Investment and investment financing patterns in Europe

A Survey-Based Approach

Annalisa Ferrando
European Investment Bank

Carsten Preuss
University of Potsdam

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Main questions:

- What type of financing mix are firms using for their investment?
- Does the financing mix change with the type of investment undertaken by the firms (tangible/intangible)?

How to answer:

- Focus on novel EIB investment survey (EIBIS) covering a broad spectrum of
  1. different types of investment expenditures (tangible and intangible) and
  2. reported sources of finance that have been used for those investments (internal, intra-group and external finance)

Mostly on physical capital expenditures

- Cash-flow and investment (Fazzari et al., 1988; Kaplan & Zingales, 1997; Cleary, 1999; Erickson & Whited, 2010)
- Leverage & Maturity structure negatively related to investment : Debt as an instrument to control over- or underinvestment (Myers, 1977; Lang et al., 1996, Aivazian et al., 2005; Bruno et al., 2017)

Less extensive literature on intangible asset investment

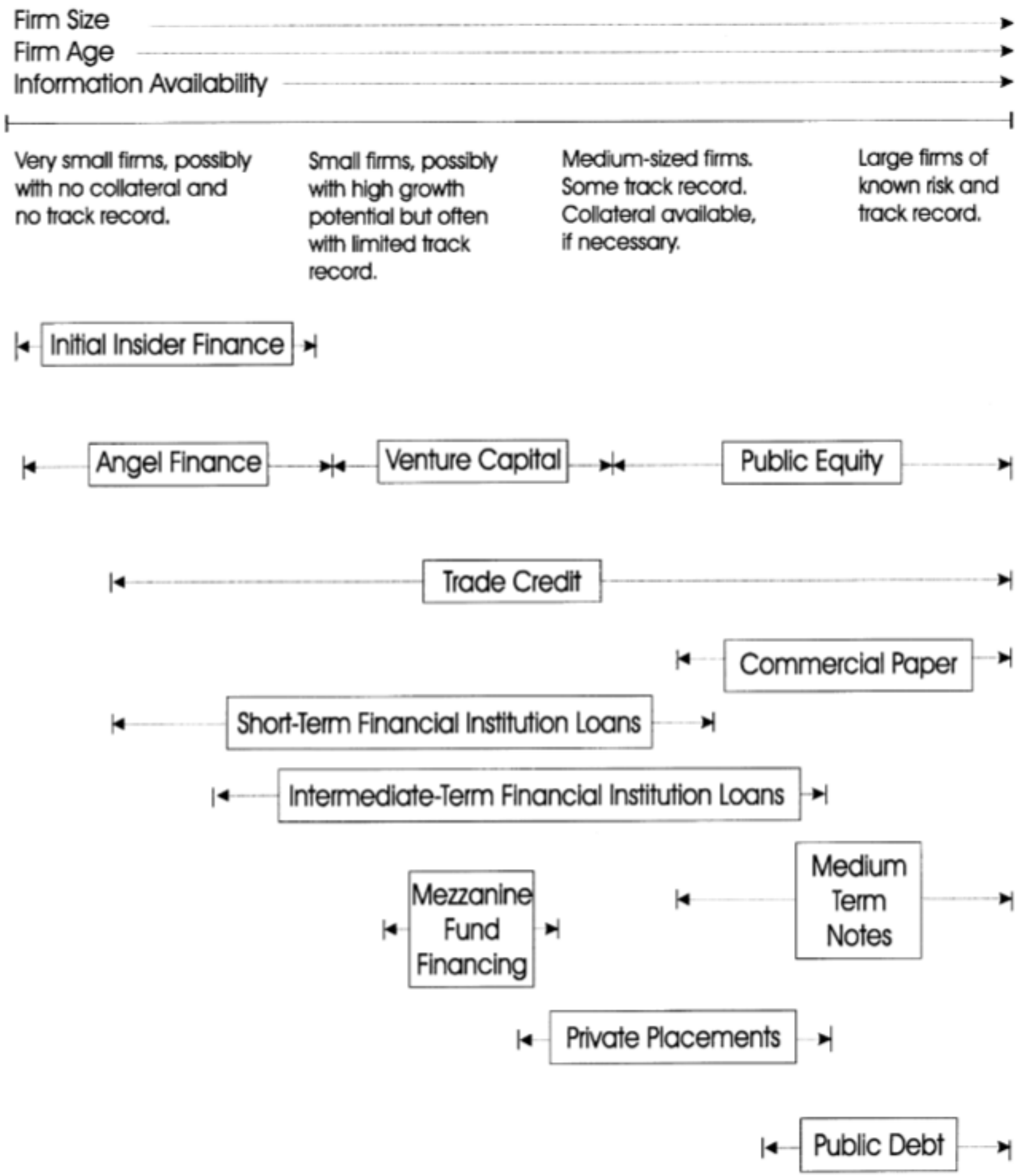
- External finance for intangible investment harder to obtain (less collateralizable) (Hall & Lerner, 2009)
- Negative correlation of debt ratio and intangibles (Long & Malitz, 1983; Hall, 1992; Bhagat & Welch, 1995)
- R&D investment is countercyclical without credit constraints, but it becomes procyclical as firms face tighter credit constraints (Aghion et al., 2010 and 2012)

A small empirical literature investigates the effect of different types of financing on investment

- Large firms substitute between debt - equity financing over the cycle
- Small firms' financing policy for debt and equity is pro-cyclical (Covas and Den Haan, 2012, Begenau and Salomao 2016)

- Investments with more volatile cash flows, like R&D investments, tend to be equity-financed
- Investment in assets that are more tangible and non-unique tend to be debt-financed (Grundy and Verwijmeren, 2017)

Firms' funding escalator



- Support for the pecking order theory when considering SMEs
- Internal finance – retained profits or funds from the entrepreneur and other insiders- over external funds
- Debt over raising new equity

Source: Berger-Udell, 1998

EIB Investment Survey (EIBIS)

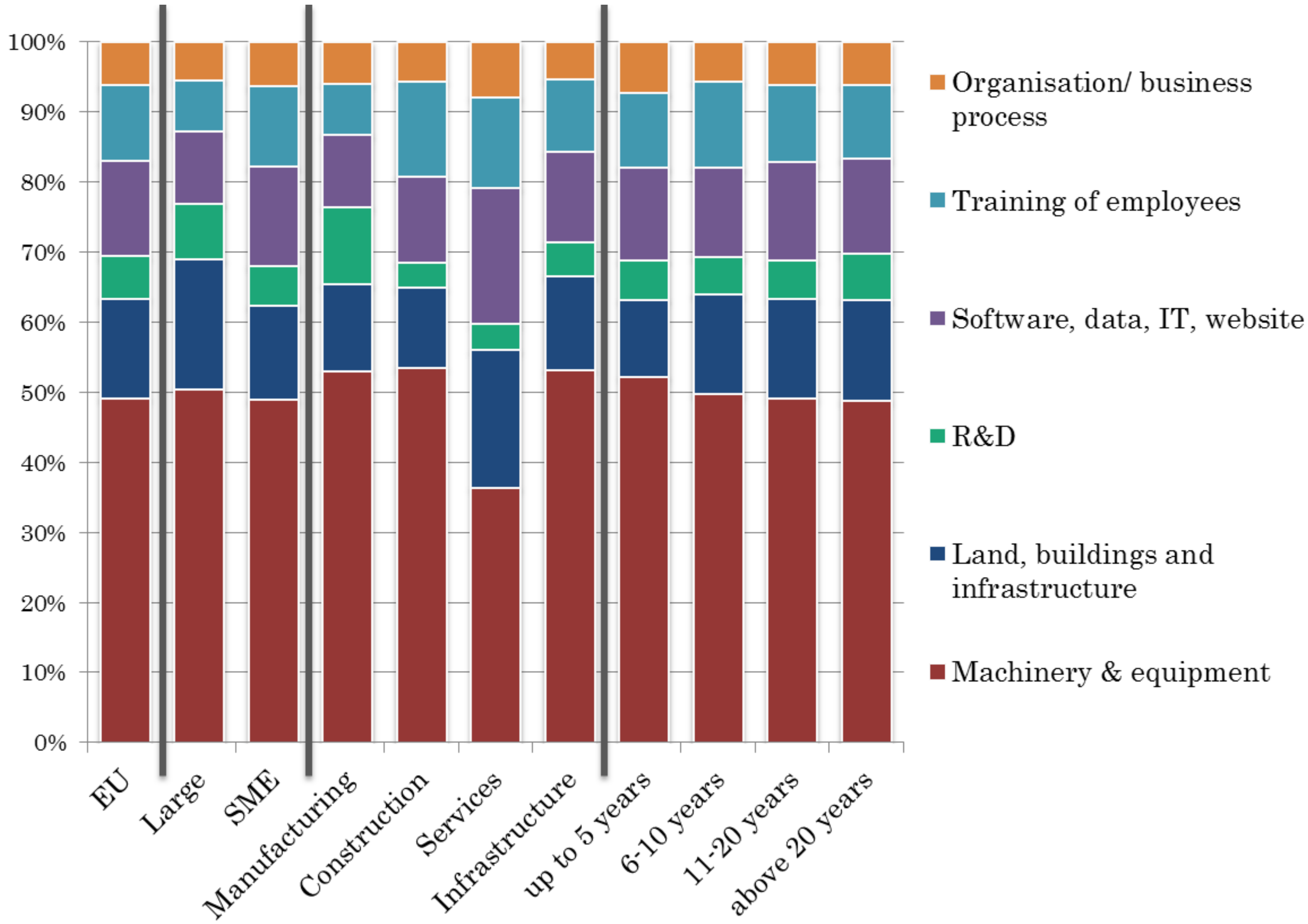
- Some 12,500 firms in the 28 EU member states
- Survey of non-financial corporate sector (firms with 5+ employees)
  - Covering manufacturing, services, construction and infrastructure sector
- Qualitative and quantitative information on:
  - firm characteristics and performance
  - past investment activities and future plans
  - sources of finance
  - and challenges that businesses face
- Representative of the economy (firms weighted by value-added) at the level of:
  - EU28 and for each EU member state (separately)
  - 4 industry groups (within each member state – for most countries)
  - and 4 size classes (within each member state – for most countries)
- Complement to the ECB SAFE survey and national business surveys
- Annual survey

