Macromodels of the Romanian transition Economy

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MACROMODELS OF THE ROMANIAN TRANSITION ECONOMY

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Contents

Foreword

This book is the result of my activity as senior fellow of the National Institute for Economic Research of the Romanian Academy. The first versions of a possible short-run macromodel of the Romanian transition economy have been published in 1992 - 1993. They have been improved by the later versions, which have been used for economic analysis and forecast.

In June 1996, I was invited by Hoover Institution as visiting scholar at Stanford University. I had the possibility to discuss the transition and modelling problems with specialists as J. Raisian, J. Taylor, E. Lazear, R. Sousa, M. Bernstam. I have been honoured to have a substantial scientific conversation with I. Adelman from Berkeley University. I was impressed by the complexity of the Stanford and Berkeley Universities' researches. The process of transition from command to the market system is analyzed not only from a strictly economic point of view, but from the sociological and political perspectives, too. It is probably the most productive approach, the transition being first of all a great cultural transformation. This documentation visit had an essential role in the finalizing of the macromodel presented in this book.

The commentaries of M. Lord (Boye - Lord International Ltd., Washington D.C.) and F. Barry (University College Dublin), who examined some preliminary versions of the model have also been useful. The debates organized during the last years by the Romanian National Institute for Economic Research, the Academy for Economic Studies, Bucharest University, the General Association of Romanian Economists, the Romanian Economic

Society have been stimulative for my investigations. This book would not have been possible without the informational support of some Romanian institutions such as the National Commission for Statistics, Ministry of Finance, National Bank, National Commission for Forecast. I was assisted in preparing data and performing computations by my collegues from the Informatics department (headed by P. Fomin) of the National Institute for Economic Research. I benefited by valuable suggestions of C. Popa and C. Ciupagea concerning the final editing of the text. Expert publishing house and its general manager V. Ioan-Franc have assumed the difficult target to print it in a record time. The author is grateful to all of them.

The present book contains six chapters. In the first, the Romanian transition economy is characterized as a weakly structured economy (from the institutional point of view) with its main features: the poorly defined ownership rights, the limited effectiveness of new market mechanisms, the significant role of informal institutions, the behavioural instability of economic agents, the great influence of resources' allocation by the political factor. These features have many macroeconomic implications, of which three are especially analyzed: the waste of economic resources induced by the fuzzy ownership structure, by uncertainty and high transaction costs; the deep fracture between the real and nominal sectors; the presence of numerous economic activities not included in the official statistics (nonaccounted economy).

The next chapter describes the main indicators used in the macromodel of the Romanian transition economy (definitions, symbols, specifications, relations among them, in accordance with the methodologies adopted by national statistics).

The third chapter approaches the econometric problems. Unfortunately, the microeconomic foundations of the transition are not sufficiently studied and, in effect, in many cases we lack the necessary assumptions for building up econometric functions. On the other hand, the same statistical series are relatively short and are based on conventional simplifications imposed by the

translation of the former methodologies (from material production system) to the language of the national accounts. Being weakly structured, the transition economy does not yet reveal consistent trends. Despite the unavoidable (under these conditions) instability of individual econometric functions, their integration into the macromodel, including the equilibrium constraints (accounting identities), can ensure acceptable results for short-run forecasts. Twenty econometric functions have been elaborated. They deal with: real output of the Romanian economy, domestic aggregate demand, investment, export, labour force, labour productivity, exchange rate, main deflators, labour incomes, households production for self-consumption, evolution of the non-accounted economy, monetary processes. These functions reflect the peculiarities of the Romanian experience. It is possible that other transition economies may show similar tendencies, but eventual generalizations require supplementary researches.

The fourth chapter is dedicated to the main version of the macromodel of the Romanian transition economy. Its tests for 1992 - 1995 (the 1994 - 1995 are presented herein), gave encouraging results. Consequently, it has been used for previsional estimations.

Thus, in the fifth chapter, some possible scenarios of the evolution of the Romanian economy between 1996 - 2000 are examined. This analysis demonstrates that only a deep restructuring process is able to determine sound, long term sustainable, economic growth. Among the necessary policies I can mention: the realization of an ownership structure adequate to a modern market economy; the drastic limitation of inefficient economic activities subsidized by the state budget; the improvement of corporate governance; the progressive integration of Romania into the European and world economy; the effective functioning of different markets, including the capital one; maintenance of the inflation under control by a prudent monetary policy; lowering the share of the budget expenditures in GDP and the promotion, on this basis, of a rational fiscality.

The last chapter examines an extended version of the macromodel, in

which the general consolidated budget is explicitly presented. At the same time, other possible developments of the macromodel are outlined; its qualities and limits are mentioned. The most important problem remains the instability of the econometric functions. Consequently, it is necessary to reestimate them every year, taking into account new findings of the theory related to the transition and new statistical information. In other words, the macromodel must be permanently updated. In this way, a sort of sliding macroeconomic modelling is practiced.

The appendices of the book contain a relevant set of macroeconomic indicators of Romania for the period 1980 - 1995, the detailed presentation of the econometric functions and of the macroeconomic estimations, as well as a selective bibliography.

Bucharest, September 1996

Prof. Emilian Dobrescu

Introductory remarks

The Romanian experience demonstrates that the transition economy is weakly structured (from the institutional point of view). Its general functioning has distinct features.

1.1. The ownership rights are poorly defined:

- practically, the state owned commercial companies do not have a real owner;
- in the enterprises privatised by vouchers effective corporate governance does not exist;
- only in the new private sector, especially in the small and medium sized firms, ownership rights are more clearly established, but the activity of these private firms is marked by the general economic environment.

The validity of the Coase theorem concerning the implications of poorly defined ownership rights is confirmed by the Romanian experience.

1.2. The transition from the command to the market economy implies a global change of the formal institutions. They are assimilated by society throughout a long period; consequently, their short-run effectiveness is limited.

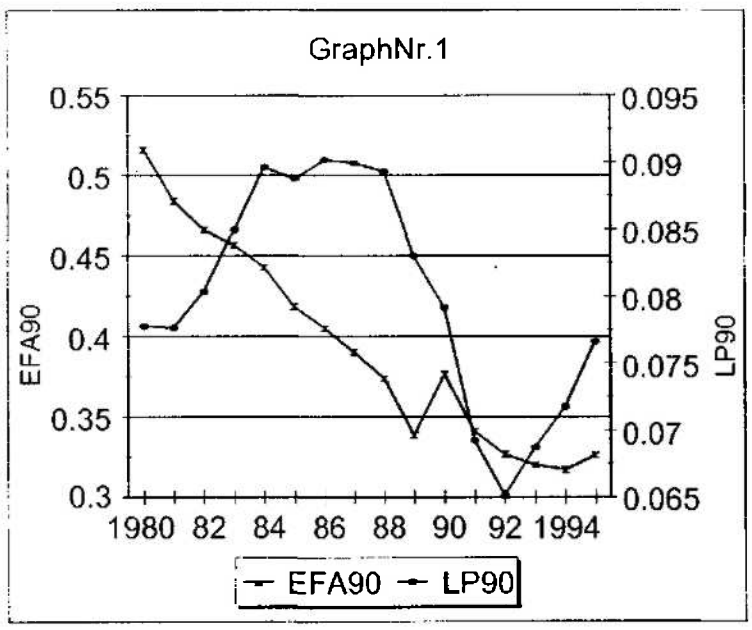
1.3. Instead, the informal institutions of the economic and social life have a very important role, in any case greater than in the structured economies. Among the informal rules there are some with strong inertia, given that they reflect the historical traditions of the respective population, its experience and spirituality (in the case of Romania, see Blaga, Draghicescu, Mungiu, Munteanu - Gurgu, Pasti, Radulescu - Motru, Vulcanescu).

1.4) There is a significant instability in the behaviour of the firms and households. Uncertainty and transactions costs are high. Economic agents are interested first of all in short- run decisions.

1.5) The political factor and its conjunctural criteria substantially interfere with economic processes.

The above mentioned features have some essential implications, of which three are essential on a macroeconomic scale. Appendix I containes the main indicators of the Romanian economy for the period 1980-1995.

2) The poor definition of ownership rights, the high degree of uncertainty and great transaction costs induce a huge waste of economic resources. The evolution of labour productivity (LP90) and of the efficiency of fixed assets (EFA90) in Romania (both indicators being in 1990 prices) is presented in Graph No.1:



LP90 is represented by the gross domestic product per employed person (mill. lei) and EFA90 by the ratio between gross domestic product and fixed assets

3) The transition economy, as a weakly structured economy,is characterized by the deep fracture between its real and nominal components. The nominal flows and the corresponding macroeconomic indicators are disturbed by the "dollarization" of an important share of domestic transactions (performed by the direct utilisation of the foreign currency) and by the use of the interenterprise arrears as a monetary substitute (Begg and Portes, Bernstam, Clifton and Khan, Croitoru, Daianu). Concerning this phenomenon, I suggested (Dobrescu 1993 b, 1994 a and 1994 b) to introduce in the analysis the monetary distortion coefficient (β):

$$\beta = \frac{M2 + Z + N}{M2}$$

where:

$M2$ - broad money (currency outside banks, demand deposits of economic agents, households deposits, time and restricted deposits, forex deposits of residents);

Z - the equivalent in $M2$ of the foreign currency directly used in domestic transactions (the monetary effect of the "dollarization" of the economy);

N - the equivalent in $M2$ of the interenterprise arrears (their monetary effect).

The value of Z is given by

$$Z = [H_1 * (ER^* - ER) + H_2 * ER^*] * h$$

where:

H_1 - the deposits in foreign currency held by residents in the banking system, in USD;

ER - the reference exchange rate, in national currency per USD, used in the determination of $M2$;

ER^* - the effective exchange rate, that is the exchange rate used (explicitly or implicitly) in the domestic transactions (in national currency per USD); this analysis assumes that $ER^* > ER$;

H_2 - the amount of foreign currency held by firms and households outside the banking system and used for carrying out domestic transactions (in USD);

h - the transformation coefficient of the expression $[H_1 * (ER - ER^*) + H_2 * ER^*]$ into $M2$ equivalent.

The value of N is determined by

$$N = A * m$$

where:

A - the amount of gross arrears;

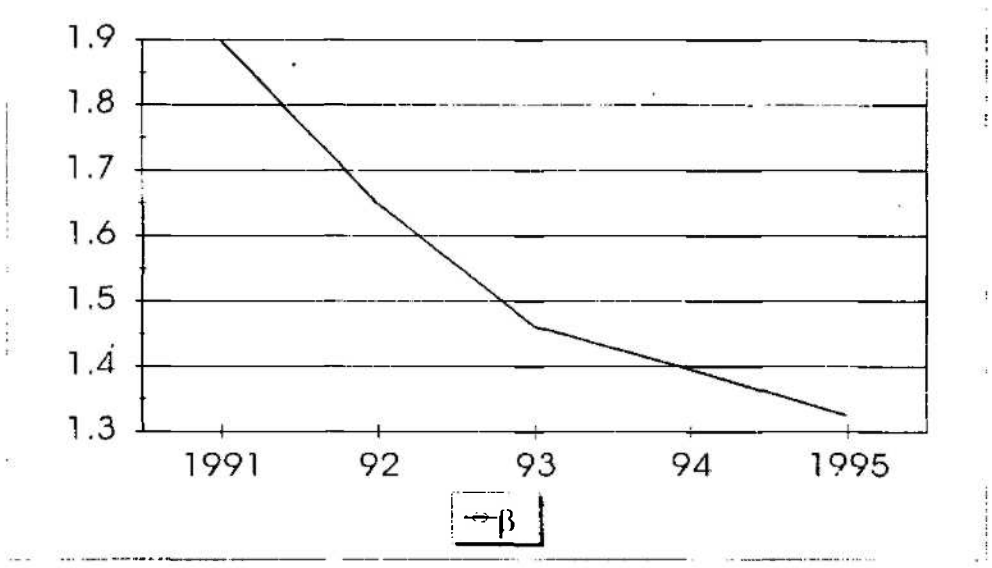
m - the transformation coefficient of gross arrears into an $M2$ equivalent.

In the case of Romania, during 1991 - 1996, there could be identified two cycles for the building up of arrears: the first one developed in 1991 and has been interrupted by the global compensation enacted in the begining of 1992, while the second one has started after this operation and is still in process.

Concerning the coefficients h and m, the expert estimations are usually practiced; I preferred the econometric determinations (Dobrescu 1994 a and 1994 b).

For Romania, the monetary distortion coefficient β has been evaluated using the estimations of the National Bank, commercial banks, Ministry of Finance, some economic publications concerning gross interenterprise arrears and the possible volume of foreign currency involved in the domestic transactions. In Graph No.2 the variation of β is presented.

Graph Nr.2



Despite its declining trend, the monetary distortion coefficient remains significant.

4) The informal institutions play a great role in weakly structured economies. There is an important nonaccounted sector (Albu, Alessandrini and Dallago, Chadeau, Gaertner and Wening, Houston, Pestieau, Petersen, Puwac, Pyle, Roubaud and Seruzier, Smith, Traimond). The Romanian statistics have been structured according to the European System. For the following discussion, I considered that *GDP* represents the gross domestic product of the accounted economy (that is included in the national accounts), *UND* the gross domestic product of the nonaccounted economy (that is not recorded in these accounts) and

$$s = \frac{GDP}{GDP + UND}$$

The gross domestic product created in the nonaccounted economy is composed by: legally admitted production that is omitted by official statistics

(for technical or informational reasons); legally admitted production but not declared by firms or individual producers on fiscal evasion purposes; forbidden production. Therefore, the gross domestic product created in the nonaccounted economy is defined in the broadest sense. That is why I do not use the expression underground economy (usually interpreted only as illicit activity).

I have tried to evaluate *UND* and *s* using: the differences between the determination of *GDP* by production method, incomes method and expenditures method; monetary approach; Laffer curve; households surveys; reports of the economic control authorities. The ratio s evaluated by different procedures varies within broad limits: from 60-62% to 90-91%. Obviously, such results cannot be considered relevant.

Consequently, I gave up the direct determination of the ratio s, insisting on obtaining more plausible estimates concerning the index $Is = \frac{s}{s(-1)}$. This solution allows for the utilisation of different procedures, choosing the most adequate method for each period.

4.1) Thus, for 1985 - 1990 it is possible to estimate *Is* by the monetary aproach (the fluctuation of the money velocity).

Usually, Romanian statistics operates with the following expression of the money velocity (*v*):

$$v = \frac{GDP}{M2}$$

If we introduce v^* - "operational" velocity defined by the volume of the transactions (in equivalent GDP) effectively intermediated by money unit, *v* can be also written:

$$v = v^* * \beta * s$$

It can be assumed that during the period 1985 - 1990 the coefficient β did not significantly exceed 1.0 because the interenterprise arrears have been periodically compensated by budget resources (as a form of soft budget

constraint) and the possibilities of using foreign currency in domestic transactions have been extremely limited.

With prices being stable (of course, due to administrative reasons), it can be assumed that v^* has also been influenced by objective factors (first of all by the evolution of the ratio between the volume of inventories and investments in progress, on one hand, and *GDP*, on the other).

Using these estimations of v^*, the statistic series of v and the assumption that $\beta = 1.0$, we determined the indexes *Is* in comparison with 1985 (the s for this year is not known), noted *Is*85.

4.2) After 1990, this approach cannot be used, since v^* has been seriously influenced by the inflation; besides, the monetary distortion became significant. Instead, I noticed an interesting evolution of returns to unit energy consumption.

The ratio between *GDP* and the consumption of primary energy in the rest of economy (excluding industry and construction) decreased substantially during 1990-1992 and increased in the recent period. I have no basis to assume that this tendency could have been determined by changes in the accounted economy. Therefore, I assumed that it was an expression of the fluctuation of the nonaccounted economy. Consequently, I accepted that returns to unit energy consumption remained constant at the level of 1990 and the registred differences (in comparison with statistical data) in the later years represented a modification of gross domestic product created in the nonaccounted economy (*DUND*90).

As a result, the following system has been solved:

$$Is85(t)=Is85(t-1)*Is(t)$$

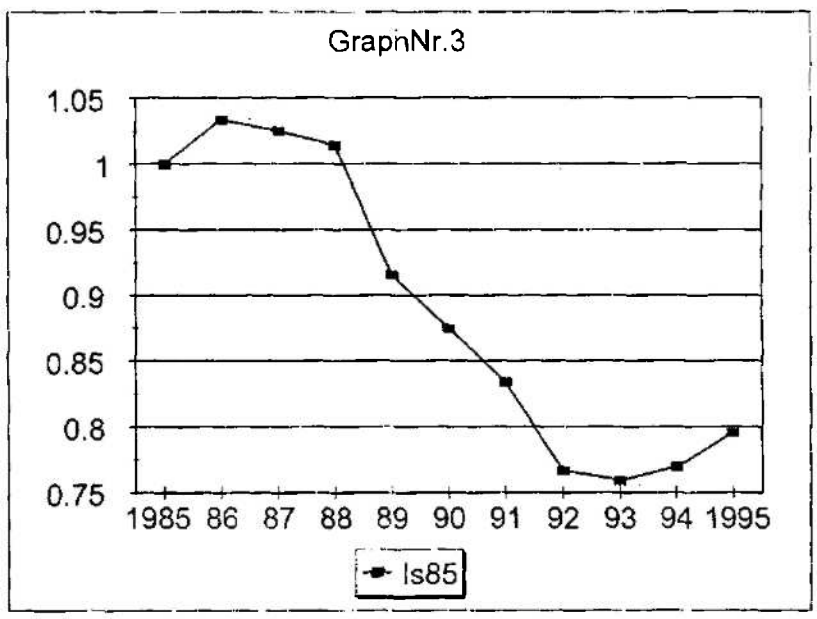
$$Is(t)=\frac{GDP90(t)}{GDP90(t)+UND90(t)}:\frac{GDP90(t-1)}{GDP90(t-1)+UND90(t-1)}$$

$$UND90(t)=GDP90(t)*[\frac{1}{x*Is85(t-1)}-1]+DUND90(t)$$

in which *Is*85(*t*) represents the index of *s*(*t*) in comparison with its level in 1985, denoted by *x*; for 1986-1990 the *Is*85 have already been determined by monetary method; t = 1991....1995.

I estimated *Is*85 for 1991-1995 assuming a large variation of x (from 0.95 to 0.75) and established that the influence of its dimension on the *Is*85 series is very small. Finally, the Is85 series presented in the statistical Appendix has been obtained.

The evolution of *Is*85 has the following shape:



It is plausible to admit a certain development of the nonaccounted economy before 1989. This tendency has been accentuated by the initial conditions of the transition from command to market system (the absence of a clear institutional framework, the weakness of new legal authorities etc). Probably, it was slowed down in the latest years. In other words, the Graph No.3 correctly approximates the general evolution of the nonaccounted economy in Romania.

5) The fact that the transition economy can be considered as a special type of economy explains why a generally accepted theory about this field does not exist. Most books and papers dedicated to these problems are based on eclectic foundations.

It is interesting to notice that the main approach has been normative. These studies outlined, first of all, the possible strategies and programmes, the necessary processes. The most important question was: "how to undertake the transition ?" It was an understandable tendency because for all the former socialist countries the crucial problem was to promote the reforms to democracy and to the market economy; they needed recommendations concerning this evolution.

Now, after 6-7 years, the situation is different. The normative approach remains necessary, but it is not sufficient. The transition economy is a special type of economy and we must know what its real mechanism is. Therefore, it is very important to complement the normative approach with a positive one, based on substantial empirical investigations. The macromodel of the Romanian transition economy has been developed taking into account this positive approach; its target is to simulate the short-run implications of macroeconomic policies.

2 Economic indicators and their symbols

The macromodel uses annual data. It is based on the national accounts adopted in the last years by Romanian statistics. Some series of data have also been recalculated for the past period (generally beginning with 1980). The economy is represented by both the accounted part (reflected in the national accounts) and the nonaccounted part (not included in these accounts).

Accounted economy

Symbol	Indicator
P	Population, millions persons
AP	Population over 15 years of age, millions persons
LF	Labour force, millions persons
lfp	Labour force rate
	$lfp=\frac{LF}{P}$
E	Employment, millions persons
UN	Unemployment, millions persons
	UN=LF-E
*E*1	Number of salaried employees, millions persons

*E*2	Peasants and other nonsalaried employed people, millions persons
	$E=E1+E2$
RP	Social insurance retired people, millions persons
*RP*1	State social insurance retired people (excluding farmers), millions persons
*RP*2	Other retired people, millions persons
	$RP=RP1+RP2$
QE	Quasi-employees, (salaried employees, registered unemployment and state social insurance retired people, that is the persons having incomes as a result of a present or former labour contract), millions persons
	$QE=E1+RP1+UN$
qe	Quasi-employees rate
	$qe=\frac{QE}{AP}$
GDP	Gross domestic product, current prices, trillions lei
*GDP*90	Gross domestic product, 1990 prices, trillions lei
LP	Labour productivity, current prices, millions lei per employed person
	$LP=\frac{GDP}{E}$
*LP*90	Labour productivity, 1990 prices, millions lei per employed person
	$LP90=\frac{GDP90}{E}$
GDPD	Gross domestic product deflator

*GDPD*90 GDP price index, 1990=1

$$GDP90 = \frac{GDP}{GDPD90}$$

$$GDPD = \frac{GDPD90}{GDPD\ 90(-1)}$$

GVA Gross value added, current prices, trillions lei

GVAIC Gross value added in industry and construction, current prices, trillions lei

GVAA Gross value added in agriculture, silviculture, forestry, hunting and fishing, current prices, trillions lei

GVAT Gross value added in transport, post and communications, current prices, trillions lei

GVAPS Gross value added in public services, current prices, trillions lei

GVAO Gross value added in trade, financial, banking and insurance activities, real estate and other services, current prices, trillions lei

$$GVA=GVAIC+GVAA+GVAT+GVAPS+GVAO$$

*GVA*90 Gross value added, 1990 prices, trillions lei

$$GVA90 = \frac{GVA}{GDPD90}$$

*GVAIC*90 Gross value added in industry and construction, 1990 prices, trillions lei

$$GVAIC90 = \frac{GVAIC}{GDPD90}$$

*GVAA*90 Gross value added in agriculture, silviculture, forestry, hunting and fishing, 1990 prices, trillions lei

$$GVAA90 = \frac{GVAA}{GDPD90}$$

*GVAT*90 Gross value added in transport, post and communications, 1990 prices, trillions lei

$$GVAT90 = \frac{GVAT}{GDPD90}$$

*GVAPS*90 Gross value added in public services, 1990 prices, trillions lei

$$GVAPS90 = \frac{GVAPS}{GDPD90}$$

*GVAO*90 Gross value added in trade, financial, banking and insurance activities, real estate and other services, 1990 prices, trillions lei

$$GVAO90 = \frac{GVAO}{GDPD90}$$

$$GVA90 = GVAIC90 + GVAA90 + GVAT90 + GVAPS90 + GVAO90$$

DAD Domestic aggregate demand (final consumption of households and private nonprofit institutions serving households, final consumption of general government, gross capital formation), current prices, trillions lei

*DAD*90 Domestic aggregate demand, 1990 prices, trillions lei

$$DAD90 = \frac{DAD}{GDPD90}$$

I Investments, current prices, trillions lei

id Investment rate

$$id = \frac{I}{DAD}$$

*I*90 Investments, 1990 prices, trillions lei

XGD Exports, billions USD

XG Exports, trillions lei

ER Exchange rate, employed in GDP and M2 estimations, thousands lei per USD

*ER*90 Exchange rate, 1990 prices, thousands lei per USD

$$ER90 = \frac{ER}{CPI90}$$

$$XG=XGD*ER$$

*xgdp*90 Export rate

$$xgdp90 = \frac{XGD*0.02303}{GDP90}$$

in wich 0.02303 represents the exchange rate of 1990 year

MGD Imports, billions USD

MGDP Imports for production, billions USD

mgdp Production import coefficient

$$mgdp = \frac{MGDP}{GDP\,90}$$

MGDI Imports for investment, billions USD

mgdi Investment import coefficient

$$mgdi = \frac{MGDI}{I90}$$

MGDC Imports for final consumption and other uses, billions USD

mgdc Consumption import coefficient

$$mgdc = \frac{MGDC}{DAD90-I90}$$

MG Imports, trillions lei

$$MG=MGD*ER$$

NX Surplus (+) or deficit (-) of foreign trade balance, billions USD

$$NX=XGD-MGD$$

$$DAD+XG-MG=GDP$$

FA Fixed assets, current prices, trillions lei

*FA*90 Fixed assets, 1990 prices, trillions lei

EFA Efficiency of fixed assets, current prices

$$EFA=\frac{GDP}{FA}$$

*EFA*90 Efficiency of fixed assets, 1990 prices

$$EFA90=\frac{GDP90}{FA90}$$

*DFA*90 Fixed assets depreciation, 1990 prices, trillions lei

dfa Fixed assets depreciation rate

$$dfa=\frac{DFA90}{FA90(-1)}$$

CFPI Current gross capital formation price index

*CFPI*90 Gross capital formation price index, 1990 = 1

$$CFPI=\frac{CFPI90}{CFPI90(-1)}$$

$$I90=\frac{I}{CFPI90}$$

$$FA90=FA90(-1)*(1-dfa)+I90$$

GRP Nominal gross income of households, trillions lei

DRP Nominal disposable income of households, trillions lei

GLEE Total labour income, trillions lei

GLE Labour income, millions lei per employed person

$$GLEE=GLE*E$$

ler Labour income rate

$$ler = \frac{GLEE}{GVA}$$

GLE 90 Labour income, 1990 prices, millions lei per employed person

$$GLE\,90 = \frac{GLE}{GDPD90}$$

*GW*1 Nominal gross wage, millions lei per salaried employee

$$GW1 = \frac{ler*GVA - GW2*E2}{E1}$$

*GW*2 Nominal net labour income of peasants and other nonsalaried employed people, millions lei per person

$$GLE = \frac{GW1*E1 + GW2*E2}{E}$$

RE Nominal pension of social insurance retired people, millions lei per person

re Pension rate

$$re = \frac{RE}{GLE}$$

TRE Total social insurance pensions, trillions lei

$$TRE = RE*RP$$

UNA Nominal unemployment benefits, millions lei per person

una Unemployment benefit rate

$$una = \frac{UNA}{GW1(1-wst)}$$

TUNA Total unemployent benefits, trillions lei

$$TUNA = UNA*UN$$

SA Social assistance (pensions and financial assistance for war invalids, orphans and war widows, military and other persons; allowances and other financial assistance for children; other social expenditures), trillions lei

sa Social assistance rate

$$sa = \frac{SA}{GCBE}$$

GCBE Expenditures of the general consolidated budget (state budget, local budgets, social insurance budget and similary funds), trillions lei

gvaps Public services rate

$$gvaps := \frac{GVAPS}{GCBE}$$

OE Dividends and other nonsalary incomes of households, trillions lei

GOS Gross operating surplus, trillions lei

oe Dividend rate

$$oe = \frac{OE}{GOS}$$

DRF Disposable income of firms, trillions lei

SC Production for self-consumption, current prices, trillions lei

$$GRP=GLEE+TRE+TUNA+SA+OE+SC$$

GCBR Total revenues of the general consolidated budget (state budget, local budgets, social insurance budget and similar funds), trillions lei

