



Discovering the signs of Dutch disease in Russia

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Briefly

- Aim:** to detect Dutch Disease in Russia, i.e. to find out whether excessive oil revenues undermine the growth in manufacturing sector
- Method:** we compare the predictions of the theoretical model by Corden, Neary (1982) to the empirical results
- Results:** we confirm the presence of Dutch Disease in Russia

Outline

- 1) Motivation
- 2) The theoretical model
- 3) Theoretical results VS Empirical evidence
- 4) Conclusions

Outline

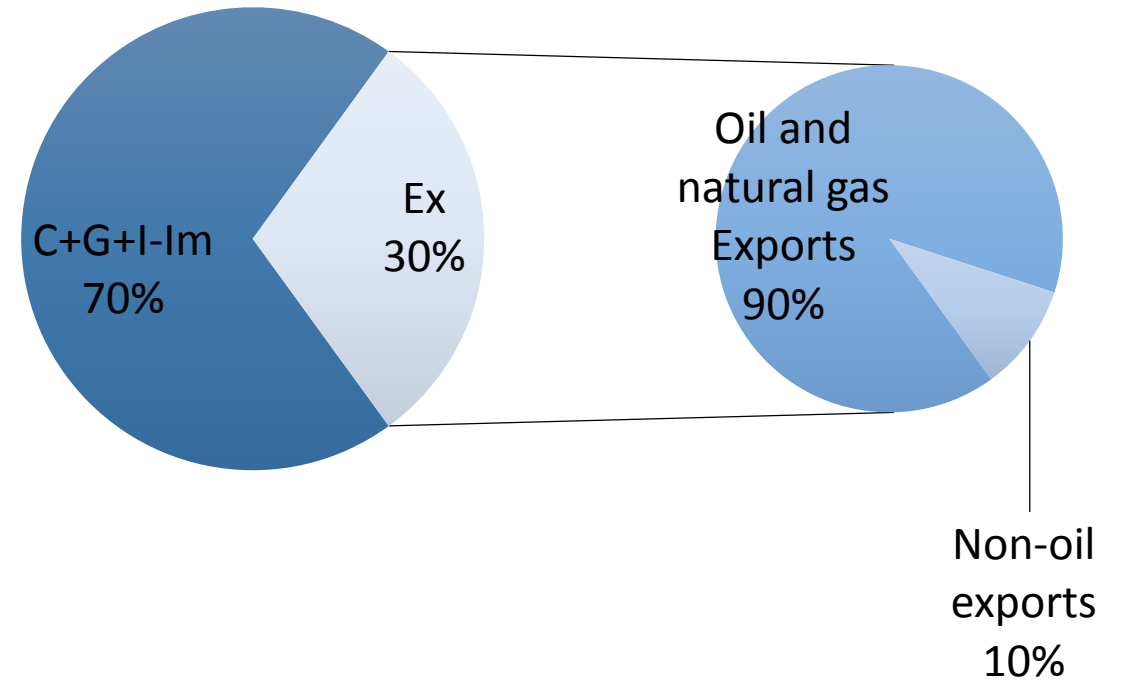
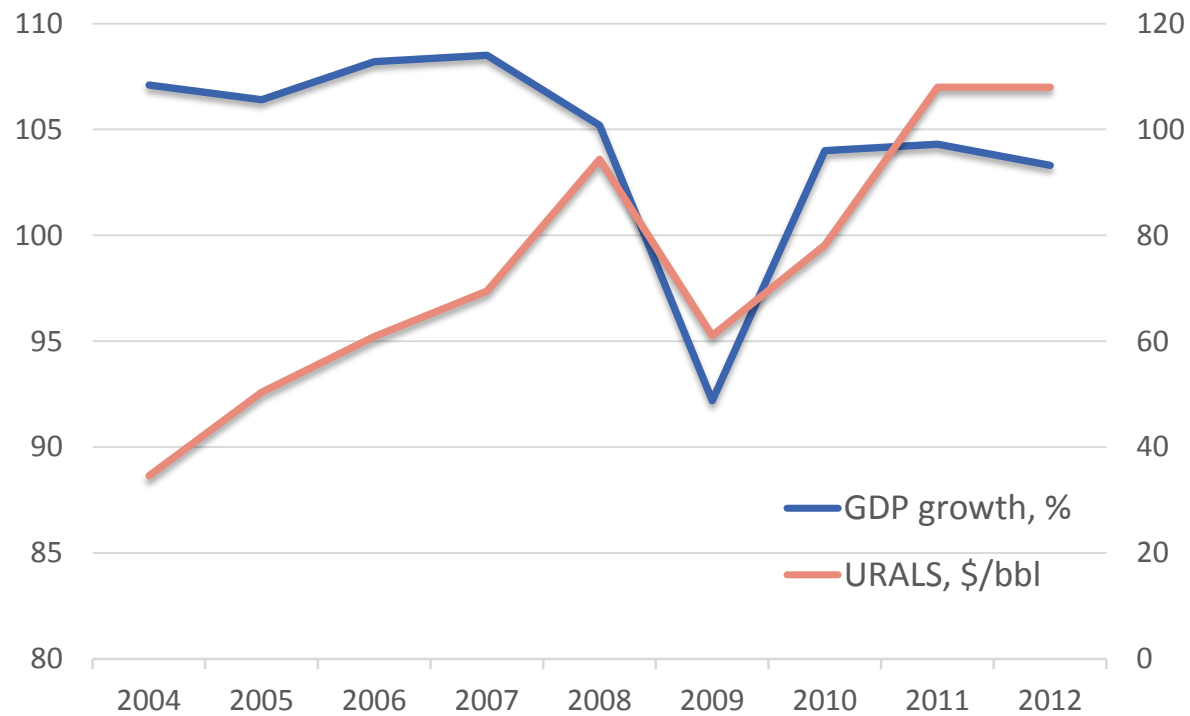
1) Motivation

