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"The Globalinto survey: A large-scale survey regarding investments in intangible assets and the digital transformation of firms from seven European economies"

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The evolving concept of intangible assets/investments

- "**Intangible Assets"** is today **a very broad and complex evolving concept**, reflecting the changes in the real economy as well as in management practice and economic theory. Yet, there is **not a unified definition**. Generally speaking, as also happens with other similar kinds of multidimensional concepts (i.e., systems of innovation) we can identify **a continuum starting from narrow to wider or broader definitions** of Intangible Assets. Moreover, there are **different meanings** for Intangible Assets and **various forms of knowledge** with important implications for management, economic performance, and innovation.
- **An intriguing statement: One century back, in 1922, John Stuart, the then president of Quaker Oats Company**, an American food conglomerate based in Chicago (owned since 2001 by PepsiCo) made the following statement (Diefenbach T. et al, p.554): "***If this business were to be split up, I would be glad to take the brands, trademarks, and goodwill, and you could have all the bricks and mortar and I would be better than you***". In this regard, he had expressed his interest in things that were familiar from an investment and accounting perspective i.e., **the difference between book and market value, and were capitalized as "intangible assets and goodwill".**

The added value of Globalinto Survey

- The **GLOBALINTO project** aimed at filling **an important gap** in the measurement of IAs which has restricted statistical production, micro-based analysis and evidence-based policymaking.
- In general, the **current treatment of IAs** can be characterized as **partial and uncoordinated** with **a particular lack of measurement at a micro (business-firm) level**.
- **New methodologies and statistics** with micro-foundations and harmonization approaches across countries **are needed for micro-level analysis to better understand individual firm behavior and performance**, i.e., innovation and firm productivity.
- In this context, one of the main activities of the Globalinto project was the design and implementation of **a large-scale survey in 1796 firms** (both manufacturing and service firms) across seven European countries, including Denmark, Finland, France, Germany, Greece, Slovenia, and the UK. The survey was carried out during late Fall 2020 and early Spring 2021 (Caloghirou et al., 2021; 2023).

Why surveying business investments in intangible assets is hard, but necessary

- Although IAs are gradually recognized as significant sources of business growth and productivity gains, **the measurement** of their value and contribution are still in their **infancy**.
- Despite the need for **regular** and **systematic** measurement of intangibles, their treatment is frequently inconsistent and uncoordinated resulting in **severe limitations** in measurement.
- In particular, **business surveys are relatively scarce** and entail several challenges both for respondents and data collectors as business intangibles are difficult to measure, while their measured concept is not always clear to both researchers and businesses (Martin and Baybutt, 2021)*.
- An additional hurdle for carrying out the Globalinto survey emerged **due to the Covid-19 pandemic**. Even so, in terms of the survey results, there was an opportunity for comparing firm behaviour before and after the early stage of the pandemic.

*IARIW-ESCoE Conference “Measuring Intangible Capitals and their Contribution to Growth”, November 11-12, 2021, R2SA House

Challenges of surveying businesses

There are a number of measurement challenges characterized as 4 Fs (Martin and Baybutt, 2021)

First, data on intangibles are difficult to collect from businesses given the lower chance of data on these being regularly and consistently recorded: these intangible assets can be ***forgotten*** by businesses.

Second, with precise data on intangible investment rarely recorded and retrievable by businesses, their responses might often be 'best guesses or estimates: the ***framing*** of surveys on intangible might be especially important.

Third, the measured concept of intangibles is not always clear to researchers, let alone businesses: These terms, for businesses and researchers are ***fuzzy***.

Fourth, unlike most investments, the creation of intangible assets (especially for internally developed intangibles) can take a long time. Providing investment data in any given period might cause problems: the **frequency** of surveys can therefore be key.

Business surveys on intangible assets spending

- There are **a few recent business surveys** that measure intangible assets and relevant investments in different countries [ONS, Imperial College London and NESTA (UK), 2009 & 2011; INAPP and ISTAT (Italy), 2013; Innobarometer survey, 2013 & 2015]. These surveys focus on measuring:
  - a firm's spending on **diverse intangible types** (i.e. R&D, Training, Organization and Business Process Improvement, Software & Databases, Design, and Reputation & Branding), differentiating between **in-house spending** and the **purchase** of intangible assets **from external providers**.
  - the **expected duration of the benefits** reaped from investing in each category of intangible capital explored.
- Furthermore, there are also **two EU-wide business surveys touching upon specific dimensions of intangibles:**

  a) the Community Innovation Survey (CIS), introduced in 1992, in which intangibles are simply treated as activities enterprises have engaged in for innovation, and

  b) the European Investment Bank Investment Survey (EIBIS), conducted annually from 2016 onwards, that gathers information on business investment activities regarding both tangible and intangible assets.

