# 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.

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[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.

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[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.

## 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 budge 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

**WL:** Total gross wages paid in non-tradable sector

**$\varepsilon_K$:** Elasticity of GDP on fixed capital

**$\varepsilon_L$:** 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

**LKL** = LN(K/L)

**LQL** = LN(IND_Q/L)

**MCN** = NMRK x CT

**MN** = NMRK x NROK

**NMRLW** = NMRL – W

**P** <u>after</u> each variable means that variable is deflated by the GDP deflator

**PEXP** <u>after</u> each variable means that variable is deflated by export prices' index

**PIM** <u>after</u> each variable means that variable is deflated by import prices' index

**RATE** before symbol means annual rate of the variable: RATE_VAR = (VAR – VAR(-4))/VAR(-4)

**S** <u>before</u> symbol means the share of this variable in the GDP

**T:** time trend

**APPENDIX 2**

**LIST OF MODEL EQUATIONS & IDENTITIES**

$$K = f_K(I, DI, AMORT) \tag{1}$$

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

$$KNON = K - KTR \tag{3}$$

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

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

$$LNON = L - LTR \tag{6}$$

$$IND\_Q = f_Q(K, L, IMP, DI, MIACR,$$
$$TTAX, IND\_AD, M, TARIF, CT,$$
$$ROK, SOCG, CAP, P, PEN) \tag{7}$$

$$IND\_QTR = f_{QTR}(KTR, LTR, IMP, DI,$$
$$MIACR, TTAX, IND\_QNON, M,$$
$$TARIF, AMORTTR, P) \tag{8}$$

$$IND\_QNON = \frac{IND\_Q - SPQTR \times IND\_QTR}{1 - SPQTR} \tag{9}$$

$$P = f_P(MB, IND\_Q, PG, PEXPD, PIMD,$$
$$TARIF, DOLLAR, S, DEF, PEN) \tag{10}$$

$$PTR = f_{PTR}(P, PNON, M, IND\_QNON,$$
$$PEXPD, TARIF, PEN, CAP) \tag{11}$$

$$PQ = P \times IND\_Q \tag{12}$$

$$PQTR = PTR \times IND\_QTR \tag{13}$$

$$PQNON = PQ - PQTR \tag{14}$$

$$PNON = PQNON / IND\_QNON \tag{15}$$

$$\varepsilon_K = \frac{\partial(IND\_Q)}{\partial K} \frac{K}{IND\_Q} \tag{16}$$

$$\varepsilon_L = \frac{\partial(IND\_Q)}{\partial L} \frac{L}{IND\_Q} \tag{17}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$C = IND\_C \times CPI \quad (35)$$

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

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

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

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

$$NMRKTR =$$
$$\varepsilon_{KTR} \frac{PQTR - INTAXTR - PTAXTR - NATTAX}{KTR} \tag{40}$$

$$\varepsilon_{KTR} = \frac{\partial(IND\_QTR)}{\partial KTR} \frac{KTR}{IND\_QTR} \tag{41}$$

$$ROK = PQ - WL - INTAX \tag{42}$$

$$ROKTR = PQTR - WLTR - INTAXTR \tag{43}$$

$$NROK = ROK - PTAX - NATTAX \tag{44}$$

$$NROKTR = ROKTR - PTAXTR - NATTAX \tag{45}$$

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

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

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

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

$$DI = f_{DI}(P, DOLLAR, PIMD, PG,$$
$$INTAX, M, IMPDUT, TARIF, PEN, \tag{50}$$
$$AMORT, NX, IND\_Q, IND\_QTR)$$

$$IND\_I = I / DI \tag{51}$$

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

$$DEPRF = f_{DEPRF}(M, DEPCB, DOLLAR,$$
$$TRANSFER, IND\_Q, MIACR, G, P) \tag{53}$$

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

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

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

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

$$DEP = DEPR + DEPV \qquad (58)$$

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

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

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

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

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

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

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

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

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

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

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

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

$$IND\_EXP = f_{IND\_EXP}(PEXPD, PEXP, P, \\ DOLLAR, PEN, IND\_Q, IND\_C, \\ IND\_I, IND\_G, INTAXIN, TARIF, \\ IND\_QTR) \qquad (71)$$

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

$$EXP = IND\_EXP \times PEXP \qquad (73)$$

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

$$SEXPEN = f_{SEXPEN}(PEXPEN, PEXP, \\ INTAXIN, EXP, DOLLAR, IND\_QTR, \\ PEN, IND\_G, IND\_I) \qquad (75)$$

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

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

$$IND \_ EXPO = EXPO \ / \ PEXPO \qquad (78)$$

$$IND \_ IMP = f_{IND \_ IMP}(IND \_ QTR,$$
$$IND \_ QNON, IND \_ I, IND \_ C, \qquad (79)$$
$$DOLLAR, CAP, G, PQ)$$

$$IMP = IND \_ IMP \times PIM \qquad (80)$$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$G = IND \_ G \times PG \qquad (94)$$

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

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

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

$$PEN = f_{PEN}(P, PEXPEN, TARIF, G,$$
$$IND\_QTR, IND\_EXPEN, DOLLAR) \tag{98}$$

$$IND\_AD =$$
$$\frac{IND\_C^{SC} IND\_I^{SI} IND\_G^{SG} IND\_EXP^{SEXP}}{IND\_IMP^{SIMP}} \tag{99}$$

$$SC = C / PQ \tag{100}$$

$$SI = I / PQ \tag{101}$$

$$SG = G / PQ \tag{102}$$

$$SEXP = EXP / PQ \tag{103}$$

$$SIMP = IMP / PQ \tag{104}$$

$$S = PQ - C - I - G - NX \tag{105}$$

$$AMORT = 1 + \frac{4I_t}{K_{t-1}(1 + RATE\_DI_t)} - \frac{K_t}{K_{t-1}(1 + RATE\_DI)} \tag{106}$$

$$AMORTTR = 1 + \frac{4ITR_t}{KTR_{t-1}(1 + RATE\_DI_t)} - \frac{KTR_t}{KTR_{t-1}(1 + RATE\_DI)} \tag{107}$$

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 |

| | 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 |

| | | | |
|---|---|---|---|
| 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 | | |

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 |
| DINCOMECPI | 0.000473 | 0.000162 | 2.914091 | 0.0059 |
| DINCOMECPI(-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 |

| | | | |
|--------------------|----------|----------------------|-----------|
| 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 | | |

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 | | |

## 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 |
| DDEFP(-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 |

| | | | |
|---|---|---|---|
| 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 | | |

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 |
| DINCOMEP(-6) | 0.159660 | 0.012897 | 12.38002 | 0.0000 |
| DINCOMEP(-10) | 0.039830 | 0.012169 | 3.273098 | 0.0011 |
| DINCOMEP(-11) | 0.067319 | 0.010832 | 6.214617 | 0.0000 |

| | | | | |
|---|---|---|---|---|
| DINCOMEP(-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 |

| | | | | |
|---|---|---|---|---|
| DINCOMEP | 0.117466 | 0.010117 | 11.61090 | 0.0000 |
| DINCOMEP(-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 | | |

| | | | |
|---|---|---|---|
| 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 |

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 |

| | | | |
|---|---|---|---|
| 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 | | |

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 |

| | | | |
|---|---|---|---|
| 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 | | |

R-squared 0.991316 Mean dependent var 0.502713

Adjusted R-squared 0.987595 S.D. dependent var 0.060230

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 % |