Resource misallocation

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Banque de France

This discussion

- Firm-level dispersion in productivity, Is the Devil in the details?, by Foster Grim Haltiwanger and WolF

- Factor Reallocation in Europe, by Bartelsman, Lopez-Garcia and Presidente

- 2 different methodological approach
  - Can firm-level productivity dispersion inform us about the presence of barriers to reallocation?
  - Can we measure the importance of reallocation itself?

- Answers to these questions require mobilizing theoretical models and confront predictions to firm-level data

- With these two papers we learn a lot from the measurement of reallocation

Foster Grim Haltiwanger and Wolf

- What is firm-level dispersion in productivity within sectors?
  - **Distortions** (in product or factors markets)? ➜ Hsieh and Klenow (2009) – henceforth HK – under **Constant Returns to Scale**
  - Other assumptions : non-CRS, demand shocks, market structure, adjustment frictions
  - Measurement issues (e.g. sector aggregation, misreporting of firm-level information)
  - Or, more likely : a combination of these ingredients

- This paper shows that the interpretation of TFPR dispersion in terms of market frictions in HK heavily relies on the CRS assumption
  - Relaxing this assumption can lead to very different interpretation
  - Under non-CRS, role of demand shocks and TFPQ
  - Theoretical prediction tested on US establishments' data

- Really nice and useful work as so many papers are now using the HK

- **Alternative explanations**

- Market structure
  - <u>Variable markups</u> under non-CES demand and perfect competition (Cf. Melitz and Ottaviano, 2008) or CES with oligopolistic market structure (Cf. Atkeson and Burstein, 2008)
  - Different firms react differently to macro shocks (Cf. Berman, Martin and Mayer, 2012), even under CRS assumption
  - Impact on TFPR dispersion

- Adjustment frictions (discussed in paper)
  - It takes time to adjust production factors consecutive to demand shocks
  - How does this mechanism relate to the CRS hypothesis? Similar predictions?

- TFPR dispersion over the cycle
  - Counter-cyclical? ➔ e.g. more dispersed distribution during recessions
  - Some evidence from firm-level analysis from Bloom, Floetotto, Jaimovich, Saporta-Eksten, and Terry (2014)

