The Economy after the Fall: Less Innovative, Less Intangible

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Motivation

- Intangible investment has been rising across advanced countries
- Intangible intensity has also been rising → Production relies more on intangibles
- Many implications on the way the economy works and policy ([Akcigit and Ates, 2021], [De Ridder, 2019], [Döttling and Ratnovski, 2020])

Definition

- In this paper we define intangible investment as
  1. Innovation: $R\&D$ Expenditure to improve products or introduce new ones
  2. Firm Specific Intangibles (FSI)= wide definition including software and databases, marketing, training expenditure linked to firms' ability to bring their products to the market

Research questions and Data

- This paper contributes empirical evidence to the recent theoretical literature evaluating the role of intangible investment on firm behaviour
- Focus: long run and after negative shocks
- We pose two research questions:
  1. Does intangible intensity matter for firm growth?
  2. Was the rise of intangible intensity accelerated or slowed down by the Great Recession?
- COMPUSTAT - United States - whole economy excluding firms in the utility sector, agriculture, public administration, finance, insurance are real estate, or unclassifiable sectors.
- 1980-2018
- Definition of key variables:
  1. Innovation intensity: $\frac{R\&D}{sales}$
  2. FSI intensity: $\frac{FSI}{sales}$ where $FSI = 0.3(xsga - R\&D)$ PT
  3. Intangible Intensity: $\frac{R\&D+FSI}{sales}$

Intensity and Growth

Hypothesis: firms invest in intangible capital to sustain demand for their goods and grow
Findings:

- Small firms invest relatively more in intangibles
- Firms with relatively more intangible capital are larger
- Past intangible investment is associated with higher growth

	(1) Sales growth b/se	(2) Sales growth b/se	(3) Sales growth b/se
$\frac{R\&D}{sales}(t-1)$		1.114***	
		(0.055)	
$\frac{FSI}{sales}(t-1)$	3.105***		
	(0.114)		
$\frac{IntanInvest}{sales}(t-1)$			1.410***
			(0.049)
Number of obs.	78,322	78,322	78,322
R^2	0.292	0.238	0.298
Firm fixed effects	YES	YES	YES
Industry-time fixed effects	YES	YES	YES
S.e. clustered at firm level	YES	YES	YES
Firm level controls	YES	YES	YES

Figure 2: Figure caption

The Great Recession

Hypotheses:

- Recessions are cleansing periods (Creative Destruction) → Frontier firms outperform laggard competitors → large shocks bring about reallocation of production in favour of intangible intensive firms → Intangible intensity ↑
- L-shaped recovery of output → all firms reduced investment efforts (even more?) → the rise of intangible intensity slowed down
- Draw from [Hershbein and Kahn, 2018] to separate the effects of the Great Recession from the underlying trend

$$INT_{i,j,t} - INT_{i,j,2007} = \beta_0 + \beta_1 IntanIntensity_{i,j,2007} + \\ + \beta_2 Shock_j * I^t + \\ + \beta_3 I^t + \sum_{\kappa}^{N} \gamma_\kappa X^\kappa_{i,j,2007} + \epsilon_{i,j,t} \quad (1)$$

$$INT_{i,j,t} = \left[\frac{R\&D_{i,t}}{sales_{i,t}} * 100, \frac{FSI_{i,t}}{sales_{i,t}} * 100, \frac{IntInv_{i,t}}{sales_{i,t}} * 100 \right]$$

$$Shock_j = -(ln(GDP_{j,2009}) - ln(GDP_{j,2007})) * 100$$

Main results

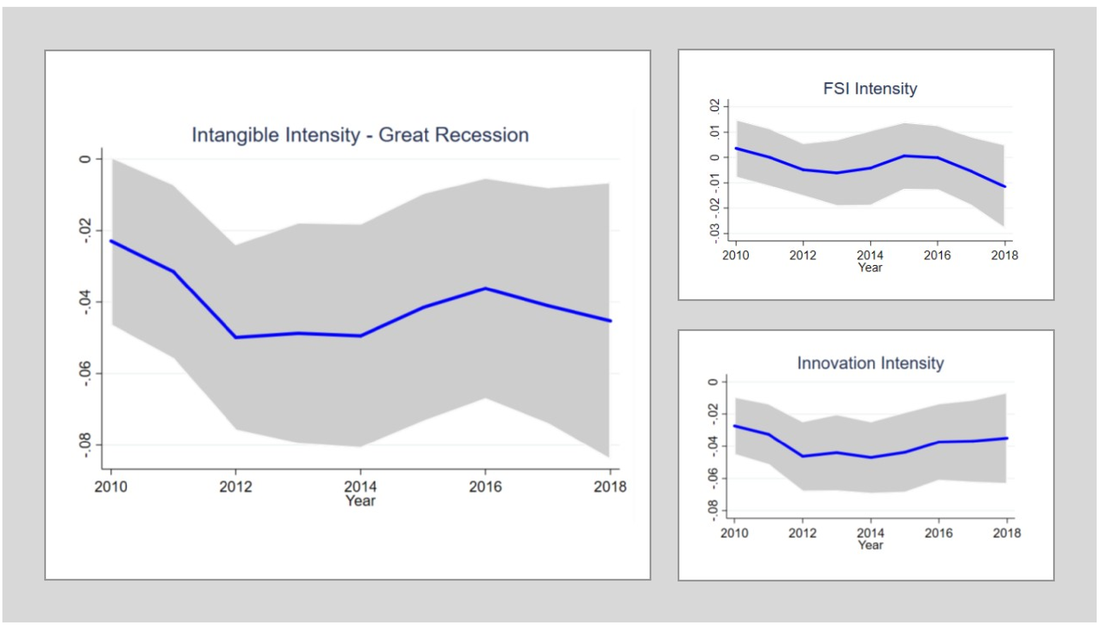

Figure 1: GDP shock × time effects

Disclaimers

Disclaimer: *Any views expressed in this paper are solely those of the authors and so cannot be taken to represent those of the Bank of England or to state BoE policy.*
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