It collects information on several types of investment (amounts, Q13)

Asset category		Types of asset captured in EIBIS	Captured as investment in accounts
Tangible fixed assets		Land, buildings and infrastructu	✔
		Machinery and equipment	✔
Intangible fixed assets	**Innovative**	Research and Development	✔
	Computerized information	Software, data, IT networks and website activities	✔
Other intangible assets	**Economic competency**	Training of employees	✖
		Organisation and business process improvements	✖

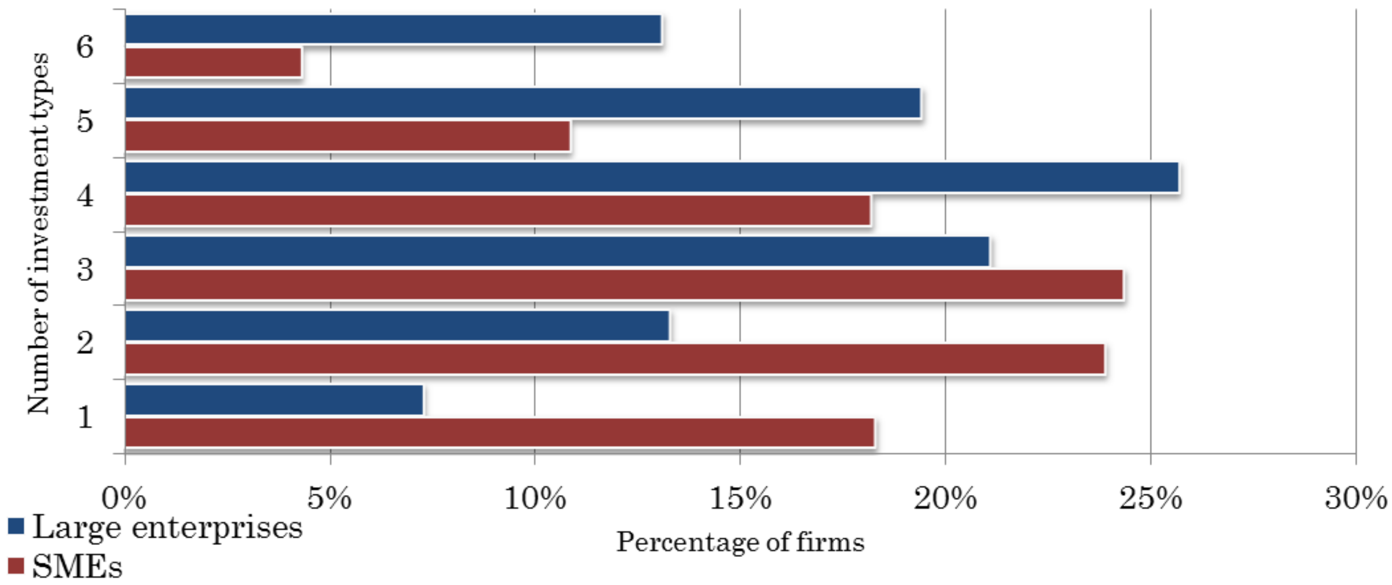
Sources: Authors' own illustration based on Corrado et al. (2015)

Type of investment across size, industry sectors and age



Source: EIBIS. Notes: weighted percentages

Frequency of Number of Investment Type



- SMEs are focusing on fewer types of investment

Source: EIBIS

Financing instruments used for investment activities

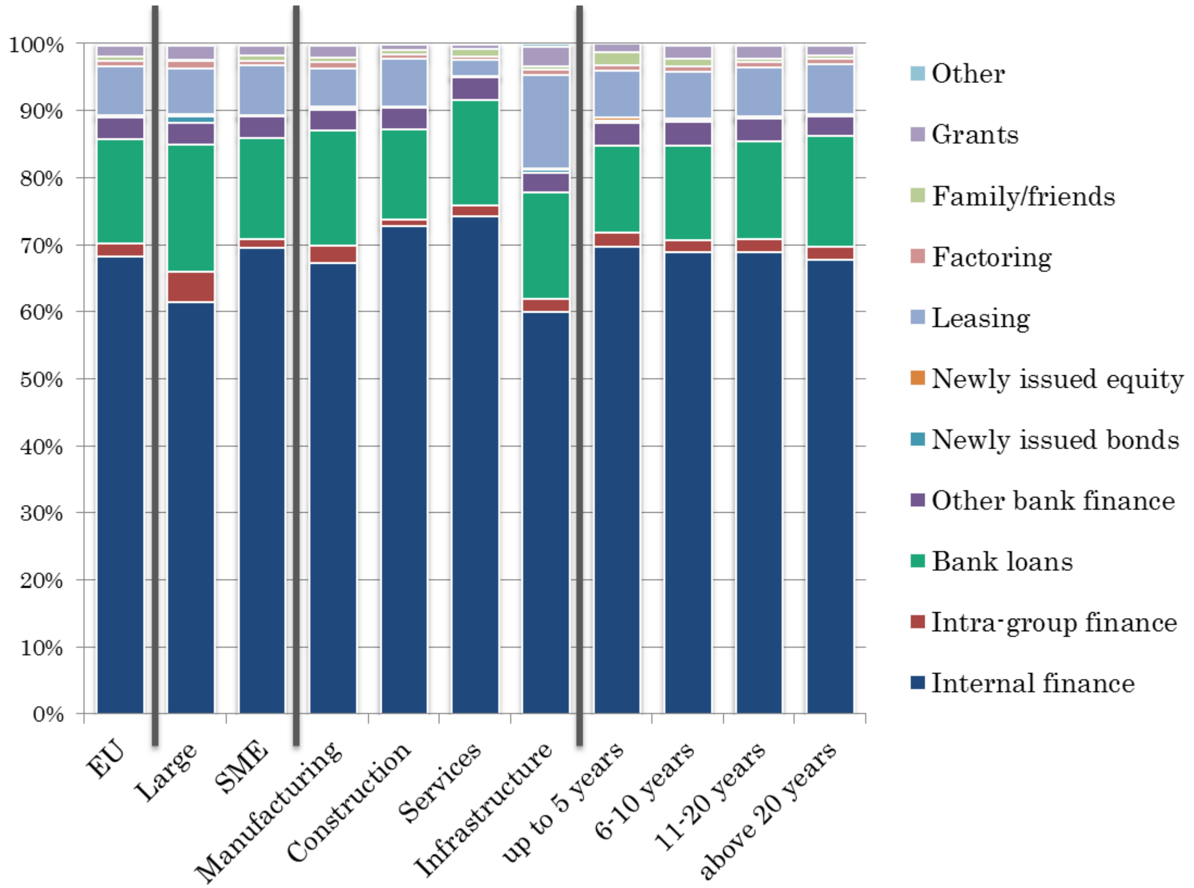
Q27. Approximately what proportion of your investment was financed by each of the following:

