

Econometric model of Russian Federation: what is the price of growth?

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1. Model

1.1. General description of the model

The model consists of 32 equations and 75 identities that describe the relationships between 107 variables. Among them there are 15 exogenous and 92 endogenous variables. Among the exogenous variables there is the capital account balance, the Bank of Russia' key loan rate, the monetary base, economically active population, government purchases' quantity and prices' index, export and import prices' dollar indexes and transportation tariffs' index. All the variables can be grouped in seven units:

1. Social Unit that calculates wages and consumption;
2. The Investment Unit which determines investment in fixed capital;
3. The Production Unit includes production functions and factors of production dynamics' equations;
4. The Prices' Unit calculates CPI, the GDP and gross fixed capital formation deflators and some other indicators of inflation;
5. Monetary Unit determines the money mass and interest rates;
6. Bank Unit includes equations and identities of bank deposits and loans;
7. Fiscal Unit describes government revenues and expenditures;
8. Foreign Economy Unit determines export and import volumes and prices and ruble to dollar exchange rate.

A total list of variables in alphabetical order and symbols used in estimation outputs are presented Appendix 1. The list of all equations and identities of the model in mathematical form is given in Appendix 2. The estimation outputs of equations you can see in Appendix 3.

1.2. What is new in the 2017 year version of the model?

The most important innovations which were done in 2017-year version of the model are the following.

1. The economy was split in two sectors, that is, of tradable and of non-tradable goods. The first one includes such activity as agriculture, fishery, mining and manufacturing, and all other are in the second one.

2. As a consequence we planned to use two production functions, two equations of fixed capital and of labor dynamics and of investment in fixed capital. But due to incomplete data we had to estimate these equations for the total economy first (as the aggregate data are much more complete and exact) and then only for tradable sector which constitute about 22 % of total economy. The variables for non-tradable sector were calculated then simply by subtraction of the estimates for tradable sector from aggregate estimates.

3. The export was also split on oil & gas and non-oil one. But for the same reasons we had to estimate equations for aggregate export first and then for oil & gas one. The estimates for other export were calculated by subtraction of oil & gas export from aggregate one.

4. The personal income tax and social tax were now included in the model. Due to this the estimates of government revenues and state budget deficit became more complete.

5. The net personal income was calculated in the model and served as a regressor in different equations and in the households' consumption index' equation first of all.

6. In this version of the model we estimated the depreciation of fixed capital and used it in the regressions.

7. The total GDP of OECD – member countries was included in export equation. We used only OECD data as quarterly data for World GDP are absent.

8. All the equations were re-estimated based on the enlarged samples of the new time series presented by Rosstat. The specifications of the majority of equations were changed consequently.

2. Data and estimation methods

The model's parameters were estimated on the quarterly time series sample from Q1 1999 to Q4 2016. The methods of estimation were OLS and ML – ARCH. The final selection of estimated equations was carried out in accordance with the following criteria:

1. equation has appropriate statistical properties;
2. the signs of parameters are consistent with economic theory;
3. all independent variables are statistically significant and
4. the inclusion of the equation in the model [as a system of equations]

demonstrates the best values of Theil coefficients in a post forecast imitations carried out by means of the entire model.

That is, the quality of the model was evaluated on the basis of Theil coefficients in the post forecasts. For the majority of equations the values of the latter lie in the range 0.1 – 0.3.

3. The multipliers and the forecasts

After estimation of the model and analysis of its quality at first we calculated the impulse multipliers of the exogenous variables and did it in following manner. We calculated what we call “zero forecast” (Table 5.1 in Appendix 5 demonstrates it for three the most important variables); that is, forecast variant for the period 2017 – 2019 where all exogenous variables are constant. Then we changed one exogenous variable by 1 % and the model calculated the percent of change of all endogenous variables.¹ The results are presented in Appendix 4 (only for three the most important variables).

The table 4.1 helps to make the following conclusions.

¹ We calculated the percent change of the variables as the model is non-linear and we couldn't use the traditional reduced form.

1. Russian economy still depends significantly on the demographic factors. This is the single exogenous variable (with only one exception) that has a strong impact on the most important endogenous variables.

2. The reaction of endogenous variables on the other exogenous ones is weak as the impulse multipliers of them are small. That means that the chances to strengthen economic growth by means of either monetary or fiscal policy are low.

3. The hopes that situation in the economy will improve due to favorable changes in the world markets are also illusive.

4. The increase of prices for government purchases has very negative impact on economic situation as their increase leads to the reduction of the GDP and gross fixed capital formation and increase of inflation.

Then the model was used to run several forecast variants. The basic variant was based on assumption that the dynamics of all exogenous variables will be the same as in previous years. To fulfill this assumption we simply extrapolated the dynamics of exogenous variables for 2017 – 2019 years by means of 12 – lag autoregressions. The results for three the most important variables are presented in Table 5.2 in Appendix 5.

We see that in the basic variant the average growth rates of Russian GDP are negative and even worse than in the zero variant. The analysis of the model helps to explain it. The rapid growth of prices for equipment and other fixed assets which prevents investment and reduces the profitability and total factor productivity of the economy is the main reason. This negative effect is strengthened by no progress in total factor productivity, inadequate incentives to invest and low liquidity of the economy and low efficiency of monetary and fiscal policy instruments.

The rapid increase of prices for fixed assets is caused in turn by import limitation and ruble devaluation.

Other forecast variants differ from the basic one by dynamics of some exogenous variables. Their results are represented in Appendix 5. They show that negative dynamics of Russian economy for the period 2017 – 2019 preserves in all of them.² The active monetary policy and freezing the prices for government purchases can smooth such effect to some degree. A moderately positive dynamics of real investment gives some hopes for future (for the period beyond 2019 year) though for 2018 – 2019 years it is overcome by stagnation of total factor productivity and low marginal revenue on fixed capital.

4. Conclusions

The model and forecasts show that the recovery in Russian economy will not start since 2018. The main reasons are low total factor productivity and low investment rate.

The dependence of Russian economy on the ability of labor force is still very high. This is a severe obstacle for economic growth due to aging of population.

The termination of restrictive monetary policy is necessary to enhance the investment and support economic growth. The losses due to higher inflation will be not so strong. A reduction of the tax burdens especially what about the indirect taxes other than export and import duties will help to improve profits and give some hope to economic recovery too. But the efficiency of both monetary and fiscal policy should be improved radically in order to change negative trends.

Workforce reduction which began a few years ago puts the new challenges in the fields of improvement of education, healthcare, scientific and technological advances. The main purpose of all these necessary changes is an overall increase of economic efficiency. Failure to meet them will retain an inherent weakness of Russian economy and postpone a significant improvement of living standards of her citizens.

² In some variants the annual GDP growth for 2017 is slightly positive (less than 1 %) but then it changes for negative in 2018-2019.

APPENDIX 1

1.1. LIST OF MODEL VARIABLES

Exogenous variables

CAP: Capital account balance (in dollars)

IND_G: Government purchases' index

KEY: The Bank of Russia' key loan rate

MB: Monetary base

MROT: Minimal monthly wages

N: Economically active population, age 15-72

NORM: Reserve requirement

OECD: OECD countries total GDP

PEXPD: Dollar index of export prices

PEXPEND: Dollar index of oil and gas export prices

PEXPOD: Dollar index of non-oil export prices

PG: Government consumption' price index

PIMD: Dollar index of import prices

SOCG: a share of social expenditures (education and healthcare) in government purchases

TARIF: Transportation services' tariffs' index

Endogenous variables

AMORT: Fixed assets' depreciation

AMORTTR: Fixed assets' depreciation in tradable sector

AMORTNON: Fixed assets' depreciation in non-tradable sector

C: Households' consumption in current prices

CH: Consumer bank loans, total

CPI: Consumer price index

CR: Ruble bank loans to companies

CT: Bank loans to companies, total

CV: Foreign currency bank loans to companies

DEF: a proxy of the state budget balance

DEP: Total bank deposits

DEPCB: Commercial banks' obligations to the Bank of Russia

DEPR: Total bank ruble deposits

DEPRF: Companies' bank ruble deposits

DEPRP: Households' bank ruble deposits

DEPV: Total bank foreign currency deposits

DEPVF: Companies' bank foreign currency deposits

DEPVP: Households' bank foreign currency deposits

DI: Gross fixed capital formation price index

DOLLAR: Ruble to dollar exchange rate index

EXP: Export (volume of) in current prices

EXPEN: Export (volume of) oil & gas in current prices

EXPO: Non-oil export (volume of) in current prices

EXPDUT: Export duties in current prices

G: Government purchases in current prices

I: Gross fixed capital formation in current prices

IB: Investment in fixed capital through bank loans in current prices

IG: Investment in fixed capital from state budget in current prices

IMP: Import (volume of) in current prices

IMPDUT: Import duties in current prices

INCOME: Households' total net income

IND_AD: aggregate demand index

IND_C: Households' consumption index (in constant prices; CPI deflator)

IND_EXP: Export's index in constant prices

IND_EXPEN: Oil & gas export's index in constant prices

IND_EXP: Non-oil export's index in constant prices

IND_I: Gross fixed capital formation' index in constant prices

IND_IMP: Import's index in constant prices

IND_Q: the GDP index (in constant prices; GDP deflator)

IND_QTR: the GDP index (in constant prices; GDP deflator) for tradable sector

IND_QNON: the GDP index (in constant prices; GDP deflator) for non-tradable sector

INTAX: Indirect taxes paid in current prices

INTAXTR: Indirect taxes paid by tradable sector

INTAXNON: Indirect taxes paid by non-tradable sector

IO: Investment in fixed capital on companies' own expense in current prices

ITR: Gross fixed capital formation in tradable sector

INON: Gross fixed capital formation in non-tradable sector

K: Fixed capital volume in current prices

KTR: Fixed capital volume in tradable sector

KNON: Fixed capital volume in non-tradable sector

L: Number of employed

LTR: Number of employed in tradable sector

L: Number of employed in non-tradable sector

M: Money mass

MIACR: Moscow interbank loan rate

NATTAX - taxes for the use of natural resources paid

NMRK: Net marginal revenue on fixed capital

NMPL: Net marginal product of labor

NMPLTR: Net marginal product of labor of tradable sector

NMRL: Net marginal revenue on labor

NMRLTR: Net marginal revenue on labor in tradable sector

NROK: Net profit

NWL: Total wages net of personal and social taxes

NX: Net export

OINTAX: Indirect taxes other than export and import duties paid in current prices

P: the GDP deflator index

PTR: the tradable sector value-added deflator index

PNON: the non-tradable sector value-added deflator index

PEN: Energy inputs' price index

PEXP: Ruble index of export prices

PEXPEN: Ruble index of oil & gas export prices

PEXPO: Ruble index of non-oil export prices

PIM: Ruble index of import prices

PQ: Nominal GDP

PTAX: Corporate income tax paid in current prices

PTAXTR: Corporate income tax paid by tradable sector

PTAXNON: Corporate income tax paid by non-tradable sector

REV: Total taxes paid in the economy

ROK: Gross profit

ROKTR: Gross profit in tradable sector

ROKNON: Gross profit non-tradable sector

S: Inventory change

SC: a share of households' consumption in the GDP

SEXP: a share of export in the GDP

SG: a share of government purchases in the GDP

SI: a share of gross fixed capital formation in the GDP

SIG: investment in fixed capital from state budget as a share of gross fixed capital formation

SIMP: a share of import in the GDP

SITR: a share of investment in tradable sector in total gross fixed capital formation

SNWLIN: a share of net total wages in households' total net income

SPQTR: a share of value added in tradable sector in the GDP

SROKTR: a share of gross profit in tradable sector in total gross profit

STRIN: a share of social transfers in households' total net income

STTAX: a share of corporate taxes (PTAX + INTAX + NATTAX) in the GDP

TRANSFER: Government transfers in current prices

TTAX: total corporate taxes (PTAX + INTAX + NATTAX) paid in current prices

TTAXTR: total taxes paid by tradable sector

TTAXNON: total taxes paid by non-tradable sector

U: number of unemployed

W: Gross wages per 1 employee

WTR: Gross wages per 1 employee in tradable sector

WNON: Gross wages per 1 employee in non-tradable sector

WL: Total gross wages paid in the economy

WLTR: Total gross wages paid in tradable sector

WLNON: Total gross wages paid in non-tradable sector

ε_K : Elasticity of GDP on fixed capital

ε_L : Elasticity of GDP on labor

1.2. SYMBOLS OF SPECIAL VARIABLES AND DERIVATIVES OF VARIABLES USED IN ESTIMATIONS' OUTPUTS

(-k): lag of k quarters

A: ratio; e.g. $AWTRNON = WTR/WNON$

CONST: constant

CPI after each variable means that variable is deflated by CPI deflator

D before symbol means the first difference of this variable: $DVAR = VAR - VAR(-1)$

D after symbol means that variable is deflated by ruble-to-dollar exchange rate

DEL_I = $I - I(-1)$

DI after each variable means that variable is deflated by gross fixed capital formation deflator

DXY where X and Y are numbers: Dummy variable for a year XY; this variable is equal to zero for points before this year and 1 for this year and after

DXY_HI where X and Y and Z are numbers: Dummy variable for a year XY and half a year I; this variable is equal 1 for this half year of this year and 0 for all other points

DXYZ where X and Y and Z are numbers: Dummy variable for a year XY and quarter Z; this variable is equal to zero for points before this year and quarter and 1 after

DXY_Z where X and Y and Z are numbers: Dummy variable for a year XY and quarter Z; this variable is equal 1 for this quarter of this year and 0 for all other points