2) The theoretical model

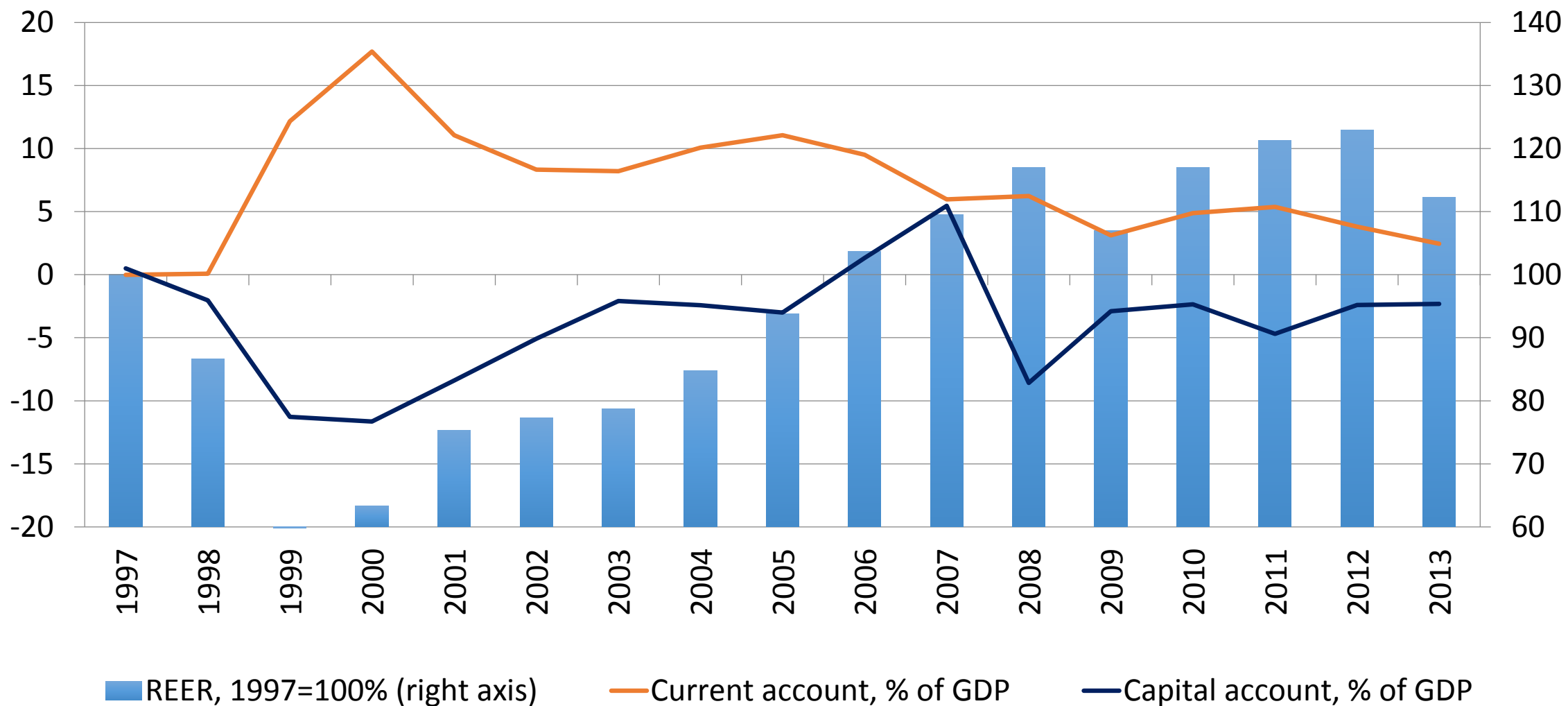
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Russia in 2000s



Russia in 2000s



Russia faces resource curse?

