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ROLE OF POLICY FOR THE DEVELOPMENT AND USE OF
INTANGIBLE ASSETS

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SUMMARY

Intangible capital is made up of three broader categories: (1) computerised information; (2) innovative property; and (3) economic competencies. The importance of intangible aka knowledge capital is confirmed by several studies, meaning that it is important to promote further investment in intangibles also with different policy measures. This paper:

- (1) provides an overview of the dynamics of intangible investments in Europe and in European countries, relying on various data resources to capture the investment characteristics to the fullest possible extent;
- (2) explores the obstacles to investments by relying largely on European Investment Bank survey data, which cover the investment structure and motives as well as obstacles since 2016; and
- (3) presents the main policy measures for the stimulating of intangible investments and their components on EU and selected national levels.

Table S1: Summary of the key findings on intangible capital/investments

	Findings
Intangible investment intensity	Increasing investments in intangible capital Big differences between countries, particularly new EU members lagging behind Large differences between sectors in the intensity of intangible investments Significant variations in the change of the intangible investments among different sectors between 2000 and 2014 After the crisis, the share of tangible investments has increased
Structure of intangible investments	Most important investments in Software, data, IT networks and website activities, followed by training of employees, R&D, and Organisation and business process improvement Significant cross-country variations, in new members principally tangible investments are very important
Impact of COVID-19 on investments at large (not just intangible)	Around 45% of firms will invest less The majority will only delay their investment plans One-fifth of companies will permanently lower employment, which will impact intangible investments Around one-half report increased use of digital technologies, which will also stimulate intangible investments
Obstacles to investments and factors impacting investments	At the moment, uncertainty is the biggest obstacle 45% of firms report that a lack of staff with the right skills is a major obstacle, another 29% report it is a minor obstacle Labour and general business regulation is a major obstacle for 30% of firms The availability of finance is a major obstacle only for 20% of EU firms It is also important to study differences by size and sector

Policy suggestions. The current policy suggestion mainly refers to a review of existing suggestions. In the continuing, as the project delivers the final results these suggestions will be expanded and adjusted by relying on project findings. To stimulate intangible investments, the literature suggests several measures – a “broad nexus of mutually reinforcing policy initiatives” (Eustace, 2000). Among others, these aspects include:

- (1) macroeconomic and institutional conditions, including the regulatory framework and business environment;
- (2) providing suitable financial support and support for development of the financial system;
- (3) human capital accumulation generally;



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- (4) raising awareness about the role of investments, intangible investments as well as corporate governance; and
- (5) smart policy packages that address a broad spectrum of mutually dependent and reinforcing aspects to stimulate intangible and other (complementary) investments.

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Introduction

The decomposition of growth has long been associated with the puzzle of the “unexplained” component of total productivity growth, also known in the literature as the Solow residual. In 1957, Solow was able to explain only about 13% of variation with the capital and labour inputs, while the remaining 87% was often largely attributed to technological change or total factor productivity growth (Acs et al., 2014). Capturing the elusive residual has engaged many researchers in the last 60 years, developing a vast array of solutions from theoretical models through to extensive econometric research analysing the factors of growth (Barro, 1996; Bernanke & Gürkaynak, 2001; Romer, 1987, 1990; Sala-i-Martin, 2002). Sala-i-Martin (2002) stresses in his discussion of the new growth theory the importance of the “empirical touch”, the study of (theoretical) models of technology, increasing returns and imperfect competition, and the importance or contributions of the “merging of economics literature” across fields, stressing the importance of economic geography, trade, industrial organisation, economic history, demography and other as well as institutions. However, the literature still lacks a comprehensive model of long-term economic growth with the elusive residual continuing to be a core interest in the literature.

Total factor productivity growth or the contribution made by technological progress has been studied intensely where intangible capital has been identified as one of the biggest contributors to productivity growth. Upon revising the literature in the field, Ducharme (1998) also noted that Kendrick (1956, 1976), Denison (1962, 1967), Jorgenson and Griliches (1967) had already shown that a significant share of productivity growth cannot be explained by standard productivity growth elements (capital and labour) and that primarily the factors closely linked to knowledge (such as R&D, education etc.) are important. The study of the contribution of intangibles has been gradual, often fragmented or partial. Authors have for example studied the relationships between advertising, internationalisation, market entry, firm valuation, goodwill, market strategy, firm competences, firm performance and profitability (Barrett, 1986; Barwise et al., 1990; Budworth, 1989; Chauvin & Hirschey, 1994; Harvey & Lusch, 1997; Hirschey, 1982; Hula, 1989; Kumar, 1987; Lefcbvre et al., 1996; Patterson & Hayenga, 1995; Philippe, 1995; Vasapollo, 1994) (as described in Redek and Bavdaž, 2020). Intangible assets as a “term” referring to a production factor were first mentioned as a source of value back in 1908 (Veblen, 1908), albeit the study of intangible assets and investment received a considerable boost from the seminal work of Corrado et al. (2006b) (Redek et al., 2020). Corrado et al. (2006b) propose a definition of intangible capital following the works of Lev (2001) and Nakamura (1999) claiming that intangible capital comprises three broader categories: (1) computerised information; (2) innovative property; and (3) economic competencies.

A number of empirical studies reveal that intangible capital contributes to productivity growth and ultimately increases the wealth of nations. Already Corrado et al.'s (2006a) initial estimates showed that intangible capital can contribute up to one-third to productivity growth. The importance of intangible aka knowledge capital (OECD, 2013) has been confirmed in several studies since then (Corrado, Haskel, & Jona-Lasinio, 2016;



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Goodridge et al., 2017, 2018; Haskel, 2015; Ilmakunnas & Piekkola, 2014; Piekkola, 2011, 2018a; Roth, 2020; Roth & Thum, 2013; van Ark et al., 2009). Data on investment in intangibles show that on average in the EU investment in intangible assets represents around 36% of all investment. The share of intangible investments has even declined a little, by around 2 percentage points, while tangible investments have grown (European Investment Bank, 2020). According to the latest EIB survey (European Investment Bank, 2020), the recent pandemic will further harm all investments given that almost 45% of European firms reported having invested less due to COVID-19. Of those that plan to invest less, 76% will delay their investment plans and the investments will possibly also be reduced. Around 13% will abandon their investment plans entirely.

