What impact do oil shocks have on manufacturing firms?

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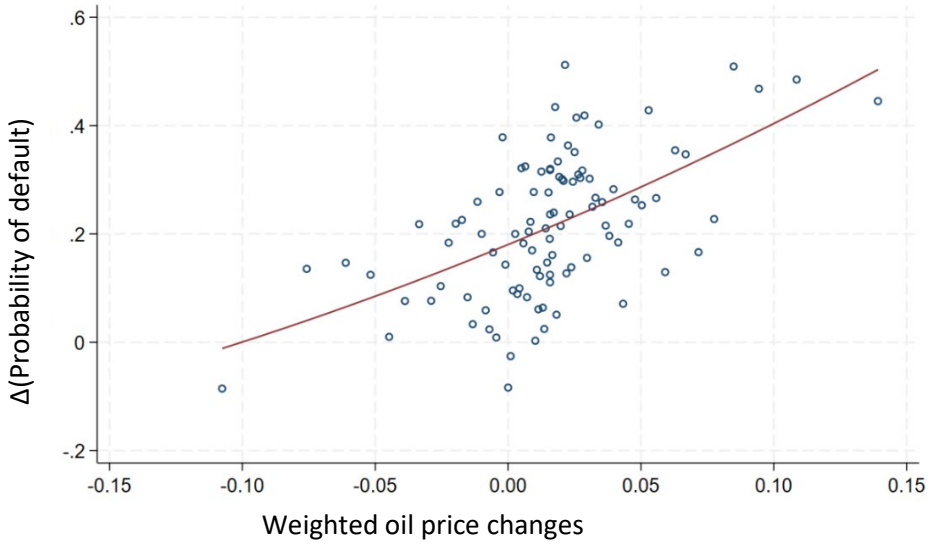
Increases in oil prices have persistent effects on manufacturing firms, causing their financial ratios to deteriorate for two to three years, while decreases have no significant impact. The impact of oil price increases is also greater for large companies, which are more dependent on raw materials, and for energy-intensive sectors.

Chart 1. Oil price dependency and credit risk of manufacturing firms



Note: This chart shows changes in the probability of corporate default (y-axis) depending on oil price shocks (x-axis), weighted by companies' dependence on raw materials (see Vinas, 2025)

From the end of the Second World War until the early 1980s, six out of the seven recessions in the United States were preceded by oil price increases (Hamilton, 1983). This stylised fact prompted economic research and led to oil prices being incorporated into macroeconomic models in order to better understand the economic cycle. However, with the sharp decline in oil prices in the early 1980s, the relationship between oil prices and macroeconomic variables weakened, leading to reconsider this link with macroeconomic aggregates. Significant oil price fluctuations in the 2000s and 2010s, the focus on climate risks (physical and transition risks) and, more recently, the energy crisis caused by Russia's invasion of Ukraine have reignited interest in better understanding the impact of energy prices on the economy.

This blog post reviews the main economic impacts of oil price fluctuations, and more broadly, fossil fuel price shocks, on manufacturing firms in France (excluding manufacture of coke and refined petroleum

products). It is based on an empirical analysis of individual company data from the Banque de France, FIBEN company database, covering two decades (2000-19, see Vinas,2025).

The persistent impact of rising oil prices

When analysing oil price increases and decreases separately, we observe that price increases have an impact in the short and medium term on the key financial ratios used in financial analysis, whereas decreases have no significant impact. While the differing impacts of rising and falling oil prices are well known at the macroeconomic level, for example on GDP growth (Hamilton(2003)), detailed microeconomic analysis provides insight into how such shocks are transmitted within the manufacturing industry, while also taking into account the demand shocks that they may simultaneously face.

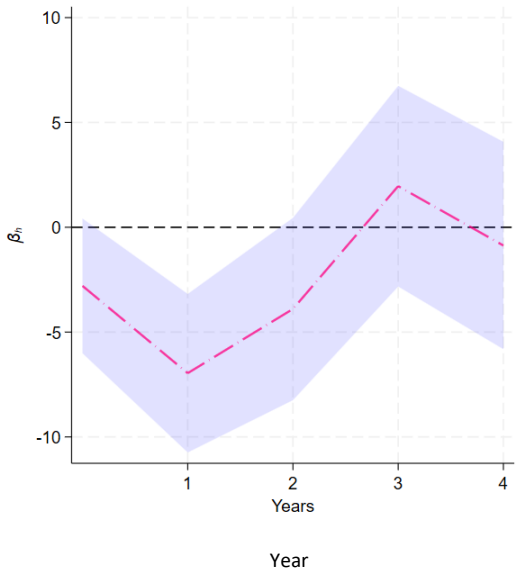
To analyse the impact of oil price shocks, the empirical study on which this blog is based weights oil price shocks according to a company's dependence on raw materials. The idea being that companies have direct and indirect dependencies on hydrocarbons because of their input production processes, i.e. upstream production processes. For example, the agri-food industry consumes cereals as inputs, and cereal production uses large amounts of fertiliser, which is made from ammonia, itself produced from natural gas. The use of hydrocarbons in the upstream production process therefore creates indirect dependencies for the manufacturing industry (here, the agri-food industry). Oil price shocks are therefore likely to affect the price of non-fossil inputs (in this case agricultural inputs, but the same principle applies to mineral production). Hence the importance of taking all raw materials into account in the analysis of the impact of hydrocarbon price shocks: for a given change in oil prices, companies may be affected both directly (e.g. through higher fuel prices) and indirectly (through higher prices for their hydrocarbon-dependent inputs).