Resource curse: on average, resource-rich economies exhibit lower rates of growth than those that are poorly endowed or without resources.

Reasons:

- corruption;
- excessive debts;
- fluctuations of incomes;
- **appreciation of the national currency exchange rate (Dutch disease);**

Dutch Disease

High inflow of export income leads to a decline in the manufacturing sector

Mechanism:



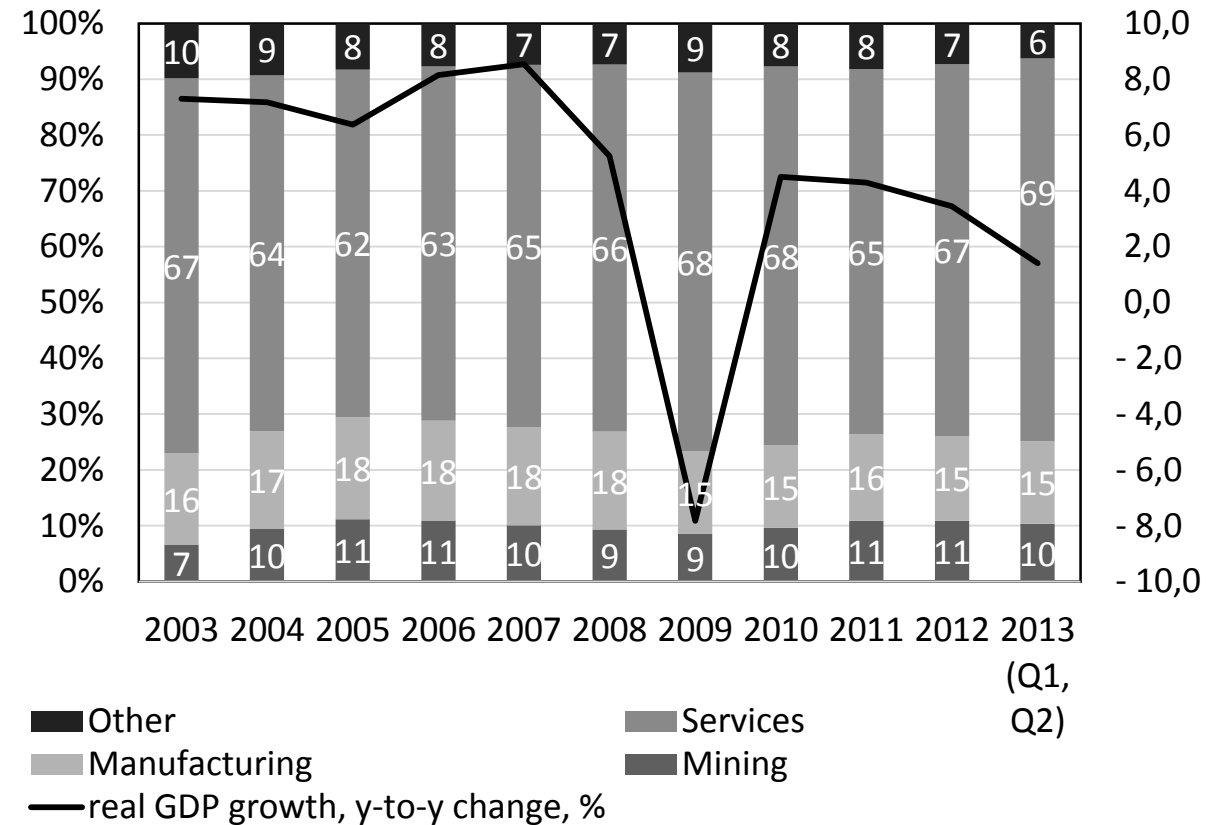
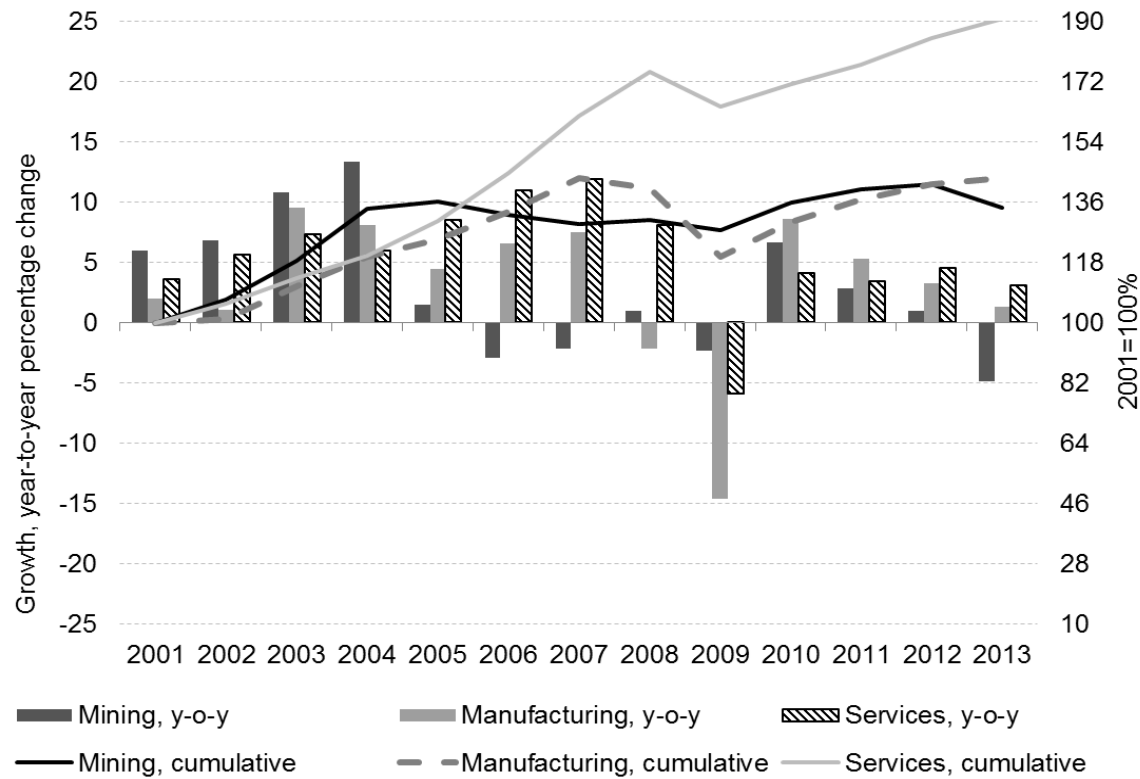
LR outcome:

