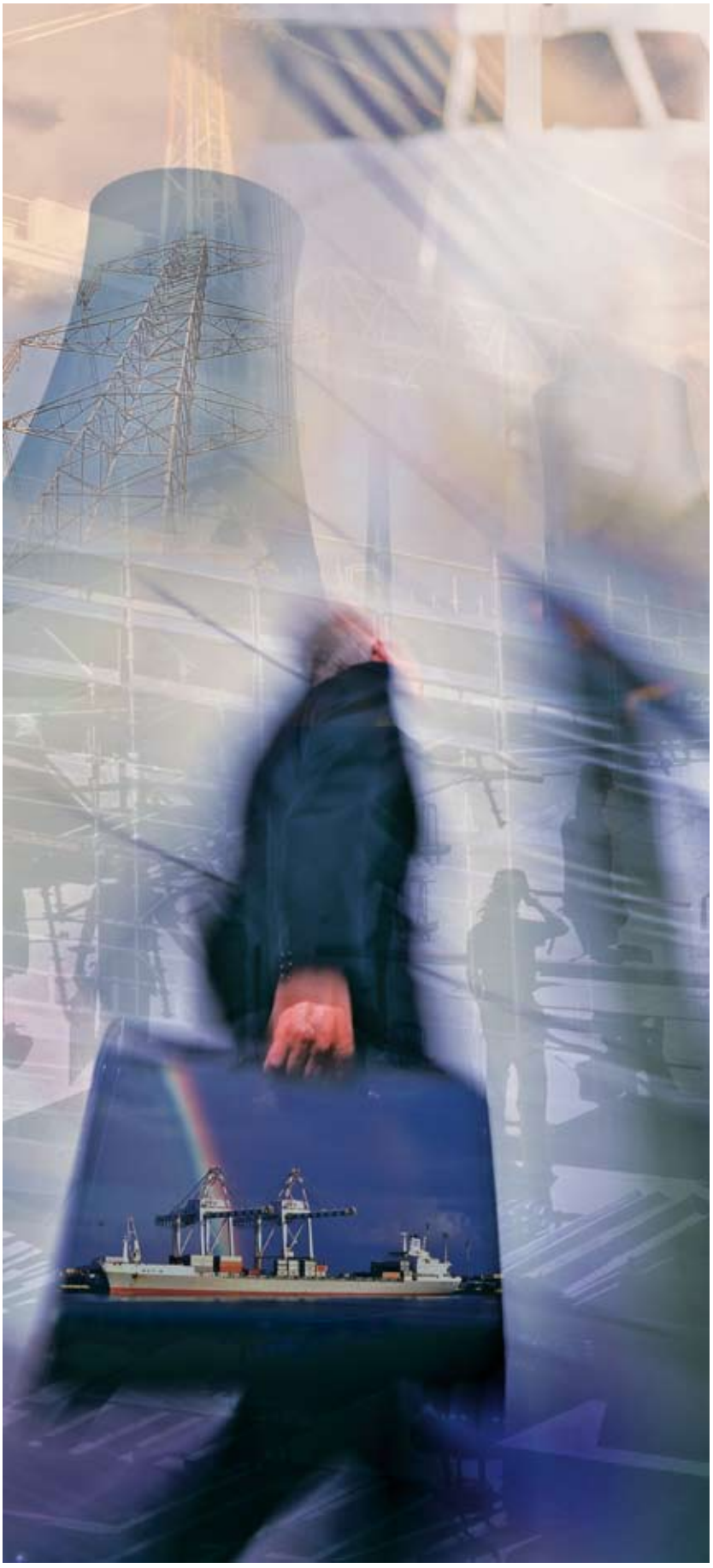

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Oil Shocks and the Great Moderation: Different Sources, Different Effects[†]

Martino Pelli [‡]

June 5, 2008

Work in Progress, Comments Highly Appreciated
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Abstract

The oil shocks experienced in the 1970s were fundamentally different from those of the 2000s. Empirically, the share of variance of the real price of oil imputable to variations in oil production decreased from the 1970s while the share attributable to oil-specific demand shocks increased. I compare both periods and use near-VAR analysis to show that these two shocks have drastically different effects on real variables. The sources of the disruptions in the price of oil do therefore affect the observed behavior of the economy. This distinction is crucial in the context of a comparison between oil price shocks in the 1970s and in the 2000s as in Blanchard and Galí (2007). I show that an oil supply shock was recessionary in the 1970s and has no effect nowadays, thus corroborating the hypothesis of an improved monetary policy which does not respond to supply shocks; whereas, more surprisingly, an oil-specific demand shock was expansionary in the 1970s and is contractionary today.

JEL classification: E20, E32, Q31, Q43.

Keywords: Great Moderation, near-VAR, Oil Demand Shock, Oil Supply Shock

[†]I am grateful for helpful comments and suggestions to Jordi Galí, Jean Imbs, Florian Pelgrin, Martin Strieborný and seminar participants at the University of Lausanne and the Spring Meeting of Young Economists (Lille 2008). I thank Jordi Galí and Lutz Kilian for providing the data used in the paper.

[‡]HEC Lausanne, Department of Economics (Deep). Email: Martino.Pelli@unil.ch

1 Introduction

This paper shows that when comparing the effects of oil price shocks on the macroeconomy in the 1970s and in the 2000s the source of the shocks is crucial. Different sources can lead to different consequences. This study focuses on two reasons which can cause an increase in the price of oil - oil-specific supply shocks and oil-specific demand shocks - and uses near-VAR analysis in order to assess the effect of each on real variables. A switch in the relative importance of these two factors affecting the real price of oil (Kilian 2007) occurred around the beginning of the Great Moderation.

There has been considerable debate over the sources of the Great Moderation. A large share of the literature identifies these sources in an improvement in the way monetary policy is conducted, coupled with an increased flexibility of the economy. The decrease in the degree of dependence of the US economy on oil bears part of the responsibility for the reduction of the effect of *unconditional* oil price shocks as well.

I show that nowadays an increase in the price of oil conditional on a cut in supply does not have any effect on GDP, thus supporting the idea that monetary policy got smarter. It does not respond to supply shocks anymore. This result goes a step further with respect to the one obtained in Blanchard and Gali (2007), in which it is shown that following an unconditional increase in the price of oil the response of the economy is nowadays muted with respect to the response obtained in the 1970s.

The second result of the paper is that if the increase in the price of oil is conditional on an oil-specific (precautionary) demand shock it has a recessionary effect on GDP, while it used to have an expansionary effect in the 1970s.

Finally if we run a variance decomposition we observe a dramatic decrease of the share of variance of different macroeconomic variables imputable to oil-specific supply shocks.

