Rising energy prices and productivity: short-run pain, long-term gain?

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Objective and contribution

Paper investigates the **impact of energy price shocks on productivity**

- through the channels of within-firm productivity changes and productivity-enhancing reallocation dynamics

Contribution lies in **distinguishing between the short and medium-to-long term** effects

- efficiency gains due to investment or innovation take time to materialise, hence the need for a dynamic approach
- "short-run pain, long-term gain"

Findings provide useful insights into the optimal **policy response to energy price shocks**

- particularly relevant at the current juncture: need to reconcile (i) supporting firms in the case of severe shocks and (ii) ensuring incentives for fossil fuel demand reduction and decarbonisation remain

Simulations to estimate **impact of the recent (2022) energy price shock on firms' profitability**

- documenting heterogeneities relevant for policy support design in the current context

Describes **EU countries' policy response and major green initiatives**

Approach

The paper uses a **rich dataset** covering a wide range of countries over a long period of time

- firm-level productivity and financial data from ORBIS
- country-sector energy prices from IEA

Estimates a **short-term dynamic model** disentangling (i) within-firm and (ii) between-firm effects of higher energy prices

i. model of firm productivity growth based on technology diffusion
ii. model of relative employment growth for firms of different productivity levels

Estimates a **medium-term dynamic specification** to capture effects that take longer to materialise

- comparing firm productivity in the years 0-4 after the energy price shock with pre-shock productivity
- exploring the investment channel

Simulate **effects of the 2022 energy price increases on the corporate sector**

- translate higher expenditures on energy into reduced firm profitability
- simple accounting exercise, broadly in line with the approach taken by the Commission in a similar analysis
  - cfr. Archanskaia, Nikolov, Simons, Turrini and Vogel (QREA, July 2023)

Discussion & comments

Topical and interesting read

- rich and robust analysis, well developed methodology
- valuable contribution by looking at longer-term dynamics
- relevant insights, useful to inform policy debate

Main comments relate to

- focus on mild shocks – how to transpose findings to dramatic energy price peaks in 2022?
- type of energy price shock – exogeneous vs policy
- sample selection and sector coverage
- energy reliance measure
- firm-level simulations on the 2022 energy shock
  - methodological choices
  - suggestions for further work

Comments

Can we **extrapolate from "mild shocks"** under study to current period with dramatic price peaks?

- period of study (1995-2020) likely characterised by different dynamics than 2022
- paper focuses on mild shocks, while 2022 surely classifies as severe

Did you distinguish between **different types of shocks**?

- exogeneous vs "policy" shocks – e.g. carbon tax might be more anticipated leading to different adjustment dynamics

Quite selective when determining the **sample** – possible introduction of bias?

- firms with information on all variables (e.g. age of the firm) – better covered firms = better performers?
- firms that are in the sample for a period of at least six years – attrition bias?

Sectoral coverage

- narrow focus on manufacturing and construction industries – services also impacted (e.g. transport)
- firm simulations for 2022 cover all sectors, but quite aggregate – e.g. heterogeneity in manufacturing (metals vs computers)

Energy reliance – incorporate indirect reliance?

- narrow focus on direct energy reliance while indirect reliance (non-energy inputs) matters for many industries
- firms lower capacity utilisation further? Firms adjust their sourcing strategy in addition to investment?

Comments – simulations on 2022 shock

Pass-through of the higher input prices into output prices

- assumption of non-zero pass-through results in a **modelling inconsistency**
  - only energy inputs price increases in the accounting exercise
  - yet, non-zero pass-through throughout the supply chain leads to additional price increases in non-energy inputs too
  - as such, non-zero pass-through is inconsistent with the exclusive focus on energy expenditure increases in the accounting exercise
- one value for the **pass-through parameter** (0.79) across all sectors, even if estimated at the sector-level?
  - overlooks potentially strong differences in pass-through across sectors – what do you find?
  - current situation potentially very different from estimation period – not clear how this affects pass-through (data are there by now)

Encourage further work on impact of 2022 energy price peaks on European corporates