Business Surveys on intangible assets spending

Survey	Components of IAs	Measurement Approach	Other issues under Investigation	Sample
Imperial College London, UK National Statistical Institute (ONS) and NESTA (UK), 2009 & 2011	• Training (employer funded) • Software • Reputation & Branding • R&D • Design • Organisation / Business Process Improvement	• Expenditures ➢ In-house ➢ Purchased • Assets life-lengths / depreciation rates		• 838 UK firms with 10+ employees (Sample Source: firms participated in CIS) • Sample stratified by industry & employment ➢ Over-sample to knowledge-intensive industries: Engineering; ICT; Financial Services ➢ Under-sample: Construction; Utilities; Distribution; Accommodation
INAPP and ISTAT (Italy), 2013	• Training • Software/Databases • Reputation & Branding • R&D • Design • Organisation and Management & Production Processes Improvement • Other (sector specific) IAs	• Expenditures ➢ In-house ➢ Purchased • Assets life-lengths / depreciation rates • Ratio of internal/external use for specific IAs (R&D, Software/Databases, Design)	• Effect of the economic crisis on Intangible Assets Investments	• 10.631 Italian firms with 10+ employees • Sectors: ➢ Manufacturing ➢ Services
Innobarometer Survey, 2013 & 2015	• Training • Software • Reputation & Branding • R&D • Design • Organisation / Business Process Improvement	• Expenditures <u>but via qualitative scales</u> ➢ In-house ➢ Purchased	• <u>2013:</u> a) Expected Benefits, Motivation/Obstacles, Impact and Relation to innovation projects of Investments in IAs, b) Innovation • <u>2015:</u> a) Investments in tangibles, b) Use of design within the firm, c) Use of innovative manufacturing technologies, d) Innovation (Investments for innovation activities, Innovation performance, Barriers, obstacles and public support for innovation commercialization, Role of public procurement in innovation development)	• <u>2013:</u> 11.317 firms with 1+ employees in EU28 and nine other non-EU countries - Sectors: Manufacturing, Services, Utilities. • <u>2015:</u> 14.118 European firms with 1+ employees in EU28 countries, Switzerland and the United States - Sectors: Manufacturing, Services, Utilities, Construction.
Globalinto Survey	• R&D and External knowledge acquisition • Training • Organisation / Business Process Improvement • Software & Databases • Design • Reputation & Branding	• Decision to invest • Investments intensity ➢ In-house ➢ Purchased	• Business strategy and export activity • Human & Technological Resources • Dynamic, digital and design capabilities • Firm performance: Innovation and Economic • Policy measures: Tax incentives and direct subsidies • Impact of Covid-19 pandemic on intangible investments, economic performance and digital transformation	• 1.796 firms with 20+ employees in Germany, France, UK, Denmark, Greece, Finland and Slovenia • Sectors: ➢ Manufacturing ➢ Services ➢ Energy

Positioning of Globalinto Survey among other Intangible Surveys

The Globalinto Survey **adds to the existing studies** by:

a) developing **a more comprehensive view of business' spending on intangible assets and** contributing to the improvement of the **micro-level measurement** approach,

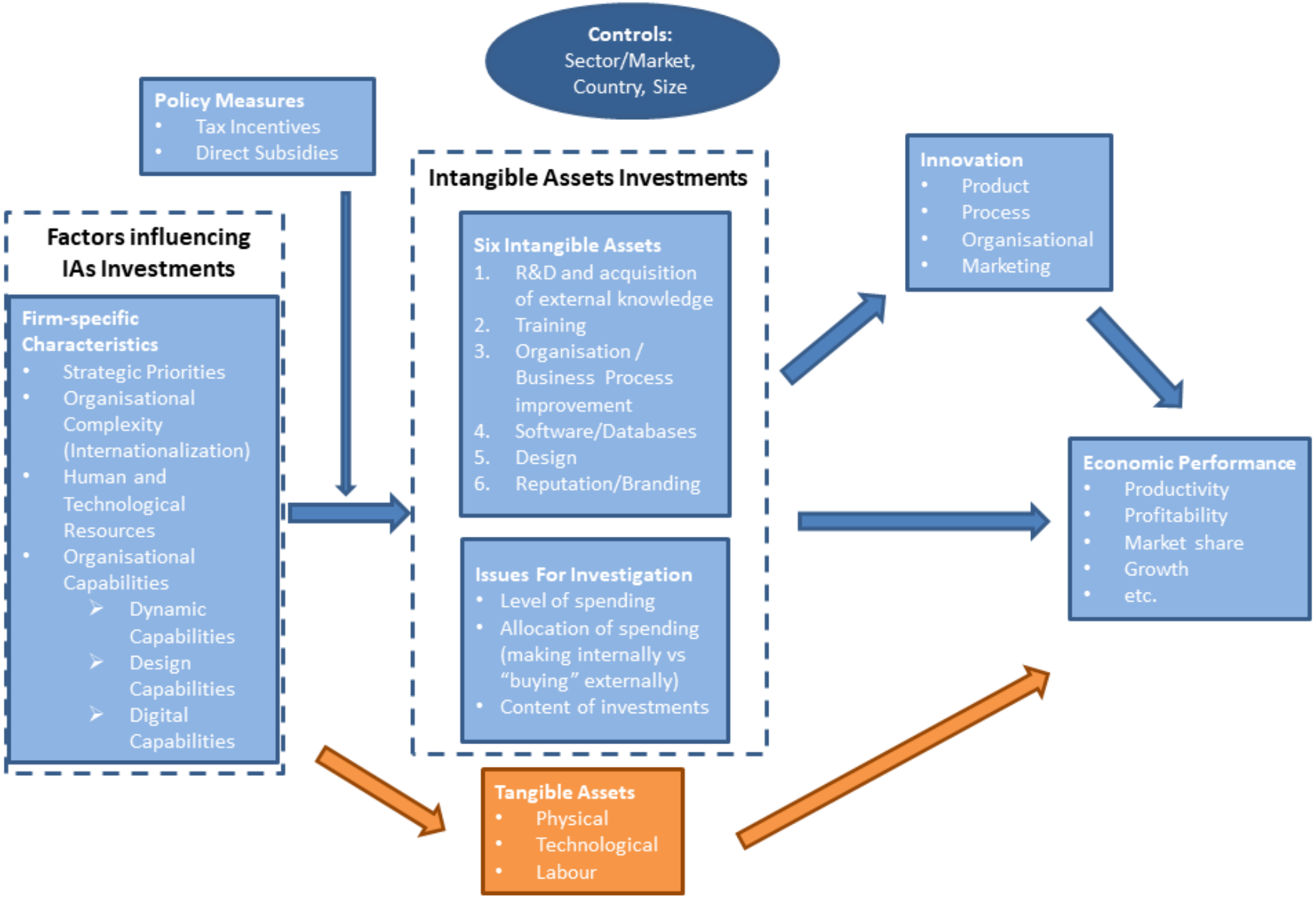
b) identifying the **factors influencing these investments**,

