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Oil Price, GDP and International Trade. The Case of Germany

by

Bernd Meyer
University of Osnabrück and GWS mbH

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Gesellschaft für Wirtschaftliche Strukturforschung mbH
Heinrichstr. 30 ° D – 49080 Osnabrück
Tel.: + 49 (541) 40933-14 ° Fax: + 49 (541) 40933-11
Email: meyer@gws-os.de ° Internet: www.gws-os.de

1. Introduction: Oil price and GDP

Shock analysis

- Vector autoregressive models:
  - GDP of oil-importing countries is negatively hit by oil price shocks; Darby (1982), Hamilton (1983)
  - Effect is asymmetric; Mork (1989)
  - nonlinear estimations: better results
    Lee et al. (1995), Hammilton (1996), Jimenez–Rodriguez / Sanduez (2005)

- Structural econometric models
  - GDP of oil importing countries is negatively hit by oil price shocks (IEA 2004, 2006)

- differences between countries can be explained by structural differences of their economies.
- positive effects of rising gdps of oil exporting countries are not easy to analyze. Accumulation of surplus stocks. (IEA 2006), (Jimenez-Rodriguez/Sandez 2005)

Effects of a permanent rise of real oil price

- ⇨ not in the focus of the literature, but more realistic for the future:
  - permanent rising oil demand
  - permanent decreasing oil reserves
- ⇨ role of oil exporting countries and connections with international trade easier:
  - $\uparrow p_{oil}$ ➔ $\uparrow GDP_{oil\ exp.}$ ➔ $\uparrow IM_{oil\ exp.}$ ➔ $\uparrow EX_{oil\ imp.}$

Contribution of the paper:

Effects of a permanent rise of the oil price on an oil importing country (Germany) including the international trade effects.

Two channels for trade effects:

- change of goods imports of oil exporting countries induce goods exports of oil importing countries
  - depending from the regional and the goods structure of the exports of the country in question
- change of trade shares
  - depending from the price impact for goods of the rise of the oil price of the countries in question

2. The instruments of the analysis

- **linked system of INFORGE and GINFORS**
  - INFORGE
    - 59 sectors
    - Final demand completely endogenous
    - Primary inputs completely endogenous
    - Input coefficients price dependent
    - Completely endogenous SNA accounting system
    - IO and SNA fully integrated
  - GINFORS
    - 50 countries, 2 regions (OPEC, Rest of the World)
    - Every country with macro – model and energy - model
    - 25 countries with input – output model (41 sectors)
    - Bilateral trade model
      - 25 commodities, 1 service sector
      - Trade shares price dependent

3. The scenario

- **Oil price**

  baseline: rising linearly 75 $ per barrel in 2020

  alternative scenario: rising linearly up to 100 $ in 2010,
  than constant difference to the