Lately, many authors (Blanchard and Gali 2007; Hooker 2002; De Gregorio, Landerretche, and Neilson 2007; Herrera and Pesavento 2007; Edelstein and Kilian 2007) have tackled the problem of the difference in the response of the economy to oil shocks after the Great Moderation started. In the Structural VAR (SVAR) proposed in Blanchard and Gali (2007) the shock is identified only by the price of oil. In order to analyze the

change in the response of the economy, they split the data in two subsamples, one ending in 1983 and the other one starting in 1984. This date has been identified by many authors, e.g. McConnell and Perez-Quiros (2000), as the starting point of the Great Moderation.

The first step of my investigation is to find a way to disentangle the conditional shocks affecting the price of oil. The methodology developed in Kilian (2007) disentangles three different structural shocks affecting the real price of oil (oil-specific supply shocks, global demand shocks and oil-specific demand shocks). Kilian shows that the sources of the increases are crucial to understand the response of the economy.

Kilian (2007) sets up a 3-variable SVAR which differentiates between supply and demand shocks in the oil market. The variables included are the growth rate of global oil production, an index of global real economic activity and the real price of oil. He uses monthly data running from 1973M1 to 2005M8 and identifies the model assuming a recursive ordering of the variables. Oil production can be affected within the month only by a shock in the oil production sector, whereas real economic activity can be affected within the month by a shock to oil production and by a global demand shock. Finally the real price of oil is affected within the month by a shock to production, a global demand shock and a precautionary oil-demand shock.

Two facts emerge from the historical decomposition of the real price of oil obtained using Kilian's model (figure 1). On the one hand it is shown that the contribution of supply shocks has always been small, becoming even smaller in the second half of the sample. On the other hand, it is shown that the contribution of oil-specific demand shocks is more important than the one of supply shocks over the whole sample, and seems to become even more important in the second subsample. As pointed out in Kilian (2007), the second graph on figure 1 shows that the increase in the price of oil of 2002-2005 was due to a shock in aggregate demand, and not to issues directly related to the oil market.

The shape of the structural shocks identified (figures 2, 3 and 4) supports the idea that a shift in the relative importance of the oil-specific demand and supply shocks coincides with the start of the Great Moderation, with some overlapping. The graphs

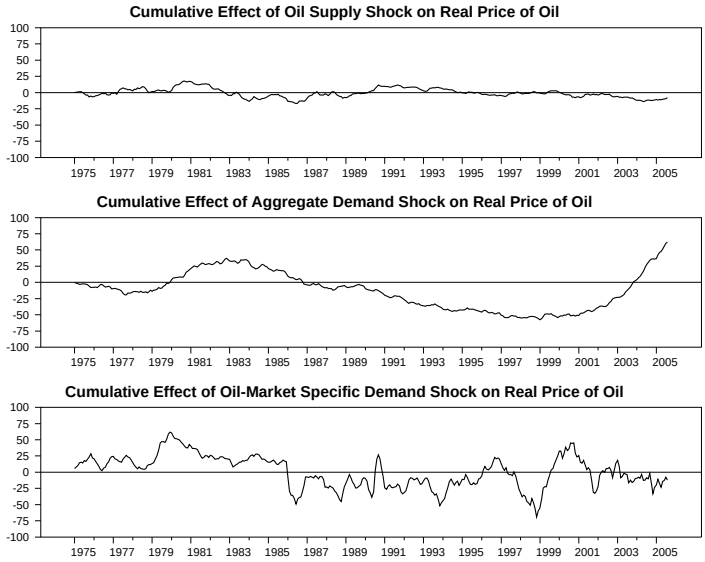

Figure 1: Historical Decomposition of Real Price of Oil, 1975:1-2005:3

of the two shocks (figures 2 and 3) are mirror images of each other. Supply shocks (figure 2) have a relatively big variance until November 1990 and then a smaller one[1]; whereas oil-specific demand shocks (figure 3) have a small variance until March 1986, and a bigger one afterward[2]. Instead, the shape of the aggregate demand shock, which is depicted in figure 4, does not change through time.

After identifying the supply and the oil-specific demand shocks, I construct a near-VAR on the basis of the SVAR presented in Blanchard and Gali (2007). The near-VAR model allows to show that the economy responds differently when subjected to different shocks. The response of the economy to an unconditional oil price shock embeds the response to a supply shock, a demand shock and other shocks, like an increase in global demand, or simple investor speculations on the oil price. If we do not distinguish between the different shocks, the expected response of the economy cannot be known precisely enough by policymakers, therefore the importance of disentangling the different shocks.

The Impulse Response Functions (IRFs) produced by Blanchard and Gali embed

[1]The standard deviation decreases from 137.84 to 74.15. If I run a variance ratio test, I reject the null hypothesis of no structural break with a confidence level of 1%. (The F value obtained is 3.46, and the critical value is $F_{1\%,190,171} = 1.593$).

[2]The standard deviation increases from 51.3 to 86.2, running a variance ratio test I get an F value of 2.83, hence the null hypothesis of no structural break is rejected with a confidence level of 1% (the critical value being $F_{1\%,228,133} = 1.635$).

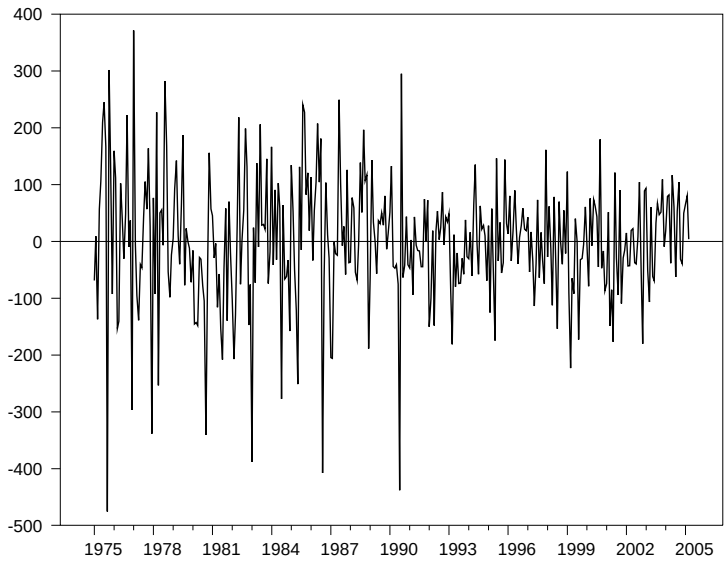

Figure 2: Supply Shock

the IRFs to the two different shocks used in this paper and some other shocks. When subjecting the economy to a supply shock I obtain a significant decrease in GDP in the first half of the sample, and no response at all in the second half, thus corroborating Blanchard and Gali's result. Yet, I show that when introducing a precautionary demand shock the responses obtained go into a different direction with respect to their conclusions. I find a positive response of GDP in the first half of the sample, but a significant decrease of it in the second half.

The non-response of the economy to an oil supply shock is due to the reasons pointed out in Blanchard and Gali (2007): an improved monetary policy, an increased flexibility of the economy and a decrease of the share of oil used in the economy. The decrease in magnitude of the response of CPI in the second subsample goes in this direction as well, being in line with the results of Hooker (2002). Before the beginning of the Great Moderation an oil price shock used to affect core inflation, whereas afterward CPI inflation increased only because of the share of oil directly included in the computation of the index.

