The effects of financialization and financial development on investment: Evidence from firm-level data in Europe

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Outline of the presentation

1. Introduction

2. Accumulation of fixed assets and financialization

3. Data and stylized facts

4. Estimation methodology and specifications of the investment function

5. Econometric estimations for Europe

6. Conclusions
Introduction (1)

> Robinson (1952:86) "where enterprise leads finance follows"
  – endogeneity of ‘financial sector development’

> Disproportionate growth of financial activities compared to the financing requirements in the last decades

> How this imbalance affected the accumulation processes in the non-financial sector?
Introduction (2)

> **Pre-2008 Mainstream lit.** : positive relationship between FMKTs development and accumulation, efficiency, TFP, financing constraints (King and Levine, 1993; Gilchrist and Himmelberg, 1995; Beck et al., 2000; Love, 2003; Beck and Levine, 2004; Love and Zicchino, 2007)

> **Post-2008 Mainstream lit.** : more cautious about this relationship (Cecchetti and Kharroubi, 2012; Beck et al., 2014) ‘Threshold effect’ (Law and Singh, 2014; Sahay et al., 2015; Arcand et. al, 2015; Cournède et al. 2015)

> **Post-Keynesian financialization lit.**: harmful impact on economic systems (Epstein, 2005), income distribution (Onaran et al., 2010; Guschanski and Onaran, 2016), investment (Stockhammer, 2004; Orhangazi, 2008; Demir, 2009; Tori and Onaran, 2015; Tori and Onaran, 2017b)
Accumulation of fixed assets and financialization: The PK literature (1)

> **Deeper connection** (not just quantitative) between financial markets and production

> **Structural changes** that led to **stagnant** investment and growth

> Financial markets are **extracting revenues** from the productive sector

> NFCs are increasingly engaging in **financial investments**

→ In the context of **financialized economies** the traditional models of investment may be **mispecified**

→ Need for additional evidence at the microeconomic level
## Accumulation of fixed assets and financialization: The PK literature (2)

<table>
<thead>
<tr>
<th>Authors</th>
<th>Period</th>
<th>Variables</th>
<th>Countries</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>van Treek (2008)</td>
<td>1965 - 2004</td>
<td>Profit rate, profit share, output growth, interest payments, dividend payments</td>
<td>USA, UK, France, Germany</td>
<td>Increase in the rentiers’ share had a <em>negative</em> impact on investment</td>
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<td>Demir (2009)</td>
<td>1991 - 2003</td>
<td>Risk and uncertainty, credit from the banking sector, real GDP, gap between returns on fixed and financial assets</td>
<td>Argentina, Mexico, Turkey</td>
<td>Preference towards reversible short-term financial investment reduce fixed investment</td>
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<td>Tori and Onaran (2015)</td>
<td>1985 - 2014</td>
<td>Lagged investments, sales, operating income, financial payments, financial incomes, debt, Tobin’s Q</td>
<td>UK</td>
<td><em>Negative</em> effect of both financial payments and incomes, especially in manufacturing</td>
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<td>Tori and Onaran (2016)</td>
<td>1995-2015</td>
<td>Lagged investments, sales, operating income, financial payments, financial incomes</td>
<td>Developed, Emerging, and developing countries</td>
<td><em>Negative</em> effect of both financial payments and incomes (not in China)</td>
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</table>
Motivation and Contributions

The state of the art
Lack of evidence at the firm-level
Main focus on the USA

Key Contributions

a) *Extension* of the earlier PK investment model of firm-level investment

b) *Worldscope* database allows us to build a consistent measure for companies’ financial activities

c) First *micro-econometric evidence for Europe* on the effects of financialization on physical investment

d) New evidence on the effect of *Financial Development* (Love and Zicchino, 2007)
Data and stylized facts

The dataset

- Publicly listed non-financial companies in the EU14 (AUT, BEL, DNK, FIN, FRA, GER, GRE, IRL, ITA, NLD, PRT, SPA, SWE, U.K.) from Worldscope database (Thomson Reuters)