The European Commission reports that “intangible assets are at the heart of what makes firms competitive” (Thum-Thyssen et al., 2017), making them crucial for productivity and economic growth. Alongside productivity growth declining in Europe over the past 20 years, Europe has been unable to close the productivity gap with the USA (OECD, 2021). This means the European Union must increase the level of investments, both tangible and intangible, to boost its productivity, competitiveness and technological progress (Thum-Thyssen et al., 2017).

To boost investments generally and investments in intangible assets in particular, it is important to understand the nature of intangible investments as well as the obstacles that may appear in the decision and implementation of such investments. Understanding the nature of intangible investments will also permit the formulation of specific intangible investment-boosting policies on the supranational (EU) and national levels. This is especially important given the potential scarring effect of the current COVID-19 pandemic, or as Baldwin and di Mauro Weder (2020) state, to “reduce the accumulation of *‘economic scar tissue’*”.

This paper has three purposes; namely to:

- (6) provide an overview of the dynamics of intangible investments in European countries, relying on various data resources to capture the investment characteristics to the fullest possible extent;
- (7) explore the obstacles to investments relying mainly on European Investment Bank survey data, which cover the investment structure and motives as well as obstacles since 2016; and
- (8) present the principal policy measures for stimulating intangible investments and their components on EU and selected national levels.

The paper has three main parts. Following the introduction, data on intangible investments are first presented using EU Klems, EIB survey data (European Investment Bank, 2020; The Vienna Institute for International Economic Studies, 2019) and Globalinto data (Dimas et al., 2021; Tsakanikas, Vasileiadis, et al., 2020). A detailed analysis of the motives for and obstacles to investment largely using EIB data follows. Finally, policies used on the EU level are addressed in view of the empirical results given in the first part.

Definition and measurement of intangible capital

While the definition of intangible capital was developing early on in the literature (e.g. the aforementioned Veblen and several other authors from the fields of economics and management, see Redek, Godnov, Erjavec, 2020), how to measure intangible assets has posed a bigger challenge. Initial estimates of the value and impact of intangible assets on economic performance date back to the 1960s and 1970s when intangible capital is mentioned in the literature in terms of investment or knowledge capital as related to productivity (Connor, 1964). Moreover, Kendrick (1972) classified R&D, education and training, health and mobility as intangible components that importantly contribute to a rise in GDP. The concept of intangibles developed gradually in the business literature and, from an accounting and business point of view, was recognised as being strategically important and thus included in strategy development and strategy execution (Marr et al., 2003). With a focus on strategic value, education, R&D and intellectual property, intangibles are linked to the profitability of a firm (Griliches, 1981). The main purpose of the management of intangibles is to enhance a firm's value through the creation of competitive advantage. This idea goes back to Porter (1980) who defined these attributes as competitive forces, opportunities and threats of the industry. A firm's competitive advantages are derived from a resource-based theory of a firm which states that it also consists of intangible assets (Stewart, 1997; Roos et al., 1997; Lev, 2001; Marr et al., 2004), with the outcome that the firm's goal is to efficiently manage intangibles to increase its value. Competitive advantage such as knowledge, internationalisation, goodwill or other therefore relies on strategic assets (Wang and Ahmed, 2007; Helfat et al., 2007; Tidd, 2006). Although research on intangible capital in the 1980s and 1990s was largely focused on the microeconomic dimension, the research has recently embraced regional and national perspectives (Amidon, 2001; Bounfour, 2003; Bounfour and Edvinsson, 2005). In the mid-1990s, economists started to look for ways to measure private investment in intangibles. With less attention than in business literature, intangibles were developing in the economic literature and continued to develop steadily after Kendrick (1956, 1976), Denison (1962, 1967), Jorgenson and Griliches' (1967) empirical work showing that intangible capital is related to the effects on economic growth and therefore the GDP of a country. Following previous research, Ducharme (1998) stressed that a significant share of productivity growth cannot be explained by the standard productivity growth elements (capital and labour), but by other factors like education, skills, R&D, and the acquisition and transmission of know-how. In economic literature, intangibles are characterised by four properties: non-rivalry, little market value, positive spillovers and synergies of intangibles. Thus, while intangible assets tend to be difficult to value and can be impossible to resell, they offer potentially very large benefits to society as a whole (Haskel & Westlake, 2017). Both the definition and the measurement have been identified as considerable challenges with respect to development of the field.

The work of Lev (2001) and Nakamura (1999) represents a notable breakthrough in the field of research regarding intangibles in economics. Following their work, Corrado et al. (2005, 2006) defined intangible capital as the sum of three broader components (Table 1). The first component is computerised information, further divided into software and databases. The second component "innovative property" includes R&D, mineral exploration, development costs in the financial industry, and new architectural and engineering



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designs. The last are economic competencies, which include brand equity, firm-specific human capital and organisational structure (as defined by Corrado et al., 2006).

Table 1: Intangible assets classification

Type of intangible asset	Further classification
Computerised information	Software
	Databases
Innovative property	R&D, including the social sciences and humanities
	Mineral exploration and evaluation
	Copyright and licence costs
	Development costs in the financial industry
	New architectural and engineering designs
Economic competencies	Brand equity (advertising expenditure, market research)
	Firm-specific human capital (continuing vocational training, apprentice training)
	Organisational structure (purchased, own account)

Sources: Corrado et al., 2006 and Thum-Tysen et al. (2017).

Measurement poses a significant challenge to the literature even today. According to Thum-Tysen et al. (2017), one of the key problems is “where to draw the line”, what can be considered an actual investment, and what in fact is a cost. This was already pointed out systematically by Mortensen (2012), who stressed that the biggest challenges in the measurement of intangibles are the: “taxonomy and classification of production accounts used as the basis for the calculation of multi-factor productivity”; and (2) defining a clear division line between what comprises gross fixed asset formation and what consumption, both intermediate and final.” Alongside agreeing on a clear definition of intangibles and the definition of the dividing line between investment and consumption, another challenge is the actual assessment of the contribution made by intangibles to economic growth, especially due to their non-rival nature and the consequent problems with the aggregation of their value, estimating their ‘actual’ value or their extrinsic value, their changing value due to emerging alternatives, or possible improvements (Mortensen, 2012).