DXY_VAR, where X and Y and Z are numbers and VAR is the title of variable: a dummy for year XY multiplied by variable

k_{VAR} means the proportionality factor that determines the share of the value of the variable which is in the left side of identity in the value of the other variable which is in the right side of the identity

L after variable means that it is divided by L

$$\mathbf{LKL} = \text{LN}(K/L)$$

$$\mathbf{LQL} = \text{LN}(\text{IND}_Q/L)$$

$$\mathbf{MCN} = \text{NMRK} \times \text{CT}$$

$$\mathbf{MN} = \text{NMRK} \times \text{NROK}$$

$$\mathbf{NMRLW} = \text{NMRL} - W$$

P after each variable means that variable is deflated by the GDP deflator

PEXP after each variable means that variable is deflated by export prices' index

PIM after each variable means that variable is deflated by import prices' index

RATE before symbol means annual rate of the variable: $\text{RATE_VAR} = (\text{VAR} - \text{VAR}(-4))/\text{VAR}(-4)$

S before symbol means the share of this variable in the GDP

T: time trend

APPENDIX 2

LIST OF MODEL EQUATIONS & IDENTITIES

$$K = f_K(I, DI, AMORT) \quad (1)$$

$$KTR = f_{KTR}(ITR, DI, AMORTTR) \quad (2)$$

$$KNON = K - KTR \quad (3)$$

$$L = f_L(N, NMPL, W, WL, PQ, DI, G, MIACR, IMP) \quad (4)$$

$$LTR = f_{LTR}(N, NMPLTR, WTR, WNON, PQTR, TTAXTR) \quad (5)$$

$$LNON = L - LTR \quad (6)$$

$$IND_Q = f_Q(K, L, IMP, DI, MIACR, TTAX, IND_AD, M, TARIF, CT, ROK, SOCG, CAP, P, PEN) \quad (7)$$

$$IND_QTR = f_{QTR}(KTR, LTR, IMP, DI, MIACR, TTAX, IND_QNON, M, TARIF, AMORTTR, P) \quad (8)$$

$$IND_QNON = \frac{IND_Q - SPQTR \times IND_QTR}{1 - SPQTR} \quad (9)$$

$$P = f_P(MB, IND_Q, PG, PEXPD, PIMD, TARIF, DOLLAR, S, DEF, PEN) \quad (10)$$

$$PTR = f_{PTR}(P, PNON, M, IND_QNON, PEXPD, TARIF, PEN, CAP) \quad (11)$$

$$PQ = P \times IND_Q \quad (12)$$

$$PQTR = PTR \times IND_QTR \quad (13)$$

$$PQNON = PQ - PQTR \quad (14)$$

$$PNON = PQNON / IND_QNON \quad (15)$$

$$\varepsilon_K = \frac{\partial(IND_Q)}{\partial K} \frac{K}{IND_Q} \quad (16)$$

$$\varepsilon_L = \frac{\partial(IND_Q)}{\partial L} \frac{L}{IND_Q} \quad (17)$$

$$NMRK = \varepsilon_K \frac{PQ - INTAX - PTAX - NATTAX}{K} \quad (18)$$

$$NMPL = \varepsilon_L \frac{(IND - Q) \times (1 - STTAX)}{L} \quad (19)$$

$$NMRL = \varepsilon_L \frac{PQ \times (1 - STTAX)}{L} \quad (20)$$

$$W = f_W(NMRL, MROT, G, U, PERTAX, L, EXP, IMP) \quad (21)$$

$$WL = W \times L \quad (22)$$

$$U = N - L \quad (23)$$

$$WTR = f_{WTR}(NMRLTR, MROT, G, U) \quad (24)$$

$$WLTR = WTR \times LTR \quad (25)$$

$$WLNON = WL - WLTR \quad (26)$$

$$WNON = WLNON / LNON \quad (27)$$

$$IND_C = f_C(CPI, G, DOLLAR, INCOME, SNWLIN, STRIN, DEPP) \quad (28)$$

$$INCOME = PQ - REV + TRANSFER \quad (29)$$

$$REV = INTAX + PTAX + NATTAX + PERTAX + SOCTAX \quad (30)$$

$$NWL = WL - PERTAX - SOCTAX \quad (31)$$

$$SNWLIN = NWL / INCOME \quad (32)$$

$$STRIN = TRANSFER / INCOME \quad (33)$$

$$CPI = f_{CPI}(P, DOLLAR, MB, PEXP, PIM) \quad (34)$$

$$C = IND_C \times CPI \quad (35)$$

$$I = IO + IG + IB \quad (36)$$

$$ITR = I \times SITR \quad (37)$$

$$INON = I - ITR \quad (38)$$

$$SITR = f_{SITR}(PQ, PQTR, ROK, ROKTR, IMP, TTAXTR, NMRKTR, IG) \quad (39)$$

$$NMRKTR = \varepsilon_{KTR} \frac{PQTR - INTAXTR - PTAXTR - NATTAX}{KTR} \quad (40)$$

$$\varepsilon_{KTR} = \frac{\partial(IND_QTR)}{\partial KTR} \frac{KTR}{IND_QTR} \quad (41)$$

$$ROK = PQ - WL - INTAX \quad (42)$$

$$ROKTR = PQTR - WLTR - INTAXTR \quad (43)$$

$$NROK = ROK - PTAX - NATTAX \quad (44)$$

$$NROKTR = ROKTR - PTAXTR - NATTAX \quad (45)$$

$$MIACR = f_{MIACR}(KEY, P, MB, PEXPD, PIMD, NMRK, CAP, DEF) \quad (46)$$

$$IO = f_{IO}(NMRK, NROK, IG, G, CT, M, TARIF, DI, CAP, IMP) \quad (47)$$

$$IG = f_{IG}(REV, IMP, M, CAP, MIACR, TARIF, G, DI) \quad (48)$$

$$IB = f_{IB}(NMRK, CT, IO, IG, G, IMP, MIACR, CAP, DI) \quad (49)$$

$$DI = f_{DI}(P, DOLLAR, PIMD, PG, INTAX, M, IMPDUT, TARIF, PEN, AMORT, NX, IND_Q, IND_QTR) \quad (50)$$

$$IND_I = I / DI \quad (51)$$

$$DEPRP = f_{DEPRP}(M, INCOME, P, TRANSFER, WL, G, DOLLAR, CAP) \quad (52)$$

$$DEPRF = f_{DEPRF}(M, DEPCB, DOLLAR, TRANSFER, IND_Q, MIACR, G, P) \quad (53)$$

$$DEPVP = f_{DEPVP}(M, DOLLAR, INCOME, G, WL, DEPCB, MIACR, P) \quad (54)$$

$$DEPVF = f_{DEPVF}(DEPRF, MIACR, DEPCB, TRANSFER, G, DOLLAR, CAP) \quad (55)$$

$$DEPR = DEPRP + DEPRF \quad (56)$$

$$DEPV = DEPVP + DEPVF \quad (57)$$

$$DEP = DEPR + DEPVP \quad (58)$$

$$DEPP = DEPRP + DEPVP \quad (59)$$

$$DEPF = DEPRF + DEPVF \quad (60)$$

$$CR = f_{CR}(DEPR, DEPCB, DOLLAR, TTAX, G, P, NMRK, EXPO, IMP) \quad (61)$$

$$CV = f_{CV}(DEPV, MIACR, TTAX, TARIF, CAP, G, DOLLAR, NMRK) \quad (62)$$

$$CT = CR + CV \quad (63)$$

$$CH = f_{CH}(DEPR, MIACR, DOLLAR, WL, TRANSFER, DEPCB, G, P) \quad (64)$$

$$DEPCB = k_{DEPCB}(CT + CH) \quad (65)$$

$$DOLLAR = f_{DOLLAR}(PEXPD, PIMD, PQ, CAP, NX, TTAX, G) \quad (66)$$

$$PEXP = PEXPD \times DOLLAR \quad (67)$$

$$PEXPEN = PEXPEND \times DOLLAR \quad (68)$$

$$PEXPO = PEXPOD \times DOLLAR \quad (69)$$

$$PIM = PIMD \times DOLLAR \quad (70)$$

$$IND_EXP = f_{IND_EXP}(PEXPD, PEXP, P, DOLLAR, PEN, IND_Q, IND_C, IND_I, IND_G, INTAXIN, TARIF, IND_QTR) \quad (71)$$

$$INTAXIN = INTAX + NATTAX - EXPDUT - IMPDUT \quad (72)$$

$$EXP = IND_EXP \times PEXP \quad (73)$$

$$EXPEN = SEXPEN \times EXP \quad (74)$$

$$SEXPEN = f_{SEXPEN}(PEXPEN, PEXP, INTAXIN, EXP, DOLLAR, IND_QTR, PEN, IND_G, IND_I) \quad (75)$$

$$SINTAXIN = INTAXIN / EXP \quad (76)$$

$$EXPO = EXP - EXPEN \quad (77)$$

$$IND_EXPO = EXPO / PEXPO \quad (78)$$

$$IND_IMP = f_{IND_IMP}(IND_QTR, \\ IND_QNON, IND_I, IND_C, \\ DOLLAR, CAP, G, PQ) \quad (79)$$

$$IMP = IND_IMP \times PIM \quad (80)$$

$$NX = EXP - IMP \quad (81)$$

$$EXPDUT = k_{EXPDUT} \times EXP \quad (82)$$

$$IMPDUT = k_{IMPDUT} \times IMP \quad (83)$$

$$PTAX = k_{PTAX} \times ROK \quad (84)$$

$$PTAXTR = k_{PTAXTR} \times ROKTR \quad (85)$$

$$PTAXNON = PTAX - PTAXTR \quad (86)$$

$$INTAX = k_{INTAX} \times PQ \quad (87)$$

$$INTAXTR = k_{INTAXTR} \times PQTR \quad (88)$$

$$INTAXNON = INTAX - INTAXTR \quad (89)$$

$$NATTAX = k_{NATTAX} \times PQTR \quad (90)$$

$$TTAX = INTAX + PTAX + NATTAX \quad (91)$$

$$PERTAX = k_{PERTAX} \times (WL + NROK - \\ SOCTAX) \quad (92)$$

$$SOCTAX = k_{SOCTAX} \times WL \quad (93)$$

$$G = IND_G \times PG \quad (94)$$

$$TRANSFER = k_{TRANSFER} \times PQ \quad (95)$$

$$DEF = REV - G - TRANSFER \quad (96)$$

$$M = f_M(MB, PQ, DEPCB, DOLLAR, \\ CAP, DEF) \quad (97)$$

$$PEN = f_{PEN}(P, PEXPEN, TARIF, G, IND_QTR, IND_EXPEN, DOLLAR) \quad (98)$$

$$IND_AD = \frac{IND_C^{SC} IND_I^{SI} IND_G^{SG} IND_EXP^{SEXP}}{IND_IMP^{SIMP}} \quad (99)$$

$$SC = C / PQ \quad (100)$$

$$SI = I / PQ \quad (101)$$

$$SG = G / PQ \quad (102)$$

$$SEXP = EXP / PQ \quad (103)$$

$$SIMP = IMP / PQ \quad (104)$$

$$S = PQ - C - I - G - NX \quad (105)$$

$$AMORT = 1 + \frac{4I_t}{K_{t-1}(1 + RATE_DI_t)} - \frac{K_t}{K_{t-1}(1 + RATE_DI)} \quad (106)$$

$$AMORTTR = 1 + \frac{4ITR_t}{KTR_{t-1}(1 + RATE_DI_t)} - \frac{KTR_t}{KTR_{t-1}(1 + RATE_DI)} \quad (107)$$

APPENDIX 3: ECONOMETRIC OUTPUTS

EQUATION 1

GROSS FIXED CAPITAL FORMATION IN THE ECONOMY

Dependent Variable: DKDI

Method: ML - ARCH

Date: 08/04/17 Time: 20:12

Sample (adjusted): 2001Q2 2016Q4

Included observations: 63 after adjustments

Convergence achieved after 129 iterations

Presample variance: backcast (parameter = 0.7)

GARCH = C(12) + C(13)*RESID(-1)^2 + C(14)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DKDI(-1)	-0.492941	0.039463	-12.49117	0.0000
DKDI(-2)	-0.502749	0.050063	-10.04232	0.0000
DKDI(-3)	-0.432570	0.066431	-6.511562	0.0000
DKDI(-4)	0.504818	0.009493	53.17992	0.0000
DIDI	3.736312	0.970064	3.851615	0.0001
DIDI(-2)	2.954312	0.842559	3.506355	0.0005
DIDI(-4)	-1.168494	1.229812	-0.950140	0.3420
DIDI(-5)	3.743192	1.003926	3.728553	0.0002
DIDI(-7)	2.991940	0.904479	3.307917	0.0009
DAMORTDI(-12)	0.061566	0.043701	1.408811	0.1589
C	24.74007	13.00475	1.902387	0.0571

Variance Equation

C	849.7772	483.6820	1.756892	0.0789
RESID(-1)^2	-0.250831	0.084830	-2.956867	0.0031
GARCH(-1)	1.115382	0.051619	21.60790	0.0000

R-squared	0.956450	Mean dependent var	25.53414
Adjusted R-squared	0.948075	S.D. dependent var	353.6286
S.E. of regression	80.58146	Akaike info criterion	11.45128
Sum squared resid	337655.3	Schwarz criterion	11.92754
Log likelihood	-346.7155	Hannan-Quinn criter.	11.63860
Durbin-Watson stat	1.633232		

