The Dutch Disease Effect in a High vs Low Oil Dependant Countries.

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Since the early 2000's, oil price has risen dramatically. This increase is similar to the two oil shocks of 1973 and 1979. The price of Brent increased fivefold, exceeding for the first time 100 US Dollars (see figure 1). High oil price has an important impact on macroeconomic performances in importing and exporting oil countries. Indeed, the raise of commodity prices (particularly oil prices), may have, as stressed in the literature, three major consequences: high inflation, economic volatility and the Dutch disease.
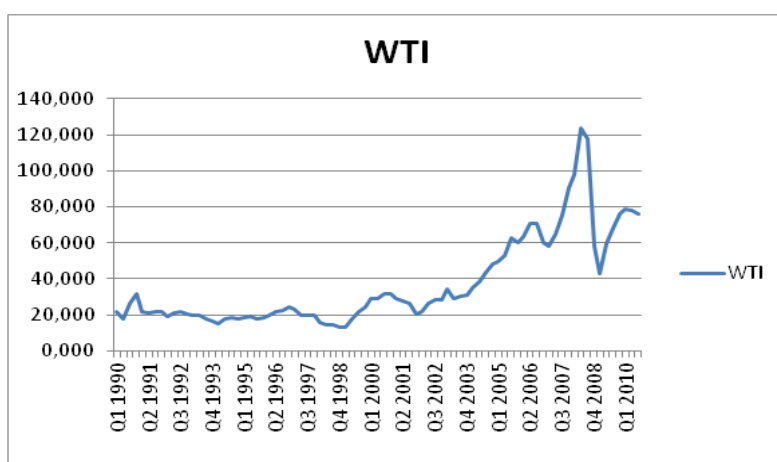

Figure 1: Evolution of oil price (WTI) between 1990 and 2010

Regarding importing countries, as the United-States and the Euro Area, studies such as Bernanke, Gertler and Watson (1997, 2004), Hamilton and Herrera (2004), and

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Blanchard and Gali (2010) show that the increase in oil prices has not only a negative effect on both inflation and growth, but also on economic volatility.

Regarding oil-exporting countries, the most cited impact in the literature is that of Dutch disease. Following Corden and Neary (1982) and Corden (1984), the Dutch disease shows that an exogenous increase in resource prices or in resource output results in real exchange rate appreciation and a decline in the manufacturing sector. This effect occurs mainly in two forms: the spending effect and the resource movement effect. The spending effect can be defined as the negative consequence of real exchange rate appreciation on manufacturing sector production. The resource movement effect results from the perfect mobility of capital and labor from the manufacturing sector to the oil and services sectors. This effect occurs because an increase in oil prices generates a rise in wages and/or profits and generates a rise in aggregate demand in the economy. To the extent that a part of this demand will move toward the service sector, the price of non-tradable goods will rise. Consequently, the real exchange rate appreciates and lead to a de-industrialization process.

Table 1: Oil Exporting Countries Ranked According to their Dependence Degree to Oil Sector.

	$\frac{X_o}{X}$ *	$\frac{X_o}{GDP}$ **
Algeria	97,70	35,59
Venezuela	95,90	21,25
Kuwait	93,21	46,54
Libya***	92,61	59,31
Nigeria	90,36	34,36
Saudi Arabia	87,58	48,07
Gabon	85,61	50,98
Oman	79,04	43,62
Russia	66,69	13,94
United Arab Emirates	64,81	25,66
Ecuador	50,32	16,68
Egypt	43,98	3,68
Indonesia	28,42	2,22
Malaysia	14,81	7,44
Mexico	13,51	4,03
Argentina	10,34	1,71
Median	72,865	23,455

* Fuel exports in % of merchandise exports in 2009. World Bank, World dataBank

** Oil exports in % of GDP (2010). International Monetary Fund, World Economic Outlook Database, October 2011

*** Last available data: 1998.

To investigate the dynamic effect of the recent increase in oil price on a small open oil exporting economy, we estimate a Dynamic, Stochastic, General equilibrium (DSGE) model for some oil producing countries using the Bayesian approach. We build a small open economy model with three production sectors.

Empirically, we consider a sample of 16 oil exporting countries (Algeria, Argentina, Ecuador, Gabon, Indonesia, Kuwait, Libya, Malaysia, Mexico, Nigeria, Oman, Russia, Saudi Arabia, United Arab Emirates, and Venezuela) over the period from 1980 to 2010, except for Russia where our sample begins in 1992. We use quarterly detrended data extracted from the International Financial Statistics provided by the IMF. In order to distinguish between high-dependent and low-dependent countries, we use two indicators: the ratio of fuel exports to total merchandise exports and the ratio of oil exports to GDP. We estimate the median for each ratio on our 16 studied countries. Countries above (below) the median are considered as high (low) oil dependent economies (see Table 1). We verify if the first group is more sensitive to the Dutch disease effect.

In this paper, we also assess the role of monetary policy. For this, we evaluate the efficiency of two policy rules, namely exchange rate (ER) and inflation targeting (IT) rules. The choice of these rules is important in the case of a Dutch disease. Indeed, since the Dutch disease occurs under the spending and the resource movement effects, each monetary policy could play a central role to avoid this effect. Theoretically, in the case of an ER rule, the exchange rate will be fixed, which will lead to lock the spending effect channel. Similarly for the IT rule, the inflation rate will be stabilized. Knowing that wages are indexed to price index, this rule will prevent the resource movement effect. Thus, It would be interesting to verify if, empirically, these rules could prevent the Dutch disease.

Our results show that high oil dependent countries are most likely vulnerable to oil price shock than low oil dependent ones. Regarding the appropriate monetary policy rule, we find that both inflation targeting and exchange rate rules may be effective to contain the size of the Dutch disease effect. Our results suggest that in Algeria and Saudi Arabia, inflation targeting offers better performances. We observe the opposite in Gabon, Kuwait, Oman, and Venezuela. Such results are consistent with economic theory. Indeed, we see that in more open economies and smaller countries (in terms of economic size), the exchange rate rule is preferable to inflation rule. Venezuela seems an exception. Such country does not fulfill the traditional criteria favoring the choice of the exchange rule. In fact, this exception is only apparent. First, if we consider the volatility (see Table 1), we see that Venezuela is among the most volatile economy. Second, Venezuela suffers from a fiscal dominance effect: both inflation rate and fiscal deficit are the highest relative to other studied countries.

The remainder of the paper is organized as follows. Section 2, presents the model. Section 3, describes solving and calibration methods. Section 4, discusses the data and the estimation results. Section 5 determines the best monetary policy rule. Section 6 concludes.