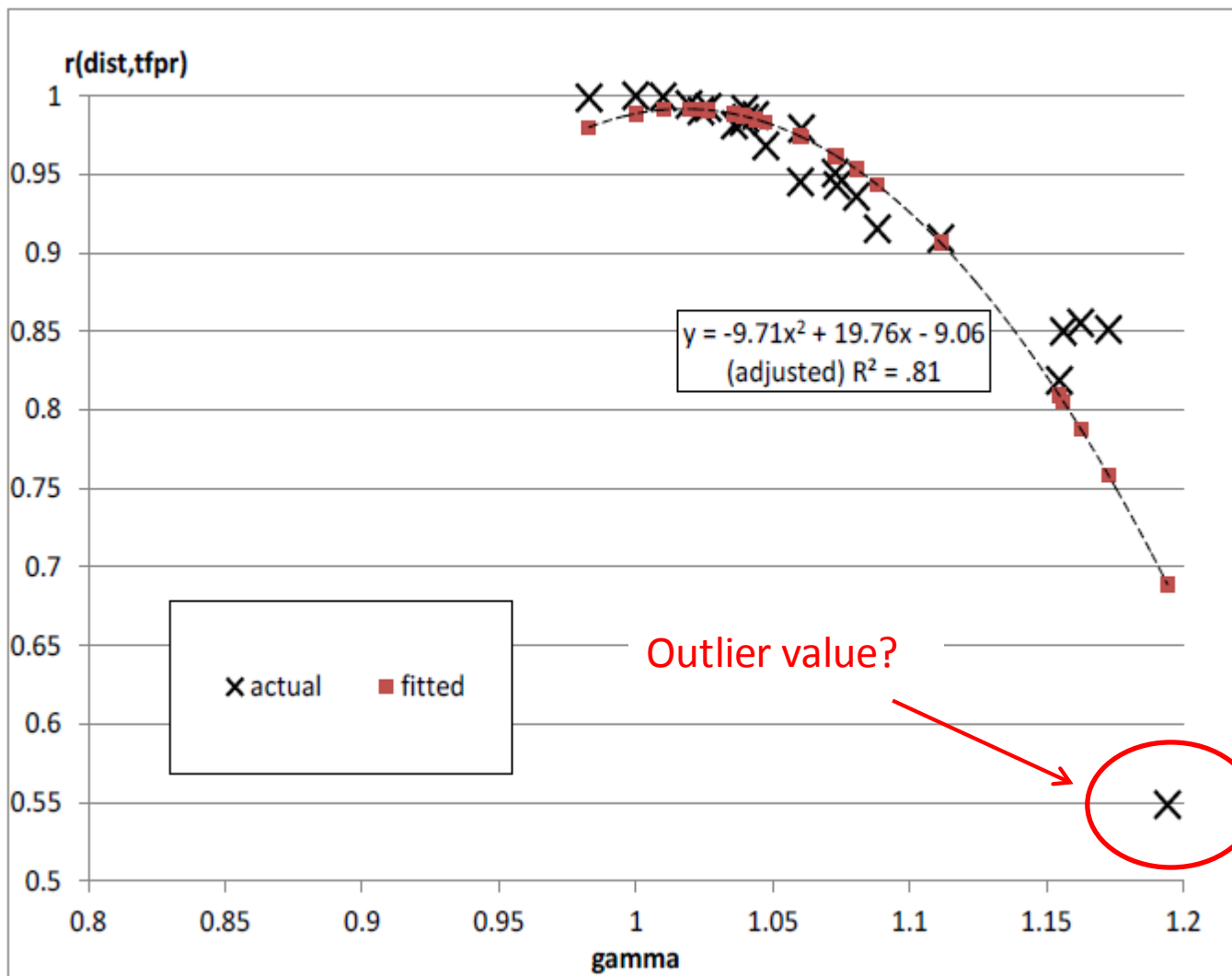# Counter-cyclical: micro-uncertainty, the variance of plant TFP shocks, increased by 76% in the Great Recession
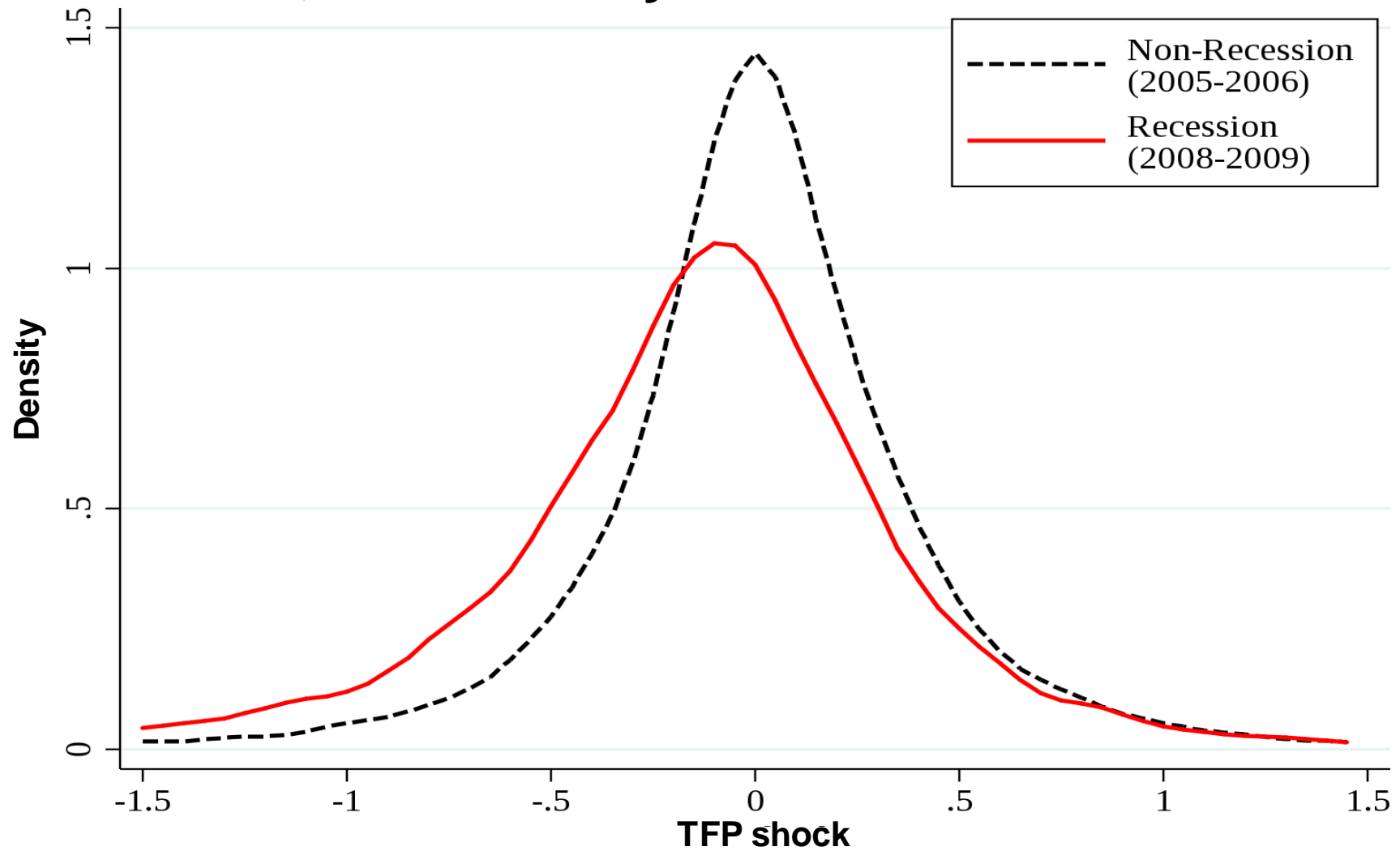
Notes: Constructed from the Census of Manufactures and the Annual Survey of Manufactures using the <u>balanced panel of all 15,752 establishments active in 2005-06 and 2008-09</u>. Moments of the distribution for non-recession (recession) years are: mean 0 (-0.166), variance 0.198 (0.349), coefficient of skewness -1.060 (-1.340) and kurtosis 15.01 (11.96). The year 2007 is omitted because according to the NBER the recession began in December 2007, so 2007 is not a clean "before" or "during" recession year.