Deceleration of economic growth in the long run

Other possible causes:

Inflow of loans, foreign aid and fiscal expansion, financing the populism of the government or a rapid increase in military expenditures

Russia in 2000s: the manufacturing sector



The purpose of the paper

To verify the presence of Dutch Disease in the Russian economy

H_0 : Russia is sick with Dutch Disease

H_1 : Russia is sick with something else

- a decline in the price/quality competitiveness of national producers
- or the weakness of institutions
- etc

There is no consensus in the literature:

Accept H_0 : Ahrend et al. (2007), Ollus, Barisitz (2007), Sosunov, Zamulin (2006)

Reject H_0 : van der Marel (2012) , Dobryanskaya, Turkisch (2010),
Oomes, Kalcheva (2007), Beck, Kamps, Mileva (2007)

Our approach

Assuming that H_0 is true (DD exists), we build the theoretical model of DD in Russia (Cordon, Neary (1982))

1. We identify the effects of the oil price rise **theoretically**
2. We estimate these effects **empirically**
3. We compare the theoretical results with empirics
 - H_0 if empirics = theory
 - H_1 if empirics \neq theory

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The model: Corden, Neary (1982)

2 sectors of tradable goods: **manufacturing, mining**

1 sector of non-tradable good: **services**

Only two factors: labor and capital

Prices are formed on the local market

No monetary variables

No government

Flexible labor market (no unemployment)

Real foreign exchange rate is the ratio of prices for non-tradable to tradable goods

Oil price boom – REER appreciation

Assumptions for Russia:

- Mobile labor, partly mobile capital
- Labor intensiveness:

$$\text{MAN} > \text{MIN} > \text{SERV}$$

We calibrate the model for Russia

2 theoretical effects of the oil price boom in Russia

1. Resource movement effect (RM)

- L moves to the mining sector
- Manufacturing is crowded out by services: **direct de-industrialization**

2. Spending effect (S)

- Rise in demand for services
- Prices for services rise -> REER appreciates
- manufacturing is crowded-out again: **indirect de-industrialization**

The theoretical consequences of Dutch disease

| | Manufacturing | | | Services | | | Mining | | |
|--------------------|---------------|---------|---------|----------|---------|--------|--------|---------|--------|
| Effects | RM | S | Total | RM | S | Total | RM | S | Total |
| Output | decline | decline | decline | growth | growth | growth | growth | growth | growth |
| Employment | decline | NA | decline | growth | growth | growth | growth | NA | growth |
| Wages | growth | decline | NA | growth | decline | NA | growth | decline | NA |
| Returns on capital | decline | growth | NA | decline | growth | NA | growth | growth | growth |

| | |
|--|---------|
| | decline |
| | NA |
| | growth |

1. de-industrialization of the economy
2. transformation of labor market
3. real wages remain neutral
4. heterogeneous returns on capital in different sectors, the highest in mining

Do we observe these consequences in the data?