The System of National Accounts 2008 and the European System of Accounts add an important change to the evaluation of ‘intangible assets’ and their contribution to growth, largely because R&D expenditure is considered as gross fixed capital formation instead of a cost (Ravets & Mazzi, 2010) since R&D increases future revenue and competitive advantage (Cuervo-Cazurra & Un, 2010; Govindarajan et al., 2019). On top of this, Mortensen (2012) notes that the inclusion of intangibles in the SNA was improved for several reasons: (1) ICT was included as a special category in the machinery and equipment section; (2) intangible fixed assets are now called an “intellectual property right”, while mineral exploration is expanded to mineral exploration and evaluation; (3) computer software now also includes databases. In sum, as Mortensen (2012) describes,

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intangible assets in the SNA now comprise “research and development, mineral exploration and evaluation, computer software and databases, literary or artistic originals and “other intellectual property products”. This process of the capitalisation of costs is in line with arguments used in the “intangible” capital analysis, which considers all costs that raise the potential for future revenue as an investment (capital). This issue is not new in the literature and was already acknowledged by Veblen (1908).

While the SNA/ESA provide an improved estimate of intangible assets, the comprehensive inclusion of all categories defined by the prevailing Corrado et al. (2005/2006) definition is still not possible. This means it is even more important that extensive efforts are invested in the preparation of databases on intangible capital based on both official statistical and survey sources. Databases that rely on official statistical sources (either firm-level or sectoral data) include Innodrive, IntanInvest, Conference Board datasets (European Commission, 2013), while among the better known intangibles surveys are the Eurobarometer, Imperial College Business School & ONS, ISFOL&ISTAT surveys as well as the survey on intangibles in the Balkans (Eurobarometer, 2013; ONS, 2009; Perani & Guerrazzi, 2012; Prašnikar, 2010)). The Globalinto team conducted a survey on the firm level in seven countries.

Although the initial estimates of Lev (2001) showed that intangible investment (at the time limited to R&D and advertising expenditure costs) was between 5.5% and 7% of non-financial corporations' income, recent estimates based on the definition by Corrado et al. (2006b) show aggregate intangible investments at the level between 6% and 13% of GDP, depending on country and year (Corrado et al., 2012; Corrado, Haskel, Jona-Lasinio, et al., 2016; van Ark et al., 2009). Several projects such as INTAN, COINVEST, INNODRIVE and SPINTAN have attempted to develop suitable register-based methodologies, leading to several empirical studies focused on the size of intangible investments, cross-country differences and linkages to productivity and other performance indicators (Chun et al., 2016; Corrado et al., 2009, 2012, 2013, 2017; Corrado, Haskel, & Jona-Lasinio, 2016; de Rassenfosse, 2017; Fukao et al., 2009; Hashmi, 2013; Piekkola, 2018a, 2018b), confirming that intangibles have an important direct and indirect effect on firm performance, productivity growth, and competitiveness. This means supporting firms' efforts to invest in intangibles with suitable policy measures is even more important.

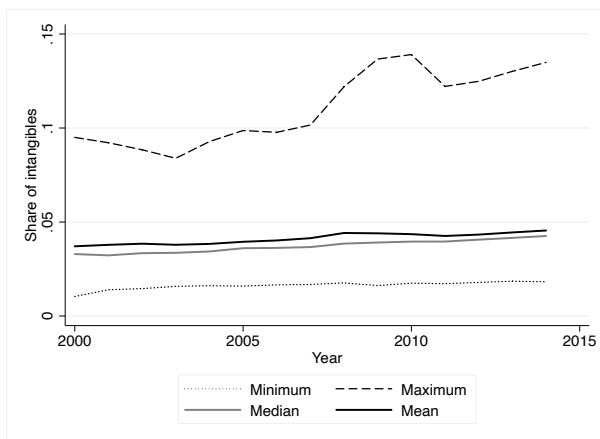
Intangible investment in the EU in the private and public sectors

As an introduction to the policy discussion, this section first revises the available data to present an overview of investment activity regarding intangible assets in the EU, across countries and sectors and in both the private and public sectors. The key data sources are EU Klems, which spans from 1995 to 2017 (The Vienna Institute for International Economic Studies, 2019), the Globalinto database, which spans from 2000 to 2014 (Dimas et al., 2021; Tsakanikas, Roth, et al., 2020; Tsakanikas, Vasileiadis, et al., 2020) and European Investment Bank survey from 2016 to 2020 (European Investment Bank, 2020).

Overview of intangible investment in Europe

The Globalinto and EU Klems data both show that, although that in the past 20 or 15 years the role of intangible capital has grown, there is significant variation between countries. The data prepared in the Globalinto project also suggest the importance of intangibles has been increasing gradually, albeit there is significant cross-country variation. Figure 1 presents the dynamics of total intangibles as a share of total output in European economies on average. While in the year 2000 the mean share was 3.7% and the median 3.3%, the value was steadily increasing and reached a mean value of 4.55% of total output and a median of 4.26%.

Figure 1: Share of intangibles to total output in the EU-28: average, median, minimum and maximum, 2000–2014



Data: (Dimas et al., 2021)



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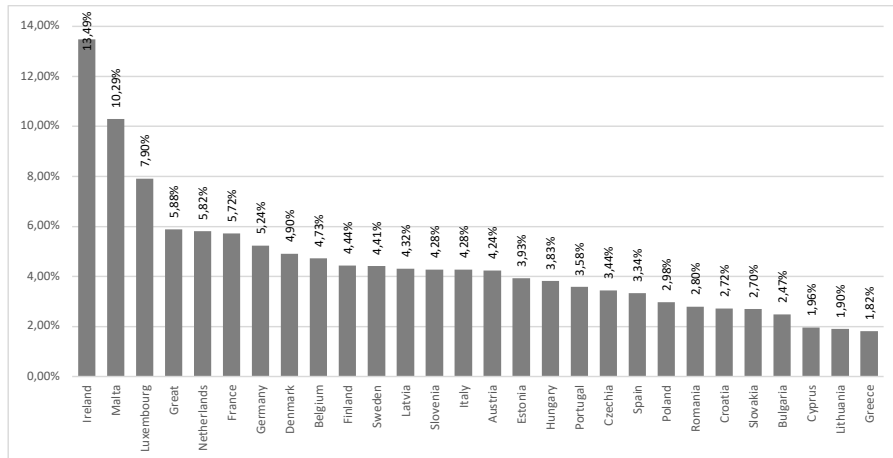
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As is evident from Figure 1, there is a significant gap among economies that in each year were at the bottom and those at the top. A closer look at the country-level data (Table A 2 in the Appendix) reveals that Ireland throughout the investigated period continuously outperformed the rest by at least 2 percentage points on average, followed by Malta, if the whole period between 2000 and 2014 is observed. At the bottom, Romania with only 1% and Lithuania with 1.38% in the year 2000 can be found. Between 2001 and 2003, Croatia and Lithuania were the two worst performers, followed by Cyprus and Lithuania between 2004 and 2012 with shares with one exception always lower than 2%. In 2007 alone, Slovakia was second-worst with 2.02% while Lithuania was third at the bottom with 2.12%. In 2013 and 2014, Greece was the worst-performing country with an 1.8% share of total intangibles in total output (Table A 2 in the Appendix). The 'hump' in Figure 1 represents Ireland where between 2007 and 2010 the share increased from around 10% to almost 14%, which may also be attributed to the decline in output due to the crisis.