c) assessing their **impact on the enterprise in terms of economic and innovation performance**, and

d) investigating the **role of relevant policies** and the **impact of the Covid-19 pandemic** on the level of IAs investments.

Conceptual Framework for questionnaire development

a) **comprehensive**,
b) **factors influencing these investments**,
c) **economic and innovation performance**, and
d) **the Covid-19 pandemic**.



Questionnaire Layout

- **Section A** focuses on **general information about the firm** including firm's primary and secondary activities, whether the firm belongs to a national or multinational enterprise group and firm size.
- **Section B** concentrates on **firm's intangible investments** and aims at investigating **whether the firm made an investment** in 2019 on each intangible category and secondly **the level of this investment** as % of the same year's turnover either for **in-house** spending or for **purchasing** intangible assets. In addition, section B attempts to capture the **impact of Covid-19 crisis on the enterprise spending** on each IA type.
- **Section C** puts emphasis **on the determinants of a firm's investment in intangible assets**. In line with the **capability view of the firm** we choose to focus on variables such as **strategic priorities** (e.g., price vs. differentiation strategy), **organizational complexity** (e.g., degree of internationalization, FDIs), **human and technological resources** as well as specific **organizational capabilities** (e.g., dynamic capabilities, and design and digital capabilities) which may have a significant impact on the firm's intangible investment decisions.
- **Section D** aims at capturing **innovation performance** and the **impact of investments in intangible assets on economic performance**.
- **Section E** includes questions related to the **impact of public policies** (direct subsidies & tax incentives) **on the firms' intangible investments**
- **Section F** attempts to capture the **impact of the Covid-19 pandemic on firms' economic performance** as well as on their **digital strategy and capabilities.**

Preparation of the survey

- The survey aimed to cover **economic activities in both manufacturing industries and knowledge-intensive services** and focused on **enterprises employing at least 20 people in seven countries**: Germany, UK, France, Finland, Denmark, Slovenia, and Greece.
- In terms of completed questionnaires, **the target was set to 1790 responses across countries**. To achieve this final sample target, a minimum of **215 responses** was decided **for small countries** (Finland, Denmark, Greece, and Slovenia) and **310 responses for large-sized countries** (UK, France, and Germany).
- **The sample structure by country** was refined by imposing **two quotas:**
  - A sector quota: 60% Manufacturing & 40% Services
  - A firm size quota: 60% SMEs & 40% Large
- **The survey population was mainly drawn from Orbis** that includes information on more than 310 mil. companies across the globe.
- **Telephone -Computer-Assisted Telephone Interviewing (CATI)** type-interviews were selected as the most suitable method for implementing the survey. The respondent should be the CEO of the enterprise and/or top-level managers (including the financial director).

Implementation of the survey

- **Global Data Collection Company (GDCC)** was appointed for the execution of the interviews. GDCC **interviewers were trained** with LIEE-NTUA and SEB-UL's involvement.
- The survey **was launched in November 2020 and was completed in March 2021** (pilot fieldwork on 27-29/10/2020: 27 interviews in total).
- **The fieldwork progress was significantly affected by the Covid-19 pandemic**. Major challenges were:
  - Unavailability of businesses (businesses out of reach) [e.g., many enterprises with answering machines informing that the company was closed temporarily due to the Covid-19]
  - Difficulty in reaching the appropriate respondent due to teleworking [e.g., numerous respondents worked from home and were only contactable by email]
  - Lower availability of time for questionnaire completion [e.g., many businesses reduced staff and opening hours, thus had less time for their usual, day-to-day business responsibilities]
- **To overcome the above-mentioned difficulties:**
  - the sample population was expanded by **additional economic activities** (2-digit NACE codes), and
  - the initial firm size quota targets were amended to **77% SMEs vs. 23% Large firms***.
- **This change was essential to enlarge the target population** due to the constraints in reaching out to large firms, especially large firms in small countries.

*The 23% threshold would ensure that a minimum of 20 complete questionnaires for large firms in services would be achieved per country.

Achieved sample targets per country, sectoral group, and firm size

	Manufacturing SMEs	Manufacturing Large	Services SMEs	Services Large	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**

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Quality Control & Dataset Cleaning Process

- Upon the fieldwork completion, the **quality control and dataset cleaning process** was launched to eliminate potential errors, especially regarding data on intangible investments, and, in general, to ensure the highest possible quality of the database.
- **The NTUA and UL research teams** decided to do **some desk research** and, most importantly, **follow-up calls in both countries** to understand the source and extent of measurement errors.
- Following the initial feedback from Greece and Slovenia, **the subcontractor was asked to provide feedback and assistance for follow-up work** that would be needed to identify and correct possible errors **in the remaining five countries** (review of interviews recordings, desk research and follow-up calls).
- **The data cleaning process** was completed in early June 2021 and the dataset was amended accordingly.
- **A unified dataset** in both MS Excel and SPSS accompanied by an 'instruction guide', which includes a description of the database variables and shows how each variable was measured and coded were delivered by the end of June 2021