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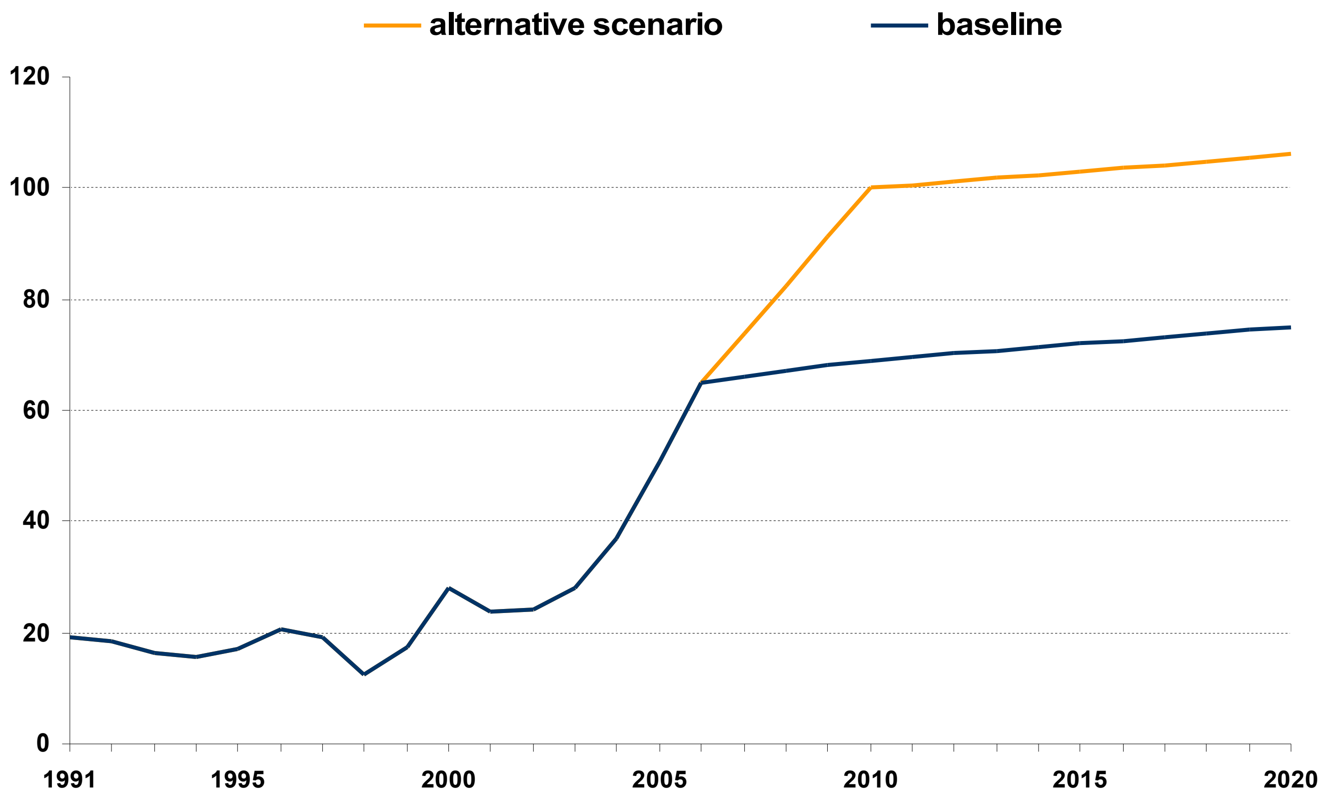
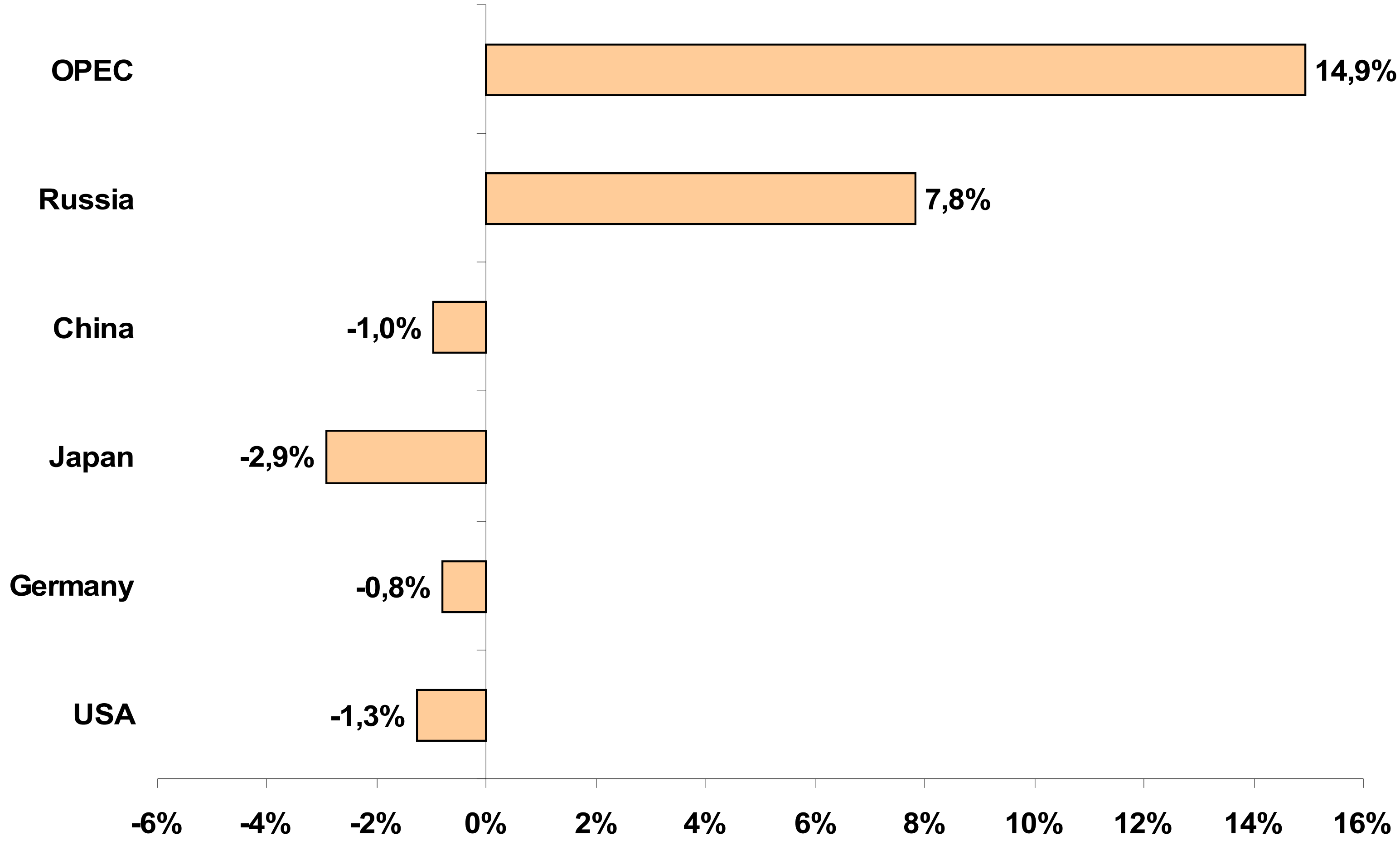


