Selected Results of the Globalinto Survey on firm's Intangible Assets (work in progress)

Yannis Caloghirou, Prof. LIEE/NTUA
Aggelos Tsakanikas, Asc.Prof. LIEE/NTUA
Dr. Aimilia Protogerou, Senior Researcher, LIEE/NTUA
Panagiotis Panagiotopoulos, post doc LIEE/NTUA

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Globalinto large-scale pilot survey on intangibles investments (1)

- **Basic objectives of the Survey:**

1. **To measure the enterprises' investments in a broad range of Intangible Assets (IAs)** contributing to the improvement of micro level measurement approaches.
2. **To investigate the factors influencing** the IAs investments, **the impact of IAs on enterprise performance**, the **role of relevant policy measures** and **the impact of Covid-19 crisis** on IAs.

❑ **Not an ad hoc, one-off survey but oriented towards the possibility of regular data collection at National Statistical Institutes**, or possible integration of core elements into existing survey instruments (i.e. measurement of IAs in a sustainable manner).

❑ **Limited number** of business surveys on intangible assets in Europe:

- ONS (Office for National Statistics), Imperial College London and NESTA (UK), 2009 & 2011
- Eurobarometer survey, 2013
- INAPP and ISTAT (Italy), 2013 & 2020 (survey in progress)

Globalinto large-scale pilot survey on intangibles investments (2)

Policy and Business Implications

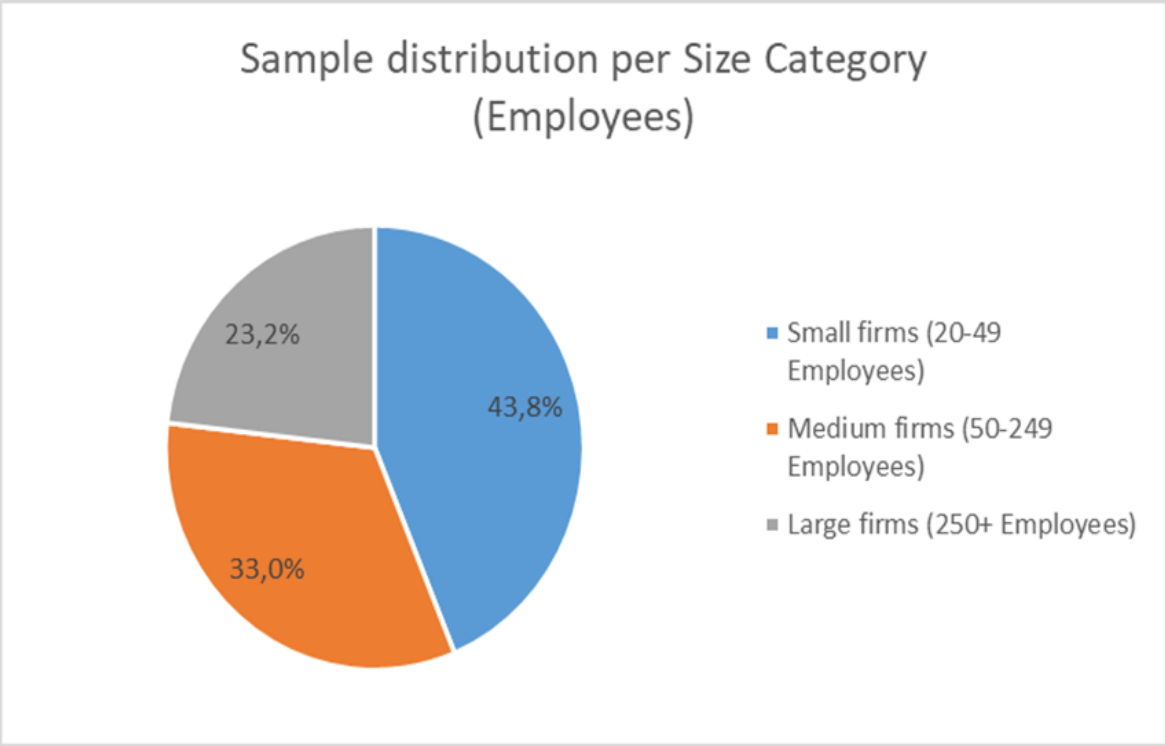
- The survey aims at providing **evidence-based implications for coherent public policies as well as business strategies**:
  - **Policy Implications:** Informing policy formulation (system of policies & mix of measures diversified per sector, firm type etc.) at a EU and national level to support IAs development and effective use.
  - **Business Implications:** Informing strategic decisions on the appropriate mix of IAs investments and developing specific organisational capabilities so as to improve innovation and long-term economic performance.
- These implications are more significant after the **outbreak of Covid-19 crisis**
  - Impact of the Covid-19 business disruption on the importance of ICT investments and their complementarity with other types of IAs

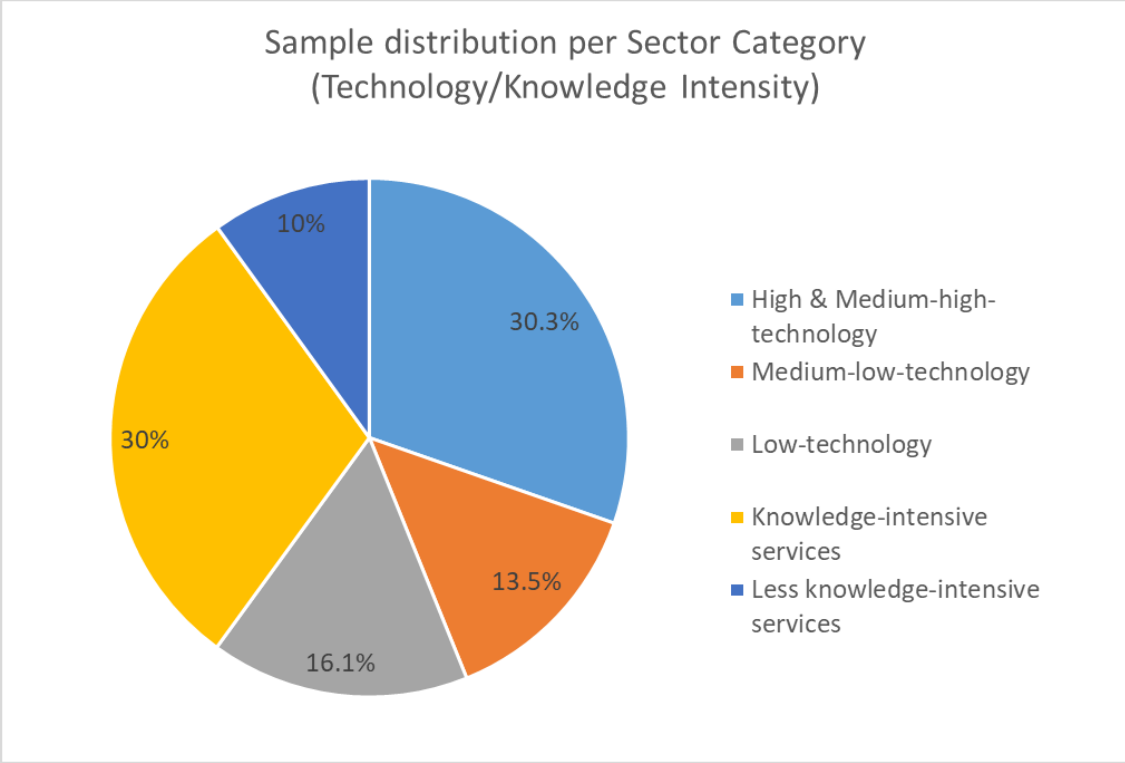
Globalinto Survey Sample: 7 countries and 1796 SMEs and Large Firms from Manufacturing and Services

	Manufacturing SMEs (20-249 employees)	**Manufacturing Large** (250+ employees)	**Services SMEs** (20-249 employees)	**Services Large** (250+ employees)	**TOTAL**
Denmark	99	30	66	20	215
Finland	99	29	66	21	215
France	145	43	96	30	314
Germany	143	43	95	29	310
Greece	98	30	67	20	215
Slovenia	99	33	66	17	215
UK	144	43	96	29	312
TOTAL	**827**	**251**	**552**	**166**	**1796**

Sample characteristics

- Manufacturing: 60%, Services: 40%
- 60% are high and medium-high tech manufacturing firms and knowledge-intensive services
- Almost two thirds (63.6%) have less than 100 full-time employees



