.66	10.82	3.91	26.45	57.65
	0.05	0.04	0.05	0.03	−0.01	0.12	0.25	0.26	0.36
	0.12	0.16	0.19	0.23	0.26	0.27	0.29	0.3	0.28
IFTY PERCENT DECREASE IN TARIFF RATES									
	1.08	0.34	0.24	2.11	2.5	2.25	2.02	4.43	4.47
T	0	0.02	0.02	0.02	0.08	0.11	0.16	0.12	0.18
GUS	−0.02	0.07	0.12	0.1	0.28	0.39	0.33	0.24	0.31
	−0.11	0.33	0.35	0.25	0.71	0.79	0.66	0.45	0.59
	0	0	0	0	0	0	0	0	0
	−6.97	−6.58	−5.65	−6.24	−6.75	−7.02	−7.22	−7.66	−7.4
	0.61	−0.03	−0.09	0.75	0.45	0.4	0.35	1.4	1.34
T	−4.72	−4.66	−3.79	−3.87	−4.49	−5.35	−5.67	−5.6	−5.53
	−0.5	−0.25	−0.52	−0.56	0.08	0.29	0	−0.13	0.73
	16.72	116.45	−12.29	−11.13	−33.4	−30.94	−11.82	−92.91	−181.57
NO	0.45	0.26	0.13	0.36	0.38	0.28	0.23	0.52	0.69
	0.11	0.06	0.04	0.1	0.1	0.1	0.11	0.2	0.28
	−0.02	−0.01	0	0	0.01	0.02	0.03	0.04	0.04
F	−9.83	−12.67	−11.04	−6.84	−6.9	−9.59	−10.88	−3.87	−4.43

TABLE 4
THE IMPACT OF VARIOUS SCENARIOS ON SELECTED VARIABLES
(Percentage Deviation from Base Solutions)
(Continued)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
(D) TEN PERCENT INCREASE IN TOTAL IMPORTS OF JAPAN									
Y	2.91	3.42	4.07	4.25	4.13	5.2	4.44	4.12	3.69
XTOT	2.77	2.95	3.34	3.1	3.06	3.3	2.75	2.39	1.95
XNOGUS	0.15	0.44	1.15	0.94	0.75	1.07	0.89	0.48	0.26
XM	1.91	2.27	2.67	2.07	1.86	1.78	1.52	0.95	0.75
XOIL	3.65	3.63	3.8	3.79	3.97	4.15	4.51	4.28	4.48
XPR	−0.21	−0.1	0.39	0.2	0.03	0.37	0.23	−0.05	−0.27
MPR	1.03	1.22	1.38	1.31	1.1	2.48	2.16	1.44	1.44
MTOT	0.15	0.18	0.16	0.14	0.14	0.31	0.25	0.21	0.22
SER	1.85	1.9	2.11	2.22	2.37	2.44	2.59	2.12	1.99
CA	13.04	82.7	−7.99	−5.92	−20.75	−16.49	−2.47	−34.42	−55.26
GR	0.19	0.22	0.31	0.32	0.3	0.38	0.49	0.4	0.43
MS2	1.41	1.57	1.65	1.72	1.69	1.62	1.49	1.41	1.18
(E) TEN PERCENT DECREASE IN TOTAL IMPORTS OF USA									
Y	−1.1	−1.24	−1.27	−1.29	−1.27	−1.48	−1.3	−1.23	−1.15
XTOT	−0.99	−0.98	−0.78	−0.76	−0.86	−0.76	−0.73	−0.72	−0.66
XNOGUS	−0.71	−0.65	−0.4	−0.46	−0.54	−0.36	−0.38	−0.44	−0.51
XM	−0.82	−0.91	−1.03	−0.76	−0.69	−0.65	−0.53	−0.38	−0.3
XOIL	−1.09	−1.07	−0.86	−0.86	−0.98	−0.91	−1.07	−0.99	−0.88
XPR	−0.69	−0.58	−0.08	−0.27	−0.44	−0.09	−0.23	−0.51	−0.74
MPR	−0.36	−0.4	−0.33	−0.3	−0.27	−0.63	−0.59	−0.42	−0.45
MTOT	−0.05	−0.06	−0.04	−0.03	−0.04	−0.08	−0.07	−0.06	−0.07
SER	−0.71	−0.68	−0.66	−0.64	−0.7	−0.69	−0.73	−0.62	−0.62
CA	−4.59	−26.87	1.63	1.33	5.71	3.39	0.62	10.53	19.75
GR	−0.07	−0.08	−0.09	−0.09	−0.08	−0.1	−0.13	−0.11	−0.12
MS2	−0.54	−0.57	−0.54	−0.52	−0.5	−0.46	−0.41	−0.4	−0.34
(F) TEN PERCENT INCREASE IN TOTAL IMPORTS OF EEC									
Y	0.19	0.19	0.2	0.22	0.22	0.27	0.29	0.3	0.33
XTOT	0.16	0.13	0.11	0.14	0.17	0.16	0.27	0.26	0.3
XNOGUS	0.63	0.61	0.63	0.59	0.58	0.57	0.55	0.51	0.51
XM	0.45	0.39	0.39	0.31	0.29	0.28	0.26	0.22	0.25
XOIL	0	0	0	0	0	0	0	0	0
XPR	0.67	0.68	0.74	0.77	0.77	0.85	0.86	0.85	0.79
MPR	0.06	0.05	0.05	0.06	0.05	0.12	0.16	0.12	0.16
MTOT	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
SER	0.13	0.11	0.1	0.11	0.12	0.13	0.16	0.16	0.19
CA	.73	3.44	−0.23	−0.27	−1.14	−0.76	−0.35	−4.31	−10.98
GR	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.04
MS2	0.09	0.09	0.08	0.09	0.09	0.08	0.08	0.09	0.1
(G) COMBINATION OF (D), (E) AND (F)									
Y	2.2	2.57	3.12	3.31	3.23	4.09	3.53	3.34	3.13
XTOT	2.17	2.25	2.65	2.51	2.47	2.67	2.3	2.08	1.93
XNOGUS	0.98	1.08	1.28	1.19	1.13	1.17	1.09	0.85	0.81
XM	1.64	1.87	2.17	1.69	1.52	1.47	1.28	0.8	0.72
XOIL	2.57	2.56	2.94	2.94	2.99	3.24	3.45	3.29	3.6
XPR	0.85	0.85	0.84	0.86	0.87	0.88	0.89	0.91	0.9

TABLE 4
THE IMPACT OF VARIOUS SCENARIOS ON SELECTED VARIABLES
(Percentage Deviation from Base Solutions)
(Continued)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
R	0.83	0.95	1.1	1.07	0.9	2	1.76	1.21	1.29
DT	0.12	0.14	0.13	0.11	0.12	0.25	0.2	0.18	0.19
R	1.41	1.44	1.62	1.73	1.87	1.93	2.07	1.73	1.7
	10.27	62.99	-6.43	-4.88	-16.83	-13.49	-2.18	-30.98	-59.51
	0.15	0.17	0.24	0.26	0.24	0.31	0.39	0.33	0.36
P	1.06	1.19	1.27	1.34	1.33	1.29	1.19	1.15	0.99
FIFTY PERCENT INCREASE IN INTRA-ASEAN TRADE									
	2.36	2.82	3.38	3.7	3.16	3.65	2.99	2.83	2.59
DT	2.33	2.53	2.87	2.93	1.95	1.77	1.26	1.46	1.34
DGUS	2.05	2.61	3.5	2.94	2.65	2.91	2.38	1.93	1.64
	4.87	6.27	6.93	5.08	4.56	4.42	3.41	2.68	2.19
L	2.43	2.5	2.73	2.92	1.68	1.34	0.21	0.99	0.9
R	1.48	1.54	1.79	1.53	1.4	1.46	1.3	1.07	1.05
R	0.9	1.06	1.2	1.25	0.73	1.58	1.3	0.94	0.99
DT	0.13	0.16	0.14	0.13	0.1	0.19	0.15	0.14	0.15
R	1.54	1.58	1.77	1.92	1.89	1.69	1.7	1.39	1.37
	10.99	71.14	-6.91	-5.8	-11.87	-7.6	-0.59	-20.04	-38.05
	0.16	0.19	0.27	0.29	0.25	0.28	0.33	0.27	0.29
P	1.15	1.3	1.39	1.49	1.37	1.21	1.05	0.97	0.81

al manufactured exports would be an increase by 16.6 percent and for non-oil l gas exports, a deviation by as much as 11.7 percent from their respective eline scenarios.

hose figures, combined with the import declines, imply a current account plus. Obviously, this is a dramatic improvement in Indonesia's balance of ments position. The fiscal revenues and monetary variables are also driven up such an improvement. By 1988, the simulation result indicates a 6 to 8 percent itive deviation in government revenues and an increase in nominal money pply of around 7 percent.

aken all together, the simulated real GDP will jump by more than 18 percent n the baseline scenario. It is the accelerating rates of deviation for GDP obved from the yearly simulated figures that are more important to note. The centage deviation from the baseline has always been increasing, reaching 18.4 cent in 1988.

harts 11 to 20 display the comparison between the actual values, the baseline nario and the 20 percent YENUS simulation for some selected variables. Notice in the enlarging deviation for manufactured exports to Japan (Chart 15) and the current account variable (Chart 16).

Increase in Japan's Imports by Ten Percent, Decrease in US Imports by Ten Percent and Increase in EEC Imports by Ten Percent (Separately and Combined Scenario)

torically, a 1 percent increase in Japan's imports had always been accompanied a 0.82 percent increase (in values) of Indonesian exports to Japan. During 7–88 the sectoral breakdown of exports to Japan averaged out to yield 82.8 cent for oil and gas, 3.8 percent for manufactured products, and 13.3 percent

for the primary exports account. Utilising such information, we assume a different growth rate for each individual sector in the total exports to Japan. The resulting revision (i.e., a 6.8 percent increase in oil and gas exports, and 0.32 percent and 1.1 percent increases in manufactured and primary exports, respectively) is inserted into the database for simulation purposes.

The most affected variable is the Indonesian exports of oil and gas which would increase by around 4 percent in value terms. The largest increases will turn out to be those in 1986, 1988 and 1987 (listed in order). Total government revenues (GR) will also undergo a series of increases in similar order. The percentage increases of primary and manufactured exports vary from year to year.

As shown in Table 4, row D, a 10 percent increase in total imports of Japan would generate a decrease in Indonesian primary exports for the first two simulation years, and an increase for the next five years before another declining trend is observed for 1987 and 1988. On the other hand, a persistent increase in manufactured exports, although with decreasing rates, would be evident during the simulation period.

The net results of those trends would be positive for total exports, thus showing an improvement in the current account balance. It is important to note that in Table 4 the positive percentages for CA for 1980 and 1981, and the negative percentages for the rest of the simulation period all imply improvements in the current account, for in 1980 and 1981 the Indonesian current accounts were in surplus.

Following the specification of the model, the simulation of 10 percent increase in total imports of Japan would also affect the reserve money (RM) through exports (net foreign assets) and, in turn, will generate greater (broad) money supply M2. It is recorded that the increase in money supply would be in the range of 1.2 to 1.7 percent (see Table 4, row D).

With the improvement in the balance of payments and government budget, the resulting GDP would have been higher by 3 to 5.2 percent. The percentage increase of GDP follows a pattern in which there is an acceleration up to 1985 and a deceleration from 1985 to 1988.

The historical trend shows that a 10 percent increase in US imports results in a 6.5 percent increase in Indonesian exports to the US. This implies a lower elasticity than in the preceding case of Japanese imports. Indeed, the dominance of Japan in the destination of exports is apparent in Charts 50 and 52 (for oil and gas, and other primary exports). By implementing a similar procedure as before, the implicit rates of reduction in the Indonesian exports due to a 10 percent decrease in US imports would be 4.8 percent, 0.6 percent and 1.07 percent for oil and gas, manufacturing and primary exports, respectively.

As expected, the trend observed in the preceding case would be reversed. Declining exports, particularly for oil and gas, would cause a deterioration in the current account balance at an accelerating pace. By 1988, the current account deficit would have risen by almost 20 percent of the baseline, that is, US$0.49 billion compared to US$0.41 billion. Obviously the impact is softer than in the case of altering the Japanese imports. This is also true with respect to the impact on the government budget. The percentage decline of government revenues never exceeds 0.13 percent, with the lowest being 0.07 percent for 1980. The money supply would decrease with a decelerating pace to reach only 0.34 percent lower than the baseline figure in 1988. Meanwhile, the resulting GDP would be lower by 1.15 percent in the same year.

It is clear therefore that the overall impact of a 10 percent decrease in US imports is smaller than that of a 10 percent increase in total imports of Japan.