- Internal funds or retained earnings (e.g. cash, profits) %
- External finance (e.g. financing from banks, private or public equity) %
- Intra-group funding (e.g. loan form parent company) %

Q29. Approximately what proportion of your external finance does each of the following represent:

- Bank loans excluding subsidised bank loans, overdrafts and other credit lines
- Other terms of bank finance including overdrafts and other credit lines
- Newly issued bonds
- Newly issued equity
- Leasing or hire purchase
- Factoring/invoicing discounting
- Loans from family/friends/business partner
- Grants
- Other

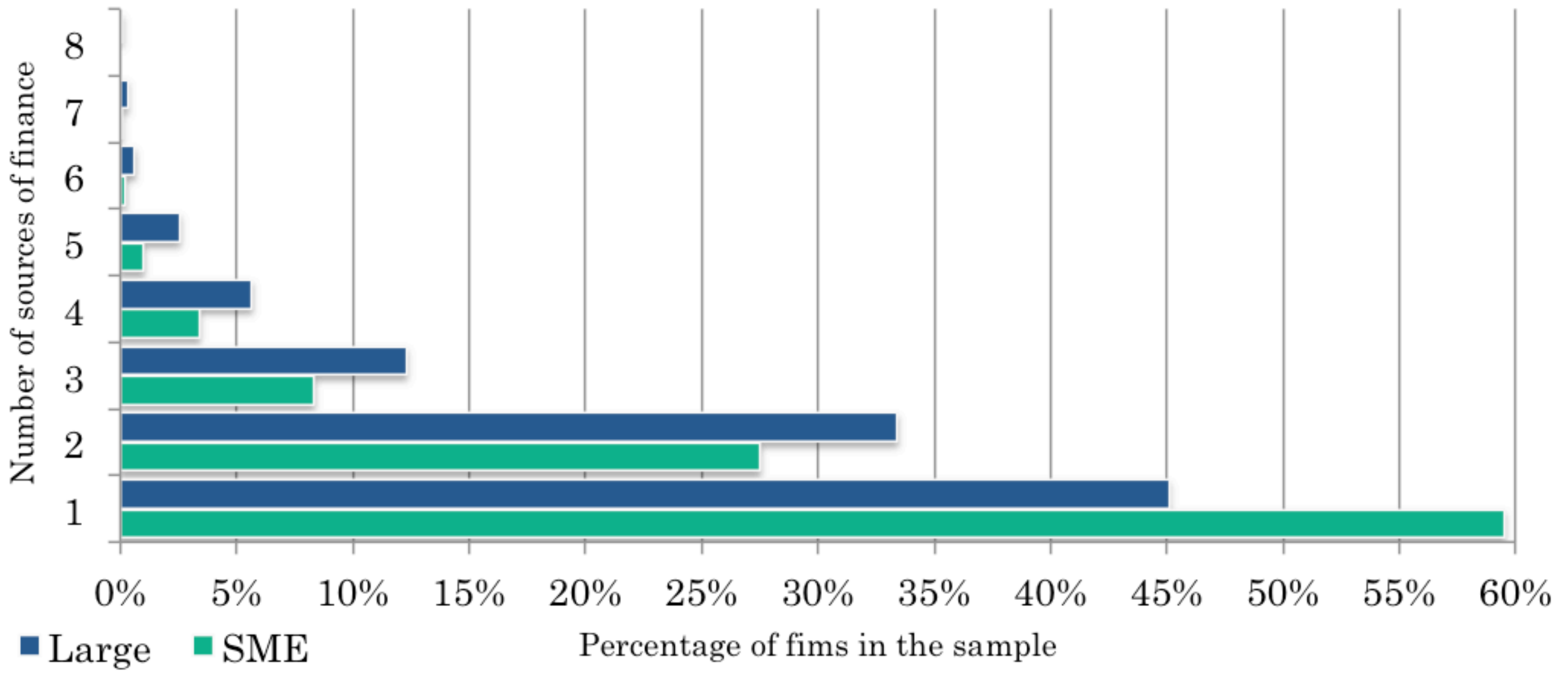
Type of finance across size, industry sectors and age



Source: EIBIS.
Notes: weighted percentages

- Weak evidence of "funding escalator" for SMEs
- EU firms tend mostly to rely on internal funds (68%) to finance their investment, while external finance represents only 30%
- Market-based finance is still underutilised

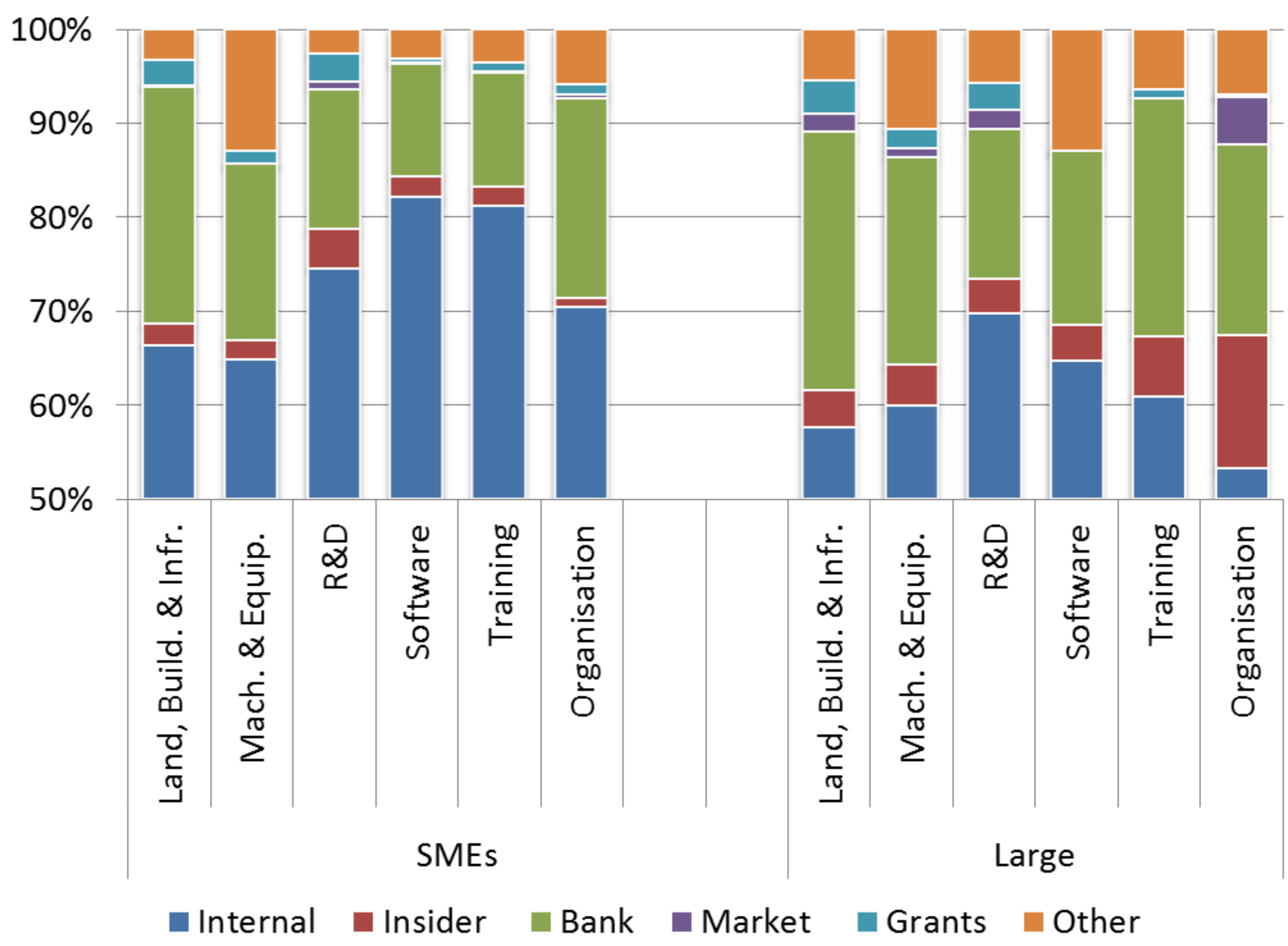
Number of sources of finance used by firm size



- Very few firms use three or more different financial instruments

Source: EIBIS

Putting finance and investment together



Source: EIBIS. Notes: Each bar shows the average use of finance for those firms that have invested the most in a specific type of investment.

