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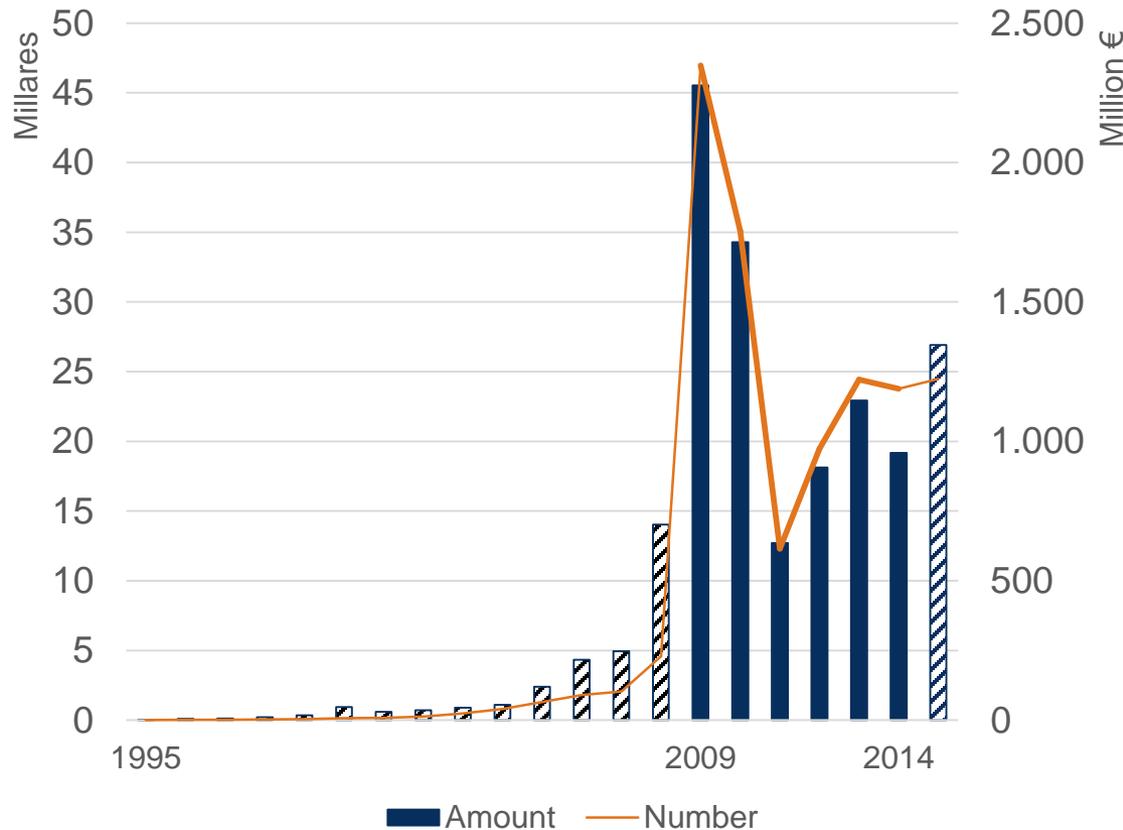
# Economic Impact of the Portuguese Mutual Guarantee Scheme 2009-2014

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# Mutual guarantees in Portugal

Time frame for evaluation: 2009-2014



More than 160 thousand guarantees amounting to some 7.6 billion euros issued between 2009 and 2014.

These correspond to 93% of all guarantees issued by the Portuguese mutual guarantee scheme up to 2014, and 83% of their amount.

# What impact did these guarantees have on the Portuguese economy?

Two steps: What impact did mutual guarantees have on the firms that used them? Did this impact on users have positive repercussions on the rest of the Portuguese economy?

*An “additionality” perspective: how did users and the aggregate Portuguese economy develop compared to how they would have in the absence of the mutual guarantee scheme?*

## Impact on users of mutual guarantees

*Financial additionality.* Did users of mutual guarantees obtain finance at lower cost than would have been possible without them? Did users have access to finance that they would have been unable to obtain without them?

*Economic additionality.* Did the users of mutual guarantees invest more than they would have if the guarantees were not available? And did they export more?

## Impact on the aggregate Portuguese economy

What impact did the additional investment and exports induced by access to mutual guarantees have on the Portuguese Gross Domestic Product (GDP)? And what impact did they have on employment?



Mutual Guarantees

# IMPACT ON USERS



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# Method

## Differences in differences

How does the difference between users and nonusers in a variable of interest change between before and after using mutual guarantees.