CHART 11
REAL GROSS DOMESTIC PRODUCT

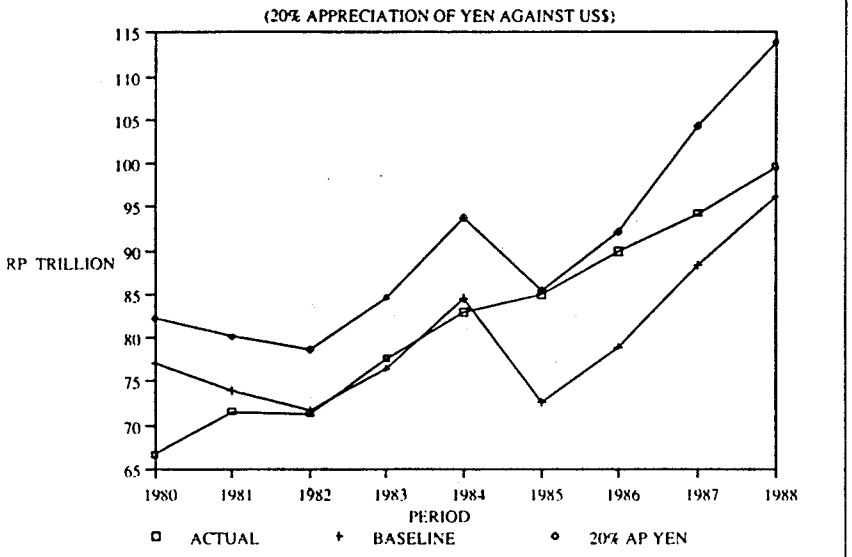


CHART 12
TOTAL EXPORTS

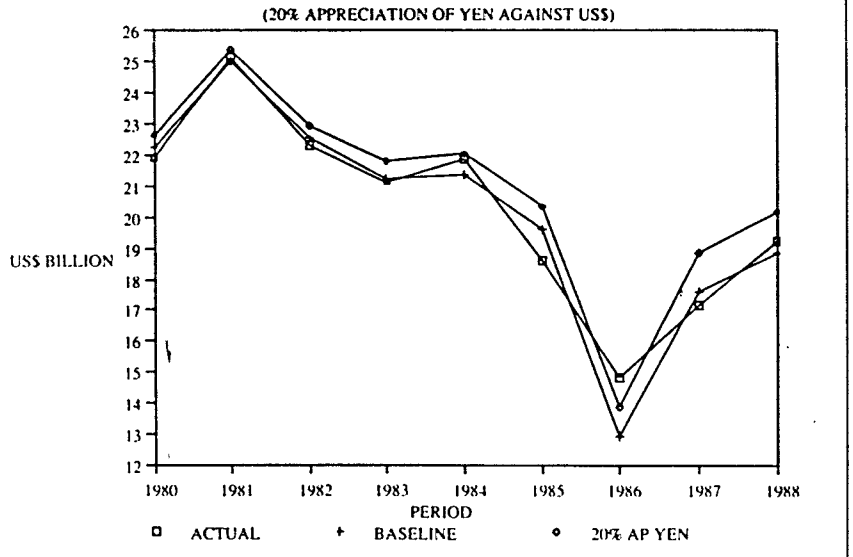


CHART 13
NON-OIL AND GAS EXPORTS

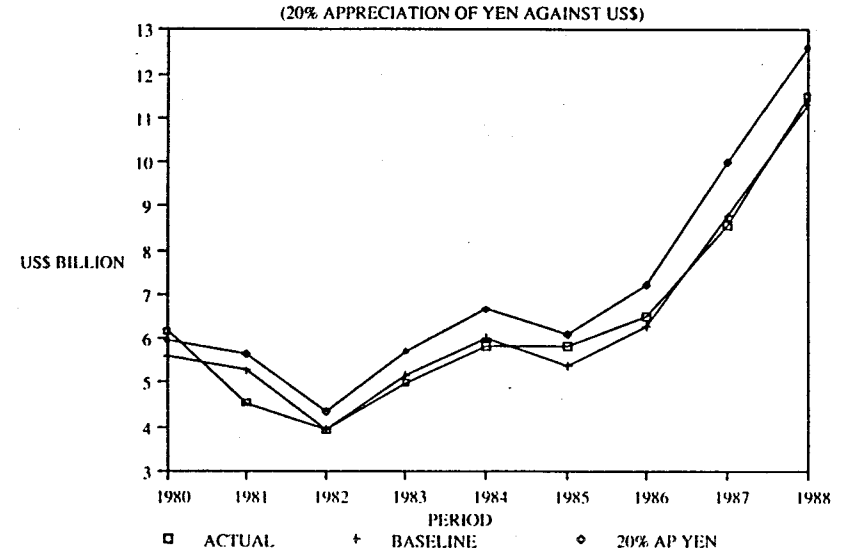


CHART 14
TOTAL MANUFACTURING EXPORTS

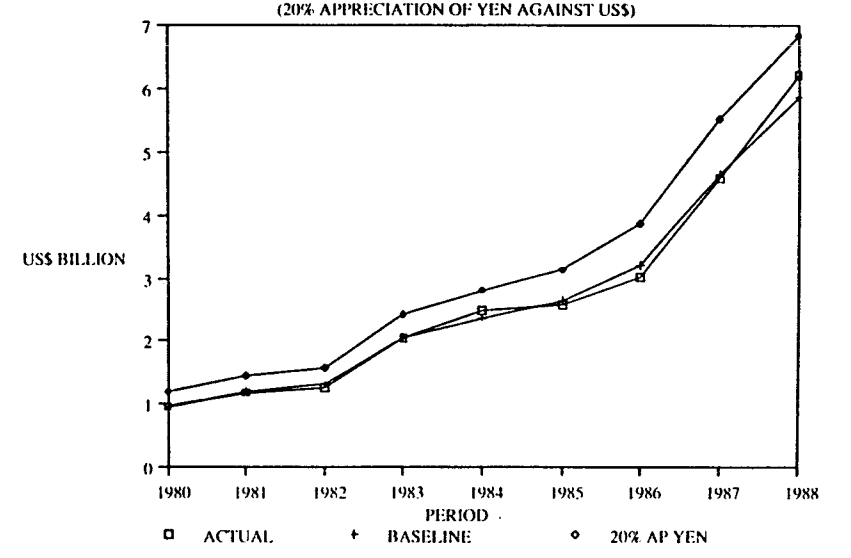


CHART 15
MANUFACTURING EXPORTS TO JAPAN

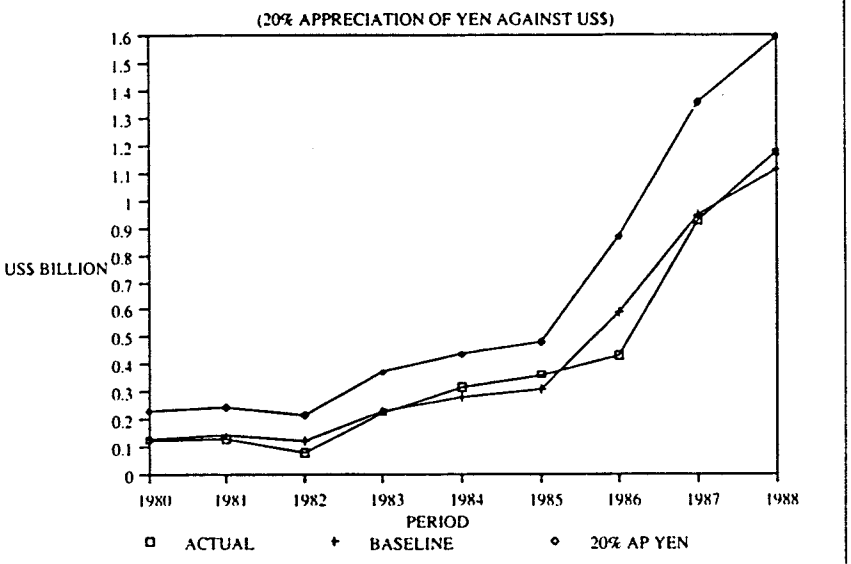


CHART 16
CURRENT ACCOUNT

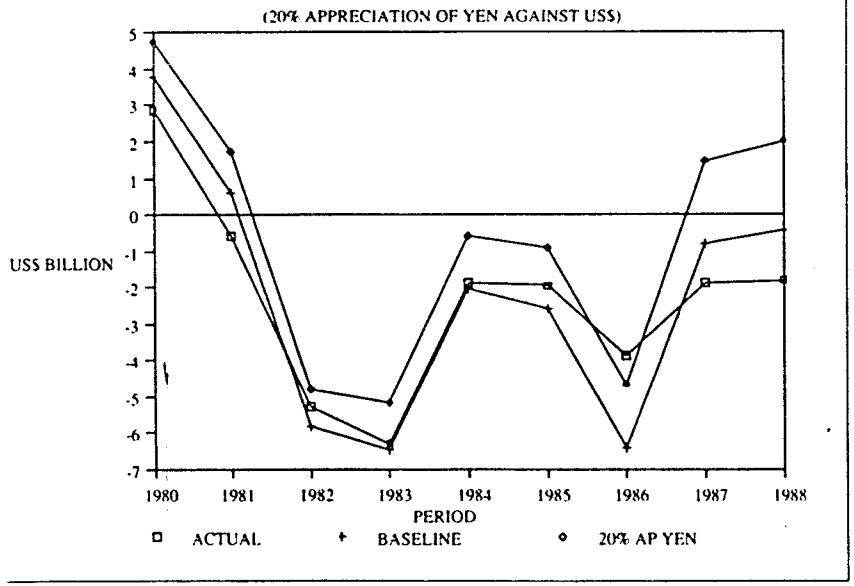


CHART 17
GOVERNMENT REVENUES FROM NON-OIL & GAS

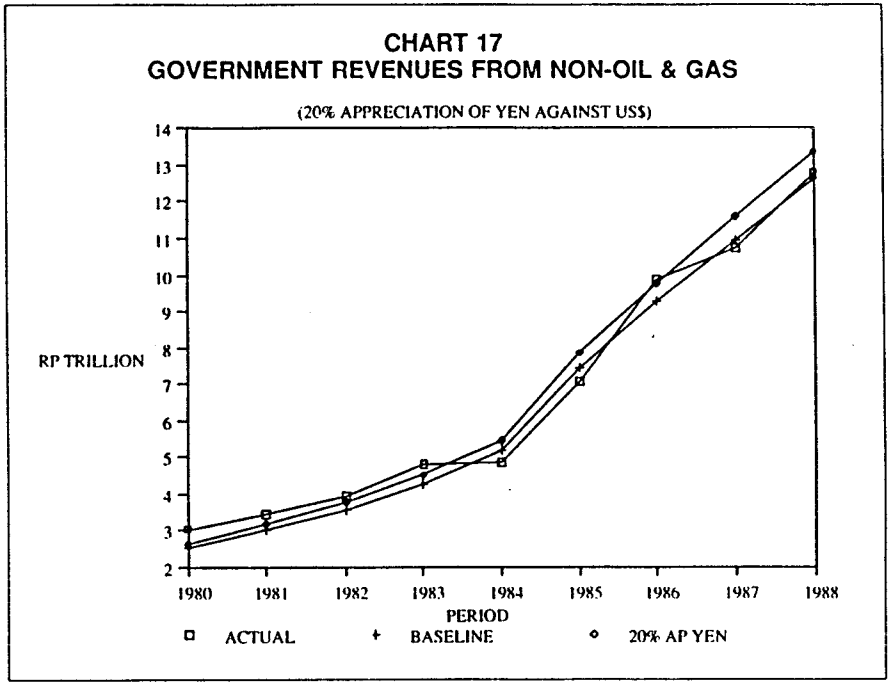


CHART 18
GOVERNMENT REVENUES FROM OIL

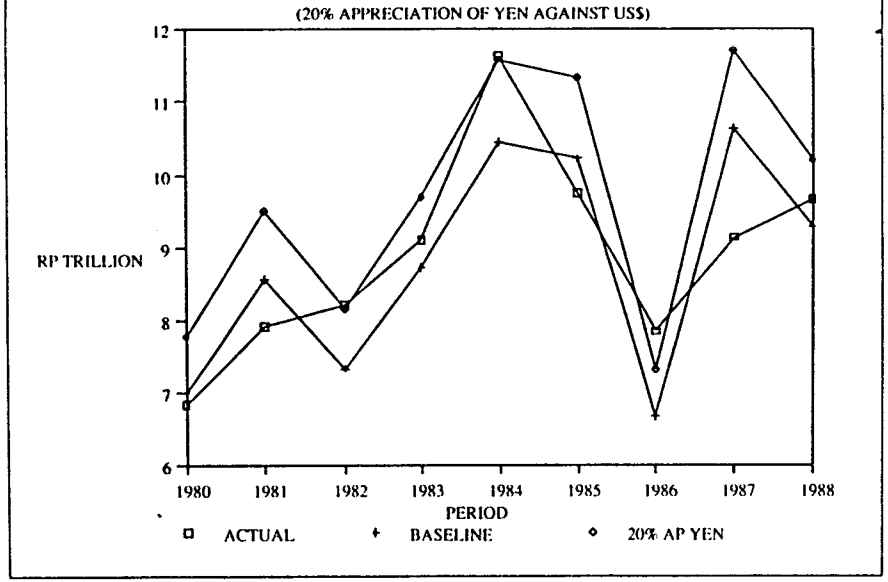


CHART 19
TOTAL GOVERNMENT REVENUES

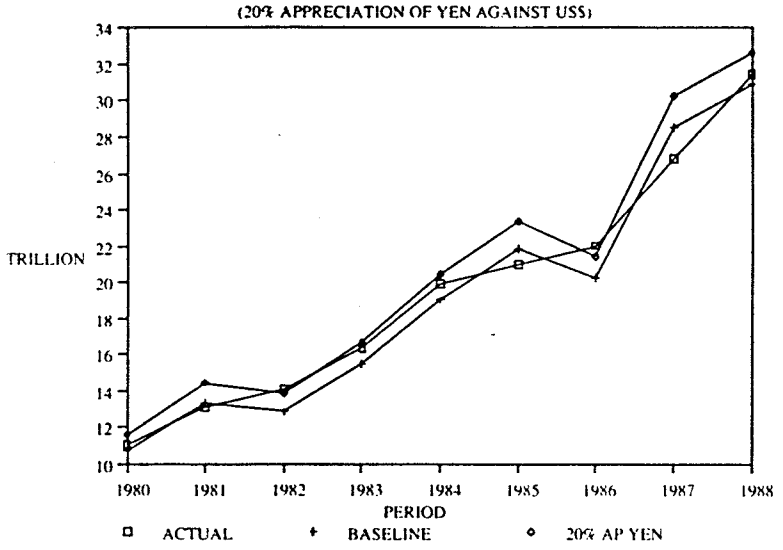


CHART 20
NOMINAL MONEY SUPPLY

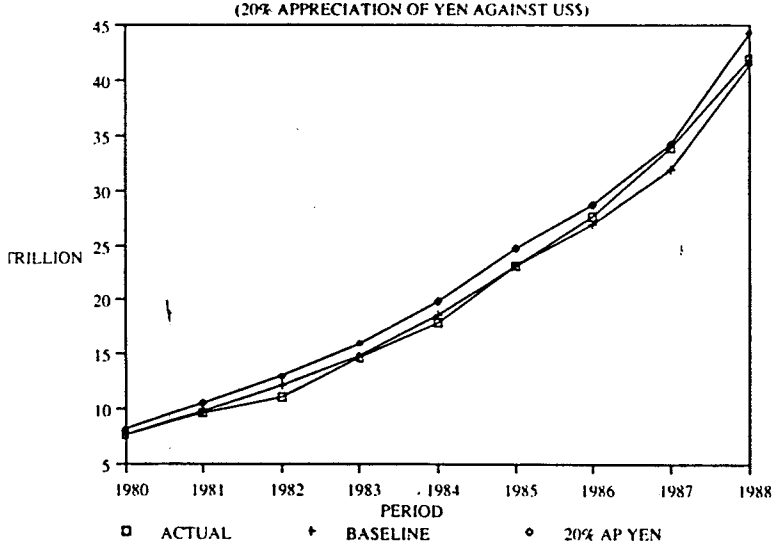


CHART 21
REAL GROSS DOMESTIC PRODUCT

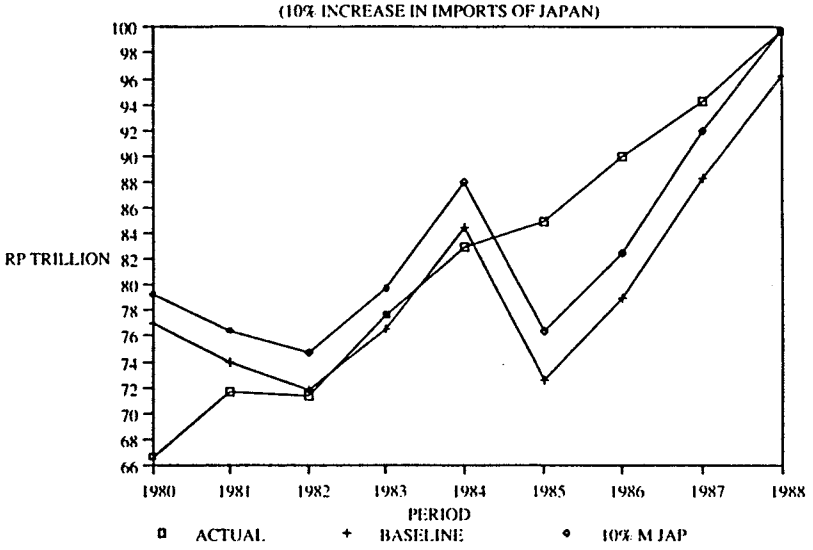


CHART 22
TOTAL EXPORTS

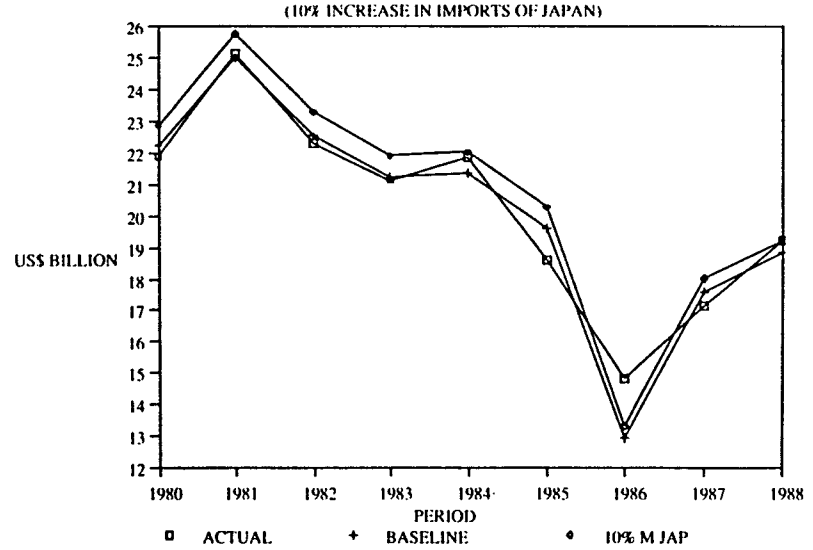


CHART 23
TOTAL EXPORTS OF OIL AND GAS

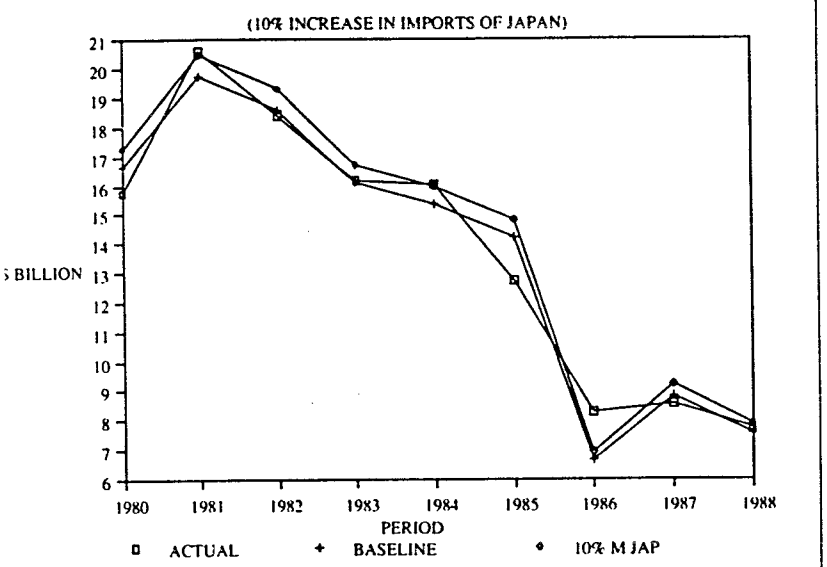
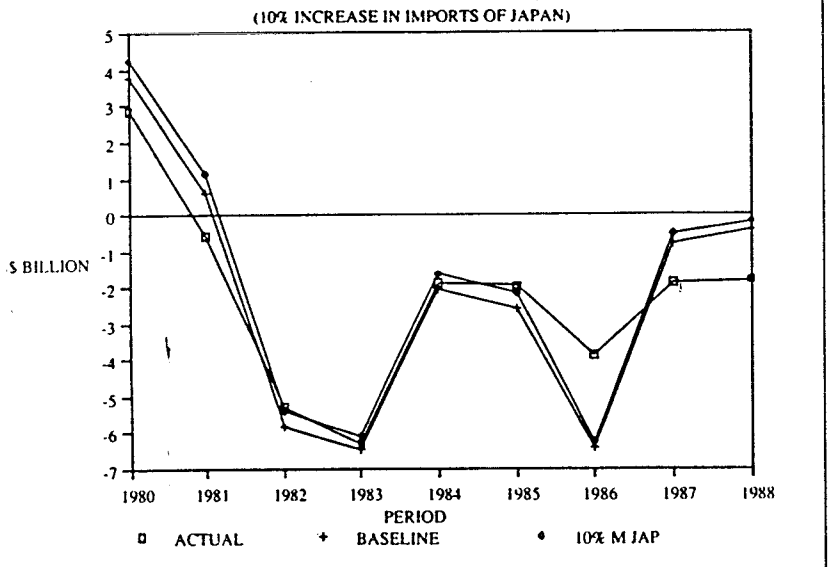


CHART 24
CURRENT ACCOUNT



The EEC share of Indonesian exports has been lower than that of Japan and the US, except for primary exports since 1984. It is therefore not surprising that the elasticity of the increase of EEC imports is even lower (0.524). With a similar procedure as before, we obtain the following rates of increase for Indonesian exports to EEC: 0.43 percent for oil and gas, 1.33 percent for manufacturing and 3.5 percent for primary commodities. However, unlike in the previous two cases, the largest impact of a 10 percent increase in imports of EEC would be felt in the primary exports. Indeed, by 1988 EEC is the second largest market after Japan for Indonesian primary exports (see Chart 52). Yet, the percentage increase of primary exports will never exceed 0.86 percent, which is smaller than changes in oil and gas exports in the US case and even much smaller than in the case of changing Japanese imports.

The maximum improvement in the current account balance will take place in 1988 when an 11 percent decrease in the deficit is expected. The improvement in the government budget is also minimal, never exceeding 0.04 percent, as is the deviation of GDP from the baseline scenario.