EQUATION 2

GROSS FIXED CAPITAL FORMATION IN TRADABLE SECTOR

Dependent Variable: DKTRDI

Method: Least Squares

Date: 07/12/17 Time: 17:38

Sample (adjusted): 2002Q2 2016Q4

Included observations: 59 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed

bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DKTRDI(-1)	-0.398537	0.090185	-4.419113	0.0001
DKTRDI(-2)	-0.394081	0.093337	-4.222142	0.0001
DKTRDI(-3)	-0.716659	0.113701	-6.302989	0.0000
DKTRDI(-4)	0.581895	0.094021	6.189015	0.0000
DKTRDI(-7)	0.366290	0.106323	3.445048	0.0012
DITRDI	4.829315	0.653016	7.395401	0.0000
DITRDI(-4)	-6.883628	0.944231	-7.290192	0.0000
DITRDI(-5)	0.357726	0.207271	1.725887	0.0909
DITRDI(-12)	5.196829	1.794784	2.895518	0.0057
DITRDI(-16)	-3.147995	1.235406	-2.548146	0.0142
DAMORTTRDI(-16)	-0.067331	0.052544	-1.281412	0.2063
D07	13.36160	3.396598	3.933818	0.0003
R-squared	0.963433	Mean dependent var		5.920777
Adjusted R-squared	0.954875	S.D. dependent var		76.46225
S.E. of regression	16.24263	Akaike info criterion		8.592545
Sum squared resid	12399.68	Schwarz criterion		9.015095
Log likelihood	-241.4801	Hannan-Quinn criter.		8.757492
Durbin-Watson stat	1.535803			

EQUATION 4

NUMBER OF EMPLOYED IN THE ECONOMY

Dependent Variable: DL

Method: ML - ARCH

Date: 09/15/17 Time: 15:32

Sample (adjusted): 2001Q3 2016Q4

Included observations: 62 after adjustments

Failure to improve Likelihood after 27 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(16) + C(17)*RESID(-1)^2 + C(18)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DL(-8)	-0.251562	0.015499	-16.23067	0.0000
DN	1.348444	0.051203	26.33538	0.0000
DNMPLW(-9)	0.082966	0.078547	1.056258	0.2909
DSW(-9)	-2.172843	0.731104	-2.972003	0.0030
DMIACRDI(-3)	3.195462	0.548044	5.830670	0.0000
DMIACRDI(-9)	3.320151	0.514500	6.453165	0.0000
DSG(-5)	11.65776	1.814771	6.423822	0.0000
DSG(-6)	8.764940	2.739089	3.199947	0.0014
DSG(-8)	-10.45187	1.975924	-5.289611	0.0000
DSEXP(-4)	1.759659	0.997741	1.763643	0.0778
DSEXP(-9)	7.161159	0.841853	8.506427	0.0000
DSIMP(-1)	-4.582452	1.692304	-2.707819	0.0068
DSIMP(-5)	-7.396754	1.892053	-3.909379	0.0001
DSIMP(-7)	-10.36102	0.967297	-10.71131	0.0000
DSIMP(-12)	-3.675025	1.405796	-2.614195	0.0089

Variance Equation

C	0.047668	0.020091	2.372567	0.0177
RESID(-1)^2	-0.249312	0.077091	-3.233992	0.0012
GARCH(-1)	0.273541	0.500285	0.546769	0.5845
R-squared	0.965555	Mean dependent var		0.129565
Adjusted R-squared	0.955295	S.D. dependent var		1.229984
S.E. of regression	0.260063	Akaike info criterion		0.205375
Sum squared resid	3.178744	Schwarz criterion		0.822930
Log likelihood	11.63339	Hannan-Quinn criter.		0.447842
Durbin-Watson stat	1.691843			

EQUATION 5

NUMBER OF EMPLOYED IN TRADABLE SECTOR

Dependent Variable: LTR

Method: ML - ARCH

Date: 07/12/17 Time: 20:43

Sample (adjusted): 2002Q1 2016Q4

Included observations: 60 after adjustments

Convergence achieved after 75 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(21) + C(22)*RESID(-1)^2 + C(23)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
LTR(-1)	0.322032	0.043285	7.439791	0.0000
LTR(-3)	0.356242	0.028282	12.59593	0.0000
LTR(-6)	-0.254074	0.024826	-10.23401	0.0000
LTR(-9)	-0.092798	0.032747	-2.833776	0.0046

N(-3)	-0.296218	0.036622	-8.088488	0.0000
N(-4)	0.318212	0.034357	9.261951	0.0000
N(-9)	-0.098970	0.024481	-4.042800	0.0001
N(-11)	0.213918	0.028784	7.431779	0.0000
NMPLTRW(-1)	0.099413	0.019456	5.109623	0.0000
AWTRNON(-7)	3.039894	0.540171	5.627649	0.0000
AWTRNON(-10)	1.939685	0.446881	4.340500	0.0000
AWTRNON(-11)	1.568587	0.471284	3.328326	0.0009
AWTRNON(-12)	-5.060019	0.439909	-11.50241	0.0000
SWTR(-12)	14.97320	2.470408	6.061023	0.0000
STTAXTR(-2)	-2.439917	0.168111	-14.51376	0.0000
STTAXTR(-5)	-1.196958	0.180707	-6.623740	0.0000
D07	0.560611	0.131465	4.264324	0.0000
D08	-0.470279	0.131915	-3.565014	0.0004
D09	-0.975533	0.103653	-9.411565	0.0000
D11	-0.215648	0.085319	-2.527542	0.0115

Variance Equation

C	0.001893	4.79E-06	395.4516	0.0000
RESID(-1)^2	-0.180090	0.065123	-2.765373	0.0057
GARCH(-1)	1.092953	0.083106	13.15124	0.0000

R-squared	0.992561	Mean dependent var	18.79221
Adjusted R-squared	0.989028	S.D. dependent var	1.906250
S.E. of regression	0.199675	Akaike info criterion	-0.326473
Sum squared resid	1.594800	Schwarz criterion	0.476359
Log likelihood	32.79420	Hannan-Quinn criter.	-0.012441
Durbin-Watson stat	2.027461		

EQUATION 7

THE PRODUCTION FUNCTION OF THE ECONOMY

Dependent Variable: DLQL

Method: ML - ARCH

Date: 08/31/17 Time: 15:07

Sample (adjusted): 2003Q1 2016Q4

Included observations: 56 after adjustments

Convergence achieved after 191 iterations

Presample variance: backcast (parameter = 0.7)

GARCH = C(29) + C(30)*RESID(-1)^2 + C(31)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DLQL(-1)	-0.378677	0.052137	-7.263189	0.0000
DLQL(-3)	-0.392566	0.049664	-7.904495	0.0000
DLQL(-9)	-0.160910	0.029703	-5.417234	0.0000
DLKL	0.134343	0.023002	5.840507	0.0000
DLKL(-2)	0.037302	0.015620	2.388143	0.0169
DLKL(-3)	0.169056	0.018764	9.009557	0.0000
DLKL(-8)	-0.124736	0.025210	-4.947789	0.0000
DDI(-1)	-0.007335	0.002616	-2.803982	0.0050
DDI(-3)	-0.005738	0.001583	-3.624395	0.0003
DDI(-5)	-0.005779	0.002157	-2.679734	0.0074
DD084_DI(-1)	-0.002775	0.002618	-1.059664	0.2893
DD084_DI(-2)	-0.001391	0.001512	-0.919599	0.3578
DMDI	0.000291	5.67E-05	5.133605	0.0000
DAD(-11)	0.056227	0.010822	5.195386	0.0000
DSTTAX(-4)	-0.107319	0.033667	-3.187647	0.0014

DSIMP(-5)	0.322108	0.063210	5.095874	0.0000
DMIACRP(-3)	-0.063074	0.016654	-3.787299	0.0002
DTARIFP(-6)	0.070834	0.012404	5.710436	0.0000
DSOCG(-4)	0.071047	0.031146	2.281091	0.0225
DSCTL(-10)	-0.132165	0.039037	-3.385670	0.0007
DSROK(-9)	0.078824	0.042084	1.872988	0.0611
DIND_IMP(-4)	0.006084	0.001672	3.639749	0.0003
DIND_IMP(-5)	-0.005345	0.002169	-2.463655	0.0138
DPENP	-0.055389	0.036621	-1.512473	0.1304
DPENP(-6)	-0.055959	0.018643	-3.001661	0.0027
C	0.019807	0.002652	7.469000	0.0000
D084	-0.008823	0.001629	-5.414875	0.0000
D14	-0.005553	0.002988	-1.858625	0.0631

Variance Equation

C	3.98E-08	1.13E-07	0.353649	0.7236
RESID(-1)^2	0.621173	0.225169	2.758697	0.0058
GARCH(-1)	0.351878	0.158138	2.225135	0.0261

R-squared	0.988250	Mean dependent var	0.006363
Adjusted R-squared	0.976920	S.D. dependent var	0.031852
S.E. of regression	0.004839	Akaike info criterion	-8.418756
Sum squared resid	0.000656	Schwarz criterion	-7.297579
Log likelihood	266.7252	Hannan-Quinn criter.	-7.984078
Durbin-Watson stat	2.004190		

EQUATION 8

THE PRODUCTION FUNCTION OF TRADABLE SECTOR

Dependent Variable: DLQLTR

Method: ML - ARCH

Date: 08/01/17 Time: 14:42

Sample (adjusted): 2002Q2 2016Q4

Included observations: 59 after adjustments

Convergence achieved after 4 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(51) + C(52)*RESID(-1)^2 + C(53)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DLQLTR(-1)	0.015362	0.005701	2.694344	0.0071
DLQLTR(-3)	0.102968	0.010524	9.784241	0.0000
DLQLTR(-4)	0.028616	0.009583	2.986136	0.0028
DLQLTR(-5)	-0.170004	0.006948	-24.46651	0.0000
DLQLTR(-6)	-0.692331	0.014306	-48.39396	0.0000
DLQLTR(-7)	0.239661	0.006074	39.45649	0.0000
DLQLTR(-8)	0.299506	0.011528	25.98064	0.0000
DLQLTR(-9)	0.034451	0.010485	3.285765	0.0010
DLQLTR(-10)	0.256827	0.010798	23.78426	0.0000
DLQLTR(-11)	-0.415709	0.007736	-53.73722	0.0000
DLQLTR(-12)	-0.294272	0.008679	-33.90727	0.0000
DLKLTR(-1)	-0.199859	0.005821	-34.33701	0.0000
DLKLTR(-3)	0.383452	0.005319	72.09662	0.0000
DLKLTR(-4)	0.216806	0.008659	25.03708	0.0000
DLKLTR(-5)	0.368671	0.007650	48.19078	0.0000
DLKLTR(-7)	-0.303137	0.006674	-45.41814	0.0000
DLKLTR(-8)	-0.354800	0.011823	-30.00955	0.0000
DLKLTR(-9)	0.185606	0.004633	40.05998	0.0000

DLKLTR(-10)	0.221516	0.005784	38.30109	0.0000
DLKLTR(-12)	0.246241	0.007796	31.58657	0.0000
DDI(-5)	-0.027111	0.000661	-41.00874	0.0000
DDI(-11)	-0.015170	0.000844	-17.96578	0.0000
DD084_DI	-0.009003	0.000672	-13.39924	0.0000
DD084_DI(-3)	0.006796	0.000174	39.06278	0.0000
DD084_DI(-4)	-0.003898	0.000111	-35.24729	0.0000
DD084_DI(-9)	0.004976	0.000107	46.36780	0.0000
DD084_DI(-10)	-0.003559	0.000113	-31.62027	0.0000
DMDI(-6)	0.000174	1.29E-05	13.47613	0.0000
DMDI(-11)	0.000563	1.74E-05	32.44504	0.0000
DMIACRP(-3)	-0.295901	0.013175	-22.45938	0.0000
DTARIFP(-2)	0.184758	0.006107	30.25153	0.0000
DTARIFP(-6)	-0.251519	0.006300	-39.92362	0.0000
DTARIFP(-9)	-0.145727	0.004855	-30.01881	0.0000
DTARIFP(-10)	0.135950	0.003838	35.42167	0.0000
DLQLNON(-1)	0.115643	0.010607	10.90211	0.0000
DLQLNON(-4)	0.233534	0.012446	18.76329	0.0000
DLQLNON(-7)	-0.169158	0.014954	-11.31191	0.0000
DLQLNON(-11)	-0.218337	0.010478	-20.83836	0.0000
DAMORTTR(-6)	-0.052060	0.006034	-8.627160	0.0000
DAMORTTR(-8)	-0.123669	0.011075	-11.16659	0.0000
DAMORTTR(-10)	0.061684	0.007009	8.800393	0.0000
DSIMP(-2)	-0.342916	0.020976	-16.34817	0.0000
DSIMP(-3)	-0.246710	0.033947	-7.267460	0.0000
DSTTAX(-4)	-0.166339	0.013222	-12.58077	0.0000
DSTTAX(-5)	-0.132129	0.010196	-12.95949	0.0000
DSTTAX(-11)	0.036413	0.014319	2.543020	0.0110
D084	-0.075847	0.012955	-5.854705	0.0000
D09	0.074182	0.012826	5.783901	0.0000
D15	-0.002556	0.000860	-2.972082	0.0030

D16	0.003682	0.001404	2.623212	0.0087
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Variance Equation

C	1.65E-07	2.62E-07	0.628221	0.5299
RESID(-1)^2	0.149972	0.185820	0.807080	0.4196
GARCH(-1)	0.599946	0.269129	2.229213	0.0258