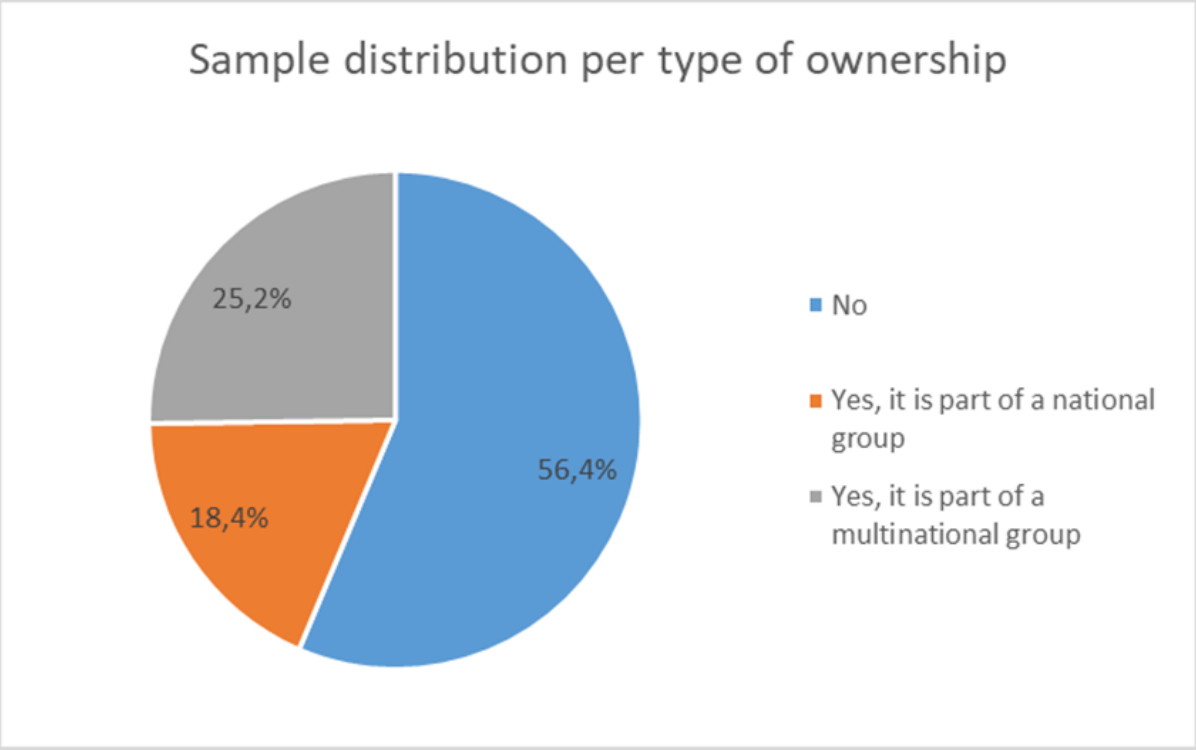


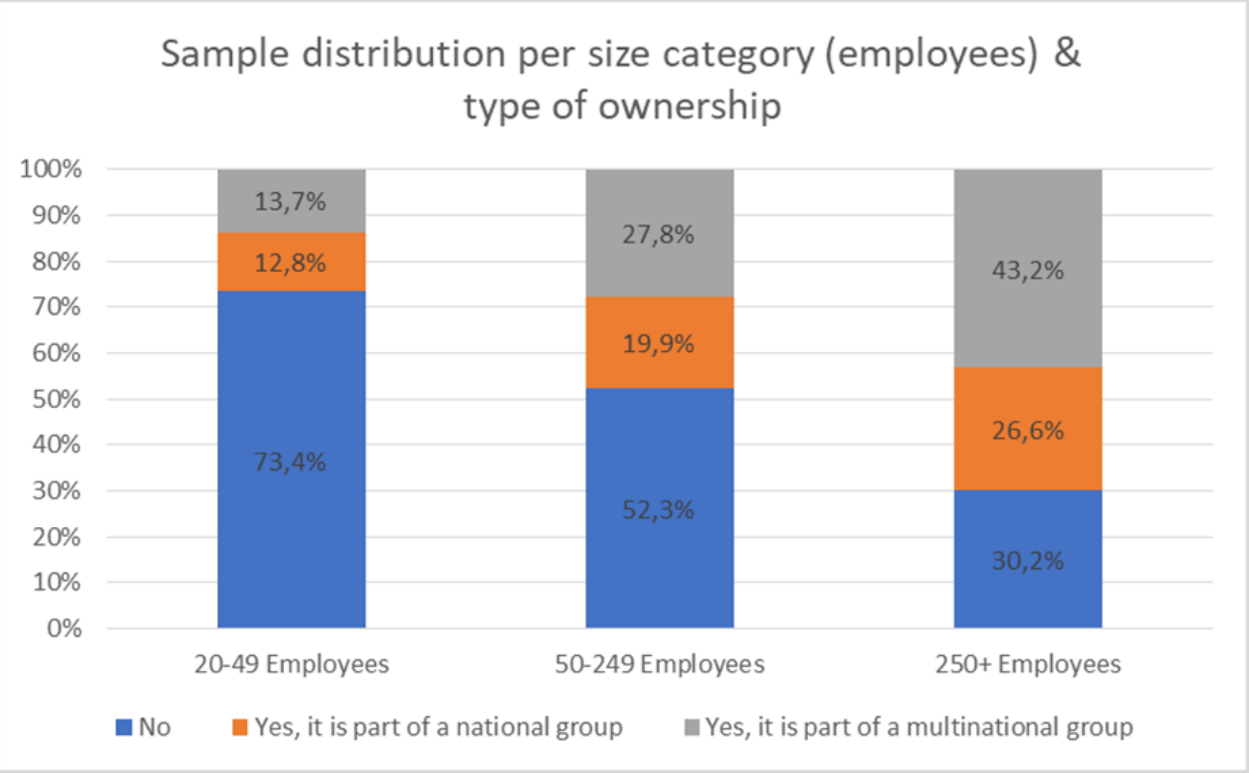
Sample characteristics

	High & Medium-high-technology	Medium-low-technology	Low-technology	Knowledge-intensive services	Less knowledge-intensive services	TOTAL
Denmark	35.8%	12.6%	11.6%	37.7%	2.3%	100%
Finland	30.7%	18.6%	10.2%	34.4%	6.0%	100%
France	31.2%	11.8%	16.9%	19.1%	21.0%	100%
Germany	33.9%	13.2%	12.9%	36.5%	3.5%	100%
Greece	18.1%	10.7%	30.7%	18.6%	21.9%	100%
Slovenia	24.7%	20.9%	15.8%	24.7%	14.0%	100%
UK	34.3%	9.6%	16.0%	37.8%	2.2%	100%

Sample Characteristics

- The majority of firms (56.4%) do not belong to a business group.
- Size matters: 7 out of 10 large firms belong to a business group.



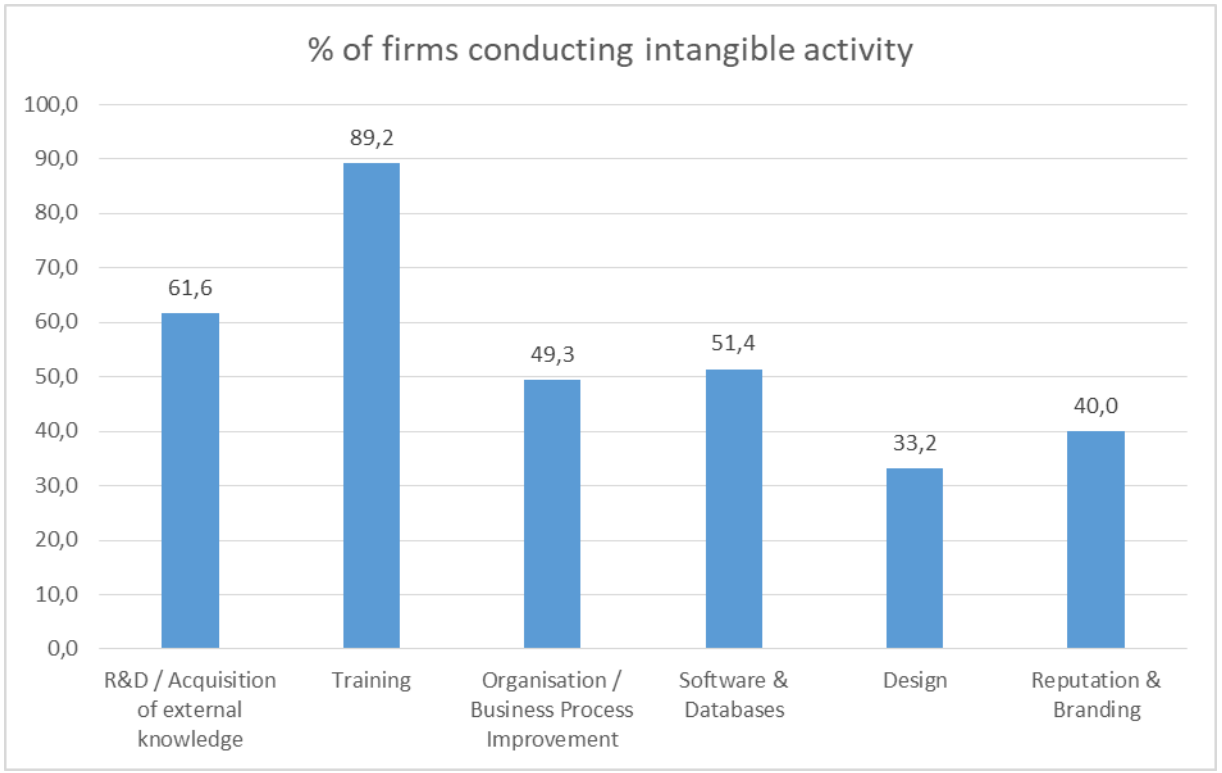


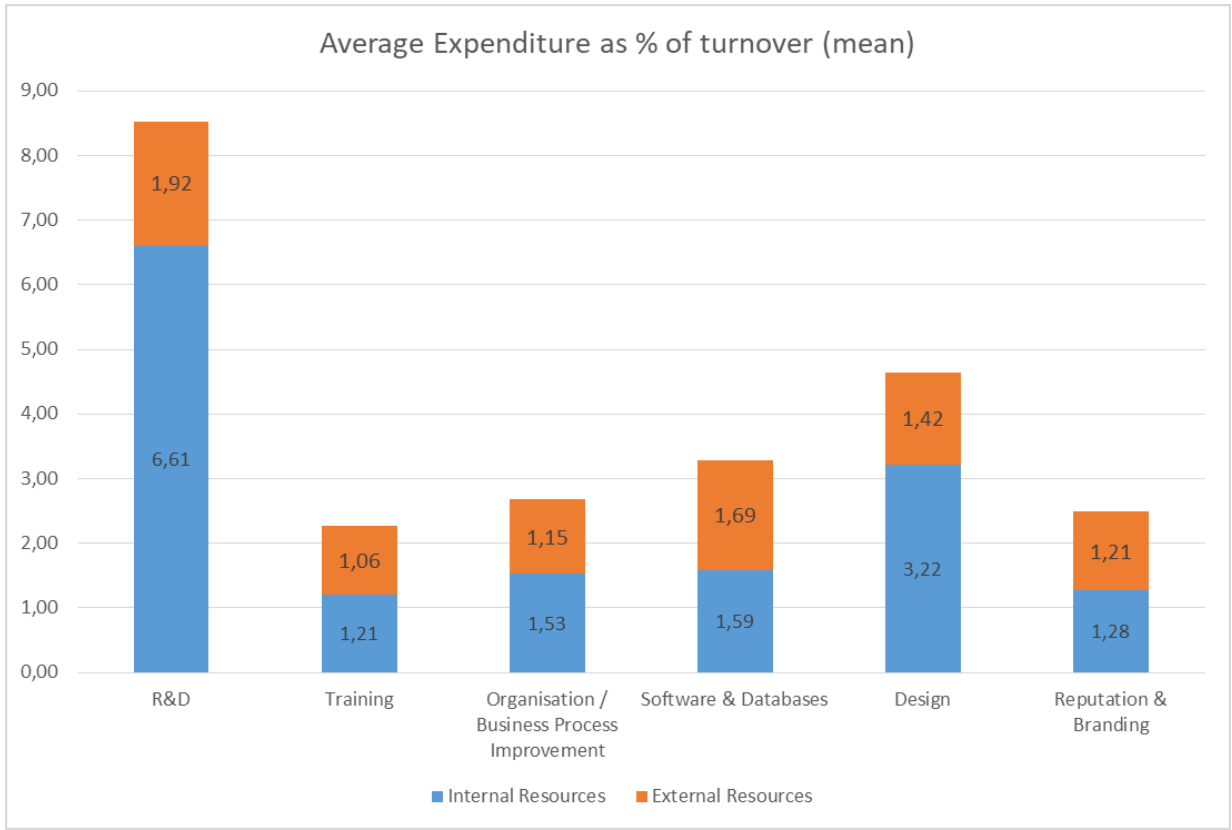
Intangible activity and spending per asset category

The **vast majority** of firms report some **training activity** (9 out of 10 firms)