It would be interesting to examine the combined effects of those three hypothetical scenarios. Table 4, row G, presents the net results of such a combination. Notice that due to the dominance of Japan in the Indonesian exports of oil and gas, the largest overall impact would be on this variable (by 1988, the increase will have reached 3.6 percent). The resulting current account deficit may shrink by 60 percent in 1988. The largest increase in government revenues will have taken place in 1986 while the peak of the GDP improvement is estimated to occur in 1985 when a more than 4 percent increase would be recorded.

The percentage deviation from the baseline for each scenario and for the combined scenario could be examined also through the charts in the appendix.

4.3 A Fifty Percent Increase in Intra-ASEAN Trade

In our simulation, changes in intra-ASEAN trade are defined in the following way. It is exports of four member countries (ASEAN excluding Indonesia) to five countries of the Association that constitute intra-ASEAN exports for Indonesian imports. On the other hand, it is imports of four member countries from five countries that are the relevant component for Indonesian exports to ASEAN. Given the sectoral composition of exports and imports to and from ASEAN, and taking into account the historical elasticities of Indonesia's trade flows with respect to ASEAN exports and imports that amount to 0.62 and 0.86, respectively, we come up with the following estimates of growth rates of Indonesian imports and exports under the scenario of 50 percent increase in intra-ASEAN trade: 15.2 percent, 10.2 percent and 5.6 percent for oil and gas, manufacturing and primary imports, respectively, and 21.1 percent, 10.1 percent and 11.9 percent for oil and gas, manufacturing and primary exports, respectively.

Row H in Table 4 displays the outcomes of the simulation. In general, the improvement in the current account will not be as extensive as in the combined case presented earlier. The shrinking deficit of current account will reach 38 percent in 1988. The largest export increase is expected to come from manufactured exports. A less ample improvement will also apply in government revenues and in money supply.