- Empirical challenge : how to identify the relative contribution of the different factors driving TFPR dispersion?
  - Market distortions are structural and should not be affected by the cycle, but…
  - They interact with demand shocks + policy distortions during downturns (safeguard measures, impact of monetary policy…)
  - + others: Returns to scale, Adjustment frictions, Variable markups…

Empirical analysis

- Estimates of the gamma parameter reflecting the degree of returns to scale
  - Shows most industries evolve with Increasing Returns to Scale
  - Is that consistent with other firm-level evidence? Show some correlation with other available industry-level indicators for plausibility?
  - Publish detailed industry results in the online appendix

- IRS reduces considerably the correlation of TFPR with the distortion, but
  - In most industries, 80% or more of the dispersion is accounted for by the distortions ➔ Not bad!
  - ➔ How much can we trust distortion measures from HK?

The chart shows r(dist,tfpr) versus gamma, with the following annotations:

y = -9.71x² + 19.76x - 9.06
(adjusted) R² = .81

Legend: ✕ actual, ■ fitted

Outlier value?

Quantification : the demand elasticity

- The rho parameter that determines the price elasticity (rho = 0.9) implies quite high values of the price elasticity of demand
  - ➢ sigma = 1/(1-rho) = 10
  - ➢ Firm-level estimations focusing on export data typically find weaker estimates (between 1 and 5)
- How does the value of this parameter affects the quantification presented above?

Overall, great work. Still much to learn from these TFP dispersions

Bartelsman, Lopez-Garcia, and Presidente

- Paper uses the Compnet data to replicate / extend the work by Foster, Grim and Haltiwanger (2014) – henceforth FGH - for the US
  - Really nice use of Compnet data as precisely the objective was to allow cross-country comparisons
  - Cross country data allow international comparisons + explore reallocation during the Great Recession
  - Provides some guidelines for future work about how to use well the CompNet data
  - Both Academic and policy contributions emphasizing the role of reallocation in determining aggregate productivity dynamics

- **Comments on the data**
  - Not firm-level data, so need some caution in the interpretation of the results and comparison with FGH (acknowledged in the paper)
  - 25 "representative firms" per country-sector-year

  - Growth rate <u>not</u> computed at the firm-level, but as a difference between representative firms' size in t and t-3 (in transition matrix)
  - <u>Question</u>: is the sample of firms used to compute the median size in t-3 the exact same sample of firms used to compute median size in t?
  - ➔ Risk = composition effects in the computation of growth rate

  - Only very few firms making big jumps (eg move from Q1 to Q5)
  - ➔ Weight the estimations?

  - No entry/exit: contribution of reallocation is underestimated?

- Identification strategy: impact of relative productivity ex-ante on L or K growth

$$\Delta x_{i,c,s,t} = \beta_1 \Delta \text{cycle}_{c,s,t} + \beta_2 \text{Rel. prod}_{i,c,s,t-3} + \gamma \text{FE} + \varepsilon_{i,c,s,t}$$

  – Fixed effects : country, sector, size, year, country*sector, sector*size

  – Could introduce as well Country-year FE or Nb. firms

  ➔ control for unobserved changes: population of firms, the distribution of firms, unobserved supply shocks, sector-specific reforms etc.

Set of FE ➔ the variance is driven by heterogeneity in relative productivity <u>within sector-size cells</u>

Initial quintile/quintile 3 years later	Q1	Q2	Q3	Q4	Q5
	Prod11	Prod12	Prod13	Prod14	Prod15
Q1	6%	24%	49%	86%	170%
Q2	-19%	0%	16%	45%	113%
Q3	-32%	-14%	-1%	17%	81%
Q4	-45%	-31%	-16%	-2%	40%
Q5	-58%	-47%	-36%	-20%	0%