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Oil price and REER

We assume that the oil price affects the economy through the REER

We have found that the link between oil price and REER is indeed positive and significant

The impact of REER

We estimate

- the total impact of REER
- the Resource Movement, Spending effects on the output growth, employment, wages and returns on capital in three sectors.

These effects are captured by the variables:

- L_SERV, L_MAN, L_MIN – resource movement effect
- INCOME_POP – spending effect
- @PC(CAP) – capital accumulation effect

We also control for the transition to the market structure:

- SG – share of labor employed in the state-owned organizations

Few observations, very parsimonious models

Impact of REER #1: output growth rates

Manufacturing:

$$Y = 14,45 - 0,29 * REER - 6,519 * @PC(SG) + 0,24 * @PC(CAP)$$

Mining:

$$Y = 0,019 * @PC(REER)$$

Services:

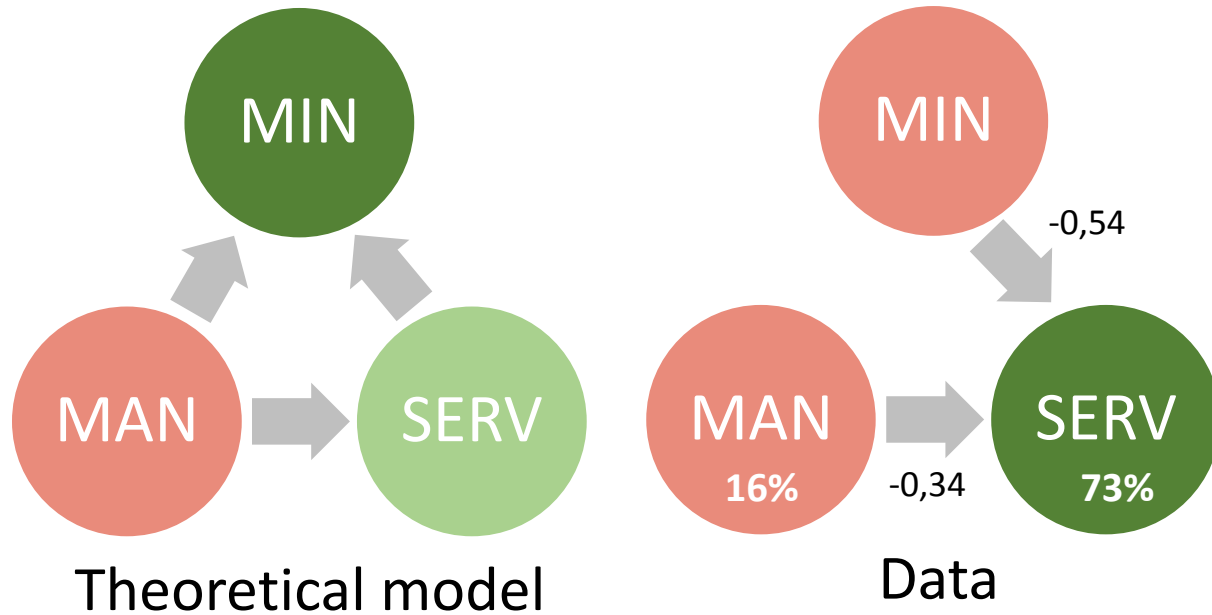
$$Y = 3,10 + 0,46 * @PC(REER) + 0,19 * @PC(CAP)$$