The largest percentage of improvement in GDP is expected to take place in 1983 when a 3.7 percent increase would be the likely outcome. Beginning in 1985, the percentage increase in GDP will slow down and eventually reach 2.6 percent in 1988.

CHART 25
REAL GROSS DOMESTIC PRODUCT

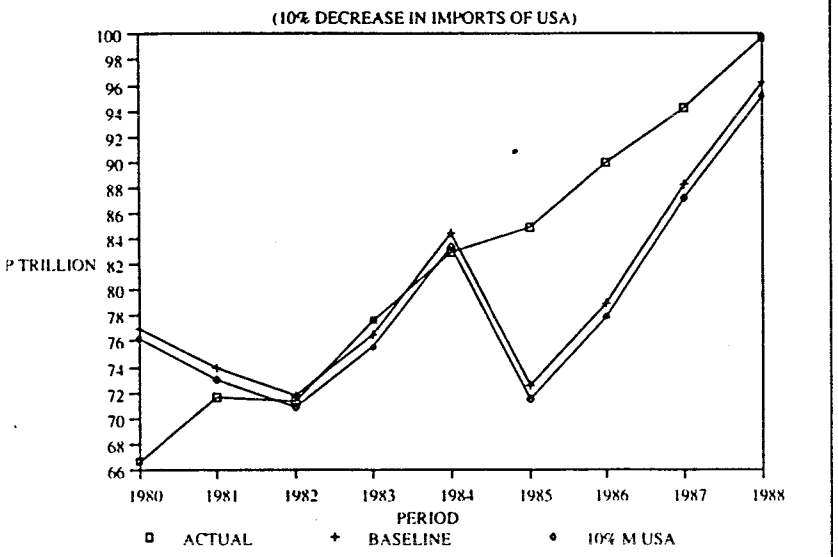


CHART 26
TOTAL EXPORTS

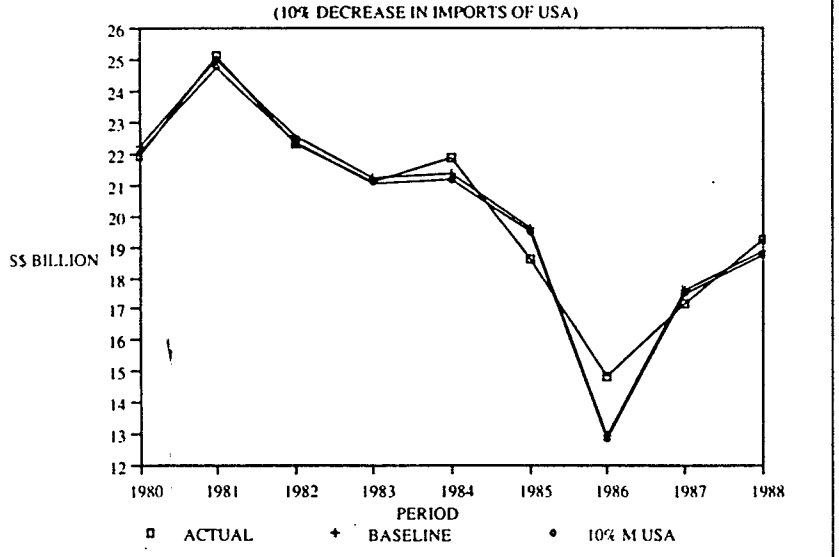


CHART 27
CURRENT ACCOUNT

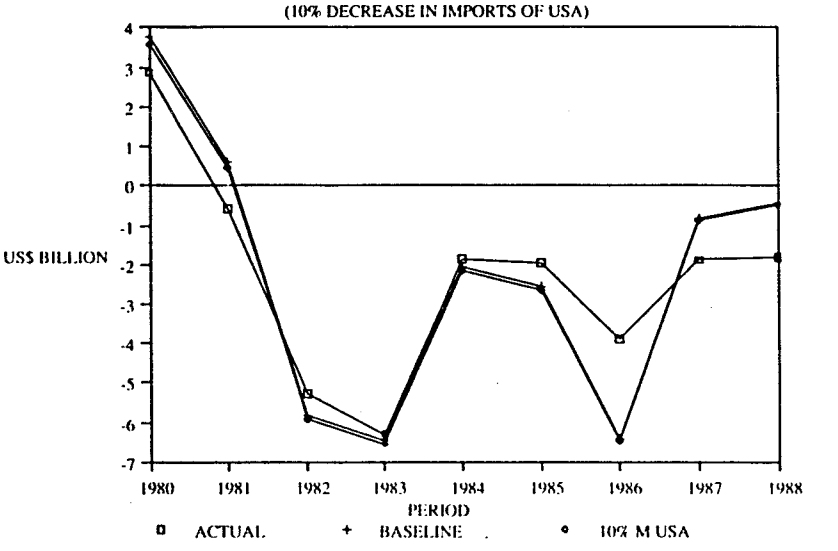


CHART 28
REAL GROSS DOMESTIC PRODUCT

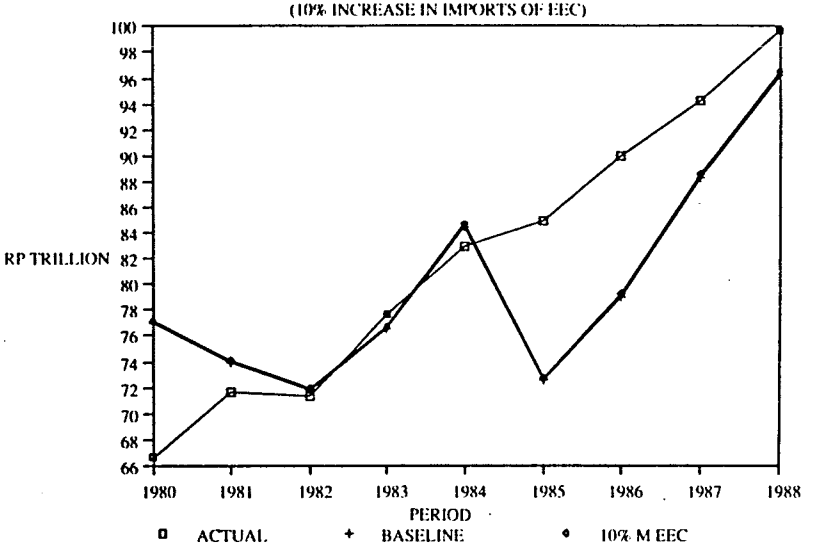


CHART 29
TOTAL EXPORTS

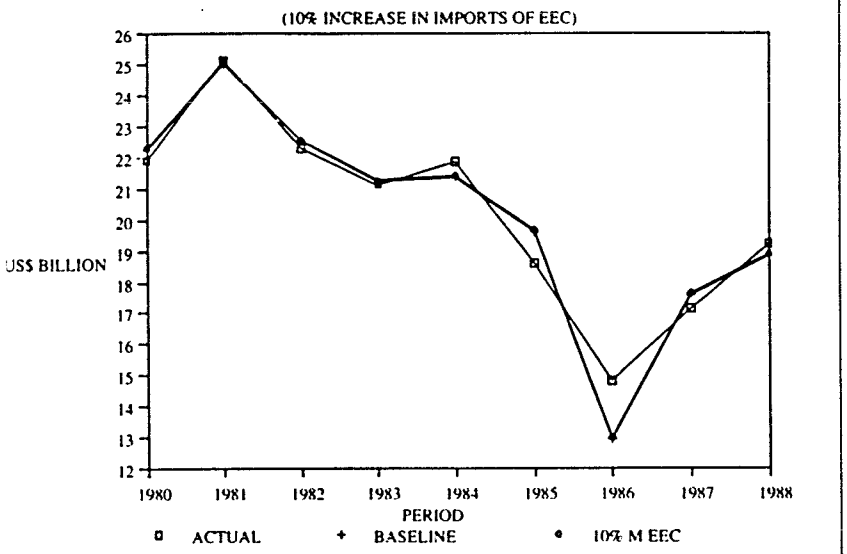


CHART 30
TOTAL PRIMARY EXPORTS

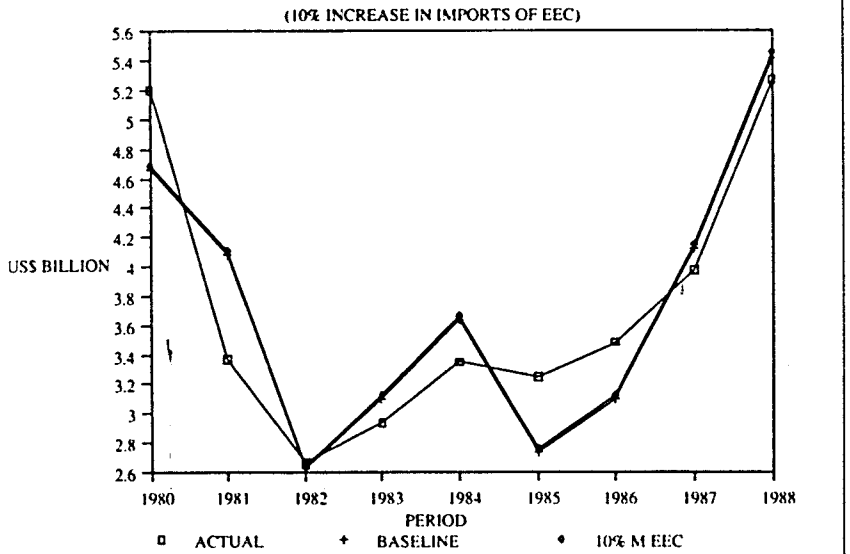


CHART 31
REAL GROSS DOMESTIC PRODUCT