- Period 1995-2015 (data availability)

The sampling process

- Exclusion of companies with negative avg. profit rate (bankruptcy signal)
- Exclusion of companies with I/K > 2.5
- Exclusion of outliers in the low and top 1% tails
Stylized facts (1)

Additions to fixed assets/operating income (I/\pi), NFCs, EU14 and selected countries
Stylized facts (2)
Stylized facts (3)

Additions to fixed assets/Fixed Assets (I/K), total financial payments (F/K), and total financial profits ($\pi_{F/K}$), NFCs, EU14
Estimation methodology

Difference-Generalized Method of Moments (GMM) (Holtz-Eakin, Newey, and Rosen, 1988; Arellano and Bond, 1991)

Our dependent variable \((I/K)\) is dynamic, and path dependent \(\rightarrow j\) lags of the dependent variable as explanatory variable. Standard estimator (i.e. OLS or GLS) would be inconsistent.

Four reasons to use GMM for our analysis (Roodman, 2009)

1) A small \(T/\)large \(N\) sample (efficiency)
2) By differencing variables, eliminates unobservable companies – fixed effects
3) Some regressors are not ‘strictly exogenous’. GMM can handle the presence of endogeneity
4) GMM can address autocorrelation problems of ‘internal instruments’
Specification of the investment function

*Capital accumulation:*

a) An intrinsically dynamic phenomenon (Kalecki, 1954)

b) Irreversible (Lopez and Mott, 1998)
  - *overlapping time-periods*
  - *path dependency*

→ The importance of the lagged level of investment as an explanatory variable (Ford and Poret, 1991; Kopcke and Brauman, 2001; Orhangazi, 2008b; Arestis et al., 2012)
\[
\left( \frac{I}{K} \right)_{it} = \beta_0 + \beta_1 \sum_{j=1}^{2} \left( \frac{I}{K} \right)_{it-j} + \beta_2 \sum_{j=1}^{2} \left( \frac{\pi - CD}{K} \right)_{it-j} + \beta_3 \sum_{j=1}^{2} \left( \frac{S}{K} \right)_{it-j}
\]
\[
+ \beta_4 \sum_{j=1}^{2} \left( \frac{\pi_F}{K} \right)_{it-j} + \beta_5 \sum_{j=1}^{2} \left( \frac{F}{K} \right)_{it-j} + \beta_6 \sum_{j=1}^{2} (Q)_{it-j} + \beta_t + \epsilon_{it}
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+ \beta_3 \sum_{j=1}^{2} \left( \frac{S}{K} \right)_{it-j} + \\
+ \beta_4 \sum_{j=1}^{2} \left( \frac{\pi_F}{K} \right)_{it-j} + \beta_4.1 \sum_{j=1}^{2} \left[ \left( \frac{\pi_F}{K} \right) * D_n \right]_{it-j} + \beta_5 \sum_{j=1}^{2} \left( \frac{F}{K} \right)_{it-j} \\
+ \beta_5.1 \sum_{j=1}^{2} \left[ \left( \frac{F}{K} \right) * D_n \right]_{it-j} + \beta_1 \sum_{j=1}^{2} \left( \frac{TD}{TA} \right)_{it-j} + \beta_6 \sum_{j=1}^{2} \left( Q \right)_{it-j} + \beta_t + \epsilon_{it}
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+ \beta_3 \sum_{j=1}^{2} \left( \frac{S}{K} \right)_{it-j} + \beta_4 \sum_{j=1}^{2} \left( \frac{\pi_F}{K} \right)_{it-j} + \beta_{4.1} \sum_{j=1}^{2} \left[ \left( \frac{\pi_F}{K} \right) \ast D_{LFD} \right]_{it-j} + \beta_5 \sum_{j=1}^{2} \left( \frac{F}{K} \right)_{it-j} \\
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+ \beta_7 \sum_{j=1}^{2} \left( Q \right)_{it-j} + \beta_t + \epsilon_{it}
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Estimation results
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<th>(2)</th>
<th>(3)</th>
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<tbody>
<tr>
<td>((I/K)_{t-1})</td>
<td>0.299***</td>
<td>0.321***</td>
<td>0.306***</td>
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<tr>
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<td>(0.050)</td>
<td>(0.042)</td>
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<td>-0.155*** (0.059)</td>
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<td>$\frac{(F/K)}{t-2} * D_{20}$</td>
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<td>$(Q)_{t-1}$</td>
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<td>0.149*** (0.033)</td>
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### Single country estimations