For example, the EU Klems data (Figure A 1, Figure A 2) also suggest that on average in the EU-19 on average since 2010 the stock of intangible capital grew by 17%, while the tangible capital stock increased by about 5%. This result is consistent with the point made by Thum-Tysen et al. (2017) that especially intangibles have been less affected by the crisis. This is in line with the findings of Roth as well, who also found that intangible investments have not been affected as much by the crisis (Roth, 2020).

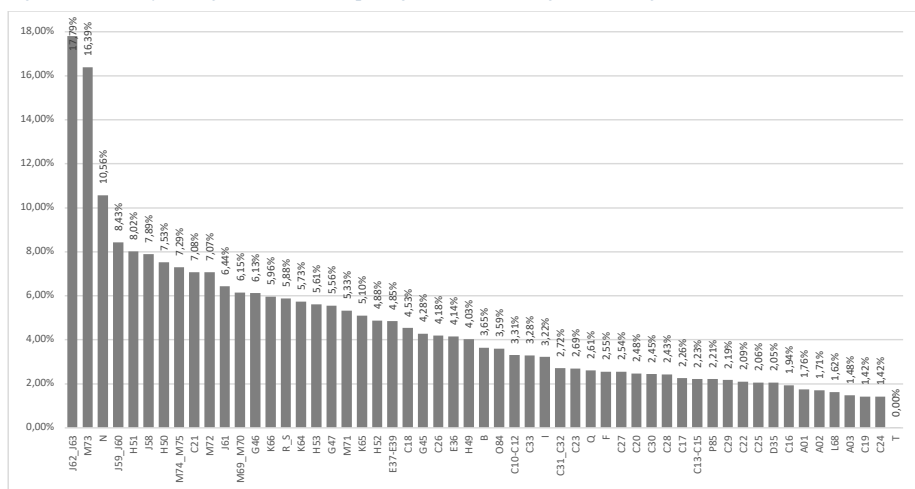
Figure 2: Share of intangibles to total output in the EU-28 in 2014, in %



Data: (Dimas et al., 2021)

Sectoral data reveal that on average (EU unweighted average) there are significant differences in the amount of intangibles. In 2014, the sectors with the largest share of intangibles to output were J62_63 (J62 - Computer programming, consultancy and related activities, J63 - Information service activities), M73 (M73 - Advertising and market research) and N (Administrative and support service activities). Sectors J, M and also H (Transporting and storage) are more strongly represented at the top with larger shares. Among manufacturing, C21 (C21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations) with on average 7.1% and C18 (C18 - Printing and reproduction of recorded media) with 4.5% are the top two sectors. At the bottom, a mix of manufacturing, agriculture and utilities can be found with intangibles shares lower than 2% on average. When comparing the data about the shares of total intangibles in output, J62 and J63 are also the two sectors where the biggest change in the share of total intangibles to output happened; namely, as seen in Figure 4, the share increased by over 4 percentage points. A very pronounced increase was also seen in sector H53 (Postal and courier activities), followed by J61 (Telecommunications). In mining and quarrying (Nace B) and several manufacturing industries (C20 - Manufacture of chemicals and chemical products, C19 - Manufacture of coke and refined petroleum products, C26 - Manufacture of computer, electronic and optical products, C31 - Manufacture of furniture, C32 - Other manufacturing), the share of intangibles in total output declined.

Figure 3: Share of intangibles to total output by sector (non-weighted average), 2014, in %



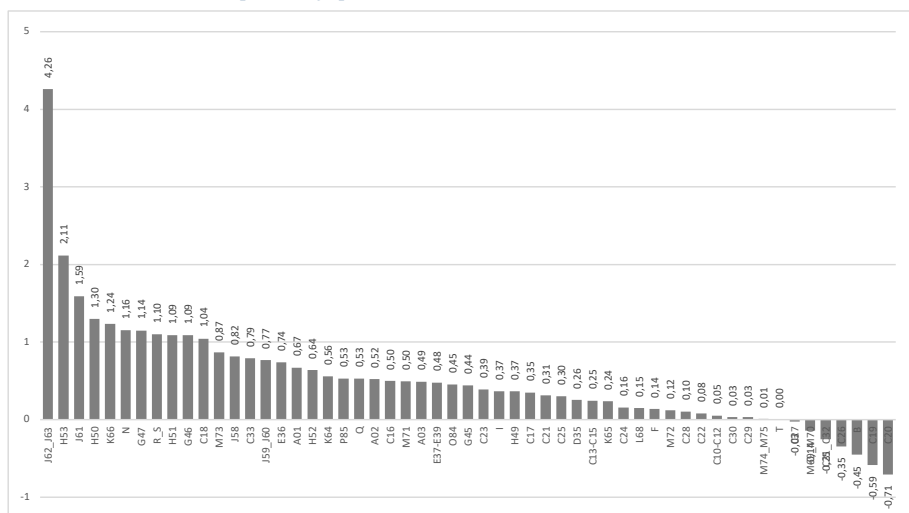
Data: (Dimas et al., 2021)

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Figure 4: Change in the share of total intangibles to output by sector in Europe on average (unweighted) between 2014 and 2000, in percentage points



Data: (Dimas et al., 2021)

The drivers of and obstacles to intangible investment

European Investment Bank investment survey data (European Investment Bank, 2020) are used below to provide some additional highlights on the drivers of and obstacles to investments generally, which includes intangible investments. These are particularly important to understand when it comes to policy formulation. Since the analysis of motives and obstacles relies on a different data source, not Globalint, first some basic findings from the survey about the level of intangible investment are also presented.