TPN Profit taxes, nonfiscal revenues of the general consolidated budget, other direct taxes on firms, trillions lei

tpn Profit taxes rate

$$tpn = \frac{TPN}{GOS}$$

SCF Contributions for social insurance borne by firms, trillions lei

scf Firms social contributions rate

$$scf = \frac{SCF}{E1*GW1}$$

VAT Value added tax and other similar taxes, trillions lei

vat Value added tax rate

$$vat = \frac{VAT}{GDP}$$

CD Custom duties, trillions lei

cd Custom duties rate

$$cd = \frac{CD}{MG}$$

WST Wages taxes and contributions for social insurances borne by salaried employees, trillions lei

wst Wage taxes rate

$$wst = \frac{WST}{E1*GW1}$$

gw2 Nonsalaried labour income rate

$$gw2 = \frac{GW2}{GW1*(1-wst)}$$

OTP Other taxes borne by households, trillions lei

otp Households other taxes rate

$$otp = \frac{OTP}{GRP}$$

$$DRP = GRP - (WST + OTP)$$

$$GCBR = TPN + SCF + VAT + CD + WST + OTP$$

DRB Disposable income of the general consolidated budget, trillions lei

TDR Total disposable income of households, firms and general consolidated budget, trillions lei

$$TDR = DRP + DRF + DRB$$

$$TDR = GDP$$

*TDR*90 Total disposable income of households, firms and general consolidated budget, 1990 prices, trillions lei

$$TDR90 = \frac{TDR}{GDPD90}$$

EAB Budget expeditures for economic activity, trillions lei

eab Economic budget expenditures rate

$$eab = \frac{EAB}{GDP}$$

SUB Budget subsidies for firms, trillions lei

sub Firms budget subsidies rate

$$sub = \frac{SUB}{EAB}$$

SUBP Budget subsidies on goods, trillions lei

subp Goods budget subsidies rate

$$subp = \frac{SUBP}{SUB}$$

EHCMS Budget expenditures for education, health, culture and municipal services, trillions lei

ehcms Rate of budget expenditures for education, health, culture and municipal services

$$ehcms = \frac{EHCMS*P(-1)}{EHCMS(-1)*P*GDPD}$$

NDPO Budget expenditures fcr national defence and public order, trillions lei

ndpo Rate of budget expenditures for national defence and public order

$$ndpo = \frac{NDPO}{NDPO(-1)*GDPD}$$

OBE Other expenditures of the general consolidated budget, trillions lei

obe Budget other expenditures rate

$$obe = \frac{OBE}{GCBE}$$

$$GCBE=TRE+TUNA+SA+EAB+EHCMS+NDPO+OBE$$

gcbe General consolidated budget expenditures rate

$$gcbe = \frac{GCBE}{GDP}$$

$$GOS=GDP+SUB-(GLEE+VAT+CD)=$$

$$=GVA*(1-ler)+SUB(1-subp)$$

$$DRF=GOS-(OE+SC+TPN+SCF)$$

$$DRB=GCBR-(TRE+TUNA+SA+SUB)$$

$$GDP=GVA+VAT+CD-SUBP$$

GCBB Surplus (+) or deficit (-) of the general consolidated budget, trillions lei

$$GCBB=GCBR-GCBE$$

gcbb Budget balance rate

$$gcbb = \frac{GCBB}{GDP}$$

btp Households budget taxes rate

$$btp = \frac{WST+OTP}{GRP}$$

gcbep Households budget revenues rate

$$gcpeb = \frac{TRE+TUNA+SA}{GCBR}$$

gosp Households self - consumption and other revenues rate

$$gosp = \frac{OE+SC}{GOS}$$

gosb Firms budget taxes rate

$$gosb = \frac{TPN+SCF}{GOS}$$

vatcd Indirect budget taxes rate

$$vatcd = \frac{VAT+CD}{GDP}$$

CPI Consumer price index

CPI 90 Consumer price index, 1990 = 1

$$CPI = \frac{CPI\,90}{CPI\,90(-1)}$$

M2 Broad money (currency outside banks, demand deposits of economic agents, household deposits, time and restricted deposits, forex deposits of residents), trillions lei

v Velocity of *M2*

$$v = \frac{GDP}{M2}$$

IR Annual average reference interest rate of the National Bank of Romania

$$dir = (1+IR) - GDPD$$

EX Prefix for the expected value (that is anterior to the given calculation system)

Nonaccounted economy

UND Gross domestic product in the nonaccounted economy, current prices, trillions lei

*UND*90 Gross domestic product in the nonaccounted economy, 1990 prices, trillions lei

$$UND90 = \frac{UND}{GDPD90}$$

s Share of accounted economy in total gross domestic product (created in accounted and nonaccounted sectors); s < 1.0

$$s = \frac{GDP}{GDP+UND}$$

Is and *Is*85 Indexes of *s*

$$Is = \frac{s}{s(-1)}$$

$$Is \leq \frac{1}{s(-1)}$$

$$Is85 = \frac{s}{s(1985)}$$

$$Is85 \leq \frac{1}{s(1985)}$$

Z	*M2* equivalent of the foreign currency directly used in domestic transactions, trillions lei
N	*M2* equivalent of the interenterprise arrears, trillions lei
MD	Monetary distortion (monetary equivalent of interenterprise arrears and "dollarization" of transactions), trillions lei $MD=Z+N$
β	Monetary distortion coefficient; $\beta \geq 1$ $\beta = \frac{M2+MD}{M2}$
IMD	Monetary distortion index $IMD = \frac{\beta}{\beta(-1)}$ $IMD \geq \frac{1}{\beta(-1)}$

3 Econometric functions

1) The shortness of relevant statistical series is a very complicated problem. Longer series are difficult to compose even using an extensive interpretation of the principle of self- similarity from the fractal mathematics (Chiarella; Mandelbrot; Pesaran and Potter; Peters). According to this interpretation, for some phenomena it is possible to consider that the data for one term or for shorter periods reflect, with satisfactory approximation, the correlations valid for the annual data. A similar solution has been used by myself for the examination of money velocity in Romania (using the annualized monthly gross domestic product and the monthly level of broad money). It is evident that the structural similarity of temporal series with different intervals characterizes only a restricted class of phenomena, so the method must be used cautiously.

There are many difficulties in the modelling of transition economies, because of the intrinsic instability of the statistic series. Some data are not homogeneous from the informational point of view due to changing primary sources, the data collecting methods, the replacement of the material production system with the national accounts. On the other hand, the evolution of some indicators is marked by spectacular breaks, new connections appear between the real and nominal sectors, a new network of economic agents emerges, having atypical, even unpredictable behaviours.

The problem is, therefore, extremely serious: in the transition period the econometric functions are frequently unstable (i.e. they do not satisfy the usual parametric constancy tests).

1.1) If we limit ourselves to short run prediction - an entirely reasonable goal for such a fluid operational context - it is worth to try to use weaker criteria. One may use, for instance, the relative deviation of econometric estimation from the actual level of the last year of the series to which the regression is applied.

This indicator, named punctual deviation ex post (d1), can be defined as:

$$d1 = [\bar{v}(t) - v(t)]/v(t)$$

where $\bar{v}$ is the fitted value and v - the effective one, for the case of an econometric function with coefficients determined on the basis of t series; obviously, $d1$ has no sign.

Could $d1$ be an indicator of the quality of the econometric function?

This would happen only in the case - allowable, given the short run character of the modelling - it can be correlated in some way with the prediction for the next year, obtained on the basis of the same function. This fact can not be deductively established. For an inductive test, one may use the punctual deviation ex ante ($d2$), determined as:

$$d2 = [\bar{v}(t+1) - v(t+1)]/v(t+1)$$

again without sign, where $\bar{v}(t+1)$ represents the value for (t+1) estimated on the basis of the same function as in the case of d1, but using the statistical data from (t+1) for the rest of involved variables. If the two parameters were directly correlated, it would have been possible to prefer the econometric functions of reduced d1, because of the higher probability for a better quality of short run prediction.

In order to undertake such a test, starting from the analysis of the Romanian economy, five functions have been defined for each of 20 macroe-

conomic indicators, that is 5 x 20 = 100 econometric functions. [1] For each one of them, using the MICROTSP programme, three sets of econometric coefficients have been estimated: on the basis of statistic data for 1980 - 1992, 1980 - 1993 and 1980 - 1994. Also, 300 pairs of punctual deviations (ex post and ex ante) were obtained. The punctual deviations ex post (d1) refer to the last year of each interval, and those ex ante (d2) to the next year, that is 1993 for the first series, 1994 for the second and 1995 for the last one. The grouping of the resulted coefficients d1 and d2 is presented in the Table No.1.

Table No. 1 : Deviations d1 and d2

		Punctual deviations ex ante (d2)		
		below 0.05	above 0.05	Total
Punctual deviations ex post (d1)	below 0.05	123	112	235
	above 0.05	18	47	65
	Total	141	159	300

Punctual deviations below 0.05 represent more than 78% of the total in ex post and 47% in ex ante, the reverse situation being true for those above 0.05; the worsening of the ex ante estimation in comparison with ex post is normal, given the unstable character of econometric functions.

It must be also kept in mind that more than half of the econometric functions that in ex post have punctual deviations less than 0.05 preserve this performance in ex ante; instead, in the group with punctual deviations over 0.05 in ex post, only about one quarter improve their estimation in ex ante. Generally, 123 + 47 = 170 econometric functions remain in the same group in both

1 *In preparing the data series and their computing, the author has been assisted competently by some of his colleagues: Adriana Agapie, Elena Andrei, Liviu Begu, Mihai Buneci, Leonard Cazan, Constantin Ciupagea, Ion Dragulin, Madalina Dogaru, Florescu Ionel, Daniel Mateescu, Constantin Popovici, Cornelia Prohanca, Constantin Rasturnoiu, Corina Saman, Cornelia Scutaru, Rodica Stanciu, Florina Tanase, Clementina Ungureanu, Manuela Unguru.*

evaluations; their share of about 57%, though important, does not seem to me enough in order to prove that punctual deviations, as defined above, are a satisfactory test for the econometric functions used in short term predictions.

1.2) It can be asked if a similar test for an entire macroeconomic model is not more relevant. It is not redundant to rise such a question, since, in a macromodel, additionally to the case examined before, there is the effect of the interactions among econometric functions and accounting identities.

In order to test this assumption, it is necessary to define a performance indicator, similar to the above analyzed punctual deviation. Experience suggested to me, as a possible way, to select a reduced number of essential variables of relatively equal importance:

- the total output, expressed by the gross domestic product in constant prices, as an indicator of the real economy;
- the gross domestic product deflator, as an indicator of the nominal economy and
- the structure of resources utilization. Such a suggestion can be formalized as follows:

$$G = \left[\frac{\overline{GDP} * GDPD}{GDP * \overline{GDPD}} - 1\right]^2$$

$$g = \left[\frac{\overline{GDPD}}{GDPD} - 1\right]^2$$

$$u = \frac{DAD}{DAD+XG} * \left[\frac{\overline{DAD}}{DAD} - 1\right]^2 + \frac{XG}{DAD+XG} * \left[\frac{\overline{XG}}{XG} - 1\right]^2$$

$$D_{1,2} = \left[\frac{G+g+u}{3}\right]^{0.5}$$

where the barred indicators are obtained from the model, while the unbarred ones are statistical values; D1 and D2 are defined, in the case of the model, in the same way as d1 and d2 for the individual econometric functions.

The test has been performed using a small size macromodel of the Romanian economy with only 21 relations: 18 of them have a fixed form, so they do not change; for the other two equations I proposed 8 different econometric variants for each one; for the last one there are 14 variants. From the total of possible combinations of 8 x 8 x 14 = 896, as much as 259 systems have been solved, that is about 30%. The 259 systems have been computed for:

1992, using the econometric coefficients estimated on the basis of statistic series 1980 - 1992; the set of these systems is noted with 92B;

1993, using the econometric coefficients estimated on the basis of statistic series 1980 - 1992; the set of these systems is noted with 93A;

1993, using the econometric coefficients estimated on the basis of statistic series 1980 - 1993; the set of these systems is noted with 93B;

1994, using the econometric coefficients estimated on the basis of statistic series 1980 - 1993; the set of these systems is noted with 94A;

1994, using the econometric coefficients estimated on the basis of statistic series 1980 - 1994; the set of these systems is noted with 94B;

1995, using the econometric coefficients estimated on the basis of statistic series 1980 - 1994; the set of these systems is noted with 95A.

Finally, 259 x 6 = 1554 systems have been computed, the result being 777 pairs of D1 and D2.

Due to comparability reasons, for all the cases, the statistic data for the respective years have been used as starting points.

Certainly, D1 (ex post evaluation) corresponds to the B systems, while D2 (ex ante evaluation) - to A systems. A presentation, similar to the one in Table No.1, shows the following:

Table No. 2: Deviations D1 and D2

		Punctual deviations ex ante (D2)		
		below 0.05	above 0.05	Total
Punctual deviations ex post (D1)	below 0.05	311	110	421
	above 0.05	63	293	356
	Total	374	403	777

The deviations below 0.05 represent about 54% in ex post and 48% in ex ante, fairly close values; the other category (in which the non feasible solution cases have been included), represent, correspondingly, 46% in ex post and 52% in ex ante. It can be seen that 311 + 293 = 604 systems belong to the same group in both evaluations; their proportion, of about 78%, is much higher than in the case of individual econometric functions. The probability for the formation of a significant direct correlation between D1 and D2 is, therefore, higher. The test is encouraging, but it must be appreciated cautiously, as all inductive approaches, even for such seemingly impressive number of samples (1554 systems).

1.3) As I mentioned, the above presented exercise has been performed on a reduced macromodel. The developed version, retained for practical tests, contains 20 econometric functions for:

- gross domestic product deflator (GDPD);
- gross value added in industry and constructions, 1990 prices (GVAIC90);
- gross value added in transport, post and communications, 1990 prices (GVAT90);
- gross value added in public services, current prices (GVAPS);
- gross value added in trade, financial, banking and insurance activities, real estate and other services, current prices (GVAO);
- domestic aggregate demand, current prices (DAD);
- export rate (xgdp90);

– quasi-employees rate (qe);
– exchange rate, 1990 prices (ER90);
– fixed assets depreciation rate (dfa);
– investment rate (id);
– current gross capital formation price index (CFPI);
– labour force rate (lfp);
– labour productivity, 1990 prices (LP90);
– labour income rate (ler);
– production for self - consumption, current prices (SC);
– consumer price index (CPI);
– money velocity (v);
– index of s against 1985 (Is85);
– gross domestic product, 1990 prices (GDP90).

The econometric coefficients will be presented at the end of this chapter. The next paragraphs (No. 2-7) contain some preliminary considerations concerning:

- output;
- domestic aggregate demand;
- labour force, labour productivity and labour income;
- main deflators;
- money velocity.

The coefficients have been determined by the iterative least squares method for the following samples: 1980 (or 1985) - 1993, 1980 (or 1985) - 1994, and 1980 (or 1985) - 1995. The VAR method has been applied only as a preliminary analysis, with the goal to identify the significant connections among macroeconomic indicators. The MICROTSP programme has been used.

2) In what concerns output, the attempts made in order to determine a global production function have not been conclusive. The sectorial approach proved to be more interesting. Consequently, the economy has been divided into five sectors:

– industry and construction;

- agriculture, silviculture, forestry, hunting and fishing;
- transport, post and communications;
- public services;
- trade, financial, banking and insurance activities, real estate transactions and other services.

2.1) In the case of the first sector, I identified three significant factors.

a) There is a strong direct dependence of the output of industry and construction on exports. it can be explained not only by the limits of the domestic market. Due to its structure, the Romanian industry depends in a great measure on the import of raw materials and energy resources; the imports for investments also influence the construction activity. Nevertheless, the level of imports is conditioned by the level of exports because the trade balance deficit cannot surpass a certain limit (foreign financial restraint is hard). Therefore, the first sector depends on export not only as a market, but as the main solution (in some cases the only one) to obtain the necessary inputs of production.

Graph No.4a presents the evolution of real output in industry and construction (IGVAIC90) and of the exports (IXGD):

$$IGVAIC90 = \frac{GVAIC90}{GVAIC90(-1)}$$

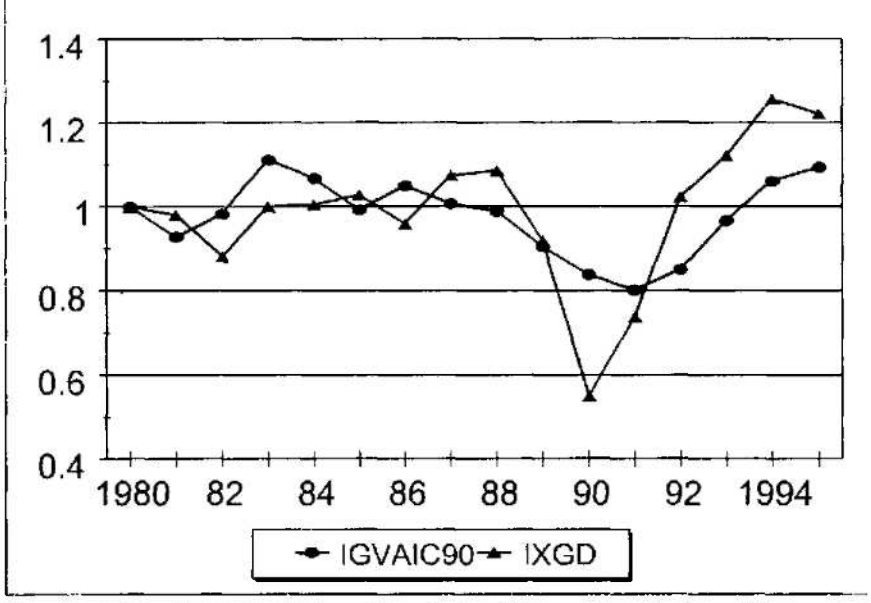
$$IXGD = \frac{XGD}{XGD(-1)}$$

b) It is important to mention that the Romanian economy is undercapitalized. As a result, its sensitivity to the ratio between the price index (inflation) and the index of broad money is very high. From this point of view, industry and construction are the most affected. Obviously, this dependence is negative.

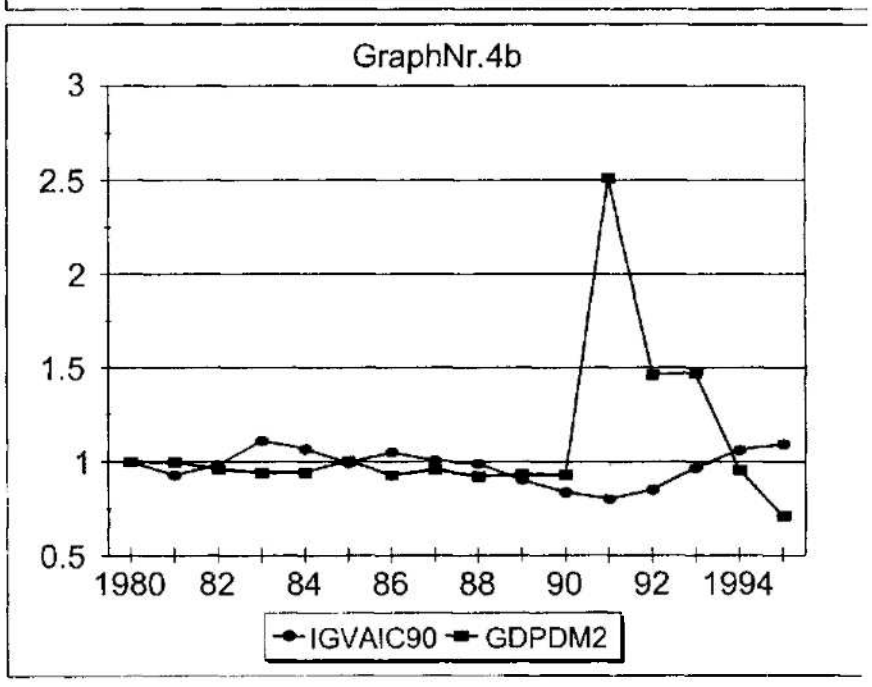
In the Graph No.4b, IGVAIC90 is correlated with the ratio between GDPD and the broad money index (GDPDM2):

$$GDPDM2 = \frac{GDPD * M2(-1)}{M2}$$

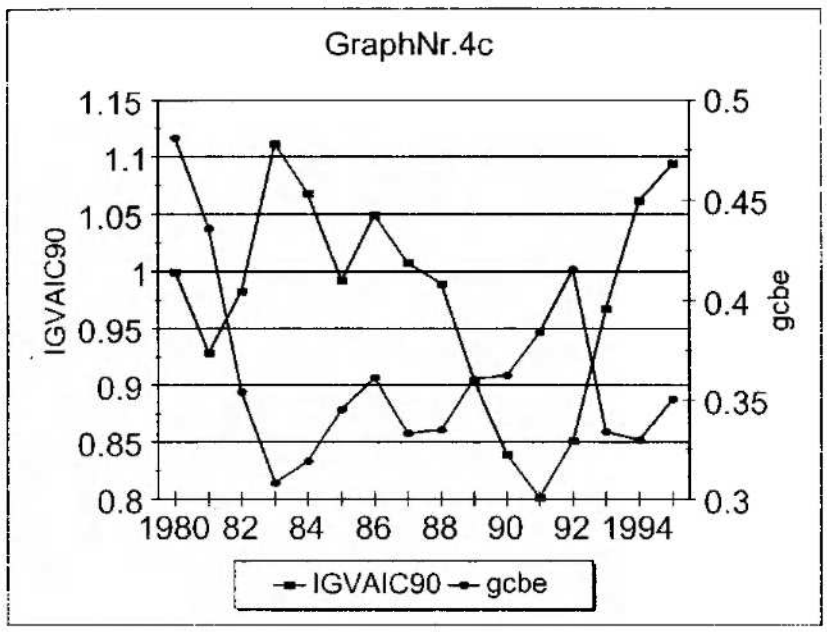
GraphNr.4a



GraphNr.4b



c) The share of the general consolidated budget in the gross domestic product (represented by gcbe) is the third factor. It is interesting to note that the negative correlation between gcbe and real output can be perceived throughout a relatively long period. From this point of view, Graph No.4c is relevant.



This correlation must be cautiously interpreted. At least in the case of Romania, the budget expenditures (obviously, in real terms) seem to be more inertial than the gross domestic product. In the first stage, the fluctuation of gcbe reflects symetrically the fluctuation of the output. At the same time, it is clear that the excessive centralization of resources inhibits the economic activity (especially when a large part of them are used as subsidies for unprofitable enterprises) and, conversely, the relaxation of the fiscality stimulates it. In other words, the variation of gcbe plays, in relation with GDP, a bivalent role (both as effect and cause).

2.2) The econometric determination of the output in agriculture and silviculture has not been possible. At the same time, I have noticed that the

methodologies used by the involved Romanian institutions (Ministry of Agriculture, National Commission for Forecast), based on traditional approaches, are performant enough. The macromodel uses the estimates of these agencies, the gross value added in agriculture and silviculture being considered exogenous.

2.3) The output in transport, post and communications is clearly linked to the output in industry, construction, agriculture and silviculture, that is to the output of the first two sectors.

2.4) The output of the public services sector depends on the expenditures of the general consolidated budget.

2.5) In the case of the last sector - trade, financial, banking and insurance activities, real estate transactions and other services - I noticed a significant correlation between its gross value added and the gross domestic product, both indicators in current prices.

2.6) GDP, as the global output, is estimated as a function of the gross value added produced in industry, construction, agriculture, silviculture, forestry, hunting and fishing, transport, post and communications, public services, trade, financial, banking and insurance activities, real estate transactions and other services.

3) Initially I intended to determine distinct econometric functions for households final consumption (including private nonprofit institutions serving households), general government final consumption and gross capital formation. During the analyzed period, in Romania there were many behavioral changes and changes in the statistical methodologies. None of these three components of domestic aggregate demand could be significantly correlated with the main macroeconomic indicators.

This is why only the global category of domestic aggregate demand (as the sum of the above mentioned components) has been defined econometrically. The domestic aggregate demand depends on the disposable revenues of the households, firms and general consolidated budget, that is on the gross domestic product (positively) and on the interest rate (negatively).

The weight of self - consumption in the domestic aggregate demand can be estimated on the basis of the weight of the gross value added of agriculture in the gross domestic product. This dependence is understandable, taking into account the important role of agriculture in household production.

4) I did not find a relevant connection of either exports, or imports with the exchange rate. These indicators are decisively influenced by other factors:

- before 1990, by the forced policy to reduce the external debt;
- after 1990, by the tendency of many firms to avoid domestic insolvent clients (the arrears' problem) even if it implies an inefficient export;
- the rigidity of energy constraints.

It is important to notice that my analysis concerns annual data; the monthly ones could reveal a certain influence of the exchange rate on the foreign trade.

A good approximation of the export rate (*ratio between the export and* the gross domestic product) can be obtained by the correlation with:

- its lagged levels (as inertial tendency);
- the real gross domestic product index.

Imports are determined by the exogenous coefficients mgdp, mgdi and mgdc.

The exchange rate can be correlated with the consumer price index and the interest rate.

5) The main demographic indicators - population, population over 15 years of age, retired people -are evaluated by specific methods; therefore, they are considered as exogenous variables.

5.1) The labour force rate (lfp) is correlated with its own first lag and with the share of the population over 15 years of age in the total population.

5.2) Concerning the function for labour productivity, I noticed its dependence on fixed assets per employed person, but this normal correlation is disturbed because a large number of workers have been kept employed

despite the dictums of economic rationality (before 1990 from ideological motivations, after 1990 as a result of trade unions' opposition). Consequently, the differentiation of the coefficients of both numerator and denominator of the respective ratio has been accepted. The elasticity of the employment index (E/E(-1)) is substantially negative; in other words, the reduction of redundant employment represents, at present, one of the most important resources for the improvement of the labour productivity.

I have also noticed an important dependence of labour productivity on labour income (per employed person, of course).

5.3) The level of the fixed assets is determined essentially by investments and the rate of fixed assets depreciation (interpreted not only as a financial, but also as a real process).

The investment rate (id) is correlated with the gross domestic product and domestic aggregate demand.

Fixed assets depreciation is influenced negatively by the real output index. This means that when economic activity is expanding, the tendency to eliminate old fashioned equipment is weaker and vice versa.

5.4) For the Romanian economy I felt necessary to operate with an ad-hoc demographic category, conventionally named "quasi-employees"; it includes salaried employees, the registered unemployed and the state social insurance retired people (the common feature being the fact that their revenues are conditioned by a present or former labour contract). All of these groups change frequently. These modifications are contradictory, so that the whole mentioned category is more stable than its components. The share of quasi-employees in the population over 15 years of age is strongly connected to:

a) its lagging level (as an inertial factor);

b) the population over 15 years of age index (negative influence, of course);

c) the real gross domestic product index (whose influence is also negative).

The explanation of the negative influence of the last factor is not obvious. It is true that when the real gross domestic product diminishes, it seems natural to expect an increasing social pressure to obtain the quasi-employee status (revenue security).

What happens when the real gross domestic product grows? The economy can be divided in two parts: in one of them the salaried employees work, in the other are the rest of employed persons (individual firms, peasant households etc). The second part of the economy is more dynamic and, under the mentioned conditions, some salaried employees and persons registered as unemployed migrate to it.

5.5) The labour income rate (ler) is related to:

- its preceding level, since it is always a reference point of the wages negotiations;
- the real gross value added index. This connection can be inferred from the relations between the national accounts.

$$GOS=GDP+SUB-[GLEE+VAT+CD]=$$

$$=GVA+[VAT+CD]+[SUB-SUBP]-GLEE-[VAT+CD]=$$

$$=GVA+[SUB-SUBP]-GLEE$$

It would be convenient to divide the gross operating surplus (GOS) into fixed assets depreciation (DFA) as a financial resource, and the rest (denoted GOSN). The result is:

$$GLEE=GVA-[GOSN-SUB+SUBP]-DFA$$

and:

$$ler = 1-\frac{GOSN-SUB+SUBP}{GVA}-\frac{DFA}{GVA}$$

$$ler+\frac{GOSN-SUB+SUBP}{GVA}=1-\frac{DFA}{GVA}$$

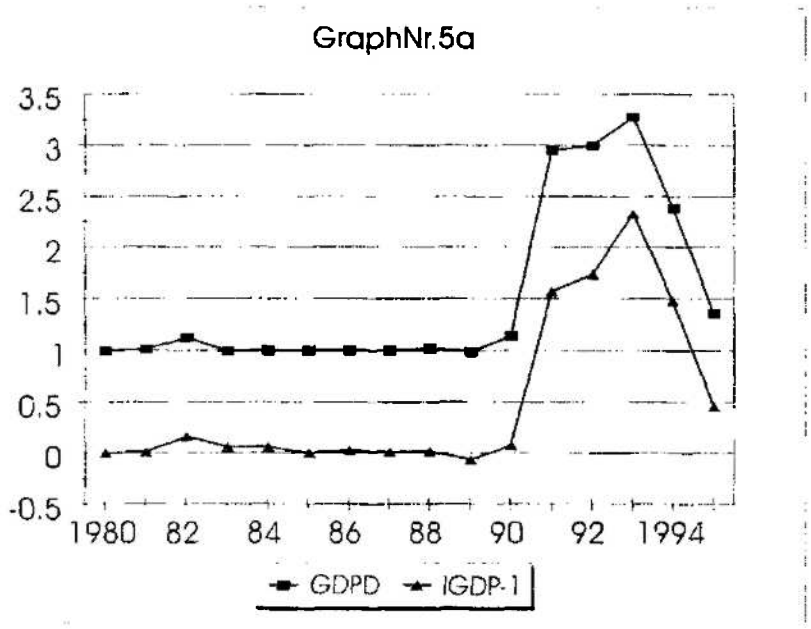
DFA is relatively constant in the short run and its share in gross value added raises if gross value added diminishes, and vice versa. It is normal to admit that this modification will influence both Ier and $(GOSN-SUB+SUBP)/GVA$; this means the gains and losses are distributed (not necessarily in a proportional way) between the employees and firms.