### Implementation: Regression Analysis

- Fixed effects: period and firm
- 3 specifications for use of mutual guarantee
  - Dummy
  - Dummy + interaction terms with age, size, and weight of fixed assets on total assets
  - Dummy + interaction terms with age, size, and weight of fixed assets on total assets + interaction terms with guarantee “slots”
- Other explanatory variables suggested by theory or intuition

### Estimation of impact

- From regression coefficients: total marginal effect
- ... determined the impact on the explained variable (always a ratio) for every firm
- ... selected the median impact
- ... applied to the median firm to get monetary amounts
- ... multiplied by the number of firms using guarantees in each year to get total amount per period



# Data

## Panel data

One observation is one firm in one year. We consider some 168 thousand Portuguese firms, including 45 thousand users of mutual guarantees, for 2008-2014, but not all are considered in each equation.

## Extraction and “cleaning” procedures

- From the Portuguese mutual guarantee scheme: list of all mutual guarantee operations (beneficiary, amount, date, etc.)
- From a commercial database (SABI by BvD): P&L statements and balance sheets for all Portuguese firms 2008-2015
- Kept only corporate entities with non-financial activity
- Excluded firms with missing values for key variables and outliers

## Limitations

Annual data: we do not consider the exact date of the operation.

Several variables measured by proxy: e.g., “interest rate” is financial expenses (P&L) over debt (BS).



# Cost of debt

## Measured as interest paid over average debt

### Sample

336 thousand observations, involving 116 thousand firms.

### Potential determinants considered

Size of the firm

Leverage

Profitability

Weight of fixed assets on total assets

Use of mutual guarantees

Year fixed effects

Firm fixed effects

### Technical information

Linear regression. In the base case, all coefficients are statistically significant.  $R^2=0.6883$ ;  $F=1869.32$ .

### Estimated impact of mutual guarantees

Lowers cost of debt by 0.42 to 0.47 percentage points per firm. Summing over all firms, results in **savings of 57 to 65 million euros** in the period considered.

Using mutual guarantees lowers cost of debt by roughly the same amount as doubling the size of the firm.

The impact of using mutual guarantees is stronger for

- Younger firms
- Smaller firms
- Firms with fewer fixed assets.

# Access to debt

## Measured as debt over total assets

### Sample

290 thousand observations, involving 107 thousand firms.

### Potential determinants considered

Leverage

Profitability

Growth of sales in current year

Growth of sales in the following year

Use of mutual guarantees

Year fixed effects

Firm fixed effects

### Technical information

Linear regression. In the base case, profitability's coefficient is the only not statistically significant.

$R^2=0.8208$ ;  $F=1224.21$ .

### Estimated impact of mutual guarantees

Increases access to debt by 5.2 to 5.4 percentage points per firm.

Summing over all firms, results in **increased access to debt of 3.2 to 3.3 billion euros** in the period considered, compared with what would have happened if firms did not use mutual guarantees.

The impact of using mutual guarantees is stronger for smaller firms.



# Investment

## Measured as rate of change of total assets

### Sample

157 thousand observations, involving 85 thousand firms.

### Potential determinants considered

Cost of debt

Size

Weight of fixed assets on total assets

Growth of sales (current and following year)

Profitability (previous, current and following year)

Use of mutual guarantees

Year fixed effects

Firm fixed effects

### Technical information

Linear regression. Growth in the following year has the only coefficient that is not statistically significant.

$R^2=0.7509$ ;  $F=464.18$ .

### Estimated impact of mutual guarantees

Increases rate of change of total assets by 4.3 percentage points per firm, compared with what would have happened if they did not use mutual guarantees. Summing over all firms, results in **increased investment of 2.6 billion euros** in the period considered.

The impact on investment in fixed assets is estimated at 457 to 572 million euros.

The impact of using mutual guarantees is again stronger for smaller firms.



# Exports

## Measured as exports over total sales

### Sample

464 thousand observations, involving 153 thousand firms.

### Potential determinants considered

Size of the firm

Age of the firm

Export experience (one and two periods lag)

Use of mutual guarantees

Sector

Year fixed effects

### Technical information

TOBIT regression. All coefficients are statistically significant. Pseudo  $R^2=0.5462$ ; LR  $\chi^2(18)=187556.62$ .

### Estimated impact of mutual guarantees

Increases weight of exports on sales by 0.52 to 0.57 percentage points per firm. Summing over all firms, results in **increased exports of 312 to 341 million euros** in the period considered.

Sector has a strong impact on exports, with manufacturing presenting the highest outward orientation.



Mutual Guarantees

# AGGREGATE IMPACT ON THE PORTUGUESE ECONOMY



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# Measuring repercussions on the rest of the Portuguese economy

## Method: Input-Output Analysis

Input-output analysis divides the economy in sectors and characterizes the technical relations between them: to respond to an increase in its demand, how much does each sector buy from every other? Input-output tables are composed of the technical coefficients that answer this question. Assuming the stability of these coefficients, its possible to determine the impact that an increase in demand in one sector would have in the production of all others. And, assuming stable productivity, its then possible to estimate the labour requirements that this implies.