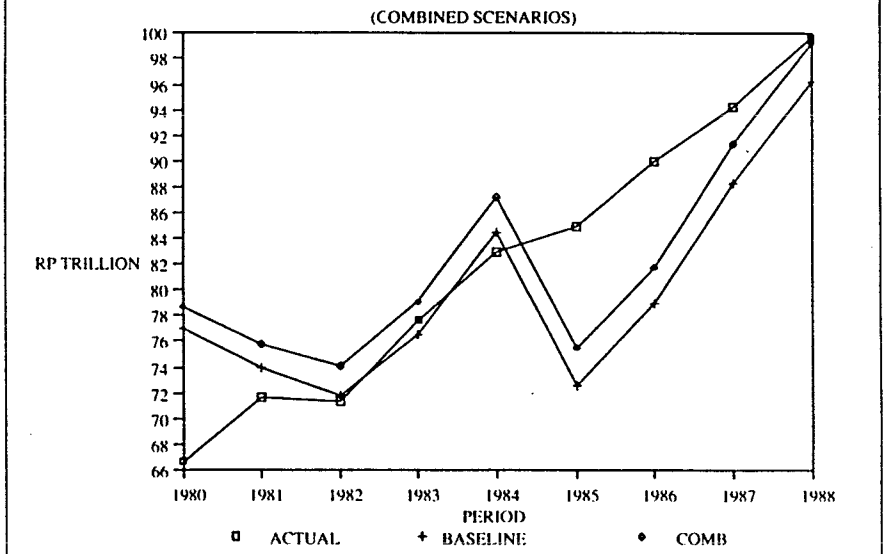


CHART 32
TOTAL EXPORTS

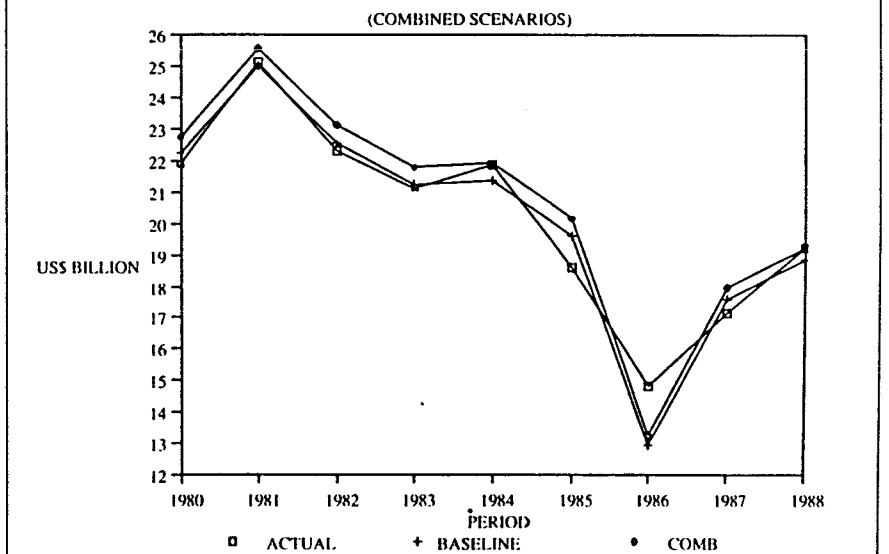


CHART 33
TOTAL EXPORTS OF NON-OIL AND GAS

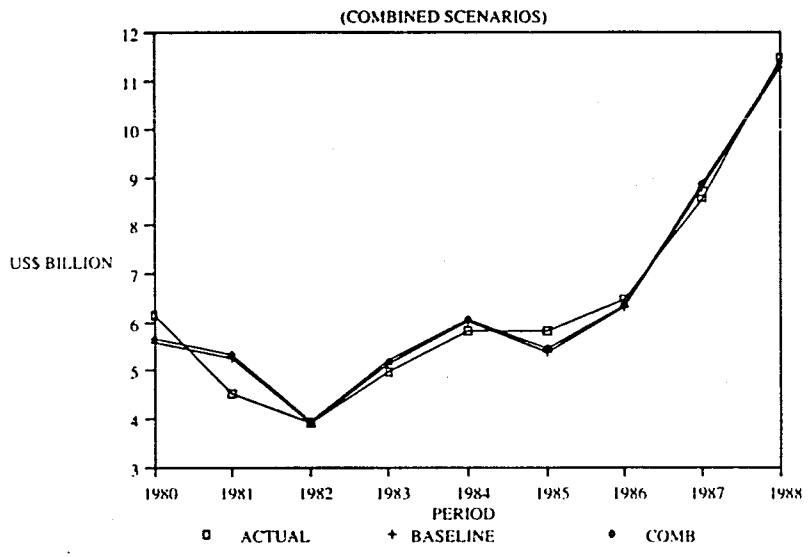


CHART 34
TOTAL OIL AND GAS EXPORTS

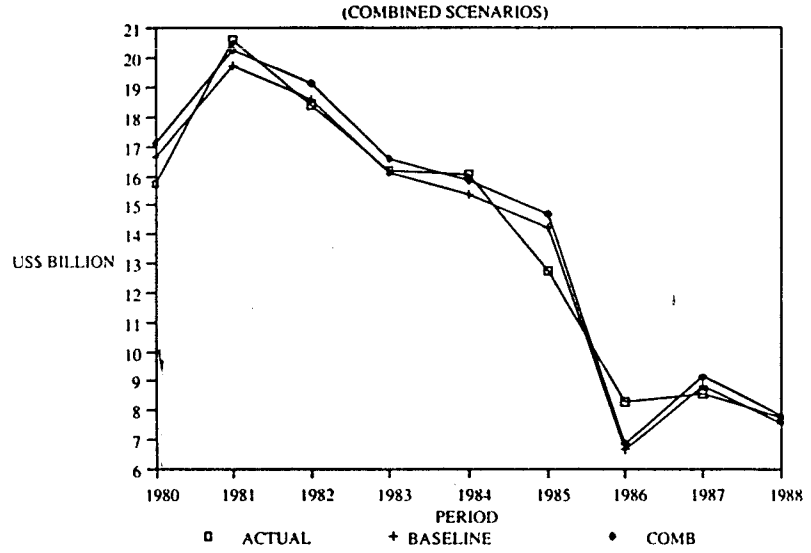


CHART 35
CURRENT ACCOUNT

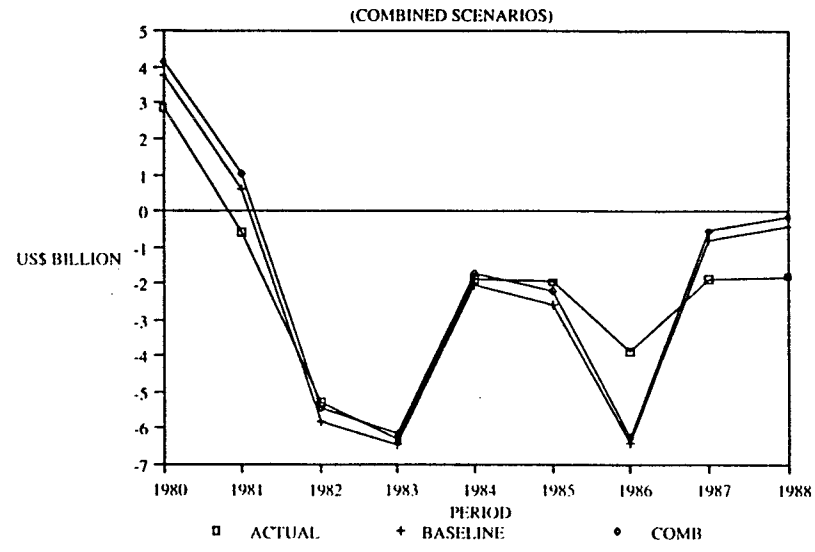


CHART 36
REAL GROSS DOMESTIC PRODUCT

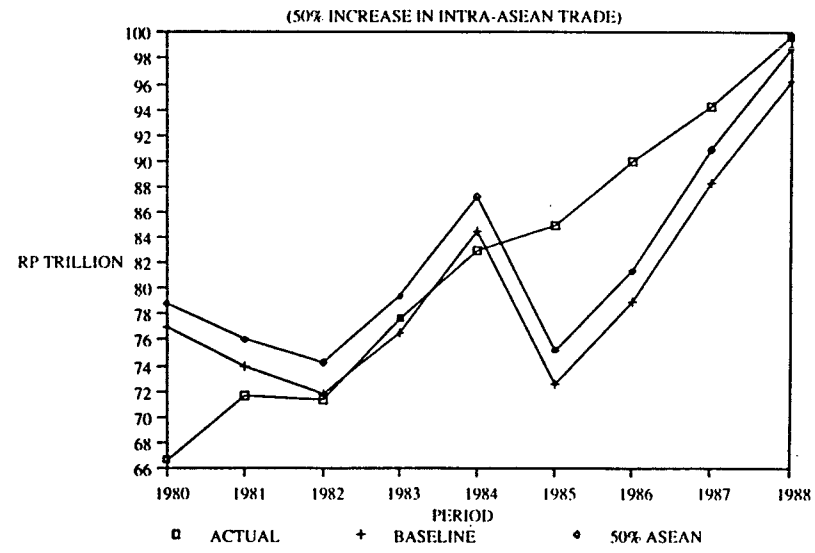


CHART 37
TOTAL EXPORTS

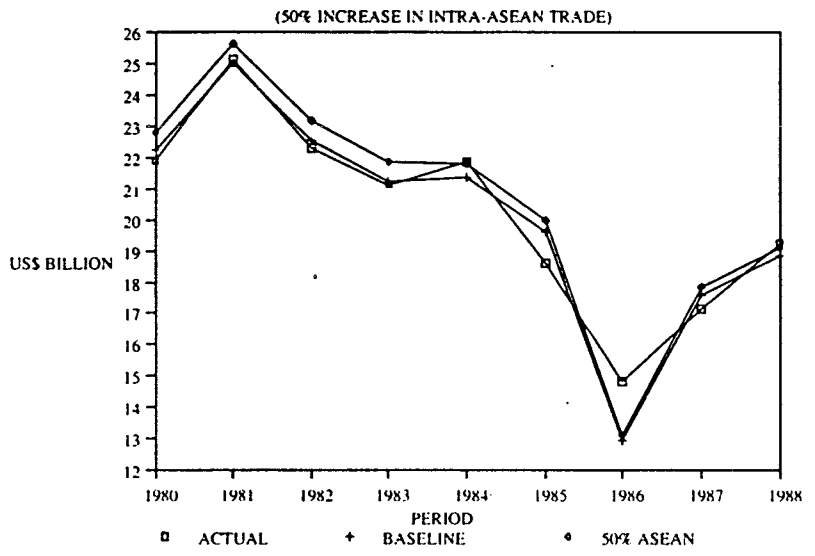


CHART 38
TOTAL NON-OIL AND GAS EXPORTS

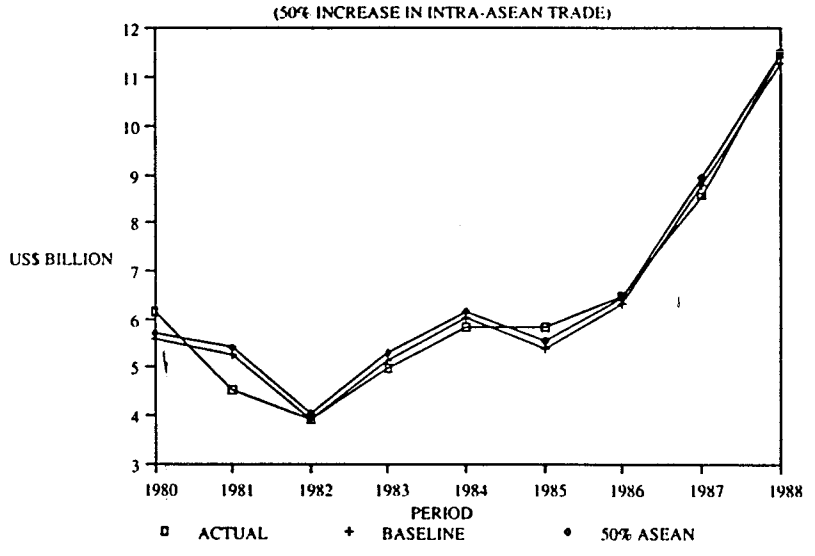


CHART 39
TOTAL OIL AND GAS EXPORTS

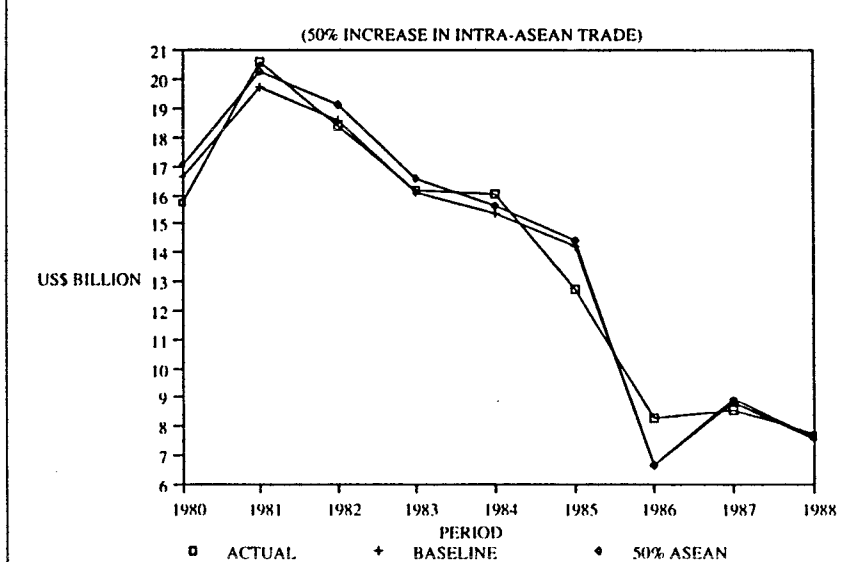
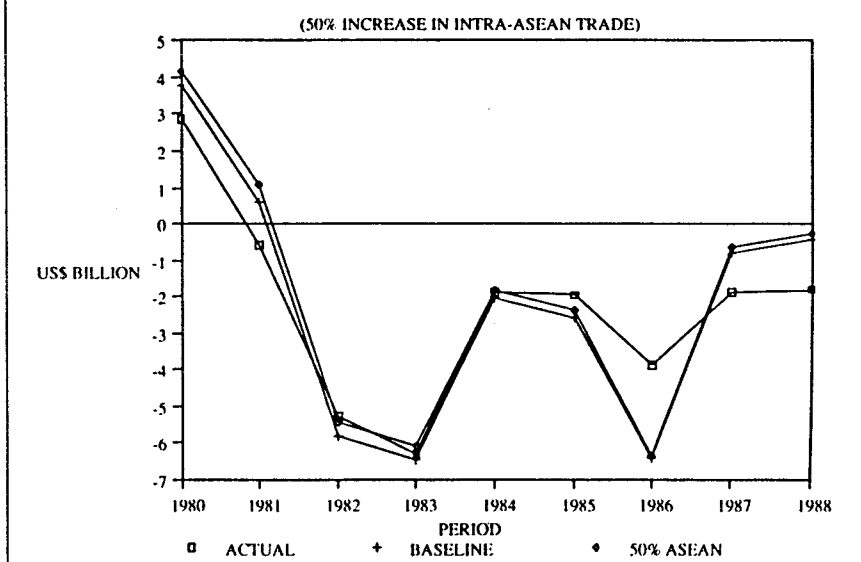