6) The macromodel operates with three deflators.

The gross domestic product deflator is correlated with:

- the disposable revenues of households, firms and general consolidated budget, the sum being equal to the gross domestic product, in current prices (Graph No.5a); $IGDP=GDP/GDP(-1)$

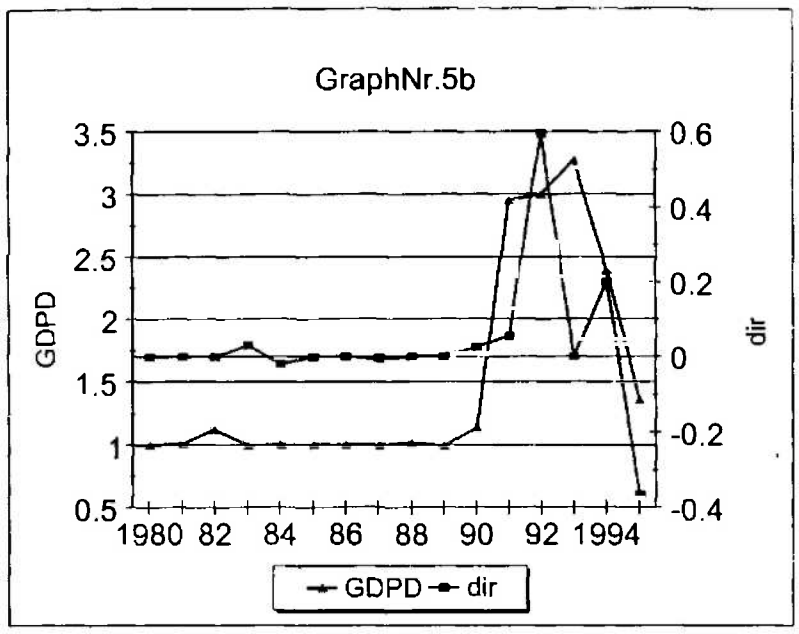
GraphNr.5a



- the interest rate (Graph No.5b).

The capital formation price index and the consumer price index have been estimated on the basis of the gross domestic product deflator.

7) An acceptable econometric determination of money velocity, as an index, has been obtained:



$$\frac{v}{v(-1)} = \frac{v^*}{v^*(-1)} * \frac{\beta}{\beta(-1)} * \frac{s}{s(-1)} = \frac{v^*}{v^*(-1)} * IMD * Is$$

I admitted that $v^*/v^*(-1)$ has been influenced positively by inflation and negatively by the interest rate. This assumption cannot be doubted after 1990, but is not completely adequate for the previous period. Having a too short statistical series, however, I included in the regression the data for the whole interval 1985 - 1995.

According to the determination of money velocity, I have tried to define an econometric function of the evolution of Is85 because it is simple to determine Is = Is85/Is85(-1). It is needless to emphasize the problem is very complicated and insufficiently clarified. In the case of the Romanian economy two factors appear to be significant.

One of them is the same gross domestic product created in the accounted economy. It seems normal to assume that if the gross domestic product of the accounted economy increases, a part of the labour force, employed in the nonaccounted economy, migrates to the accounted one. The

reverse process is valid when the activity of the accounted economy decreases. The majority of specialists in the problems of the nonaccounted economy accept its compensating role during the business cycle.

The other factor is the ratio between the index of the population over 15 years of age and the employment index. It is very probable that an eventual increase of this ratio may stimulate the extension of the nonaccounted economy. The effect is symmetrical when this ratio decreases.

8) The following 20 functions have been selected:

$$GDPD = [\frac{GDP}{GDP(-1)}]^{c1} * (1+IR)^{c2}$$

$$GVAIC90 = GVAIC90(-1) * [c3 * \frac{XGD}{XGD(-1)} + c4 * GDPD * \frac{M2}{M2(-1)} + c5 * gcbe + c6]$$

$$GVAT90 = c7 * GVAIC90 + c8 * GVAA90$$

$$GVAPS = c9 * GCBE$$

$$GVAO = GVAO(-1) + c10 * [GDP - GDP(-1)]$$

$$DAD = c11 * [GDP + GDP(-1) * GDPD] * [1 + c12 * (IR - IR(-1))]$$

$$xgdp90 = c13 * xgdp90(-1) + c14 * xgdp\ 90(-2) + c15 * \frac{GDP90}{GDP\ 90(-1)}$$

$$qe = \frac{c16 * qe(-1) + c17 * \frac{AP}{AP(-1)}}{qe(-1) + c18 * \frac{GDP90}{GDP90(-1)}}$$

$$ER90 = ER90(-1) * [\frac{CPI}{CPI(-1)} * \frac{(1+IR)}{(1+IR(-1))}]^{c19}$$

$$dfa = c20 + c21 * \frac{GDP90}{GDP90(-1)}$$

$$id=c22*id(-1)+c23*\frac{GDP}{DAD}$$

$$CFPI=GDPD^{c24}$$

$$lfp=c25*lfp(-1)+c26*\frac{AP}{P}$$

$$\dot{L}P90=LP90(-1)*[\frac{FA90}{FA90(-1)}]^{c27}*[\frac{E}{E(-1)}]^{c28}*[\frac{GLE}{GLE(-1)*GDPD}]^{c29}*c30$$

$$ler=c31*ler(-1)+c32*\frac{GVA90}{GVA90(-1)}$$

$$SC=c33*DAD*\frac{GVAA90}{GDP90}$$

$$CPI=GDPD^{c34}$$

$$v=v(-1)*IMD*[\frac{CPI}{(1+IR)}]^{c35}*ls$$

$$ls85=ls85(-1)*[\frac{GDP90}{GDP90(-1)}]^{c36}*[\frac{AP}{AP(-1)}:\frac{E}{E(-1)}]^{c37}$$

$$GDP90=c38*GVA90$$

The econometric functions for xgdp90, qe, dfa, id, lfp and ler are valid only within certain limits; their approximation requires supplementary researches.

The statistical series beginning with 1980 have been used for the functions GDPD, GVAIC90, GVAT90, GVAPS, GVAO, DAD, xgdp90, qe, ER90, dfa, id, CFPI, lfp, LP90, ler, SC, CPI and GDP90. The functions v and ls85 have been determined using the time series beginning with 1985.

Table No. 3: Econometric coefficients

	Sample 1980(85) - 1993	Sample 1980(85) - 1994	Sample 1980(85) - 1995
c1	1.1927549	1.1613825	1.1581022
c2	-0.46388377	-0.34697016	-0.33747028
c3	0.24579756	0.23795891	0.24376544
c4	-0.076500913	-0.07693573	-0.077997262
c5	-1.0320986	-1.026988	-1.0170212
c6	1.1910103	1.1965181	1.1891554
c7	0.093172983	0.093014491	0.097190961
c8	0.14845998	0.1490397	0.1337367
c9	0.21596829	0.21746134	0.21249352
c10	0.21527918	0.20546057	0.19861803
c11	0.5242189	0.52386995	0.52267066
c12	-0.0645605	-0.069246761	-0.05733126
c13	1.0157379	1.0147117	1.0167918
c14	-0.29507547	-0.31289156	-0.31703438
c15	0.064954615	0.07009343	0.070718144
c16	1.1878996	1.1876593	1.1788288
c17	-0.30646568	-0.30579226	-0.24944867
c18	0.07023906	0.071189336	0.16174187
c19	0.2068672	0.19862292	0.19876334
c20	0.36389177	0.38617837	0.37632797
c21	-0.30710361	-0.33118169	-0.32086856

	Sample 1980(85) - 1993	Sample 1980(85) - 1994	Sample 1980(85) - 1995
*c*22	0.80953857	0.8043844	0.80439949
*c*23	0.054453743	0.056027236	0.056022442
*c*24	0.98155418	0.98161232	0.98193574
*c*25	0.76435451	0.79092837	0.7712104
*c*26	0.14594553	0.12973495	0.1418015
*c*27	0.97631534	0.99147106	1.0157468
*c*28	-2.5214808	-2.5983538	-2.6649801
*c*29	0.32305873	0.32651291	0.34413135
*c*30	0.9603839	0.96119463	0.96262604
*c*31	0.75318855	0.75338147	0.75285943
*c*32	0.083365577	0.083409743	0.083949064
*c*33	0.69058306	0.61526387	0.61738686
*c*34	1.0178328	1.0147885	1.0143788
*c*35	0.55590346	0.53128297	0.5510557
*c*36	0.52219573	0.51770199	0.51254172
*c*37	-0.62180251	-0.62609805	-0.62583064
*c*38	1.092995	1.0923177	1.0914578

Appendix II contains a detailed analysis of the econometric functions.

4 The macromodel of the Romanian economy

The macromodel combines econometric functions with identity relations derived from national accounts. The econometric functions for domestic aggregate demand and for exports are rounded off the balancing coefficient EC, in order to realize the equality *GDP=DAD+ER*NX*.

In this version of the macromodel, the general consolidated budget is represented only by the share of its total expenditures in the gross domestic product (gcbe). The extended version, presented in the last chapter, contains the main budget indicators.

1) In the macromodel, the following variables are determined exogenously:

- P, AP, GVAA90, mgdp, mgdi and mgdc, since for them there are other, more performant, computing methods;
- dir, EXv and gcbe having clearly optional character;
- EXTDR as the sum of disposable incomes expected by households, firms and government.

Table No. 4: Exogenous variables (statistical data) for tests

	1993	1994	1995
EXTDR, trill. lei	20.051	49.7948	72.2489
P, mill. pers.	22.7553	22.7306	22.681
AP, mill.pers.	17.8083	17.789	17.744
GVAA90, trill. lei	0.14501154	0.1442773	0.1567594
mgdp	6.0734734	6.1371498	7.4775443
mgdi	8.0535238	8.5816463	9.2988855
mgdc	1.2868856	1.4512776	2.0967563
dir	-1.576	-0.4906	0.1784
EXv	7.2658554	7.2218709	5.4892622
gcbe	0.333749	0.3295405	0.3505228

2) The Romanian transition economy is characterized by a strong inflationary expectation. The economic agents exert an important pressure on the nominal incomes, under the conditions of a fragile market mechanisms. As a result, the probability of the expected disposable incomes to be achieved is relatively high.

The estimation of EXTDR implies sociological researches. A possible way is to consult a representative sample of competent and well informed specialists working in parliament commissions, government agencies, enterprises, banks, trade unions, academic institutions, economic publications etc.

The questionnaire must be established in such manner as to allow the conversion of the obtained information to indicators usable in the determination of the disposable revenues of the households, firms, general consolidated budget.

It is possible to elaborate a special model based on the relations of the national accounts and some essential coefficients defining the macroe-

conomic environment (fiscal, commercial and monetary policies, social pressure etc). For instance, in the case of the Romanian economy, the estimations usable for the determination of DRP, GRP, GLEE, GCBR, GOS, DRF, GVA and DRB can be integrated in such a model. These indicators are linked by the accounting relations:

$$DRP=(1-btp)*GRP$$

$$GRP=GLEE+gcbep*GCBR+gosp*GOS$$

$$GCBR=vatcd*TDR+gosb*GOS+btp*GRP$$

$$DRF=(1-gosp-gosb)*GOS$$

$$GOS=(1+sub*eab)*TDR-(GLEE+vatcd*TDR)$$

$$GVA=(1-vatcd+subp*sub*eab)*TDR$$

$$GLEE=ler*GVA$$

$$DRB=GCBR-[gcbep*GCBR+sub*eab*TDR]$$

Solving this system, we determine the multipliers (noted with suffix M):

$$DRPM=\frac{TDR}{DRP}=\frac{GRPM}{1-btp}$$

$$GRPM=\frac{TDR}{GRP}=\frac{1-btp*gcbep}{\frac{ler}{GVAM}+gcbep*vatcd+\frac{gcbep*gosb+gosp}{GOSM}}$$

$$GCBRM=\frac{TDR}{GCBR}=\frac{1}{vatcd+\frac{gosb}{GOSM}+\frac{btp}{GRPM}}$$

$$DRFM=\frac{TDR}{DRF}=\frac{GOSM}{1-gosp-gosb}$$

$$GOSM = \frac{TDR}{GOS} = \frac{1}{1+sub*eab-vatcd-\frac{ler}{GVAM}}$$

$$GVAM = \frac{TDR}{GVA} = \frac{1}{1-vatcd+subp*sub*eab}$$

$$GLEEM = \frac{TDR}{GLEE} = \frac{GVAM}{ler}$$

$$DRBM = \frac{TDR}{DRB} = \frac{1}{\frac{1-gcbep}{GCBRM}-sub*eab}$$

In Romania, the evolution of these multipliers is presented in the Table No.5:

Table No. 5: TDR multpliers

Multipliers	1993	1994	1995
GVAM	1.06945	1.074446	1.0693312
GLEEM	2.5367545	2.6497709	2.6802295
GOSM	1.7466316	1.7522394	1.7180723
DRFM	5.7034359	4.2386873	3.927202
GRPM	1.3740502	1.517797	1.528495
GCBRM	2.9935478	3.1506513	3.1224104
DRPM	1.540928	1.7141185	1.7468874
DRBM	5.6912865	5.5344232	5.7830645

If the consulted sample comprises n specialists, i = 1,2,....n, it is possible to calculate n estimations of SOTDR(i) (the usual symbol is completed with prefix SO *accounting for sociological information*). They can be aggregated by:

$$EXTDR = \frac{\sum_{i=1}^{n} SOTDR_i}{n}$$

Two final remarks:

Generally, these sociological investigations take place before the forecast time interval. Therefore, the estimations reflect the characteristics of the existing macroeconomic environment. Consequently, one can use the statistic coefficients (for the last period) btp, gcbep, gosp, gosb, vatcd, sub, eab, subp, ler.

a) It is possible to adopt a prospective solution, including in the questionnaire the predictible changes (in 2-3 variants) of the fiscal, commercial, monetary policies etc. In this case, the system will be transformed substituting the statistic coefficients with previsional ones defining the macroeconomic environment, and with corresponding multipliers.

b) The individual estimations of the specialists participate in the global determination of EXTDR with equal weights. If there are sufficient reasons, these weights can be differentiated, taking into account the professional credibility of the authors and their decisional positions.

3) The control of the inflation by broad money cannot be effective enough as a consequence of interenterprise arrears, "dollarization" of a part of domestic transactions and of the fluctuation of unaccounted economy. The National Bank of Romania fights against the inflation first of all by interest rate IR.

It seems that - by a very complicated social and political mechanism, sometimes transparent and often invisible - the economy gravitates around the variables EXTDR and IR.

From these variables follows EXGDPD. Consequently, EXTDR can be represented by its nominal and real components:

$$EXTDR = \frac{EXTDR}{EXGDPD} * EXGDPD$$

This is why the proposed macromodel contains an objective function: the minimization of differences between the calculated and expected values of the deflator and of the real gross domestic product.

4) The relations of the macromodel:

$$EXGDPD=[\frac{EXTDR}{GDP(-1)}]^{c1}*(EXGDPD+dir)^{c2}$$

$$GVAIC90=GVAIC90(-1)*[c3*\frac{XGD}{XGD(-1)}+c4*GDPD:\frac{M2}{M2(-1)}+c5*gcbe+c6]$$

$$GVAT90=c7*GVAIC90+c8*GVAA90$$

$$GVAPS=c9*gcbe*GDP$$

$$GVAPS90 = \frac{GVAPS}{GDPD90}$$

$$GVAO=GVAO(-1)+c10*(GDP-GDP(-1))$$

$$GVAO90 = \frac{GVAO}{GDPD90}$$

$$GVA90=GVAIC90+GVAA90+GVAT90+GVAPS90+GVAO90$$

$$GVA=GVA90*GDPD90$$

$$GDP90=c38*GVA90$$

$$GDP=GDP90*GDPD90$$

$$GDPD = \frac{GDPD90}{GDPD90(-1)}$$

$$DAD=c11*(GDP+GDP(-1)*GDPD)*[1+c12*(IR-IR(-1))]*EC$$

$$DAD90 = \frac{DAD}{GDPD90}$$

$$XGD=xgdp90*\frac{GDP90}{0,02303}*EC$$

$$xgdp90=c13*xgdp90(-1)+c14*xgdp90(-2)+c15*\frac{GDP90}{GDP90(-1)}$$

$$MGD=mgdp*GDP90+mgdi*I90+mgdc*[DAD90-I90]$$

$$ER90=ER90(-1)*[\frac{CPI}{CPI(-1)}:\frac{(1+IR)}{(1+IR(-1))}]^{c19}$$

$$ER=ER90*CPI90$$

$$NX=XGD-MGD$$

$$FA90=FA90(-1)*(1-dfa)+I90$$

$$dfa=c20+c21*\frac{GDP90}{GDP90(-1)}$$

$$id=c22*id(-1)+c23*\frac{GDP}{DAD}$$

$$I=id*DAD$$

$$CFPI=GDPD^{c24}$$

$$CFPI90=CFPI90(-1)*CFPI$$

$$I90=\frac{I}{CFPI90}$$

$$E=\frac{GDP90}{LP90}$$

$$lfp=c25*lfp(-1)+c26*\frac{AP}{P}$$

$$LF=lfp*P$$

$$LP90=LP90(-1)*[\frac{FA90}{FA90(-1)}]^{c27}*[\frac{E}{E(-1)}]^{c28}*[\frac{GLE}{GLE(-1)*GDPD}]^{c29}*c30$$

$$UN=LF-E$$

$$ler=c31*ler(-1)+\frac{c32*GVA90}{GVA90(-1)}$$

$$GLE=\frac{ler*GVA}{E}$$

$$GDP=v*M2$$

$$GDP=DAD+ER*NX$$

$$CPI=GDPD^{c34}$$

$$CPI90=CPI90(-1)*CPI$$

$$IR=GDPD-1+dir$$

$$M2=\frac{EXTDR}{EXv}$$

$$v=v(-1)*IMD*[\frac{CPI}{(1+IR)}]^{c35}*Is$$

$$Is=\frac{Is85}{Is85(-1)}$$

$$Is85=Is85(-1)*[\frac{GDP90}{GDP90(-1)}]^{c36}*[\frac{AP}{AP(-1)}:\frac{E}{E(-1)}]^{c37}$$

$$IMD>\frac{1}{\beta(-1)}$$

$$[\frac{GDP}{GDPD}:\frac{EXTDR}{EXGDPD}-1]^2+[\frac{GDPD}{EXGDPD}-1]^2=\min$$

The inequality s(-1) * Is < 1 is not operational, s(1985) being unknown. I suppose that, under present conditions of the Romanian economy, it is implicitly satisfied.

5) The system contains the following 44 endogenous variables: EXGDPD, GVAIC90, GVAT90, GVAPS, GVAPS90, GVAO, GVAO90, GVA90, GVA, GDP90, GDP, GDPD90, GDPD, EC, DAD, DAD90, XGD,

xgdp90, MGD, ER90, ER, NX, FA90, dfa, id, I, CFPI, CFPI90, I90, E, Ifp, LF, LP90, UN, Ier, GLE, CPI, CPI90, IR, M2, v, IMD, Is, Is85.

The system can be completed with additional restrictions including - if necessary - the limits for some indicators (acommodating the involved econometric functions).

The experimental computation has been performed using QUATTRO PRO programme.

6) In the first phase, the test for 1993 has been accomplished using the econometric coefficients determined on the basis of the sample 1980(85) - 1993 (that is including the test year). Similarly, for 1994 the econometric coefficients determined on the basis of the sample 1980(85) - 1994 have been used and for 1995 the econometric coefficients determined for the sample 1980(85) - 1995. These versions are noted **SB**.

In the second testing phase, the ex-ante forecast has been determined. Thus, the endogenous variables for 1994 have been estimated using the econometric coefficients determined on the basis of the sample 1980(85) - 1993. The same estimation has been obtained for 1995 using the econometric coefficients determined on the basis of the sample 1980(85) - 1994. These versions are noted **SA**. The results are presented in the Table No. 6.

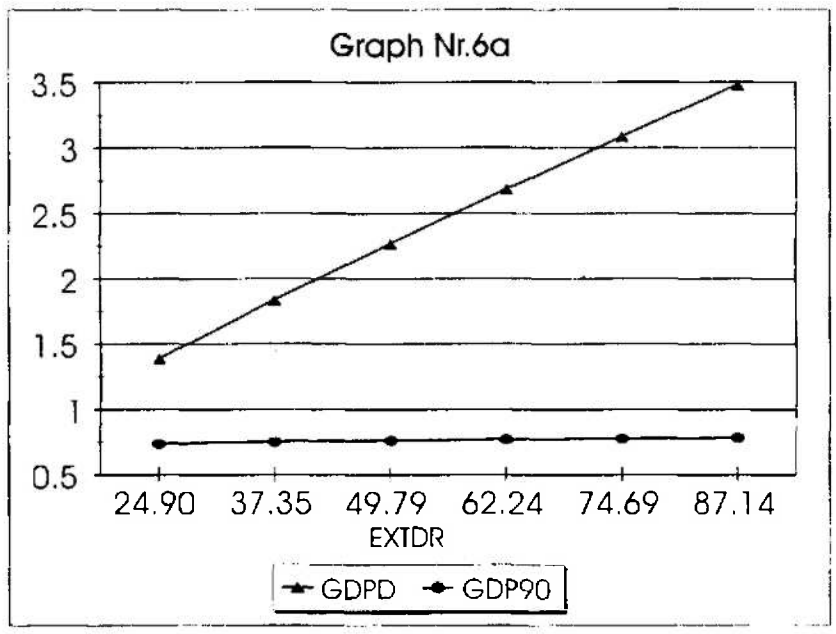
Table No. 6: Estimations for 1994 and 1995 (SA)

	1994		1995	
Indicators	**Statistics**	**Macromodel**	**Statistics**	**Macromodel**
LF, mill. pers.	11.2356	11.16833	11.12	11.16918
E, mill. pers.	10.012	9.68311	10.02	9.73167
GDP, trill. lei	49.7948	49.9716	72.2489	75.58726
GVA90, trill. lei	0.66578	0.69534	0.71334	0.73489
GDP90, trill. lei	0.71838	0.76	0.76754	0.80273
DAD90, trill. lei	0.72819	0.7706	0.79273	0.82699
FA90, trill. lei	2.2665	2.2651	2.35612	2.4204
XGD, bill. USD	6.1513	6.49631	7.5195	8.02576
MGD, bill. USD	6.5624	6.92977	8.6859	9.10778
NX, bill. USD	-0.4111	-0.43346	-1.1664	-1.08202
GDPD	2.39	2.26712	1.358	1.35846
CPI	2.367	2.30046	1.323	1.36463
CFPI	2.353	2.23315	1.381	1.35083
ER, th. lei per USD	1.65509	1.60753	2.03328	2.1115
IR	0.8994	0.77652	0.5364	0.53686

The estimated real output (GDP90 and GVA90) is higher by 3-5% than statistical data. The export and the import estimations are higher too, but the foreign trade balance practically does not change. The deflators and the indicators derived from them are close to the effective level. Generally, the differences between the macromodel estimations and statistics are acceptable. Only the evaluated unemployment exceeds significantly the registered level.

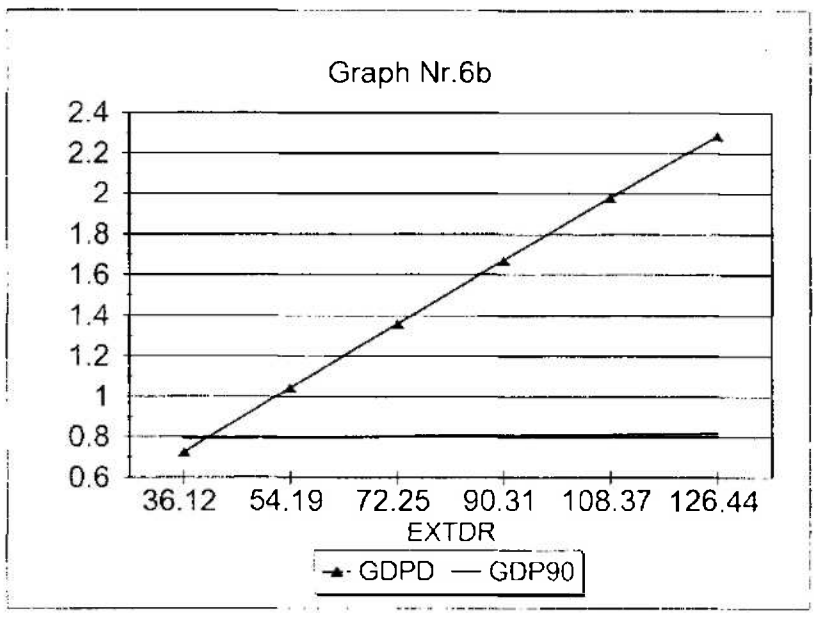
7) The macromodel allows the identification of some features of the Romanian transition economy. It is interesting, with this aim, to change - obviously, between plausible limits - the exogenous indicators and to establish the main implications of these changes.

7.1) Thus, in Graphs 6a (for 1994) and 6b (for 1995) the influences of the variation of EXTDR on nominal (GDPD) and real (GDP90) sectors have been presented:



If the expected disposable revenues increase, the inflation increases, too. The ratio between the highest and the lowest levels represents 2.51 in 1994-th and 3.16 in 1995-th. In the first case the monetary distortion coefficient, being over its limit, could decrease and consequently, the money velocity, too. In the second, β is situated close to its minimum: the growth of EXTDR translates in a more accentuated inflation.

The real gross domestic product registers a certain increase simultaneously with EXTDR, as a result of the expansion of the broad money (EXv being constant). GDP90 grows from 0,7368 to 0,7838 in the first case and from 0,7924 to 0,8163 in the second one.



It is important to note that, till the amplitude of GDPD is very large, the sensitivity of GDP90 is relatively low. It is an undisputable sign of the well known rigidity of the Romanian economy.

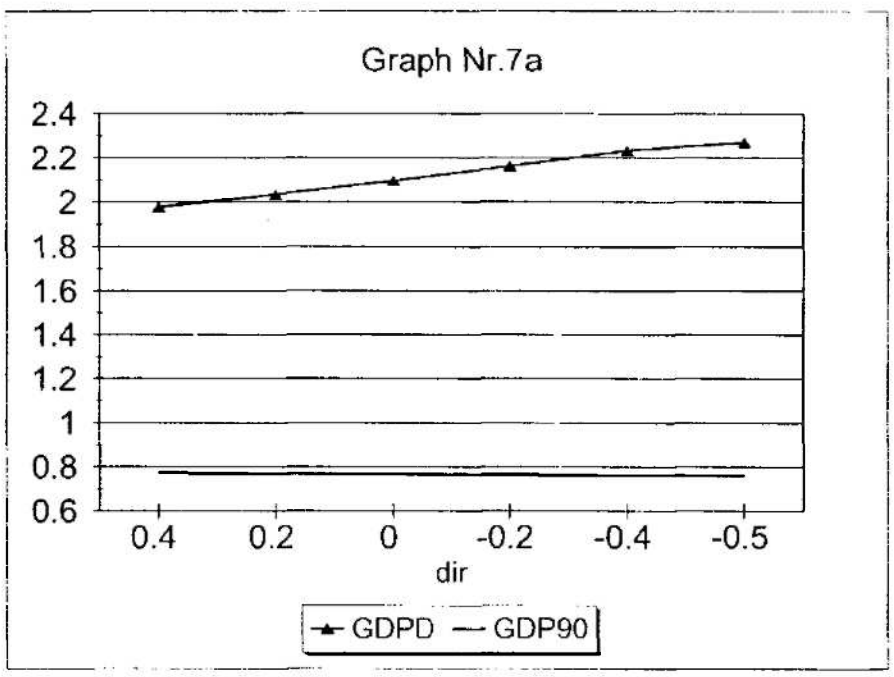
7.2) Graphs 7a and 7b reflect the impact of variation of the interest rate.