An oil-specific demand shock may be due to increased fears about future oil supply or to a change in inventory policies, thus, an increase in the price of oil due to this shock is likely to generate a slowdown in economic activity of the same kind of the one which

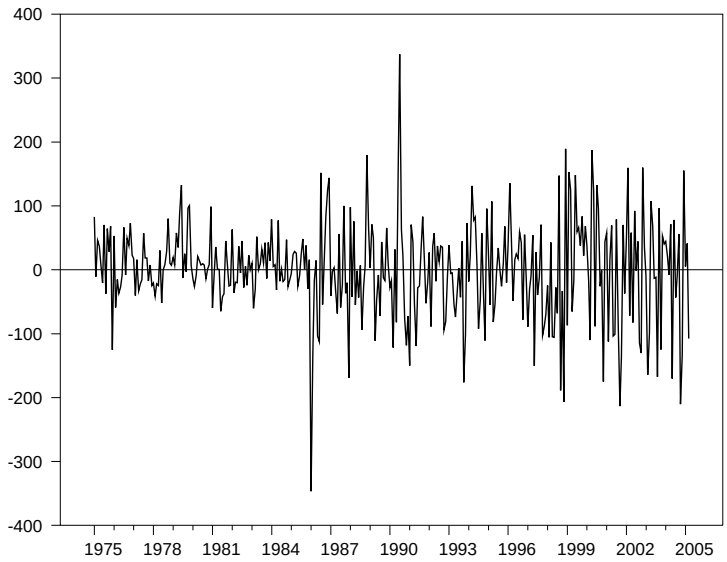

Figure 3: Precautionary Demand for Oil Shock

is generated by a shortage in supply. The same shock before the start of the Great Moderation had a positive effect on GDP and employment because in that period there was still scope for an increase in the size of the US oil industry. Daily oil production in the US was rising between 1975 and 1986, while after 1986 it has been constantly decreasing, as one can see in figure 9. This is due to regulations fixing the maximum amount of oil that can be extracted in order to keep some reserves of oil in the US.

The remainder of the paper is organized as follows. Section 2 discusses Kilian's model and how the relevant structural innovations are retrieved. Section 3 introduces the shocks computed in section 2 into a near-VAR in the style of the SVAR of Blanchard and Galí (2007) and compares the two methodologies. Section 4 analyzes the results. Section 5 concludes.

2 Identifying Structural Innovations to the Supply and the Demand of Oil

Many different methodologies have been developed to isolate supply shocks. The measure of net oil price increase developed in Hamilton (1996), defined as the amount by which oil price in quarter t exceeds its peak value over the previous 12 months. If it does not

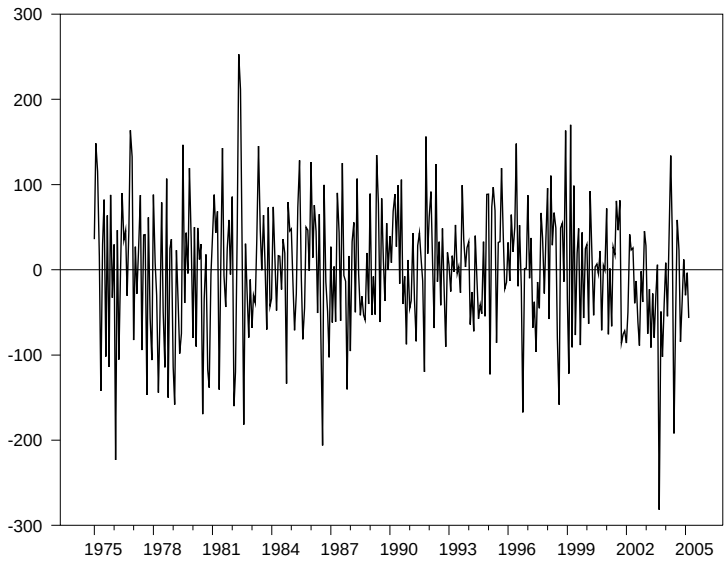

Figure 4: Aggregate Demand Shock

exceed the previous peak, then the value is set to zero. Or the measure developed by Kilian (2005) using a counterfactual for what oil production would have been if the oil shock had not taken place. The advantage of this measure is that it allows to follow the evolution of the different quantity shocks through time.

In this paper it is crucial to find a methodology which not only produces a series of exogenous shocks to quantities provided, but at the same time tells something about quantities demanded. I need, in Kilian's words, to disentangle supply and demand shocks to the price of oil. To my knowledge, the only methodology allowing this developed to date is the one proposed in Kilian (2007). Kilian identifies 3 different shocks affecting the price of oil. His identification scheme rests on the fact that production has to be operating at full capacity (on a vertical supply).

The three shocks are disentangled using a 3-variables SVAR recursively identified. The three variables included in the SVAR are the percent change in global crude oil production ($\Delta prod_t$), an index of real economic activity (rea_t, constructed by Kilian on the basis of dry cargo single voyage freight rates) and the real price of oil (rpo_t), refiner acquisition cost of imported crude oil deflated by the US CPI.

The main innovation of Kilian's methodology consists in the index of real global activity which has the advantage to be directly linked to the commodity market, while a

measure for example of aggregate GDP would not be directly linked to it, and therefore could move because of many other reasons. Moreover in order to compute this measure we do not need to adjust the different GDP for the exchange rate or for the switching weights of countries through time.[3]

$$\begin{bmatrix} u_{\Delta prod_t} \\ u_{rea_t} \\ u_{rpo_t} \end{bmatrix} = \begin{bmatrix} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} \varepsilon_t^{Oil\ Supply\ Shock} \\ \varepsilon_t^{Aggregate\ Demand\ Shock} \\ \varepsilon_t^{Oil-Specific\ Demand\ Shock} \end{bmatrix}$$

The model is estimated using monthly data running from 1973M1 to 2005M8 and two years worth of lags. Recursive identifying assumptions are set as follows.

First it is assumed that crude oil supply (production) does not respond to innovations to aggregate demand - in this specific setup aggregate demand refers to the demand for all industrial commodities, and not for all goods and services - or to precautionary oil demand within the same month. Due to the cost of adjusting oil production (opening up new oil fields can take years) and the uncertainty about the state of the crude oil market, oil producing countries will be slow in responding to both kind of demand shocks.

Second, real global activity is affected, within a month, only by innovations to global demand or sudden changes in oil production. Shocks specific to the demand side of the oil market do not immediately affect real global economic activity, a delay of at least a month is allowed.

Finally it is assumed that the real price of oil responds to innovations to the supply of oil, to global demand and to a third kind of innovation, called precautionary oil demand shock. This oil-specific demand shock reflects fears about the availability of future oil supplies. It could also reflect other factors such as oil sector-specific changes in inventory policies.