Econometric approach

- Investment is a ***vector*** of proportions, with exhausted and mutually exclusive categories which strictly all sum up to 1 (unity)

- **Multivariate version of the Fractional Response Model** (Papke & Wooldridge, (1996), Mullahy (2015)

$$E\left(y_{j,k}|\mathbf{x}_j\right) = G\left(\beta_0 + \beta_i F_{j,i} + \gamma_l C_{j,l} + \delta_{j,country\ group} + \delta_{j,sector} + \delta_{j,age} + \delta_{j,size} + \epsilon_j\right),$$

where ***y*** is the vector of ***k*** types of investment
F is a vector of a firm's current financing mix at level ***i***
C vector of ***l*** control dummy variables (profitability, willingness to invest)
δ a set of dummies to control for unobserved heterogeneity across country, sectors, size and age groups.
ε is the error term

Internal versus external finance:

- Different financing patterns of SMEs / Large companies
- Bank finance more related to tangible investment
- Internal finance key to support intangible investment
- SMEs rely more on grants, insider finance for their intangible asset investment

SMEs

VARIABLES	(1) Land, buildings, infrastructure	(2) Machinery, equipment	(3) Research, development	(4) Software, data, IT networks	(5) Training	(6) Organisation, process improvements
Bank finance	0.080***	0.086***	-0.020***	-0.090***	-0.066***	0.008
	(0.010)	(0.015)	(0.007)	(0.010)	(0.010)	(0.006)
Market-based finance	0.150	-0.300	0.122***	-0.006	-0.021	0.055
	(0.112)	(0.188)	(0.033)	(0.065)	(0.087)	(0.047)
Insider finance	0.042*	-0.035	0.049***	-0.018	-0.024	-0.014
	(0.025)	(0.036)	(0.012)	(0.021)	(0.022)	(0.012)
Grants	0.150***	0.068	0.042**	-0.191***	-0.056	-0.013
	(0.030)	(0.054)	(0.017)	(0.044)	(0.045)	(0.027)
Leasing and Factoring	-0.116***	0.403***	-0.074***	-0.129***	-0.078***	-0.007
	(0.019)	(0.022)	(0.011)	(0.017)	(0.014)	(0.011)
Observations	7050	7050	7050	7050	7050	7050

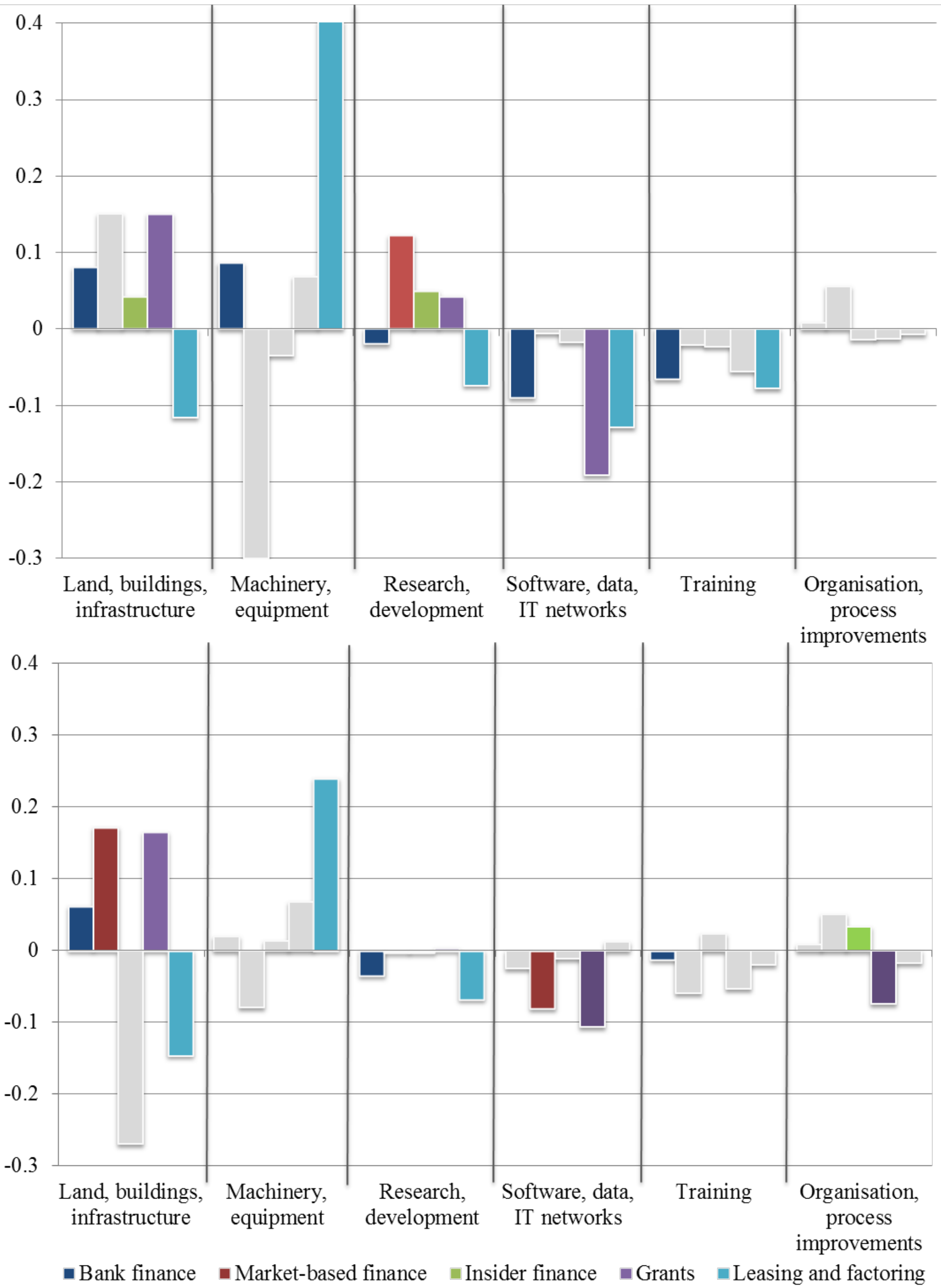
Large enterprises

VARIABLES	(1) Land, buildings, infrastructure	(2) Machinery, equipment	(3) Research, development	(4) Software, data, IT networks	(5) Training	(6) Organisation, process improvements
Bank finance	0.062**	0.019	-0.035*	-0.025	-0.013	-0.008
	(0.026)	(0.035)	(0.018)	(0.018)	(0.016)	(0.013)
Market-based finance	0.172**	-0.079	-0.003	-0.081**	-0.059	0.050
	(0.083)	(0.130)	(0.050)	(0.041)	(0.056)	(0.038)
Insider finance	-0.027	0.013	-0.031	-0.011	0.023	0.033*
	(0.051)	(0.057)	(0.029)	(0.024)	(0.021)	(0.018)
Grants	0.165**	0.068	0.003	-0.106**	-0.054	-0.075*
	(0.076)	(0.093)	(0.050)	(0.043)	(0.045)	(0.042)
Leasing and Factoring	-0.146***	0.240***	-0.068**	0.012	-0.020	-0.018
	(0.049)	(0.056)	(0.032)	(0.028)	(0.020)	(0.023)
Observations	1116	1116	1116	11116	1116	1116
Controls (Profitability, Willingness to invest more)	YES	YES	YES	YES	YES	YES
Age, Sector, Country FE	YES	YES	YES	YES	YES	YES

Notes: Average partial effects of QML estimations of multinomial fractional response models. All variables are bounded continuous variables [0,1] and sum up to 1. Reference group: internal funds. Robust standard errors in parentheses.