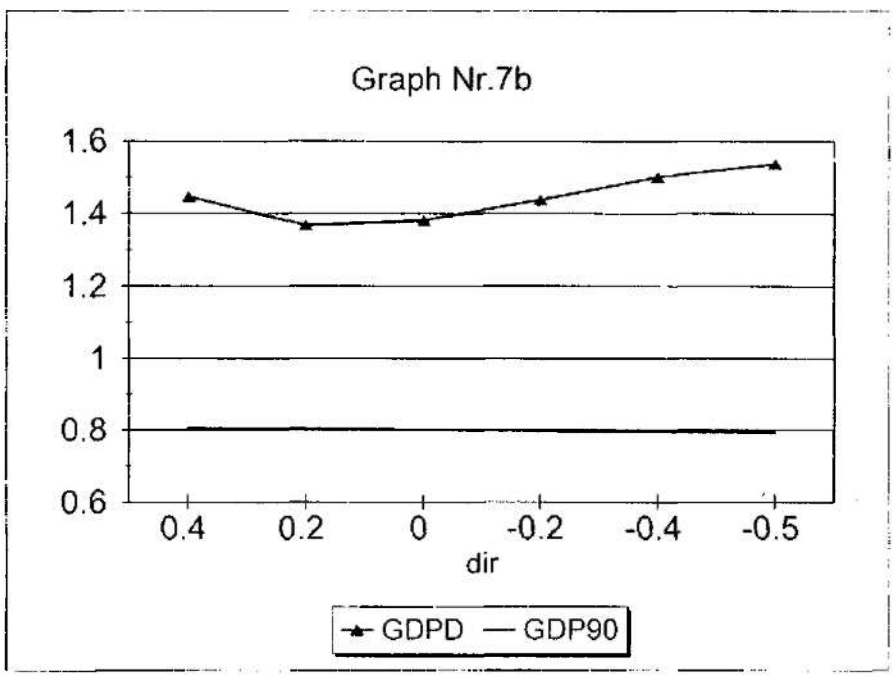
In both cases the modification of the real gross domestic product is limited.

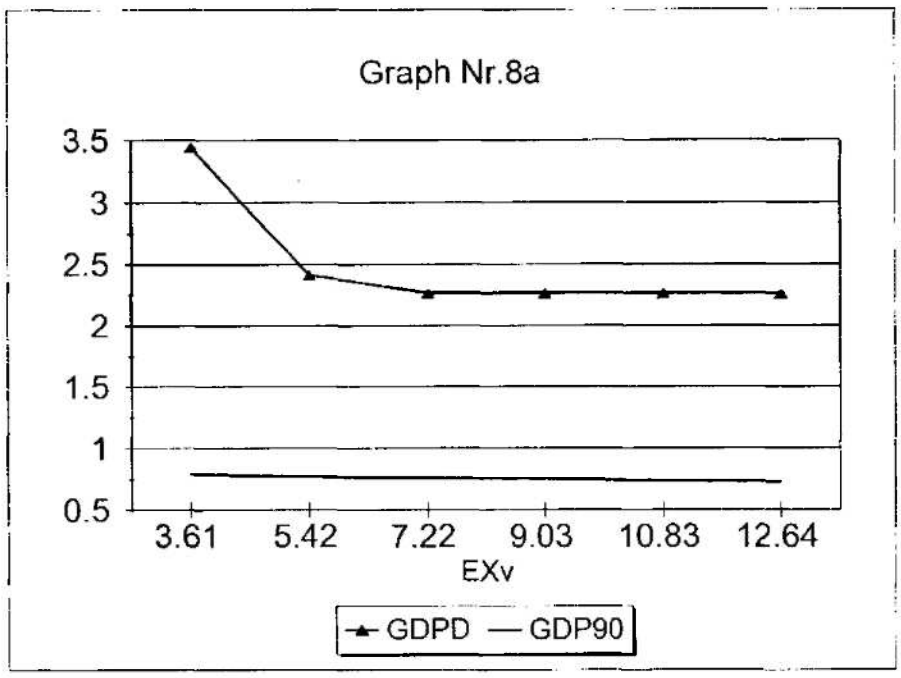
Instead, the inflation has different tendencies. 1994 is characterized by permanent increase of GDPD simultaneously with the transition from positive to negative real interest rates. In 1995, this indicator first decreases, and after dir = 0.1784 registers a certain growth. This discordance arises from the evolution of the money velocity, influenced by the monetary distortion coefficient and by the nonaccounted economy index.

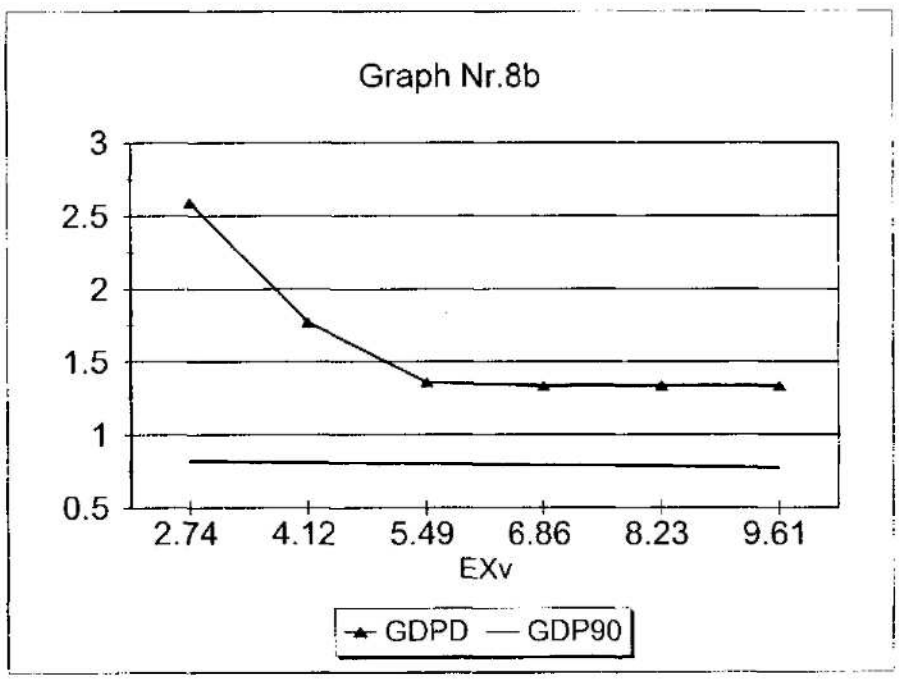
7.3) The variation of the expected money velocity (EXv) is simulated in Graphs 8a and 8b.

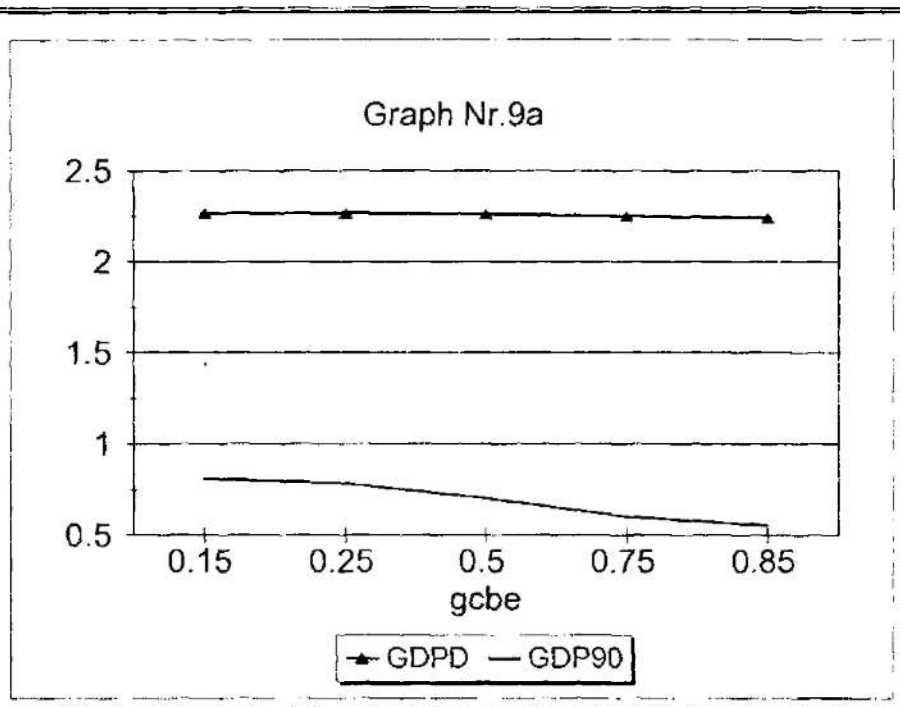
The change of M2 is the main consequence of the constancy of EXTDR. Therefore, GDPD is directly correlated with broad money. But the macromodel has the following peculiarity: the variation of M2 is more intensive than the inflation. Thus, the ratio between the highest and the lowest levels is for broad money 3.5 in both 1994 and 1995, and for GDPD correspondingly 1.525

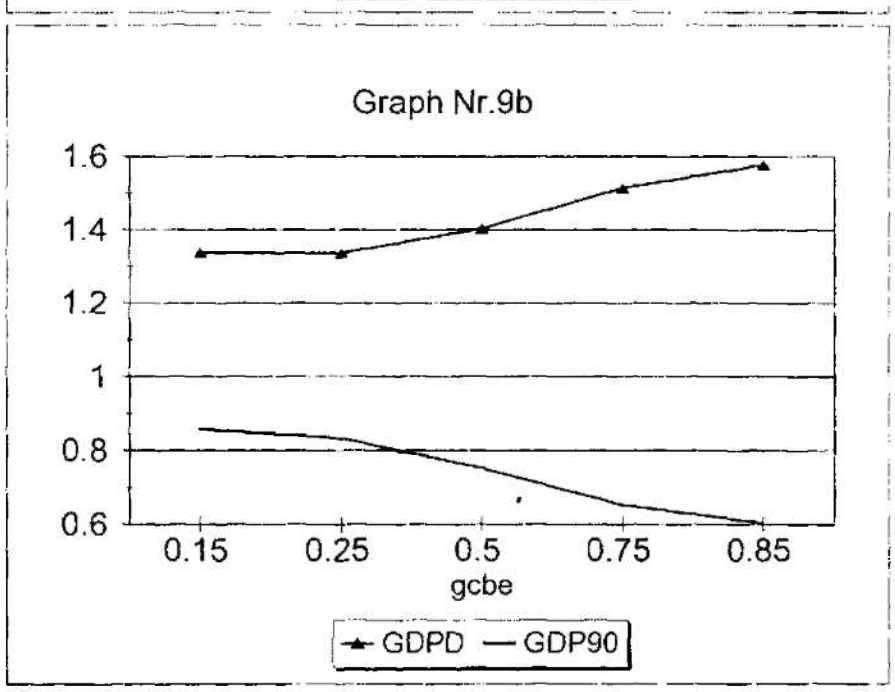

Graph Nr.7a
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.5
dir
GDPD
GDP90


Graph Nr.7b
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.5
dir
GDPD
GDP90


Graph Nr.8a
3.5
3
2.5
2
1.5
1
0.5
3.61
5.42
7.22
9.03
10.83
12.64
EXv
GDPD
GDP90


Graph Nr.8b
3
2.5
2
1.5
1
0.5
2.74
4.12
5.49
6.86
8.23
9.61
EXv
GDPD
GDP90


Graph Nr.9a
2.5
2
1.5
1
0.5
0.15
0.25
0.5
0.75
0.85
gcbe
GDPD
GDP90


Graph Nr.9b
1.6
1.4
1.2
1
0.8
0.6
0.15
0.25
0.5
0.75
0.85
gcbe
GDPD
GDP90

and 1.94. That is why the real gross domestic product decreases simultaneously with the reduction of the broad money.

7.4) The Graphs 9a and 9b show a clear negative influence of the fiscality on the real economy.

The macromodel is based on the assumption that the variation of the expenditures of the general consolidated budget takes place without the modification of its relative balance, noted gcbb. This means that the change of gcbe involves a similar change of the fiscality. As I have emphasized, we must be careful with the correlation between gcbe and GDP90. Generally, the negative influence (on real output) of an excessive fiscality is unquestionable. But, if the public services are compressed too much, the economic activity is certainly affected. The formalization of these contradictory tendencies, in the case of Romania, is an open problem.

5 Forecast estimations for 1997 - 2000

1) Concerning 1996, the preliminary variant has been built on relatively optimistic premises: the growth (against 1995) of the real gross domestic product with 6-7% and of the export with 10- 15%; the inflation had not to surpass 22-25%. The evolution of the Romanian economy in the first semester of 1996 showed that some of the initial assumptions have been unrealistic. Thus, the export substantially decreased. Besides, there has been a stronger pressure to increase the nominal incomes. The employment was maintained at a high level despite the requirements of the restructuring processes. The broad money registered a greater expansion.

Using the macromodel, a new estimation for 1996 was done in August taking into account the following exogenous variables: EXTDR 110 trillions lei; GVAA90 0.159565 trillions lei; EXv 4.7826; dir 0.01588; gcbe 0.34138. In the same time two constraints have been introduced - XGD < 7 billions USD and 0.9 < UN < 1 million person - with accomodation of involved relations (the xgdp90 and XGD functions have been eliminated and the LP90 function has been complemented with the correction coefficient UC).

The main indicators of this estimation are presented in Table No.7.

Table No. 7:
Estimation for 1996

Indicators	1995 Statistics	1996 Macromodel	Indicators	1995 Statistics	1996 Macromodel
LF, mill. pers.	11.12	11.0653	MGD, bill. USD	8.6859	8.727
E. mill. pers.	10.02	10.108	NX, bill. USD	-1.1664	- 1.727
GDP, trillions lei	72.2489	107.34333	GDPD	1.358	1.43348
GVA90, trill. lei	0.71334	0.72886	CPI	1.323	1.44093
GDP90, trill. lei	0.76754	0.79552	CFPI	1.381	1.42419
DAD90, trill. lei	0.79273	0.8341	ER, th. lei per USD	2.03328	3.01469
FA90, trill. lei	2.35612	2.4528	IR	0.5364	0.44936
XGD, bill. USD	7.5195	7.0	M2, trill. lei	13.1619	23.0

This estimation will be used for medium-run forecast.

2) For the 1997 - 2000 I shall present some essential scenarios. The following exogenous variables are common for all of them:

Table No. 8: Exogenous variables for 1997-2000

	1997	1998	1999	2000
P, mill. pers.	22.617	22.595	22.570	22.545
AP, mill. pers.	17.694	17.677	17.657	17.638
GVAA90, trill. lei	0.16605	0.17279	0.17981	0.18711

The P and AP are evaluated by special demographic forecasts. It was thought possible that the agricultural output (after the land reform) would reach in the following 3-4 years the highest previous level (yearly rate of growth 4.06%).

The differences address to the rest of the exogenous variables.

3) The first possible scenario is considered the inertial one (INERSC 1997 - 2000).

3.1) It is conceived on the main tendencies of the last years.

a) Concerning EXTDR, despite the shortage of data a certain influence of the electoral cycle on the economic environment can be identified, especially on the evolution of nominal incomes. The general elections, based on the new Constitution, took place in 1992 and they are scheduled for the end of 1996. If the punctual perturbation induced by the introduction of VAT (July 1993) is eliminated, the annual rate of the disposable revenues RR - approximated by the gross domestic product, current prices - presents the following pattern:

Table No. 9 :
Annual rate of TDR

	$RR=[\frac{TDR}{TDR(-1)}-1]$	$RR/RR(-1)$
1992	1.7357	-
1993 (rectified)	1.7713	1.0205
1994	1.4834	0.8375
1995	0.4509	0.3040
1996	0.5225	1.1588

The rectified estimation for 1993 has been determined considering the VAT perturbation equal to 20%, that is: (3.3256/1.2-1).

The data in the Table No.9 show that during the first year after elections the ascending line of nominal incomes continues. Instead, the economic restrictions determine a clear diminishing tendency in the second and the third years. A new electoral year involves a new income wave. Of course, a single cycle is not enough for conclusive generalisations. However, I cannot reject

the recurrence possibility of the above mentioned trajectory. Consequently, for the inertial scenario, I used the indexes RR/RR(-1) determined for the first Romanian electoral cycle, obtaining the following annual rates of EXTDR:

1996 0.5225
1997 0.5225 * 1.0205 = 0.5332
1998 0.5332 * 0.8375 = 0.4466
1999 0.4466 * 0.3040 = 0.1358
2000 0.1358 * 1.1588 = 0.1573

Finally, the EXTDR serie for the inertial scenario is the following (trillions lei):

1996 110
1997 168.652
1998 243.972
1999 277.103
2000 320.692

b) In the retained 1996 variant, dir = 0.01588, the interest rate being therefore slightly positive; for the inertial scenario it would be normal to maintain the same level. I assume that mgdp, mgdi, mgdc, EXv and gcbe do not change.

c) the restriction concerning unemployment $0.9 < UN < 1$ is maintained.

3.2) The main indicators of the inertial scenario are presented in the Table No.10.

Table No. 10:
Macromodel INERSC 1997 - 2000

Indicators	**1997**	**1998**	**1999**	**2000**
GDP, trill. lei	162.3449	237.8728	278.8808	324.5671
GDP90, trill. lei	0.8172	0.8449	0.8695	0.8984
DAD90, trill. lei	0.8469	0.8685	0.8889	0.9103
I90, trill. lei	0.2143	0.2294	0.2425	0.2552

Indicators	1997	1998	1999	2000
NX, bill. USD	-1.3229	-1.047	-0.8588	-0.5274
UN, mill. persons	0.9926	0.989	0.982	0.9689
GDPD	1.472	1.4173	1.1392	1.1263
CPI	1.4802	1.4244	1.1413	1.1283
β	1.1057	1.1056	1.1324	1.1272
ER, th. lei per USD	4.4638	6.3569	7.2470	8.1760

The real output registers a low growth rate under conditions of relatively high inflation in the first part of the prospected period. The monetary distortion does not decrease. The signs of stagnation of the economy are clear; even the diminution of the foreign trade deficit cannot be positively appreciated, because in the absence of the capital inflows it is difficult to achieve a deep and sound restructuring process.

4) It is interesting to try an expansive monetary policy.

4.1) This scenario, named MONSC 1997 - 2000, maintains the hypothesis of the inertial one concerning EXTDR, mgdp, mgdi, mgdc, gcbe and unemployment. Instead, are introduced:

a) a negative real interest rate, dir = - 0.05 and

b) a rapid diminution of the money velocity in order to reach until 2000-th the historicaly normal level, that is approximately 2.5.

4.2) The obtained estimations are presented in the Table No. 11.

Table No. 11: Macromodel MONSC 1997 - 2000

Indicators	1997	1998	1999	2000
GDP, trill. lei	193.5955	323.5472	439.9253	631.0627
GDP90, trill. lei	0.8208	0.8456	0.8713	0.8996
DAD90, trill. lei	0.8487	0.8706	0.8915	0.9114

Indicators	**1997**	**1998**	**1999**	**2000**
I90, trill. lei	0.2155	0.2313	0.2451	0.2586
NX, bill. USD	-1.228	-1.0935	-0.8765	-0.5138
UN, mill. persons	1.0	1.0	1.0	1.0
GDPD	1.7476	1.6222	1.3196	1.3894
CPI	1.7617	1.6335	1.3249	1.3960
β	1.0502	1.0248	1.0123	1.0061
ER, th. lei per USD	5.3575	8.7538	11.6078	16.2002

The indicators of the real economy - that is GDP90, DAD90, I90 - do not register modifications in comparison with the inertial scenario; the global foreign trade deficit practically is the same. Only the monetary distortion is reduced as a consequence of the cheap money policy. Instead, the economy would be dragged into a dangerous hyperinflationary process, with a drastic devaluation of the national currency. The probability to maintain such an evolution under control is very low.

5) It is interesting to simulate a stronger pressure for nominal revenues under conditions of relatively restrictive monetary policy.

5.1) The following scenario, named REVSC 1997 - 2000, takes into account a 10 % higher EXTDR for all the years. In the same way, the general consolidated budget expenditures are higher: gcbe increases from 0.3414 in 1996 to 0.4 in 2000. The rest of the exogenous variables (mgdp, mgdi, mgdc, EXv, dir and the employment) remain at the same level as in the inertial scenario.

5.2) The Table No. 12 contains the indicators calculated for such conditions.

Table No. 12: Macromodel REVSC 1997 - 2000

Indicators	1997	1998	1999	2000
GDP, trill. lei	175.5997	255.3028	296.4074	340.3065
GDP90, trill. lei	0.8142	0.8241	0.8243	0.8184
DAD90, trill. lei	0.8433	0.8511	0.8476	0.8366
I90, trill. lei	0.2137	0.2250	0.2312	0.2343
NX, bill. USD	-1.2930	-1.1921	-1.0287	-0.8051
UN, mill. persons	0.9918	0.9895	0.9828	1.0
GDPD	1.5980	1.4365	1.1607	1.1565
CPI	1.6088	1.4440	1.1632	1.1589
β	1.0880	1.0912	1.1227	1.1270
ER, th. lei per USD	4.8534	7.0045	8.1384	9.4315

The inflation is situated between the two preceding scenarios. The indicators of the real economy are worse.

6) It is beyond any doubt that the present state of the Romanian economy requires radical measures in order to exceed its long and deep structural crisis. The most important of them can be mentioned:

- the continuation of privatization process, development of the market mechanisms including the capital market, introduction of an effective corporate governance;
- the reduction of the monetary distortion and, on this basis, the gradual normalization of the money velocity;
- the diminution of the fiscality;
- the improvement of the economic environment for foreign capital investment;
- a possible social agreement concerning a rational evolution of the nominal incomes (according to economic resources);

– the *eficient fight against corruption, monopoly tendencies,* fiscal evasion.

6.1) Consequently the restructuring scenario RESSC 1997 - 2000, is based on the following hypothesis:

– a moderate growth of EXTDR from 110 trillions lei in 1996 to 253.5 trillions lei in 2000;
– the diminution of β from 1.3255 in 1995 to 1.0 in 2000;
– the growth of *mgdi* and of mgdc as a result of a stronger integration of Romania in the world economy and of a greater participation of the western capital in investment;
– the reduction of gcbe from 0.3414 in 1996 to 0.31 in 2000;
– the elimination of the unemployment restriction;
– the continuation of the non inflationary "remonetization" of the Romanian economy by such an increase of the broad money able to induce a diminution of the money velocity from 5.48926 in 1995 to approximately 2.5 at the end of examined period.

The last condition can be observed introducing into the macromodel the equality v = EXv and the correction parameter IC in econometric function of v. As an endogenous variable, this coefficient can be interpreted as a necessary modification of the inflationary expectation evaluated in v function by $[CPI / (1+IR)]^{-35}$. Obviously, this assumption is conditioned by the above mentioned reform measures, especially the consolidation of the market mechanisms, diminution of the pressure on nominal incomes, contraction of the monetary distortion. In other words, despite their formal similarity concerning evolution of EXv, the RESSC scenario is completely different from MONSC.

6.2) These premises are reflected in the Table No.13

Table No. 13: Macromodel RESSC 1997 - 2000

Indicators	1997	1998	1999	2000
GDP, trill. lei	145.6363	194.7657	226.5564	264.9722
GDP90, trill. lei	0.8276	0.8725	0.9223	0.9848
DAD90, trill. lei	0.8611	0.9014	0.9496	1.0095
I90, trill. lei	0.2172	0.2367	0.2570	0.2802
NX, bill. USD	-1.4963	-1.2872	-1.2137	-1.0970
UN, mill. persons	1.0537	1.1440	1.2202	1.2930
GDPD	1.3039	1.2686	1.1004	1.0953
CPI	1.3089	1.2729	1.1019	1.0967
β	1.0762	1.0502	1.0248	1.0
ER, th. lei per USD	3.9393	5.0135	5.5187	6.0524

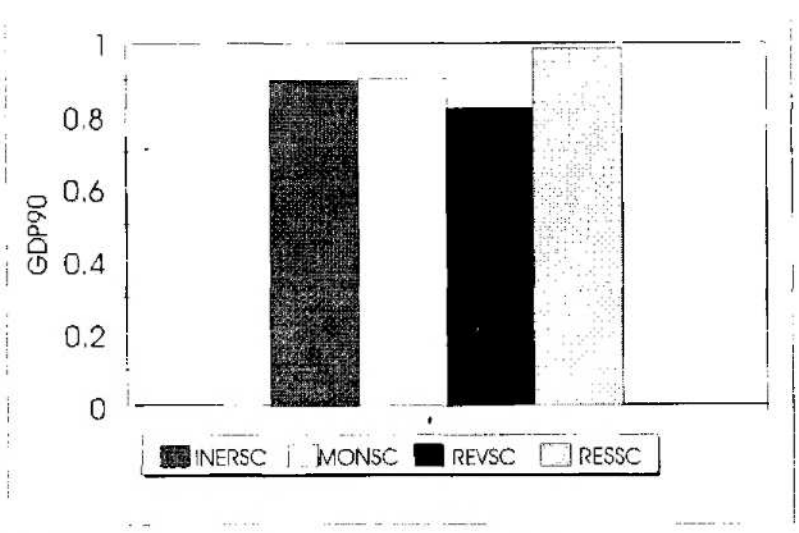
This scenario provides not only a resonable rate of inflation, but also better indicators of the real economy.

7) The Appendix III contains a detailed description of all the scenarios: INERSC, MONSC, REVSC and RESSC.

7.1) In the Graph 10a the above presented scenarios are compared from a very important point of view - the real output of the Romanian economy.

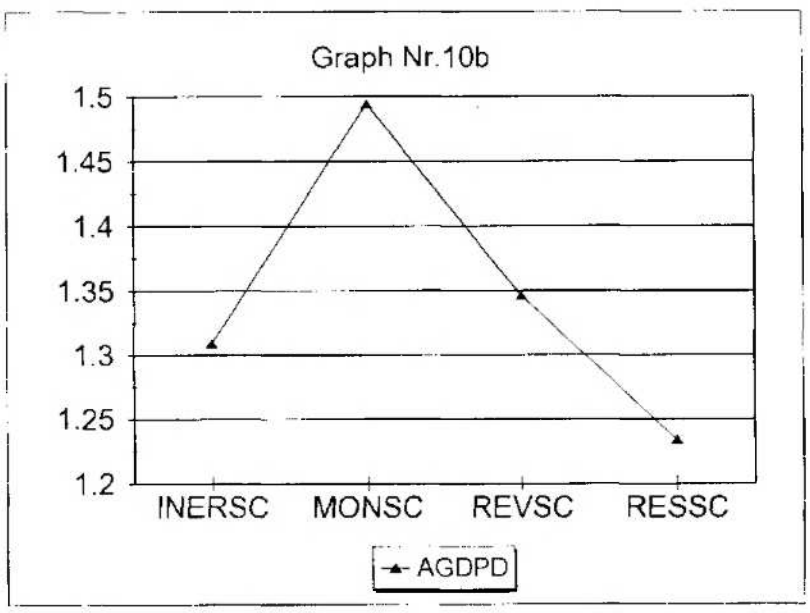
The superiority of RESSC scenario is evident: it allows the greatest rate of economic growth (5.1% against 3.2% for INERSC and MONSC scenarios and only 1.3% for REVSC). According to RESSC scenario, the 1989 level of the real output will be reached and surpassed in 1989 - 1999 and in 2000 the highest performance in this field of the '80-s will be exceeded. In the case of RESSC scenario, the labour productivity registers the most rapid evolution: the unemployment, though higher than in other scenarios, remains in bearable limits.