- **Gas price follows the path of the oil price**
- **Behavior of oil and gas exporting countries:**

$\uparrow$ EX $\rightarrow$ $\uparrow$ GDP $\rightarrow$ $\uparrow$ IM

4. The results

- Impact of the rise in oil and gas prices on real GDP of selected countries and regions in the year 2010



Impact of the rise in oil and gas prices on German import prices and deflated exports in the year 2010

Import price index, all goods	+	5,9%
among these:		
Refined petroleum products	+	22,7%
Motor vehicles	+	1,3%
Machinery	+	1,5%
Furniture	+	2,0%
Deflated Exports, all goods	+	0,7%
among these:		
Motor vehicles	+	2,7%
Machinery	+	1,9%

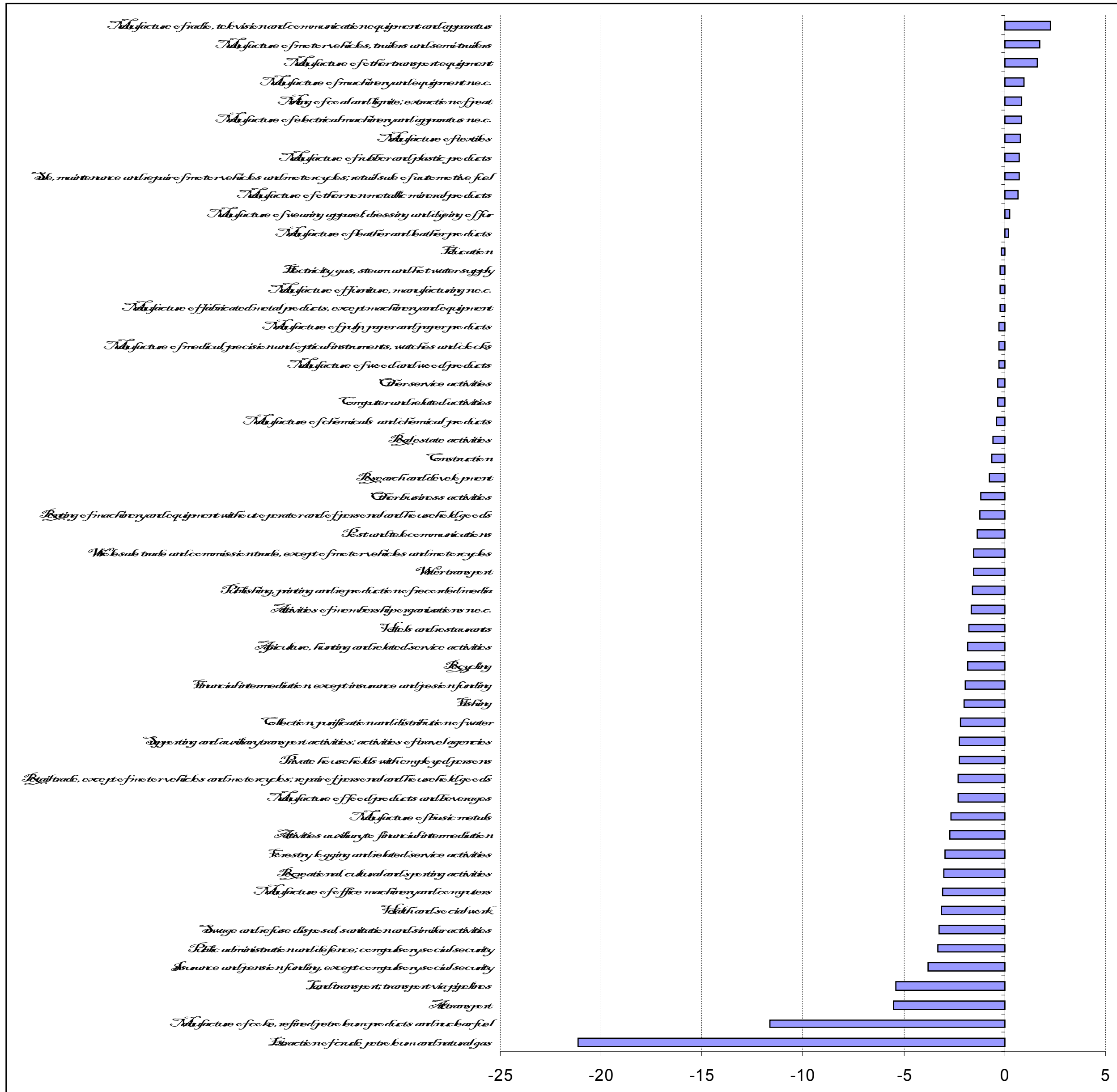
Impact of the rise in oil and gas prices on selected consumer prices in Germany in the year 2010

Consumer price index, all goods	+	2,7%
beneath this:		
Energy (Electricity, gas and other fuels)	+	13,7%
Operation of vehicles	+	10,7%
Transports services	+	9,5%

Macroeconomic effects of the rise in oil and gas prices in Germany

	2010	2020
Deflated gross production	-1,1%	-0,6%
Deflated gross domestic product	-0,8%	-0,1%
Components:		
Final consumption expenditure by households	-2,1%	-1,7%
Final consumption expenditure by government	-1,6%	-1,9%
Gross fixed capital formation: machinery and equipment	-0,6%	-0,8%
Gross fixed capital formation: dwellings, other buildings and structures	-0,9%	-1,0%
Exports	0,7%	1,9%
Imports	-1,4%	-0,6%
Economically active population	- 360.000	- 321.000

- **Impact of the rise in oil and gas prices on deflated production in the German sectors in the year 2010**



5. Conclusions

- **Germany is hit only in the short run negatively by the rise of the oil price, in the long run there is no effect on gdp**
- **But: strong structural divergence: The consumers pay the bill**
- **Impact on producers of consumer goods negative, on producers of investment goods positive.**
- **Reasons:**
  - Germany is a rather energy-efficient economy: Rising trade shares
  - Germany is exporting especially investment goods, rising demand by oil exporting countries.
- **Further research is necessary for other countries!**