The data necessary to run the model were graciously provided by Lutz Kilian. It is straightforward to retrieve the two series of structural innovations needed, i.e. $\varepsilon_t^{Oil\ Supply\ Shock}$ and $\varepsilon_t^{Oil-Specific\ Demand\ Shock}$.

[3]This even though its shortcomings, i.e. lagging the increases in economic activity and leading the decreases in it

3 Structural VAR (SVAR)

In this section I estimate a near-VAR containing 7 variables over two consecutive time spans, the first one running from 1975Q1 to 1983Q4 and the second one from 1984Q1 to 2005Q3. This exercise, exactly like in the paper by Blanchard and Galí (2007), allows to check for differences in the response of the economy to an oil shock, thus it is important for each sub-sample to include oil shocks. The variables included in the model are the following

$$Y_t = [CPI_t \;\; GDPdefl_t \;\; W_t \;\; GDP_t \;\; N_t \;\; Poil_t \;\; Shock_t]'$$

where CPI_t measures CPI inflation, $GDPdefl_t$ GDP deflator inflation, W_t wage inflation, GDP_t the log difference of real GDP, N_t the log difference of employment, $Poil_t$ the log difference of the real price of oil and $Shock_t$ is one of the two series of shocks identified by Kilian. The two series of shocks are orthogonal to each other by construction, thus I do not need to insert both of them at the same time in the model, but I can run it with one and then with the other. This fact is useful, given the short time span of the first subsample. Not inserting both shocks at the same time avoids losing too many degrees of freedom. Jordi Gali kindly provided all the data used for the following estimations, this makes the comparison with the seminal paper written by himself and Blanchard (2007) easier.

In the paper by Blanchard and Gali the different hypotheses are then verified with a version of the New-Keynesian model in which oil is imported and then used as a production input by firms and consumed by households.

3.1 Structural VAR Approach versus near-VAR Approach

Blanchard and Gali (2007) estimate a 6-variables SVAR, recursively identified. The six variables used by them are

$$Y_t = [Poil_t \;\; CPI_t \;\; GDPdefl_t \;\; W_t \;\; GDP_t \;\; N_t]'$$

Their time span runs from 1960Q1 to 2005Q4 (quarterly data), the model contains 4 lags. As pointed out earlier, this formulation allows to check only for unconditional increases in the price of oil, thus, when performing Impulse Response Function (IRF) analysis it is impossible to determine which is the reason causing the increase.

Kilian's structural shocks are estimated on a shorter time span than Blanchard and Gali's model, i.e. between 1975M1 and 2005M8. The monthly data used by Kilian actually run from 1973M1 to 2005M8, yet, using 24 lags for the estimation leads to the loss of the first 2 years of observations. In order not to lose too many degrees of freedom I have to use a shorter lag lengths than the one in Blanchard and Gali (2007). They use 4 lags, I only have 2.

One of the ways to introduce a series of exogenous shocks in a SVAR is to transform it into a near-VAR. The near-VAR allows to introduce into the system equations differing from the others in composition. In my case I have 6 equations containing 7 variables, i.e. CPI_t, $GDPdefl_t$, W_t, GDP_t, N_t, $Poil_t$ and $Shock_t$, and one last equation in which $Shock_t$ is regressed only on its lagged values. The shock is not regressed on all the other variables of the model as it is supposed to be exogenous to all of them.

If some of the VAR equations contain regressors that others do not, OLS estimates are not efficient. For this reason I estimate the near-VARs using the method of Seemingly Unrelated Regressions (SUR), which provides efficient estimates of the near-VAR coefficients. I run two near-VARs, introducing first the series of supply shocks and then the one of precautionary demand shocks. As said before, these two steps are needed in order not to lose too many degrees of freedom.

It is crucial to analyze not only the response of the economy to those two different kinds of shocks, but also the eventual change in their relative importance, running a variance decomposition. In order to perform this analysis, it is necessary to insert the two shocks of interest in the model at the same time. Hence I estimate an 8-equations near-VAR consisting of the same 6 equations I had in the previous two systems plus one equation for each shock. This will allow to perform a variance decomposition and assess the relative importance of the two shocks.

3.2 Near-VAR Results

3.2.1 Response to a Supply Shock

In figure 5 and 6 we observe the impulse responses resulting from the near-VAR in which I introduced the series of supply shocks. Figure 5 shows the responses for the subsample going from 1975Q1 to 1983Q4, and figure 6 for the subsample going from 1984Q1 to 2005Q3. I investigate the effect of a negative shock in supply (i.e. a decrease in oil supply). The shock hits the system at period 1.

All IRF graphs are shown with fractiles 0.16 and 0.84 confidence bands computed with Monte Carlo iterations, following Sims and Zha (1999). As in Blanchard and Gali (2007) the break date roughly coincides with the beginning of the Great Moderation. The responses of CPI, GDP deflator and wages are shown in inflation rates. Those of GDP, employment and the real price of oil are shown in levels. The shock is normalized to a 10% increase of the price of oil.

All estimates shown in figure 5 fit theory well. At the occurrence of a negative supply shock, accordingly to the law of supply and demand, the price of oil increases. As a consequence, all oil consuming activities (ranging from manufacturing to air transport) become more expensive, and have to rise their prices. This increase in inflation causes a slow down in economic activity, observable in a decrease of GDP. Given the decrease in economic activity, we observe a decrease in employment, which is followed by a decrease in nominal wages. All of these effects are found in figure 5. The only puzzling result is the one concerning GDP Deflator inflation, which I would expect to be positive, and not negative as it is found.

Looking now at the second half of the sample (fig. 6), the results are perfectly in line with those of Blanchard and Gali. These results even make their point stronger. We can see that GDP and employment do not respond at all. CPI inflation and GDP deflator inflation respond in the same direction as in the first part of the sample, yet in a more muted way. Wages do not respond.