The results of the empirical analysis show that an increase in oil prices (weighted by the company's dependence on raw materials) leads to (i) an increase in input costs, (ii) a contraction in value added per euro of sales, (iii) a contraction in gross operating margin, (iv) a contraction in labour productivity, and (v) an increase in the probability of default (see Chart 1). Conversely, declines in oil prices have no significant effect.

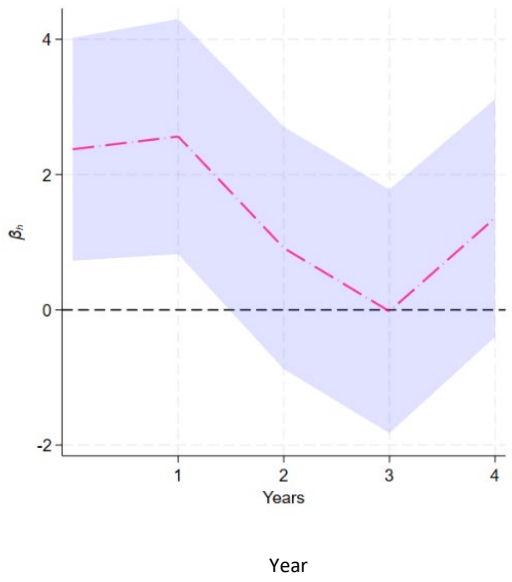
And since price decreases have no significant impact, oil price rises generate persistent effects in the medium term. Financial ratios deteriorate over a period of two to three years, depending on the ratio in question (see Chart 2).

This analysis covering the 2000-19 period shows limited impact on employment and wages. However, this could be explored in greater depth in future work, firstly by examining the period of the energy crisis to determine the extent to which company behaviour may have varied depending on the context (Lafrogne-Joussier, Martin, and Mejean (2023)), and secondly by considering other economies with more flexible labour markets.

Chart 2 Short- and medium-term deterioration in financial ratios in the manufacturing industry (productivity and probability of default) following an increase in oil prices



Labour productivity (EUR thousand per employee)



Probability of default (%)

Note: Average response (dashed line) of labour productivity and probability of default, over a four-year horizon, to increases in weighted oil prices (see Vinas,2025). Shaded area: 95% confidence interval **Key:** An increase of one standard deviation (=7.78%) in the price of oil weighted by the company's dependence on raw materials represents, one year after the increase, a loss of approximately EUR 544 in labour productivity (=7.78% x7.0, in EUR 2000, EUR 810 in 2024 euro) and an increase of approximately 20 basis points (=7.78% x2.6) in the probability of the company defaulting.

Large manufacturing firms, more sensitive to oil price increases

An empirical analysis of the impact of oil price increases by company size shows a more negative impact on large companies than on smaller ones, particularly in terms of productivity and the probability of default.

This result can be explained by the greater dependence of large companies on raw materials, and not just oil. Indeed, to generate one euro in sales, large companies consume much more raw materials than small ones. Conversely, small companies are more labour-intensive; they have a higher wage bill (per euro of sales) than large companies.

The largest companies are therefore more exposed to oil shocks than smaller ones, and are more severely impacted.

Although the financial ratios of smaller companies are less affected, they are yet not immune to adjustments. Faced with rising oil prices, small businesses adjust their external costs, in particular by reducing their use of outsourcing and external staff, and by placing greater demands on their employees.

There are also other sources of heterogeneity: for example, the effects of oil price rises appear to be more pronounced in energy-intensive sectors (Fontagné, Martin, Orefice, 2024).

The challenges posed by firms' dependence on fossil fuels

These results show that oil price shocks have implications for financial stability and the economic cycle. Oil price increases worsen the financial position of companies that are most dependent on raw materials, and large companies are particularly exposed to this. This deterioration in financial ratios has lasting effects over several years. Finally, although this point is not discussed here, price shocks on fossil fuels also generate demand effects: uncertainty as to the duration of a price increase (a few days, months or years?) may delay investment decisions (Bernanke,1983).

This analysis thus has direct applications: (i) for banks in analysing the exposure of their loan portfolios, (ii) for supervisors responsible for financial stability, and (iii) for those (supervisors) assessing climate risk outcomes, as bank and climate stress test scenarios are based on oil price assumptions.

More broadly, this impact of oil price shocks on firms' performance highlights the challenges associated with the fossil fuels needed for economic activity. Historically, in the 1970s, the focus was on oil. More recent literature has highlighted (i) dependence on other fossil sources (gas, coal) and (ii) the indirect dependence of non-fossil raw materials (agricultural and mineral) on fossil resources.

Gaining a better understanding of companies' dependence on fossil and non-fossil resources, their resilience, and, more broadly, the resilience of the economy to commodity shocks is a major challenge for investors and policymakers. However, the data required to conduct such analyses remain limited or poorly available. The publication of sustainability reports as provided for in the European directive (Corporate Sustainability Reporting Directive) could facilitate such analyses.