SMEs

Large



Internal vs external finance :

If SMEs increase *type of finance* relative to internal finance by 1 pp , investment in

- *Bank finance*: LBI & ME by 0.08 pp
- *Grants*: LBI by 0.15 pp
- *Leasing*: M&E by 0.4 pp
- *Market-based finance*: R&D by 0.12 pp

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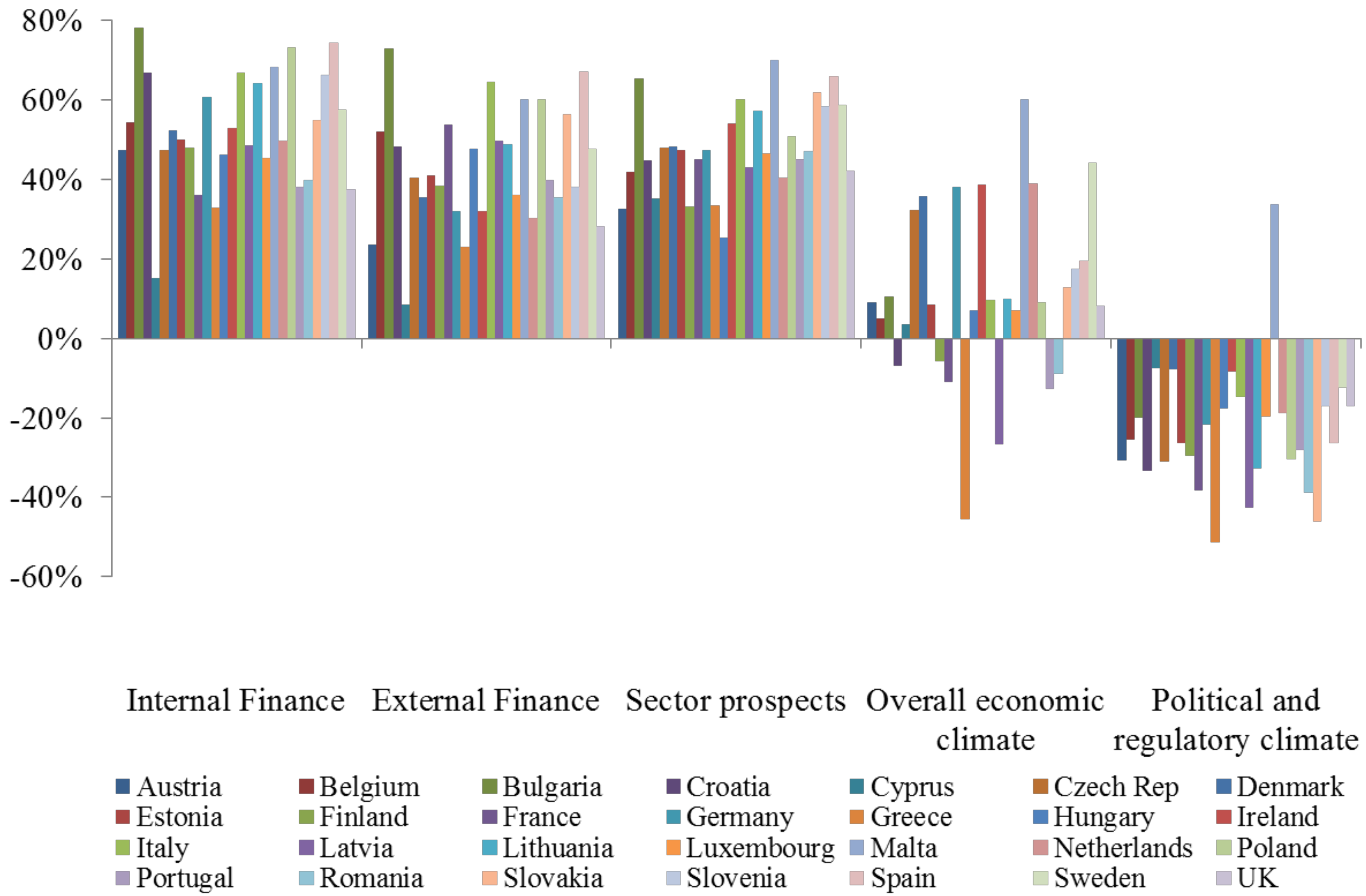
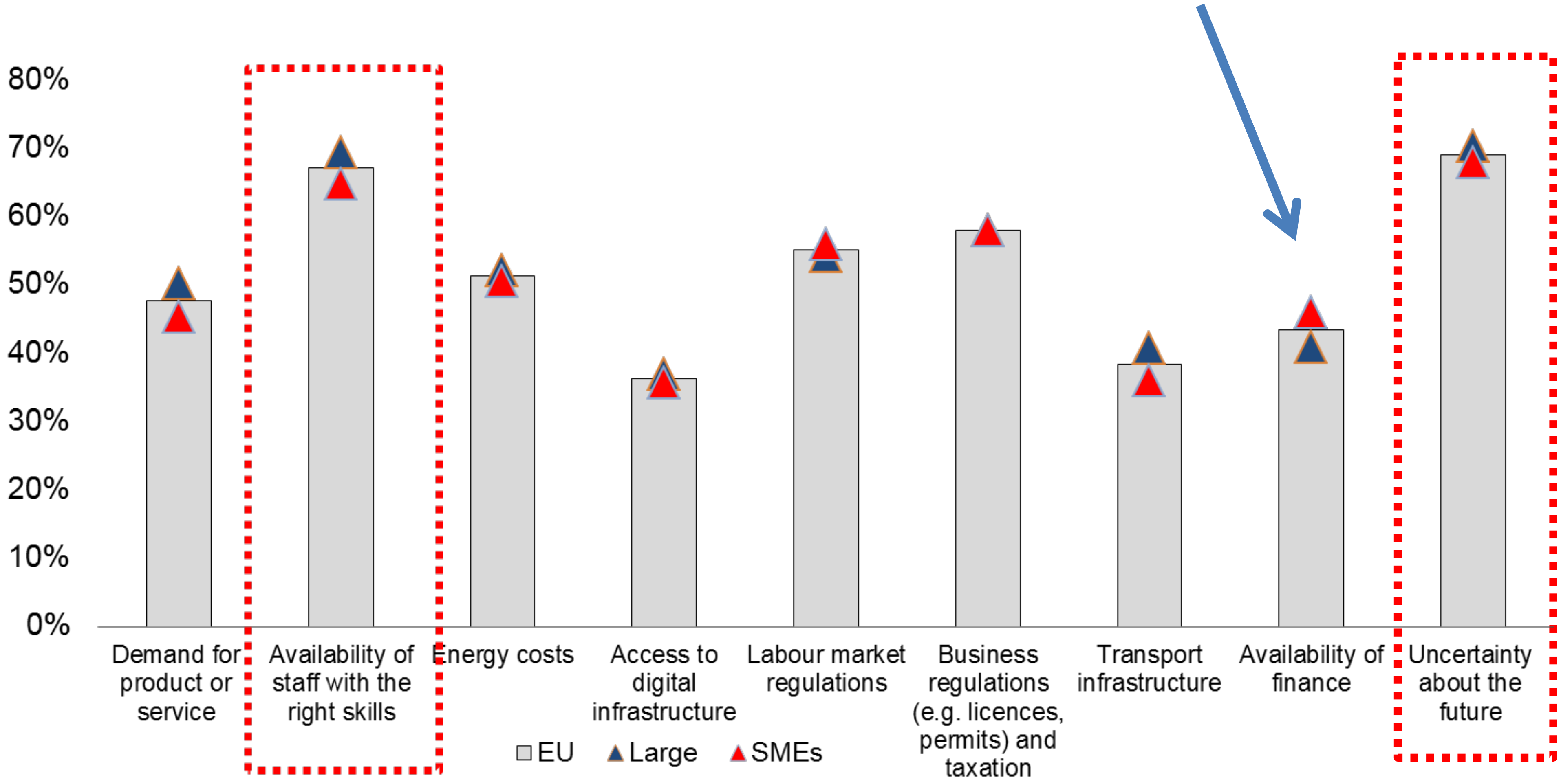
Short-term barriers to investment: Political and regulatory climate



Source: EIBIS

Note: Net balances: share of firms seeing a positive effect minus the share of firms seeing a negative effect..