Project Partners

- The Department of Economics (research group “Intangible Capital”) at the University of Vaasa (Finland, project coordinator),
- The Chair for International Economics at the University of Hamburg (Germany),
- The Danish Centre for Studies in Research and Research Policy at the Aarhus University (Denmark),
- The RITM (Réseaux Innovation Territoires Mondialisation) research unit at the University Paris-Saclay (France),
- The Faculty of Economics at the University of Ljubljana (Slovenia),
- The Laboratory of Industrial and Energy Economics (LIEE) at the National Technical University of Athens (NTUA) (Greece),
- The Manchester Institute of Innovation Research at the University of Manchester (UK), and
- The Statistics Norway
- Subcontractor for survey implementation: GDCC

The role of the partners in the Globalinto survey (1/2)

- **LIEE-NTUA** was the corresponding **work package leader** and had **the main responsibility for the overall process** from the initial steps of the survey design to the delivery of the unified survey dataset. Its **basic activities** were:
  a) the questionnaire development based on the review of existing work in the field (such as the three surveys mentioned above) as well as its experience from other large-scale firm surveys,
  b) the setting of the selection criteria for the target population,
  c) the selection of the survey implementation method,
  d) the monitoring of the pilot fieldwork and the evaluation of its feedback,
  e) the monitoring of the main fieldwork, and
  f) the data cleaning process.

The role of the partners in the Globalinto survey (2/2)

- The research group from the **University of Ljubljana** had **the second most important role** in the survey work package. Its main responsibility was the execution of all the necessary formal procedures for subcontracting the survey fieldwork to a large firm with significant experience in conducting business surveys. It had also a significant contribution to most of the other activities of the survey work.
- The **project coordinator** (University of Vaasa) played also an important role in many stages of the survey conduction (e.g. creation of the survey population).
- Furthermore, **all the other partners** contributed more or less to **various activities** of the survey design and implementation (e.g. they provided feedback for the questionnaire development or they translated the questionnaire into their national languages).

Policy and Business Implications (1/2)

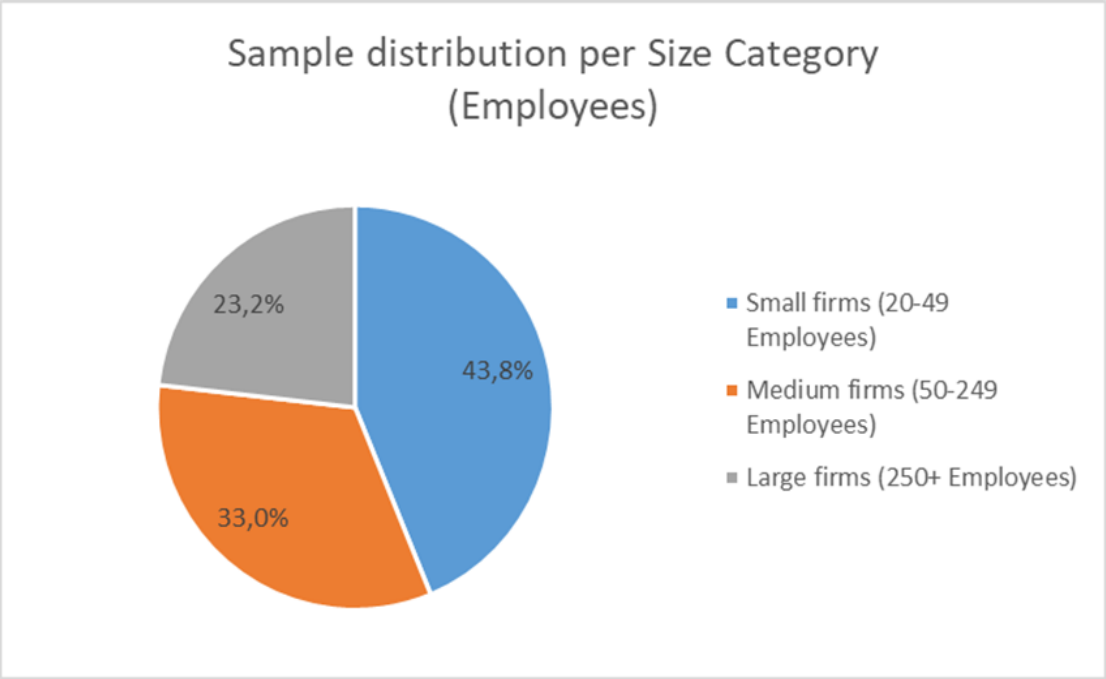
- The survey constitutes **a unique asset** of the Globalinto project as it offers a rich dataset that can be used for various types of statistical analysis and thus provide **evidence-based implications** for informing both public policies (at an EU and national level) and business strategies with a holistic view:
  - **Policy Implications:** Informing policy formulation (system of policies & mix of measures diversified per sector, firm type, etc.) at an EU (e.g., DG RTD, DG DIGIT, DG EMPL) and national level regarding the support of IAs development and effective use as well as other complementary measures for increasing European firms' and economies' innovation, competitiveness, and growth.
  - **Managerial Implications:** Informing strategic decisions regarding the appropriate mix of investments in IAs and other issues such as the development of specific organizational capabilities so as to improve innovation and economic performance in the long term.