CHART 40
CURRENT ACCOUNT



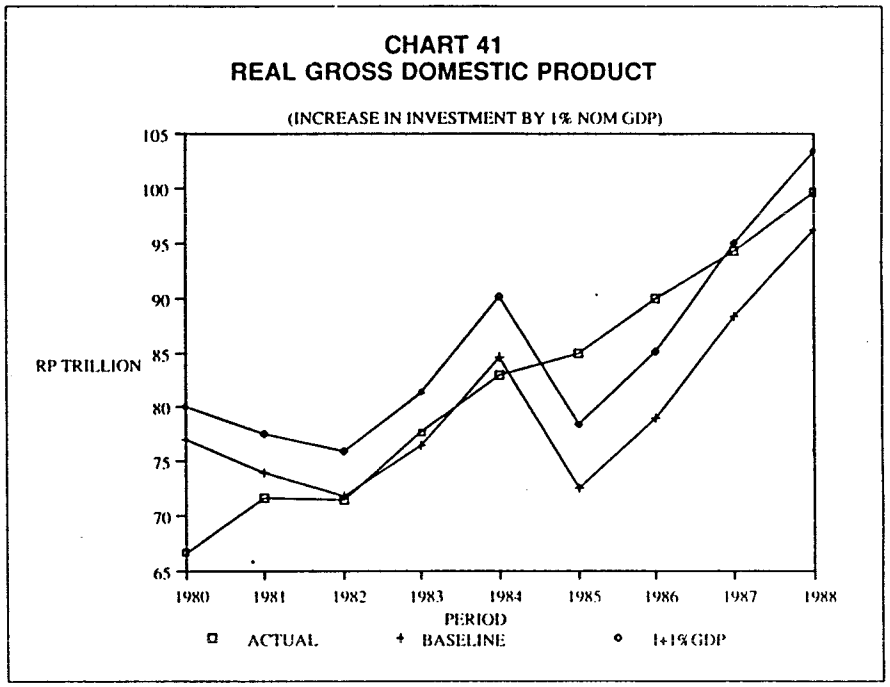
:herefore, it seems clear from the above analysis that, as far as simulation on the de altering scenario is concerned, the case of increased imports of Japan would ıerate the most significant impacts judged from the percentage changes of ividual variables.
:he percentage deviation from the baseline is presented in the appendix.

Increase in Direct Foreign Investment by One Percent of Nominal GDP

ere is no explicit variable of direct foreign investment in the model due primar- to the lack of reliable data. Reason: Most of the available data are 'approved' her than 'realised' figures. More seriously, even if some realised figures were to obtained from the investment board, there would be considerable direct foreign d domestic private investments whose size and operation would not be re- ded by the investment board. There has recently been a growing trend in such erations. Therefore, the simulation for a 1 percent increase in direct foreign estment would be treated as if it implied a 1 percent increase in total private estments (PI).
:he impacts of such a scenario appear to be mixed. The GDP increase could go high as 8.02 percent in 1985 while exports of non-oil and gas will rise by a ximum of only 2.6 percent (in 1985). The largest increase is expected to come m manufactured exports in which most foreign investments are involved. But like domestic investments, in many cases foreign investments would have ıch greater import contents. Furthermore, increasing foreign investments could o imply further outflows of factor services (indeed the SER is expected to rease by as much as 5.8 percent in 1986). The net effect on the current account ance would be very much determined by these two factors. It appears that ports will not increase much faster than exports but the deficit in net exports of vices will rise at relatively high rates such that the current account is expected deteriorate with the increasing foreign investments.
Government revenues will increase but not considerably; and in fact, from the ıulation result government revenue will decline in a single year. The moderate rease in exports will also yield moderate improvements in net foreign assets. ınsequently, with only a slight increase in the reserve money, the broad money pply is expected to rise at a relatively slow pace (a maximum of 0.3 percent in 37; see row B in Table 4).
:he percentage deviation from the baseline is also displayed in the appendix.

; A Fifty Percent Tariff Reduction

ere are at least two exogenous variables in the model that will change as the port duty is increased: the import price of consumption goods (PMCON) and port price of manufactured goods (PMM). Historical evidence showed that a 50 rcent decrease in import duty reduced PMCON by 36.9 percent and PMM by ly 2.2 percent. Since these two variables are exogenous, a simultaneous change conceivable in the model. The necessary assumption would be an automatic ercussion with the same magnitude of tariff reduction and import duty upon ICON and PMM.
As displayed in Table 4, row C, the increase in imports is only for the category primary products. On the other hand, a significant downward trend is observed r manufactured imports. Much of the explanation rests upon the dominating ice effect of PMM on manufactured imports (see the equation for MM in Table



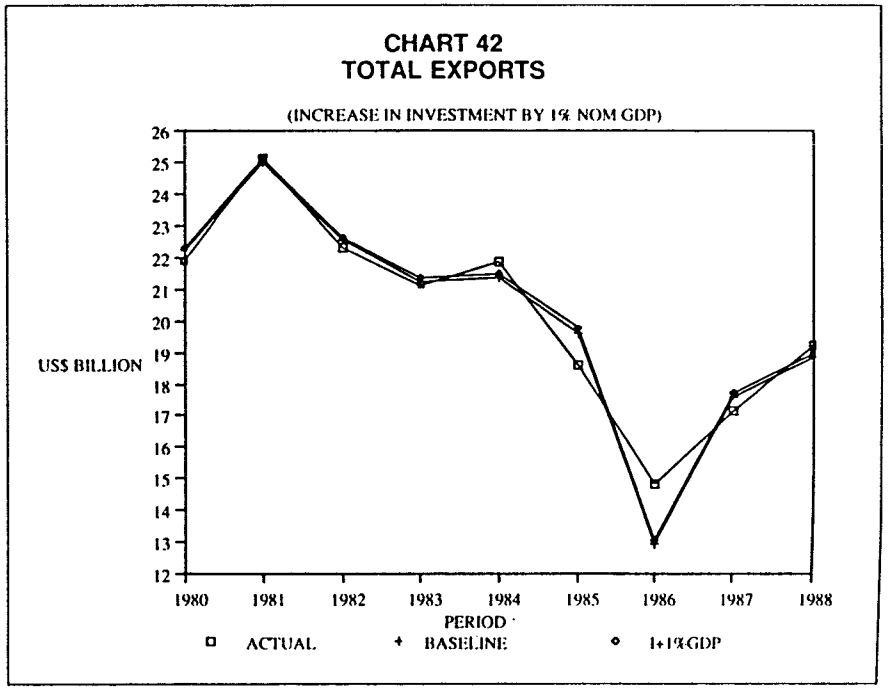


CHART 43
TOTAL MANUFACTURING EXPORTS

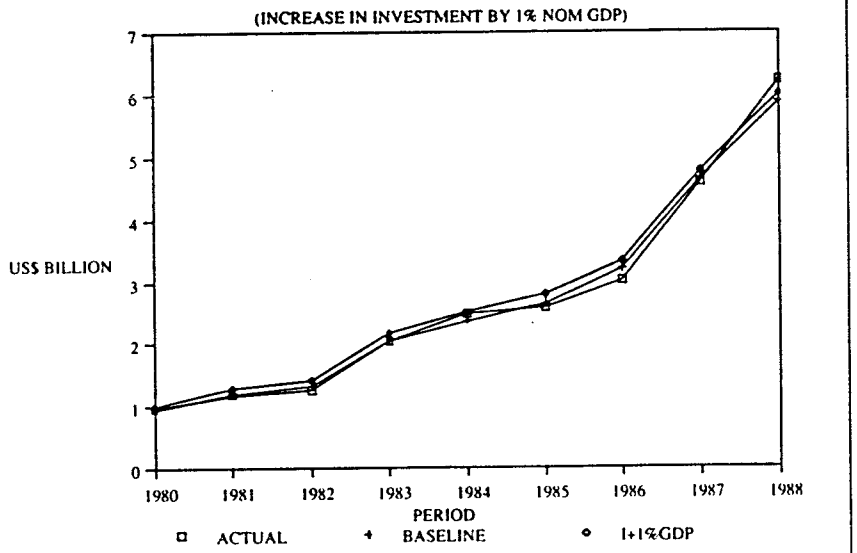
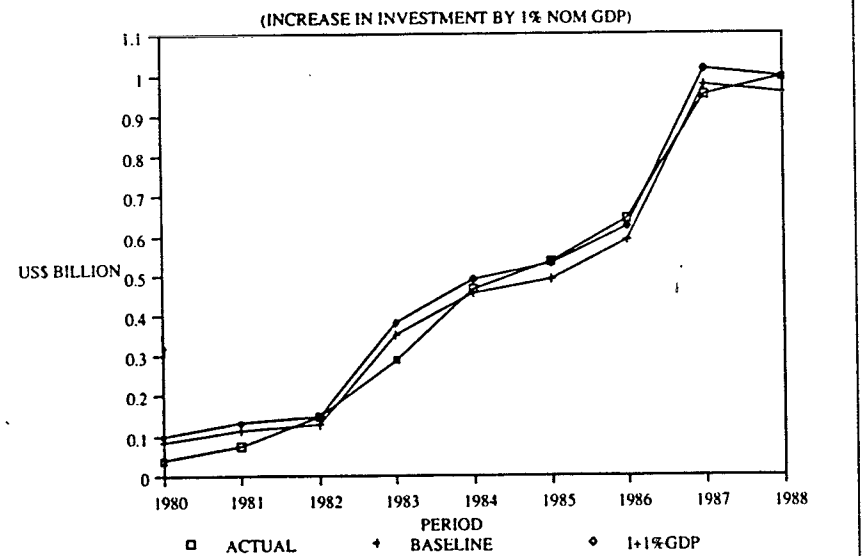


CHART 44
MANUFACTURING EXPORTS TO USA



2), such that a reduction in PMM would lower the value of manufactured imports, MM, despite the increase in volume. Since most raw material (primary) imports are needed for the processing of export-oriented goods — and this was true during the period of import-substitution as well as under the export-oriented strategy — increased primary imports may also generate the growth of manufactured exports. Such a mechanism, along with the sharp reduction in net exports of services, produces a dramatic improvement in the current account balance. In fact, a surplus in current account could have been generated under this scenario. To some extent the scenario demonstrates a windfall for the nation's balance of payment from adopting less restrictive or freer trade (through the removal of the tariff barrier).

It is also worth noting that such a significant improvement will not enforce inflationary pressures through monetary expansion. The (broad) money supply is estimated to grow at very slow rates and even to decline in the early years of the simulation period. Another improvement, although not too significant in percentage terms, is expected to take place in government revenues from taxes outside oil and gas (GDRNO).

The total welfare effect of tariff reduction is also encouraging. While the import deflator (MDEF) is reduced, the real GDP will come to as much as 4.5 percent higher than the baseline scenario.

Should we be interested with the percentage deviation from the baseline, one of the charts in the appendix can be referred to.

5. CONCLUSION

For the purpose of evaluating several scenarios of changing external trade situations, the Indonesian model is characterised by a relatively disaggregate trade block (classified by commodities and by group of countries of destination).

Although few specifications unique to the Indonesian economy deserve some elaboration, most of the discussion in the paper omits such a task because it is not too relevant given the emphasis of the present study. The use of some dummy variables is to be related to the shifts and changes in policies or trends in the Indonesian economy, particularly during the second half of 1980.

Using the baseline period 1977–88, six indicators to reflect the quality of the model are evaluated. In general, the model is able to predict variations of each variable in a satisfactory way. The disaggregate trade block turns out to be the best among the four.

In the simulation of a 20 percent yen appreciation the component that benefits the most is manufactured exports to Japan. The enhancement in exports results in a dramatic improvement of the current account balance to become a surplus. The net effect is also positive for the real GDP in which an accelerating rate of deviation from the baseline is clearly observed. By 1988, the percentage deviation could go as high as 18.4 percent.