- current description (both in terms of findings and approach) quite concise and deserves elaboration
- go beyond profitability and explore **impact on financial vulnerability**
  - equity depletion, liability accumulation, depletion of liquid assets, additional debt servicing costs, …
- analyse implications for **productivity-enhancing reallocation** process induced by energy price increases
  - both along the intensive margin (employment growth) and extensive margin (survival/exit of firms)
- further explore policy implications of heterogeneous impact of energy crisis across different firms

Impact on profitability across productivity distribution – some remarks

Important to show **counterfactual** (blue bar)

- reveals strong link between productivity and profitability in normal times

"Firms in **bottom quartile of the productivity distribution** suffered disproportionately more". Yes, but

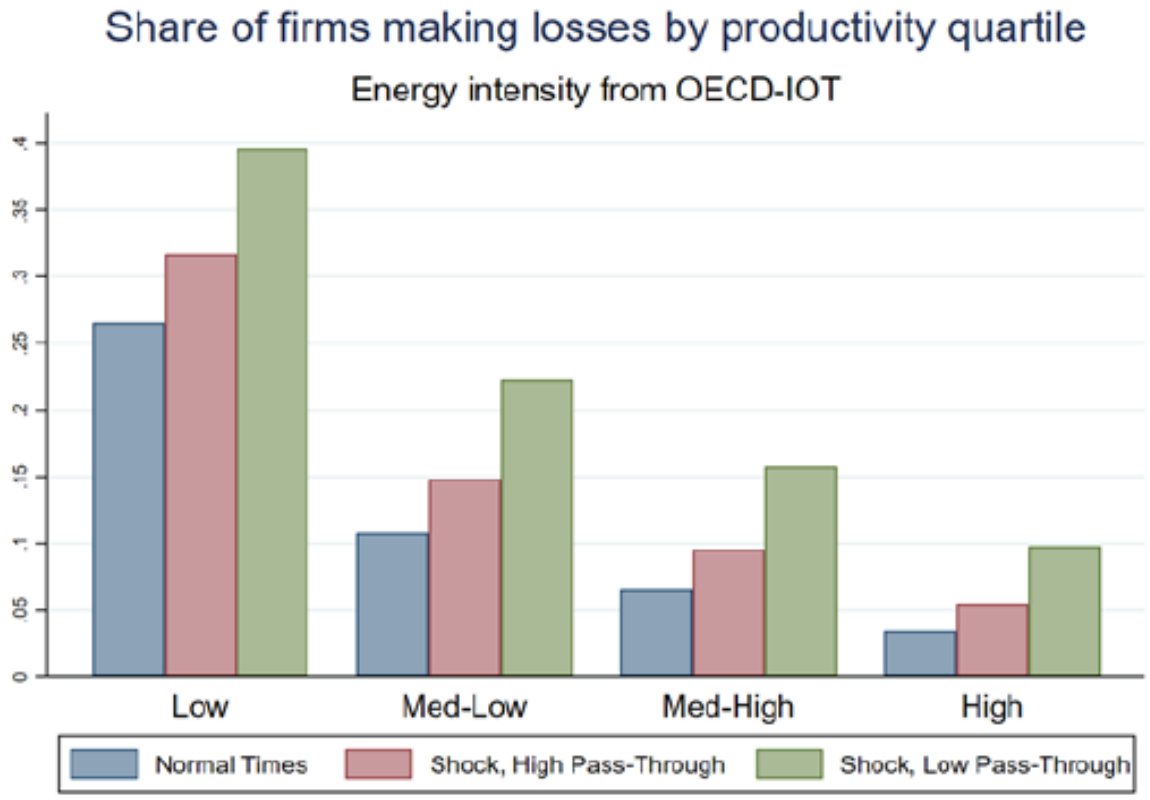
- this applies mainly to the blue bar, less to the green bar
- from the chart, energy crisis induces lower profitability also among high prod quartiles

COVID-19 legacy effects are important

- accumulation of crises amplifies existing vulnerabilities
- seem to be disregarded in the analysis

Go beyond profitability and assess **financial vulnerability**?