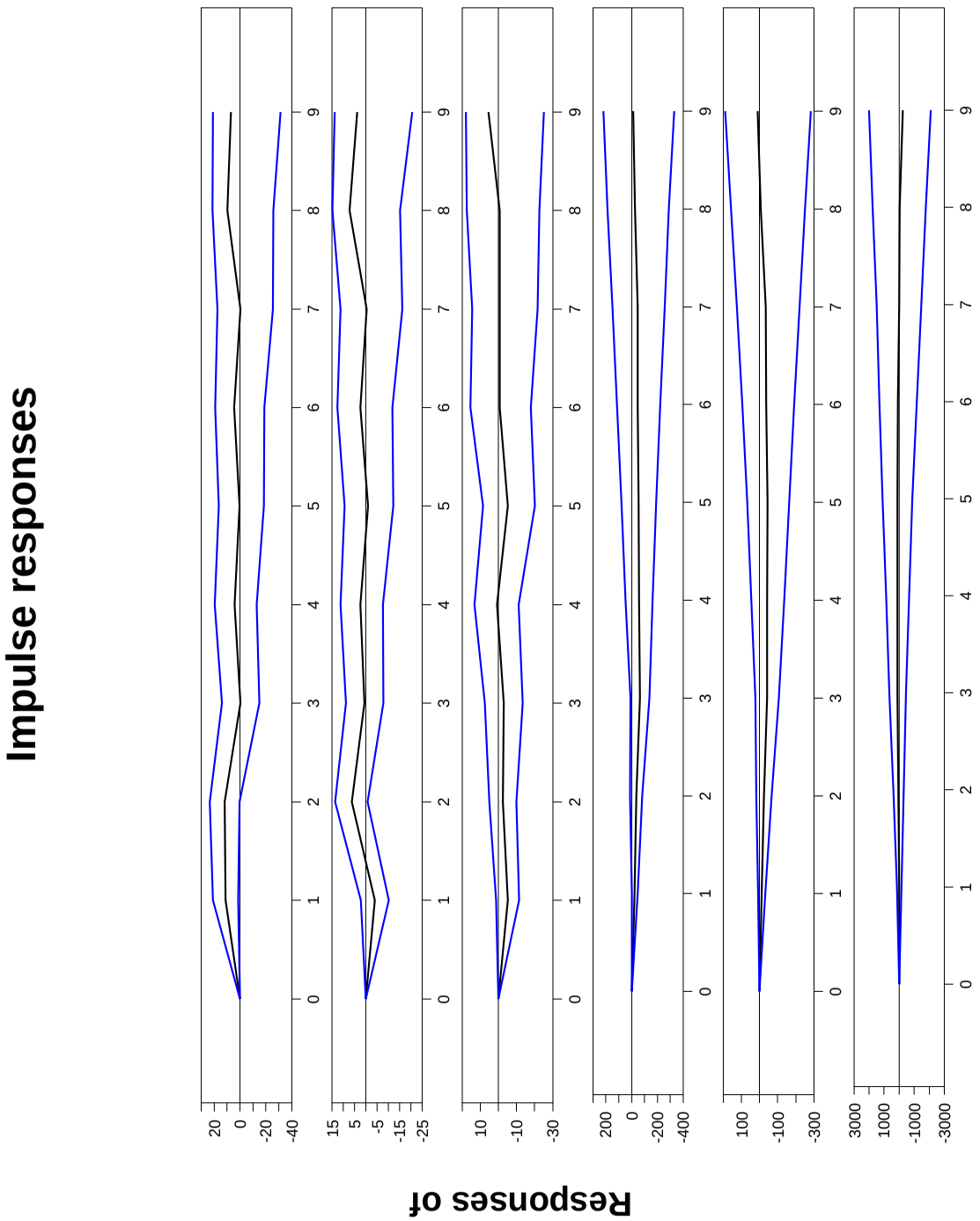

Figure 5: Responses of CPI Inflation, GDP Deflator Inflation, Wage Inflation, real GDP, Employment and Real Oil Price to a Supply Shock, 1975Q1 - 1983Q4

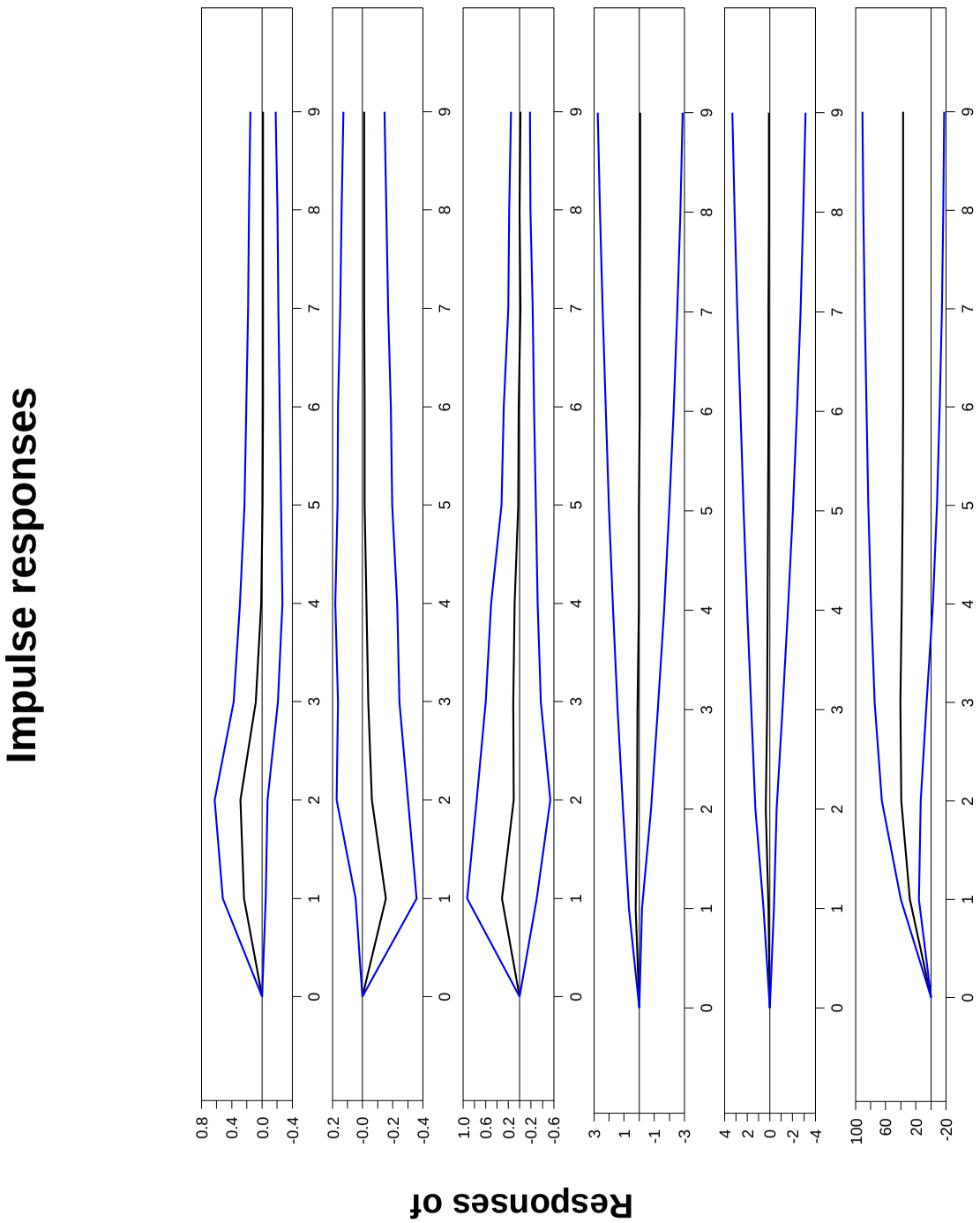

Figure 6: Responses of CPI Inflation, GDP Deflator Inflation, Wage Inflation, real GDP, Employment and Real Oil Price to a Supply Shock, 1984Q1 - 2005Q3

3.2.2 Response to a Precautionary Demand Shock

I analyze now the effects of a positive shock to the precautionary demand for oil, which we can observe in figures 7 and 8, here again we can compare the responses for the first part of the sample (1975Q1-1983Q4), in figure 7, to those for the second part of the sample (1984Q1-2005Q3), in figure 8. The response of the economy to this type of shocks significantly changes between the two periods. The response of GDP even switches in sign from positive to negative.