Graph Nr.10a



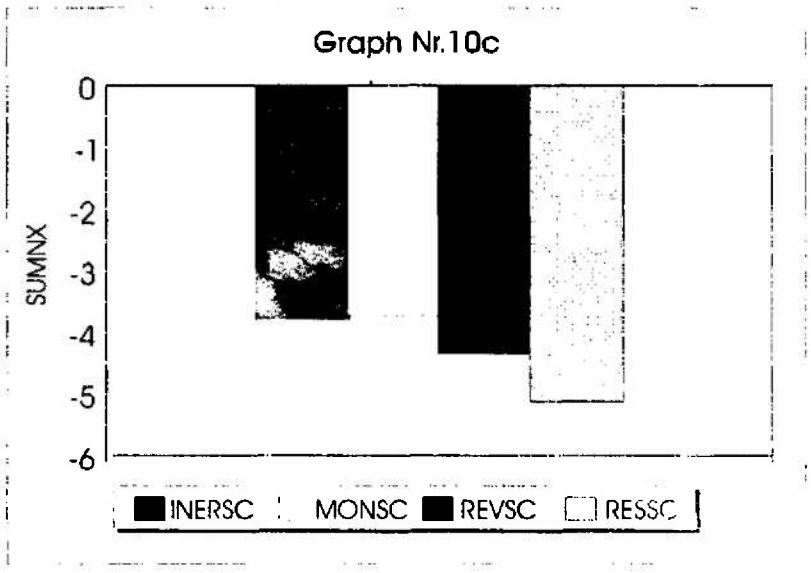
7.2) The Graph 10b presents the annual average gross domestic product deflator (noted AGDPD). MONSC scenario implies a hyperinflation. The lowest rate of gross domestic product deflator is possible with RESSC.

Graph Nr.10b



It is necessary to underline that the effectivness of RESSC scenario in the macroeconomic stabilisation is determined by the realisation of the above mentioned measures: strengthening the financial discipline, severe limitation of the arrears' practice, promotion of a prudent revenues' policy and of a rational fiscality. Without these conditions, RESSC scenario, obviously, remains a simple econometric exercise.

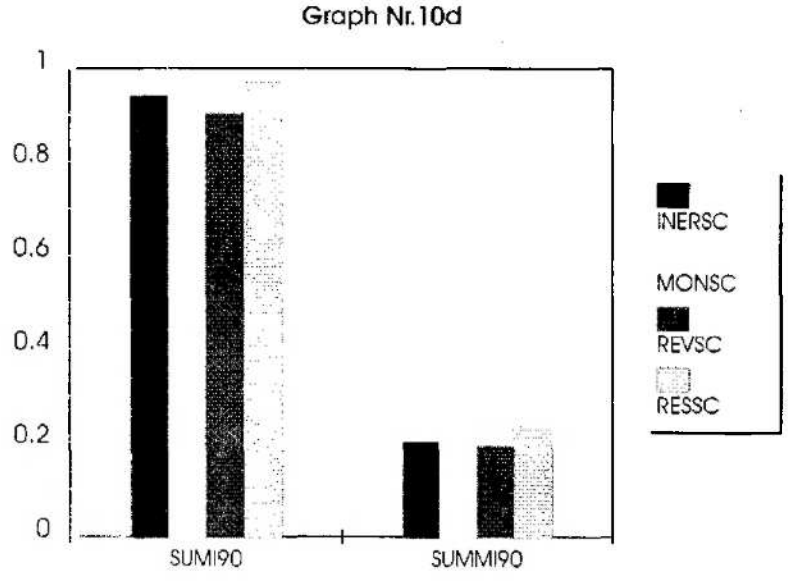
7.3) The global deficit of the foreign trade balance for 1997 - 2000 (noted SUMNX) has been estimated as folows: 3.7 billions USD by INERSC and MONSC, 4.3 billions USD by REVSC and 5.1 billions USD by RESSC.



The deficit of the last scenario is caused, formally, by the tendency of mgdi and mgdc to increase. If they are constant (as it is assumed in other scenarios), the global deficit of foreign trade balance of RESSC would be less than 3 billions USD. But only on paper, because this scenario is conceptually built on intensive integration of Romania into European and world economy, on active policy to stimulate the western capital investments. The performances of RESSC are conditioned by this orientation; this scenario is based on the growth of xgdp90 from 0,2026 in 1996 to 0,242 in 2000.

7.4) The Graph 10d clearly reflects this characteristic of RESSC.

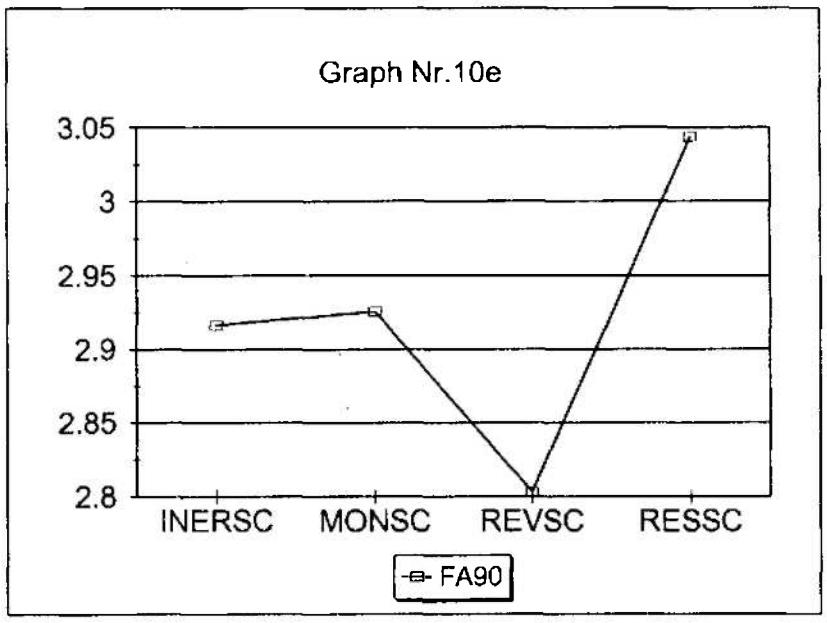
Graph Nr.10d



RESSC scenario provides not only the greatest volume of investments for 1997 - 2000 (noted SUMI90), but the highest share of those realized with imported equipments and technologies (noted SUMMI90), too: 24 - 25% in RESSC against 21.4% in other scenarios.

7.5) As a result, the final level of real fixed assets is superior in RESSC scenario (Graph 10e).

It is interesting to note that, despite this important growth of real fixed assets, their economic return does not diminish. Instead, the scenarios INERSC, MONSC and REVSC are characterized by a decrease with 5 - 10% of EFA90.



The macromodel can be used to build up a large number of other scenarios. Obviously, its estimations must be cautiously used because, as every similar work, it cannot reflect the whole complexity of real life, especially for such an unstable evolution as the transition from the command to the market economy.

6 The extended version of the macromodel

1) The macromodel can be developed in many directions. One of them concerns the general consolidated budget. In this case, the system can be composed by the following relations:

$$EXGDPD=[\frac{EXTDR}{GDP(-1)}]^{c1}*(EXGDPD+dir)^{c2}$$

$$GVAIC90=GVAIC90(-1)*[c3*\frac{XGD}{XGD(-1)}+c4*GDPD:\frac{M2}{M2(-1)}+c5*\frac{GCBE}{GDP}+c6]$$

$$GVAT90=c7*GVAIC90+c8*GVAA90$$

$$GVAPS=c9*GCBE$$

$$GVAPS90 = \frac{GVAPS}{GDPD90}$$

$$GVAO=GVAO(-1)+c10*(TDR-GDP(-1))$$

$$GVAO90 = \frac{GVAO}{GDPD90}$$

$$TDR=DRP+DRF+DRB$$

$$DRF=GOS-[OE+SC+TPN+SCF]$$

$$DRB=GCBR-[TRE+TUNA+SA+SUB]$$

$$GVA90=GVAIC90+GVAA90+GVAT90+GVAPS90+GVAO90$$

$$GVA=GDP-[VAT+CD-SUBP]$$

$$GDP90=c38*GVA90$$

$$GDP=GDP90*GDPD90$$

$$GDPD=\frac{GDPD90}{GDPD90(-1)}$$

$$DAD=c11*(TDR+GDP(-1)*GDPD)*[1+c12*(IR-IR(-1))]*EC$$

$$DAD90=\frac{DAD}{GDPD90}$$

$$XGD=xgdp90*\frac{GDP90}{0,02303}*EC$$

$$xgdp90=c13*xgdp90(-1)+c14*xgdp90(-2)+c15*\frac{GDP90}{GDP90(-1)}$$

$$qe=\frac{c16*qe(-1)+c17*\frac{AP}{AP(-1)}}{qe(-1)+c18*\frac{GDP90}{GDP90(-1)}}$$

$$QE=qe*AP$$

$$ER90=ER90(-1)*[\frac{CPI}{CPI(-1)}:\frac{(1+IR)}{(1+IR(-1))}]^{c19}$$

$$ER=ER90*CPI90$$

$$MGD=mgdp*GDP90+mgdi*I90+mgdc*[DAD90-I90]$$

$$NX=XGD-MGD$$

$$FA90=FA90(-1)*(1-dfa)+I90$$

$$dfa=c20+c21*\frac{GDP90}{GDP90(-1)}$$

$$id=c22*id(-1)+c23*\frac{GDP}{DAD}$$

$$I=id*DAD$$

$$I90=\frac{I}{CFPI90}$$

$$CFPI=GDPD^{c24}$$

$$CFPI90=CFPI90(-1)*CFPI$$

$$E1=QE-UN-RP1$$

$$E=\frac{GDP90}{LP90}$$

$$lfp=c25*lfp(-1)+c26*\frac{AP}{P}$$

$$LF=lfp*P$$

$$LP90=LP90(-1)*[\frac{FA90}{FA90(-1)}]^{c27}*[\frac{E}{E(-1)}]^{c28}*[\frac{GLE}{GLE(-1)*GDPD}]^{c29}*c30$$

$$UN=LF-E$$

$$ler=c31*ler(-1)+\frac{c32*GVA90}{GVA90(-1)}$$

$$GW1=\frac{ler*GVA-GW2*(E-E1)}{E1}$$

$$GW2=gw2*GW1*(1-wst)$$

$$GLE=\frac{GW1*E1+GW2*(E-E1)}{E}$$

$$OE=oe*GOS$$

$$SC=c33*DAD*\frac{GVAA90}{GDP90}$$

$$GRP=GLE*E+TRE+TUNA+SA+OE+SC$$

$$DRP=GRP-(WST+OTP)$$

$$GOS=GVA*(1-ler)+SUB[1-subp]$$

$$GCBR=TPN+SCF+VAT+CD+WST+OTP$$

$$TPN=tpn*GOS$$

$$SCF=scf*E1*GW1$$

$$VAT=vat*GDP$$

$$CD=cd*MGD*ER$$

$$WST=wst*E1*GW1$$

$$OTP=otp*GRP$$

$$GCBE=TRE+TUNA+SA+EHCMS+NDPO+EAB+OBE$$

$$TRE=re*GLE*RP$$

$$TUNA=una*GW1*(1-wst)*UN$$

$$SA=sa*GCBE$$

$$EHCMS - \frac{ehcms*EHCMS(-1)*P*GDPD}{P(-1)}$$

$$NDPO=ndpo*NDPO(-1)*GDPD$$

$$EAB=eab*GDP$$

$$OBE=obe*GCBE$$

$$SUB=sub*EAB$$

$$SUBP=subp*SUB$$

$$GCBB=GCBR-GCBE$$

$$GDP=v*M2$$

$$GDP=DAD+ER*NX$$

$$CPI=GDPD^{c34}$$

$$CPI90=CPI90(-1)*CPI$$

$$IR=GDPD-1+dir$$

$$M2=\frac{EXTDR}{EXv}$$

$$v=v(-1)*IMD*\left[\frac{CPI}{(1+IR)}\right]^{c35}*Is$$

$$Is=\frac{Is85}{Is85(-1)}$$

$$Is85=Is85(-1)*\left[\frac{GDP90}{GDP90(-1)}\right]^{c36}*\left[\frac{AP}{AP(-1)}:\frac{E}{E(-1)}\right]^{c37}$$

$$IMD>\frac{1}{\beta(-1)}$$

$$\left[\frac{GDP}{GDPD}:\frac{EXTDR}{EXGDPD}-1\right]^2+\left[\frac{GDPD}{EXGDPD}-1\right]^2=\min$$

The system contains 75 endogenous variables: *EXGDPD, GVAIC90, GVAT90, GVAPS, GVAPS90, GVAO, GVAO90, TDR, DRF, DRB, GVA90, GVA, GDP90, GDP, GDPD90, GDPD, DAD, DAD90, XGD, xgdp90, MGD, qe, QE, ER90, ER, NX, FA90, dfa, id, I, I90, CFPI90, CFPI, E1, E, lfp, LF, LP90, UN, ler, GW1, GW2, GLE, OE, SC, GRP, DRP, GOS, GCBR, TPN, SCF, VAT, CD, WST, OTP, GCBE, TRE, TUNA, SA, EHCMS, NDPO, EAB, OBE, SUB, SUBP, GCBB, CPI, CPI90, EC, IR, M2, v, IMD, Is, Is85.* As exogenous variables it uses: *EXTDR,*

GVAA90, mgdp, mgdi, mgdc, EXv, P, AP, RP, RP1, dir, gw2, wst, oe, sub, subp, tpn, scf, vat, cd, otp, re, una, sa, ehcms, ndpo, eab, obe.

2) The evolution of the coefficients involved in the general consolidated budget is presented in the Table No.14.

Table No. 14: Supplementary exogenous indicators (statistical data) for extended version of the macromodel

	1993	1994	1995
gw2	0.5251515	0.5282754	0.5748001
wst	0.2343412	0.2374098	0.2257062
oe	0.0815536	0.0746362	0.051215
tpn	0.1311231	0.1470492	0.1206078
scf	0.2522321	0.23233	0.277913
vat	0.0855418	0.0742045	0.0730594
cd	0.0588559	0.0603607	0.051453
otp	0.0024994	0.00279	0.0220543
re	0.4220539	0.4405095	0.4269228
una	0.2028005	0.2787312	0.36414
sa	0.038927	0.0296415	0.0352917
ehcms	0.8593046	1.0930725	1.125835
ndpo	0.769019	1.2261756	1.0971584
eab	0.10234402	0.1023119	0.09721135
obe	0.0882397	0.021048	0.065454
sub	0.6420253	0.3465827	0.4195724
subp	0.5179507	0.5100	0.5100
RP1, mill.pers.	2.9607	3.1254	3.55

These exogenous variables have been used in the testing operations of extended version of the macromodel for 1994 (Macromodel 1994EA) and 1995 (Macromodel 1995EA). In the first case the econometric coefficients estimated on the basis of statistic series 1980 (85) - 1993 have been used and, correspondingly, the coefficients obtained on the basis of the series 1980 (85) - 1994 in the second.

The Table No. 15 presents the main indicators of the general consolidated budget resulted from 1994EA and 1995EA macromodels.

Table No. 15: Indicators of the general consolidated budget

Indicators (trill. lei)	1994		1995	
	Statistics	Macromodel 1994EA	Statistics	Macromodel 1995EA
GCBR	15.8774	15.99834	23.15591	23.96938
- TPN	4.2324	4.17355	5.08313	5.32511
- SCF	3.5628	3.63732	5.98374	6.10019
- VAT	3.695	3.70601	5.27847	5.53184
- CD	0.6556	0.67204	0.90870	0.99132
- WST	3.6407	3.71684	4.85968	4.95426
- OTP	0.0909	0.09254	1.04219	1.06666
GCBE	16.4094	16.52731	25.32488	26.66594
- TRE	3.9872	4.22764	5.80266	6.24037
- TUNA	0.59122	0.75117	1.00898	1.41292
- SA	0.4864	0.48989	0.89286	0.94108
- EHCMS	4.0308	3.82351	6.14918	6.16609
- NDPO	1.8738	1.77744	2.79185	2.79953

Indicators (trill. lei)	1994		1995	
	Statistics	Macromodel 1994EA	Statistics	Macromodel 1995EA
- EAB	5.0946	5.10978	7.02341	7.36056
- OBE	0.34538	0.34788	1.65594	1.74539
GCBB	-0.532	-0.52897	-2.16897	-2.69656

The difference (relatively important) concerning TUNA is determined by the proportion of unemployment: the macromodel estimations are higher than officially registered level.

The inclusion of the general consolidated budget influences the macroeconomic indicators calculated by the extended version EA because the ratio GCBE/GDP (exogenous in the SA version) is in this case an endogenous variable. However, the differences are negligible.

Appendix IV presents the detailed solutions of both 1994EA and 1995EA models; the exogenous coefficients presented in the Table No.14 are included directly in the corresponding systems.

3) As every similar work, the macromodel analysed in this book can generate contradictory comments. Its flexibility can be considered as a quality. It is possibile to obtain new variants by relatively small changes: desaggregation of different indicators (the EA version is a conclusive example), introduction of new econometric relations, modification of the objective function and so forth. Normally, it is necessary to be especially carefull in these trials and avoid the violation of the conceptual framework of the macromodel.

Its most striking weakness is undoubtedly the instability of the econometric functions.

From this point of view, it is useful to see again the Table No.3. The econometric coefficients are relatively close; nevertheless, the change of the statistic sample induces some corrections. An interesting exercise can be their computation for a mixed (statistical - forecast) series 1980(85) - 2000, using, for instance, RESSC estimations. The following results have been obtained:

c1	1.156815	c21	-0.320877
c2	-0.334246	c22	0.80441
c3	0.243750	c23	0.056019
c4	-0.077997	c24	0.981936
c5	-1.016880	c25	0.770350
c6	10189118	c26	0.142322
c7	0.097192	c27	0.986232
c8	0.133736	c28	-2.433321
c9	0.212493	c29	0.324671
c10	0.198618	c30	0.966979
c11	0.528686	c31	0.752861
c12	-0.017667	c32	0.083945
c13	0.960890	c34	1.014379
c14	-0.257829	c35	0.553507
c15	0.067535	c36	0.512504
c19	0.198885	c37	-0.625800
c20	0.376337	c38	1.091450

The comparison with the third column of the Table No.3 shows that most coefficients practically do not change. It is normal, because the forecast estimations have been computed using the coefficients determined for the sample 1980(85) - 1995. However, some changes cannot be ignored: c12, c13, c14, c15, c27, c28, c29. It is beyond any doubt that the real evolution of the Romanian economy can induce more significant deviations. At the same time, the development of the researches concerning the microeconomic foundations of the transition will allow a better determination of the econometric functions.

Consequently, it would be desirable to recalculate them every year taking into account the new findings of the economic theory and the new statistical information. Proceeding in this way, we shall practice a sort of sliding macroeconomic modelling.

Appendix I

Macroeconomic Indicators

Year	P (mill.pers.)	AP (mill.pers.)	LF (mill.pers.)	lfp	E (mill.pers.)	QE (mill.pers.)
1980	22.2014008	16.2794008	10.3500996	0.4661913	10.3500996	8.9841003
1981	22.3526001	16.3225999	10.3754997	0.4641742	10.3754997	9.0829000
1982	22.4776993	16.4096994	10.4280996	0.4639309	10.4280996	9.2660999
1983	22.5531006	16.7391005	10.4577999	0.4636968	10.4577999	9.3922005
1984	22.6245003	16.9505005	10.4998999	0.4640942	10.4998999	9.4789000
1985	22.8234997	17.2204995	10.5860996	0.4638246	10.5860996	9.6480999
1986	22.9403992	17.3561492	10.6695004	0.4650965	10.6695004	9.7707996
1987	23.0536003	17.4881005	10.7816000	0.4676753	10.7816000	9.8956003
1988	23.1515999	17.6048498	10.8053999	0.4667237	10.8053999	10.0225000
1989	23.2066994	17.6786995	10.9456997	0.4716612	10.9456997	10.2296000
1990	23.1851006	17.7161007	10.8395004	0.4675201	10.8395004	10.6508999
1991	22.8099995	17.2809997	11.0520000	0.4845243	10.7858000	10.8542995
1992	22.7889996	17.6069994	11.3870190	0.4996717	10.4580002	10.9434004
1993	22.7553005	17.8083005	11.2270000	0.4933796	10.0620003	11.0137000
1994	22.7306000	17.7890002	11.2356000	0.4942940	10.0120000	11.0210000
1995	22.6810000	17.7440000	11.1200000	0.4902782	10.0200000	10.5500000

Macroeconomic Indicators

Year	qe	E1 (mill.pers.)	RP (mill.pers.)	GDP (trill.lei)	GDP90 (trill.lei)	GVA (trill.lei)
1980	0.5518692	7.3779998	3.0535000	0.6169000	0.8049187	0.5883000
1981	0.5564616	7.4351001	3.0759400	0.6237000	0.8057338	0.5856000
1982	0.5646721	7.5531998	3.0983800	0.7274000	0.8378955	0.6624000
1983	0.5610935	7.6001000	3.1208200	0.7687000	0.8885792	0.6898000
1984	0.5592106	7.5850000	3.1432600	0.8161000	0.9409248	0.7279000
1985	0.5602683	7.6999998	3.1657000	0.8173000	0.9394899	0.7386000
1986	0.5629590	7.7519002	3.2084000	0.8386000	0.9620502	0.7545000
1987	0.5658476	7.7900000	3.2609000	0.8452000	0.9696219	0.7695000
1988	0.5693033	7.8425999	3.1136000	0.8570000	0.9648272	0.7870000
1989	0.5786399	7.9970999	3.3476000	0.8000000	0.9085600	0.7211000
1990	0.6011989	8.1560001	3.6037000	0.8579000	0.8579000	0.7881000
1991	0.6281060	7.5740000	4.0556000	2.2038999	0.7468315	2.0661000
1992	0.6215369	6.8880000	4.2167000	6.0292000	0.6810347	5.6215640
1993	0.6184587	6.8880000	4.4000000	20.0510000	0.6913559	18.5945000
1994	0.6195410	6.6720000	4.9177000	49.7948000	0.7183759	46.1493000
1995	0.5935470	6.4380000	5.0750000	72.2489000	0.7675368	67.1469000

Macroeconomic Indicators

Year	GVA90 (trill.lei)	GVAIC (trill.lei)	GVAIC90 (trill.lei)	GVAA (trill.lei)	GVAA90 (trill.lei)	GVAT (trill.lei)
1980	0.7676019	0.3533000	0.4609787	0.0826000	0.1077748	0.0479000
1981	0.7565139	0.3314000	0.4281228	0.0963000	0.1244062	0.0484000
1982	0.7630217	0.3654000	0.4209060	0.1320000	0.1520514	0.0511000
1983	0.7973747	0.4046000	0.4676976	0.1146000	0.1324719	0.0497000
1984	0.8392344	0.4332000	0.4994592	0.1214000	0.1399685	0.0523000
1985	0.8490239	0.4312000	0.4956663	0.1220000	0.1402395	0.0540000
1986	0.8655699	0.4535000	0.5202597	0.1155000	0.1325027	0.0559000
1987	0.8827781	0.4568000	0.5240455	0.1136000	0.1303231	0.0678000
1988	0.8860199	0.4607000	0.5186650	0.1224000	0.1378003	0.0658000
1989	0.8189533	0.4132000	0.4692712	0.1152000	0.1308326	0.0538000
1990	0.7881000	0.3936000	0.3936000	0.1871000	0.1871000	0.0494000
1991	0.7001355	0.9307000	0.3153846	0.4159000	0.1409353	0.1471000
1992	0.6349897	2.3757640	0.2683569	1.1679000	0.1319214	0.4854000
1993	0.6411360	7.5279000	0.2595610	4.2058000	0.1450154	1.2293000
1994	0.6657832	19.1013000	0.2755692	10.0007000	0.1442773	3.2753600
1995	0.7133357	28.3811000	0.3015069	14.7559000	0.1567594	4.3676700

Macroeconomic Indicators

Year	GVAT90 (trill.lei)	GVAPS (trill.lei)	GVAPS90 (trill.lei)	GVAO (trill.lei)	GVAO90 (trill.lei)	LP (mill.lei)
1980	0.0624989	0.0376000	0.0490597	0.0669000	0.0872898	0.0596033
1981	0.0625261	0.0407000	0.0525787	0.0688000	0.0888800	0.0601128
1982	0.0588623	0.0434000	0.0499927	0.0705000	0.0812093	0.0697538
1983	0.0574507	0.0441000	0.0509774	0.0768000	0.0887770	0.0735049
1984	0.0602994	0.0464000	0.0534970	0.0746000	0.0860103	0.0777245
1985	0.0620732	0.0533000	0.0612686	0.0781000	0.0897763	0.0772050
1986	0.0641290	0.0506000	0.0580488	0.0790000	0.0906296	0.0785979
1987	0.0777808	0.0508000	0.0582783	0.0805000	0.0923504	0.0783928
1988	0.0740789	0.0505000	0.0568539	0.0876000	0.0986218	0.0793122
1989	0.0611007	0.0518000	0.0588293	0.0871000	0.0989195	0.0730881
1990	0.0494000	0.0636000	0.0636000	0.0944000	0.0944000	0.0791457
1991	0.0498475	0.1793000	0.0607591	0.3931000	0.1332091	0.2043335
1992	0.0548289	0.4814000	0.0543770	1.1111000	0.1255055	0.5765156
1993	0.0423861	1.4736000	0.0508095	4.1579000	0.1433639	1.9927449
1994	0.0472527	3.5732000	0.0515496	10.1987400	0.1471344	4.9735118
1995	0.0464000	5.3182300	0.0564983	14.3240000	0.1521711	7.2104691

Macroeconomic Indicators

Year	LP90 (mill.lei)	FA90 (trill.lei)	EFA90	dfa	DAD (trill.lei)	DAD90 (trill.lei)
1980	0.0777692	1.5597660	0.5160509		0.6436327	0.8397989
1981	0.0776573	1.6651689	0.4838751	0.0666107	0.6206700	0.8018195
1982	0.0803498	1.7975540	0.4661309	0.0504543	0.7045250	0.8115457
1983	0.0849681	1.9451440	0.4568192	0.0462350	0.7312510	0.8452900
1984	0.0896127	2.1245811	0.4428755	0.0335517	0.7708980	0.8888091
1985	0.0887475	2.2445620	0.4185627	0.0594560	0.7862900	0.9038438
1986	0.0901683	2.3752371	0.4050334	0.0527163	0.8103928	0.9296907
1987	0.0899330	2.4837380	0.3903881	0.0576780	0.8103360	0.9296255
1988	0.0892912	2.5803701	0.3739104	0.0578032	0.7970160	0.8972961
1989	0.0830061	2.6828811	0.3386509	0.0528564	0.7672160	0.8713272
1990	0.0791457	2.2791599	0.3764106	0.2137706	0.9368238	0.9368238
1991	0.0692421	2.1909690	0.3408682	0.0896605	2.2924684	0.7768446
1992	0.0651209	2.0858359	0.3265044	0.1101998	6.3782053	0.7204569
1993	0.0687096	2.1610000	0.3199241	0.0272653	20.9082604	0.7209141
1994	0.0717515	2.2665000	0.3169538	0.0223611	50.4752075	0.7281919
1995	0.0766005	2.3561167	0.3257635	0.0391465	74.6205178	0.7927317

Macroeconomic Indicators

Year	SC (trill.lei)	I (trill.lei)	I90 (trill.lei)	id	GLE (mill.lei)	GLE90 (mill.lei)
1980	0.0670000	0.2128000	0.2781733	0.3306233	0.0193428	0.0252128
1981	0.0740000	0.2093000	0.2583551	0.3372162	0.0202070	0.0260784
1982	0.1002000	0.2164000	0.2484829	0.3071573	0.0222689	0.0256259
1983	0.0820000	0.2307000	0.2547145	0.3154867	0.0225941	0.0260915
1984	0.0915000	0.2447000	0.2699019	0.3174220	0.0239454	0.0275802
1985	0.0804000	0.2463000	0.2741339	0.3132432	0.0245090	0.0281590
1986	0.0772000	0.2490000	0.2771390	0.3072584	0.0245358	0.0281364
1987	0.0893000	0.2455000	0.2732434	0.3029607	0.0244707	0.0280786
1988	0.0979000	0.2402000	0.2676121	0.3013741	0.0248080	0.0279293
1989	0.0957000	0.2389000	0.2632678	0.3113856	0.0253988	0.0288455
1990	0.1228000	0.1698000	0.1698000	0.1812507	0.0418703	0.0418703
1991	0.2679000	0.3170000	0.1161598	0.1382789	0.0993347	0.0337426
1992	0.9148000	1.1569000	0.1363113	0.1813833	0.2592578	0.0287141
1993	3.0127000	3.5837000	0.1320351	0.1714012	0.7724133	0.0267089
1994	6.0803000	9.8239000	0.1538224	0.1946282	1.8405633	0.0266271
1995	9.4264000	15.7294000	0.1783422	0.2107919	2.6809000	0.0286124