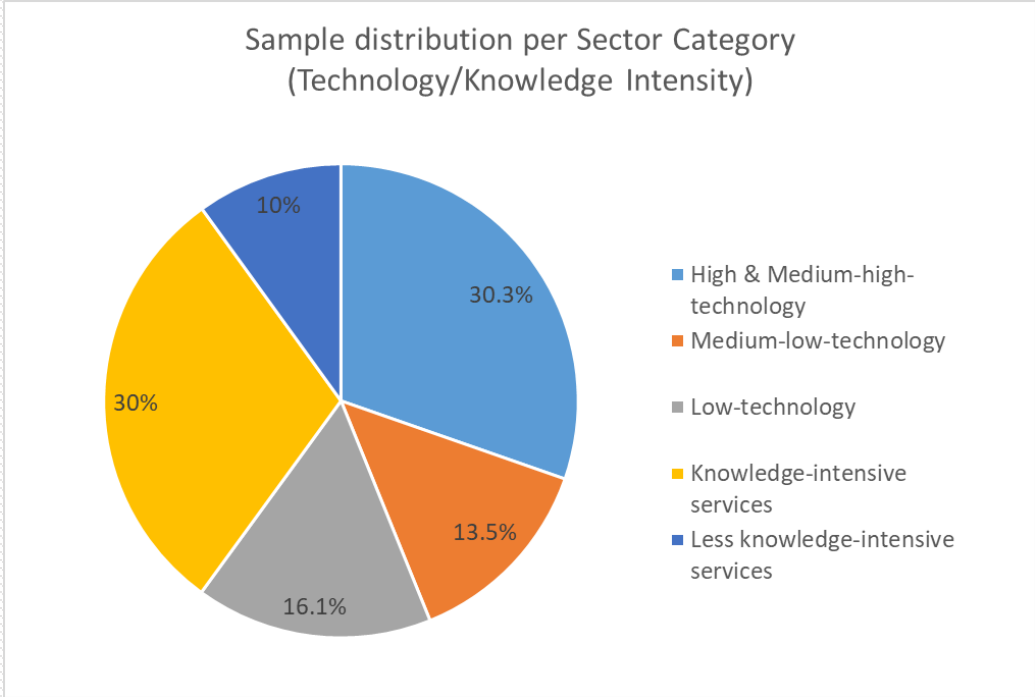
Policy and Business Implications (2/2)

- These implications seem to be **even more significant in the aftermath of the Covid-19 crisis**, i.e., the impact of the Covid-19 business disruption on the importance of ICT investments and their complementarity with investments in other types of IAs.
- Therefore, the Globalinto survey can be envisioned **not as an ad hoc, one-off survey** but oriented towards the possibility of **regular data collection** at National Statistical Institutes or the possible integration of some of its core elements into existing survey instruments (i.e., measurement of IAs in a sustainable manner).

Globalinto Survey Sample

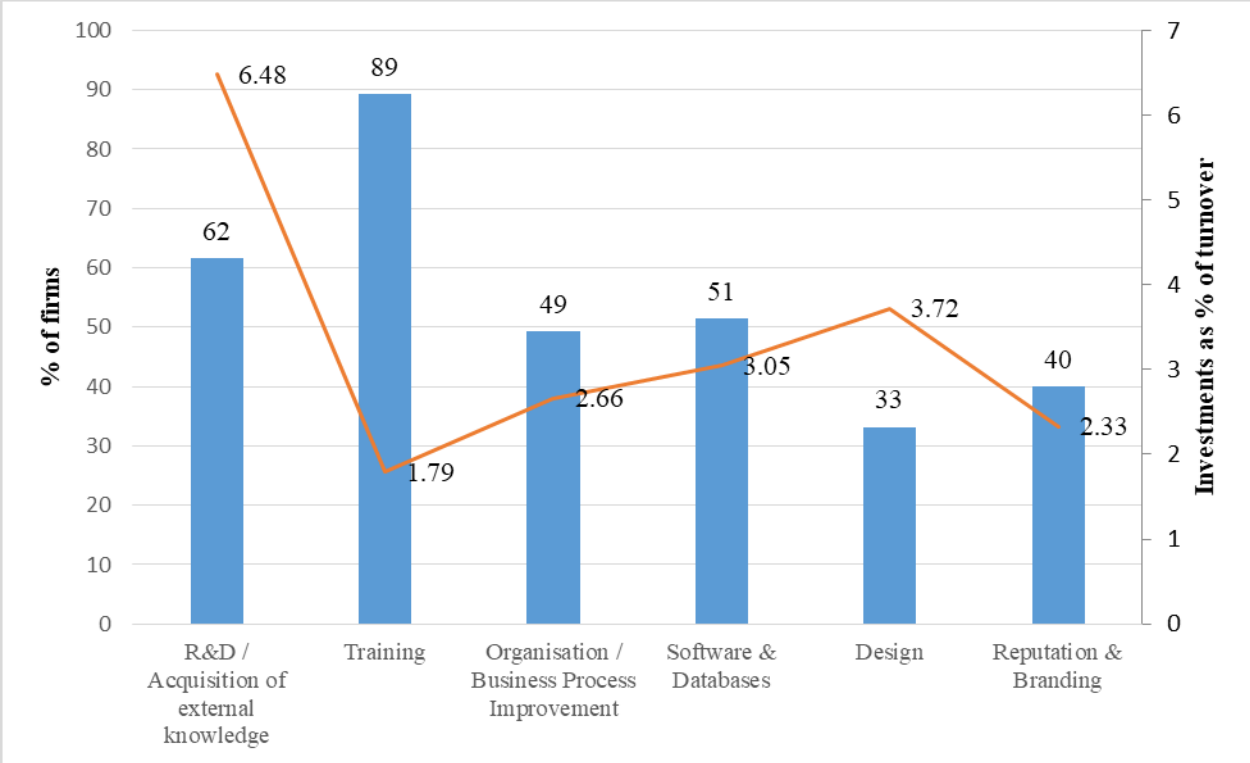
- **1796 firms from 7 Countries** (DE, FR, UK, DK, FI, GR, SI)
- Manufacturing: 60%, Services: 40%
- 60% are high and medium-high tech manufacturing firms and knowledge-intensive services
- Almost two thirds (63.6%) have less than 100 full-time employees
- Most firms (56.4%) do not belong to a business group