Confidence bands, aggregation and normalization of the responses and break date are set in the same way as before. The shock hits in period 1.

In the first half of the sample (figure 7) an increase in precautionary oil demand, which generates a persistent increase in oil price, leads to an increase in inflation, both measured via CPI and via GDP deflator. At the same time this shock leads to a small increase in GDP and in employment, with the consequent decrease in wage inflation.

In the second half of the sample (figure 8) responses become smaller in magnitude, but much more significant than in the first half of the sample. There is a clear increase in CPI inflation and in real oil price in the first quarter, yet, for CPI this increase is only temporary. In the first part of the sample the increase was less marked but more persistent.

The key result of the paper is that following an oil-specific shock, in the more recent subsample, we observe a significant decrease in GDP, and, with a lag of 2 quarters in employment. Wage inflation increases. The only variable for which I do not obtain a clear answer is inflation measured via the GDP deflator.

4 Results analysis - Structural VAR versus near-VAR

The first result of the paper is that after the beginning of the Great Moderation the economy has learned how to absorb an oil price shock caused by a cut in supply. This kind of shock used to have an inflationary effect, thus causing a decrease in GDP. Nowadays it does not have any effect. The possible reasons are on the one hand the economy adjusts faster, salaries are more flexible and the share of oil in production decreased. On the

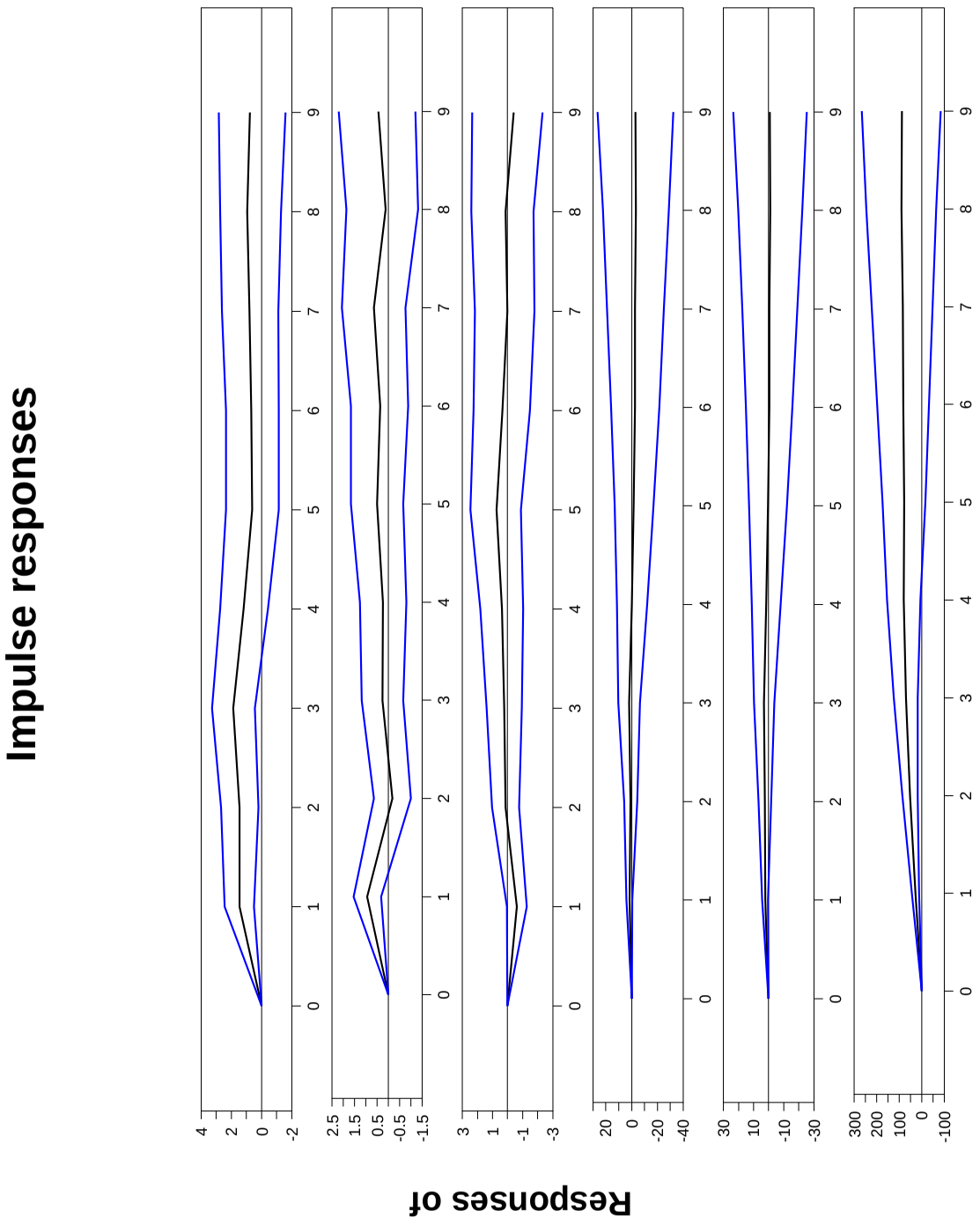

Figure 7: Responses of CPI Inflation, GDP Deflator Inflation, Wage Inflation, real GDP, Employment and Real Oil Price to a Precautionary Demand Shock, 1975:01 - 1983:04