R-squared	0.999746	Mean dependent var	0.008899
Adjusted R-squared	0.998365	S.D. dependent var	0.048499
S.E. of regression	0.001961	Akaike info criterion	-9.746519
Sum squared resid	3.46E-05	Schwarz criterion	-7.880256
Log likelihood	340.5223	Hannan-Quinn criter.	-9.018005
Durbin-Watson stat	1.737340		

EQUATION 10

THE GDP DEFLATOR OF THE ECONOMY

Dependent Variable: RATE_P

Method: ML - ARCH

Date: 09/01/17 Time: 17:10

Sample (adjusted): 2006Q2 2016Q4

Included observations: 43 after adjustments

Convergence achieved after 69 iterations

Presample variance: backcast (parameter = 0.7)

GARCH = C(24) + C(25)*RESID(-1)^2 + C(26)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
RATE_P(-3)	0.141100	0.034438	4.097239	0.0000
RATE_P(-7)	0.149695	0.026973	5.549862	0.0000
RATE_P(-8)	-0.088079	0.039174	-2.248428	0.0245

RATE_P(-10)	0.074395	0.032058	2.320617	0.0203
RATE_MB(-7)	0.046602	0.014671	3.176590	0.0015
RATE_MB(-9)	0.046684	0.008505	5.488809	0.0000
RATE_MB(-10)	-0.012072	0.010526	-1.146887	0.2514
RATE_Q(-7)	-0.488538	0.075388	-6.480327	0.0000
RATE_PG	0.206597	0.029107	7.097963	0.0000
RATE_PG(-10)	0.205552	0.038833	5.293281	0.0000
RATE_DOLLAR	0.159334	0.008998	17.70732	0.0000
RATE_PEXPD	0.254831	0.009707	26.25283	0.0000
RATE_PEXPD(-4)	-0.048804	0.010292	-4.741757	0.0000
RATE_PIMD(-1)	0.074819	0.019376	3.861380	0.0001
RATE_PEN(-4)	-0.519961	0.094457	-5.504746	0.0000
RATE_PEN(-5)	0.256614	0.090155	2.846377	0.0044
DEFN(-11)	-1.27E-05	3.36E-06	-3.768799	0.0002
RATE_TARIF(-1)	-0.059463	0.021950	-2.709024	0.0067
RATE_TARIF(-5)	0.132616	0.024300	5.457425	0.0000
RATE_TARIF(-9)	0.079727	0.017403	4.581186	0.0000
DS(-1)	5.35E-06	2.31E-06	2.317512	0.0205
DS(-3)	-1.04E-06	6.12E-07	-1.703057	0.0886
DS(-9)	-6.51E-06	3.01E-06	-2.162972	0.0305

Variance Equation

C	3.72E-07	9.65E-07	0.385541	0.6998
RESID(-1)^2	0.387624	0.223510	1.734261	0.0829
GARCH(-1)	0.474428	0.244798	1.938040	0.0526

R-squared	0.995497	Mean dependent var	0.099070
Adjusted R-squared	0.990543	S.D. dependent var	0.058215
S.E. of regression	0.005661	Akaike info criterion	-7.611140
Sum squared resid	0.000641	Schwarz criterion	-6.546228
Log likelihood	189.6395	Hannan-Quinn criter.	-7.218434
Durbin-Watson stat	1.928871		

EQUATION 11

THE VALUE-ADDED DEFLATOR OF THE TRADABLE SECTOR

Dependent Variable: DPTR

Method: ML - ARCH

Date: 08/19/17 Time: 16:59

Sample (adjusted): 2001Q4 2016Q4

Included observations: 61 after adjustments

Convergence achieved after 39 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(24) + C(25)*RESID(-1)^2 + C(26)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DPTR(-1)	-0.306157	0.033856	-9.042789	0.0000
DPTR(-2)	-0.503393	0.032841	-15.32815	0.0000
DPTR(-4)	0.512899	0.035316	14.52310	0.0000
DP	0.534342	0.020346	26.26331	0.0000
DP(-1)	0.168981	0.015170	11.13955	0.0000
DP(-2)	0.291460	0.016429	17.74055	0.0000
DP(-4)	-0.311923	0.020785	-15.00717	0.0000
DP(-11)	0.322353	0.017442	18.48163	0.0000
DPEXPD(-8)	0.219752	0.046229	4.753527	0.0000
DPEXP(-10)	-0.046127	0.018578	-2.482919	0.0130
DTARIF	-0.118555	0.015659	-7.571059	0.0000
DTARIF(-4)	-0.142492	0.012992	-10.96806	0.0000
CAP	3.82E-06	4.61E-07	8.293537	0.0000
CAP(-1)	-3.28E-06	5.23E-07	-6.267903	0.0000
DM(-6)	0.000185	2.66E-05	6.960246	0.0000
DM(-11)	-0.000189	1.86E-05	-10.17614	0.0000
DPEN(-5)	-0.463034	0.032859	-14.09174	0.0000

DPEN(-7)	-0.251513	0.069174	-3.635937	0.0003
DQNON(-6)	-2.221040	0.391919	-5.667085	0.0000
DQNON(-10)	2.128056	0.312792	6.803431	0.0000
DPNON(-4)	0.211748	0.051562	4.106680	0.0000
D09	0.028809	0.030568	0.942485	0.3459
D14	-0.036086	0.026891	-1.341917	0.1796

Variance Equation

C	-8.49E-05	3.06E-08	-2775.011	0.0000
RESID(-1)^2	0.299691	0.123804	2.420688	0.0155
GARCH(-1)	0.686588	0.088656	7.744381	0.0000

R-squared	0.995357	Mean dependent var	0.178043
Adjusted R-squared	0.992669	S.D. dependent var	1.261803
S.E. of regression	0.108039	Akaike info criterion	-1.626000
Sum squared resid	0.443551	Schwarz criterion	-0.726283
Log likelihood	75.59301	Hannan-Quinn criter.	-1.273393
Durbin-Watson stat	1.959448		

EQUATION 21

AVERAGE WAGES IN THE ECONOMY

Dependent Variable: DW

Method: ML - ARCH

Date: 09/15/17 Time: 20:39

Sample (adjusted): 2001Q2 2016Q4

Included observations: 63 after adjustments

Convergence achieved after 106 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(18) + C(19)*RESID(-1)^2 + C(20)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DNMRL	0.223543	0.014798	15.10638	0.0000
DNMRL(-2)	0.100008	0.009359	10.68555	0.0000
DNMRL(-12)	0.145044	0.027608	5.253613	0.0000
DMROT(-8)	-0.003122	0.000238	-13.11584	0.0000
DG	0.013027	0.000970	13.42390	0.0000
DU(-8)	-0.656220	0.194778	-3.369073	0.0008
DU(-11)	0.422766	0.219114	1.929436	0.0537
DPERTAXL(-6)	1.230621	0.085674	14.36395	0.0000
DPERTAXL(-9)	0.613318	0.098840	6.205193	0.0000
DSG(-3)	27.30155	5.631322	4.848161	0.0000
DSG(-4)	47.22649	9.631572	4.903300	0.0000
DSG(-8)	-16.38796	11.05125	-1.482906	0.1381
DSEXP(-2)	17.74644	6.028329	2.943841	0.0032
DSEXP(-6)	9.314309	3.672554	2.536194	0.0112
DSIMP(-3)	-33.53511	5.111179	-6.561130	0.0000

D15	-0.975420	0.521070	-1.871954	0.0612
D16	2.063543	0.573568	3.597729	0.0003

Variance Equation

C	0.105049	0.062260	1.687262	0.0916
RESID(-1)^2	0.694858	0.185691	3.742006	0.0002
GARCH(-1)	0.296014	0.151108	1.958953	0.0501

R-squared	0.955636	Mean dependent var	2.187238
Adjusted R-squared	0.940205	S.D. dependent var	4.315391
S.E. of regression	1.055240	Akaike info criterion	3.000125
Sum squared resid	51.22241	Schwarz criterion	3.680485
Log likelihood	-74.50394	Hannan-Quinn criter.	3.267714
Durbin-Watson stat	2.182905		

EQUATION 24

AVERAGE WAGES IN THE TRADABLE SECTOR

Dependent Variable: DWTR

Method: Least Squares

Date: 06/23/17 Time: 21:18

Sample (adjusted): 2002Q2 2016Q4

Included observations: 59 after adjustments

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DWTR(-4)	0.111993	0.048364	2.315627	0.0262
DWTR(-8)	0.164869	0.063598	2.592377	0.0136
DWTR(-9)	-0.332262	0.062301	-5.333136	0.0000
DWTR(-11)	-0.126813	0.063598	-1.993974	0.0536
DWTR(-12)	0.485521	0.070907	6.847279	0.0000
DNMRLTR	0.143497	0.014972	9.584543	0.0000
DNMRLTR(-8)	-0.096484	0.014579	-6.617976	0.0000
DNMRLTR(-10)	0.045105	0.014921	3.022865	0.0045
DG(-4)	0.016634	0.000938	17.72435	0.0000
DG(-6)	0.005601	0.001548	3.618627	0.0009
DG(-11)	-0.002769	0.002459	-1.126044	0.2674
DMROT	0.001339	0.000345	3.886702	0.0004
DMROT(-2)	0.001203	0.000181	6.656710	0.0000
DMROT(-3)	0.001269	0.000397	3.199512	0.0028
DMROT(-4)	0.001848	0.000221	8.349365	0.0000
DMROT(-6)	0.000736	0.000216	3.403222	0.0016
DMROT(-12)	-0.000902	0.000306	-2.949733	0.0055
DU(-3)	1.260749	0.244427	5.157975	0.0000
DU(-10)	-1.048307	0.205549	-5.100037	0.0000

DU(-12)	0.769830	0.220012	3.499031	0.0012
D084	-5.051423	0.387302	-13.04260	0.0000
D10	4.624201	0.355284	13.01550	0.0000
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R-squared	0.985496	Mean dependent var	1.888301	
Adjusted R-squared	0.977265	S.D. dependent var	4.630736	
S.E. of regression	0.698235	Akaike info criterion	2.398621	
Sum squared resid	18.03869	Schwarz criterion	3.173296	
Log likelihood	-48.75933	Hannan-Quinn criter.	2.701023	
Durbin-Watson stat	1.984864			
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EQUATION 28

HOUSEHOLDS' CONSUMPTION INDEX

Dependent Variable: DC

Method: Least Squares

Date: 08/26/17 Time: 19:26

Sample (adjusted): 2001Q4 2016Q4

Included observations: 61 after adjustments

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DC(-5)	0.153341	0.062704	2.445488	0.0192
DC(-8)	0.265935	0.072981	3.643893	0.0008
DGCPI	0.001169	0.000572	2.042707	0.0481
DGCPI(-5)	0.001994	0.000514	3.877024	0.0004
DGCPI(-7)	0.003118	0.000379	8.225182	0.0000
DIND_G(-6)	0.731234	0.188458	3.880100	0.0004
DDOLLAR(-1)	-0.040893	0.005907	-6.923197	0.0000
DDOLLAR(-3)	-0.017463	0.004769	-3.661804	0.0008
DDOLLAR(-4)	0.029079	0.004491	6.474929	0.0000
DINCOMECPPI	0.000473	0.000162	2.914091	0.0059
DINCOMECPPI(-12)	-0.000263	0.000160	-1.648067	0.1076
DSNWLIN(-4)	-0.514687	0.094238	-5.461584	0.0000
DSTRIN	-0.848209	0.339365	-2.499402	0.0169
DSTRIN(-3)	-0.917567	0.402088	-2.282006	0.0282
DSTRIN(-9)	-0.773650	0.275203	-2.811197	0.0078
DSTRIN(-11)	-0.911709	0.299038	-3.048810	0.0042
DDEPPCPI	0.000707	0.000144	4.914900	0.0000
DDEPPCPI(-2)	0.000351	0.000116	3.011119	0.0046
DDEPPCPI(-5)	0.000335	0.000152	2.210897	0.0331
D08	-0.026907	0.007668	-3.508923	0.0012

D09	-0.052963	0.010047	-5.271417	0.0000
D10	0.095405	0.013054	7.308303	0.0000
D12	-0.043074	0.009206	-4.679015	0.0000
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R-squared	0.977256	Mean dependent var	0.022937	
Adjusted R-squared	0.964088	S.D. dependent var	0.101325	
S.E. of regression	0.019201	Akaike info criterion	-4.786847	
Sum squared resid	0.014010	Schwarz criterion	-3.990944	
Log likelihood	168.9988	Hannan-Quinn criter.	-4.474925	
Durbin-Watson stat	2.253505			
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EQUATION 34

THE CONSUMER PRICE INDEX

Dependent Variable: DCPI

Method: ML - ARCH

Date: 07/31/17 Time: 17:11

Sample (adjusted): 2005Q2 2016Q4

Included observations: 47 after adjustments

Convergence achieved after 17 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(25) + C(26)*RESID(-1)^2 + C(27)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DCPI(-2)	-0.106431	0.046435	-2.292046	0.0219
DCPI(-3)	-0.357918	0.026518	-13.49704	0.0000
DCPI(-4)	0.422719	0.028878	14.63817	0.0000
DCPI(-5)	-0.583986	0.025545	-22.86122	0.0000
DCPI(-9)	0.218105	0.033753	6.461810	0.0000
DCPI(-10)	-0.252671	0.032906	-7.678522	0.0000
DP	0.202576	0.021890	9.254234	0.0000
DP(-3)	0.206742	0.015283	13.52751	0.0000
DP(-5)	0.123999	0.013084	9.476845	0.0000
DP(-8)	-0.099118	0.014952	-6.629095	0.0000
DPIM	0.239895	0.010893	22.02339	0.0000
DPIM(-1)	0.184643	0.013194	13.99473	0.0000
DPIM(-3)	0.208364	0.014648	14.22498	0.0000
DPIM(-6)	0.094700	0.014358	6.595650	0.0000
DPEXP	-0.056937	0.010916	-5.215971	0.0000
DPEXP(-1)	0.059579	0.006652	8.956826	0.0000