CAP – capital accumulation, not taken into consideration in the CN model

Impact of REER #2: labor market

The impact of REER is significant in services only:

$$L = 0,16 * @PC(REER)$$



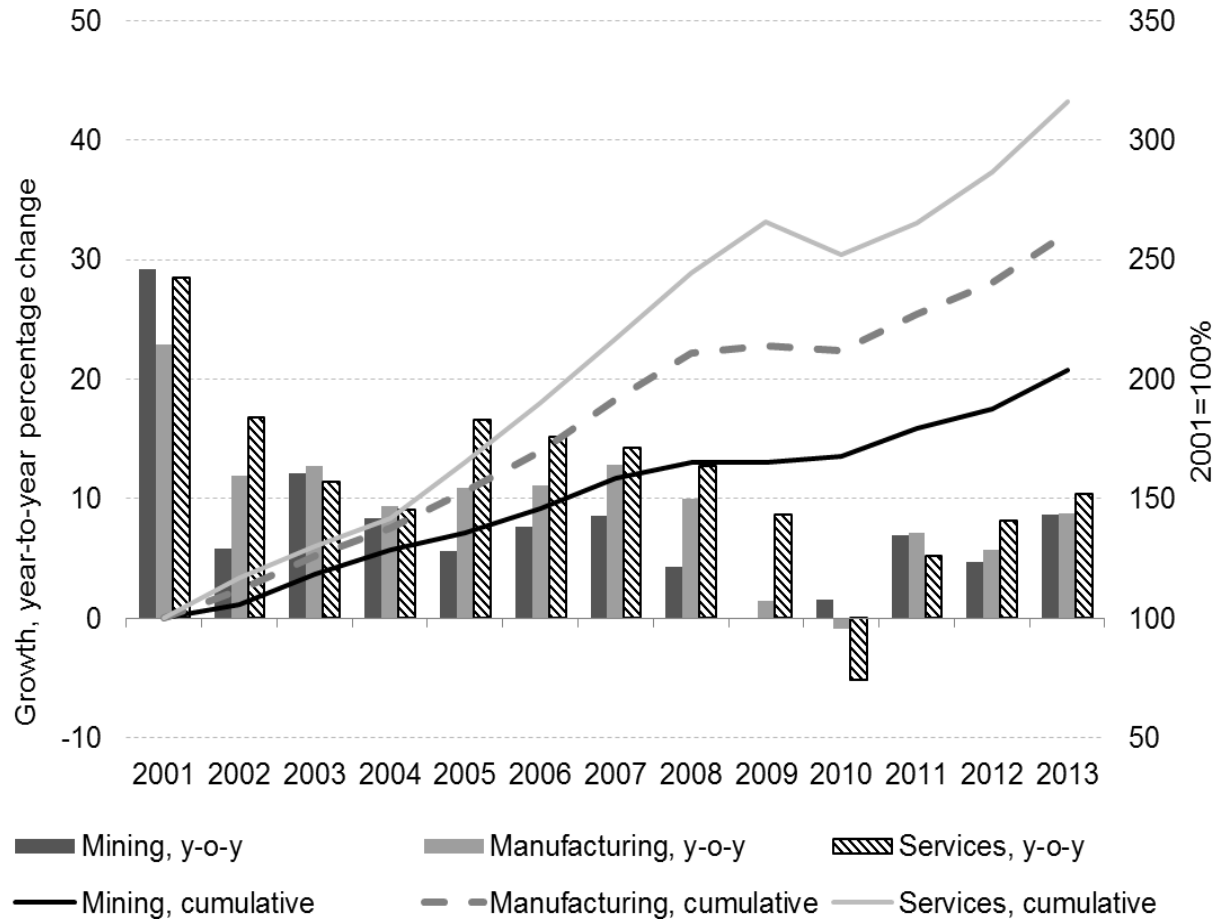
Resource movement effect:

shift from MAN to SERV

shift from MIN to SERV (Unexpected)