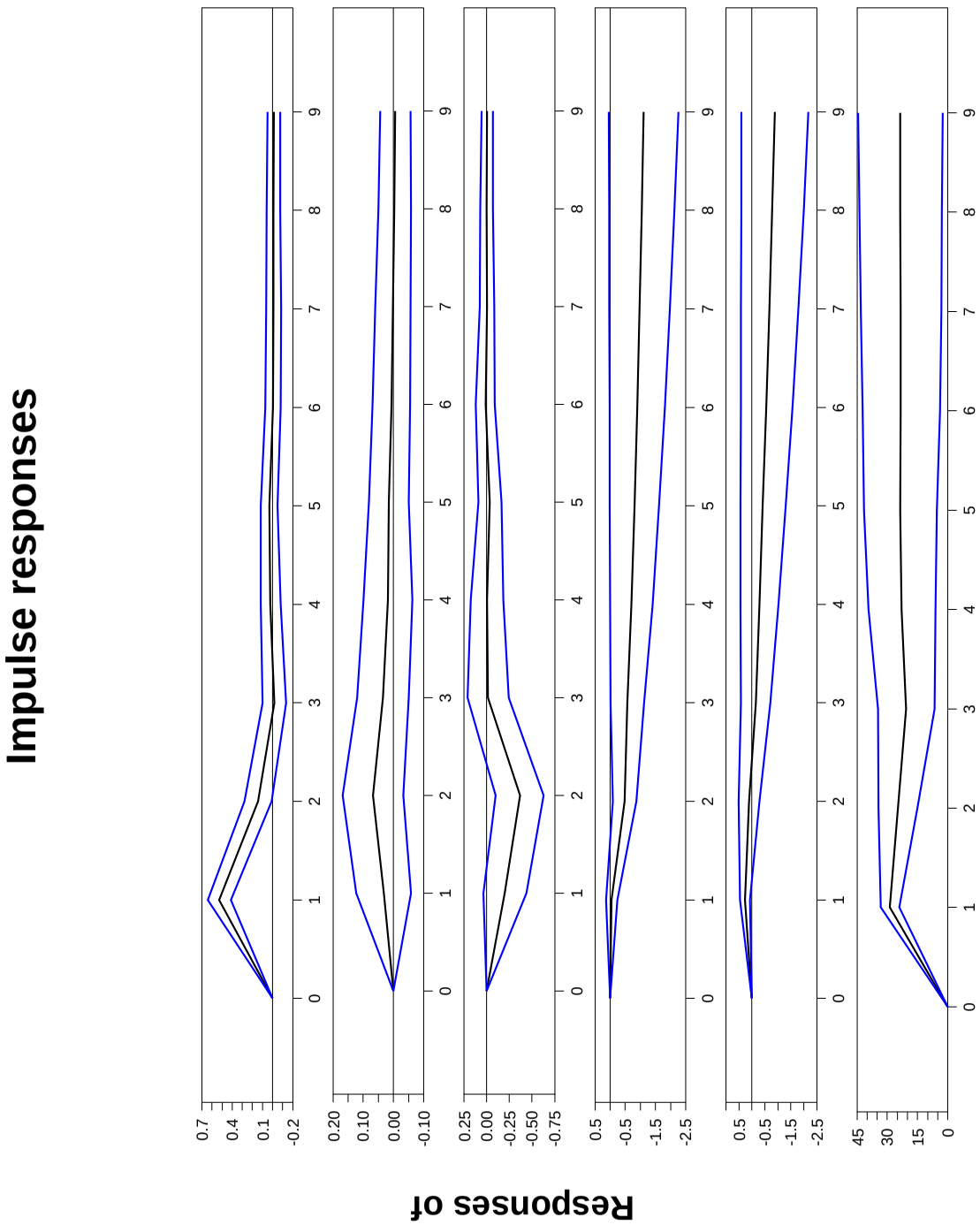

Figure 8: Responses of CPI Inflation, GDP Deflator Inflation, Wage Inflation, real GDP, Employment and Real Oil Price to a Precautionary Demand Shock, 1984:01 - 2005:03

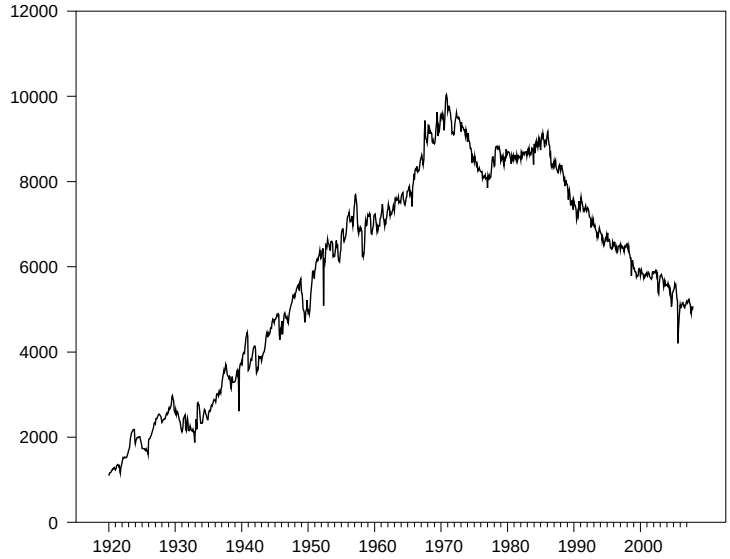

Figure 9: Oil Production in the U.S. in Thousands of Barrels Per Day

other hand monetary policy got smarter and does not respond to oil supply shocks. This result reinforces the one obtained in Blanchard and Gali (2007).

Yet, as it is pointed out in Kilian (2007), oil supply shocks have never been the main source of increases in the price of oil. For this reason we should focus also on the response to precautionary demand shocks, which are a more important source of oil price variations. The effects of these shocks on the economy are completely different from those of a supply shock, i.e. they are expansionary before the start of the Great Moderation, and contractionary afterward. This result deviates from Blanchard and Gali (2007).

A possible explanation for the increase in GDP and employment in the 1970 following a precautionary oil demand shock may be found in the fact that, at that time, the oil industry in the U.S. was not producing at full capacity. As we see in figure 9 daily oil production increased between 1976 and 1985. Thus, the increase in GDP can be explained by an increase of activity in this particular industry.

In more recent periods the oil industry in the U.S. was producing at full capacity, and was thus unable to follow the increase in demand. Therefore an increase in oil-specific demand, not linked to a general rise in demand, but only to an accrued uncertainty on the oil market, leads to a surge in price of the same kind of those which can be

experienced after a cut in supply. That is why the effect of a precautionary shock in the more recent subsample is similar to the effect of a supply shock in the former subsample.

One puzzle contained in figure 5 is why inflation measured via the GDP deflator responds in a different way than the one measured via CPI. A possible explanation is to be found in the small production of oil in the United States. An increase in its price is reflected only in inflation measured via the CPI, and not via the GDP deflator. Figure 10 clarifies this issue. While during the oil shock of 73/74 CPI inflation and GDP deflator inflation moved together, during the shock of 78/79 CPI inflation increased much more than GDP deflator inflation. Given that only the latter shock is included in my sample, this could explain the different response of these two variables in figure 5.

