The Crisis in the Oil Industry and its Impacts on the Brazilian Macroeconomic Indicators

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SUMMARY

- Overview
- Oil and Gas Industry in Brazil
- Goals
- Methodology
- Results
- Conclusions
OVERVIEW

- Oil and gas exploration and production
  - 2000: 1.5 million BOE/d
  - 2006: beginning of exploration of pre-salt resources
  - 2010: 42,000 barrels per day (pre-salt)
  - 2014: 492,000 barrels per day (pre-salt)
  - 2015: 2.8 million BOE/d

Source: Elaborated based on data from the MME (2015) and ANP (2015)
OVERVIEW

- Changes on the favorable context in the Brazilian Oil industry
  - 2014
    - 2nd half of 2014 - Oil prices dropped in the international market
    - Petrobras was severely affected by the government’s fuel price policy
    - Petrobras faces financial difficulties after the Car Wash Operation
OVERVIEW

Changes in the medium and long-term planning of Petrobras

- Decrease in Petrobras investment
  


- Investment in Exploration and Production (E&P)
  
  2013 – 2017 Business & Management Plan: US$ 147.5 billion

OIL AND GAS INDUSTRY IN BRAZIL

- High level of participation in gross fixed capital formation (GFCF)

- 2013

  - Total Petrobras investment: 10% of GFCF
  - Investments in E & P - 6% of GFCF
OIL AND GAS INDUSTRY IN BRAZIL

Employment

2007
- Oil and gas production rise
- Direct increase in the employment sector

2006 - 370,000 employees
2014 – 534,000 employees
GOALS

Questions:

- What will be the impact of reduction in investment on:
  - the employment level?
  - the national income?

Calculate the impact of reduction of investment in the oil industry on income and on employment in Brazil
METHODOLOGY

- Input-Output Model (IO)

**Hypotheses:**
- Constant returns to scale;
- Supply is perfectly elastic;
- Time invariant coefficients

\[
X_i = \sum z_{ij} + D_i
\]

\[
D_i = C_i + I_i + G_i + E_i
\]

\[
z_{ij} = a_{ij} . X_j
\]

\[
X = (I - A)^{-1} D
\]
METHODOLOGY

- Input-Output Model

- Impact Analysis

- Generation of employment and income
  - Direct effect: \( \Delta W_i = \lambda_i \cdot \Delta X_i \)
  - Sector employment coefficient: \( \lambda_i^L = \left( \frac{L_i}{X_i} \right) \)
  - National income coefficient: \( \lambda_i^{VA} = \left( \frac{VA_i}{x_i} \right) \)

- Indirect effect:
  - \( \Delta L^{dir+ind} = \lambda (I - A)^{-1} \cdot \Delta D \)
  - \( \Delta L^{ind} = \Delta L^{dir+ind} - \Delta L^{dir} \)
METHODOLOGY

- Input-Output Model
  - Update of the Input and Output Matrix
    - R.A.S. Method

\[ A_{2009} = R.A_{2005}.S \]

\[ A_{2013} = R.A_{2009}.S \]
# METHODOLOGY

Table 1. Breakdown of investment in the Input and Output Matrix sectors

<table>
<thead>
<tr>
<th>Code</th>
<th>Sector</th>
<th>Investment vector</th>
<th>Imports (%)</th>
<th>Taxes (%)</th>
<th>Domestic</th>
<th>Imported</th>
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Source: Modified from Kupffer (2000)
RESULTS

- Input-Output Model: Employment

  - In relation to investment announced in BMP 2013 – 2017 approximately:
    - 104,386 direct jobs won’t be generated in the Oil and Gas sector
    - 83,834 indirect jobs won’t be generated

  In total 188,220 jobs won’t be generated in Brazil
RESULTS

- Input-Output Model: Added value

- The reduction in investment in the oil and natural gas exploration activity will generate **US$ 3,309.53 million** less (direct and indirect impact) in the added value, compared to the investment that would be made by Petrobras in the BMP 2013 – 2017.
CONCLUSIONS

- The difference between results for investment simulations from both models BMP 2013 – 2017 and BMP 2015-2019 are significant.

The decrease in investment:
- Will generate a reduction of 36% in jobs, which is equivalent to 188,220 jobs
- The economy will lose U$ 3,309.43 million.
THANKS

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