The most affected variable under the scenario of a 10 percent increase in Japan's imports would be exports of oil and gas. Among the non-oil and gas exports, the trend of primary products tends to be volatile while manufactured exports increase persistently. Despite the increasing deficit in net exports of services, the resulting outcome is an improvement in the current account balance. The estimated increase in GDP would be between 3 and 5.2 percent. The reversed effect of a 10 percent decrease in US imports turns out to be less prevalent in which the most affected component would be exports of oil and gas. Similarly, the positive impact of a 10 percent increase in EEC imports is relatively minimal compared to

CHART 45
TOTAL MANUFACTURING IMPORTS

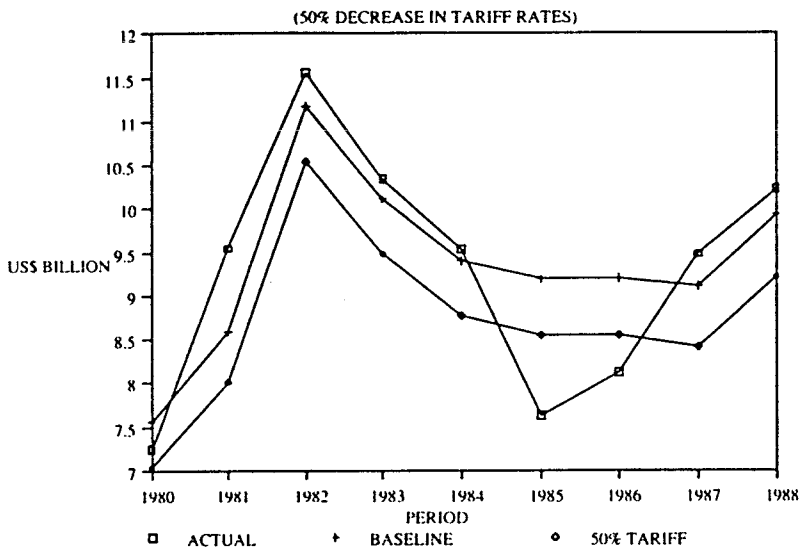


CHART 46
CURRENT ACCOUNT

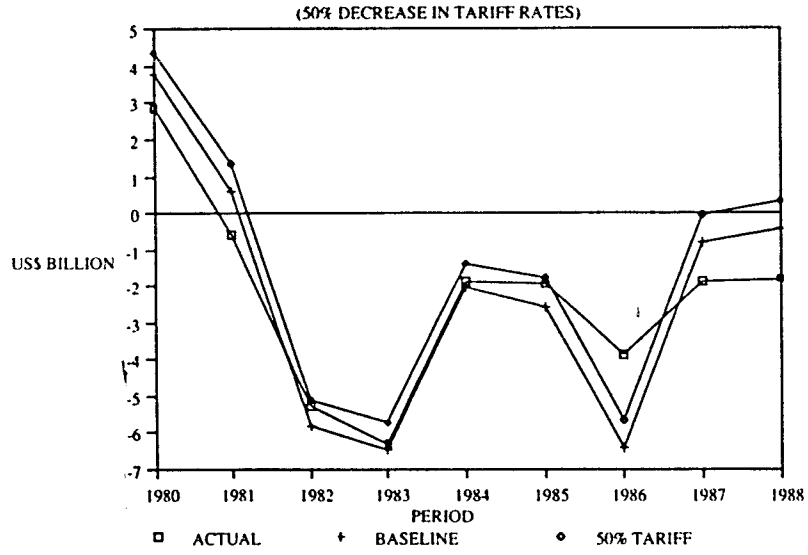


CHART 47
REAL PRIVATE INVESTMENT

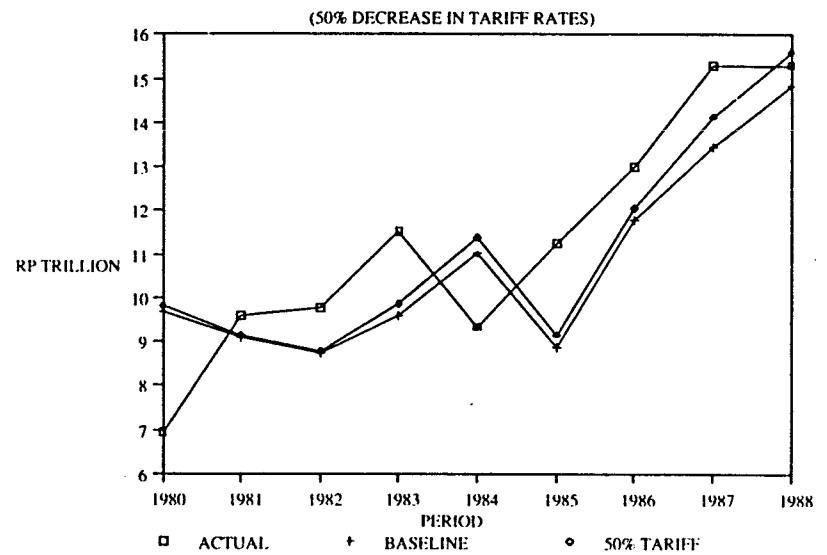


CHART 48
REAL INVESTMENT

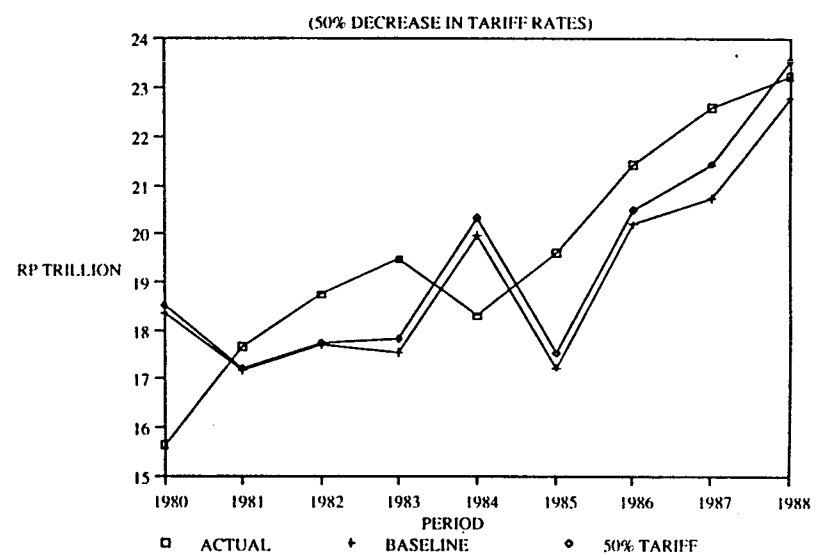


CHART 49
REAL GROSS DOMESTIC PRODUCT

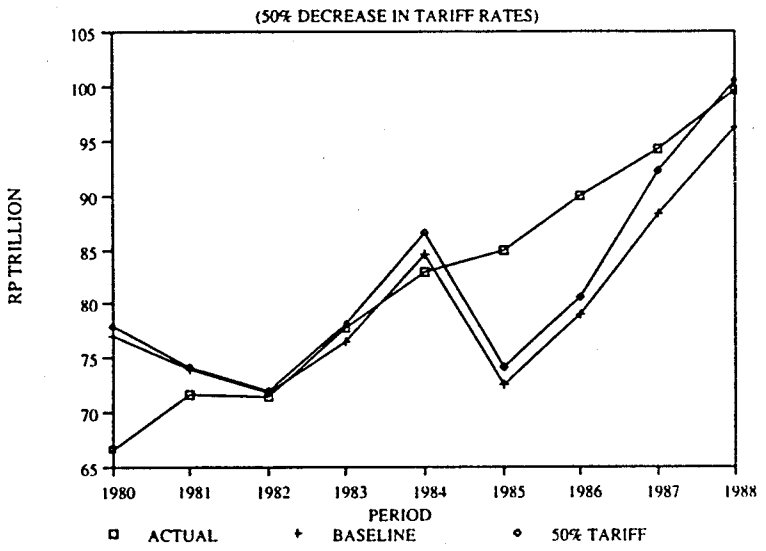


CHART 50
THE COMPOSITION OF OIL AND GAS EXPORTS, 1975–1988

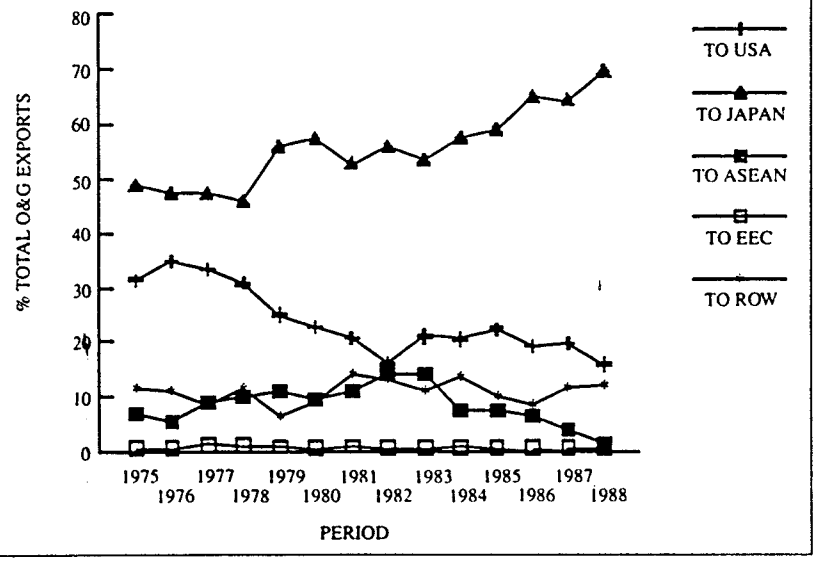


CHART 51
THE COMPOSITION OF MANUFACTURING EXPORTS, 1975–1988

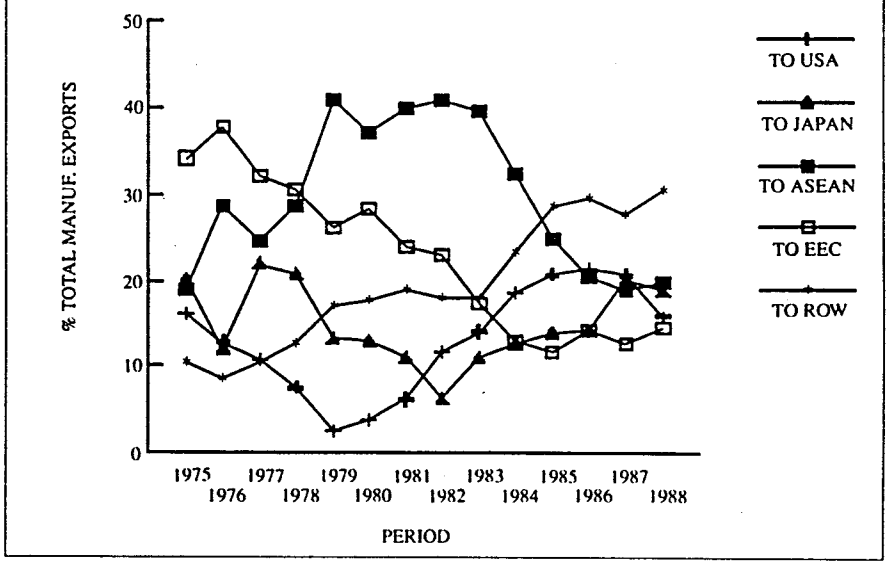


CHART 52
THE COMPOSITION OF PRIMARY EXPORTS, 1975–1988

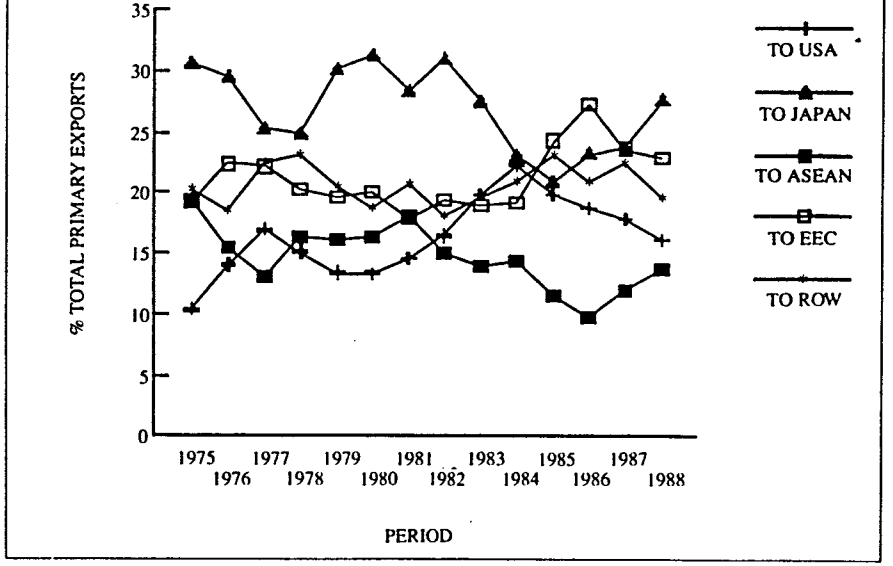


CHART 53
THE COMPOSITION OF OIL AND GAS IMPORTS, 1975–1988

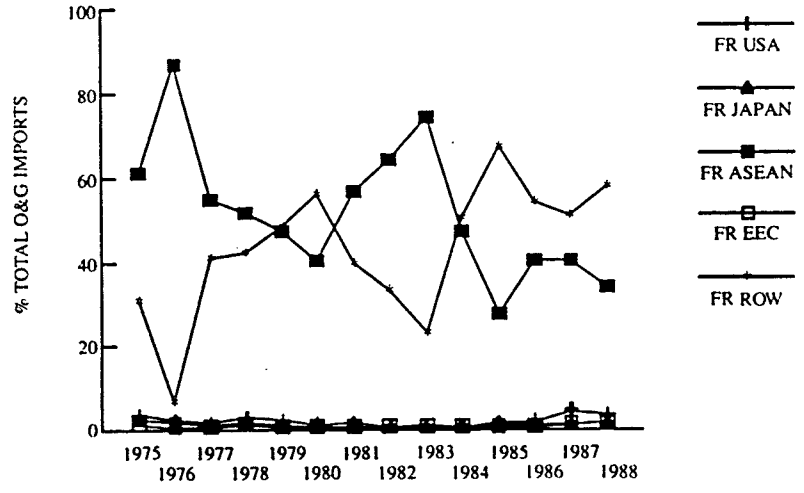


CHART 54
THE COMPOSITION OF MANUFACTURING IMPORTS, 1975–1988

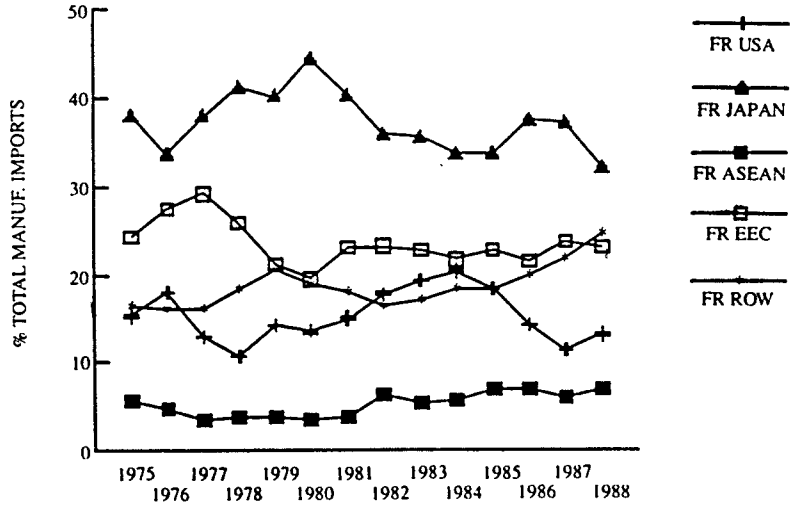
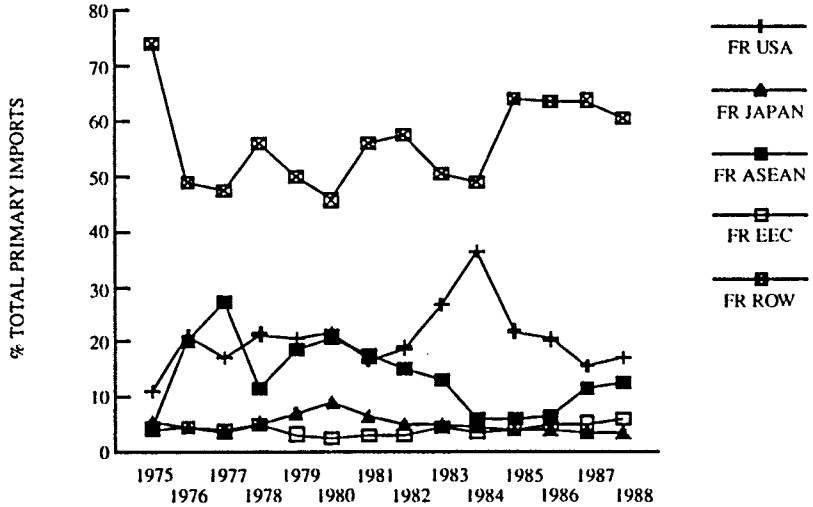


CHART 55
THE COMPOSITION OF PRIMARY IMPORTS, 1975–1988



the case of increasing Japan's imports. The most beneficial component would be exports of primary products. This is expected since up until 1988, EEC was the second largest market after Japan for Indonesian primary exports.