Macroeconomic Indicators

Year	ier	XGD (bill.USD)	xgdp90	MGD (bill.USD)	ER (thous. lei per USD)	ER90 (thous. lei per USD)
1980	0.3403027	11.4010000	0.3262007	13.2010000	0.0148515	0.0211765
1981	0.3580214	11.1800000	0.3195539	10.9780000	0.0150000	0.0207451
1982	0.3505765	9.8480000	0.2706775	8.3230000	0.0150000	0.0176105
1983	0.3425403	9.8470000	0.2552124	7.6480000	0.0170300	0.0192063
1984	0.3454101	9.8980000	0.2422626	7.7290000	0.0208400	0.0232475
1985	0.3512795	10.1740000	0.2493983	8.4020000	0.0175000	0.0193667
1986	0.3469651	9.7630000	0.2337112	8.0840000	0.0168000	0.0184079
1987	0.3428634	10.4920000	0.2492010	8.3130000	0.0160000	0.0173750
1988	0.3406104	11.3920000	0.2719220	7.6430000	0.0160000	0.0170010
1989	0.3855335	10.4870000	0.2658224	8.4380000	0.0160000	0.0168160
1990	0.5758827	5.7750000	0.1550277	9.2020000	0.0230300	0.0230300
1991	0.5185636	4.2660000	0.1315504	5.3720000	0.0800800	0.0296373
1992	0.4541952	4.3630000	0.1475400	5.7840000	0.2456054	0.0292840
1993	0.4215815	4.8922000	0.1629658	6.0201000	0.7600500	0.0254486
1994	0.4054860	6.1513000	0.1972010	6.5624000	1.6550900	0.0234123
1995	0.3989700	7.5195000	0.2256232	8.6859000	2.0332800	0.0217400

Macroeconomic Indicators

Year	GDPD	GDPD90	CFPI	CFPI90	CPI	CPI90
1980	1.0000000	0.7664129	1.0000000	0.7649908	1.0000000	0.7013202
1981	1.0100000	0.7740770	1.0590000	0.8101253	1.0310000	0.7230611
1982	1.1215000	0.8681274	1.0750000	0.8708847	1.1780000	0.8517660
1983	0.9965000	0.8650889	1.0400000	0.9057201	1.0410000	0.8866884
1984	1.0026000	0.8673381	1.0010000	0.9066258	1.0110000	0.8964420
1985	1.0030000	0.8699401	0.9910000	0.8984662	1.0080000	0.9036135
1986	1.0020000	0.8716800	1.0000000	0.8984662	1.0100000	0.9126497
1987	1.0000000	0.8716800	1.0000000	0.8984662	1.0089999	0.9208635
1988	1.0190000	0.8882419	0.9990000	0.8975677	1.0220000	0.9411224
1989	0.9913000	0.8805142	1.0110000	0.9074410	1.0110000	0.9514748
1990	1.1357000	1.0000000	1.1020000	1.0000000	1.0510000	1.0000000
1991	2.9510000	2.9510000	2.7290001	2.7290001	2.7020000	2.7020000
1992	3.0000000	8.8530000	3.1099999	8.4871900	3.1040000	8.3870080
1993	3.2760000	29.0024280	3.1980000	27.1420336	3.5610000	29.8661355
1994	2.3900000	69.3158029	2.3530000	63.8652051	2.3670000	70.6931427
1995	1.3580000	94.1308604	1.3810000	88.1978482	1.3230000	93.5270278

Macroeconomic Indicators

Year	IR	M2 (trill. iei)	v	ls	ls85	β
1980	0.0200000	0.2409766	2.5600000			
1981	0.0200000	0.2436328	2.5600000			
1982	0.0200000	0.2841406	2.5600000			
1983	0.0500000	0.3002734	2.5600000			
1984	0.0300000	0.3187891	2.5600000			
1985	0.0300000	0.3187980	2.5636923			
1986	0.0300000	0.3439850	2.4378969	1.0334951	1.0334951	1.0000000
1987	0.0250000	0.3592060	2.3529674	0.9920159	1.0252435	1.0000000
1988	0.0250000	0.3959420	2.1644584	0.9891052	1.0140737	1.0000000
1989	0.0250000	0.4209140	1.9006258	0.9029383	0.9156460	1.0000000
1990	0.0500000	0.5135360	1.6705743	0.9550471	0.8744851	1.0000000
1991	0.1050000	0.6034660	3.6520697	0.9534961	0.8338182	1.8991400
1992	0.7000000	1.2389000	4.8665752	0.9196698	0.7668374	1.6484500
1993	0.7000000	2.7596200	7.2658554	0.9899715	0.7591471	1.4616899
1994	0.8994000	6.8950000	7.2218709	1.0134959	0.7693925	1.3959600
1995	0.5364000	13.1618600	5.4892622	1.0338361	0.7954257	1.3255000

Macroeconomic Indicators

Year	GCBE (trill. lei)	GCBR (trill. lei)
1980	0.2967873	0.2980042
1981	0.2718232	0.2803424
1982	0.2574563	0.2774076
1983	0.2367962	0.2593590
1984	0.2602072	0.3109376
1985	0.2819852	0.3001256
1986	0.3028797	0.3337643
1987	0.2814260	0.3346278
1988	0.2866860	0.3309679
1990	0.3108626	0.3070655
1991	0.8462000	0.9139000
1992	2.5058000	2.2268000
1993	6.6920000	6.7267000
1994	16.4094000	15.8774000
1995	25.3249000	23.1559138

Data Sources : Romanian Statistical Yearbooks, Ministry of Finance, National Bank of Romania, author's computations

Appendix II

ECONOMETRIC FUNCTIONS

GDPD=(GDP/GDP(-1))^C(1)*(1+IR)^C(2)*EXP(C(50)*DUM92)

GVAIC90=GVAIC90(-1)*(C(3)*XGD/XGD(-1)+C(4)*GDPD*M2(-1)/M2+
+C(5)*GCBE/GDP+C(6)+C(51)*DUM89)

GVAT90=C(7)*GVAIC90+C(8)*GVAA90+C(52)*DUM90

GVAPS=C(9)*GCBE

GVAO=GVAO(-1)+C(10)*(GDP-GDP(-1))

DAD=C(11)*(GDP+GDP(-1)*GDPD)*(1+C(12)*(IR-IR(-1)))

xgdp90=C(13)*xgdp90(-1)+C(14)*xgdp90(-2)+C(15)*GDP90/GDP90(-1)+
+C(53)*DUM90

qe=(C(16)*qe(-1)+C(17)*AP/AP(-1))/(qe(-1)+C(18)*GDP90/GDP90(-1))

ER90=ER90(-1)*(CPI*(1+IR(-1))/(CPI(-1)*(1+IR)))^C(19)*EXP(C(54)*
*DUM90)

dfa=C(20)+C(21)*GDP90/GDP90(-1)+C(55)*DUM90

id=C(22)*id(-1)+C(23)*GDP/DAD+C(56)*DUM90+C(57)*DUM91

CFPI=GDPD^C(24)

lfp=C(25)*lfp(-1)+C(26)*AP/P+C(58)*DUM91+C(59)*DUM92

LP90=LP90(-1)*(FA90/FA90(-1))^C(27)*(E/E(-1))^C(28)*(GLE/(GLE(-1)*
*GDPD))^C(29)*C(30)

ler=C(31)*ler(-1)+C(32)*GVA90/GVA90(-1)+C(60)*DUM89+C(61)*DUM90

SC=C(33)*DAD*GVAA90/GDP90

CPI=GDPD^C(34)

v=v(-1)*(_/_(-1))*(CPI/(1+IR))^C(35)*IS

Is85=Is85(-1)*(GDP90/GDP90(-1))^C(36)*(AP*E(-1)/(AP(-1)*E))^C(37)*
*EXP(C(62)*DUM89)

GDP90=C(38)*GVA90

System: MOD96
Estimation Method: Iterative Least Squares
Sample: 1980 1993
Convergence achieved after 9 iterations

	Coefficient	Std. Error	T-Statistic	Prob.
C(1)	1.19275490334	0.0228253272754	52.2557634748	4.50183928252e-120
C(2)	-0.463883774747	0.0623489398174	-7.44012289713	2.7508063193e-12
C(50)	0.144390457909	0.0225064548985	6.41551317434	9.61228596216e-10
C(3)	0.245797557873	0.0999825940924	2.45840348617	0.0147892125678
C(4)	-0.0765009128901	0.0397204614378	-1.9259824816	0.0554966027553
C(5)	-1.03209855635	0.452940709005	-2.27866150211	0.0237226670167
C(6)	1.19101025211	0.202619296421	5.87806923202	1.67240655492e-08
C(51)	-0.0690730945148	0.0468599250431	-1.47403339743	0.142014056255
C(7)	0.0931729834072	0.0162440454974	5.73582383911	3.46547616209e-08
C(8)	0.148459982108	0.053507131706	2.77458307659	0.00604053935651
C(52)	-0.0150497489216	0.00729262661092	-2.06369388212	0.0403124259319
C(9)	0.215968285167	0.00304330131762	70.9651337895	9.22978118876e-146
C(10)	0.215279175263	0.00223767638745	96.2065723491	6.22364719863e-172
C(11)	0.524218854497	0.00209035666105	250.779622571	5.37637695797e-256
C(12)	-0.0645605002727	0.0223511922336	-2.88845890626	0.00428917656229
C(13)	1.01573791512	0.154691738285	6.56620661442	4.19585110469e-10
C(14)	-0.295075470808	0.14442209626	-2.04314629443	0.0423237230066
C(15)	0.0649546146262	0.0260227319271	2.49607208068	0.0133498872599
C(53)	-0.0960735496277	0.0181022331205	-5.30727612379	2.89127363165e-07
C(16)	1.18789961796	0.0341257974966	34.8094317233	9.19065476718e-88
C(17)	-0.306465677613	0.0290825236286	-10.5377951902	5.2178681277e-21
C(18)	0.0702390598109	0.0451426053216	1.55593721963	0.121273024279
C(19)	0.206867210712	0.101173408829	2.04467965552	0.0421707326892
C(54)	0.311425038495	0.117161948569	2.65807322513	0.00848185219688
C(20)	0.363891767014	0.0747852157198	4.86582492959	2.27707891417e-06
C(21)	-0.307103610416	0.0751380502054	-4.08719163694	6.27662973198e-05
C(55)	0.139858832865	0.0155110353234	9.01673098854	1.4299781981e-16
C(22)	0.809538570225	0.0863087781164	9.37956240247	1.31571794078e-17
C(23)	0.0544537426169	0.0246348371988	2.21043647163	0.0281862734295
C(56)	-0.120694126826	0.0162721124715	-7.41723774572	3.1519644108e-12
C(57)	-0.0608005053982	0.0174108942491	-3.49209549656	0.000587462022012
C(24)	0.981554178638	0.0118931150405	82.5312943913	1.09087279446e-158

C(25) 0.764354512977	0.100253448031	7.62422169003	9.12694402236e-13
C(26) 0.145945525655	0.0623623752052	2.3402817031	0.0202352302409
C(58) 0.0166039958216	0.00266010581097	6.2418554003	2.4616154811e-09
C(59) 0.0165644578296	0.00266886285815	6.20656013814	2.97412058094e-09
C(27) 0.976315340476	0.145220708784	6.72297600425	1.74951079702e-10
C(28) -2.52148079455	0.640355216506	-3.93762825625	0.000112907981149
C(29) 0.323058725149	0.07109039563	4.54433713986	9.4299021509e-06
C(30) 0.9603839043	0.00819954400515	117.126501632	4.70449666224e-189
C(31) 0.753188545366	0.0295026064768	25.5295594292	1.9387643444e-65
C(32) 0.0833655766602	0.0118780947648	7.01843000168	3.25514840526e-11
C(60) 0.0519343437199	0.00989770768781	5.24710825557	3.85900908571e-07
C(61) 0.205278429923	0.00991342036404	20.7071245226	4.83337426796e-52
C(33) 0.690583055994	0.00495426240695	139.391699363	2.78045583773e-204
C(34) 1.01783280716	0.0178167180053	57.1279630093	1.81507110022e-127
C(35) 0.555903459652	0.0960297998584	5.78886408668	2.64471717484e-08
C(36) 0.522195729505	0.0950833347656	5.49197954397	1.17490238619e-07
C(37) -0.621802510667	0.243595214903	-2.552605604	0.0114233438107
C(62) -0.0761419993239	0.0163696746687	-4.65140577713	5.92112015446e-06
C(38) 1.09299541559	0.00570367999534	191.62986291	2.89844322086e-232

Determinant residual covariance 2.37738523749e-84

Equation: GDPD=(GDP/GDP(-1))^C(1)*(1+IR)^C(2)*EXP(C(50)*DUM92)
Observations: 13

R-squared	0.997659035051	Mean dependent var	
Adjusted R-squared	0.997190842062	S.D. dependent var	0.901929265565
S.E. of regression	0.0478035949168	Sum squared resid	0.0228518368697
Durbin-Watson stat	0.93232680814		

Equation: GVAIC90=GVAIC90(-1)*(C(3)*XGD/XGD(-1)
+C(4)*GDPD*M2(-1)/M2+C(5)*GCBE/GDP+C(6)+C(51)*DUM89)
Observations: 13

R-squared	0.961508429695	Mean dependent var	0.429307371904
Adjusted R-squared	0.942262644543	S.D. dependent var	0.0942834322956
S.E. of regression	0.022654987569	Sum squared resid	0.00410598769402
Durbin-Watson stat	1.9212666418		

Equation: GVAT90=C(7)*GVAIC90+C(8)*GVAA90+C(52)*DUM90
Observations: 14

R-squared	0.637260073217	Mean dependent var	0.059804478841
Adjusted R-squared	0.571307359256	S.D. dependent var	0.00923758553785
S.E. of regression	0.00604827441134	Sum squared resid	0.000402397856904
Durbin-Watson stat	1.5573280043		

Equation: GVAPS=C(9)*GCBE
Observations: 14

R-squared	0.99675560783	Mean dependent var	0.190507142857
Adjusted R-squared	0.99675560783	S.D. dependent var	0.387655847497
S.E. of regression	0.0220807088672	Sum squared resid	0.00633825015303
Durbin-Watson stat	1.76824241727		

Equation: GVAO=GVAO(-1)+C(10)*(GDP-GDP(-1))
Observations: 13

R-squared	0.999175684647	Mean dependent var	0.496884615385
Adjusted R-squared	0.999175684647	S.D. dependent var	1.13767806434
S.E. of regression	0.0326637527087	Sum squared resid	0.0128030488922
Durbin-Watson stat	2.55437955689		

Equation: DAD=C(11)*(GDP+GDP(-1)*GDPD)*(1+C(12)*(IR-IR(-1)))
Observations: 13

R-squared	0.999795193162	Mean dependent var	2.87033482761
Adjusted R-squared	0.999776574358	S.D. dependent var	5.64233481156

S.E. of regression	0.0843384005188	Sum squared resid	0.0782426238228
Durbin-Watson stat	1.12088365754		

Equation: xgdp90=C(13)*xgdp90(-1)+C(14)*xgdp90(-2)+
+C(15)*GDP90/GDP90(-1)+C(53)*DUM90
Observations: 12

R-squared	0.928522131412	Mean dependent var	0.219607615419
Adjusted R-squared	0.901717930691	S.D. dependent var	0.053555854691
S.E. of regression	0.0167897450117	Sum squared resid	0.00225516430046
Durbin-Watson stat	1.85466378887		

Equation: qe=(C(16)*qe(-1)+C(17)*AP/AP(-1))/(qe(-1)+
+C(18)*GDP90/GDP90(-1))
Observations: 13

R-squared	0.975425410196	Mean dependent var	0.580596644145
Adjusted R-squared	0.970510492235	S.D. dependent var	0.0266744150613
S.E. of regression	0.00458066642255	Sum squared resid	0.000209825048747
Durbin-Watson stat	2.01259044405		

Equation: ER90=ER90(-1)*(CPI*(1+IR(-1))/(CPI(-1)*(1+IR)))^C(19)*
*EXP(C(54)*DUM90)
Observations: 13

R-squared	0.668532178919	Mean dependent var	0.0213212197991
Adjusted R-squared	0.638398740638	S.D. dependent var	0.00448743522254
S.E. of regression	0.00269844244615	Sum squared resid	8.00975079872e-05
Durbin-Watson stat	2.00833494466		

Equation: dfa=C(20)+C(21)*GDP90/GDP90(-1)+C(55)*DUM90
Observations: 13

R-squared	0.924666937785	Mean dependent var	0.0706352213633
Adjusted R-squared	0.909600325342	S.D. dependent var	0.0481185471262
S.E. of regression	0.0144675815711	Sum squared resid	0.00209310916515
Durbin-Watson stat	2.37634942138		

Equation: id=C(22)*id(-1)+C(23)*GDP/DAD+C(56)*DUM90+
+C(57)*DUM91

Observations: 13

R-squared	0.966035592076	Mean dependent var	0.268139877987
Adjusted R-squared	0.954714122768	S.D. dependent var	0.0707194000399
S.E. of regression	0.0150494268393	Sum squared resid	0.00203836723372
Durbin-Watson stat	2.50478452679		

Equation: CFPI=GDPD^C(24)

Observations: 14

R-squared	0.993231064795	Mean dependent var	1.45107143593
Adjusted R-squared	0.993231064795	S.D. dependent var	0.852396743849
S.E. of regression	0.0701296966707	Sum squared resid	0.0639362666166
Durbin-Watson stat	2.90893696337		

Equation: lfp=C(25)*lfp(-1)+C(26)*AP/P+C(58)*DUM91+
+C(59)*DUM92

Observations: 13

R-squared	0.968546562862	Mean dependent var	0.471997932238
Adjusted R-squared	0.958062083816	S.D. dependent var	0.0123108701781
S.E. of regression	0.00252111220719	Sum squared resid	5.72040608514e-05
Durbin-Watson stat	2.5591785165		

Equation: LP90=LP90(-1)*(FA90/FA90(-1))^C(27)*(E/E(-1))^C(28)*
*(GLE/(GLE(-1)*GDPD))^C(29)*C(30)

Observations: 13

R-squared	0.961583606842	Mean dependent var	0.0812271073991
Adjusted R-squared	0.948778142456	S.D. dependent var	0.00886182937905
S.E. of regression	0.00200563105735	Sum squared resid	3.6203003444e-05
Durbin-Watson stat	1.92551999255		

Equation: ler=C(31)*ler(-1)+C(32)*GVA90/GVA90(-1)+C(60)*DUM89+
+C(61)*DUM90

Observations: 13

R-squared	0.988481834819	Mean dependent var	0.3949248475
Adjusted R-squared	0.984642446426	S.D. dependent var	0.0767756701131
S.E. of regression	0.00951447074841	Sum squared resid	0.0008147263826
Durbin-Watson stat	1.77587424794		

Equation: SC=C(33)*DAD*GVAA90/GDP90

Observations: 14

R-squared	0.999174786547	Mean dependent var	0.369528571429
Adjusted R-squared	0.999174786547	S.D. dependent var	0.792396275607
S.E. of regression	0.0227627943811	Sum squared resid	0.00673588250444
Durbin-Watson stat	2.46406590718		

Equation: CPI=GDPD^C(34)

Observations: 14

R-squared	0.9854117552	Mean dependent var	1.48135714136
Adjusted R-squared	0.9854117552	S.D. dependent var	0.906233677856
S.E. of regression	0.109456540791	Sum squared resid	0.155749546186
Durbin-Watson stat	1.38137577867		

Equation: v=v(-1)*(_/_(-1))*(CPI/(1+IR))^C(35)*IS

Observations: 8

R-squared	0.878837692268	Mean dependent var	3.28887789533
Adjusted R-squared	0.878837692268	S.D. dependent var	1.92160476887
S.E. of regression	0.668879423552	Sum squared resid	3.13179778276
Durbin-Watson stat	1.88583362312		

Equation: Is85=Is85(-1)*(GDP90/GDP90(-1))^C(36)*(AP*E(-1)/(AP(-1)*E))^
^C(37)*EXP(C(62)*DUM89)

Observations: 8

R-squared	0.989299615256	Mean dependent var	0.902843267345
Adjusted R-squared	0.985019461358	S.D. dependent var	0.112949217536
S.E. of regression	0.0138244206879	Sum squared resid	0.000955573036779
Durbin-Watson stat	2.21362072876		

Equation: GDP90=C(38)*GVA90

Observations: 14

R-squared	0.971451296761	Mean dependent var	0.857123094916
Adjusted R-squared	0.971451296761	S.D. dependent var	0.0996511980828
S.E. of regression	0.0168374266804	Sum squared resid	0.00368548618382
Durbin-Watson stat	0.601246043608		

System: MOD96
Estimation Method: Iterative Least Squares
Sample: 1980 1994
Convergence achieved after 4 iterations

	Coefficient	Std. Error	T-Statistic	Prob.
C(1)	1.16138251383	0.0254039815022	45.7165548531	1.4697560678e-115
C(2)	-0.346970160713	0.0577671097734	-6.00636178742	7.59510931569e-09
C(50)	0.113925520751	0.0243721076921	4.67442217925	5.09031892161e-06
C(3)	0.237958907529	0.0905904076342	2.62675611848	0.0092153933635
C(4)	-0.0769357301337	0.0375871273884	-2.04686379299	0.041838853415
C(5)	-1.02698800957	0.428591745402	-2.39619176195	0.0173881500535
C(6)	1.19651805652	0.190915600671	6.26726182833	1.86361271094e-09
C(51)	-0.0688020175006	0.0443695742288	-1.55065760031	0.122395445615
C(7)	0.0930144912313	0.0140185949625	6.63507944129	2.40747863731e-10
C(8)	0.14903970491	0.0449170502195	3.31810980868	0.00105756921947
C(52)	-0.0150958325374	0.00670201940767	-2.2524304421	0.0252643301367
C(9)	0.217461343448	0.00119896605364	181.374062084	5.06576270677e-245
C(10)	0.20546057133	0.00163805237356	125.429793727	1.68939333486e-209
C(11)	0.523869954046	0.00174260963982	300.623812744	5.71471341356e-294
C(12)	-0.0692467605667	0.0167521388342	-4.13360713233	5.04830031361e-05
C(13)	1.01471174205	0.147105324671	6.89785868945	5.33444586691e-11
C(14)	-0.312891560269	0.129759868398	-2.41131225034	0.0167014973398
C(15)	0.0700934300723	0.0210633650563	3.32774131222	0.00102335271537
C(53)	-0.0958084655383	0.0172040815661	-5.56893811332	7.30638001879e-08
C(16)	1.1876593355	0.0318270183107	37.3160729007	4.2270167637e-98
C(17)	-0.305792262962	0.0196752846282	-15.5419486295	1.91588010515e-37
C(18)	0.0711893357574	0.0330547612264	2.15367871726	0.032333179933
C(19)	0.198622917568	0.0890298846869	2.23096905344	0.0266741922749
C(54)	0.311546267218	0.112350851918	2.77297645635	0.0060225130324
C(20)	0.386178366495	0.0767976210095	5.02851991271	1.01211661468e-06
C(21)	-0.331181685481	0.0768945171708	-4.30696098586	2.47677260965e-05
C(55)	0.140307750483	0.0162714159569	8.62295886565	1.20229284242e-15
C(22)	0.804384402849	0.0708297961804	11.3565822045	6.64587954279e-24
C(23)	0.0560272357972	0.019717951985	2.84143281411	0.00490534276262
C(56)	-0.120530125883	0.0153934346575	-7.82996963091	1.93202099217e-13
C(57)	-0.0613790107866	0.0158701764483	-3.86756952492	0.000144103441734
C(24)	0.981612324659	0.0108243354356	90.6856897126	1.45902810197e-178

C(25) 0.790928365087	0.0980994680713	8 06251430958	4.4714401257e-14
C(26) 0.12973494797	0.0610963835716	2.12344725475	0.0348133022205
C(58) 0.0164614219812	0.00268076848397	6.14056084277	3.70537381151e-09
C(59) 0.0162132272316	0.00267304830574	6.06544490676	5.54461005809e-09
C(27) 0.991471063751	0.142240958059	6.97036266683	3.49755967044e-11
C(28) -2.59835375084	0.624764326401	-4.15893424294	4.55584105076e-05
C(29) 0.32651291335	0.070073645979	4.65956792726	5.43675634317e-06
C(30) 0.961194627913	0.00804885650339	119.420022895	8.59241231329e-205
C(31) 0.753381469931	0.0279874130062	26.9185819269	3.7860302986e-72
C(32) 0.0834097431759	0.0112765440692	7.39674696998	2.77135680824e-12
C(60) 0.0518278082457	0.00937149982926	5.53036431628	8.86990925957e-08
C(61) 0.205161548462	0.00938069681758	21.8706085968	1.67669452193e-57
C(33) 0.615263866534	0.00933397499251	65.9165968442	1.16139632688e-148
C(34) 1.01478851976	0.0164570774695	61.6627418593	1.64822002452e-142
C(35) 0.531282966691	0.0955234527344	5.56180656669	7.57361613665e-08
C(36) 0.517701988901	0.0853501171954	6.0656271592	5.53921290906e-09
C(37) -0.626098047586	0.222877001233	-2.80916399684	0.00540605925428
C(62) -0.0764494535235	0.0149702069413	-5.10677332807	7.00074602505e-07
C(38) 1.09231767842	0.005421354223	201.484284828	3.44839100189e-255

Determinant residual covariance 1.03396542232e-80

Equation: GDPD=(GDP/GDP(-1))^C(1)*(1+IR)^C(2)*EXP(C(50)*DUM92)
Observations: 14

R-squared	0.996196890716	Mean dependent var	1.5641857107
Adjusted R-squared	0.9955054163	S.D. dependent var	0.898552049506
S.E. of regression	0.0602404178053	Sum squared resid	0.0399179873109
Durbin-Watson stat	1.38257530184		

Equation: GVAIC90=GVAIC90(-1)*(C(3)*XGD/XGD(-1)+
+C(4)*GDPD*M2(-1)/M2+C(5)*GCBE/GDP+C(6)+C(51)*DUM89)
Observations: 14

R-squared	0.96778702383	Mean dependent var	0.418326073542
Adjusted R-squared	0.953470145532	S.D. dependent var	0.0994676482241

S.E. of regression	0.0214559474513	Sum squared resid	0.00414321912929
Durbin-Watson stat	1.90286153157		

Equation: GVAT90=C(7)*GVAIC90+C(8)*GVAA90+C(52)*DUM90

Observations: 15

R-squared	0.679699736828	Mean dependent var	0.0589676946999
Adjusted R-squared	0.626316359633	S.D. dependent var	0.00947316677371
S.E. of regression	0.0057909154706	Sum squared resid	0.000402416423851
Durbin-Watson stat	1.58875671147		

Equation: GVAPS=C(9)*GCBE

Observations: 15

R-squared	0.999487188027	Mean dependent var	0.41602
Adjusted R-squared	0.999487188027	S.D. dependent var	0.949938793667
S.E. of regression	0.0215116984788	Sum squared resid	0.0064785444002
Durbin-Watson stat	1.6386916156		

Equation: GVAO=GVAO(-1)+C(10)*(GDP-GDP(-1))

Observations: 14

R-squared	0.999627993965	Mean dependent var	1.18987428571
Adjusted R-squared	0.999627993965	S.D. dependent var	2.81390023436
S.E. of regression	0.0542729825015	Sum squared resid	0.038292236185
Durbin-Watson stat	3.15224452541		

Equation: DAD=C(11)*(GDP+GDP(-1)*GDPD)*(1+C(12)*(IR-IR(-1)))

Observations: 14

R-squared	0.999968212083	Mean dependent var	6.27068287557
Adjusted R-squared	0.99996556309	S.D. dependent var	13.8296839936
S.E. of regression	0.0811566931384	Sum squared resid	0.0790369060939
Durbin-Watson stat	1.25174511876		

Equation: xgdp90=C(13)*xgdp90(-1)+C(14)*xgdp90(-2)+
+C(15)*GDP90/GDP90(-1)+C(53)*DUM90
Observations: 13

R-squared	0.928311582971	Mean dependent var	0.217884029586
Adjusted R-squared	0.904415443962	S.D. dependent var	0.0516510422577
S.E. of regression	0.0159688246916	Sum squared resid	0.00229503025829
Durbin-Watson stat	2.04159950503		