DPEXP(-3)	-0.141659	0.012062	-11.74418	0.0000
DPEXP(-12)	0.051212	0.009807	5.222013	0.0000
DMB(-9)	0.000123	1.05E-06	117.3760	0.0000
DDOLLAR	0.099496	0.009136	10.89014	0.0000
DDOLLAR(-7)	0.131694	0.016698	7.886628	0.0000
DDOLLAR(-10)	-0.111016	0.026675	-4.161839	0.0000
C	0.243966	0.037871	6.442093	0.0000
D15	-0.123294	0.039674	-3.107664	0.0019

Variance Equation

C	0.001750	0.000920	1.902311	0.0571
RESID(-1)^2	-0.210770	0.142177	-1.482445	0.1382
GARCH(-1)	0.610915	0.392480	1.556551	0.1196

R-squared	0.999673	Mean dependent var	0.462448
Adjusted R-squared	0.999346	S.D. dependent var	3.352687
S.E. of regression	0.085727	Akaike info criterion	-1.918936
Sum squared resid	0.169031	Schwarz criterion	-0.856086
Log likelihood	72.09500	Hannan-Quinn criter.	-1.518978
Durbin-Watson stat	2.367776		

EQUATION 39

INVESTMENT IN TRADABLE AS A SHARE OF GROSS FIXED CAPITAL FORMATION

Dependent Variable: SITR

Method: Least Squares

Date: 08/04/17 Time: 16:19

Sample (adjusted): 2001Q4 2016Q4

Included observations: 61 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed

bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SITR(-1)	0.709328	0.061478	11.53785	0.0000
SITR(-8)	0.386754	0.135191	2.860789	0.0064
SITR(-9)	-0.311843	0.143707	-2.169987	0.0353
SPQTR(-5)	0.087762	0.033966	2.583807	0.0131
SPQTR(-9)	-0.100223	0.032527	-3.081264	0.0035
SROKTR(-4)	0.122738	0.053846	2.279409	0.0274
SROKTR(-5)	-0.119823	0.045108	-2.656348	0.0109
SROKTR(-12)	0.041589	0.020941	1.986044	0.0531
SIMP(-2)	0.113693	0.040738	2.790826	0.0077
SIMP(-4)	0.078743	0.057557	1.368102	0.1781
AMRKTRMRK(-10)	0.057893	0.012588	4.599092	0.0000
STTAXTR(-10)	-0.043487	0.012184	-3.569075	0.0009
STTAXTR(-11)	-0.022251	0.010203	-2.180865	0.0345
SIG(-2)	-0.140891	0.042419	-3.321399	0.0018
SIG(-8)	-0.151971	0.053499	-2.840646	0.0067
D15	0.008511	0.003257	2.613140	0.0122
R-squared	0.977153	Mean dependent var		0.343116
Adjusted R-squared	0.969537	S.D. dependent var		0.023282

S.E. of regression	0.004064	Akaike info criterion	-7.953129
Sum squared resid	0.000743	Schwarz criterion	-7.399457
Log likelihood	258.5704	Hannan-Quinn criter.	-7.736140
Durbin-Watson stat	2.140095		

EQUATION 46

THE MIACR REAL INTEREST RATE

Dependent Variable: DMIACRP

Method: Least Squares

Date: 08/12/17 Time: 20:58

Sample (adjusted): 2005Q1 2016Q4

Included observations: 48 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed

bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMIACRP(-1)	-0.374827	0.070263	-5.334655	0.0000
DMIACRP(-6)	-0.213764	0.039739	-5.379153	0.0000
DMIACRP(-8)	-0.555332	0.114836	-4.835885	0.0000
DKEYP	0.886906	0.043235	20.51343	0.0000
DKEYP(-8)	0.594073	0.136911	4.339113	0.0002
CAP(-1)	-3.50E-07	8.29E-08	-4.220155	0.0002
CAP(-2)	4.26E-07	5.41E-08	7.874742	0.0000
DDEFPP(-4)	0.000320	8.44E-05	3.794966	0.0007
DPEXPD(-1)	-0.015499	0.003644	-4.253565	0.0002
DPEXPD(-4)	0.008426	0.002650	3.179385	0.0036
DPEXPD(-7)	-0.016726	0.003960	-4.224299	0.0002
DPEXPD(-10)	0.017975	0.006709	2.679277	0.0122
DPIMD	0.014811	0.006970	2.125150	0.0425
DMBP	0.000161	6.67E-05	2.417329	0.0224
DMBP(-4)	-0.000256	6.44E-05	-3.967300	0.0005
DMBP(-8)	0.000141	4.59E-05	3.074079	0.0047
DNMRKP(-1)	0.205770	0.066652	3.087256	0.0045
DNMRKP(-2)	0.071041	0.034230	2.075435	0.0472

DNMRKP(-11)	-0.066017	0.027295	-2.418622	0.0223
C	0.005762	0.001069	5.387928	0.0000
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R-squared	0.980511	Mean dependent var	0.005332	
Adjusted R-squared	0.967286	S.D. dependent var	0.039057	
S.E. of regression	0.007064	Akaike info criterion	-6.773191	
Sum squared resid	0.001397	Schwarz criterion	-5.993524	
Log likelihood	182.5566	Hannan-Quinn criter.	-6.478554	
F-statistic	74.14129	Durbin-Watson stat	2.156524	
Prob(F-statistic)	0.000000			
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EQUATION 47

INVESTMENT IN FIXED CAPITAL ON COMPANIES' OWN EXPENSE

Dependent Variable: DIODI

Method: ML - ARCH

Date: 08/18/17 Time: 18:56

Sample (adjusted): 2003Q3 2016Q4

Included observations: 54 after adjustments

Convergence achieved after 21 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(27) + C(28)*RESID(-1)^2 + C(29)*RESID(-2)^2 + C(30)
*GARCH(-1) + C(31)*GARCH(-2)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DIODI(-1)	-0.351417	0.021468	-16.36914	0.0000
DIODI(-5)	-0.474498	0.031410	-15.10636	0.0000
DIODI(-6)	-0.525431	0.026839	-19.57738	0.0000
DIODI(-7)	-0.168183	0.021033	-7.996195	0.0000
DIODI(-9)	0.225518	0.022929	9.835564	0.0000
DIODI(-11)	-0.446564	0.022336	-19.99342	0.0000
DMNDI(-1)	1.754659	0.089001	19.71503	0.0000
DMNDI(-6)	0.476895	0.099935	4.772058	0.0000
DMNDI(-7)	0.819963	0.095792	8.559791	0.0000
DMNDI(-10)	0.875663	0.065231	13.42408	0.0000
DMNDI(-12)	1.623477	0.070555	23.00996	0.0000
DIGDI	0.659927	0.052695	12.52344	0.0000
DIGDI(-4)	0.604222	0.069443	8.700930	0.0000
DMDI(-10)	0.091479	0.004851	18.85655	0.0000
DMDI(-11)	-0.088491	0.005606	-15.78381	0.0000
DTARIFDI(-10)	8.665154	2.348321	3.689935	0.0002

DIMPDI(-10)	-0.335159	0.022446	-14.93209	0.0000
DCTDI(-3)	0.041801	0.006564	6.368402	0.0000
DCTDI(-12)	0.061167	0.006356	9.622967	0.0000
CAP(-3)	7.53E-05	4.27E-06	17.61189	0.0000
CAP(-5)	-7.69E-05	3.73E-06	-20.62837	0.0000
DGDI(-2)	-0.267425	0.031424	-8.510113	0.0000
DGDI(-6)	0.381074	0.039802	9.574251	0.0000
DGDI(-7)	0.267014	0.033529	7.963673	0.0000
DGDI(-10)	-0.214738	0.047379	-4.532324	0.0000
D14	0.031387	0.237562	0.132121	0.8949

Variance Equation

C	0.143968	0.057497	2.503906	0.0123
RESID(-1)^2	-0.190548	0.084130	-2.264906	0.0235
RESID(-2)^2	0.451137	0.159530	2.827918	0.0047
GARCH(-1)	0.243779	0.146668	1.662118	0.0965
GARCH(-2)	0.207831	0.101974	2.038073	0.0415

R-squared	0.998761	Mean dependent var	1.816139
Adjusted R-squared	0.997654	S.D. dependent var	34.80570
S.E. of regression	1.685763	Akaike info criterion	3.755563
Sum squared resid	79.57036	Schwarz criterion	4.897387
Log likelihood	-70.40020	Hannan-Quinn criter.	4.195920
Durbin-Watson stat	2.649173		

EQUATION 48

INVESTMENT IN FIXED CAPITAL FROM STATE BUDGET

Dependent Variable: DIGDI

Method: ML - ARCH

Date: 08/18/17 Time: 14:50

Sample (adjusted): 2001Q3 2016Q4

Included observations: 62 after adjustments

Convergence achieved after 130 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(24) + C(25)*RESID(-1)^2 + C(26)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DIGDI(-1)	-0.334752	0.031093	-10.76601	0.0000
DIGDI(-2)	-0.222062	0.034848	-6.372256	0.0000
DIGDI(-3)	-0.196631	0.029034	-6.772521	0.0000
DIGDI(-8)	0.437709	0.019421	22.53739	0.0000
DREVDI	0.054565	0.004321	12.62909	0.0000
DREVDI(-4)	0.041107	0.004355	9.440125	0.0000
DREVDI(-5)	0.049757	0.005663	8.785792	0.0000
CAP(-5)	-1.28E-05	2.72E-06	-4.688008	0.0000
CAP(-6)	3.58E-05	1.60E-06	22.41637	0.0000
CAP(-8)	1.61E-05	2.06E-06	7.822783	0.0000
CAP(-9)	-3.00E-05	2.16E-06	-13.89494	0.0000
CAP(-10)	1.57E-05	1.52E-06	10.33548	0.0000
DMDI	0.017527	0.002508	6.987754	0.0000
DMDI(-2)	0.015711	0.002596	6.050878	0.0000
DTARIFDI(-1)	5.219163	1.155595	4.516430	0.0000
DTARIFDI(-2)	-12.77254	1.141750	-11.18681	0.0000

DTARIFDI(-3)	-8.364702	1.629284	-5.133973	0.0000
DTARIFDI(-11)	-6.865579	1.553698	-4.418863	0.0000
DIMPDI(-7)	-0.069669	0.008779	-7.935420	0.0000
DMIACRDI(-1)	-6.759290	1.322851	-5.109639	0.0000
DMIACRDI(-11)	2.346916	0.501156	4.683001	0.0000
DGDI	-0.078971	0.010708	-7.374820	0.0000
DGDI(-2)	0.089632	0.018038	4.968976	0.0000

Variance Equation

C	0.089175	0.021167	4.212892	0.0000
RESID(-1)^2	1.531781	0.472484	3.241972	0.0012
GARCH(-1)	-0.080220	0.032273	-2.485664	0.0129

R-squared	0.995981	Mean dependent var	0.329901
Adjusted R-squared	0.993713	S.D. dependent var	10.41714
S.E. of regression	0.825957	Akaike info criterion	2.429660
Sum squared resid	26.60600	Schwarz criterion	3.321684
Log likelihood	-49.31946	Hannan-Quinn criter.	2.779891
Durbin-Watson stat	1.786884		

EQUATION 49

INVESTMENT IN FIXED CAPITAL THROUGH BANK LOANS

Dependent Variable: DIBDI

Method: ML - ARCH

Date: 08/18/17 Time: 18:18

Sample (adjusted): 2003Q3 2016Q4

Included observations: 54 after adjustments

Convergence achieved after 23 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(25) + C(26)*RESID(-1)^2 + C(27)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DIBDI(-1)	-0.259815	0.020865	-12.45200	0.0000
DIBDI(-3)	-0.438731	0.031224	-14.05129	0.0000
DMCNDI(-1)	0.064680	0.018011	3.591063	0.0003
DMCNDI(-12)	0.156081	0.025715	6.069635	0.0000
DIGDI	0.605586	0.022894	26.45202	0.0000
DIGDI(-3)	0.233989	0.036821	6.354815	0.0000
DIGDI(-4)	0.394295	0.034944	11.28357	0.0000
DIGDI(-6)	0.163609	0.021725	7.530890	0.0000
DIGDI(-7)	0.259591	0.038909	6.671756	0.0000
DIODI(-4)	-0.087833	0.010827	-8.112384	0.0000
DIMPDI(-4)	-0.049161	0.010909	-4.506277	0.0000
DIMPDI(-5)	0.158966	0.007836	20.28786	0.0000
DMIACRDI	-10.48158	2.436739	-4.301478	0.0000
CAP(-1)	1.11E-05	2.88E-06	3.857039	0.0001
CAP(-3)	-1.55E-05	2.38E-06	-6.499759	0.0000
DGDI(-1)	-0.050554	0.015991	-3.161431	0.0016