- Downsizing in MIN
- Changes in the structures of large mining companies

Impact of REER #3: wages

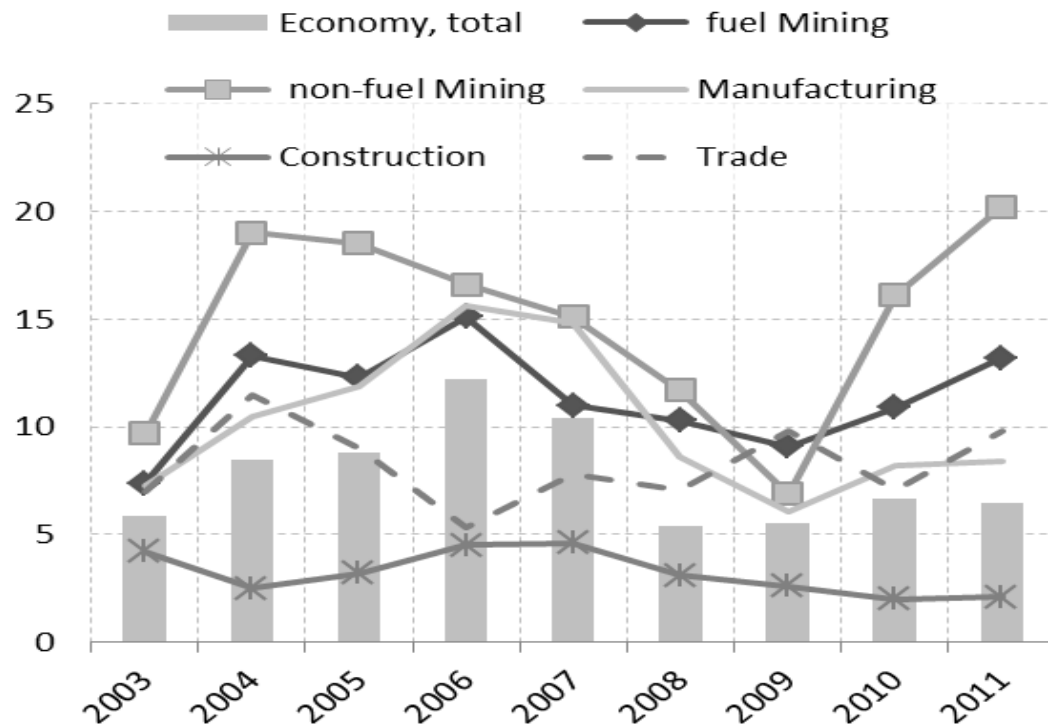


- Instead of moderate or zero growth real wages increased twice or threefold
- the REER elasticity is **0,3** in MIN, **0,5** in MAN, **0,9** in SERV - wages include oil revenues

Other reasons:

- 1) paternalistic behavior of the government
SG coefficient for services is very high!
- 2) rejection of grey schemes?

Impact of REER #4: returns on capital



Positive dependence of REER in all sectors, though not very significant

- The impact might be more clear after 2008
- the mining of non-fuel minerals is leading due to the more advantageous taxation
- Manufacturing is behind

Theoretical vs Empirical results

Theoretical results

| Effects | Manufacturing | | | Services | | | Mining | | |
|--------------------|---------------|---------|---------|----------|---------|--------|--------|---------|--------|
| | RM | S | Total | RM | S | Total | RM | S | Total |
| Output | decline | decline | decline | growth | growth | growth | growth | growth | growth |
| Employment | decline | NA | decline | NA | growth | growth | growth | NA | growth |
| Wages | growth | decline | NA | growth | decline | NA | growth | decline | NA |
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Theoretical vs Empirical results

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Conclusions

The observed indicators in general follow the theory, after consideration of the peculiarities of Russian statistical compilation, political life, fiscal conditions and investment climate.

Main arguments:

- 1) The labor shifts towards the service sector
- 2) The influence of REER on the manufacturing output is negative
- 3) The manufacturing sector tends to shrink and is relatively small
- 4) The returns on capital is the smallest in manufacturing