Table 2 presents European Investment Bank Investment Survey data. The share of tangible investment was in the EU was on average around 64%, while intangible investments accounted for approximately 36%. There is some variation, especially while comparing 2016 and 2020. In this period, the share of intangible investments declined by 2 percentage points. This could be due to a number of factors, including the economic cycle and the lagged effect of the boom on tangible investment.



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Table 2: Structure of investment in the EU on average by year (survey wave, data representing the previous year), in % of total investment

	EIBIS 2016	EIBIS 2017	EIBIS 2018	EIBIS 2019	EIBIS 2020
Land, business buildings and infrastructure	14.94	15.21	15.84	15.49	15.56
Machinery and equipment	47.34	48.33	48.68	48.49	48.78
Research and Development (including the acquisition of intellectual property)	7.95	7.78	7.72	7.41	7.87
Software, data, IT networks and website activities	13.43	12.55	12.8	13.3	12.87
Training of employees	10.41	10.46	9.39	9.46	9.27
Organisation and business process improvements	5.92	5.67	5.57	5.86	5.65
Intangibles total	37.71	36.46	35.48	36.03	35.66

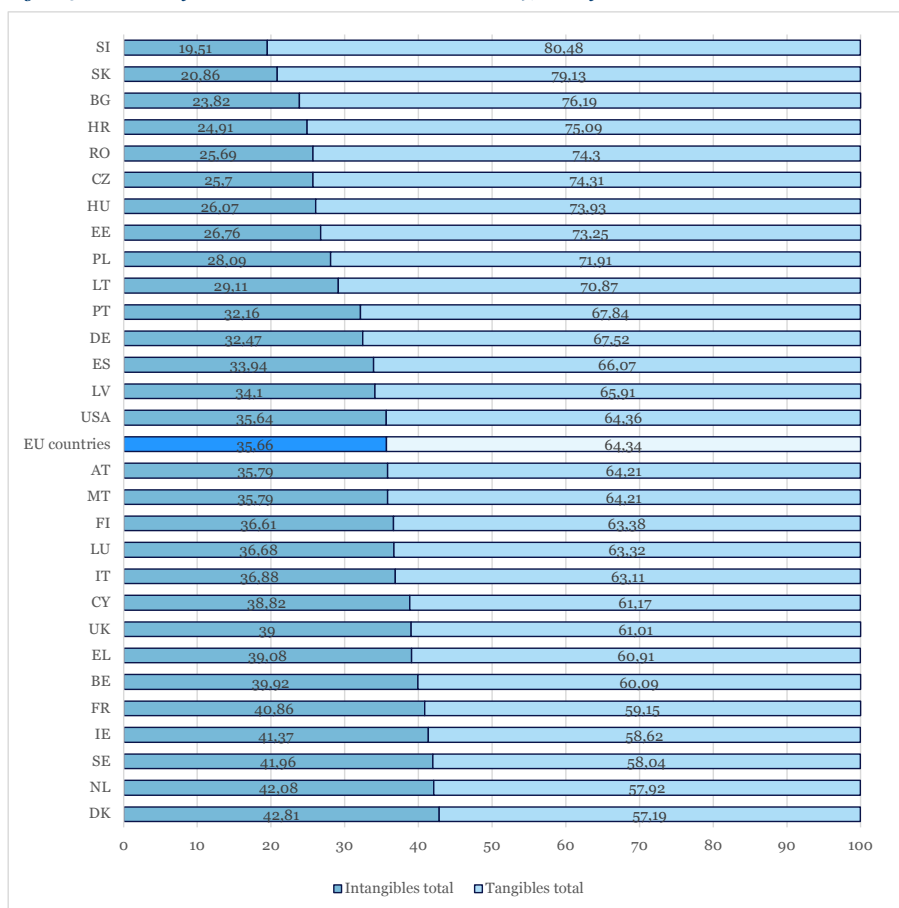
Data: (European Investment Bank, 2020)

The data (Figure 5, Figure 6) show significant differences in the structure of investments between EU economies. Intangible investments have a much larger proportion in the more developed EU economies. In Sweden, Ireland, the Netherlands and Denmark, the share of intangible investment in total investments was even above 40%. In particular, if the structure is studied in a little more detail, the investment in software, data, IT networks and website activities on average represent the biggest proportion in these economies, between 14% and 20% of total (!) investment (Figure 6). Countries that invested the least in intangibles in 2019 were Slovenia, Slovakia, Bulgaria and Croatia. In these countries, the share of total intangible investment was less than 25% (Figure 5), where a particular focus was given to investment in Machinery and equipment, with these investments representing roughly 50%–60% of total investments. Among intangibles, like in many other economies the focus was on investments in software, data, IT networks and website activities.



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Figure 5: Structure of investment in the EU economies in 2019, in % of total investment*



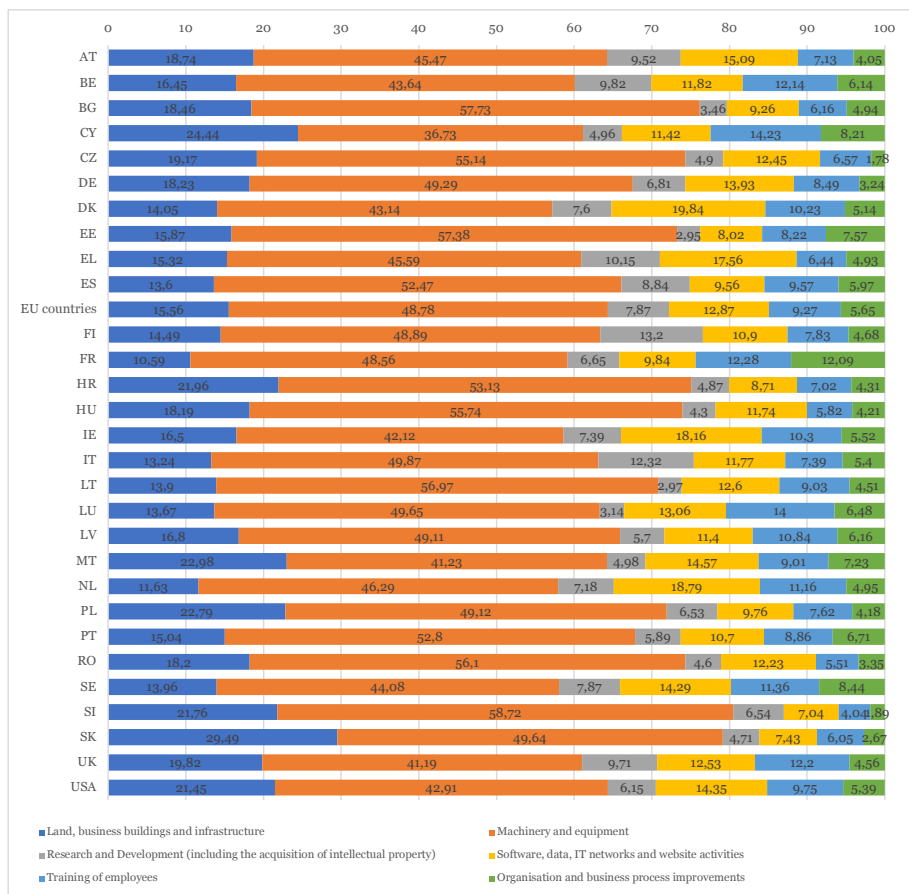
*Tangible investment was calculated as the sum of Land, business buildings and infrastructure & Machinery and equipment, while intangible investment was calculated as the sum of the categories: Research and Development (including the acquisition of intellectual property), Software, data, IT networks and website activities, Training of employees & Organisation and business process improvements