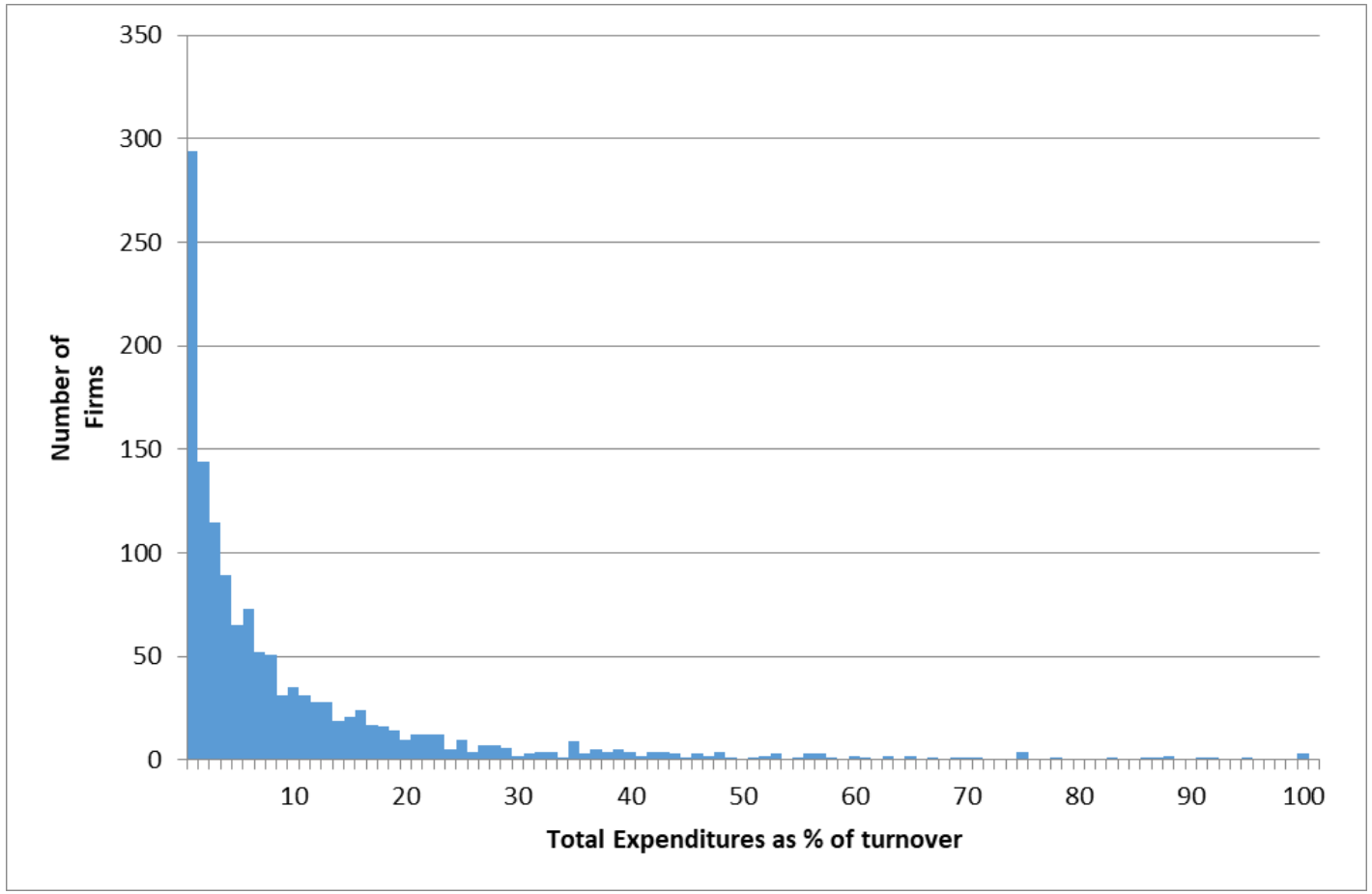
- The **majority** of firms (over 61%) also **spend on R&D**
- **Design** is characterised by the **lowest percentage of firms** (1 out of 3 firms)
- Only 66 firms (3,7%) report no intangible activity
- **Size matters:** Larger firms exhibit higher intangible activity

- **In-house R&D spending** prevail followed by in-house design expenditures





Total investment in intangible assets (all IA types)



Spending (as % of turnover)	Firms (%)
0 - 1%	21,8
1 - 5%	30,5
5- 15%	27,3
15 - 25%	9,8
25 - 50%	6,8
> 50%	3,8

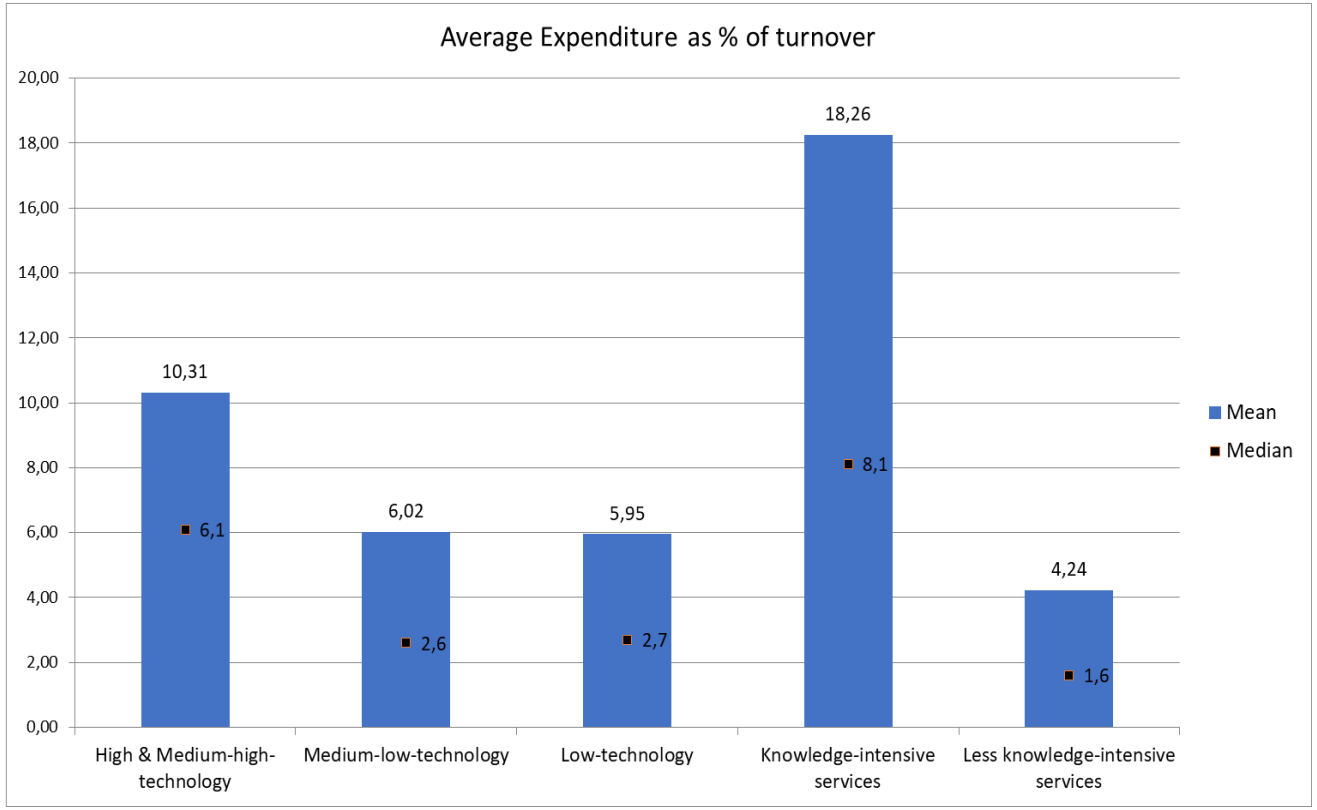
N = 1351

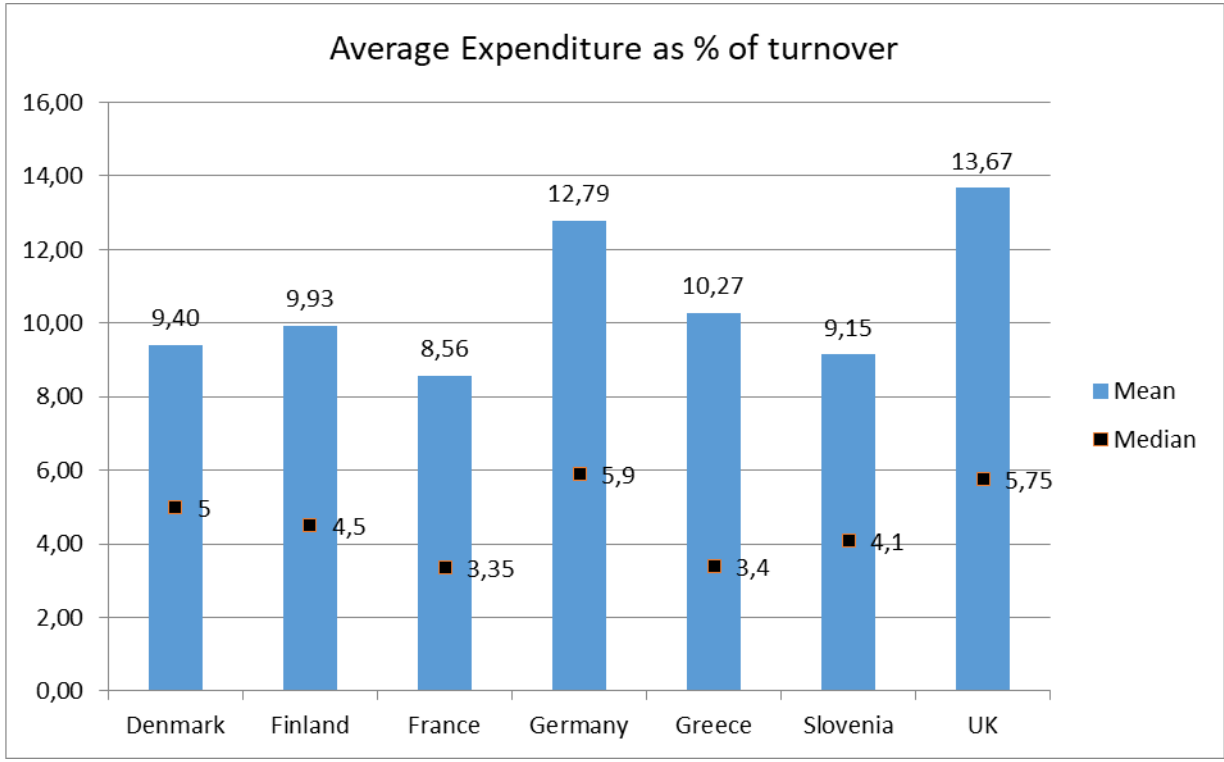
- **445 firms** could not estimate their intangible spending in at least one of the asset categories

Total investment in intangible assets per sector and country

(N = 1351)

- Sector knowledge intensity matters: Knowledge-intensive services (KIS) and High- and medium-high (H&MHT) manufacturing firms invest more
- Large countries invest more (France is an exception)
- Among small countries, DK and FI invest more





Intangible activity and spending per asset category and sector→

Knowledge-intensive services and high- and medium-high manufacturing firms invest more than less knowledge intensive sectors