- <u>Reallocation</u> if prod 11 < prod12<prod13<prod14<prod15
➔ Determines the coefficient on rel.prod. variable
- This ranking can change across countries, and within-countries over time
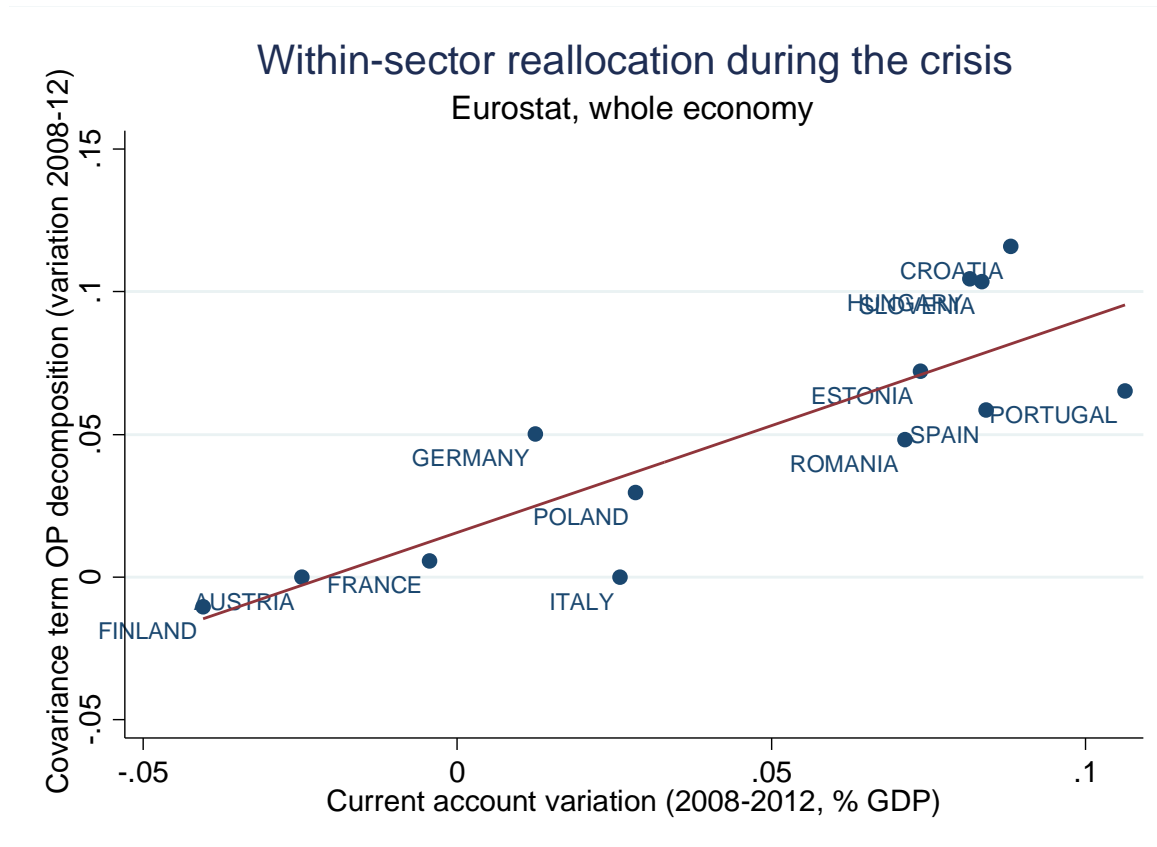
<u>Comment</u> : give more details on the calculation of prodxy, the initial productivity (in t-3) of the firms that were in Qx and are now in Qy

- <u>Main result</u>:
  - Nice as it seems that reallocation is working on average, across countries, sectors, and size classes
  - Endogeneity: "cycle" variable ➜ use instrument?
  - Endogeneity : "Rel. prod" ➜ More controls for "representative firms'" characteristics?
  - Large coefficient compared with the US evidence from FGH … any explanation?
  - What is the contribution of reallocation on aggregate productivity growth for each country? Can we measure it using this framework?

- Interesting result on the impact of regulation
  - Unclear though what is the exact chosen specification

    Rel.prod.*Reg + Rel.Prod*Sec.Expo + Rel.Prod*Sec.Expo*Reg?

  - "Rajan and Zingales" approach : ➔ how is sector exposure measured exactly?
  - Are the effects of each regulation estimated separately or simultaneously?

  ➔ Correlated with each other but need to disentangle the mechanisms
- The effects of the regulation could in principle channel through different mechanisms
  - Barriers to reallocation for a given distribution of productivities
  - Changes in the dispersion of productivities (see HK)
  - Is there a way to disentangle empirically these effects?
- Role of different factors correlated with Rigidities?

- Impact of the Great Recession = less reallocation compared to expected impact during bust.
  - Interesting to see this also for Europe, documented in FGH for the US
  - How to explain the ambiguous effect of the GR? Too small growth of high productive firms? Or, no decline of less productive firms?
- Role of trade:
  - Quadruple interactions are difficult to interpret!
  - Short term effect concentrated on the trade collapse period? Role of exporters in long term?