DGDI(-6)	-0.102498	0.016441	-6.234462	0.0000
DGDI(-9)	0.067589	0.013970	4.838266	0.0000
DGDI(-10)	0.083751	0.016668	5.024626	0.0000
DGDI(-11)	0.035832	0.015957	2.245524	0.0247
D09	-2.506433	0.219286	-11.42996	0.0000
D10	2.595699	0.180302	14.39643	0.0000
D15	-3.942580	0.240795	-16.37320	0.0000
D16	6.409101	0.362243	17.69281	0.0000

Variance Equation

C	0.022317	0.013435	1.661134	0.0967
RESID(-1)^2	-0.132854	0.182142	-0.729400	0.4658
GARCH(-1)	0.993531	0.333644	2.977818	0.0029

R-squared	0.996031	Mean dependent var	0.406908
Adjusted R-squared	0.992989	S.D. dependent var	7.734390
S.E. of regression	0.647632	Akaike info criterion	1.952858
Sum squared resid	12.58282	Schwarz criterion	2.947351
Log likelihood	-25.72718	Hannan-Quinn criter.	2.336395
Durbin-Watson stat	1.736908		

EQUATION 50

THE GROSS FIXED CAPITAL FORMATION DEFLATOR

Dependent Variable: DDI

Method: ML - ARCH

Date: 08/02/17 Time: 18:24

Sample (adjusted): 2002Q4 2016Q4

Included observations: 57 after adjustments

Convergence achieved after 10 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(28) + C(29)*RESID(-1)^2 + C(30)*GARCH(-1) + C(31)

*DDI(-12)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DDI(-2)	0.081956	0.028682	2.857396	0.0043
DDI(-3)	-0.174242	0.021098	-8.258541	0.0000
DP	0.190937	0.014027	13.61178	0.0000
DP(-5)	-0.137094	0.020992	-6.530824	0.0000
DPG(-1)	0.328904	0.021789	15.09513	0.0000
DPG(-3)	0.181761	0.010229	17.76996	0.0000
DPIMD(-5)	0.906210	0.097151	9.327866	0.0000
DDOLLAR(-1)	0.177699	0.027521	6.456863	0.0000
DINTAXN(-5)	-0.000365	6.96E-05	-5.234859	0.0000
DINTAXN(-12)	0.000920	7.35E-05	12.51403	0.0000
DSIMPDUT(-10)	5.467184	1.149537	4.755990	0.0000
DAMORTK(-8)	-6.76E-05	3.74E-06	-18.07830	0.0000
DM	0.000140	2.21E-05	6.347822	0.0000
DM(-3)	-0.000203	2.05E-05	-9.870652	0.0000
DM(-7)	7.06E-05	1.65E-05	4.281561	0.0000
DTARIF(-2)	0.132410	0.017903	7.395820	0.0000

DPEN(-2)	-0.384975	0.079002	-4.872959	0.0000
DNX(-3)	0.000769	6.80E-05	11.30922	0.0000
DNX(-6)	-0.000337	4.26E-05	-7.896461	0.0000
DQ(-12)	-1.295090	0.361060	-3.586908	0.0003
DQTR(-2)	0.966840	0.189721	5.096119	0.0000
DQTR(-7)	0.767679	0.261346	2.937406	0.0033
D07	0.253343	0.045634	5.551625	0.0000
D09	-0.169816	0.036172	-4.694677	0.0000
D13	-0.231394	0.036780	-6.291370	0.0000
D14	0.194707	0.057135	3.407863	0.0007
D16	0.582496	0.045470	12.81067	0.0000

Variance Equation

C	0.003650	0.001159	3.150613	0.0016
RESID(-1)^2	0.165961	0.093814	1.769049	0.0769
GARCH(-1)	0.588675	0.083113	7.082788	0.0000
DDI(-12)	-0.004167	0.001129	-3.691951	0.0002
R-squared	0.993846	Mean dependent var	0.480534	
Adjusted R-squared	0.988512	S.D. dependent var	1.101812	
S.E. of regression	0.118094	Akaike info criterion	-1.343723	
Sum squared resid	0.418383	Schwarz criterion	-0.232590	
Log likelihood	69.29610	Hannan-Quinn criter.	-0.911899	
Durbin-Watson stat	2.241948			

EQUATION 52

HOUSEHOLDS' RUBLE BANK DEPOSITS

Dependent Variable: DDEPRPPL

Method: ML - ARCH

Date: 08/05/17 Time: 17:08

Sample (adjusted): 2003Q3 2016Q4

Included observations: 54 after adjustments

Convergence achieved after 119 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(37) + C(38)*RESID(-1)^2 + C(39)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DDEPRPP(-2)	-0.142731	0.014539	-9.817416	0.0000
DDEPRPP(-4)	-0.190504	0.021141	-9.011180	0.0000
DDEPRPP(-6)	-0.074780	0.013484	-5.545627	0.0000
DDEPRPP(-7)	0.036157	0.010379	3.483855	0.0005
DDEPRPP(-8)	0.184388	0.019868	9.280592	0.0000
DDEPRPP(-9)	0.202999	0.031019	6.544395	0.0000
DDEPRPP(-11)	0.109546	0.011730	9.339066	0.0000
DDEPRPP(-12)	-0.074580	0.016029	-4.652780	0.0000
DMP	0.163527	0.008525	19.18220	0.0000
DMP(-1)	0.114477	0.005299	21.60335	0.0000
DMP(-2)	0.070629	0.004185	16.87520	0.0000
DMP(-3)	0.046014	0.007088	6.492262	0.0000
DMP(-9)	-0.119252	0.011810	-10.09762	0.0000
DMP(-10)	-0.245515	0.009924	-24.73927	0.0000
DINCOME(-6)	0.159660	0.012897	12.38002	0.0000
DINCOME(-10)	0.039830	0.012169	3.273098	0.0011
DINCOME(-11)	0.067319	0.010832	6.214617	0.0000

DINCOME(-12)	0.320269	0.016109	19.88168	0.0000
DSTRIN(-4)	183.4056	23.08250	7.945653	0.0000
DSTRIN(-6)	-101.4787	16.06537	-6.316608	0.0000
DSNWLIN	95.05302	11.14361	8.529824	0.0000
DSNWLIN(-2)	-49.43429	6.268969	-7.885553	0.0000
DSNWLIN(-7)	25.33800	7.126382	3.555521	0.0004
DGP	0.691778	0.062725	11.02879	0.0000
DGP(-2)	0.266361	0.062159	4.285115	0.0000
DGP(-10)	0.463311	0.048274	9.597573	0.0000
CAP(-1)	0.000185	9.45E-06	19.59471	0.0000
CAP(-4)	-6.42E-05	6.76E-06	-9.501717	0.0000
CAP(-5)	-6.26E-05	1.07E-05	-5.854097	0.0000
CAP(-10)	6.62E-05	1.28E-05	5.177608	0.0000
DDOLLAR(-6)	-3.065359	0.333597	-9.188806	0.0000
DDOLLAR(-12)	6.403051	0.476857	13.42761	0.0000
D07	-3.074242	0.463366	-6.634586	0.0000
D08	8.091930	0.474749	17.04464	0.0000
D08_4	26.88766	1.807042	14.87938	0.0000
D11	1.749843	0.466715	3.749279	0.0002

Variance Equation

C	0.000332	0.000437	0.758455	0.4482
RESID(-1)^2	0.706239	0.384211	1.838154	0.0660
GARCH(-1)	0.408155	0.176151	2.317072	0.0205

R-squared	0.999305	Mean dependent var	7.902675
Adjusted R-squared	0.997953	S.D. dependent var	46.65697
S.E. of regression	2.110839	Akaike info criterion	3.476242
Sum squared resid	80.20155	Schwarz criterion	4.912731
Log likelihood	-54.85854	Hannan-Quinn criter.	4.030239
Durbin-Watson stat	2.165913		

EQUATION 53

COMPANIES' RUBLE BANK DEPOSITS

Dependent Variable: DDEPRFP

Method: ML - ARCH

Date: 06/28/17 Time: 18:46

Sample (adjusted): 2006Q1 2016Q4

Included observations: 44 after adjustments

Failure to improve Likelihood after 71 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(26) + C(27)*RESID(-1)^2 + C(28)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DDEPRFP(-1)	-0.330250	0.015665	-21.08247	0.0000
DDEPRFP(-2)	-0.571256	0.015501	-36.85273	0.0000
DDEPRFP(-6)	0.375053	0.031452	11.92459	0.0000
DDEPRFP(-7)	0.643882	0.038106	16.89708	0.0000
DMBP(-6)	0.240173	0.015958	15.05042	0.0000
DMBP(-12)	-0.188289	0.024962	-7.543164	0.0000
DMP(-8)	0.479087	0.019410	24.68308	0.0000
DIND_Q(-1)	315.7792	18.90340	16.70489	0.0000
DIND_Q(-4)	353.9175	26.87593	13.16857	0.0000
DDEPCBP(-1)	-0.208060	0.013490	-15.42286	0.0000
DDEPCBP(-7)	0.573079	0.024625	23.27227	0.0000
DTRANSFERP(-4)	-0.626874	0.061602	-10.17621	0.0000
DDOLLARP(-8)	-96.18204	7.123488	-13.50210	0.0000
DGP(-6)	-1.151367	0.100381	-11.46993	0.0000
DGP(-7)	-1.364234	0.123453	-11.05066	0.0000
DGP(-12)	-1.197765	0.149987	-7.985789	0.0000

CAP(-11)	-0.000190	1.92E-05	-9.912203	0.0000
DMIACRP(-4)	-63.84873	10.80601	-5.908629	0.0000
DMIACRP(-9)	-49.18276	8.585831	-5.728363	0.0000
DMIACRP(-11)	-85.48919	11.76220	-7.268132	0.0000
DMIACRP(-12)	47.86064	13.69823	3.493929	0.0005
D07	-5.793136	2.045989	-2.831460	0.0046
D08	22.50481	1.869687	12.03667	0.0000
D09	-40.24267	3.055037	-13.17256	0.0000
D10	18.18869	1.524158	11.93360	0.0000

Variance Equation

C	7.222133	2.235269	3.230991	0.0012
RESID(-1)^2	0.831112	0.237614	3.497739	0.0005
GARCH(-1)	-0.193147	0.198585	-0.972617	0.3307

R-squared	0.994790	Mean dependent var	9.588817
Adjusted R-squared	0.988208	S.D. dependent var	54.15461
S.E. of regression	5.880645	Akaike info criterion	6.437759
Sum squared resid	657.0577	Schwarz criterion	7.573152
Log likelihood	-113.6307	Hannan-Quinn criter.	6.858817
Durbin-Watson stat	2.186780		

EQUATION 52

HOUSEHOLDS' FOREIGN CURRENCY BANK DEPOSITS

Dependent Variable: DDEPVPP

Method: ML - ARCH

Date: 08/15/17 Time: 16:47

Sample (adjusted): 2001Q4 2016Q4

Included observations: 61 after adjustments

Convergence achieved after 15 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(27) + C(28)*RESID(-1)^2 + C(29)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DDEPVPP(-1)	0.182545	0.041173	4.433565	0.0000
DDEPVPP(-3)	0.246372	0.033726	7.305106	0.0000
DDEPVPP(-5)	-0.271744	0.050478	-5.383361	0.0000
DMP(-1)	-0.079051	0.009847	-8.027876	0.0000
DMP(-3)	-0.061709	0.012158	-5.075506	0.0000
DMP(-5)	0.080663	0.011387	7.083492	0.0000
DMP(-6)	-0.031043	0.007481	-4.149748	0.0000
CAP(-2)	-0.000116	1.67E-05	-6.906595	0.0000
CAP(-3)	0.000128	1.61E-05	7.925498	0.0000
CAP(-6)	-0.000185	2.07E-05	-8.956351	0.0000
CAP(-7)	-0.000132	1.50E-05	-8.803073	0.0000
CAP(-9)	7.68E-05	1.88E-05	4.077048	0.0000
DDEPCBP	0.192771	0.016241	11.86909	0.0000
DDEPCBP(-2)	0.091690	0.016362	5.603816	0.0000
DGP(-2)	0.557283	0.094204	5.915701	0.0000
DGP(-7)	-0.331225	0.083329	-3.974927	0.0001

DINCOME _P	0.117466	0.010117	11.61090	0.0000
DINCOME _{P(-7)}	0.153126	0.017421	8.789507	0.0000
DSNWLIN ₍₋₇₎	93.30126	14.34650	6.503417	0.0000
DSNWLIN ₍₋₈₎	35.50198	11.97597	2.964434	0.0030
DDOLLARP ₍₋₁₎	23.45491	4.815654	4.870556	0.0000
DDOLLARP ₍₋₇₎	-22.25525	5.006030	-4.445689	0.0000
DMIACRP ₍₋₁₀₎	14.56242	6.110266	2.383270	0.0172
D09	-2.797695	0.412669	-6.779508	0.0000
D15	7.023384	1.314581	5.342677	0.0000
D16	-5.398232	1.615626	-3.341264	0.0008
Variance Equation				
C	3.937312	1.433079	2.747449	0.0060
RESID ₍₋₁₎ ²	-0.190924	0.083754	-2.279581	0.0226
GARCH ₍₋₁₎	0.518842	0.242902	2.136011	0.0327
R-squared	0.963137	Mean dependent var	2.406526	
Adjusted R-squared	0.936807	S.D. dependent var	13.15650	
S.E. of regression	3.307310	Akaike info criterion	5.451820	
Sum squared resid	382.8404	Schwarz criterion	6.455350	
Log likelihood	-137.2805	Hannan-Quinn criter.	5.845113	
Durbin-Watson stat	2.145646			