- equity depletion, leverage, interest coverage ratio



Happy to discuss further

Thank you!

EC analysis – distribution of financially vulnerable firms

Graph shows distribution of firms identified as **financially vulnerable** by end 2024

Almost half of these firms (ca. 45%) would be vulnerable **in normal times**

- **these firms** are relatively unproductive

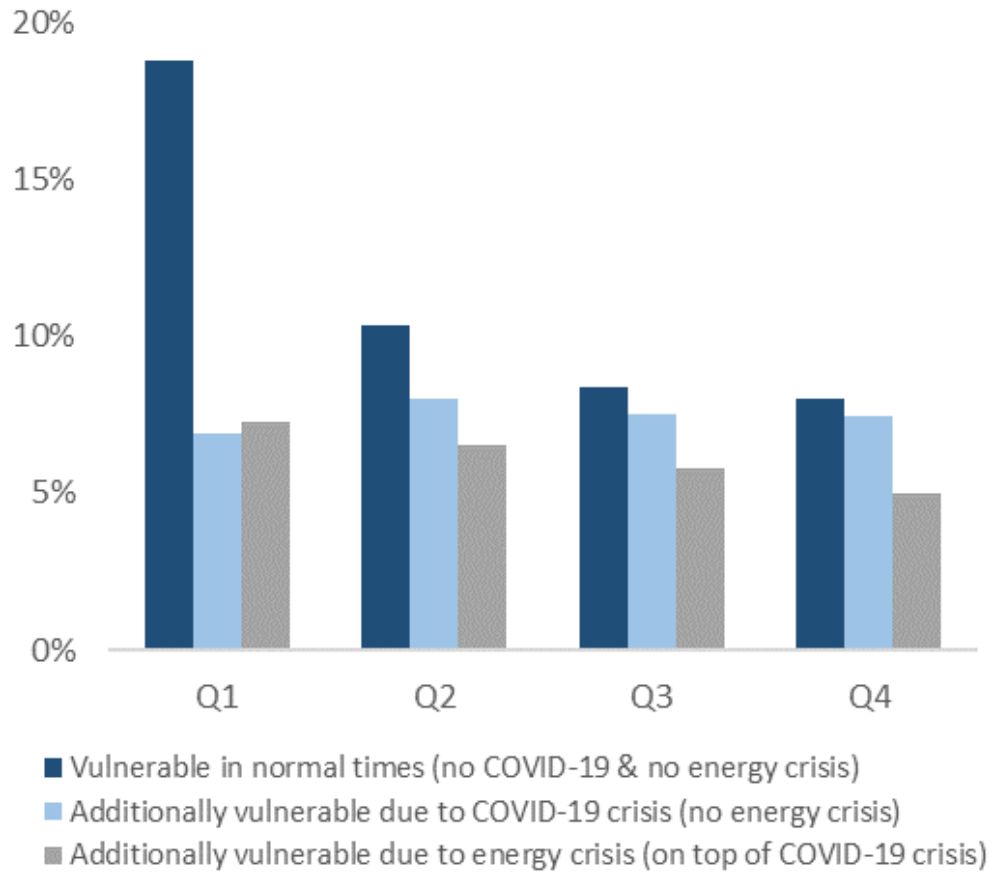
Another 30% of these firms are additionally vulnerable **due to COVID-19 crisis**

- these firms are spread evenly over TFP quartiles

The remaining 25% become additionally vulnerable **due to energy crisis**

- these firms are relatively unproductive (albeit less pronounced than in normal times)
- particularly unproductive in manufacturing industries

Distribution of financially vulnerable firms across TFP quartiles – aggregate for available euro area countries



Note: euro area countries included are BE, EE, EL, ES, FI, FR, IT, LT, LV, PT, SI, SK. Quartiles computed within country-sector to control for sectoral differences. Q1 (Q4) refers to lowest (highest) quartile of TFP distribution.
Source: European Commission elaborations on ORBIS database