On the Cleansing Effect of Recessions and Government Policy[1]

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[1] Disclaimer: The views are our own and not those of the Bank of Portugal or the Eurosystem.

Introduction

Questions

- Cleansing effect: do recessions reallocate resources to more productive firms?
- Does government support to firms offset this?

Methods

- Model to guide interpretation of data
- Empirical analysis using data on Covid-19 recession in Portugal

Results

- Resources did reallocate to more productive firms
- Lower productivity firms were more likely to use government support

Model

Firm production problem

- Production function: $y = zn^{\alpha}, \quad \alpha \in (0, 1)$
- Price p subject to shocks
- Optional: quadratic labor adjustment costs

Case 1: With no adjustment costs & aggregate price shock, % changes in sales and employment are independent of z and equal to each other.

Case 2: With adjustment costs & aggregate price shock,

- Sales and employment are less sensitive for more productive firms
- Sales changes vary less with productivity than employment changes

Case 3: With no adjustment costs, firms with smaller price shocks have smaller changes in sales

Data

Dataset 1: Covid-19 firm survey

- Panel survey of $\sim 7,000$ firms for April–July 2020
- Measures impact of recession on sales and employment
- Also information on eligibility and use of government support

Dataset 2: Administrative balance sheet data

- Used to measure pre-recession firm characteristics
- Productivity measurement: for firm i in sector s,

$$\ln TFP_{is} = \ln Y_{is} - \alpha_K^s K_{is} - \alpha_L^s L_{is} - \alpha_M^s M_{is}$$

- Standardize productivity across sectors

$$\widehat{TFP}_i = \frac{1}{\sigma^s}\left(TFP_i - \frac{1}{N_s}\sum_{j \in \mathcal{S}} TFP_j\right)$$

Empirical specification

Objective: assess relationship between productivity, and sales and employment outcomes during the recession

Regression

$$y_i = \beta_0 + \beta_1' \widehat{TFP}_i + \boldsymbol{\beta}_2' \mathbf{Sector}_i + \boldsymbol{\beta}_3' \mathbf{X}_i + \varepsilon_i,$$

- y_i: sales or employment outcomes
- $\widehat{TFP}_i$: standardized productivity
- $\mathbf{Sector}_i$: sector fixed effects (2-digit)
- $\mathbf{X}_i$: controls—age, size, leverage, in Lisbon or not

Employment effects

	Employment contracted $> 10\%$		Employment contracted $> 50\%$	
	(1)	(2)	(3)	(4)
$\widehat{TFP}_i$	-0.019^{***}		-0.017^{***}	
	(0.006)		(0.006)	
TFP Q2		0.017		-0.001
		(0.017)		(0.016)
TFP Q3		0.023		-0.008
		(0.017)		(0.016)
TFP Q4		-0.056^{***}		-0.046^{***}
		(0.017)		(0.016)
Sector FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Obs.	6499	6499	6499	6499
R^2	0.053	0.055	0.076	0.076

- Higher productivity firms less likely to have employment contractions
- Robust to controlling for government employment support

Sales effects

	Sales contracted $> 10\%$		Sales contracted $> 50\%$	
	(1)	(2)	(3)	(4)
$\widehat{TFP}_i$	0.006		-0.016^{***}	
	(0.005)		(0.006)	
TFP Q2		0.016		-0.002
		(0.014)		(0.017)
TFP Q3		0.027^{**}		-0.009
		(0.014)		(0.017)
TFP Q4		0.022		-0.027
		(0.014)		(0.017)
Sector FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Obs.	6378	6378	6378	6378
R^2	0.028	0.029	0.064	0.064

- Higher productivity firms less likely to have large sales contractions
- Less variation in sales than employment by productivity
- Consistent with model with adjustment costs

Government support policies

Debt moratorium

- Firms could skip debt payment for 6 months (extended to 1 year)
- Interest capitalized on loans

Government credit lines

- Initially credit offered to SMEs in most affected sectors
- In early April, program expanded to all sectors

Tax deferral

- Option to defer income, value-added & social security taxes
- Deferral period: 3 or 6 months

Paid furlough

- Government subsidized wages to prevent layoffs
- Employees not working received 2/3 of salary, 70% paid by gov.

Takeup of government support

Specification

$$y_i = \beta_0 + \beta_1' \widehat{TFP}_i + \beta_2' \mathbf{Sector}_i + \beta_3' \%\mathbf{\Delta Sales}_i + \beta_4' \mathbf{X}_i + \varepsilon_i,$$

- Restrict sample to eligible firms
- Control for change in sales

Results

	Debt Moratorium	Credit Lines	Tax Deferral	Paid Furlough
$\widehat{TFP}_i$	-0.065^{***}	-0.024^{***}	-0.028^{***}	-0.044^{***}
	(0.005)	(0.004)	(0.006)	(0.011)
Sector FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
$\%\Delta$ Sales FE	Yes	Yes	Yes	Yes
Obs.	4997	4975	5170	1866
R^2	0.073	0.042	0.069	0.100

- Higher-productivity firms less likely to use all policies

Conclusion

Questions

- Do recessions reallocate resources to more productive firms?
- Is government support for firms likely to offset this?

Insights

- Covid-19 recession did reallocate resources to more productive firms
- Evidence that adjustment frictions were partially responsible for this
- Lower productivity firms were more likely to use government support