Data: (European Investment Bank, 2020)



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Figure 6: Structure of investment in the EU economies in 2019, in % of total investment



Data: (European Investment Bank, 2020)

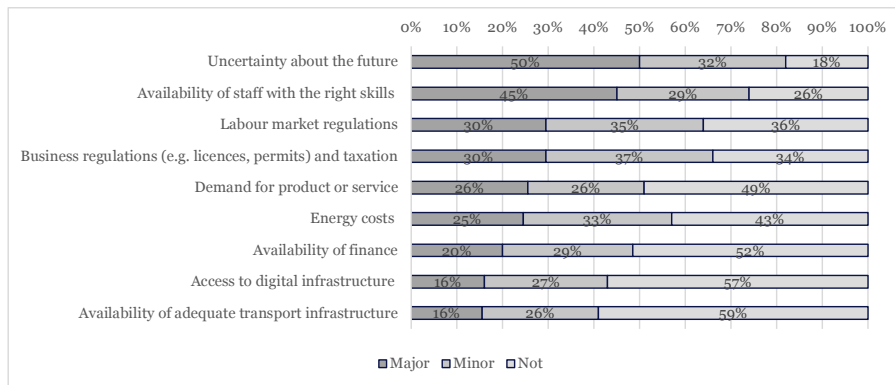
From the policy perspective, it is especially important to understand which factors represent obstacles to investments and how important they are comparatively. Among obstacles, the key factor in 2020 was, as expected, uncertainty about the future since 50% of all firms reported it as the biggest obstacle. The second-most important factor, in fact a major obstacle for 45% of firms, was the availability of staff with the right skills, followed by labour and business regulations, which together represent a major obstacle in about 30% of firms. Interestingly, the availability of finance was a major obstacle in only 20% of firms. These results are consistent with other studies about EU investments – that the lack of suitable workers with the required skills can pose a



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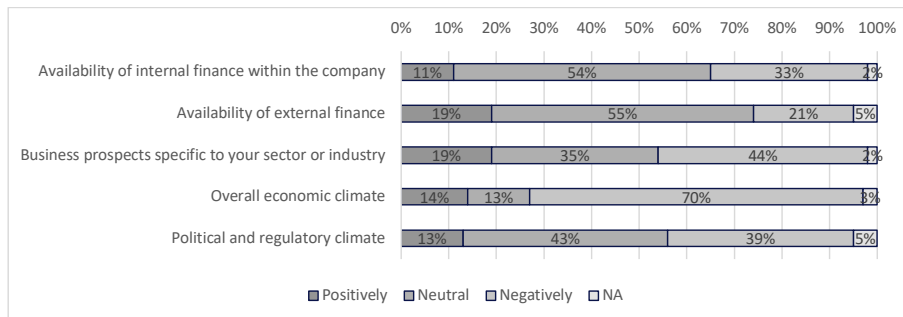
serious danger to investment as well as the implementation of new technologies and firm performance (Čater et al., 2019; Morris et al., 2019; Siepel et al., 2019).

Figure 7: Obstacles to investment in the EU economies in 2019, in % of firms



Data: (European Investment Bank, 2020)

Figure 8: Impact of selected factors on investment in the EU economies in 2019, in % of firms



Data: (European Investment Bank, 2020)

Impact of COVID-19 on investment in the EU

Table 3 presents the expected change in investment in the EU-28 in 2020. As observed in the data, half the firms expect a decrease in investments, with this drop being somewhat more pronounced in manufacturing and in medium and large firms. The EIB specifically also asked if a change in investment was expected due to COVID-19 (Table 4). Overall, 44% of companies report that their investments will fall due to COVID-19, particularly small firms and those in manufacturing.

Table 3: Expected investment in the current financial year compared to the previous one in the EU-28, percent of firms

Sector	Size	Increase	No Change	Decrease
All	All	21.80	27.20	50.00
	Large	21.30	27.40	50.60
	Medium	23.40	25.00	51.10
	Micro	19.50	30.30	48.40
	Small	22.20	27.90	48.20
	SME	22.20	27.10	49.40
Construction	All	25.60	31.30	41.20
Infrastructure	All	20.20	31.50	47.40
Manufacturing	All	21.60	24.20	53.50
Services	All	22.30	26.00	50.40

Data: (European Investment Bank, 2020)

Table 4: Change in investment expectations due to COVID-19, percent of all firms

Sector	Size	More investment	Less investment	No change in investment plans
All	All	5.7	44.6	49.7
All	Micro	11.8	40.2	48.1
All	Small	8.2	40.8	51.0
All	Medium	5.9	42.3	51.8
All	SME	7.6	41.4	51.0
All	Large	3.9	47.5	48.6
Manufacturing	All	4.9	50.8	44.3
Construction	All	6.0	34.9	59.1
Services	All	7.4	42.8	49.8
Infrastructure	All	5.0	40.4	54.6

Data: (European Investment Bank, 2020)

Among firms expressing that their investment will decline, firms were asked about their plans if the decline is due to COVID-19. On average, only around 13% of firms will completely abandon their investment plans, while the majority either expects a delay and/or continuance at a different scale (Table 5).