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**Notes:**
- **Significance levels:**
  - ****: p < 0.1
  - ****: p < 0.05
  - ***: p < 0.01
- Standard errors are in parentheses.
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*Note:*** indicates significance levels at 0.01, ** at 0.05, and * at 0.10.*
## Single country estimations

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**FD index**: Index 1 + Findex 1 from Demirguc-Kunt and Levine (1996), Beck et al. (2000)

- **Index 1** = the sum of (standardized indices of) market capitalization to GDP, tot. value traded to GDP, and turnover (stock mkt activity)

- **Findex1** = sum of (standardized indices of) ratio of liquid liabilities to GDP (i.e. M3/GDP), and ratio of domestic credit to private sector to GDP (fin. intermediaries)
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*Internal finance (long-run coefficients)*

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**HFD** -0.36 -0.20

**LFD** 0.00 0.60
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**Financial Payments (long-run coefficients)**

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- In countries with high FD the ‘size effect’ is not confirmed.
- Both small and large companies experienced negative effect of financial incomes.
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**Economic effects (2)**

- In countries with high FD the ‘size effect’ is not confirmed.
- Both small and large companies experienced negative effect of financial incomes.
- In countries with low FD only small firms experienced a positive effect of financial incomes.
<table>
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Economic effects (2)

Based on estimation 4

- In countries with high FD the ‘size effect’ is not confirmed
- Both small and large companies experienced negative effect of financial incomes
- In countries with low FD only small firms experienced a positive effect of financial incomes
- Positive effect of financial incomes for smaller NFCs at the aggregate level seems to be driven by the ones in low FD environment
Financialization had a fundamental role in *suppressing the rate of physical accumulation of NFCs in Europe*

*In Europe we find:*

> Robust *negative impact* of financial incomes and financial payments on NFCs’ investment

> At a first sight, dimension ‘matters’...

> On aggregate, the effect of financial incomes is:

   - *Positive* for *smaller* companies (‘financially constrained’)
   - *Negative* for *larger* companies (they create the vast majority of $K$)

> In a financialization framework the change in the level of *debt* is a less robust explanatory variable explaining firm-level investment
Conclusion (2)

Financial development

> is certainly *easing* the ‘internal finance’ constraint

> When ‘controlling’ for financialization (incomes and payments) higher levels of financial development (index) increase the overall *negative effect of financial incomes* on NFCs investment

> In countries with high FD both *big* and *small* companies’ investment are negatively effected by their financial incomes

> seems to support investment in smaller companies in countries with relatively *low* FD levels
Conclusion (3)

How to get out of the recession?

> The financialization of the European system favoured by a political processes aimed at the deregulation (liberalization) of financial markets and at reduction of tax rates for corporations (Bieling, 2013).

> De-financialization (socio)economic program?