Sector Category	R&D and External Knowledge acquisition		Training		Organisation / Business Process improvement		Software & Databases		Design		Reputation & Branding	
	% of Firms	% of Turnover*	% of Firms	% of Turnover*	% of Firms	% of Turnover*	% of Firms	% of Turnover*	% of Firms	% of Turnover*	% of Firms	% of Turnover*
High & Medium-high-technology	77,9	6,61 (4)	88,8	1,57 (0,9)	49	2,82 (1,5)	50,7	2,52 (1)	38	3,64 (1,5)	38,3	2,55 (1,3)
Medium-low-technology	60,2	2,72 (1,5)	87,6	1,40 (0,5)	46,7	2,96 (1)	44,4	2,38 (1)	26,4	2,34 (0,75)	25,5	1,34 (0,9)
Low-technology	57,6	2,92 (1,2)	84,4	1,34 (0,5)	50,5	2,89 (1)	42,7	1,28 (0,5)	36,5	1,98 (0,6)	44,8	1,78 (1)
Knowledge-intensive services	57,6	13,54 (5)	92,9	2,87 (1)	51,3	2,78 (1,5)	60,4	5,58 (2)	30	9,69 (2)	44,8	3,32 (2)
Less knowledge-intensive services	32,8	2,17 (0,9)	88,8	0,94 (0,45)	46,1	1,17 (0,4)	49,4	1,57 (0,5)	31,8	2,33 (0,9)	42,5	1,72 (0,9)
N	1778	975	1792	1337	1780	695	1787	758	1785	494	1788	609

* Mean (Median)

R&D activity and spending

Among all Firms	% of Firms	% of Turnover (Mean)	% of Turnover (Median)
At least one type of R&D activity	61,6	7,16	3
In-house R&D	**55,3**	**6,61**	**3**
R&D by external providers	**24,7**	**1,92**	**1**
External knowledge acquisition	**18,2**	**1,84**	**0,5**
Continuity of R&D (among firms with In-house R&D) [*Q9*]	69,6	9,19	4

- **38,4% of firms: No R&D activity**
- **The most "popular" type** of R&D activity **is In-house R&D**
- **Size matters:** Over 6 out of 10 medium-sized and large firms conduct in-house R&D activity (small firms: 46.9%)
- **Sector matters:**
  - **63% of manufacturing firms conduct in-house R&D** (service firms: 43,7%)
  - **H&MHT manufacturing: 3 out of 4 firms (**MLT, LT manufacturing and KIS: 1 out of 2, less KIS: 1 out of 4)
  - **Much higher expenditures** (as % of turnover) **in KIS** (mean: 13,54 , median: 5) and **H&MHT** manufacturing firms (mean: 6,61 , median: 4)

Training activity and spending

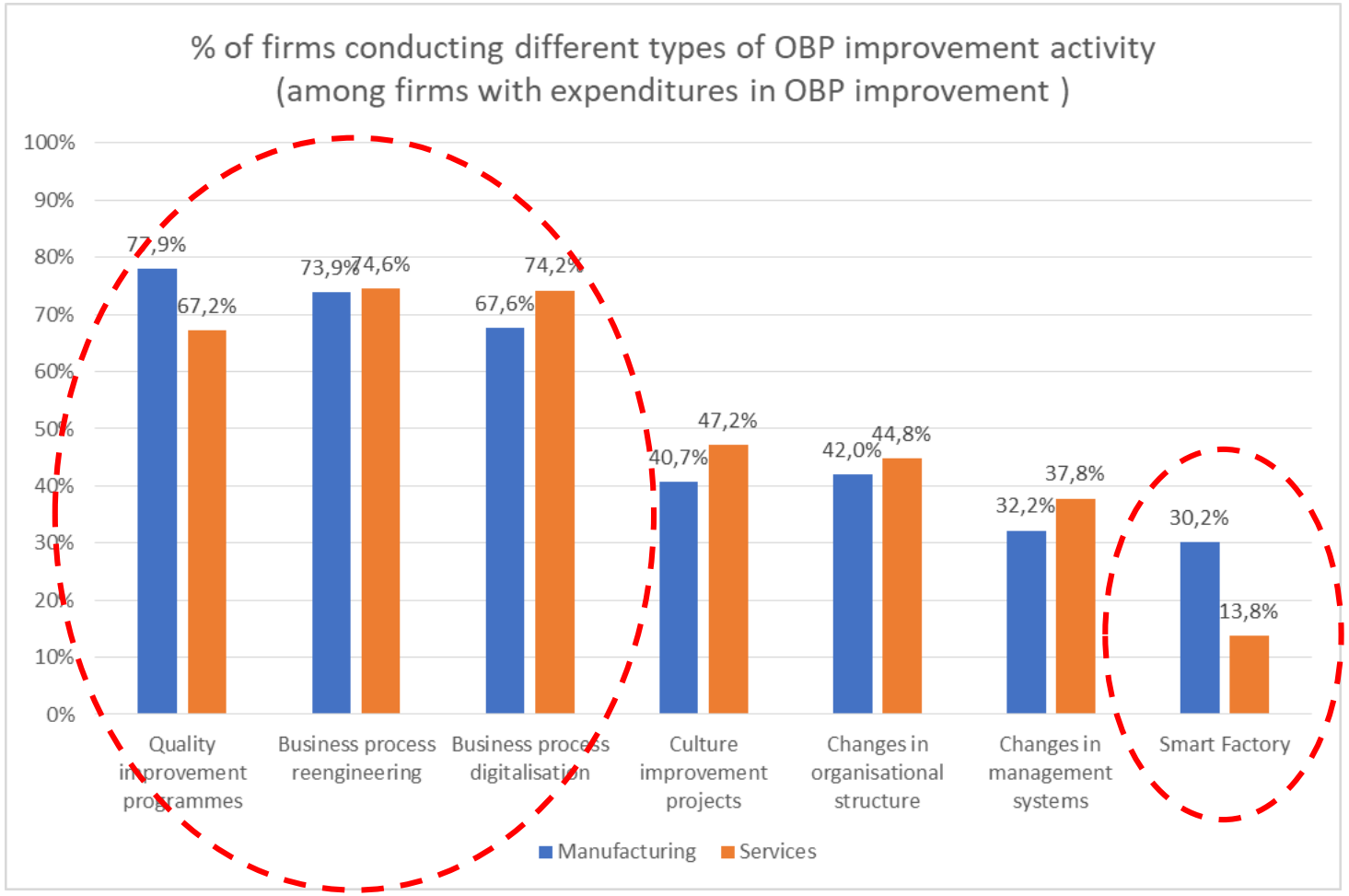
	% of Firms	% of Turnover (Mean)	% of Turnover (Median)
At least one of two activities	**89,2**	**1,84**	**1**
Training (by external organisations)	78,7	1,06	0,5
Training (using internal resources)	68,5	1,21	0,5

- **The vast majority of firms have training activity** in all size and sector categories.
- **Some differentiation between:**
  - Size Categories: 96,2% of large firms conduct training activity (medium firms: 91,9%, small firms: 83,4%)
  - Sector Categories: The highest share of firms with training activity is in knowledge-intensive services (92,9%) whereas the lowest is in low-tech manufacturing firms (84,4%)
- **Firms in Services make higher expenditures** (mean: 2,37%, median: 1) than firms in manufacturing (mean: 1,47%, median: 0,6%)

Organisation/Business Process (OBP) improvement: activity and spending

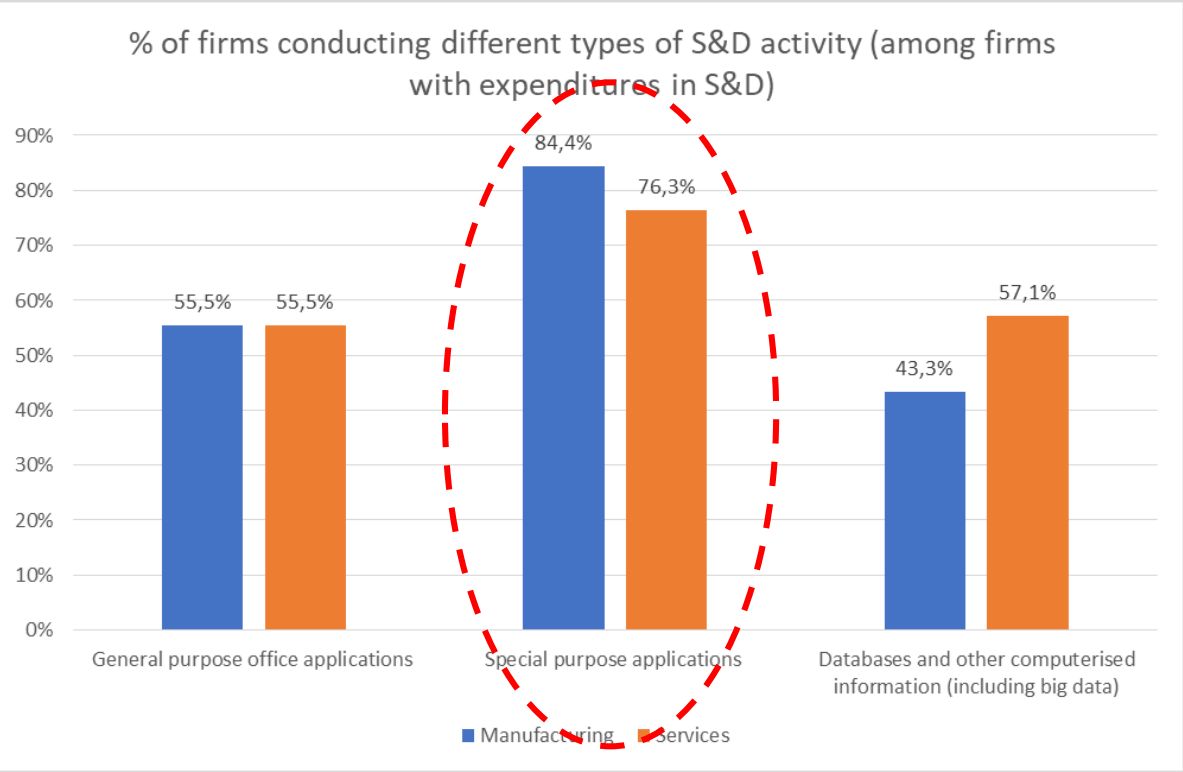
% of Firms	% of Turnover (Mean)	% of Turnover (Median)
49,3	**2,69**	**1**
By external providers	1,15	0,4
Using internal resources	1,53	0,5

- **1 out of 2 firms have no activity**
- **No differentiation exists between manufacturing and services** regarding % of firms conducting OBP improvement activity.
- **Size matters:** only 4 out of 10 small firms spend on OBP (medium firms: 54%, large firms: 61,2%)
- **The most "popular" types** of OBP in both manufacturing and services are Quality improvement, BPR and Business process digitalization.