The effect of combining the three scenarios is an improvement by as much as 60 percent in the current account balance. Due to the dominance of Japan, the largest overall impact, measured by the size of percentage changes, is expected to be felt in the Indonesian exports of oil and gas. The GDP figure could go as high as over 4 percent more than the baseline.

A milder improvement in current account is expected from a 50 percent increase in intra-ASEAN trade. Most of the increase would come from manufactured exports. The GDP positive deviation is likely to be less than 4 percent.

An interesting simulation pertains to the increase in direct foreign investments by 1 percent of nominal GDP. While the impact on real GDP is significantly positive (more than 8 percent in 1985), the current account balance is expected to deteriorate. Further outflows of factor services and increasing imports provide the explanation to the phenomenon.

The scenario of 50 percent tariff reduction is not less interesting. The strong price effect in manufactured imports will yield a positive relation between the two. Only primary imports are expected to rise. Such a trend, combined with the strong growth of manufactured exports, will generate a dramatic improvement in the current account balance to yield a surplus position. The GDP effect is also desirable, for it may go as high as 4.5 percent higher than the baseline scenario. Another good feature of this is the absence of significant monetary expansion, implying the lack of inflationary pressures at least from the monetary sector. A clear lesson from this scenario is the beneficial effect for Indonesia from adopting freer trade at least through the removal of tariff barriers.

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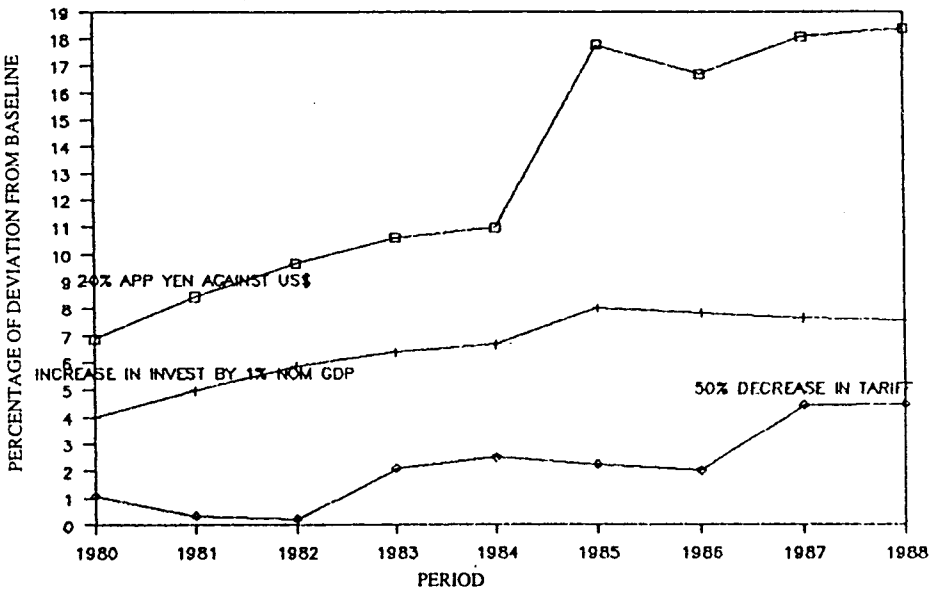
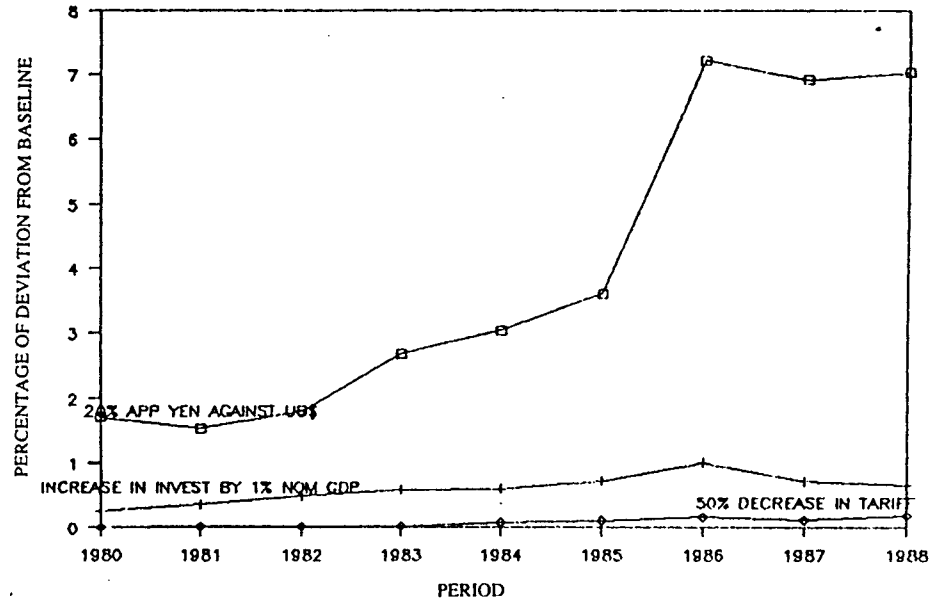
APPENDIX

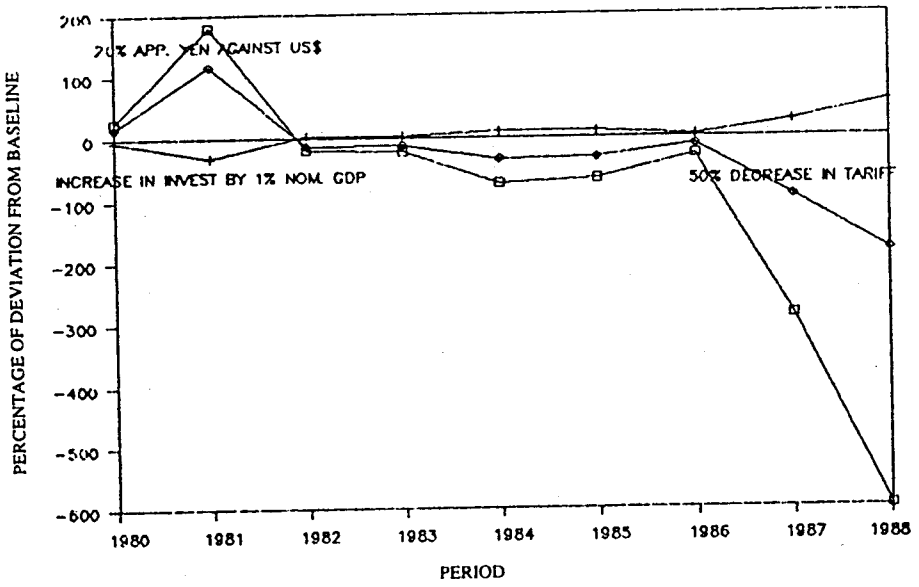
IMPACT OF SELECTED SCENARIOS ON REAL GROSS DOMESTIC PRODUCT



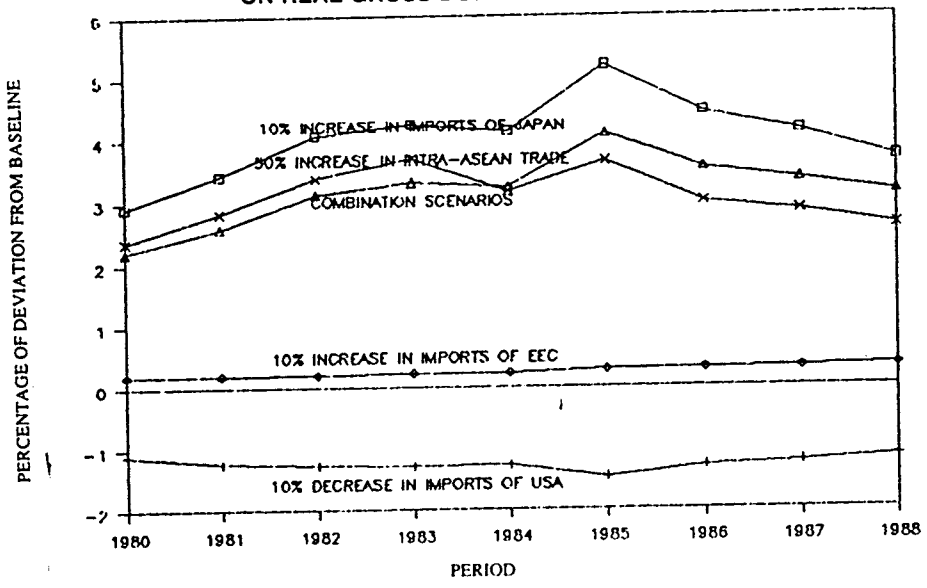
IMPACT OF SELECTED SCENARIOS ON TOTAL EXPORTS



IMPACT OF SELECTED SCENARIOS ON CURRENT ACCOUNT



IMPACT OF SELECTED SCENARIOS ON REAL GROSS DOMESTIC PRODUCT



IMPACT OF SELECTED SCENARIOS ON TOTAL EXPORTS