Main Findings

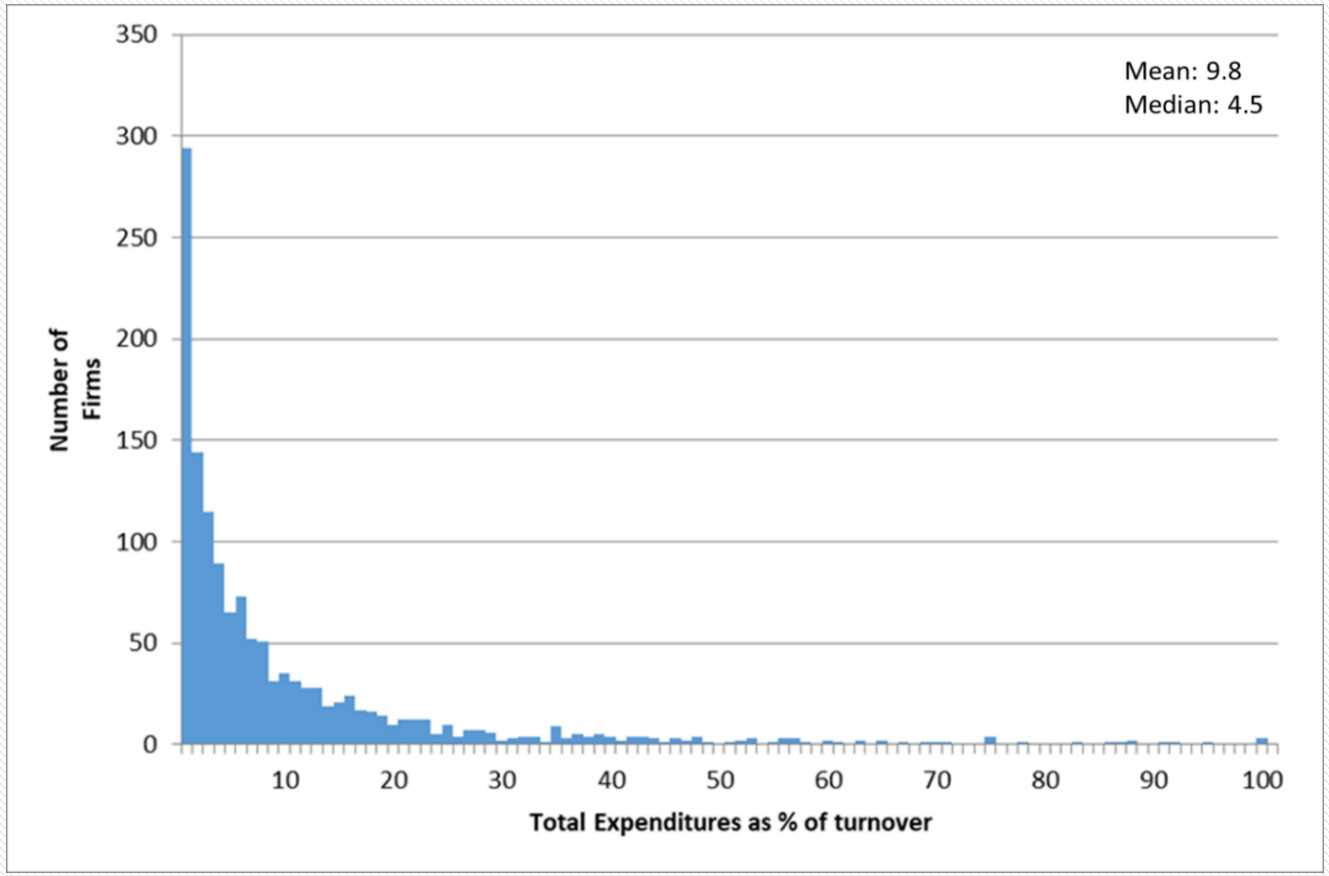
Firms with intangible investments and investment intensity by asset type



- **Almost all sample firms** (96%) reported **some intangible investment**.
- **2 out of 3 firms** make investments in **3 or more intangible categories**
- Most firms state some investment in **training**.
- Many firms have **R&D expenditures** and/or acquire external knowledge such as patents, process blueprints, or non-patented inventions.
- About half the firms report expenditures on **software/databases** and **organization/business process** (OBP) improvement activities.
- Lower is the percentage of firms with **reputation and branding** expenditures, whereas **design** exhibits the lowest incidence.
- **Size matters**: Larger firms exhibit higher intangible activity

- **R&D exhibits by far the largest average expenditure level** (6.48%), followed by **design** and **software & databases**, while average spending on the remaining three intangibles is relatively smaller.