Software & Databases (S&D) activity and spending

% of Firms	% of Turnover (Mean)	% of Turnover (Median)
51,4	**3,27**	**1**
Purchased by external providers	1,69	0,9
In-house development	1,58	0,18

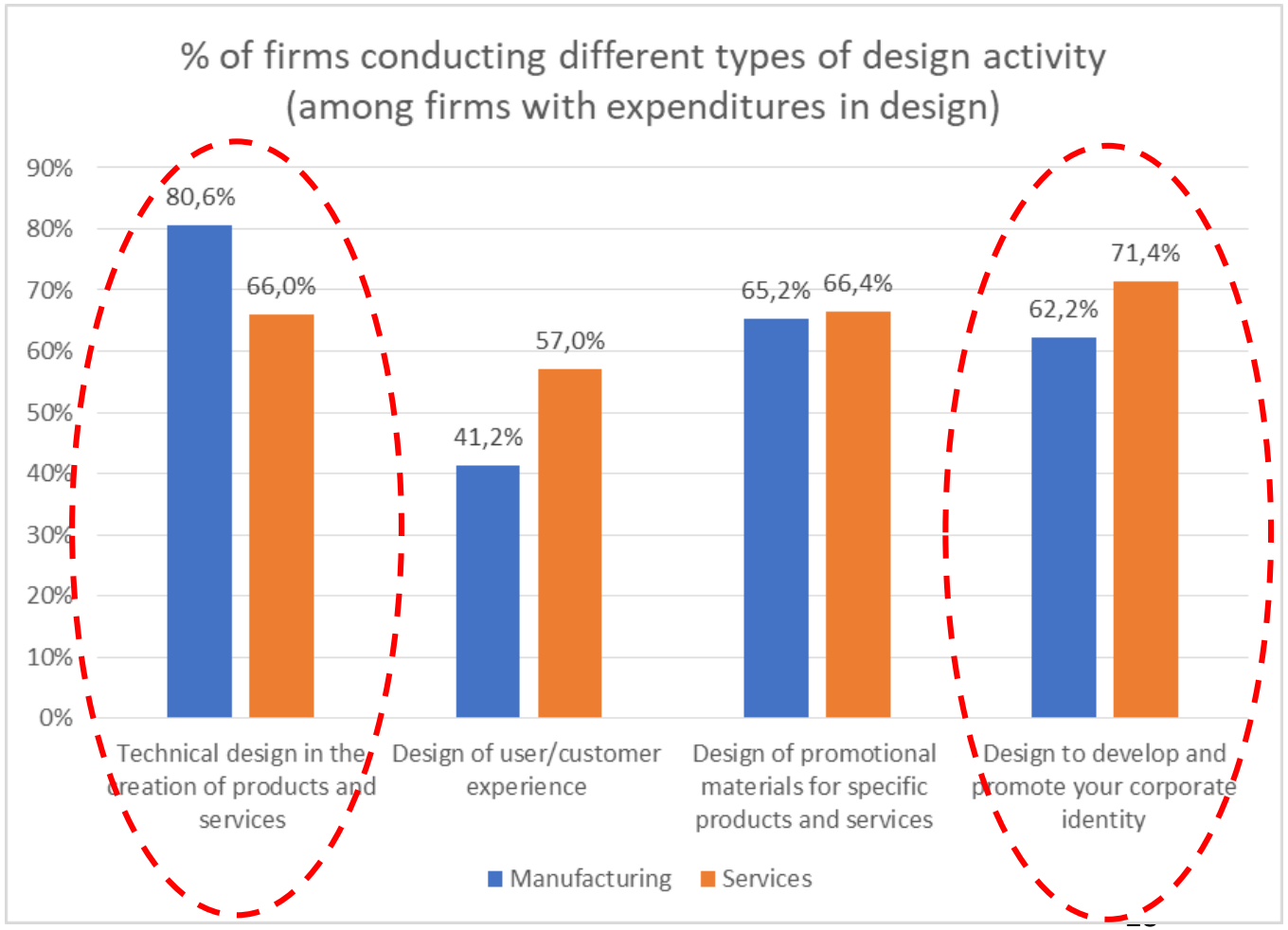


- **1 out of 2 firms have no S&D activity**
- **Size matters:** 63,5% of large firms spend on S&D (medium: 53,7%, small: 43,2%)
- **Sector matters:**
  - 57,7% of service firms spend on S&D (manufacturing firms: 47,2%)
  - Higher number of firms in more knowledge intensive sectors spend on S&D (e.g. KIS: 60,4%, Less KIS: 49,4%)
  - Much higher expenditures in KIS (mean: 5,58, median: 2)
- The most “popular” type of S&D is “special purpose applications”.
- Much higher number of firms in services (57,1%) spend on Databases than manufacturing (43,3%)

Design activity and spending

% of Firms	% of Turnover (Mean)	% of Turnover (Median)
33,2	**4,69**	**1**
By external providers	1,42	0,3
Using internal resources	3,22	0,5

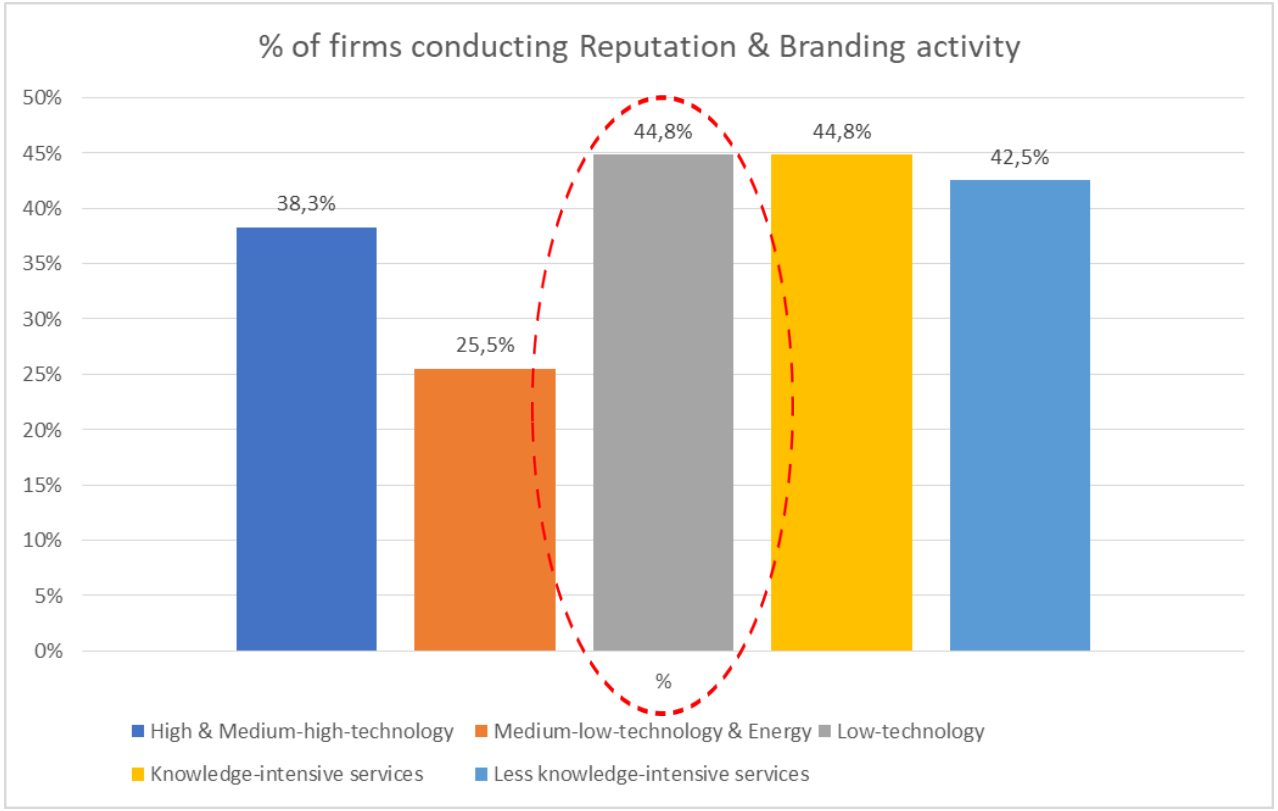
- **2 out of 3 firms have no design activity**
- **Sector matters:**
  - Higher share of firms with design activity in H&MHT and LT manufacturing firms (38% and 36,5%)
  - Much higher expenditures in KIS especially using internal resources (mean: 7,36 , median: 1)
- The most “popular” type of design activity in manufacturing is “technical design” and in services is “design for corporate identity”
- Much higher share of firms in services invest on design of user/customer experience (57%) than manufacturing (41,2%)



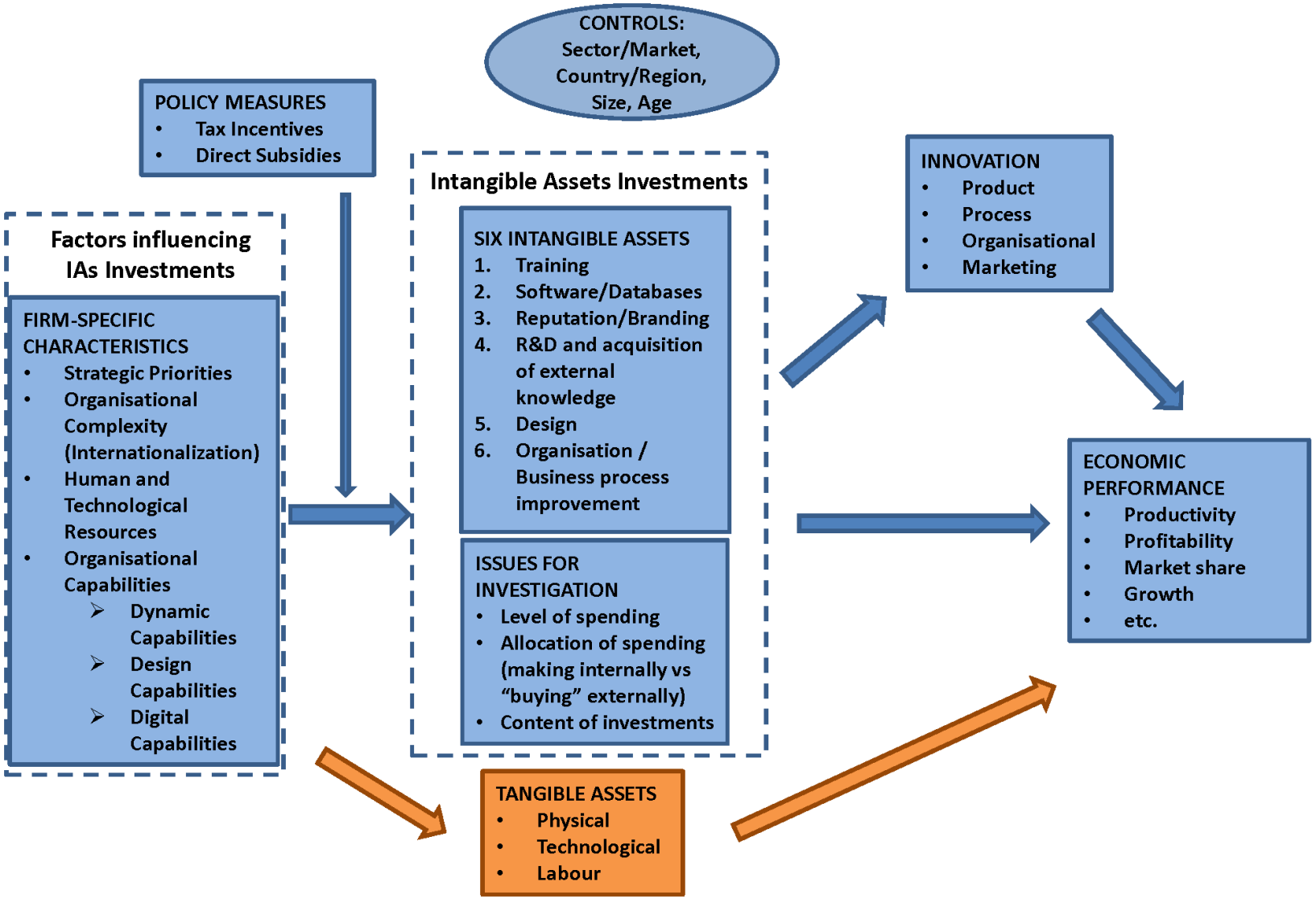
Reputation & Branding activity and spending

