The Many Channels of Firm's Adjustment to Energy Shocks: Evidence from France

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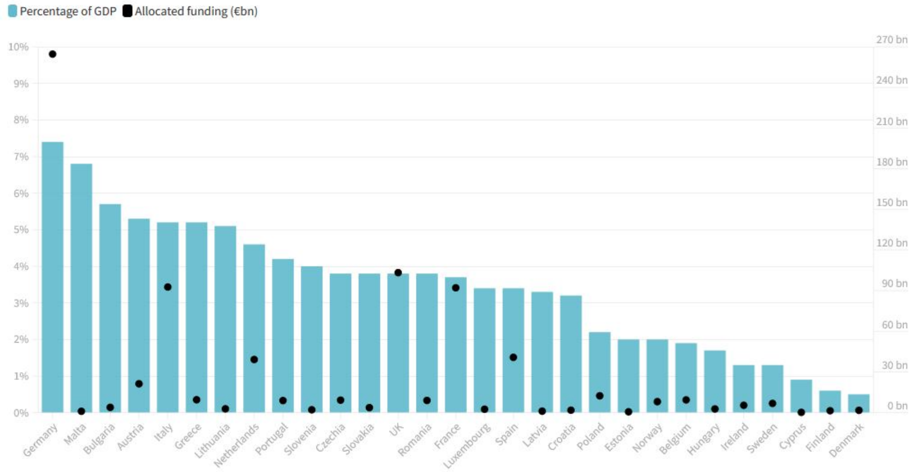
77th Economic Policy Panel Meeting, Stockholm - Riksbank

April, 2023

Fiscal response to Energy Crisis

"hundreds of thousands of jobs would be at risk" - Olaf Scholz (2022)



Source: Bruegel.

Subsidised energy for firms

Some trade-offs:

- + job preservation
- + support aggregate demand
- - distort energy consumption
- - fiscal cost

$\Rightarrow$ all depends on firms' response to energy prices

This paper

Study how French manufacturing firms respond to energy price changes (electricity & gas):

- Combine data on energy use (EACEI) and balance sheets (FICUS/FARE) at the firm level over the period 1996-2019.
- Exploit variation in energy prices paid by different firms at different points in time.
- Consider variety of outcomes: energy demand and efficiency, employment, profits, etc.

Findings

Micro elasticities w.r.t. energy price

	electricity	gas
Energy demand	-0.4	-0.9
Energy efficiency	0.66	0.59
Employment	-0.16	-0.06
Value added	-0.15	-0.06
Profits	0	0

$\Rightarrow$ substantial responsiveness, profits shielded.

$\Rightarrow$ many more findings (changes over time, large vs small shocks, within-firm substitutions, etc)

Policy implications

"Given this observed ability of firms here to adapt to energy price shocks through energy efficiency, our main policy recommendation is to limit shortterm price absorption by the public budget and use public money."

Two reservations

1. Should policy makers worry about employment effects?
2. Micro vs macro effects

Employment effects during energy crisis

Was Scholz wrong?

Imagine a policy maker looking at this paper one year ago:

- Real electricity (gas) prices increased by 118% (82%).
- Change in employment implied by baseline elasticities: 118%*(-0.16)+0.82%*(-0.06)=-18.8%
  - 0.6M jobs lost lost in French manufacturing alone.
  - 5.1M jobs lost when extrapolated to the entire French economy!

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Questions:

- Smaller employment losses when accounting for non-linearities?
- Micro vs macro elasticities?
- How many job losses can policy prevent in the aggregate, and at what cost?

Smaller employment losses following large shocks?

Table 14: Large energy price shocks

Dep Var:	Elec. demand	Gas demand	Emplo.	Value added	Energy efficiency	Profit
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel a: Electricity price shock (average = 36.2%)			
Elec. Price (ln) lag	-0.209***		-0.171***	-0.228***	-0.019	-0.349*
	(0.071)		(0.048)	(0.067)	(0.081)	(0.180)
Observations	6,416		6,416	6,350	6,350	4,504
			Panel b: Gas price shock = (average = 53.1%)			
Gas Price (ln) lag		-0.711***	-0.096**	-0.147**	0.197**	-0.004
		(0.121)	(0.043)	(0.058)	(0.086)	(0.123)
Observations		7,585	7,585	7,490	7,490	5,540
Firm FE	yes	yes	yes	yes	yes	yes
Sec-Year FE	yes	yes	yes	yes	yes	yes

Notes: Electricity and gas price approximated by value over quantity purchased in the year. Robust standard errors in parenthesis. *** $p < 0,01$; ** $p < 0,05$; * $p < 0,1$.

Micro $\neq$ macro

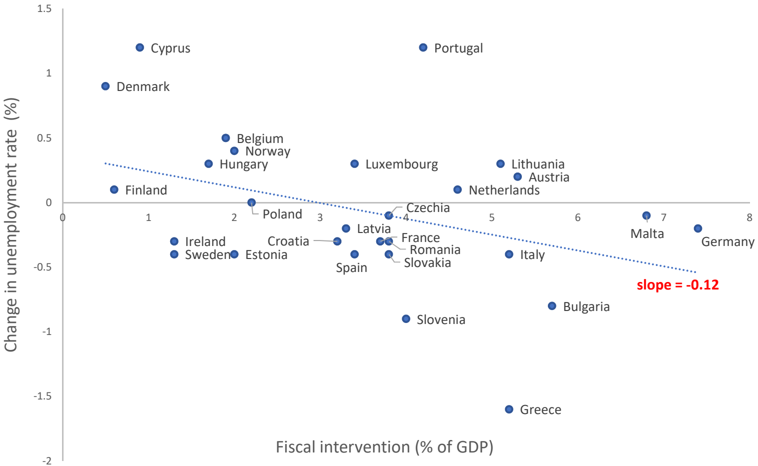
Aggregate employment effects depend on

1. Covariance between size/use and elasticity
   - Dunquerque aluminium smelter

2. General equilibrium feedbacks:
   - Income vs substitution effects on labor supply
   - Amplification channels, as e.g. in RBC, HA & multisector economies
   - Dampening channels as in NK economies
   - etc.

Macro effects of policy

suggestive evidence



Notes: Unemployment rate from Eurostat (02/22-02/23). Fiscal intervention from Bruegel.

Conclusion

- High-quality micro evidence on one of today's most important economic policy debates.
- Future research to reconcile results with macro evidence.
- This allows for a more complete evaluation social costs and benefits of fiscal support measures.