Total investment in intangible assets (all IA types): Large heterogeneity of firms



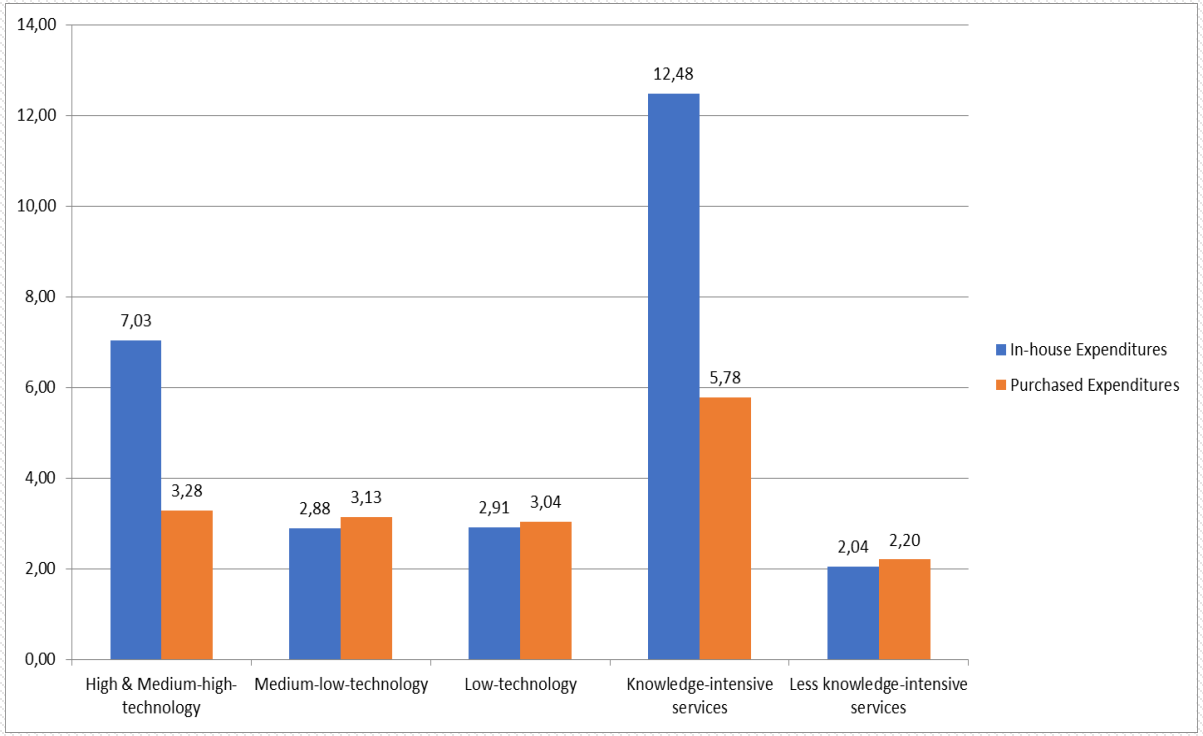
Spending (as % of turnover)	Firms (%)
0 - 1%	**21.8**
1 - 5%	**30.5**
5- 15%	27.3
15 - 25%	9.8
25 - 50%	6.8
> 50%	3.8

Valid N = 1310

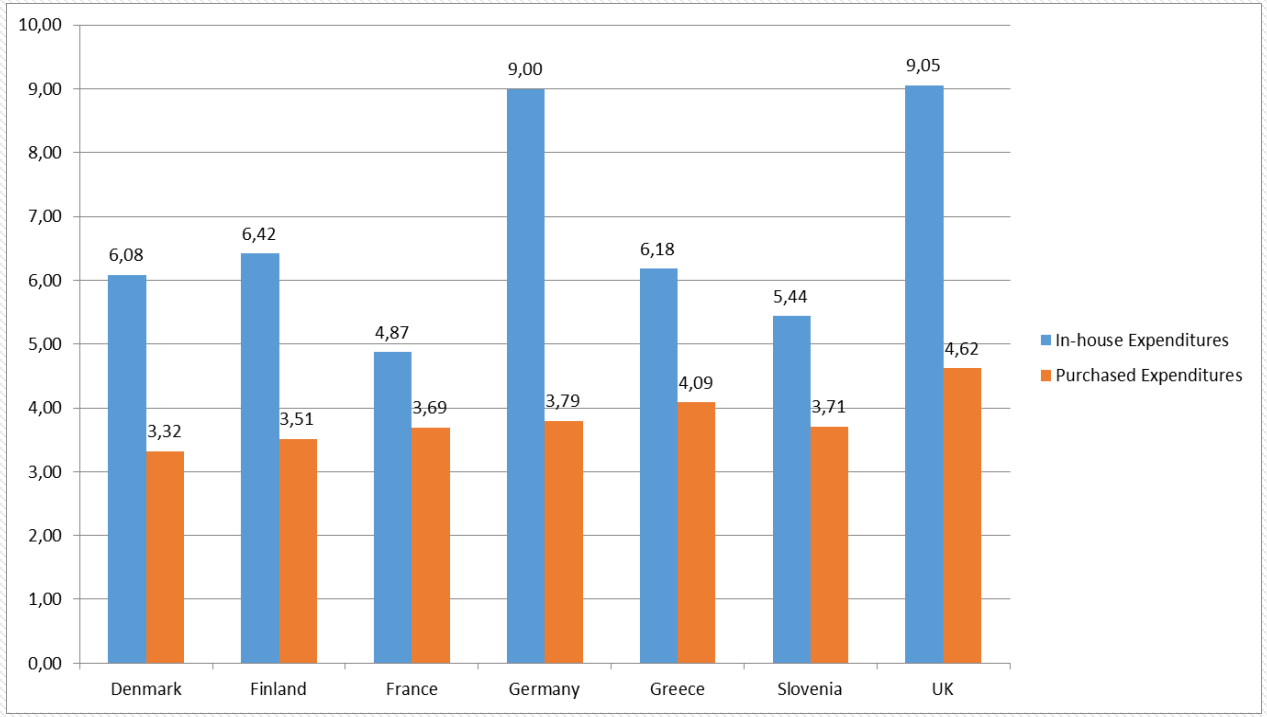
- **486 firms** could not estimate their intangible spending in at least one of the asset categories