Equation: qe=(C(16)*qe(-1)+C(17)*AP/AP(-1))/(qe(-1)+
+C(18)*GDP90/GDP90(-1))
Observations: 14

R-squared	0.978902651816	Mean dependent var	0.583378383849
Adjusted R-squared	0.975066770328	S.D. dependent var	0.0276608899384
S.E. of regression	0.00436772631565	Sum squared resid	0.000209847364853
Durbin-Watson stat	2.01916788111		

Equation: ER90=ER90(-1)*(CPI*(1+IR(-1))/(CPI(-1)*(1+
+IR)))^C(19)*EXP(C(54)*DUM90)
Observations: 14

R-squared	0.672972835443	Mean dependent var	0.0214705836155
Adjusted R-squared	0.64572057173	S.D. dependent var	0.00434745935137
S.E. of regression	0.00258766765684	Sum squared resid	8.03522868269e-05
Durbin-Watson stat	2.31871546849		

Equation: dfa=C(20)+C(21)*GDP90/GDP90(-1)+C(55)*DUM90
Observations: 14

R-squared	0.915365259791	Mean dependent var	0.0671870723696
Adjusted R-squared	0.899977125208	S.D. dependent var	0.0479973284997
S.E. of regression	0.015179823845	Sum squared resid	0.00253469757161

Durbin-Watson stat	1.91064264349

Equation: id=C(22)*id(-1)+C(23)*GDP/DAD+C(56)*DUM90+
+C(57)*DUM91
Observations: 14

R-squared	0.968607188865	Mean dependent var	0.262889045571
Adjusted R-squared	0.959189345525	S.D. dependent var	0.07072849952
S.E. of regression	0.0142883218581	Sum squared resid	0.00204156141521
Durbin-Watson stat	2.90503571972		

Equation: CFPI=GDPD^C(24)
Observations: 15

R-squared	0.993734571747	Mean dependent var	1.51120000687
Adjusted R-squared	0.993734571747	S.D. dependent var	0.853764193568
S.E. of regression	0.0675792421738	Sum squared resid	0.063937355619
Durbin-Watson stat	2.91086247175		

Equation: lfp=C(25)*lfp(-1)+C(26)*AP/P+C(58)*DUM91+
+C(59)*DUM92
Observations: 14

R-squared	0.971622678319	Mean dependent var	0.473590511032
Adjusted R-squared	0.963109481814	S.D. dependent var	0.0132441517068
S.E. of regression	0.00254379157493	Sum squared resid	6.47087557668e-05
Durbin-Watson stat	2.89969157392		

Equation: LP90=LP90(-1)*(FA90/FA90(-1))^C(27)*(E/E(-1))^C(28)*
*(GLE/(GLE(-1)*GDPD))^C(29)*C(30)
Observations: 14

R-squared	0.961737675522	Mean dependent var	0.0805502772198

Adjusted R-squared	0.950258978178	S.D. dependent var	0.00888281951936
S.E. of regression	0.00198110817259	Sum squared resid	3.92478959149e-05
Durbin-Watson stat	1.93191742218		

Equation: ler=C(31)*ler(-1)+C(32)*GVA90/GVA90(-1)+C(60)*DUM89+
+C(61)*DUM90

Observations: 14

R-squared	0.988474073756	Mean dependent var	0.395679215536
Adjusted R-squared	0.985016295882	S.D. dependent var	0.0738176616359
S.E. of regression	0.00903586799979	Sum squared resid	0.000816469105096
Durbin-Watson stat	1.81364010605		

Equation: SC=C(33)*DAD*GVAA90/GDP90

Observations: 15

R-squared	0.996085764777	Mean dependent var	0.750246666667
Adjusted R-squared	0.996085764777	S.D. dependent var	1.66049283643
S.E. of regression	0.103886823363	Sum squared resid	0.151094608958
Durbin-Watson stat	1.80305478585		

Equation: CPI=GDPD^C(34)

Observations: 15

R-squared	0.986061908085	Mean dependent var	1.5403999986
Adjusted R-squared	0.986061908085	S.D. dependent var	0.90271200967
S.E. of regression	0.106573905803	Sum squared resid	0.159011963572
Durbin-Watson stat	1.8290485179		

Equation: v=V(-1)*(_/_(-1))*(CPI/(1+IR))^C(35)*IS

Observations: 9

R-squared	0.908374380874	Mean dependent var	3.7258771204
Adjusted R-squared	0.908374380874	S.D. dependent var	2.2247941885

S.E. of regression	0.673439060509	Sum squared resid	3.62816134576
Durbin-Watson stat	2.23173404691		

Equation: ls85=ls85(-1)*(GDP90/GDP90(-1))^C(36)*(AP*E(-1)/(AP(-1)*E))^
^C(37)*EXP(C(62)*DUM89)

Observations: 9

R-squared	0.990815991862	Mean dependent var	0.888015404564
Adjusted R-squared	0.987754655816	S.D. dependent var	0.11463692536
S.E. of regression	0.0126855712148	Sum squared resid	0.000965542302274
Durbin-Watson stat	2.36355939703		

Equation: GDP90=C(38)*GvA90

Observations: 15

R-squared	0.974376930294	Mean dependent var	0.847873279702
Adjusted R-squared	0.974376930294	S.D. dependent var	0.102491150747
S.E. of regression	0.0164059713331	Sum squared resid	0.00376818253534
Durbin-Watson stat	0.588359962743		

System: MOD96
Estimation Method: Iterative Least Squares
Sample: 1980 1995
Convergence achieved after 4 iterations

	Coefficient	Std. Error	T-Statistic	Prob.
C(1)	1.15810223964	0.0237298387467	48.8036287143	6.92713261193e-128
C(2)	-0.337470275079	0.052576750359	-6.41862178196	7.10550144236e-10
C(50)	0.112185834391	0.0232964254225	4.81558146182	2.57729209616e-06
C(3)	0.243765436785	0.0835761485588	2.91668665031	0.00386739084136
C(4)	-0.0779972621605	0.0355772908871	-2.19233281162	0.0293004929847
C(5)	-1.01702115118	0.406459967086	-2.50214346684	0.012999915539
C(6)	1.18915542462	0.179763944556	6.61509418678	2.3301248371e-10
C(51)	-0.0693881383796	0.0421941305772	-1.6444974083	0.101361215823
C(7)	0.0971909609629	0.0126855049174	7.66157607407	4.31540621821e-13
C(8)	0.133736698895	0.0394939650054	3.38625658065	0.000825680164784
C(52)	-0.0138764985983	0.006400599983	-2.16799966178	0.0311258150698
C(9)	0.212493521246	0.00112879902858	188.247434544	3.74435719114e-266
C(10)	0.198618026491	0.00299816638961	66.2464989198	5.62859682522e-158
C(11)	0.522670657367	0.000533790051715	979.168974184	0
C(12)	-0.0573312597455	0.00330145457456	-17.3654546657	1.59215284525e-44
C(13)	1.01679184267	0.137803809199	7.37854670767	2.50123000996e-12
C(14)	-0.31703437801	0.114770381	-2.76233619901	0.00617580221556
C(15)	0.0707181438288	0.0188224852198	3.75710980793	0.00021506124932
C(53)	-0.0958247601954	0.0163273061298	-5.86898778242	1.42309477912e-08
C(16)	1.1788288464	0.0565442731578	20.8478910518	4.03218570192e-56
C(17)	-0.249448672314	0.0306405815614	-8.14112068384	2.01688948629e-14
C(18)	0.161741870782	0.0561426206472	2.88091059729	0.00431812317661
C(19)	0.198763342692	0.0824352396083	2.41114532615	0.0166423272186
C(54)	0.311544202332	0.10794282657	2.8861964452	0.00424864219044
C(20)	0.376327969265	0.0703385683478	5.35023640806	2.02216445583e-07
C(21)	-0.320868555496	0.0700668166469	-4.57946529971	7.43513377938e-06
C(55)	0.140420062649	0.0156942155392	8.94724953273	9.38750359627e-17
C(22)	0.804399488412	0.0641124555089	12.5466959895	3.39555305875e-28
C(23)	0.0560224417573	0.0175490408169	3.19233639843	0.00159668261161
C(56)	-0.12053043315	0.0146706978188	-8.21572597558	1.24081764577e-14
C(57)	-0.0613771362316	0.0149000574695	-4.11925500002	5.20795875127e-05
C(24)	0.981935740466	0.0105066243723	93.4587271485	4.83316660613e-193

C(25) 0.77121040346	0.0932342496655	8.27174998701	8.6019653265e-15
C(26) 0.141801504886	0.058135666239	2.43914818665	0.0154355556071
C(58) 0.016538265555	0.0026328071726	6.28160912319	1.52576043985e-09
C(59) 0.0164443221482	0.00261117310082	6.29767599207	1.3957791186e-09
C(27) 1.0157468035	0.152202408777	6.67365787214	1.6641518238e-10
C(28) -2.6649800788	0.670030945695	-3.97739850065	9.18723321298e-05
C(29) 0.344131347369	0.074584518748	4.61397825106	6.38457324693e-06
C(30) 0.962626044579	0.0086268888961	111.584379511	2.13816280005e-211
C(31) 0.752859425178	0.0269113647003	27.9755201404	4.31768654788e-78
C(32) 0.0839490635563	0.0107871537678	7.78231824291	2.01547147045e-13
C(60) 0.0515071251679	0.00899152705191	5.72840685131	2.9722775706e-08
C(61) 0.204843812169	0.00900091785289	22.7581026199	2.87493594335e-62
C(33) 0.617386864036	0.00533327670925	115.761266046	3.21922894313e-215
C(34) 1.0143787584	0.0159572367689	63.5685722462	7.66364872817e-154
C(35) 0.551055698228	0.10036565227	5.49048091417	1.00412423048e-07
C(36) 0.512541716354	0.0747541165292	6.85636778483	5.75130014903e-11
C(37) -0.625830636013	0.206852314184	-3.0254949696	0.00274785322535
C(62) -0.0767571941765	0.0138096606482	-5.55822450183	7.1267824037e-08
C(38) 1.09145780541	0.00518408984421	210.539909262	6.11065400967e-278

Determinant residual covariance	1.18766543892e-78

Equation: GDPD=(GDP/GDP(-1))^C(1)*(1+IR)^C(2)*EXP(C(50)*DUM92)

Observations: 15

----------R-			
quared	0.996133686376	Mean dependent var	1.55043999666
Adjusted R-squared	0.995489300772	S.D. dependent var	0.867501485845
S.E. of regression	0.0582629086515	Sum squared resid	0.0407347982945
Durbin-Watson stat	1.42709568142		

Equation: GVAIC90=GVAIC90(-1)*(C(3)*XGD/XGD(-1)+
+C(4)*GDPD*M2(-1)/M2+C(5)*GCBE/GDP+C(6)+C(51)*DUM89)

Observations: 15

R-squared	0.970471250009	Mean dependent var	0.410538125875
Adjusted R-squared	0.958659750013	S.D. dependent var	0.100483302317

S.E. of regression	0.0204305683694	Sum squared resid	0.00417408123898
Durbin-Watson stat	1.94124022421		

Equation: GVAT90=C(7)*GVAIC90+C(8)*GVAA90+C(52)*DUM90
Observations: 16

R-squared	0.699676880936	Mean dependent var	0.0581822125057
Adjusted R-squared	0.653473324157	S.D. dependent var	0.00967625336824
S.E. of regression	0.00569607328032	Sum squared resid	0.000421788260593
Durbin-Watson stat	1.54597973661		

Equation: GVAPS=C(9)*GCBE
Observations: 16

R-squared	0.999476421182	Mean dependent var	0.722408125
Adjusted R-squared	0.999476421182	S.D. dependent var	1.53107926897
S.E. of regression	0.0350339181098	Sum squared resid	0.0184106312719
Durbin-Watson stat	2.00474820545		

Equation: GVAO=GVAO(-1)+C(10)*(GDP-GDP(-1))
Observations: 15

R-squared	0.999236188132	Mean dependent var	2.06548266667
Adjusted R-squared	0.999236188132	S.D. dependent var	4.34198240277
S.E. of regression	0.120000003859	Sum squared resid	0.201600012967
Durbin-Watson stat	1.66371677438		

Equation: DAD=C(11)*(GDP+GDP(-1)*GDPD)*(1+C(12)*(IR-IR(-1)))
Observations: 15

R-squared	0.999987951289	Mean dependent var	10.8273385367
Adjusted R-squared	0.999987024465	S.D. dependent var	22.1143704775
S.E. of regression	0.0796594329004	Sum squared resid	0.0824931282501
Durbin-Watson stat	1.27406397664		

Equation: xgdp90=C(13)*xgdp90(-1)+C(14)*xgdp90(-2)+
+C(15)*GDP90/GDP90(-1)+C(53)*DUM90
Observations: 14

R-squared	0.928374277701	Mean dependent var	0.2184368251
Adjusted R-squared	0.906886561011	S.D. dependent var	0.0496678026646
S.E. of regression	0.0151558790369	Sum squared resid	0.00229700669381
Durbin-Watson stat	2.05339499413		

Equation: qe=(C(16)*qe(-1)+C(17)*AP/AP(-1))/(qe(-1)+
+C(18)*GDP90/GDP90(-1))
Observations: 15

R-squared	0.942850351938	Mean dependent var	0.584056291592
Adjusted R-squared	0.933325410595	S.D. dependent var	0.0267836973192
S.E. of regression	0.00691593182291	Sum squared resid	0.00057396135575
Durbin-Watson stat	2.08306403264		

Equation: ER90=ER90(-1)*(CPI*(1+IR(-1))/(CPI(-1)*(1+
+IR)))^C(19)*EXP(C(54)*DUM90)
Observations: 15

R-squared	0.673062140906	Mean dependent var	0.0214885464298
Adjusted R-squared	0.647913074822	S.D. dependent var	0.00418989426835
S.E. of regression	0.00248615391942	Sum squared resid	8.03524970437e-05
Durbin-Watson stat	2.32188615073		

Equation: dfa=C(20)+C(21)*GDP90/GDP90(-1)+C(55)*DUM90
Observations: 15

R-squared	0.916135887389	Mean dependent var	0.0653177002059
Adjusted R-squared	0.902158535287	S.D. dependent var	0.046814620763
S.E. of regression	0.0146434356271	Sum squared resid	0.00257316248359
Durbin-Watson stat	2.16344682316		

Equation: id=C(22)*id(-1)+C(23)*GDP/DAD+C(56)*DUM90+
+C(57)*DUM91
Observations: 15

R-squared	0.969784162301	Mean dependent var	0.259415901886
Adjusted R-squared	0.961543479293	S.D. dependent var	0.0694704156246
S.E. of regression	0.0136233806677	Sum squared resid	0.00204156150899
Durbin-Watson stat	2.90622500624		

Equation: CFPI=GDPD^C(24)
Observations: 16

R-squared	0.993652981195	Mean dependent var	1.50306250644
Adjusted R-squared	0.993652981195	S.D. dependent var	0.825456589379
S.E. of regression	0.0657626236303	Sum squared resid	0.064870840001
Durbin-Watson stat	2.88811945862		

Equation: lfp=C(25)*lfp(-1)+C(26)*AP/P+C(58)*DUM91+
+C(59)*DUM92
Observations: 15

R-squared	0.972936898595	Mean dependent var	0.474703024058
Adjusted R-squared	0.965556052758	S.D. dependent var	0.0134701047476
S.E. of regression	0.00249992759593	Sum squared resid	6.87460178339e-05
Durbin-Watson stat	2.96196379004		

Equation: LP90=LP90(-1)*(FA90/FA90(-1))^C(27)*(E/E(-1))^C(28)*
*(GLE/(GLE(-1)*GDPD))^C(29)*C(30)
Observations: 15

R-squared	0.951877592355	Mean dependent var	0.0802869573875
Adjusted R-squared	0.93875329936	S.D. dependent var	0.00862023828861
S.E. of regression	0.00213334267144	Sum squared resid	5.00626604916e-05

Durbin-Watson stat 1.56666166815

Equation: ler=C(31)*ler(-1)+C(32)*GVA90/GVA90(-1)+C(60)*DUM89+
+C(61)*DUM90

Observations: 15

R-squared	0.988257730126	Mean dependent var	0.395898601167
Adjusted R-squared	0.985055292888	S.D. dependent var	0.0711375531295
S.E. of regression	0.00869646246904	Sum squared resid	0.00083191305423
Durbin-Watson stat	1.78743852859		

Equation: SC=C(33)*DAD*GVAA90/GDP90

Observations: 16

R-squared	0.998608155911	Mean dependent var	1.29250625
Adjusted R-squared	0.998608155911	S.D. dependent var	2.69780429003
S.E. of regression	0.100648135872	Sum squared resid	0.151950708818
Durbin-Watson stat	2.10432969248		

Equation: CPI=GDPD^C(34)

Observations: 16

R-squared	0.98596853038	Mean dependent var	1.52681249869
Adjusted R-squared	0.98596853038	S.D. dependent var	0.87379457733
S.E. of regression	0.103504903631	Sum squared resid	0.160698976135
Durbin-Watson stat	1.81076946518		

Equation: v=v(-1)*(_/_(-1))*(CPI/(1+IR))^C(35)*IS

Observations: 10

R-squared	0.888473804498	Mean dependent var	3.90221562396
Adjusted R-squared	0.888473804498	S.D. dependent var	2.17041336449
S.E. of regression	0.724821218825	Sum squared resid	4.72829219333
Durbin-Watson stat	1.76851463063		

Equation: ls85=ls85(-1)*(GDP90/GDP90(-1))^C(36)*(AP*E(-1)/(AP(-1)*E))^
^C(37)*EXP(C(62)*DUM89)
Observations: 10

R-squared	0.991396564618	Mean dependent var	0.878756436072
Adjusted R-squared	0.988938440223	S.D. dependent var	0.111976466787
S.E. of regression	0.0117770073289	Sum squared resid	0.000970885311379
Durbin-Watson stat	2.35280957071		

Equation: GDP90=C(38)*GVA90
Observations: 16

R-squared	0.974549380722	Mean dependent var	0.842852250155
Adjusted R-squared	0.974549380722	S.D. dependent var	0.101032232742
S.E. of regression	0.0161179248986	Sum squared resid	0.00389681254555
Durbin-Watson stat	0.571250304223		

Appendix III

Main Scenarios for 1997-2000

Macromodel INERSC 1997 - 2000

Nr.	Indicators	Statistics 1994	Statistics 1995	Solution 1996	Solution 1997	Solution 1998	Solution 1999	Solution 2000	Indicators
1	xgdp90	0.1972	0.2339	0.2026	0.2045	0.2168	0.2284	0.2366	xgdp90
2	EXGDPD	2.3900	1.3580	1.4351	1.4746	1.4189	1.1373	1.1246	EXGDPD
3	DAD	50.4752	74.6205	111.3450	168.2502	244.5283	285.1049	328.8789	DAD
4	DAD90	0.7282	0.7927	0.8250	0.8469	0.8685	0.8889	0.9103	DAD90
5	XGD	6.1513	7.5195	7.0000	7.3083	7.9278	8.4202	9.0855	XGD
6	MGD	6.5624	8.6859	8.3210	8.6312	8.9748	9.2790	9.6129	MGD
7	GVAIC90	0.2756	0.3015	0.3030	0.3090	0.3182	0.3254	0.3349	GVAIC90
8	GVAO	10.1987	14.3240	21.2981	32.2187	47.2199	55.3648	64.4389	GVAO
9	GVAO90	0.1471	0.1522	0.1578	0.1622	0.1677	0.1726	0.1784	GVAO90
10	GVAT90	0.0473	0.0464	0.0508	0.0522	0.0540	0.0557	0.0576	GVAT90
11	GVAPS	3.5732	5.3182	7.7882	11.7768	17.2557	20.2305	23.5447	GVAPS
12	GVAPS90	0.0515	0.0565	0.0577	0.0593	0.0613	0.0631	0.0652	GVAPS90
13	GVA90	0.6658	0.7133	0.7289	0.7487	0.7741	0.7966	0.8231	GVA90
14	ER	1.6551	2.0333	3.0152	4.4638	6.3569	7.2470	8.1760	ER
15	GDPD	2.3900	1.3580	1.4337	1.4720	1.4173	1.1392	1.1263	GDPD
16	GDPD90	69.3158	94.1309	134.9596	198.6599	281.5532	320.7491	361.2693	GDPD90
17	NX	-0.4111	-1.1664	-1.3210	-1.3229	-1.0470	-0.8588	-0.5274	NX
18	GDP	49.7948	72.2489	107.3620	162.3449	237.8728	278.8808	324.5671	GDP
19	GDP90	0.7184	0.7675	0.7955	0.8172	0.8449	0.8695	0.8984	GDP90

20	FA90	2.2665	2.3561	2.4512	2.5510	2.6666	2.7861	2.9166	FA90
21	E	10.0120	10.0200	10.1080	10.0415	10.0189	10.0018	9.9936	E
22	GLE	1.8406	2.6809	3.7577	5.5837	8.0612	9.3345	10.7666	GLE
23	GVA	46.1493	67.1469	98.3657	148.7413	217.9404	255.5122	297.3702	GVA
24	id	0.1946	0.2108	0.2236	0.2339	0.2426	0.2500	0.2564	id
25	I	9.8239	15.7294	24.8944	39.3543	59.3346	71.2724	84.3170	I
26	I90	0.1538	0.1783	0.1982	0.2143	0.2294	0.2425	0.2552	I90
27	dfa	0.0224	0.0391	0.0438	0.0467	0.0446	0.0461	0.0448	dfa
28	ler	0.4055	0.3990	0.3861	0.3769	0.3706	0.3654	0.3618	ler
29	CFPI	2.3530	1.3810	1.4244	1.4618	1.4084	1.1365	1.1239	CFPI
30	CFPI90	63.8652	88.1978	125.6328	183.6438	258.6371	293.9498	330.3737	CFPI90
31	UN	1.2236	1.1000	0.9573	0.9926	0.9890	0.9820	0.9689	UN
32	lfp	0.4943	0.4903	0.4888	0.4879	0.4872	0.4867	0.4863	lfp
33	LP90	0.0718	0.0766	0.0787	0.0814	0.0843	0.0869	0.0899	LP90
34	LF	11.2356	11.1200	11.0653	11.0340	11.0079	10.9838	10.9625	LF
35	CPI	2.3670	1.3230	1.4412	1.4802	1.4244	1.1413	1.1283	CPI
36	CPI90	70.6931	93.5270	134.7902	199.5166	284.1888	324.3589	365.9606	CPI90
37	EC	1.0000	1.0000	1.0049	1.0070	0.9966	0.9764	0.9845	EC
38	UC	1.0000	1.0000	1.0577	1.0103	1.0164	1.0139	1.0149	UC
39	IR	0.8994	0.5364	0.4496	0.4879	0.4331	0.1551	0.1422	IR
40	M2	6.8950	13.1619	23.0000	34.4357	49.8147	56.5795	65.4796	M2
41	IMD	0.9550	0.7664	0.8321	1.0025	0.9999	1.0242	0.9955	IMD
42	v	7.2219	5.4893	4.6679	4.7144	4.7752	4.9290	4.9568	v

43	ß	1.3960	1.3255	1.1029	1.1057	1.1056	1.1324	1.1272	ß
44	Is	1.0135	1.0338	1.0253	1.0103	1.0164	1.0145	1.0171	Is
45	Is85	0.7694	0.7954	0.8155	0.8240	0.8375	0.8496	0.8641	Is85

Exogenous

1	EXTDR	49.7948	72.2489	110.0000	168.6520	243.9720	277.1030	320.6920	EXTDR
2	GVAA90	0.1443	0.1568	0.1596	0.1661	0.1728	0.1798	0.1871	GVAA90
3	mgdp	6.1371	7.4775	7.0000	7.0000	7.0000	7.0000	7.0000	mgdp
4	mgdi	8.5816	9.2989	9.2989	9.2989	9.2989	9.2989	9.2989	mgdi
5	mgdc	1.4513	2.0968	1.4513	1.4513	1.4513	1.4513	1.4513	mgdc
6	EXv	7.2219	5.4893	4.8976	4.8976	4.8976	4.8976	4.8976	EXv
7	P	22.7306	22.6810	22.6400	22.6170	22.5950	22.5700	22.5450	P
8	AP	17.7890	17.7440	17.7120	17.6940	17.6770	17.6570	17.6380	AP
9	EXUN	1.2236	1.1000	0.9-1	0.9-1	0.9-1	0.9-1	0.9-1	EXUN
10	dir			0.0159	0.0159	0.0159	0.0159	0.0159	dir
11	gcbc			0.3414	0.3414	0.3414	0.3414	0.3414	gcbe

Macromodel MONSC 1997 - 2000

Nr.	Indicators	Statistics 1994	Statistics 1995	Solution 1996	Solution 1997	Solution 1998	Solution 1999	Solution 2000	Indicators
1	xgdp90	0.1972	0.2339	0.2026	0.2049	0.2169	0.2285	0.2366	xgdp90
2	EXGDPD	2.3900	1.3580	1.4351	1.4913	1.2345	0.8873	0.7735	EXGDPD
3	DAD	50.4752	74.6205	111.3450	200.1745	333.1196	450.0993	639.3867	DAD
4	DAD90	0.7282	0.7927	0.8250	0.8487	0.8706	0.8915	0.9114	DAD90
5	XGD	6.1513	7.5195	7.0000	7.4407	7.9043	8.4402	9.1353	XGD
6	MGD	6.5624	8.6859	8.3210	8.6687	8.9978	9.3167	9.6491	MGD
7	GVAIC90	0.2756	0.3015	0.3030	0.3111	0.3187	0.3265	0.3356	GVAIC90
8	GVAO	10.1987	14.3240	21.2981	38.4256	64.2364	87.3512	125.3145	GVAO
9	GVAO90	0.1471	0.1522	0.1578	0.1629	0.1679	0.1730	0.1786	GVAO90
10	GVAT90	0.0473	0.0464	0.0508	0.0524	0.0541	0.0558	0.0576	GVAT90
11	GVAPS	3.5732	5.3182	7.7882	14.0438	23.4707	31.9130	45.7784	GVAPS
12	GVAPS90	0.0515	0.0565	0.0577	0.0595	0.0613	0.0632	0.0653	GVAPS90
13	GVA90	0.6658	0.7133	0.7289	0.7520	0.7748	0.7983	0.8242	GVA90
14	ER	1.6551	2.0333	3.0152	5.3575	8.7538	11.6078	16.2002	ER
15	GDPD	2.3900	1.3580	1.4337	1.7476	1.6222	1.3196	1.3894	GDPD
16	GDPD90	69.3158	94.1309	134.9596	235.8598	382.6157	504.9035	701.5072	GDPD90
17	NX	-0.4111	-1.1664	-1.3210	-1.2280	-1.0935	-0.8765	-0.5138	NX
18	GDP	49.7948	72.2489	107.3620	193.5955	323.5472	439.9253	631.0627	GDP
19	GDP90	0.7184	0.7675	0.7955	0.8208	0.8456	0.8713	0.8996	GDP90
20	FA90	2.2665	2.3561	2.4512	2.5558	2.6701	2.7932	2.9259	FA90
21	E	10.0120	10.0200	10.1080	10.0340	10.0079	9.9838	9.9625	E
22	GLE	1.8406	2.6809	3.7577	6.6701	10.9761	14.7550	20.9990	GLE
23	GVA	46.1493	67.1469	98.3657	177.3733	296.4358	403.0620	578.1832	GVA