> Fiscal policies from ‘realized’ profits to ‘re-invested’ profits

> Need for a vast programme of public investment to provide the private initiative with a sustainable incentive structure (Stockhammer, 2015; Onaran, 2016)

> Reconsideration of the process of European (financial) integration guided by ‘market-rules prominence’
APPENDICES
# Variables definition and codes.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Variable</th>
<th>Definition</th>
<th>Worldscope Code</th>
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<td>$I$</td>
<td>Investment</td>
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<tr>
<td>$K$</td>
<td>Capital stock</td>
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<tr>
<td>$S$</td>
<td>Sales</td>
<td>Net sales</td>
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<td>$\pi$</td>
<td>Net profit rate</td>
<td>Operating income-depreciation</td>
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<td>$F$</td>
<td>Financial Payments</td>
<td>Interest + cash dividends paid</td>
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<td>Non-operating profit from interest and dividends</td>
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<td>WC02003+ WC02250+ WC02008</td>
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<td>(Market share price*common share outstanding + total liabilities)/total assets</td>
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<td>$FD$</td>
<td>Financial Development</td>
<td>Standardized average of Stock market and financial intermediaries development over GDP</td>
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### Estimation results, other countries

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<td>$(I/K)_{t-1}$</td>
<td>0.378*** (0.092)</td>
<td>0.191** (0.084)</td>
<td>0.348*** (0.056)</td>
<td>0.096 (0.069)</td>
<td>0.269*** (0.102)</td>
<td>0.432* (0.251)</td>
<td>0.382** (0.175)</td>
<td>0.294*** (0.089)</td>
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<td>$(S/K)_{t-1}$</td>
<td>0.751*** (0.207)</td>
<td>0.501* (0.287)</td>
<td>0.534*** (0.205)</td>
<td>0.036 (0.155)</td>
<td>1.302* (0.792)</td>
<td>0.732 (0.550)</td>
<td>0.477 (0.398)</td>
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<td>$[(\pi - CD)/K]_{t-1}$</td>
<td>0.045 (0.039)</td>
<td>0.075** (0.036)</td>
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<td>-0.025 (0.045)</td>
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<td>$(\pi_F/K)_{t-1}$</td>
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<td>$(Q)_{t-1}$</td>
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<td>0.245** (0.119)</td>
<td>0.151* (0.092)</td>
<td>0.245** (0.119)</td>
<td>0.280*** (0.153)</td>
<td>0.324*** (0.196)</td>
<td>0.252*** (0.119)</td>
<td>0.280*** (0.153)</td>
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**Number of Observations**: 470 708 561 684 314 536 580 904

**Number of Firms**: 76 89 84 82 54 55 92 94

**Number of Instruments**: 34 34 32 32 32 32 32 34

**p-value Hanses test**: 0.735 0.485 0.468 0.445 0.085 0.097 0.599 0.410

**p-value A B test (AR 2)**: 0.242 0.727 0.022 0.696 0.427 0.909 0.622 0.001

**Time effects**: yes yes yes yes yes yes yes yes

**p-value Wald test for time effects**: 0.003 0.000 0.000 0.000 0.001 0.005 0.002 0.011
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## Sample coverage