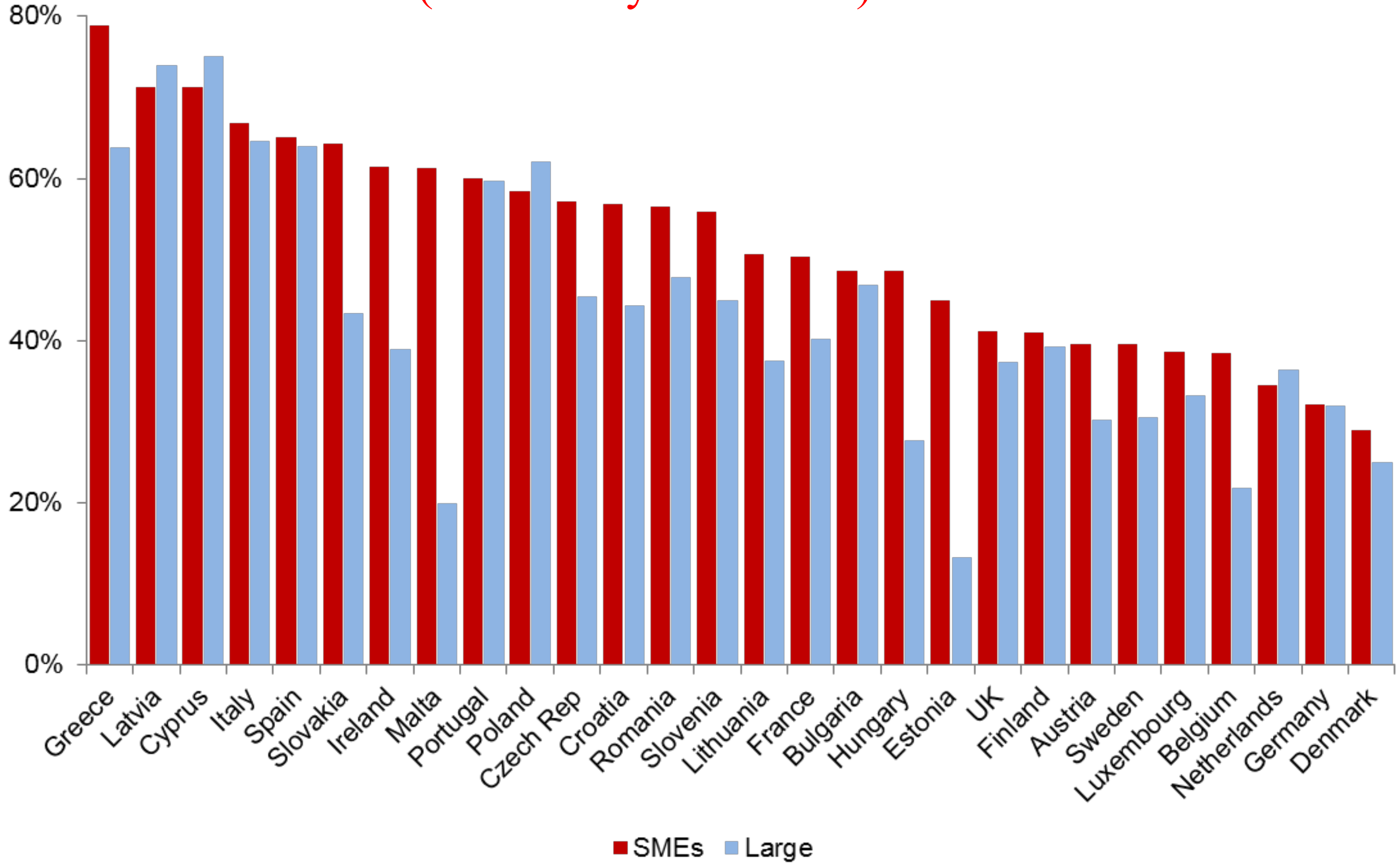
Long-term barriers to Investment: uncertainty and lack of skilled staff stand as main bottlenecks but not access to finance …



Source: EIBIS

…..but there are differences across countries

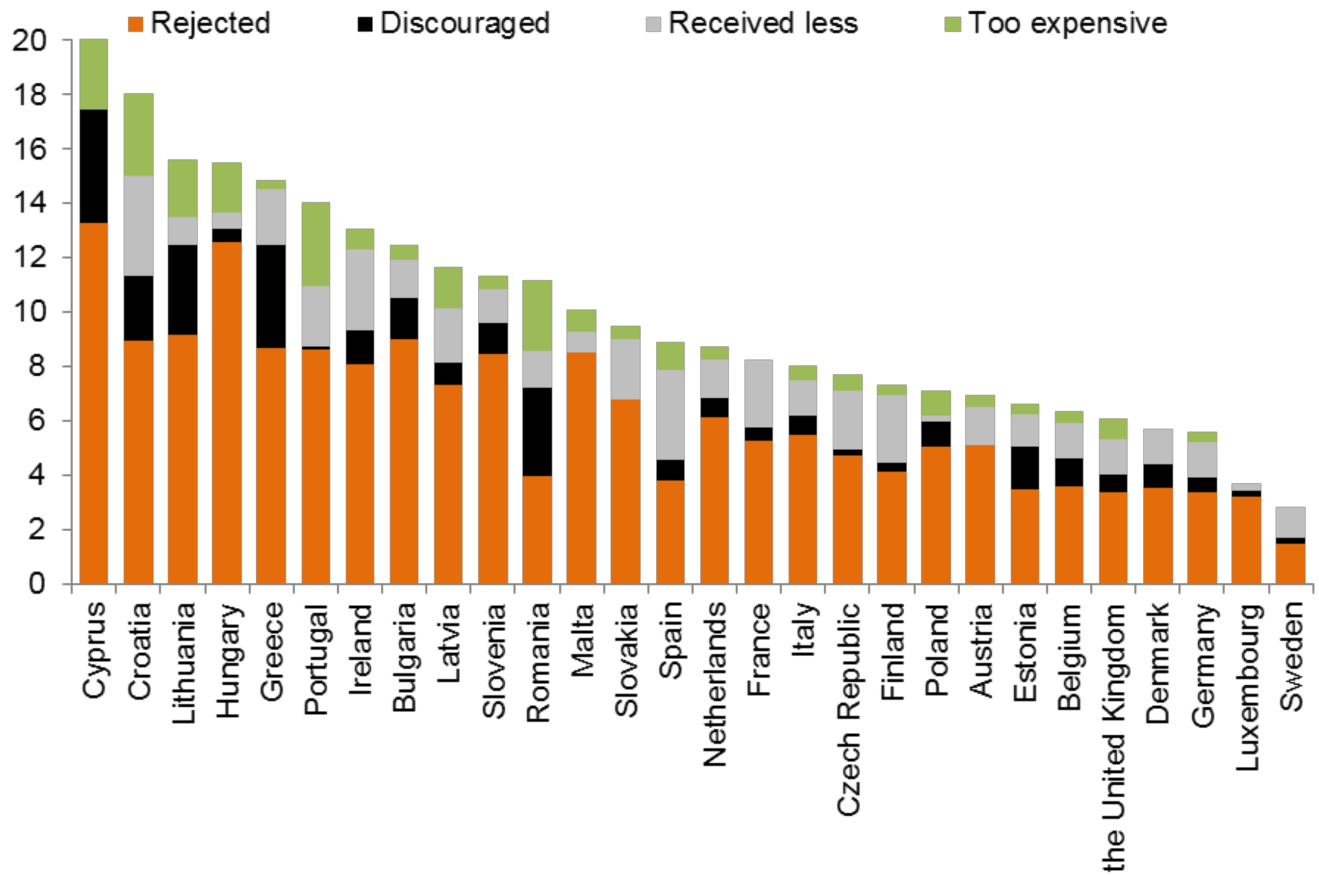
This is a *"subjective"* indicator of financing obstacles (availability of finance)



Source: EIBIS

.. and different types of finance constraints among SMEs

This is a more *"objective"* indicator



Source: EIBIS

Note: Finance constrained SMEs include: those dissatisfied with the amount of finance obtained (received less), firms that sought external finance but did not receive it (rejected) and those who did not seek external finance because they thought borrowing costs would be too high (too expensive) or they would be turned down (discouraged).

Conclusions

- Analysis of firms' financing policies with respect to firms' investment decisions

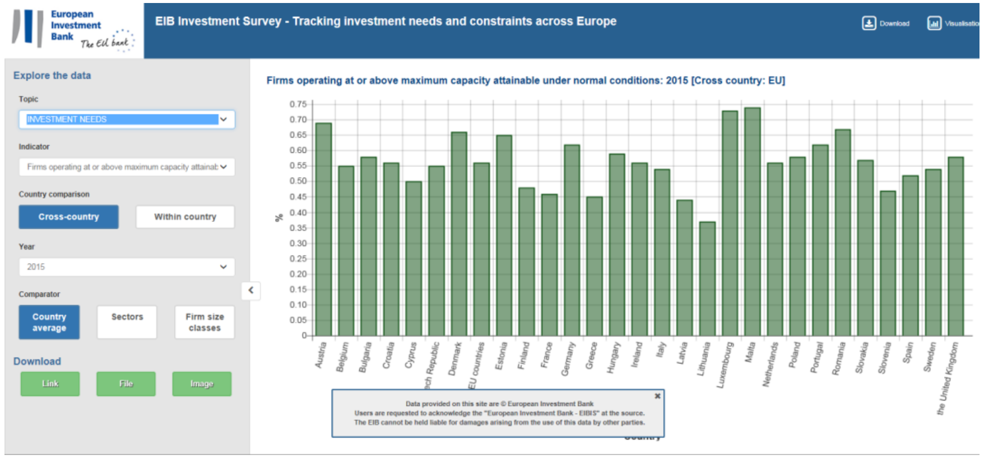
- Novel survey-based dataset (EIBIS) for 28 EU countries

- Evidence of different financing patterns of SMEs vs large firms

- Pecking order theory of finance: with internal finance being key to support intangible investment, bank finance being more related to tangibles and market-based finance and grants providing support to investment in R&D for SMEs

EIB investment survey website

www.eib.org/eibis



EIB Investment Survey - Tracking investment needs and constraints across Europe

Download the data

Select an indicator: Average share of investment in different asset types

Select a country: — All countries —

Select a year: — All years —

Select a sub-groups: — All subgroups —

Download: Link | File

Show 10 entries

Average share of investment in different asset types

All firms (excluding don't know/refused responses)

Q13. In the last financial year how much did your business invest in each of the following with the intention of maintaining or increasing your company's future earnings?