24	id	0.1946	0.2108	0.2236	0.2340	0 2427	0.2500	0 2564	id
25	I	9.8239	15.7294	24.8944	46 8465	80.8364	112.5049	163.9114	I
26	I90	0.1538	0.1783	0.1982	0.2155	0.2313	0.2451	0.2586	I90
27	dfa	0.0224	0.0391	0.0438	0.0453	0.0458	0.0457	0 0450	dfa
28	ler	0.4055	0.3990	0.3861	0.3773	0.3706	0.3655	0 3618	ler
29	CFPI	2.3530	1.3810	1.4244	1.7301	1.6081	1.3130	1.3812	CFPI
30	CFPI90	63.8652	88.1978	125.6328	217.3570	349.5319	458.9408	633.8704	CFPI90
31	UN	1.2236	1.1000	0 9573	1.0000	1.0000	1.0000	1.0000	UN
32	lfp	0.4943	0 4903	0.4888	0.4879	0.4872	0.4867	0 4863	lfp
33	LP90	0.0718	0.0766	0.0787	0.0818	0.0845	0.0873	0.0903	LP90
34	LF	11.2356	11.1200	11.0653	11.0340	11.0079	10 9838	10 9625	LF
35	CPI	2.3670	1.3230	1.4412	1.7617	1.6335	1.3249	1.3960	CPI
36	CPI90	70.6931	93.5270	134.7902	237.4623	387.9043	513.9277	717.4298	CPI90
37	EC	1.0000	1.0000	1.0049	1.0191	0.9925	0.9765	0 9887	EC
38	UC	1.0000	1.0000	1.0577	1.0094	1.0143	1.0119	1.0111	UC
39	IR	0.8994	0.5364	0.4496	0.6976	0.5722	0.2696	0 3394	IR
40	M2	6.8950	13.1619	23.0000	42.1630	69.7063	92.3677	128.2768	M2
41	IMD	0.9550	0.7664	0.8321	0.9522	0 9758	0.9878	0.9939	IMD
42	v	7.2219	5.4893	4 6679	4 5916	4.6416	4.7628	4.9195	v
43	ß	1.3960	1.3255	1.1029	1.0502	1.0248	1.0123	1.0061	ß
44	Is	1.0135	1.0338	1.0253	1.0122	1.0143	1.0146	1.0158	Is
45	Is85	0.7694	0 7954	0.8155	0.8254	0.8373	0.8495	0.8630	Is85

Exogenous

1	EXTDR	49.7948	72.2489	110	168.652	243.972	277.103	320.692	EXTDR
2	GVAA90	0.1442	0.1567	0.1595	0.1660	0.1727	0.1798	0.1871	GVAA90
3	mgdp	6.1371	7.4775	7	7	7	7	7	mgdp
4	mgdi	8.5816	9.2988	9.2988	9.2988	9.2988	9.2988	9.2988	mgdi
5	mgdc	1.4512	2.0967	1.4512	1.4512	1.4512	1.4512	1.4512	mgdc
6	EXv	7.2218	5.4892	4.8975	4.0000	3.5000	3.0000	2.5000	EXv
7	P	22.7306	22.681	22.64	22.617	22.595	22.57	22.545	P
8	AP	17.789	17.744	17.712	17.694	17.677	17.657	17.638	AP
9	EXUN	1.2236	1.1	1	0 9-1	0.9-1	0.9-1	0.9-1	EXUN
10	dir			0.0158	-0.05	-0 05	-0.05	-0.05	dir
11	gcbe			0.3413	0.3413	0.3413	0.3413	0.3413	gcbe

Macromodel REVSC 1997 - 2000

Nr.	Indicators	Statistics 1994	Statistics 1995	Solution 1996	Solution 1997	Solution 1998	Solution 1999	Solution 2000	Indicators
1	xgdp90	0.1972	0.2339	0.2026	0.2043	0.2150	0.2246	0.2304	xgdp90
2	EXGDPD	2.3900	1.3580	1.4351	1.6018	1.4398	1.1619	1.1587	EXGDPD
3	DAD	50.4752	74.6205	111.3450	181.8752	263.6530	304.7790	347.8999	DAD
4	DAD90	0.7282	0.7927	0.8250	0.8433	0.8511	0.8476	0.8366	DAD90
5	XGD	6.1513	7.5195	7.0000	7.3079	7.5775	7.7865	7.9765	XGD
6	MGD	6.5624	8.6859	8.3210	8.6010	8.7696	8.8151	8.7816	MGD
7	GVAIC90	0.2756	0.3015	0.3030	0.3051	0.3015	0.2919	0.2785	GVAIC90
8	GVAO	10.1987	14.3240	21.2981	34.8513	50.6818	58.8459	67.5651	GVAO
9	GVAO90	0.1471	0.1522	0.1578	0.1616	0.1636	0.1637	0.1625	GVAO90
10	GVAT90	0.0473	0.0464	0.0508	0.0519	0.0524	0.0524	0.0521	GVAT90
11	GVAPS	3.5732	5.3182	7.7882	13.2464	20.0726	24.2491	28.9252	GVAPS
12	GVAPS90	0.0515	0.0565	0.0577	0.0614	0.0648	0.0674	0 0696	GVAPS90
13	GVA90	0.6658	0.7133	0.7289	0.7460	0.7551	0.7553	0.7498	GVA90
14	ER	1.6551	2.0333	3.0152	4.8534	7.0045	8.1384	9.4315	ER
15	GDPD	2.3900	1.3580	1.4337	1.5980	1.4365	1.1607	1.1565	GDPD
16	GDPD90	69.3158	94.1309	134.9596	215.6600	309.7879	359.5695	415.8393	GDPD90
17	NX	-0.4111	-1.1664	-1.3210	-1.2930	-1.1921	-1.0287	-0.8051	NX
18	GDP	49.7948	72.2489	107.3620	175.5997	255.3028	296.4074	340.3065	GDP
19	GDP90	0.7184	0.7675	0.7955	0.8142	0.8241	0.8243	0.8184	GDP90
20	FA90	2.2665	2.3561	2.4512	2.5475	2.6411	2.7261	2.8029	FA90
21	E	10.0120	10.0200	10.1080	10.0423	10.0184	10.0010	9.9625	E
22	GLE	1.8406	2.6809	3.7577	6.0340	8.6042	9.8140	11.1238	GLE

23	GVA	46.1493	67.1469	98.3657	160.8854	233.9099	271.5702	311.7907	GVA
24	id	0.1946	0.2108	0.2236	0.2339	0.2424	0.2495	0.2555	id
25	I	9.8239	15.7294	24.8944	42.5473	63.9165	76.0398	88.8851	I
26	I90	0.1538	0.1783	0.1982	0.2137	0.2250	0.2312	0.2343	I90
27	dfa	0.0224	0.0391	0.0438	0.0479	0.0516	0.0554	0.0578	dfa
28	ler	0.4055	0.3990	0.3861	0.3766	0.3685	0.3614	0.3554	ler
29	CFPI	2.3530	1.3810	1.4244	1.5845	1.4271	1.1576	1.1535	CFPI
30	CFPI90	63.8652	88.1978	125.6328	199.0634	284.0828	328.8473	379.3118	CFPI90
31	UN	1.2236	1.1000	0.9573	0.9918	0.9895	0.9828	1.0000	UN
32	lfp	0.4943	0.4903	0.4888	0.4879	0.4872	0.4867	0.4863	lfp
33	LP90	0.0718	0.0766	0.0787	0.0811	0.0823	0.0824	0.0821	LP90
34	LF	11.2356	11.1200	11.0653	11.0340	11.0079	10.9838	10.9625	LF
35	CPI	2.3670	1.3230	1.4412	1.6088	1.4440	1.1632	1.1589	CPI
36	CPI90	70.6931	93.5270	134.7902	216.8458	313.1178	364.2140	422.0922	CPI90
37	EC	1.0000	1.0000	1.0049	1.0119	0.9848	0.9685	0.9742	EC
38	UC	1.0000	1.0000	1.0577	1.0097	1.0121	1.0093	1.0031	UC
39	IR	0.8994	0.5364	0.4496	0.6138	0.4523	0.1766	0.1724	IR
40	M2	6.8950	13.1619	23.0000	37.8793	54.7962	62.2374	72.0275	M2
41	IMD	0.9550	0.7664	0.8321	0.9864	1.0029	1.0289	1.0039	IMD
42	v	7.2219	5.4893	4.6679	4.6358	4.6591	4.7625	4.7247	v
43	ß	1.3960	1.3255	1.1029	1.0880	1.0912	1.1227	1.1270	ß
44	Is	1.0135	1.0338	1.0253	1.0085	1.0053	0.9998	0.9945	Is
45	Is85	0.7694	0.7954	0.8155	0.8225	0.8268	0.8266	0.8221	Is85

Exogenous

1	EXTDR	49.7948	72.2489	110.0000	185.5172	268.3692	304.8133	352.7612	EXTDR
2	GVAA90	0.1443	0.1568	0.1596	0.1661	0.1728	0.1798	0.1871	GVAA90
3	mgdp	6.1371	7.4775	7.0000	7.0000	7.0000	7.0000	7.0000	mgdp
4	mgdi	8.5816	9.2989	9.2989	9.2989	9.2989	9.2989	9.2989	mgdi
5	mgdc	1.4513	2.0968	1.4513	1.4513	1.4513	1.4513	1.4513	mgdc
6	EXv	7.2219	5.4893	4.8976	4.8976	4.8976	4.8976	4.8976	EXv
7	P	22.7306	22.6810	22.6400	22.6170	22.5950	22.5700	22.5450	P
8	AP	17.7890	17.7440	17.7120	17.6940	17.6770	17.6570	17.6380	AP
9	EXUN	1.2236	1.1000	1.0000	0.9-1	0.9-1	0.9-1	0.9-1	EXUN
10	dir			0.0159	0.0159	0.0159	0.0159	0.0159	dir
11	gcbe			0.3414	0.3550	0.3700	0.3850	0.4000	gcbe

Macromodel RESSC 1997 - 2000

Nr.	Indicators	Statistics 1994	Statistics 1995	Solution 1996	Solution 1997	Solution 1998	Solution 1999	Solution 2000	Indicators
1	xgdp90	0.1972	0.2339	0.2026	0.2055	0.2192	0.2325	0.2424	xgdp90
2	EXGDPD	2.3900	1.3580	1.4351	1.3038	1.2691	1.1009	1.0960	EXGDPD
3	DAD	50.4752	74.6205	111.3450	151.5307	201.2190	233.2543	271.6117	DAD
4	DAD90	0.7282	0.7927	0.8250	0.8611	0.9014	0.9496	1.0095	DAD90
5	XGD	6.1513	7.5195	7.0000	7.4428	8.4073	9.3361	10.4965	XGD
6	MGD	6.5624	8.6859	8.3210	8.9391	9.6945	10.5497	11.5935	MGD
7	GVAIC90	0.2756	0.3015	0.3030	0.3161	0.3364	0.3604	0.3917	GVAIC90
8	GVAO	10.1987	14.3240	21.2981	28.9001	38.6581	44.9722	52.6023	GVAO
9	GVAO90	0.1471	0.1522	0.1578	0.1642	0.1732	0.1831	0.1955	GVAO90
10	GVAT90	0.0473	0.0464	0.0508	0.0529	0.0558	0.0591	0.0631	GVAT90
11	GVAPS	3.5732	5.3182	7.7882	10.3672	13.6575	15.4054	17.4545	GVAPS
12	GVAPS90	0.0515	0.0565	0.0577	0.0589	0.0612	0.0627	0.0649	GVAPS90
13	GVA90	0.6658	0.7133	0.7289	0.7583	0.7994	0.8450	0.9023	GVA90
14	ER	1.6551	2.0333	3.0152	3.9393	5.0135	5.5187	6.0524	ER
15	GDPD	2.3900	1.3580	1.4337	1.3039	1.2686	1.1004	1.0953	GDPD
16	GDPD90	69.3158	94.1309	134.9596	175.9735	223.2365	245.6391	269.0500	GDPD90
17	NX	-0.4111	-1.1664	-1.3210	-1.4963	-1.2872	-1.2137	-1.0970	NX
18	GDP	49.7948	72.2489	107.3620	145.6363	194.7657	226.5564	264.9722	GDP
19	GDP90	0.7184	0.7675	0.7955	0.8276	0.8725	0.9223	0.9848	GDP90
20	FA90	2.2665	2.3561	2.4512	2.5642	2.7032	2.8599	3.0436	FA90
21	E	10.0120	10.0200	10.1080	9.9804	9.8639	9.7636	9.6695	E
22	GLE	1.8406	2.6809	3.7577	5.0543	6.7500	7.8587	9.2376	GLE
23	GVA	46.1493	67.1469	98.3657	133.4328	178.4455	207.5722	242.7690	GVA

24	id	0.1946	0.2108	0.2236	0.2337	0.2422	0.2492	0.2551	id
25	I	9.8239	15.7294	24.8944	35.4113	48.7365	58.1373	69.3004	I
26	I90	0.1538	0.1783	0.1982	0.2172	0.2367	0.2570	0.2802	I90
27	dfa	0.0224	0.0391	0.0438	0.0425	0.0381	0.0371	0.0337	dfa
28	ler	0.4055	0.3990	0.3861	0.3780	0.3731	0.3696	0.3679	ler
29	CFPI	2.3530	1.3810	1.4244	1.2977	1.2631	1.0985	1.0935	CFPI
30	CFPI90	63.8652	88.1978	125.6328	163.0289	205.9284	226.2030	247.3544	CFPI90
31	UN	1.2236	1.1000	0.9573	1.0537	1.1440	1.2202	1.2930	UN
32	lfp	0.4943	0.4903	0.4888	0.4879	0.4872	0.4867	0.4863	lfp
33	LP90	0.0718	0.0766	0.0787	0.0829	0.0885	0.0945	0.1019	LP90
34	LF	11.2356	11.1200	11.0653	11.0340	11.0079	10.9838	10.9625	LF
35	CPI	2.3670	1.3230	1.4412	1.3089	1.2729	1.1019	1.0967	CPI
36	CPI90	70.6931	93.5270	134.7902	176.4245	224.5755	247.4525	271.3912	CPI90
37	EC	1.0000	1.0000	1.0049	1.0080	1.0124	1.0026	1.0125	EC
38	IC			1.0000	0.8741	0.8865	0.8686	0.8400	IC
39	IR	0.8994	0.5364	0.4496	0.3289	0.2936	0.1254	0.1203	IR
40	M2	6.8950	13.1619	23.0000	36.4091	55.6474	75.5188	105.9889	M2
41	v	7.2219	5.4893	4.6679	4.0000	3.5000	3.0000	2.5000	v
42	Is	1.0135	1.0338	1.0253	1.0130	1.0205	1.0231	1.0286	Is
43	Is85	0.7694	0.7954	0.8155	0.8262	0.8431	0.8625	0.8872	Is85

Exogenous

1	IMD	0.9550	0.7664	0.8321	0.9758	0.9758	0.9758	0.9758	IMD
2	ß	1.3960	1.3255	1.1029	1.0762	1.0502	1.0248	1.0000	ß
3	EXTDR	49.7948	72.2489	110.0000	146.6539	192.8632	219.0538	253.5115	EXTDR
4	GVAA90	0.1443	0.1568	0.1596	0.1661	0.1728	0 1798	0 1871	GVAA90
5	mgdp	6.1371	7.4775	7.0000	7.0000	7.0000	7.0000	7.0000	mgdp
6	mgdi	8.5816	9.2989	9.2989	9.7638	10.2520	10.7646	11.3029	mgdi
7	mgdc	1.4513	2.0968	1.4513	1.5921	1.7465	1.9159	2.1017	mgdc
8	EXv	7.2219	5.4893	4.6679	4.0000	3.5000	3.0000	2.5000	EXv
9	P	22.7306	22.6810	22.6400	22.6170	22.5950	22.5700	22.5450	P
10	AP	17.7890	17.7440	17.7120	17.6940	17.6770	17.6570	17.6380	AP
11	dir			0.0159	0.0250	0.0250	0.0250	0.0250	dir
12	gcbe			0.3414	0.3350	0.3300	0.3200	0.3100	gcbe

Appendix IV

MACROMODELS SA AND EA FOR 1994 - 1995

Macromodel 1994SA

	Endogenous	Statistics	Solution 1994	(Mod.-Stat.)/Stat.
1	xgdp90	0.197201	0.193399	
2	EXGDPD	2.390000	2.266954	-0.051484
3	DAD	50.475208	50.668399	0.003827
4	DAD90	0.728192	0.770598	0.058235
5	XGD	6.151300	6.496311	0.056087
6	MGD	6.562400	6.929769	0.055981
7	GVAIC90	0.275569	0.287560	0.043511
8	GVAO	10.198740	10.599183	0.039264
9	GVAO90	0.147134	0.161199	0.095592
10	GVAT90	0.047253	0.048212	0.020305
11	GVAPS	3.573200	3.556494	-0.004675
12	GVAPS90	0.051550	0.054089	0.049271
13	GVA90	0.665783	0.695338	0.044391
14	ER	1.655090	1.607526	-0.028738
15	GDPD	2.390000	2.267124	-0.051412
16	GDPD90	69.315800	65.752044	-0.051413
17	NX	-0.411100	-0.433458	0.054385
18	GDP	49.794800	49.971604	0.003551
19	GDP90	0.718376	0.760001	0.057943
20	FA90	2.266500	2.265061	-0.000635
21	E	10.012000	9.683106	-0.032850
22	GLE	1.840563	1.926152	0.046502
23	GVA	46.149300	45.719884	-0.009305
24	id	0.194628	0.192461	
25	I	9.823900	9.751671	-0.007352
26	I90	0.153823	0.160886	0.045921

27	dfa	0.022361	0.026296	
28	ler	0.405486	0.407944	
29	CFPI	2.353000	2.233152	-0.050934
30	CFPI90	63.865126	60.612211	-0.050934
31	UN	1.223600	1.485220	0.213812
32	lfp	0.494294	0.491334	
33	lp90	0.071751	0.078487	0.093884
34	LF	11.235600	11.168326	-0.005988
35	CPI	2.367000	2.300459	-0.028112
36	CPI90	70.693059	68.705729	-0.028112
37	IR	0.899400	0.776524	
38	M2	6.895000	6.895001	0.000000
39	v	7.221871	7.247512	0.003551
40	IMD	0.955032	0.841607	-0.118765
41	Is	1.013496	1.026588	0.012918
42	Is85	0.769393	0.779332	0.012918

Exogenous

EXTDR	49.7948	EXv	7.22187
GVAA90	0.1442773	P	22.7306
mgdp	6.1371498	AP	17.789
mgdi	8.5816463	dir	-0.4906
mgdc	1.4512776	gcbe	0.3295405

Macromodel 1994EA

	Endogenous	Statistics	Solution 1994	(Mod.-Stat.)/Stat.
1	xgdp90	0.197201	0.193360	
2	EXGDPD	2.390000	2.266954	-0.051484
3	TDR	49.794800	49.943201	0.002980
4	DRF	12.758494	11.809737	-0.074363
5	DRB	9.046884	8.758670	-0.031858
6	DAD	50.475208	50.643894	0.003342
7	DAD90	0.728192	0.770236	0.057738
8	XGD	6.151300	6.490203	0.055095
9	MGD	6.562400	6.926091	0.055420
10	GVAIC90	0.275569	0.287110	0.041880
11	GVAO	10.198740	10.593069	0.038664
12	GVAO90	0.147134	0.161109	0.094976
13	GVAT90	0.047253	0.048170	0.019419
14	GVAPS	3.573200	3.569375	-0.001071
15	GVAPS90	0.051550	0.054286	0.053086
16	GVA90	0.665783	0.694952	0.043812
17	ER	1.655090	1.607504	-0.028751
18	GDPD	2.390000	2.267093	-0.051426
19	GDPD90	69.315800	65.751124	-0.051427
20	NX	-0.411100	-0.435889	0.060298
21	GDP	49.794800	49.943201	0.002980
22	GDP90	0.718376	0.759579	0.057357
23	FA90	2.266500	2.264577	-0.000848
24	E	10.012000	9.712320	-0.029932
25	qe	0.619540	0.616037	
26	QE	11.021000	10.958685	-0.005654
27	E1	6.672000	6.377278	-0.044173
28	GLE	1.840563	1.951556	0.060304
29	GVA	46.149300	46.468343	0.006913

30	GW1	2.298424	2.454937	0.068096
31	GW2	0.925938	0.988990	0.068096
32	id	0.194628	0.192456	
33	I	9.823900	9.746724	-0.007856
34	I90	0.153823	0.160807	0.045405
35	dfa	0.022361	0.026483	
36	ler	0.405486	0.407894	
37	CFPI	2.353000	2.233121	-0.050947
38	CFPI90	63.865126	60.611379	-0.050947
39	UN	1.223600	1.456006	0.189936
40	lfp	0.494294	0.491334	
41	LP90	0.071751	0.078208	0.089989
42	LF	11.235600	11.168326	-0.005988
43	CD	0.655600	0.672039	0.025075
44	SCF	3.562800	3.637316	0.020915
45	DRP	28.849588	29.374795	0.018205
46	EAB	5.094600	5.109784	0.002980
47	EHCMS	4.030800	3.823513	-0.051426
48	GCBB	-0.532000	-0.528969	-0.005697
49	GCBE	16.409400	16.527309	0.007185
50	GCBR	15.877400	15.998340	0.007617
51	GOS	28.782184	28.381977	-0.013905
52	GRP	32.581188	33.184223	0.018509
53	NDPO	1.873800	1.777438	-0.051426
54	OBE	0.345385	0.347867	0.007186
55	OE	2.148190	2.118323	-0.013903
56	OTP	0.090900	0.092584	0.018526
57	SA	0.486400	0.489894	0.007184
58	SC	6.080300	6.643055	0.092554
59	SUB	1.765700	1.770963	0.002981
60	SUBP	0.900500	0.903191	0.002988
61	TPN	4.232400	4.173547	-0.013905
62	TRE	3.987200	4.227644	0.060304
63	TUNA	0.591216	0.751170	0.270551

64	WST	3.640700	3.716844	0.020915
65	VAT	3.695000	3.706010	0.002980
66	CPI	2.367000	2.300426	-0.028126
67	CPI90	70.693059	68.704750	-0.028126
68	IR	0.899400	0.776493	
69	M2	6.895000	6.895000	-0.000000
70	v	7.221871	7.243394	0.002980
71	IMD	0.955032	0.839796	-0.120661
72	Is	1.013496	1.028215	0.014523
73	Is85	0.769393	0.780567	0.014523

Exogenous

EXTDR	49.7948	EXv	7.221871
GVAA90	0.144277	P	22.7306
mgdp	6.137150	AP	17.789
mgdi	8.581646	RP	4.9177
mgdc	1.451278	dir	-0.4906

Macromodel 1995SA

	Endogenous	Statistics	Solution 1995	(Mod.-Stat.)/Stat.
1	xgdp90	0.233926	0.227436	
2	EXGDPD	1.358000	1.334563	-0.017258
3	DAD	74.620518	77.871945	0.043573
4	DAD90	0.792731	0.826995	0.043222
5	XGD	7.519500	8.025760	0.067326
6	MGD	8.685900	9.107778	0.048570
7	GVAIC90	0.301507	0.300992	-0.001708
8	GVAO	14.324000	15.498074	0.081965
9	GVAO90	0.152171	0.164589	0.081602
10	GVAT90	0.046400	0.051360	0.106896
11	GVAPS	5.318230	5.761651	0.083378
12	GVAPS90	0.056498	0.061188	0.083012
13	GVA90	0.713336	0.734888	0.030214
14	ER	2.033280	2.111503	0.038471
15	GDPD	1.358000	1.358457	0.000337
16	GDPD90	94.130900	94.162548	0.000336
17	NX	-1.166400	-1.082018	-0.072344
18	GDP	72.248900	75.587261	0.046206
19	GDP90	0.767537	0.802732	0.045854
20	FA90	2.356117	2.420396	0.027282
21	E	10.020000	9.731668	-0.028776
22	GLE	2.680900	2.826879	0.054451
23	GVA	67.146900	69.198952	0.030561
24	id	0.210792	0.210939	
25	I	15.729400	16.426244	0.044302
26	l90	0.178342	0.190403	0.067629
27	dfa	0.039146	0.016107	
28	ler	0.398970	0.397553	

29	CFPI	1.381000	1.350826	-0.021849
30	CFPI90	88.197841	86.270801	-0.021849
31	UN	1.100000	1.437512	0.306829
32	lfp	0.490278	0.492447	
33	LP90	0.076600	0.082487	0.076848
34	LF	11.120000	11.169180	0.004423
35	CPI	1.323000	1.364626	0.031463
36	CPI90	93.526971	96.469613	0.031463
37	IR	0.536400	0.536857	
38	M2	13.161860	13.161865	0.000000
39	v	5.489262	5.742899	0.046206
40	IMD	0.766444	0.716353	-0.065355
41	Is	1.033836	1.042148	0.008040
42	Is85	0.795426	0.801821	0.008040

Exogenous			
EXTDR	72.248900	EXv	5.489260
GVAA90	0.156759	P	22.681000
mgdp	7.477544	AP	17.744000
mgdi	9.298886	dir	0.178400
mgdc	2.096756	gcbc	0.350523

Macromodel 1995EA

	Endogenous	Statistics	Solution 1995	(Mod.-Stat.)/Stat.
1	xgdp90	0.233926	0.227381	
2	EXGDPD	1.358000	1.334563	-0.017258
3	TDR	72.248900	75.717050	0.048003
4	DRF	19.145995	21.086183	0.101336
5	DRB	12.510769	12.286722	-0.017908
6	DAD	74.620518	78.011095	0.045438
7	DAD90	0.792731	0.826479	0.042571
8	XGD	7.519500	8.017981	0.066292
9	MGD	8.685900	9.101711	0.047872
10	GVAIC90	0.301507	0.300404	-0.003658
11	GVAO	14.324000	15.524740	0.083827
12	GVAO90	0.152171	0.164475	0.080855
13	GVAT90	0.046400	0.051305	0.105718
14	GVAPS	5.318230	5.798810	0.090365
15	GVAPS90	0.056498	0.061435	0.087374
16	GVA90	0.713336	0.734378	0.029499
17	ER	2.033280	2.116805	0.041079
18	GDPD	1.358000	1.361735	0.002750
19	GDPD90	94.130900	94.389717	0.002750
20	NX	-1.166400	-1.083730	-0.070876
21	GDP	72.248900	75.717050	0.048003
22	GDP90	0.767537	0.802175	0.045129
23	FA90	2.356117	2.419700	0.026987
24	E	10.020000	9.766589	-0.025290
25	qe	0.593547	0.616257	
26	QE	10.550000	10.934863	0.036480
27	E1	6.438000	5.982272	-0.070787
28	GLE	2.680900	2.880214	0.074346

29	GVA	67.146900	70.768912	0.053942
30	GW1	3.344358	3.669175	0.097124
31	GW2	1.488454	1.633018	0.097124
32	id	0.210792	0.210935	
33	I	15.729400	16.455301	0.046149
34	I90	0.178342	0.190289	0.066990
35	dfa	0.039146	0.016364	
36	ler	0.398970	0.397489	
37	CFPI	1.381000	1.354025	-0.019533
38	CFPI90	88.197841	86.475100	-0.019533
39	UN	1.100000	1.402591	0.275082
40	lfp	0.490278	0.492447	
41	LP90	0.076600	0.082135	0.072253
42	LF	11.120000	11.169180	0.004423
43	CD	0.908705	0.991322	0.090917
44	SCF	5.983739	6.100192	0.019462
45	DRP	41.306300	42.344145	0.025126
46	EAB	7.023413	7.360556	0.048003
47	EHCMS	6.149178	6.166088	0.002750
48	GCBB	-2.168971	-2.696558	0.243243
49	GCBE	25.324884	26.665937	0.052954
50	GCBR	23.155914	23.969379	0.035130
51	GOS	42.145941	44.152306	0.047605
52	GRP	47.208167	48.365056	0.024506
53	NDPO	2.791852	2.799529	0.002750
54	OBE	1.655942	1.745392	0.054018
55	OE	2.158504	2.261260	0.047605
56	OTP	1.042195	1.066657	0.023472
57	SA	0.892856	0.941086	0.054018
58	SC	9.426400	9.379558	-0.004969
59	SUB	2.946830	3.088286	0.048003
60	SUBP	1.502883	1.575026	0.048003
61	TPN	5.083130	5.325112	0.047605
62	TRE	5.802660	6.240367	0.075432

63	TUNA	1.008983	1.412917	0.400337
64	WST	4.859677	4.954253	0.019461
65	VAT	5.278468	5.531842	0.048002
66	CPI	1.323000	1.367967	0.033988
67	CPI90	93.526971	96.705794	0.033988
68	IR	0.536400	0.540135	
69	M2	13.161860	13.161860	-0.000000
70	v	5.489262	5.752762	0.048003
71	IMD	0.766444	0.716353	-0.065355
72	Is	1.033836	1.044113	0.009941
73	Is85	0.795426	0.803333	0.009941

Exogenous

EXTDR	72.2489	EXv	5.489262
GVAA90	0.156759	P	22.681
mgdp	7.477544	AP	17.744
mgdi	9.298886	RP	5.075
mgdc	2.096756	dir	0.1784

Appendix V

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