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Table 5: Expected investment impact of COVID if the decline in investment was caused by COVID-19 in the EU-28, percent of all firms

Sector	Size	Abandon investment plans	Delay investment plans	Continue investment plans with different or reduced scale or scope
All	All	13.1	76.4	40.9
All	Large	13.7	77.4	44.3
All	Medium	12.1	76.4	39.3
All	Micro	15.6	69.9	29.3
All	Small	11.6	75.5	35.6
All	SME	12.4	75.2	36.6
Construction	All	9.6	71.0	38.3
Infrastructure	All	12.8	69.9	44.8
Manufacturing	All	13.8	82.2	41.5
Services	All	13.0	73.9	36.4

Data: (European Investment Bank, 2020)

The COVID-19 pandemic will also have important long-term consequences for the companies where, in particular, their use of digital technologies will rise, and their portfolios and supply chains will be subject to change. Unfortunately, around one-fifth also report a permanent reduction in employment (Table 6).

Table 6: Expected long-term impact of COVID on firms in the EU-28, percent of all firms

Sector	Size	Impact on service or product portfolio	Impact on supply chain	Increased use of digital technologies	Permanent reduction in employment
All	All	37.9	36.1	59.4	20.5
All	Micro	38.9	37.6	35.6	21.1
All	Small	39.7	36.7	40.7	21.9
All	Medium	37.1	38.7	48.4	17.9
All	SME	38.4	37.7	43.1	20.1
All	Large	37.3	34.3	58.2	21.0
Manufacturing	All	32.5	39.2	55.0	20.0
Construction	All	33.5	33.3	36.7	16.3
Services	All	41.2	38.9	49.5	23.8
Infrastructure	All	43.6	29.7	49.1	19.3

Data: (European Investment Bank, 2020)

The analysis of the impact of COVID and also intangibles using the EIB data reveals several interesting aspects. It is interesting to see that the investments will decline. However, it should also be noted that the findings of Roth (2020) show that during the 2009 crisis intangible investments were not impacted much. However, recent findings by (Domadenik et al., 2020) show that in Slovenia between 60%–70% of respondents claimed that they would cut their investments in R&D, intangible investments generally and most of all in “training”. It should also be noted with “training” that much of it is in fact ‘in-house’ and is often not monitored, while evidence from the field (survey data collection) even points to the possibility that in some respects it has increased due to the needs of work-process adjustments.

Key findings regarding (intangible) investments

Table 7 summarises the key findings from the analysis of the nature of investments and intangible investments in the EU. While intangible investments have become more important in all EU economies, the data reveal huge cross-country variations and primarily the lagging of new EU member states. While this is to some extent expected given the sectoral structure and value-added composition, it is important that this gap be acknowledged and gradually reduced.

Table 7: Summary of the key findings

	Findings
Intangible investment intensity	<p>Increasing investments in intangible capital</p> <p>Big differences between countries, particularly new EU members lagging behind</p> <p>Large differences between sectors in the intensity of intangible investments</p> <p>Significant variations in the change of intangible investments between different sectors between 2000 and 2014</p> <p>After the crisis, the share of tangible investments has increased</p>
Structure of intangible investments	<p>Most important investments in Software, data, IT networks and website activities, followed by training of employees, R&D and Organisation and business process improvement</p> <p>Significant cross-country variations, in new members primarily tangible investments are very important</p>
Impact of COVID-19 on investments generally (not just intangible)	<p>Around 45% of firms will invest less</p> <p>The majority will only delay their investment plans</p> <p>One-fifth of companies will permanently lower their employment, which will impact intangible investments</p> <p>Around one-half report increased use of digital technologies, which will also stimulate intangible investments</p>
Obstacles to and factors impacting investments	<p>At the moment, the biggest obstacle is uncertainty</p> <p>45% of firms report that a lack of staff with the right skills is a major obstacle, another 29% report it is a minor obstacle</p> <p>Labour and general business regulation is a major obstacle for 30% of firms</p> <p>The availability of finance is a major obstacle only for 20% of EU firms</p> <p>It is also important to study differences by size and sector</p>

Further, sectoral differences are considerable and while in the majority of the sectors both the intensity and importance of intangible investments have increased, in some sectors the opposite is the case. From a policy



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perspective, it is very important to understand why this is so and what is the perspective and long-run goal of these sectors in terms of their contribution to future growth.

The data also show that the pandemic will impose a significant cost on the economy and investments. This is especially important from the perspective of long-run scarring and hence the long-run impact of the pandemic on the future competitiveness and growth of EU firms. Policymakers should pay close attention to this problem even while designing rescue packages.

To satisfactorily address the investment challenges, the characteristics of the obstacles and severity of their impact should be understood. Besides the short-term uncertainty, the challenges include the lack of suitable skills and workers as the most important obstacle. This is quite worrying due to the ageing problems in Europe and the digitalisation needs where specific skills or the lack thereof also represent a major obstacle. Therefore, policy that successfully addresses intangible investment should be carefully designed and should not simply focus on R&D, digitalisation and access to finance. Still, it is true (albeit not specifically confirmed in any of the presented data, yet see for example Thum-Tysen, 2017) that significant risk is entailed in especially some intangible assets, which requires financial security or even tangible collateral. This means that financial measures should still be considered. Overall, a carefully designed set of measures should address different aspects that are directly or indirectly related to intangible investments.

Policy practices and implications

Intangibles have been shown to contribute increasingly to overall economic performance and to be crucial for continuous productivity growth, which has been declining in the EU over the last 20 years. In addition to numerous estimates that confirm the importance of intangibles for productivity and overall growth, Thum-Tysen et al. (2017) stressed that with intangible investments capital deepening is becoming a more important source of growth and that, crucially, intangibles are less dependent on cyclical factors than tangible investments. This may be further understood as evidence of their importance. However, the recent epidemic, which will impact significantly investment in both tangible and intangible assets, poses a significant challenge to policymakers in terms of avoiding the scarring effects that the current epidemic could have on long-run growth potential and competitiveness.