In-house and purchased average expenditures as percentage of turnover per sector and country (Valid N = 1310)

- **Sector knowledge intensity matters:** Knowledge-intensive services (KIS) and High- and medium-high (H&MHT) manufacturing firms invest more
- Firms in **high knowledge/technology-intensive** sectors make **much higher in-house investments** in intangibles

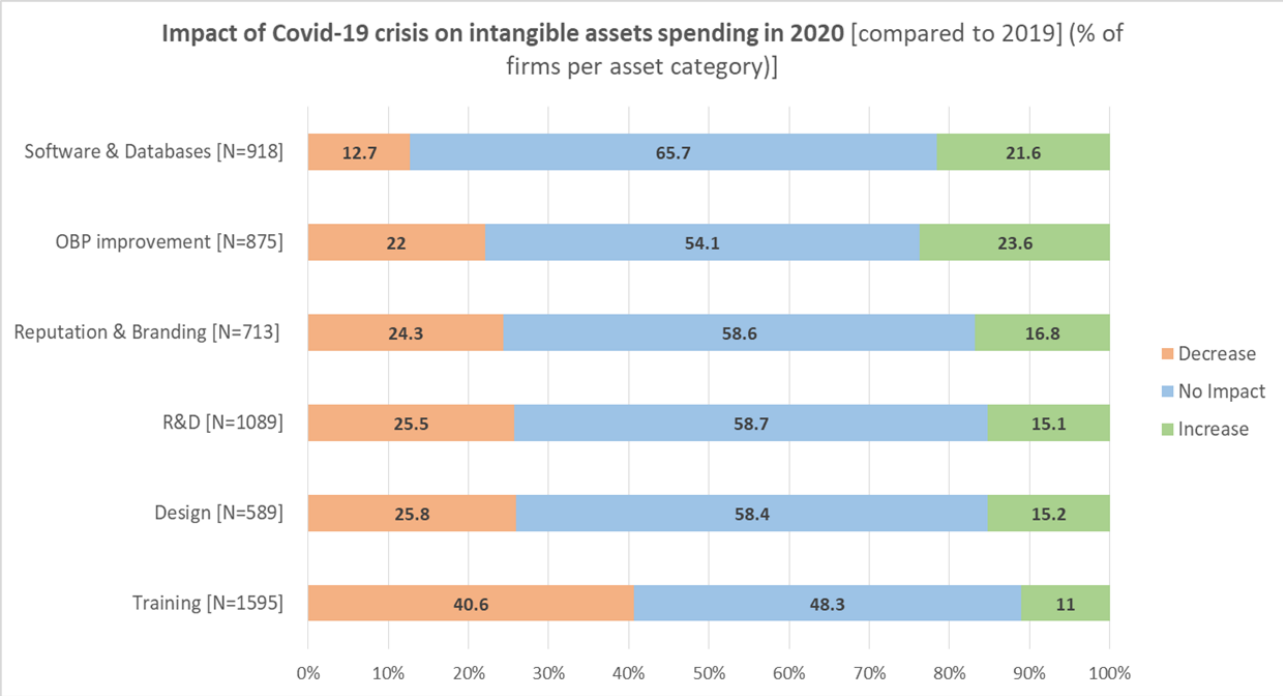


- **Large countries invest more** (France appears to be an exception)
- Among small countries, DK and FI invest more
- **In-house investments** prevail at the **country level**



Impact of Covid-19 crisis on IAs spending in 2020 (compared to 2019)

- **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"



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- **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

- **Most firms did not proceed to an extensive increase of ICT investments** (23.5%) **or renewal of business processes and practices** (27.3%) as a reaction to the Covid-19 pandemic disruptive changes.
- Almost **4 out of 10 firms** sees **Covid-19 crisis as an opportunity** to accelerate their digital transformation, whereas **1 out of 4 firms** sees **Covid-19 crisis as a threat to survive** in the short term.
- **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.
- Firms exhibiting higher levels of digital transformation performance, i.e., **innovators and early adopters** (of digital technologies), have increased their spending on ICT infrastructure and business processes/practices renewal at a higher degree compared to lower performers (i.e., late adopters and laggards).
- **Higher digital performers** see the **Covid-19 crisis** primarily **as a digital transformation accelerator**.
- **Firms in services** seem to adopt and implement digital transformation practices as a response to the pandemic challenges at a higher level than firms in manufacturing.

Thank you for your attention

The H2020 GLOBALINTO project

- Title: Capturing the value of intangible assets in microdata to promote the EU's growth and competitiveness
- Time Period: 1/2/2019 – 30/4/2023 [39 months (with an extension of 3 months)]
- Work Packages
  1. Foresight on growth, methodologies, and data for measuring intangible assets
  2. Setting the conceptual framework for processing new data and value chains
  3. Processing data and indicators
  4. **Large-scale pilot survey of intangible investments**
  5. Micro-economic underpinnings of growth
  6. Macro-economic underpinnings of growth using EU wide industry-level data
  7. Intangible assets in the public sector and policy
  8. DCE – Dissemination, Communication and Exploitation
  9. Project Management and Administration
  10. Ethics requirements