% of Firms	% of Turnover (Mean)	% of Turnover (Median)
40	**2,48**	**1**
By external providers	1,21	0,5
Using internal resources	1,28	0,5

- **6 out of 10 firms have no activity in R&B**
- **Size matters:** 44% of medium and 45,7% of large firms conduct Reputation & Branding activity (small firms: 34%)
- **Sector matters:**
  - Higher share of service firms (44,2%) invest on R&B than manufacturing firms (37,2%)
  - Low-tech manufacturing firms (44,8%) exhibit higher activity than H&MHT (38,3%) and MLT (25,5%) manufacturing firms
  - Higher expenditures in KIS (mean: 3,32 , median: 2)



Conceptual Framework



Models development and testing

- We run two econometric model groups to test the following two basic causal relationships of the conceptual framework:

1. Factors that influence the propensity to invest in intangible assets (IAs)

Y: Incidence of investment in a specific IA type (YES/NO)

X: Strategy, Organizational Complexity (Export performance, Part of an Enterprise Group, Competition & FDI), Human Resources, Technological Resources, Dynamic Capabilities, Design capabilities, Digital Transformation capabilities, Policy Measures (Tax incentives & Direct subsidies)

CV: Size [Log (no. of employees)], Sector (Manufacturing/Services), Country

2. Innovation impact of different aspects of intangibles investment

Y: Introduction of a specific innovation type (YES/NO)

X: Incidence of investment in a specific IA type (YES/NO)

CV: Size [Log (no. of employees)], Sector (Manufacturing/Services), Country, Organizational Complexity (Export performance & Part of an Enterprise Group)

Propensity to invest in intangible assets (IAs)

- Literature largely focuses on the relative effect of IAs on economic performance. Contributions on the factors affecting IAs investments are relatively rare, focusing mainly on industry-related variables. For example, the relative differences in the intensity and appropriability of innovation across industries leads to different incentives for the development of IAs (i.e., the level and growth rate of intangible assets differ across industries).
- Our approach: A firm's propensity to invest in IAs is seen as a product of the bundle of unique resources and capabilities that the firm has evolved over time than as a result of purely exogenous technological or other contingencies (factors).

Drivers of intangible investments per asset category (probit analysis results)

FACTORS	INDICATORS	In-house R&D [Q6a]	Training [Q11a/b]	OBP improve-ment [Q14]	Software /Databases [Q18]	Design [Q22]	Reputation & Branding [Q26]
Size	Log (no. of employees) [Q4]	0.057**	0.101***	0.118***	0.142***	0.017	0.088***
Sector	Manufacturing (-) vs Services (+) [Q1]	-0.140***	0.016	0.030	0.089***	-0.007	0.037
Strategy	Rapid development of new products or services [Q29a]	0.083***	-0.002	0.065**	0.001	0.074***	0.066**
	Development of tailored, customized solutions [Q29b]	0.040*	0.005	0.013	0.005	0.015	0.031
	Ensuring lower prices [Q29c]	-0.047*	0.005	-0.004	0.009	0.034	0.004
	Increasing labour productivity [Q29d]	0.010	0.032*	0.081***	0.053**	0.019	0.022
	Decreasing production costs [Q29e]	-0.034	-0.002	0.043	-0.017	0.005	0.032
Organisational Complexity	Exports as % of turnover [Q30b+c]	0.002***	0.000	-0.001	0.000	0.000	-0.001
	Few business competitors [Q31]	0.077	-0.007	0.061	0.003	-0.034	0.080
	Many business competitors [Q31]	0.090*	0.017	0.069	0.004	-0.036	0.155***
	Part of an Enterprise Group [Q2]	0.009	0.011	-0.010	-0.062**	-0.027	-0.074***
	Foreign Direct Investments [Q32]	0.047	0.004	0.127***	0.172***	0.095***	0.090**
Human Resources	Ratio of Employees with University degree to Total [Q33a+b]	0.014	0.094**	0.001	0.032	0.069	-0.011
	Ratio of R&D Employees to Total [Q34]	0.650***	0.157**	0.204**	0.197**	0.059	0.133
Technological Resources	Investments in innovative hardware technologies [Q35a]	0.028***	0.001	0.041***	0.017*	0.022**	0.000
	Investments in innovative digital technologies [Q35b]	0.031***	0.015*	0.022*	0.023*	0.008	0.035***
Dynamic Capabilities	Networking [Q37c+d]	0.061***	0.009	0.027**	0.013	0.021*	0.030**

***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.1$

FACTORS	INDICATORS	In-house R&D [Q6a]	Training [Q11a/b]	OBP improve-ment [Q14]	Software /Databases [Q18]	Design [Q22]	Reputation & Branding [Q26]
Design Capabilities	Design is used as last finish [Q38]	0.068**	-0.008	0.033	0.078**	0.207***	0.014
	Design is integrated into the product development process [Q38]	0.080***	-0.052**	0.008	0.060*	0.283***	0.119***
	Design is a key strategic element of the enterprise's business model [Q38]	0.043	-0.028	0.035	-0.022	0.386***	0.119***
Digital Transformation capabilities	Digital platforms use [Q40]	0.016	0.003	-0.008	0.030*	0.021	0.069***
	Late adopter of digital technologies [Q49]	0.055*	0.032	0.027	0.021	0.054	0.031
	Early adopter of digital technologies [Q49]	0.032	0.027	0.044	0.057	0.041	0.007
	First to adopt digital technologies [Q49]	0.101**	-0.031	0.040	0.094*	0.069	-0.035
Policy Measures	Tax Incentives for R&D [Q44a1]	0.280***					
	Direct Subsidies for R&D [Q44a2]	0.048					
	Tax Incentives for Training [Q44b1]		0.047**				
	Direct Subsidies for Training [Q44b2]		0.057***				
	Tax Incentives for S&D (in-house development) [Q44c1]			0.099	0.077		
	Direct Subsidies for S&D (in-house development) [Q44c2]			0.046	0.040		
	Tax Incentives for S&D (purchase from providers) [Q44d1]			-0.062	-0.035		
	Direct Subsidies for S&D (purchase from providers) [Q44d2]			0.163***	0.167***		
Country Dummies		*Included*	*Included*	*Included*	*Included*	*Included*	*Included*
No. of Observations		1422	1433	1425	1429	1445	1445
Log likelihood		-653.46829	-389.20756	-892.57575	-851.30638	-740.81995	-873.86557
LR(χ^2)		644.95***	207.86***	190.31***	275.26***	369.22***	207.33***
Pseudo R^2		0.3304	0.2108	0.0963	0.1392	0.1995	0.1060

***: p < 0.01, **: p < 0.05, *: p < 0.1

Propensity to invest in intangible assets _ results 1/3

- **Size matters**: larger firms are likely to have a positive impact on the propensity to invest in IAs (important across all IAs except for design)
- **Strategic priorities matter**: firms pursuing "rapid development of new products and services" have of greater probability of investing in IAs (in-house R&D, organization/BPI, Design , reputation and branding). Firms targeting at "increasing labor productivity" have also a greater probability of investing in IAs (training, organization/BPI, software and databases). On the contrary, lower price strategies have a negative (in-house) or non-significant effect suggesting that such strategies drive primarily investments in tangible assets.
- **Organizational complexity matters:** For example, more globalized firms have a greater probability in investing in R&D, firms with foreign direct investments are more likely to invest in different IAs (Organization, Software and Databases, Design and Reputation and Branding), firms facing increased competition are also more likely to invest in IAs (in house R&D and reputation and branding)
- **Human capital matters**: firms with more human resources employed in R&D activities have a great probability of investing in IAs (in-house R&D, training, organization/BPI software and databases).

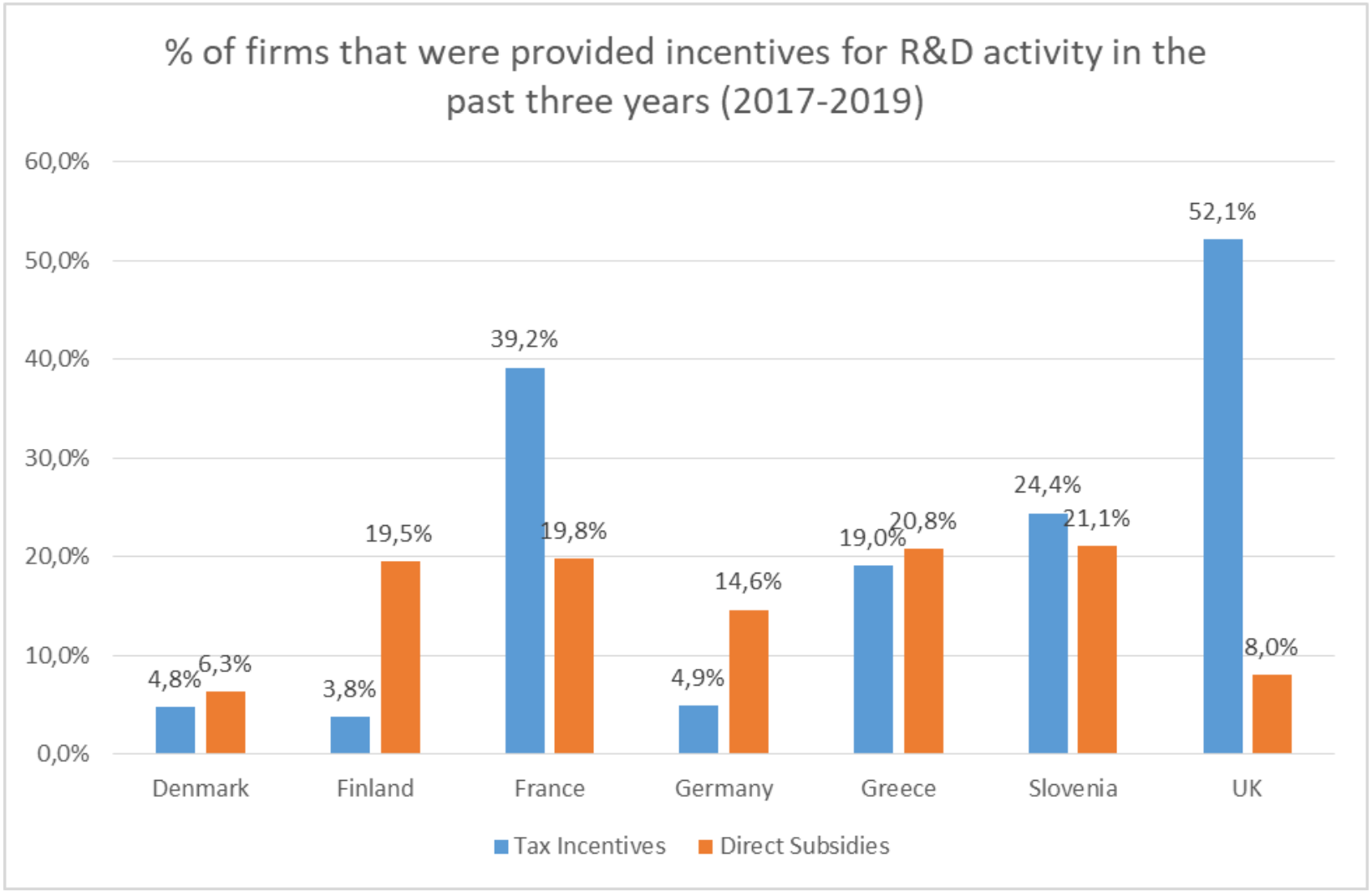
Propensity to invest in intangible assets_results (2/3)