EQUATION 55

COMPANIES' FOREIGN CURRENCY BANK DEPOSITS

Dependent Variable: DDEPVFP

Method: Least Squares

Date: 08/29/17 Time: 17:45

Sample (adjusted): 2001Q4 2016Q4

Included observations: 61 after adjustments

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DDEPCBP	0.321313	0.066120	4.859517	0.0000
DGP(-11)	1.014291	0.246522	4.114405	0.0002
DTRANSFERP(-7)	-2.017671	0.232541	-8.676638	0.0000
DTRANSFERP(-11)	1.213264	0.251312	4.827728	0.0000
DDOLLARP(-1)	208.5549	43.53832	4.790146	0.0000
DDOLLARP(-9)	-159.7747	28.52102	-5.602000	0.0000
DDEPRFP	0.229971	0.055518	4.142281	0.0001
DDEPRFP(-4)	0.283844	0.050959	5.570061	0.0000
DDEPRFP(-5)	-0.178273	0.027476	-6.488212	0.0000
DMIACRP(-4)	-99.58513	26.49786	-3.758233	0.0005
CAP(-1)	0.000158	6.25E-05	2.525340	0.0152
CAP(-4)	-0.000142	6.13E-05	-2.320448	0.0249
CAP(-11)	9.61E-05	3.22E-05	2.979189	0.0046
D14	10.52565	3.799334	2.770393	0.0081
D15	10.47921	5.538376	1.892109	0.0649
D16	-23.51985	7.722368	-3.045678	0.0039
R-squared	0.927455	Mean dependent var	4.718895	
Adjusted R-squared	0.903274	S.D. dependent var	26.42786	

S.E. of regression	8.219292	Akaike info criterion	7.271224
Sum squared resid	3040.054	Schwarz criterion	7.824896
Log likelihood	-205.7723	Hannan-Quinn criter.	7.488213
Durbin-Watson stat	2.164142		

EQUATION 61

RUBLE BANK LOANS TO COMPANIES

Dependent Variable: DCRP

Method: ML - ARCH

Date: 08/15/17 Time: 18:13

Sample (adjusted): 2002Q4 2016Q4

Included observations: 57 after adjustments

Convergence achieved after 67 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(17) + C(18)*RESID(-1)^2 + C(19)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DCRP(-9)	-0.122000	0.018155	-6.719761	0.0000
DDEPRP	0.395104	0.022087	17.88891	0.0000
DDEPRP(-2)	0.050916	0.008263	6.162102	0.0000
DDEPRP(-4)	0.068114	0.022260	3.059865	0.0022
DDOLLARP(-4)	-66.78288	10.00124	-6.677463	0.0000
DGP	1.673508	0.197227	8.485182	0.0000
DDEPCBP	0.333582	0.026673	12.50615	0.0000
DDEPCBP(-1)	0.176712	0.018263	9.676186	0.0000
CAP	0.000115	2.35E-05	4.916223	0.0000
DNMRKP(-9)	43.07518	20.27648	2.124392	0.0336
DTTAXP	0.197456	0.041067	4.808150	0.0000
DTTAXP(-8)	0.162219	0.046901	3.458720	0.0005
DTTAXP(-9)	0.150920	0.054406	2.773945	0.0055
DEXPOP(-4)	0.117319	0.050309	2.331993	0.0197
DIMPP(-1)	0.214448	0.041121	5.215091	0.0000
D16	10.13811	4.259614	2.380054	0.0173

Variance Equation

C	0.233316	0.567076	0.411437	0.6808
RESID(-1)^2	-0.123922	0.084660	-1.463748	0.1433
GARCH(-1)	1.152866	0.078363	14.71177	0.0000
R-squared	0.994594	Mean dependent var		9.216462
Adjusted R-squared	0.992617	S.D. dependent var		70.37589
S.E. of regression	6.047061	Akaike info criterion		6.481666
Sum squared resid	1499.245	Schwarz criterion		7.162683
Log likelihood	-165.7275	Hannan-Quinn criter.		6.746332
Durbin-Watson stat	1.848118			

EQUATION 62

FOREIGN CURRENCY BANK LOANS TO COMPANIES

Dependent Variable: DCVLP

Method: Least Squares

Date: 08/15/17 Time: 18:40

Sample (adjusted): 2003Q2 2016Q4

Included observations: 55 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed

bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DCVLP(-10)	-0.501074	0.059773	-8.382974	0.0000
DCVLP(-11)	-0.316198	0.045722	-6.915666	0.0000
DDEPVLP	0.429847	0.023475	18.31095	0.0000
DDEPVLP(-10)	0.232226	0.032525	7.140012	0.0000
DDEPVLP(-11)	0.283619	0.026419	10.73526	0.0000
CAP	-0.000224	3.19E-05	-7.004738	0.0000
CAP(-4)	0.000120	3.29E-05	3.661066	0.0008
CAP(-7)	-0.000254	1.92E-05	-13.23576	0.0000
DTTAXP(-12)	0.280955	0.038938	7.215399	0.0000
DTARIFP(-7)	22.58051	8.330145	2.710698	0.0101
DDOLLARP(-7)	-55.02614	10.10965	-5.442933	0.0000
DMIACRP(-4)	59.66402	19.76579	3.018549	0.0046
DMIACRP(-8)	22.97749	20.74909	1.107397	0.2753
DNMRKP(-1)	-52.29072	17.33535	-3.016422	0.0046
DNMRKP(-7)	-75.15543	21.85600	-3.438664	0.0015
D09	-7.437439	0.852590	-8.723347	0.0000
D14	7.304409	1.574771	4.638395	0.0000
D16	-5.098274	1.984866	-2.568573	0.0144

R-squared	0.984008	Mean dependent var	5.334148
Adjusted R-squared	0.976660	S.D. dependent var	25.46370
S.E. of regression	3.890195	Akaike info criterion	5.812926
Sum squared resid	559.9439	Schwarz criterion	6.469871
Log likelihood	-141.8555	Hannan-Quinn criter.	6.066972
Durbin-Watson stat	2.301119		

EQUATION 64

BANK LOANS TO HOUSEHOLDS

Dependent Variable: DCHP

Method: ML - ARCH

Date: 08/07/17 Time: 21:33

Sample (adjusted): 2002Q3 2016Q4

Included observations: 58 after adjustments

Convergence achieved after 142 iterations

Presample variance: backcast (parameter = 0.7)

GARCH = C(20) + C(21)*RESID(-1)^2 + C(22)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DCHP(-4)	0.499160	0.049839	10.01550	0.0000
DCHP(-8)	-0.168231	0.056838	-2.959857	0.0031
DDEPRP	0.190317	0.018708	10.17308	0.0000
DDEPRP(-3)	0.102063	0.009544	10.69429	0.0000
DMIACRP(-3)	-61.97473	11.24724	-5.510216	0.0000
DMIACRP(-11)	-24.18737	5.447113	-4.440402	0.0000
DDOLLARP(-4)	-44.59904	6.357890	-7.014755	0.0000
DDEPCBLP	0.067509	0.011342	5.952112	0.0000
DDEPCBLP(-2)	-0.116683	0.015381	-7.586002	0.0000
DGP	0.812645	0.092529	8.782627	0.0000
DGP(-4)	-0.362083	0.140020	-2.585932	0.0097
DGP(-5)	0.226463	0.037884	5.977750	0.0000
DGP(-7)	-0.555152	0.061675	-9.001290	0.0000
DSNWLIN(-6)	-42.30707	9.015051	-4.692937	0.0000
DSTRIN(-1)	-142.9499	30.13636	-4.743436	0.0000
D07	-3.796116	0.721205	-5.263576	0.0000
D12	11.06952	1.340831	8.255711	0.0000

D13	-2.846545	1.316469	-2.162257	0.0306
D15	-10.05306	1.349795	-7.447844	0.0000

Variance Equation

C	8.74E-06	0.006637	0.001317	0.9989
RESID(-1)^2	3.071451	1.403309	2.188720	0.0286
GARCH(-1)	-0.001670	0.047055	-0.035482	0.9717

R-squared	0.990745	Mean dependent var	5.255435
Adjusted R-squared	0.986473	S.D. dependent var	32.17547
S.E. of regression	3.742200	Akaike info criterion	4.798257
Sum squared resid	546.1584	Schwarz criterion	5.579804
Log likelihood	-117.1494	Hannan-Quinn criter.	5.102685
Durbin-Watson stat	1.832006		

EQUATION 66

RUBLE TO DOLLAR EXCHANGE RATE INDEX

Dependent Variable: DDOLLAR

Method: Least Squares

Date: 08/21/17 Time: 16:54

Sample (adjusted): 2001Q3 2016Q4

Included observations: 62 after adjustments

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DDOLLAR(-2)	-0.155627	0.047514	-3.275367	0.0022
DDOLLAR(-3)	0.404735	0.056270	7.192784	0.0000
DDOLLAR(-6)	-0.503728	0.078053	-6.453623	0.0000
DDOLLAR(-8)	-0.193076	0.070961	-2.720869	0.0095
DPEXPD	-0.650152	0.123522	-5.263458	0.0000
DPIMD	-2.488544	0.315326	-7.891982	0.0000
DPIMD(-1)	-3.359747	0.261485	-12.84873	0.0000
DPIMD(-4)	3.440256	0.330495	10.40942	0.0000
DPIMD(-5)	3.385792	0.255517	13.25077	0.0000
CAP(-6)	-5.04E-06	9.37E-07	-5.379031	0.0000
CAP(-10)	-3.64E-06	9.47E-07	-3.845604	0.0004
DGD(-1)	0.007876	0.001427	5.519368	0.0000
DGD(-4)	-0.003340	0.001020	-3.275900	0.0021
DTTAXD(-3)	0.004178	0.000560	7.463987	0.0000
DTTAXD(-4)	-0.000966	0.000493	-1.958639	0.0570
DPQD(-1)	-0.001007	0.000228	-4.414513	0.0001
DPQD(-3)	-0.000556	0.000258	-2.153035	0.0372
DPQD(-7)	-0.000261	0.000131	-1.986403	0.0537
DNXD(-5)	-0.002013	0.001048	-1.920594	0.0618

D14	0.653848	0.093869	6.965504	0.0000
D16	-0.616181	0.171686	-3.588991	0.0009
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R-squared	0.958088	Mean dependent var	0.103851	
Adjusted R-squared	0.937643	S.D. dependent var	0.665294	
S.E. of regression	0.166133	Akaike info criterion	-0.488201	
Sum squared resid	1.131605	Schwarz criterion	0.232280	
Log likelihood	36.13424	Hannan-Quinn criter.	-0.205322	
Durbin-Watson stat	1.716625			
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EQUATION 71

THE EXPORT'S INDEX IN CONSTANT PRICES

Dependent Variable: DIND_EXP

Method: ML - ARCH

Date: 08/08/17 Time: 23:01

Sample (adjusted): 2002Q3 2016Q4

Included observations: 58 after adjustments

Convergence achieved after 20 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(33) + C(34)*RESID(-1)^2 + C(35)*GARCH(-1) + C(36)

*DIND_EXP(-8)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DIND_EXP(-1)	-0.549157	0.023322	-23.54655	0.0000
DIND_EXP(-2)	-0.152024	0.023755	-6.399573	0.0000
DIND_EXP(-4)	0.448506	0.036195	12.39153	0.0000
DIND_EXP(-5)	0.702446	0.030021	23.39849	0.0000
DIND_EXP(-8)	0.340434	0.027542	12.36052	0.0000
DPEXPD(-1)	0.061770	0.007935	7.784917	0.0000
DPEXPD(-2)	-0.183976	0.007987	-23.03513	0.0000
DPEXPD(-6)	0.168069	0.012803	13.12723	0.0000
DPEXPD(-10)	0.147681	0.011258	13.11829	0.0000
DIND_Q	0.987937	0.053762	18.37599	0.0000
DIND_Q(-4)	-0.865268	0.075573	-11.44940	0.0000
DIND_Q(-5)	-0.765723	0.092661	-8.263679	0.0000
DIND_QTR(-7)	0.287628	0.043561	6.602926	0.0000
DDOLLAR(-1)	0.009439	0.003334	2.831104	0.0046
DDOLLAR(-5)	0.010909	0.002834	3.849667	0.0001

DDOLLAR(-7)	0.009270	0.002554	3.629808	0.0003
DDOLLARp(-4)	0.415093	0.070431	5.893574	0.0000
DDOLLARp(-12)	-0.494891	0.050766	-9.748496	0.0000
DIND_OECD(-2)	1.081761	0.323127	3.347785	0.0008
DIND_G(-8)	1.313724	0.160380	8.191334	0.0000
DIND_G(-11)	-0.742602	0.080287	-9.249314	0.0000
DIND_G(-12)	-0.942849	0.156242	-6.034545	0.0000
DIND_I(-7)	0.090882	0.012085	7.520128	0.0000
DIND_I(-11)	-0.024405	0.011202	-2.178668	0.0294
DIND_C(-8)	-0.367711	0.039192	-9.382350	0.0000
DPENPEXPEN(-1)	-0.355213	0.038833	-9.147295	0.0000
DINTAXINPEXP(-8)	-0.000730	0.000223	-3.272655	0.0011
DINTAXINPEXP(-9)	-0.000690	0.000246	-2.808574	0.0050
DTARIFPEXP(-2)	0.074448	0.024209	3.075191	0.0021
DTARIFPEXP (-6)	0.174588	0.020443	8.540182	0.0000
DTARIFPEXP (-10)	0.091153	0.028936	3.150140	0.0016
DTARIFPEXP (-12)	0.119202	0.016729	7.125371	0.0000