- Using productivity decompositions?
  - Olley and Pakes (1996) productivity decomposition
  - Ongoing work for the Banque de France Bulletin (Berthou, 2016)

Within-sector reallocation during the crisis
Eurostat, whole economy

Y-axis: Covariance term OP decomposition (variation 2008-12)
X-axis: Current account variation (2008-2012, % GDP)

Labeled points: CROATIA, HUNGARY, SLOVENIA, ESTONIA, PORTUGAL, SPAIN, ROMANIA, GERMANY, POLAND, FRANCE, AUSTRIA, ITALY, FINLAND

- **Credit constraints : barriers to reallocation ?**

Bartelsman, di Mauro and Dorrucci (2015), "Eurozone rebalancing: Are we on the right track for growth? Insights from the CompNet micro-based data"

Graph: Percentage of credit-constrained firms by labour productivity decile in stressed and non-stressed economies
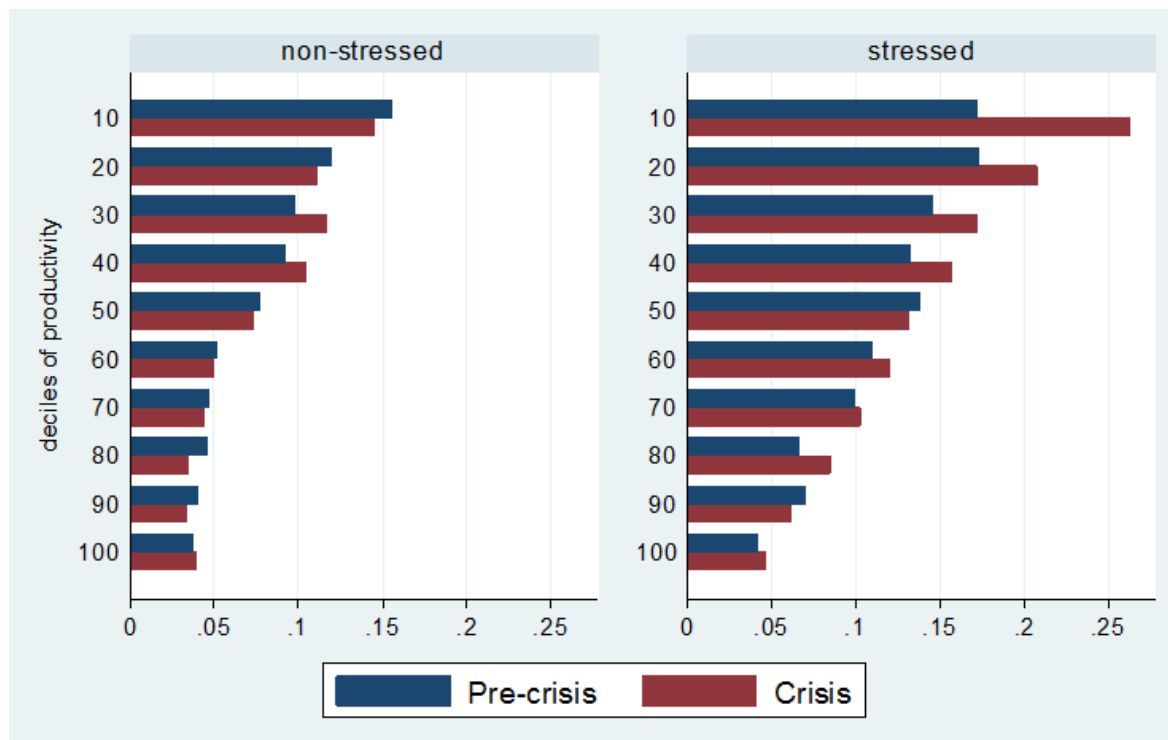
Overall

- Very nice analysis and shows the interest in using CompNet data

- Very much work with impressive collection of results

- Need to focus a bit more on identification, and the implied theoretical mechanisms.

- Quantification of macro impact of these mechanisms on productivity would be nice