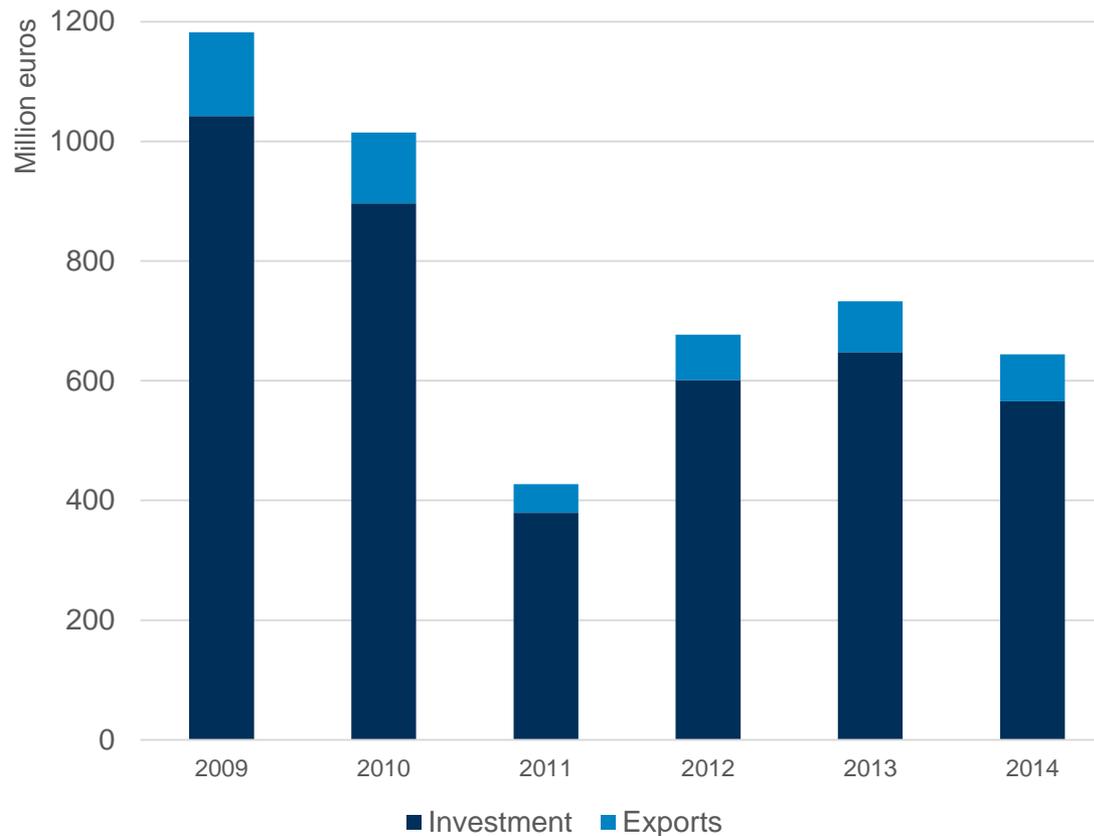
## Data

The most recent input-output tables for the Portuguese economy, used here, refer to 2008. The impact of mutual guarantees on investment and exports by its users, determined in the previous section, is the variation in demand considered for the purposes of this analysis.



# Mutual guarantees in Portugal

## Impact on Gross Value Added 2009-2014



Investment and exports that would not have happened but for the support of mutual guarantees induced **4.7 billion euros GVA** in six years. Their contribution represented **0.28% to 0.76%** of total Portuguese GVA, depending on the year.

Retail and wholesale trade are the sectors in which the impact was largest, but together represent only **22%** of the total impact.

# Impact on employment 2009-2013

Between 2009 and 2013, GVA induced by investment and exports that would not have happened but for the support of mutual guarantees required labour inputs corresponding to **0.7% to 1.9% of total employment in Portugal**, depending on the year.

	Employment induced by Mut. Guar.	% of employment in Portugal
2009	95,698	1.9%
2010	78,562	1.6%
2011	33,699	0.7%
2012	53,391	1.2%
2013	56,504	1.3%
2014	n.a.	n.a.

*Note: Estimates for 2014 are not presented due to data limitations.*



# Economic impact of the Portuguese Mutual Guarantee Scheme 2009-2014: Summary

In 2009-2014, *compared to what would have happened if they did not use them*, users of mutual guarantees were able to:

- Save 57 to 65 million euros in interest payments;
- Obtain 3.2 to 3.3 billion euros of additional funding;
- Grow their balance sheets by 2.6 billion euros;
- Increase exports by 312 to 341 million euros.

Small and young firms benefited proportionally more from the use of mutual guarantees than larger and more established ones.

Investment and exports induced by the use of mutual guarantees had positive repercussions across the Portuguese economy:

- Leading to an increase in Gross Value Added of some 4.7 billion euros, i.e., 0.28% to 0.76% of total Portuguese GVA, depending on the year;
- Requiring labour inputs corresponding to 0.7% to 1.9% of total employment in Portugal, depending on the year.





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