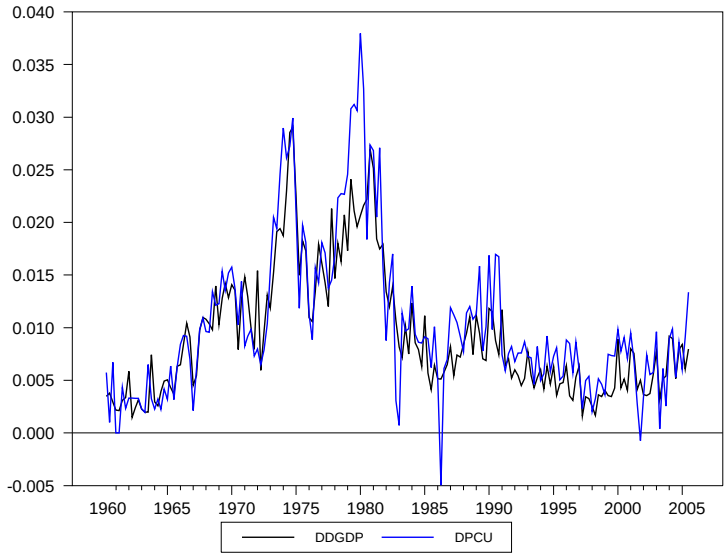

Figure 10: CPI Inflation and GDP Deflator Inflation

The difference in the magnitude of the response of inflation between figure 5 and figure 6 goes, as I said earlier, in the direction of Hooker (2002). It gives support to the idea that in the earlier subsample an oil supply shock directly affected core inflation, whereas in the more recent subsample an oil supply shock (with the relative increase in price) affects inflation only because oil is included in the computation of the CPI index. This is due to a change in the structure of the economy, which includes the reduction of the dependence of the economy on oil.

It is now interesting to know which of the two shocks has more influence on the

different variables included in the model. This can be observed through a variance decomposition, which is reported in tables 1, 2, 3, 4 and 5. As I expect following Kilian's results, precautionary demand shocks are more important in both subsamples. Confirming what is known on the Great Moderation, both shocks have become less important in the second period, yet, the precautionary demand shock becomes, relatively to the supply shock, drastically more important.

Given this switch in the relative importance of the two different shocks, it becomes crucial both, to disentangle the causes hiding behind oil price increases, and to know which response to expect from the economy to each of these different shocks.

It is worth noting that, for the first subsample, in Blanchard and Galí's results real wages were almost constant (the positive response of nominal wages was balanced by the positive response of CPI inflation and of the GDP deflator inflation) whereas in my results an increase in supply leads to an increase in nominal wages and to a negative CPI inflation, thus to an increase at least in consumption wages. If instead of CPI inflation we take the GDP deflator inflation, I observe almost no movement of the real wages, the same result of Blanchard and Galí (2007).

This suggests that it is important to continue this research program and to further decompose oil price movements.

Table 1: Variance Decomposition of CPI Inflation Due to Oil Supply or Demand Shocks Before and After 1984

Period	**1975:01 - 1983:04**		**1984:01 - 2005:03**	
	Oil Supply	**Oil Demand**	**Oil Supply**	**Oil Demand**
1	0.000	0.000	0.000	0.000
2	28.887	20.392	0.122	37.461
3	28.203	28.453	0.121	34.242
4	21.362	32.506	0.133	32.436
5	20.330	29.957	0.130	31.073
6	21.205	28.419	0.132	29.997
7	20.112	27.729	0.132	29.163
8	19.011	25.913	0.132	28.493
9	18.384	25.418	0.131	27.962
10	17.223	26.278	0.129	27.534
11	16.430	26.331	0.128	27.193

Table 2: Variance Decomposition of GDP Deflator Inflation Due to Oil Supply or Demand Shocks Before and After 1984

Period	**1975:01 - 1983:04**		**1984:01 - 2005:03**	
	Oil Supply	**Oil Demand**	**Oil Supply**	**Oil Demand**
1	0.000	0.000	0.000	0.000
2	0.169	28.448	0.790	0.055
3	9.775	17.350	1.005	1.045
4	7.367	14.857	1.042	1.117
5	6.906	12.993	1.079	1.159
6	5.322	12.637	1.061	1.114
7	4.442	13.149	1.046	1.075
8	4.003	13.344	1.025	1.043
9	3.853	12.807	1.006	1.021
10	3.886	12.108	0.988	1.012
11	3.743	11.525	0.972	1.011

Table 3: Variance Decomposition of Wage Inflation Due to Oil Supply or Demand Shocks Before and After 1984

Period	**1975:01 - 1983:04**		**1984:01 - 2005:03**	
	Oil Supply	**Oil Demand**	**Oil Supply**	**Oil Demand**
1	0.000	0.000	0.000	0.000
2	5.616	1.671	0.548	0.688
3	4.742	1.471	0.574	1.507
4	3.401	1.001	0.596	1.599
5	3.158	3.167	0.590	1.646
6	2.706	6.277	0.585	1.633
7	2.717	7.367	0.581	1.623
8	3.233	7.132	0.579	1.618
9	3.656	6.803	0.577	1.612
10	3.561	6.493	0.575	1.610
11	3.408	6.436	0.573	1.609

Table 4: Variance Decomposition of GDP Due to Oil Supply or Demand Shocks Before and After 1984

Period	**1975:01 - 1983:04**		**1984:01 - 2005:03**	
	Oil Supply	**Oil Demand**	**Oil Supply**	**Oil Demand**
1	0.000	0.000	0.000	0.000
2	0.898	7.359	0.057	0.111
3	3.345	7.620	0.070	3.014
4	11.153	6.697	0.071	3.029
5	9.864	11.645	0.068	3.104
6	9.373	11.362	0.067	3.122
7	10.803	11.748	0.065	3.247
8	10.528	14.108	0.065	3.303
9	9.942	15.343	0.065	3.381
10	10.451	14.958	0.065	3.432
11	11.003	14.946	0.066	3.487

Table 5: Variance Decomposition of Employment Due to Oil Supply or Demand Shocks Before and After 1984

Period	**1975:01 - 1983:04**		**1984:01 - 2005:03**	
	Oil Supply	**Oil Demand**	**Oil Supply**	**Oil Demand**
1	0.000	0.000	0.000	0.000
2	0.077	10.022	0.042	4.258
3	5.993	7.442	0.364	6.304
4	15.664	6.894	0.368	7.440
5	14.986	15.065	0.438	8.040
6	13.749	16.667	0.459	8.391
7	14.964	15.697	0.480	8.635
8	15.541	17.051	0.492	8.802
9	14.910	18.503	0.501	8.924
10	14.949	18.219	0.508	9.009
11	15.514	18.232	0.514	9.071

5 Conclusion

I showed that the response of the economy to an oil price shock differs accordingly to the source of the shock. I introduced two different measures of exogenous shocks: one to the supply and one to the precautionary demand of oil into the model of Blanchard and Galí (2007), substituting them for the more general measure used by the authors: oil price. I showed that we have to be much more specific regarding the type of shock we are identifying when constructing a model containing different oil shocks. If two shocks have different causes, they will most probably have different effects as well. Taking the responses of GDP and of employment in the first half of the sample, the analysis by Blanchard and Galí predicts that they would respond in a negative way. My analysis predicts that GDP and employment will respond negatively to a supply shock, but positively to a precautionary demand shock. I show that in both subsamples demand shocks are relatively more important than supply shocks. Furthermore the relative importance of demand shocks drastically increases in the second subsample.

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