Country	Year	Sector	Size	Population	Land, business buildings and infrastructure	Machinery and equipment	Research and Development (including the acquisition of intellectual property)	Software, data, IT networks and website activities	Training of employees	Organisation and business process improvements
Austria	2015	All	All	63812.1	0.17	0.49	0.07	0.12	0.08	0.07
Austria	2015	All	Micro	30762.1	0.13	0.47	0.01	0.22	0.11	0.07
Austria	2015	All	Medium	4164	0.17	0.43	0.07	0.14	0.12	0.06
Austria	2015	All	SME	62908.1	0.14	0.44	0.06	0.18	0.11	0.07
Austria	2015	All	Small	27982	0.11	0.44	0.06	0.19	0.1	0.09
Austria	2015	All	Large	904	0.2	0.55	0.08	0.06	0.04	0.07
Austria	2015	Manufacturing	All	11138.29	0.13	0.58	0.11	0.08	0.05	0.05
Austria	2015	Construction	All	11380.45	0.16	0.54	0.04	0.13	0.08	0.04
Austria	2015	Services	All	32424.38	0.27	0.3	0.05	0.17	0.13	0.09
Austria	2015	Infrastructure	All	8868.98	0.11	0.54	0.05	0.14	0.07	0.09

Showing 1 to 10 of 290 entries

Thank you

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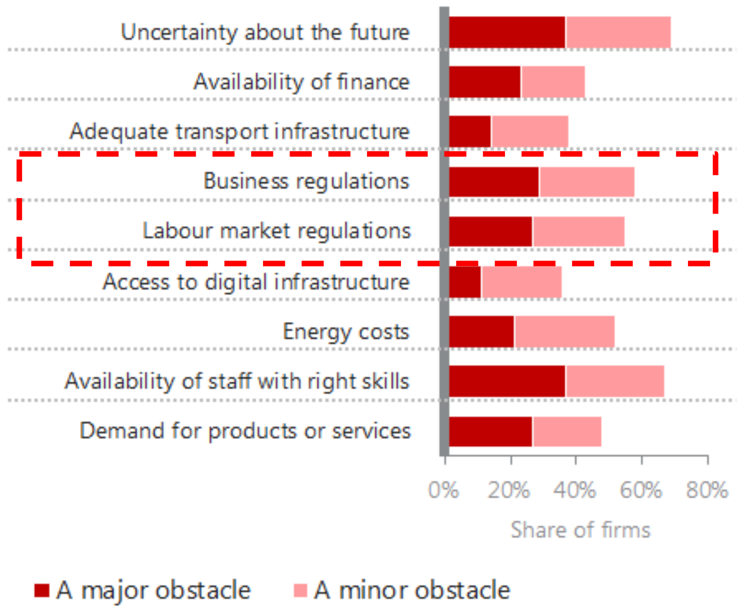
Political and Regulatory Environment

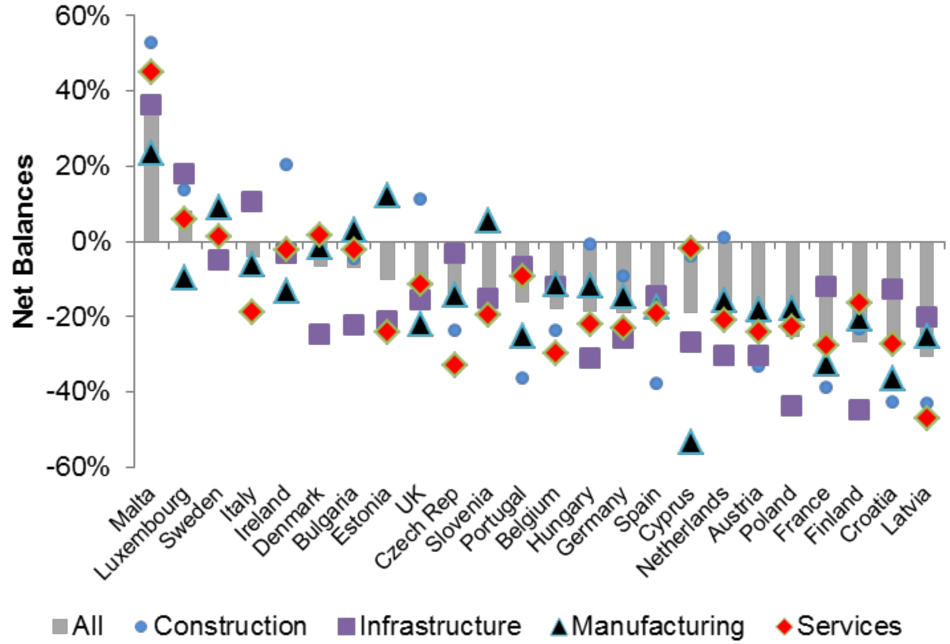
Long term barriers to investment



Base: *EU average of all firms (data not shown for those who said not an obstacle at all/don't know/refused)*

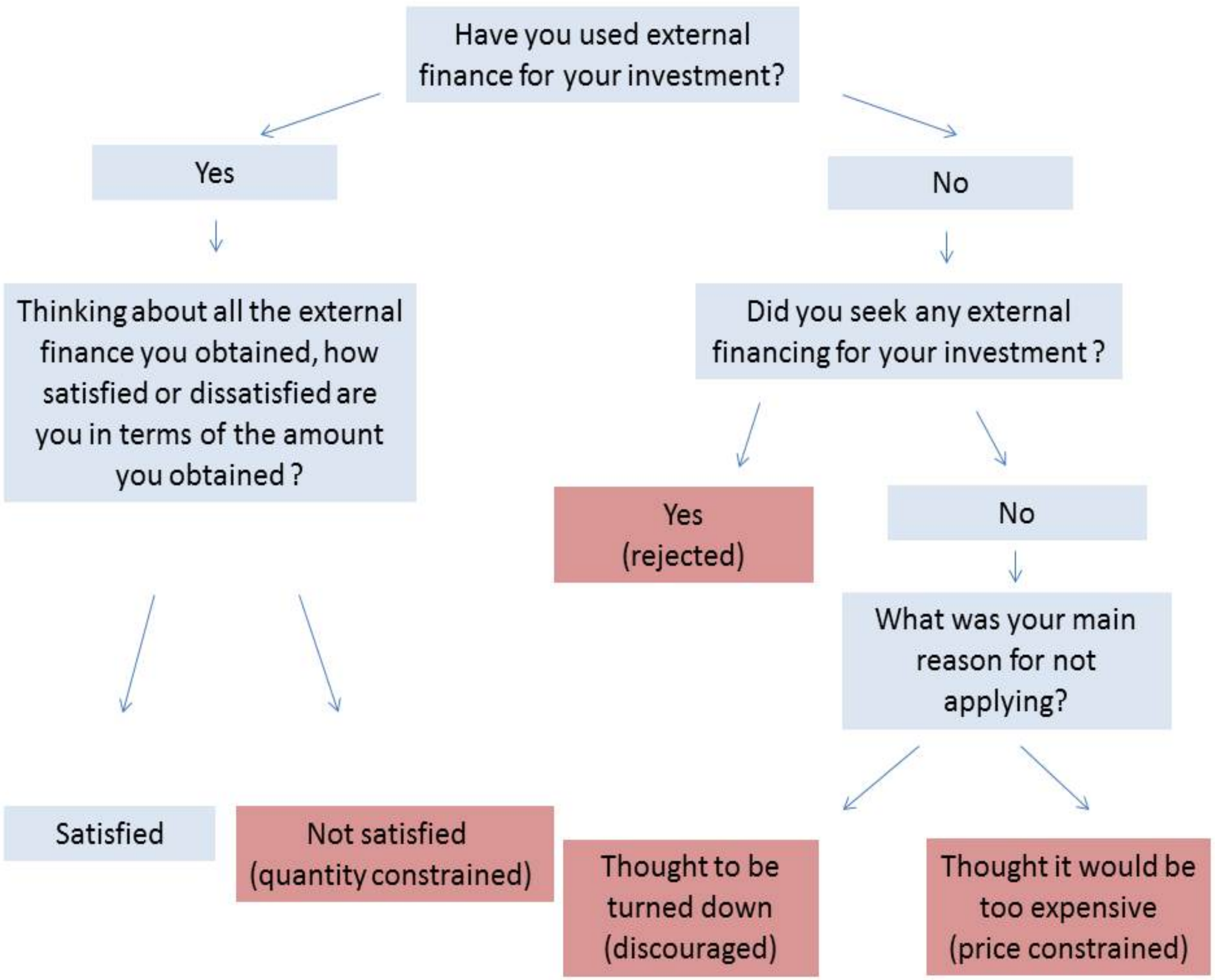
Q. Thinking about your investment activities in #country#, to what extent is each of the following an obstacle? Is a major obstacle, a minor obstacle or not an obstacle at all?