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<th>(c) Number of firms</th>
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<th>(e) Firms with avg. $\text{Ta} &lt; 20p\text{Ta}$ (%)</th>
<th>(f) Firms with avg. $\text{Ta} &gt; 80p\text{Ta}$ (%)</th>
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<td>25726</td>
<td>1.00</td>
<td>2881</td>
<td>1.00</td>
<td>645 (22.39)</td>
<td>930 (32.28)</td>
<td>9.89</td>
</tr>
</tbody>
</table>
Descriptive statistics for selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>( I/K ) mean</th>
<th>( I/K ) s.d.</th>
<th>( S/K ) mean</th>
<th>( S/K ) s.d.</th>
<th>((\pi - CD)/K) mean</th>
<th>((\pi - CD)/K) s.d.</th>
<th>( \pi_F/K ) mean</th>
<th>( \pi_F/K ) s.d.</th>
<th>( F/K ) mean</th>
<th>( F/K ) s.d.</th>
<th>( I/\pi ) mean</th>
<th>( I/\pi ) s.d.</th>
<th>( FA/K ) mean</th>
<th>( FA/K ) s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.31</td>
<td>0.24</td>
<td>5.29</td>
<td>2.80</td>
<td>0.74</td>
<td>1.55</td>
<td>0.03</td>
<td>0.06</td>
<td>0.32</td>
<td>0.54</td>
<td>0.38</td>
<td>0.26</td>
<td>2.03</td>
<td>4.01</td>
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<tr>
<td>Germany</td>
<td>0.28</td>
<td>0.21</td>
<td>4.50</td>
<td>1.26</td>
<td>0.55</td>
<td>1.76</td>
<td>0.04</td>
<td>0.10</td>
<td>0.30</td>
<td>0.68</td>
<td>0.40</td>
<td>0.27</td>
<td>2.34</td>
<td>6.71</td>
</tr>
<tr>
<td>Italy</td>
<td>0.21</td>
<td>0.15</td>
<td>7.35</td>
<td>0.86</td>
<td>0.38</td>
<td>0.86</td>
<td>0.02</td>
<td>0.05</td>
<td>0.27</td>
<td>0.56</td>
<td>0.42</td>
<td>0.26</td>
<td>1.49</td>
<td>3.41</td>
</tr>
<tr>
<td>Spain</td>
<td>0.18</td>
<td>0.15</td>
<td>4.97</td>
<td>7.39</td>
<td>0.27</td>
<td>0.50</td>
<td>0.02</td>
<td>0.05</td>
<td>0.30</td>
<td>0.64</td>
<td>0.43</td>
<td>0.26</td>
<td>1.09</td>
<td>2.48</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.29</td>
<td>0.21</td>
<td>7.24</td>
<td>3.26</td>
<td>1.00</td>
<td>1.25</td>
<td>0.06</td>
<td>0.17</td>
<td>0.75</td>
<td>1.76</td>
<td>0.33</td>
<td>0.25</td>
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<tr>
<td>United Kingdom</td>
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<td>0.19</td>
<td>5.07</td>
<td>7.65</td>
<td>0.83</td>
<td>1.34</td>
<td>0.03</td>
<td>0.09</td>
<td>0.43</td>
<td>0.92</td>
<td>0.35</td>
<td>0.26</td>
<td>2.67</td>
<td>6.53</td>
</tr>
</tbody>
</table>
The true effect of explanatory variable ‘x’ will be equal to the sum of the interacted and the non-interacted coefficient.

The discussion is a bit more complex when more than one interaction for the same variable is included in the specification.

Taking financial income as an example, the estimated coefficient $\beta_4$ will correspond to the effect of this variable for companies lying in the top 80% of the distribution in terms of total assets, which also are in country with high FD.

Coefficient $\beta_{4.1}$ will be the effect of financial incomes in the companies in the top 80% of the size distribution but based in countries with low FD.

Coefficient $\beta_{4.2}$ will reveal the effect of this variable in relatively smaller companies (the low 20% of the size distribution), irrespective of their location in terms of FD.

The result of $\beta_4 + \beta_{4.2}$ will be the effect of financial incomes in relatively smaller companies based in countries with low FD.
Figure 1. Additions to fixed assets/Fixed Assets (I/K), total payments (F/K), and total financial profits (πF/K), NFCs, UK

Figure 2. Additions to fixed assets/Fixed Assets (I/K), total payments (F/K), and total financial profits (πF/K), NFCs, France

Figure 3. Additions to fixed assets/Fixed Assets (I/K), total payments (F/K), and total financial profits (πF/K), NFCs, Germany

Figure 4. Additions to fixed assets/Fixed Assets (I/K), total payments (F/K), and total financial profits (πF/K), NFCs, Italy

Figure 5. Additions to fixed assets/Fixed Assets (I/K), total payments (F/K), and total financial profits (πF/K), NFCs, Spain

Figure 6. Additions to fixed assets/Fixed Assets (I/K), total payments (F/K), and total financial profits (πF/K), NFCs, Sweden