- **Technological resources matter**: firms adopting advanced hardware and digital technologies at a higher degree have a greater probability in investing in IAs.
- **Networking matters**: Firms entering more into alliances and strategic cooperations and collaborate with universities and research institutes have a larger propensity to invest in intangible assets (in-house R&D, Organization/BPI, design, reputation and branding).
- **Design use matters**: firms integrating design into product development and using design as key strategic element of their business model have a larger propensity to invest in intangible assets (in-house R&D, software and databases, design, and reputation and branding) than firms that do not work systematically with design.
- **Digital transformation capabilities matter**
  - firms using digital platforms at a higher level are more likely to invest in IAs (software and databases, reputation and branding).
  - firms that are first to adopt digital technologies have a larger propensity to adopt in IAs (in-house R&D, software & databases) than firms slower to adopt digital technologies

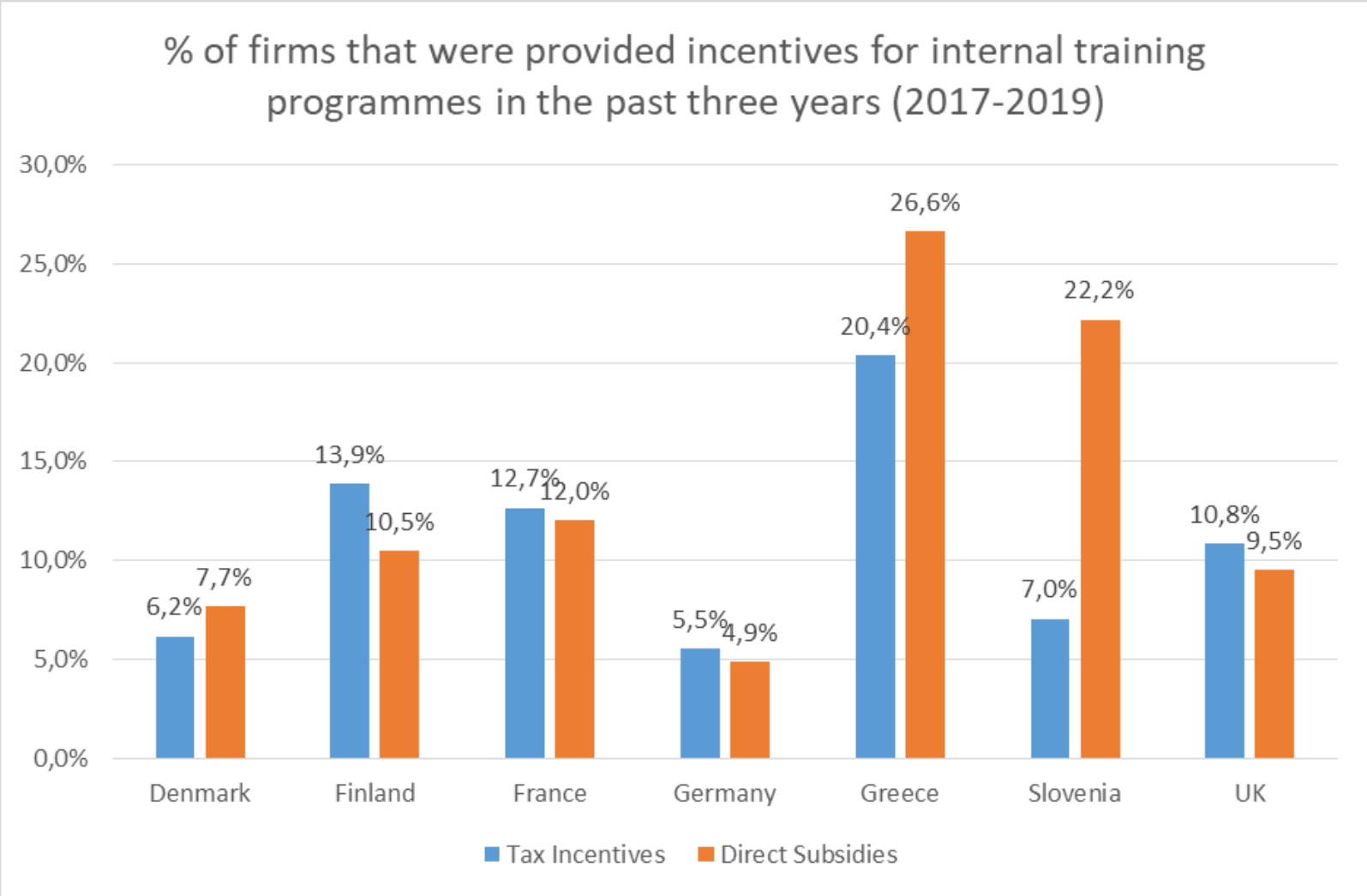
Propensity to invest in intangible assets_results (3/3)

- **Policy matters**
  - **Tax incentives for R&D matter**: firms provided with tax incentives in 2017-2019, are more likely to invest in-house R&D
  - **Tax incentives and direct subsidies for training matter:** firms provided with tax incentives or direct subsidies for developing internal training programs (2017-2019) are more likely to invest in training activities.
  - **Direct subsidies for software and databases (S&D) matter:** firms provided with tax incentives (2017-2019) for purchasing software application and databases, are more likely to invest in organization/BPI and S&D activities.