Regulation is a barrier to Investment by sector

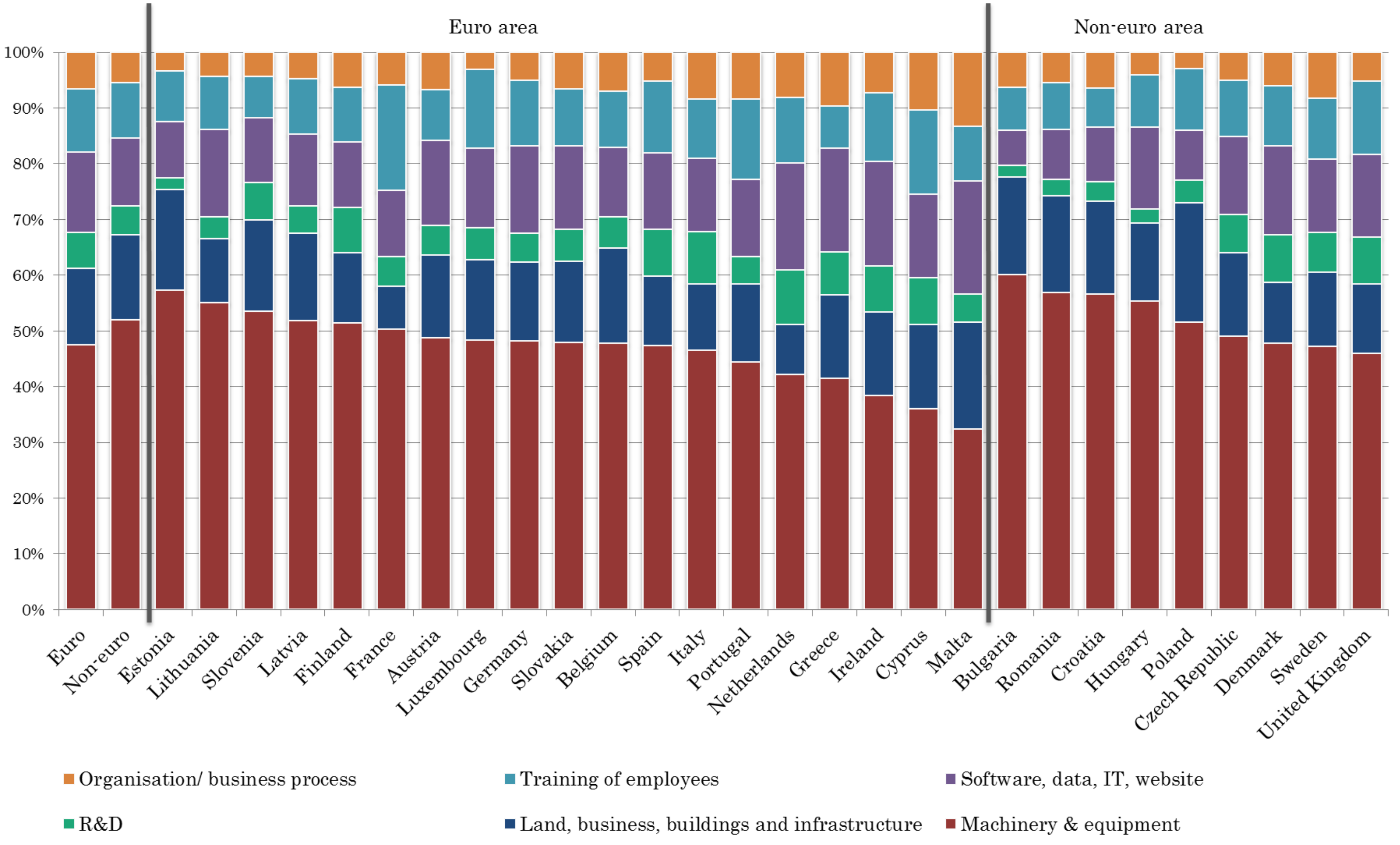


Note : negative values=negative drivers on investment

A more objective measure of financial constraints

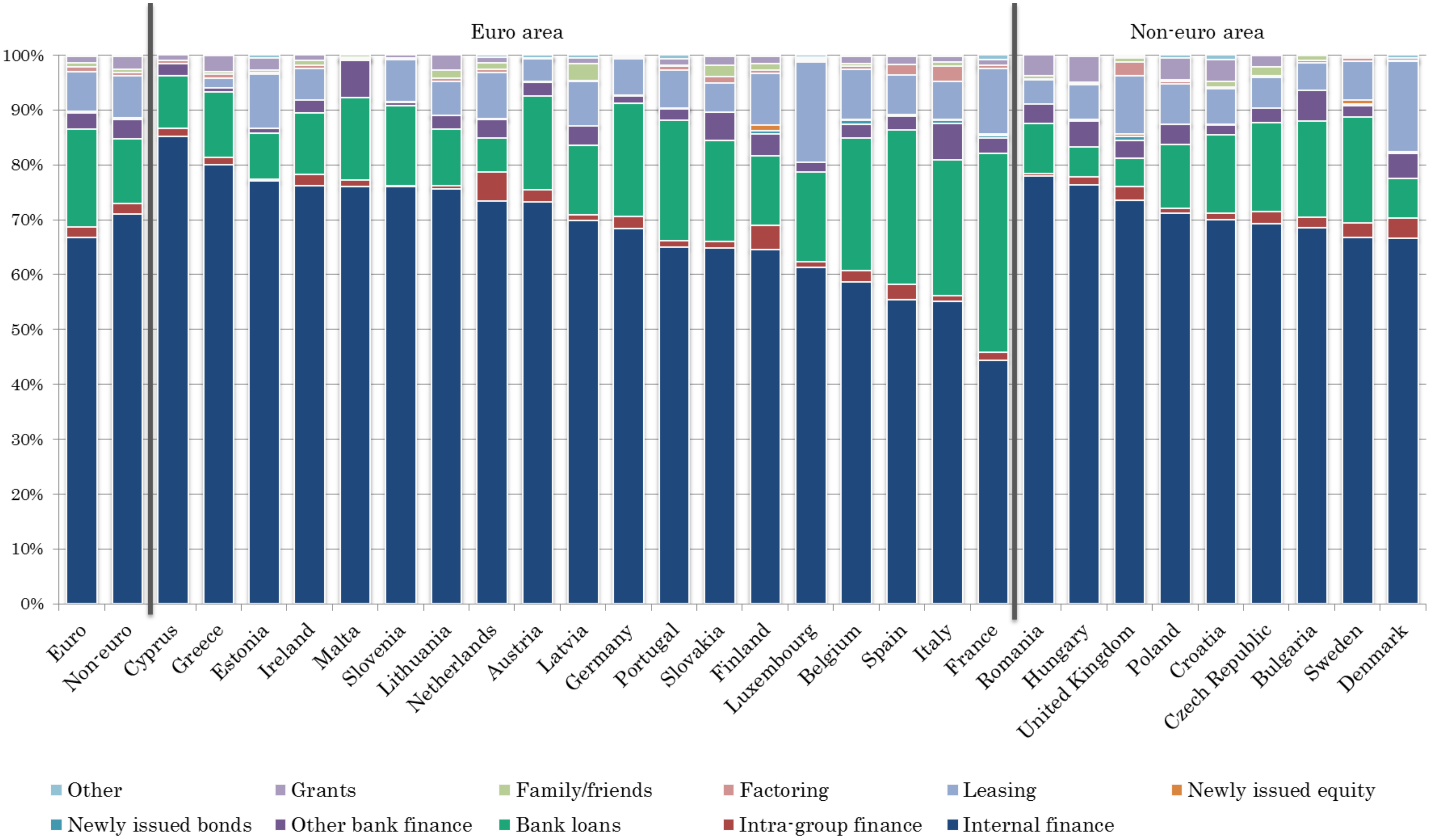


Type of investment across countries



Source: EIBIS. Notes: weighted percentages

Type of finance across countries



Source: EIBIS. Notes: weighted percentages