We can not reject the presence of Dutch disease in Russia

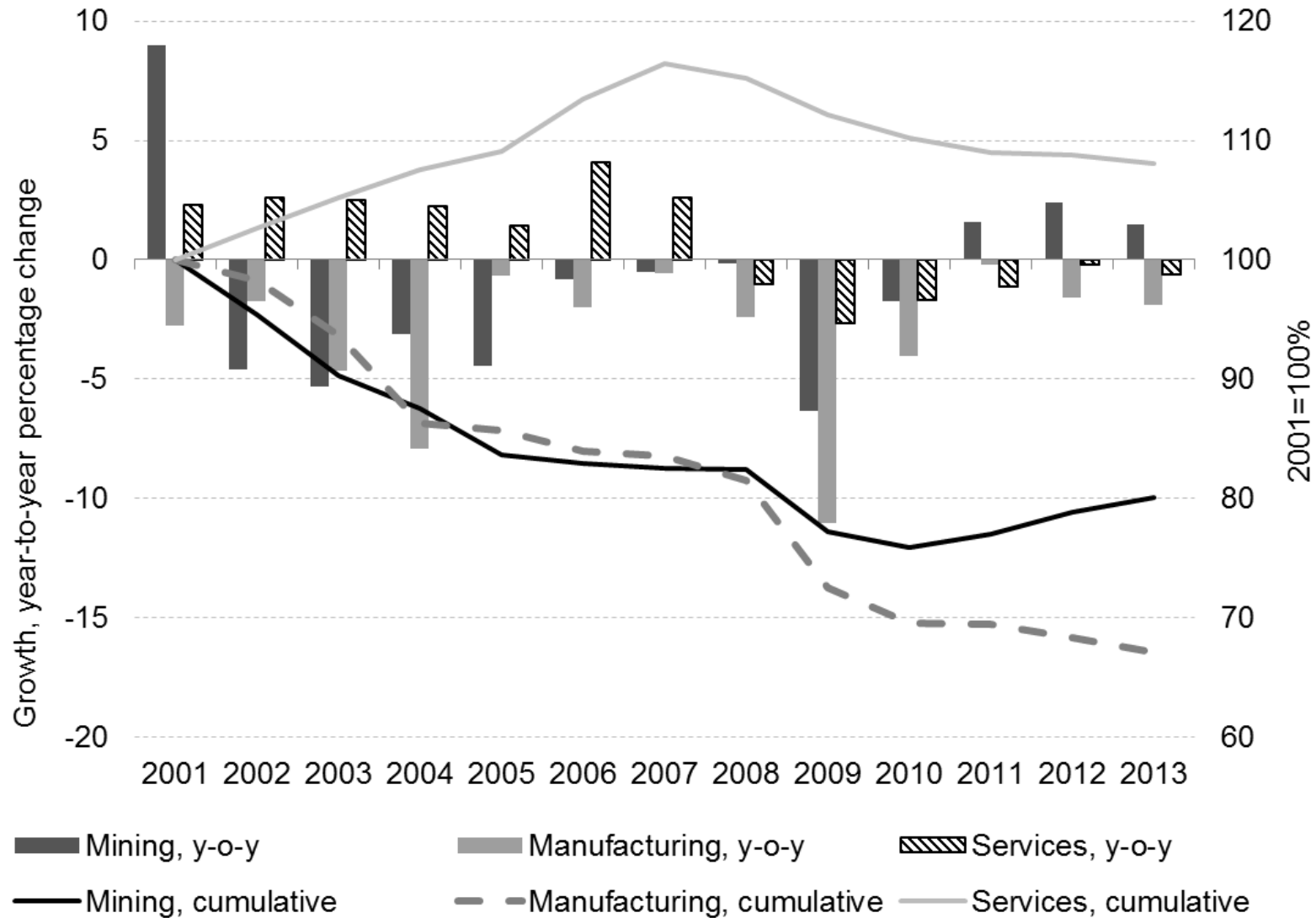
Further directions of study

- Robustness check
- Effects of movement of capital

- Switch to inflation targeting – in order to decrease the costs
- Diversification of the economy
- Get rid of other problems of the “resource curse”: corruption, institutional quality

Thank you

Impact of REER #2: labor market



Specification for Russia

- Complete mobility of labor
- Partly limited inter-sector mobility of capital
- Capital intensity: highest in energy, less in services, the least in manufacturing

I. Does the oil price affect REER?

Cointegration model

$$\text{REER} = a_1 * \log(\text{URL}) + a_2 * \log(\text{URL} * \text{Q}) + a_3 * \text{Log}(\text{EXPG}) + a_4 * \text{Log}(\text{ZVR}) + a_5 * \text{dummy 1998} + a_6 * \text{dummy 2009}$$

REER – Real effective Exchange rate

URL - price for Urals oil

Q – quantity of oil exported

EXPG – government expenditures

ZVR – Central Bank reserves

| | Model (1) | Model (2) | Model (3) |
|--------------------------------|---------------|---------------|---------------|
| First observation | January 1997 | May 1997 | February 2005 |
| Last observation | April 2013 | January 2005 | April 2013 |
| Number of observations | 192 | 93 | 99 |
| Log(URL) | 0.2139 | | 0.2424 |
| t-statistics | 2.0806 | | 1.8227 |
| Log(URL*Q) | | 0.1724 | |
| t-statistics | | 3.1947 | |
| Log(EXPG) | 1.1254 | 0.6896 | 1.4664 |
| t-statistics | 20.2964 | 3.5597 | 9.4792 |
| Log(ZVR) | 0.0048 | -0.0249 | -0.2646 |
| t-statistics | 0.0996 | 0.8227 | -2.0461 |
| D1(-1) | -0.1720 | -0.2358 | |
| t-statistics | 2.0656 | 2.8518 | |
| D2(-1) | -0.2504 | | -0.1382 |
| t-statistics | 4.0228 | | -2.1104 |
| Loglikelihood | 1603.748 | 414.3264 | 4313.704 |
| Akaike information criterion | -15.7207 | -7.7059 | -85.3274 |
| Schwartz information criterion | -13.5516 | -6.1809 | -82.9682 |

It does!

We can proceed to the analysis of the impact of REER on the macroeconomic variables

Impact of REER #1: output growth rates

The impact on services is much bigger than on mining

1) Peculiarity of Russian statistics

In fact, part of mining is accounted as services (transport, finance)

2) Foreign Russian economy

in 2012 the outflow of investment – 2.5% GDP

3) Natural limits

4) Transition from the planning economy