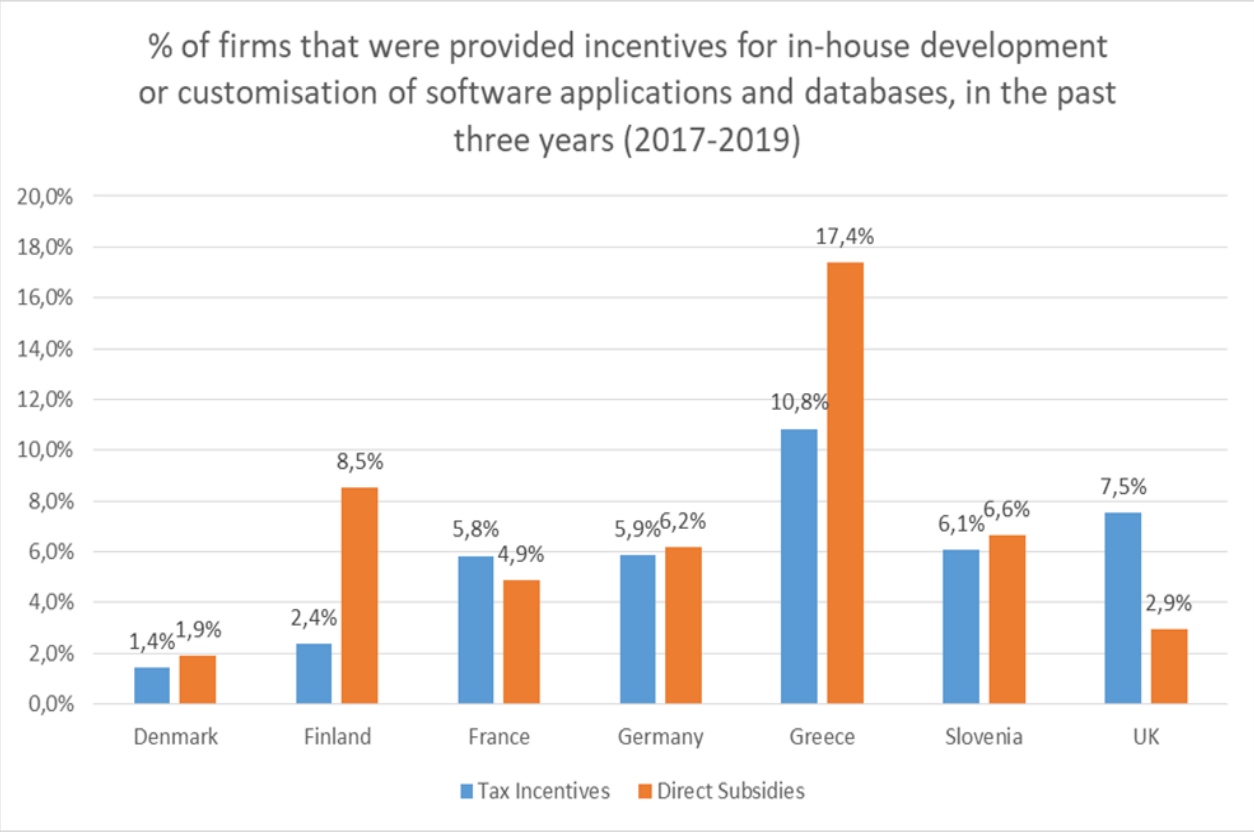
Policy Measures
R&D

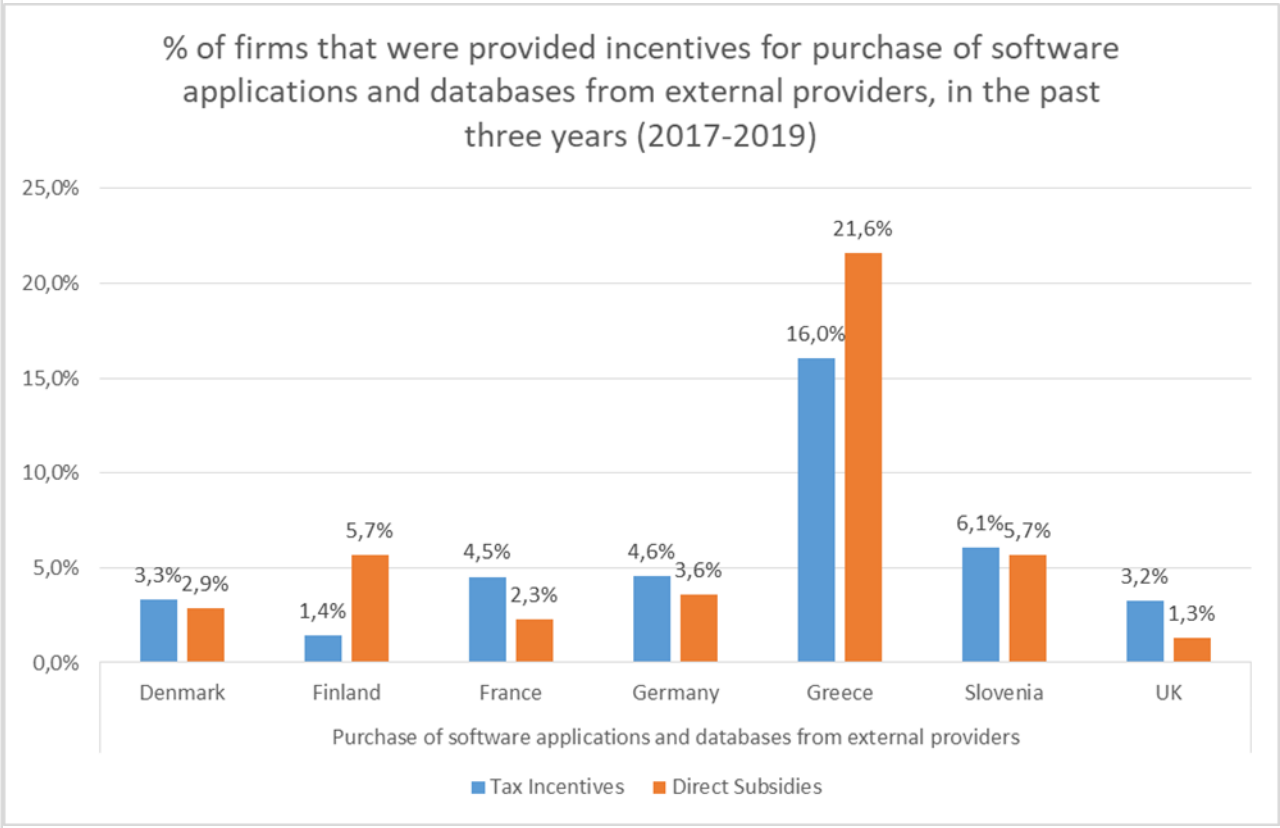


Policy Measures
Training



Policy Measures
Software & Databases





Intangible investments and innovation propensity

- IAs have been generally considered as simple innovative inputs and and only seldom as an asset portfolio. However, the growing empirical literature on intangibles suggests a wide spectrum of IAs together with a broader role.
- Drawing on the resource-based view of the firm (Wernerfelt, 1984: Barney, 1991) and the more recent dynamic capabilities approach (Teece et all, 1997; Teece, 2007), IAs can be considered as an array of heterogeneous assets driving the firm's competitive advantage, i.e., they enable the firm to embark in the different activities that constitute the innovation process at the firm level.

Impact of Intangible Assets on Innovation

FACTORS	INDICATORS	Product Innovation [Q41a]	Service Innovation [Q41b]	Process Innovation [Q41c]	Marketing Innovation [Q41d]	Organisational Innovation [Q41e]
Size	Log (no. of employees) [Q4]	-0.031	-0.026	0.065***	-0.045*	0.024
Sector	Manufacturing (-) vs Services (+) [Q1]	-0.103***	0.260***	-0.165***	0.069***	0.051*
Organisational Complexity	Part of an Enterprise Group [Q2]	0.023	-0.059**	-0.038	-0.002	-0.047*
	Exports as % of turnover [Q30b+c]	0.001***	-0.000	-0.001	-0.001	0.000
Investments in Intangible Assets	In-House R&D [Q6a]	0.227***	0.078***	0.052*	0.096***	0.044
	R&D by external providers [Q6b]	-0.023	0.021	0.011	-0.006	0.023
	External Knowledge acquisition [Q7]	0.028	0.092***	0.022	0.046	0.088***
	Training (by external organisations) [Q11a]	-0.015	0.024	-0.023	0.031	0.015
	Training (using internal resources) [Q11b]	-0.002	0.068**	0.048*	0.038	0.024
	OBP improvement [14]	0.026	0.073***	0.105***	0.037	0.070***
	Software & Database [Q18]	0.041*	0.079***	0.055**	0.032	0.007
	Design [Q22]	0.106***	-0.014	0.054**	0.079***	0.032
	Reputation & Branding [Q26]	0.103***	0.083***	0.053**	0.182***	0.058**
Country Dummies		*Included*	*Included*	*Included*	*Included*	*Included*
No. of Observations		1648	1648	1650	1647	1649
Log likelihood		-959.81164	-998.22147	-1046.067	-996.27308	-1085.5282
LR(χ^2)		290.09***	287.97***	188.69***	211.80***	89.39***
Pseudo R^2		0.1313	0.1261	0.0827	0.0961	0.0395

***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.1$

Intangible investments and innovation propensity or **innovation impact of different aspects of intangibles investment**

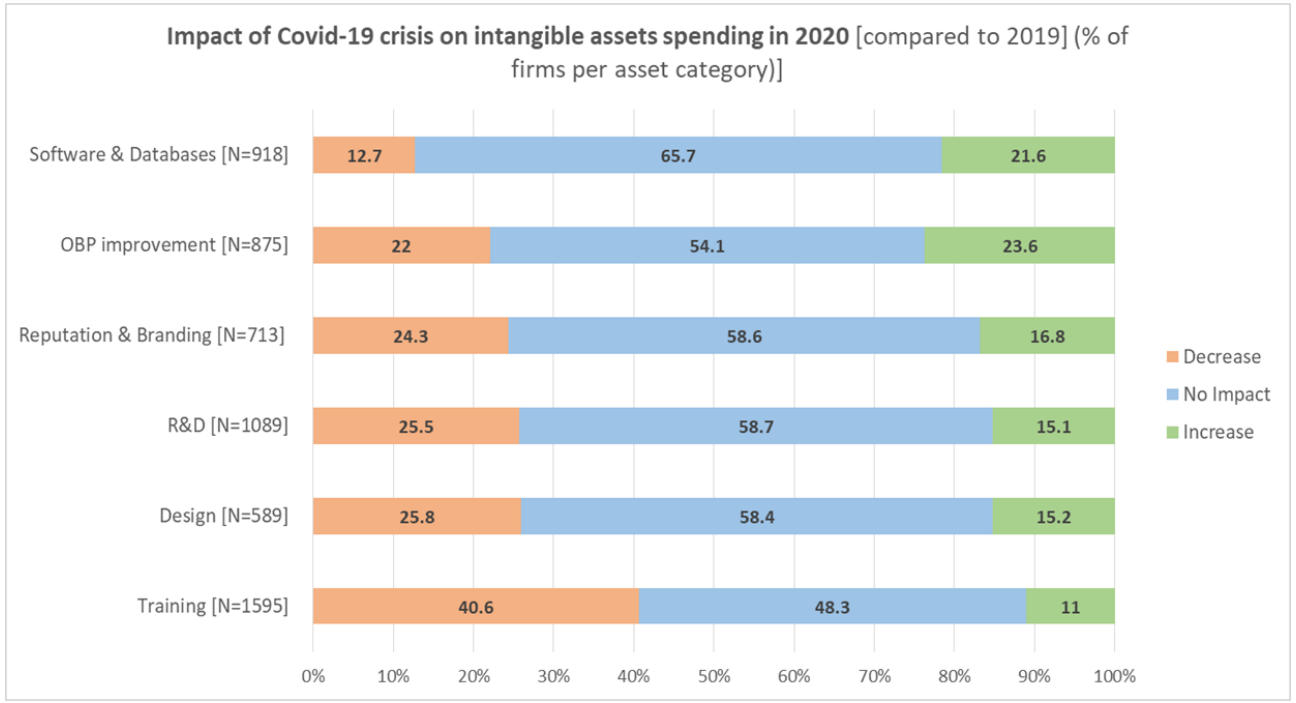
- Investing in IAs appears to be important for different innovation types at the firm level.
- R&D and especially inhouse R&D activity has a significant positive impact on a firm's propensity to innovate across innovation types (except for organizational innovation).
- Firms that invest in reputation and branding (R&B) are more likely to innovate across innovation types.
- Investing in design increases the propensity to innovate in terms of product, process and marketing innovation.
- Spending on Organization and business process improvement (O&BPI) increases the probability to innovate in terms of service, process and organizational innovation.
- Investing in Software and databases increases the probability to innovate in terms of product, service and process innovation.
- Acquiring external knowledge has a positive significant impact on the firm's probability to innovate in terms of service and organizational innovation.

Intangible investments and innovation propensity

- Investing in intangibles internally (in-house R&D and internal training) increases the probability to innovate.
- This finding is related to the strategic choice of ‘making’ rather than ‘buying’ intangibles. External development of IAs could pose problems of knowledge fragmentation and issues of coordination and control which could negatively affect innovation performance.

Impact of Covid-19 crisis on IAs spending

- **Most firms reported "no impact"** on IAs spending across types
- **Training is most affected** by Covid-19 followed by design and R&D.
- **Higher number of firms reported "increase"** of expenditures **in Software & Databases and OBP** improvement than "decrease"



- **The level of spending decrease is quite higher** than the level of increase across categories

IA type	Covid-19 impact on spending (2020)	N	% of Firms	N	% of Change (Mean)	% of Change (Median)
R&D	Decrease	280	25,7	263	-34,8%	-30%
	No Impact	643	59,0			
	Increase	166	15,2	161	35,8%	15%
Training	Decrease	648	40,6	609	-46,7%	-50%
	No Impact	772	48,4			
	Increase	175	11,0	162	29,8%	10%
Organisation	Decrease	193	22,1	177	-43,4%	-50%
	No Impact	475	54,3			
	Increase	207	23,7	188	39,5%	15%
Software & Databases	Decrease	117	12,7	114	-46,5%	-50%
	No Impact	603	65,7			
	Increase	198	21,6	185	29,6%	10%
Design	Decrease	153	26,0	143	-42,3%	-40%
	No Impact	346	58,7			
	Increase	90	15,3	85	36,5%	20%
Reputation & Branding	Decrease	174	24,4	165	-40,7%	-40%
	No Impact	419	58,8			
	Increase	120	16,8	108	26%	10%

Covid-19 and digital transformation

- The share of **firms that renewed to high extent their business processes and practices** to use more efficiently ICTs (27,3%) is somewhat **higher than firms that increased their spending in ICT infrastructure** (23,5%).
  - ➢**Service firms have higher percentages** (28,6% and 31,7%) than manufacturing firms in both issues (20,1% and 24,3%).
- Almost **4 out of 10 firms** sees **Covid-19 crisis as an opportunity** to accelerate their digital transformation
  - ➢**The share of firms in services (47,6%) is much higher** than firms in manufacturing (32%)
- **1 out of 4 firms** sees **Covid-19 crisis as a threat to survive** in the short term
  - ➢KIS are characterized by the lowest percentage (18,3%)
- **2 out of 3 firms** refer that they **will sustain the changes implemented** (in business processes and practices) to adapt and respond to the Covid-19 challenges in the long run

Conclusions

- **Large heterogeneity of firms** regarding the existence and intensity of intangible activity
- **Larger firms tend to have higher activity** in all types of IAs
- **The differentiation** in intangible activity **between sector** categories is **significant for some IAs** (R&D, Design, Software & Databases, Reputation & Branding) and **not so significant for others** (Training, OBP improvement)
- **Knowledge-intensive service firms make the highest investment in IAs** followed by high- and medium-high manufacturing firms.
- **The propensity of firms to invest in IAs** depends largely on **endogenous factors** such as their strategic priorities, human and technological resources, dynamic and other organisational capabilities as well as on **exogenous factors** such as policy measures and the technological and business environment of their economic sector.

Conclusions

- **Each type of innovation** is favoured by **specific combinations of IAs**
- **Service innovation demands investments in a variety of IAs** (R&D and external knowledge acquisition, Software/Databases and Organisation improvement, Reputation & Branding)
- **The acceleration of digital transformation by Covid-19 shock is more clear in services** than in manufacturing

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Thank you