Variance Equation

C	2.80E-05	3.05E-06	9.170949	0.0000
RESID(-1)^2	0.191180	0.085121	2.245974	0.0247
GARCH(-1)	0.631382	0.100759	6.266278	0.0000
DIND_EXP(-8)	-0.000344	3.37E-06	-102.0909	0.0000

R-squared	0.995712	Mean dependent var	0.022898
Adjusted R-squared	0.990598	S.D. dependent var	0.190028
S.E. of regression	0.018426	Akaike info criterion	-5.167144
Sum squared resid	0.008827	Schwarz criterion	-3.888249
Log likelihood	185.8472	Hannan-Quinn criter.	-4.668989
Durbin-Watson stat	2.530383		

EQUATION 75

THE SHARE OF OIL & GAS EXPORT IN TOTAL EXPORT'S VOLUME

Dependent Variable: DSEXPEN

Method: ML - ARCH

Date: 08/09/17 Time: 18:12

Sample (adjusted): 2002Q2 2016Q4

Included observations: 59 after adjustments

Convergence achieved after 9 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(20) + C(21)*RESID(-1)^2 + C(22)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DSEXPEN(-1)	-0.515735	0.027946	-18.45440	0.0000
DSEXPEN(-4)	0.071393	0.027056	2.638719	0.0083
DSEXPEN(-11)	-0.089205	0.040509	-2.202115	0.0277
DPEXPENPEXP	0.051491	0.005003	10.29220	0.0000
DPEXPENPEXP(-1)	0.053769	0.008631	6.229704	0.0000
DPEXPENPEXP(-2)	0.104256	0.005956	17.50526	0.0000
DPEXPENPEXP(-3)	0.088702	0.005762	15.39519	0.0000
DPEXPENPEXP(-8)	0.097425	0.008436	11.54889	0.0000
DPEXPENPEXP(-9)	0.039350	0.005099	7.717692	0.0000
DSINTAXIN(-8)	-0.132802	0.017147	-7.744724	0.0000
DDOLLAR	0.025317	0.001849	13.68840	0.0000
DDOLLAR(-1)	-0.036175	0.002165	-16.70850	0.0000
DIND_QTR(-6)	0.161886	0.023685	6.835053	0.0000
DPENPEXPEN(-1)	-0.206476	0.026760	-7.715830	0.0000
DPENPEXPEN(-8)	0.402501	0.033069	12.17141	0.0000
DPENPEXPEN(-12)	0.102891	0.021263	4.839026	0.0000

DIND_G(-1)	-0.636682	0.065209	-9.763667	0.0000
DIND_I(-2)	-0.029585	0.009074	-3.260553	0.0011
DIND_I(-6)	0.043255	0.008757	4.939535	0.0000

Variance Equation

C	9.97E-05	9.14E-07	109.0361	0.0000
RESID(-1)^2	-0.371464	0.115196	-3.224630	0.0013
GARCH(-1)	0.730267	0.141030	5.178111	0.0000

R-squared	0.905619	Mean dependent var	-0.000733
Adjusted R-squared	0.863147	S.D. dependent var	0.041408
S.E. of regression	0.015319	Akaike info criterion	-5.384952
Sum squared resid	0.009386	Schwarz criterion	-4.610277
Log likelihood	180.8561	Hannan-Quinn criter.	-5.082550
Durbin-Watson stat	2.657070		

EQUATION 79

THE IMPORT'S INDEX IN CONSTANT PRICES

Dependent Variable: DIND_IMP

Method: ML - ARCH

Date: 09/15/17 Time: 13:04

Sample (adjusted): 2002Q1 2016Q4

Included observations: 60 after adjustments

Convergence achieved after 178 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(27) + C(28)*RESID(-1)^2 + C(29)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DIND_IMP(-1)	-0.396468	0.024076	-16.46736	0.0000
DIND_IMP(-2)	-0.755924	0.022595	-33.45543	0.0000
DIND_IMP(-3)	-0.587021	0.016938	-34.65724	0.0000
DIND_IMP(-5)	-0.178343	0.021571	-8.267688	0.0000
DIND_IMP(-7)	-0.214890	0.034216	-6.280464	0.0000
DIND_IMP(-9)	-0.419928	0.019153	-21.92469	0.0000
DIND_IMP(-11)	0.171341	0.032653	5.247303	0.0000
DIND_I(-6)	-0.476092	0.033908	-14.04049	0.0000
DIND_C	2.907422	0.204852	14.19279	0.0000
DIND_C(-1)	3.368233	0.144193	23.35918	0.0000
DIND_C(-2)	4.471689	0.201039	22.24294	0.0000
DIND_C(-3)	2.199086	0.119976	18.32934	0.0000
DIND_C(-11)	-2.947342	0.292178	-10.08748	0.0000
DDOLLAR	-0.058745	0.009348	-6.284373	0.0000
DDOLLAR(-7)	-0.106050	0.012804	-8.282293	0.0000

DIND_QTR(-9)	1.169252	0.228668	5.113320	0.0000
DIND_QNON(-7)	-2.199054	0.336026	-6.544296	0.0000
CAP	4.59E-06	3.91E-07	11.74605	0.0000
CAP(-1)	3.88E-06	5.32E-07	7.283987	0.0000
CAP(-5)	-1.86E-06	2.58E-07	-7.216280	0.0000
CAP(-9)	-2.75E-06	4.41E-07	-6.227178	0.0000
DSG	-5.316769	0.819229	-6.489966	0.0000
DSG(-2)	-3.900510	0.822643	-4.741439	0.0000
D08	0.193472	0.022109	8.750671	0.0000
D13	-0.238284	0.031656	-7.527347	0.0000
D15	0.151870	0.038813	3.912827	0.0001

Variance Equation

C	1.70E-05	3.48E-05	0.486930	0.6263
RESID(-1)^2	0.812678	0.328266	2.475674	0.0133
GARCH(-1)	0.282529	0.134910	2.094212	0.0362

R-squared	0.995867	Mean dependent var	0.069325
Adjusted R-squared	0.992828	S.D. dependent var	1.301700
S.E. of regression	0.110237	Akaike info criterion	-1.598292
Sum squared resid	0.413171	Schwarz criterion	-0.586025
Log likelihood	76.94876	Hannan-Quinn criter.	-1.202339
Durbin-Watson stat	2.003865		

EQUATION 97
THE MONEY MASS

Dependent Variable: DM

Method: ML - ARCH

Date: 08/23/17 Time: 20:12

Sample (adjusted): 2004Q1 2016Q4

Included observations: 52 after adjustments

Failure to improve Likelihood after 30 iterations

Bollerslev-Wooldridge robust standard errors & covariance

Presample variance: backcast (parameter = 0.7)

GARCH = C(26) + C(27)*RESID(-1)^2 + C(28)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
DM(-1)	0.183537	0.016802	10.92333	0.0000
DM(-4)	-0.059638	0.028601	-2.085130	0.0371
DM(-7)	-0.283345	0.027888	-10.16001	0.0000
DM(-12)	0.478259	0.066185	7.226073	0.0000
DMB	0.294158	0.042671	6.893585	0.0000
DMB(-4)	0.345048	0.043354	7.958928	0.0000
DPQ(-2)	0.154363	0.028174	5.478975	0.0000
DPQ(-8)	0.452086	0.029789	15.17631	0.0000
DPQ(-10)	-0.235134	0.027460	-8.562710	0.0000
DPQ(-11)	0.082791	0.030560	2.709168	0.0067
DPQ(-12)	-0.445010	0.054353	-8.187406	0.0000
DDEPCB(-6)	-0.237049	0.024004	-9.875523	0.0000
DDEPCB(-11)	0.425587	0.032235	13.20257	0.0000
CAP	0.014094	0.000332	42.44810	0.0000
CAP(-8)	-0.002457	0.000716	-3.432111	0.0006
DDEF(-2)	-0.309767	0.052114	-5.944057	0.0000

DDEF(-4)	0.334971	0.037919	8.833964	0.0000
DDEF(-8)	-0.160021	0.050187	-3.188515	0.0014
DDEF(-9)	0.295569	0.033939	8.708904	0.0000
DDEF(-11)	-0.513640	0.064036	-8.021116	0.0000
DDOLLAR(-5)	-151.4254	24.54642	-6.168939	0.0000
DDOLLAR(-12)	-290.3279	45.42209	-6.391778	0.0000
T	8.136930	0.618554	13.15475	0.0000
D09	141.0281	32.35018	4.359423	0.0000
D16	-333.3865	38.22881	-8.720818	0.0000

Variance Equation

C	5628.636	1341.755	4.194979	0.0000
RESID(-1)^2	0.750135	0.243589	3.079515	0.0021
GARCH(-1)	-0.121684	0.066113	-1.840547	0.0657

R-squared	0.990667	Mean dependent var	677.0231
Adjusted R-squared	0.982372	S.D. dependent var	1003.137
S.E. of regression	133.1880	Akaike info criterion	12.73816
Sum squared resid	478954.1	Schwarz criterion	13.78883
Log likelihood	-303.1921	Hannan-Quinn criter.	13.14096
Durbin-Watson stat	2.163253		

EQUATION 98

THE ENERGY PRICES' INDEX

Dependent Variable: PENP

Method: Least Squares

Date: 07/06/17 Time: 19:29

Sample (adjusted): 2001Q4 2016Q4

Included observations: 61 after adjustments

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed

bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PENP(-1)	0.723476	0.040979	17.65465	0.0000
PENP(-4)	0.509051	0.037820	13.46000	0.0000
PENP(-5)	-0.561785	0.030010	-18.72018	0.0000
PENP(-6)	0.221191	0.027144	8.148797	0.0000
PEXPENP(-6)	-0.030446	0.005624	-5.413555	0.0000
PEXPENP(-8)	0.025534	0.004138	6.171213	0.0000
PEXPENP(-11)	-0.011438	0.004111	-2.782406	0.0080
TARIFP	0.192056	0.016708	11.49475	0.0000
IND_QTR(-9)	-0.074104	0.013410	-5.525982	0.0000
IND_EXPEN(-1)	0.013062	0.003296	3.962646	0.0003
IND_EXPEN(-4)	0.017902	0.005694	3.143945	0.0031
IND_EXPEN(-10)	-0.021214	0.005053	-4.198283	0.0001
DOLLARP(-10)	-0.039149	0.010182	-3.845053	0.0004
GP	0.001300	0.000243	5.359211	0.0000
GP(-1)	-0.000430	0.000221	-1.941361	0.0589
GP(-4)	-0.000659	0.000182	-3.626219	0.0008
GP(-9)	-0.000294	0.000171	-1.715569	0.0936
D10	-0.020938	0.003937	-5.317921	0.0000

D15	0.016476	0.004142	3.978119	0.0003
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R-squared	0.991316	Mean dependent var	0.502713	
Adjusted R-squared	0.987595	S.D. dependent var	0.060230	
S.E. of regression	0.006708	Akaike info criterion	-6.921152	
Sum squared resid	0.001890	Schwarz criterion	-6.263667	
Log likelihood	230.0951	Hannan-Quinn criter.	-6.663478	
Durbin-Watson stat	2.353515			
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APPENDIX 4: THE IMPULSE MULTIPLIERS

Table 4.1

The most significant impulse multipliers (% reaction of the most important endogenous variable on 1 % change of exogenous one): average 2017-19 to average 2014-16

Exogenous / Endogenous	The GDP constant prices index (IND_Q)	The GDP deflator (P)	The gross fixed capital formation constant prices index (IND_I)
Economically active population (N)	+1,16	-0,29	+0,42
Export prices – the dollar index (PEXPD)	-0,01	+0,24	+0,07
Import prices – the dollar index (PIMD)	+0,01	+0,07	+0,05
The government purchases constant prices index (IND_G)	+0,03	-0,04	+0,04
The government purchases deflator (PG)	-0,24	+0,26	-0,32
The monetary base (MB)	+0,03	+0,02	+0,07

APPENDIX 5: FORECASTS

Table 5.1

ZERO VARIANT (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-0,8 %	-1,0 %
The GDP deflator (P)	+5,8 %	+3,7 %	+3,4 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+5,4 %	+1,9 %

Table 5.2

THE BASIC VARIANT (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-2,0 %	-2,3 %
The GDP deflator (P)	+5,8 %	+7,7 %	+7,0 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+4,4 %	+1,3 %

Table 5.3

VARIANT1: rapid increase of export prices (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-2,2 %	-2,7 %
The GDP deflator (P)	+5,8 %	+10,9 %	+11,7 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+4,3 %	+1,9 %

Table 5.4

VARIANT2: aggressive monetary policy (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-1,2 %	-1,3 %
The GDP deflator (P)	+5,8 %	+7,8 %	+7,7 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+5,8 %	+3,7 %

Table 5.5

VARIANT3: freezing the prices for government services (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-0,6 %	-0,6 %
The GDP deflator (P)	+5,8 %	+6,3 %	+5,0 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+6,2 %	+3,6 %

Table 5.6

VARIANT4: radical tax rate reduction (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-1,6 %	-2,3 %
The GDP deflator (P)	+5,8 %	+7,3 %	+7,0 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+1,0 %	-1,3 %

Table 5.7

VARIANT5: import prices reduction (average annual rates of growth, %)

	Fact	Forecast	Forecast
	2015 - 2016	2017 - 2018	2017 - 2019
The GDP constant prices index (IND_Q)	-1,5 %	-2,1 %	-2,4 %
The GDP deflator (P)	+5,8 %	+7,5 %	+6,6 %
The gross fixed capital formation constant prices index (IND_I)	-5,9 %	+4,2 %	+1,1 %