Supporting intangible investment in the EU: policy overview

»In today's 'knowledge economy', intangible assets such as research, software, and other intellectual property, are becoming more and more important. The importance of intangible investment is growing relative to the level of investment in the tangible assets we tend to associate with investment, such as bridges, machinery or power plants. As a result, the role of intangible investment is becoming increasingly important to understanding and forecasting trends in productivity, economic growth and innovation.«

(European Commission, 2016)

The European Union promotes several development goals through its various mechanisms, where it also addresses the field of intangible investments. The European Commission (2020a) recognises that intangible assets (brands, designs, patents, data), as the Commission stressed in a recent post, are becoming ever more important for the knowledge-driven economy in which we live today. According to the Commission (2020a), IP-intensive industries contribute “45% of all GDP and 93% of all EU exports, while the added value of IP is growing across most European industrial ecosystems”.

The discussion on intangible assets and investments in the EU is not new. Consider, for example, the 2000 Report of the European High Level Expert Group on the Intangible Economy (Eustace, 2000). Already this early report on intangibles recognised that “*there is no comprehensive pan-European policy prescription for the intangible economy, rather that a broad nexus of mutually-reinforcing policy initiatives is required*”.

The European Union is presently active in many fields related directly or indirectly to economic development and the quality of life in the EU. In this context, the EU is again directly or indirectly promoting or addressing aspects related to intangible investments. The EU is generally active in the following key policy areas (European Parliament, 2020a):

- (1) Internal market
- (2) Consumer protection and public health
- (3) Social and employment policy
- (4) Industrial, energy and research policies
- (5) Environment policy
- (6) Economic and monetary union, taxation and competition policies

The European Union has had in the past and still has today as its core development agenda the desire to become “the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion” (European Committee of the Regions, 2020), which summarises the wording of the 2000 Lisbon Agenda. The desire to become the most competitive as well as a sustainable economy remains in place. While the Lisbon Strategy has been renewed and revised several times, the core idea that also summarises the policy efforts on the EU level are still largely the same. These are (European Committee of the Regions, 2020):

- (1) promoting knowledge and innovation



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- (2) unlocking business potential, especially for SMEs
- (3) increasing employment opportunities, which includes improving the quality of jobs
- (4) focusing on sustainable development, climate change and energy policy for Europe

The European Union has thus far already stimulated intangible investment within the policy areas it focuses on since different policy mechanisms concentrate on areas directly or indirectly related to intangibles. These are summarised in Table 8. In particular, it is important to mention the ongoing focus on research and innovation policy and increasingly also on IPP protection policies, which has gained in momentum in the last few years (see e.g. recently (European Commission, 2020a)). These policies target primarily together the field of computerised information and innovative property, while IPP protection is especially important also in the formation of brand equity within economic competencies. Further, investment in human capital is also crucial for economic competencies, which the EC is efficiently promoting via numerous Education and training channels. Other policies – from internal market, fiscal (structural) to labour market policies, which are not specifically addressed in the table, provide an improved overall framework for investments in intangibles.

Table 8: Key policy agendas on the EU level relevant to specific intangibles

Type of intangible asset	Further classification	Policies
Computerised information	Software	Digital agenda for Europe
	Databases	Internal market and protection of intellectual, industrial and commercial property H2020 and Horizon Europe An SME Strategy for a sustainable and digital Europe
Innovative property	R&D, including the social sciences and humanities	Digital agenda for Europe Internal market and protection of intellectual, industrial and commercial property
	Mineral exploration and evaluation	H2020 and Horizon Europe
	Copyright and licence costs	An SME Strategy for a sustainable and digital Europe
	Development costs in the financial industry	Europe
Economic competences	New architectural and engineering designs	
	Brand equity (advertising expenditure, market research)	Internal market and protection of Intellectual, industrial and commercial property
	Firm specific human capital (continuing vocational training, apprentice training)	Education and training – Adult learning, Vocational education and training, higher education, and other
	Organisational structure (purchased, own account)	

For more, see: (European Commission, 2018a, 2018b; European Parliament, 2019, 2020a, 2020b, 2020c, 2020d, 2020e, 2020f)

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In March 2020, the European Commission presented a new “A European Industrial Strategy” focused, as the strategy claims, on (European Commission, 2020b):

- (1) maintaining European industry's global competitiveness as well as equal opportunities at home and globally;
- (2) making Europe climate-neutral by 2050; and
- (3) focusing on Europe's digital future.

The New European Industrial Strategy (European Commission, 2020b) also considers many areas relevant for the further strengthening of intangible assets (to mention just a few):

- (1) intellectual property protection, which includes adaptation of the regulation for the green and digital transition;
- (2) focusing on maintaining a high level of competition in the EU, while ensuring that the competition rules are regularly evaluated in order not to hamper development;
- (3) promoting the structural transformation, modernisation and decarbonisation of energy-intensive industries, support the development of sustainable industries as well as those promoting smart mobility;
- (4) supporting the development of strategic digital infrastructures and key enabling technologies;
- (5) continuing with the focus on innovation, investment and skills;
- (6) promoting the development of SMEs, their scale-up and technological and digital transformation; and
- (7) focusing on the advantages of the single market.

These aspects or policy focuses directly and indirectly address the issues surrounding intangible investments. Yet, for the policies to be efficient and not just ‘many’, the channels of the (desired) direct and indirect influence of various overall policy goals should be carefully studied.

Table 9 summarises key policy efforts in Slovenia to illustrate how policy is designed on the national level and the complexity entailed while seeking to address ‘intangibles’ with policy measures is. Like for the EU, policy in Slovenia is also fragmented and therefore a comprehensive ‘intangibles’ approach is not visible. However, several instruments have been put in place that in fact are indirectly or also directly linked to intangible investments.

Table 9: Summary of policy efforts in Slovenia

Intangibles/ policy field		Slovenia
Improving general framework conditions		
General framework conditions	Increasing the international competitiveness of enterprises, particularly of SMEs, to accelerate economic development and the creation of jobs Promotion of entrepreneurship, also using incubators, developing new business models, internationalisation of SMEs Increasing the institutional capacities and efficiency of the public administration and public services Improving the environmental infrastructure, energy efficiency, supporting climate change adaptation, increasing energy efficiency Transport and infrastructure development (smart and green) Improving the labour market and promoting lifelong learning and health and equal opportunity Promotion of regional development Improving institutional environment and public sector efficiency	
Intangibles		
Type of intangible asset	Further classification	Policy goals
Computerised information	Software Databases	Focus on developing high-quality broadband infrastructure and enhancing access to broadband electronic communication services Increase in the use of ICT in institutions and e-learning, e-health
Innovative property	R&D, including the social sciences and humanities	Improving the infrastructure for research and innovation while strengthening its links with enterprises and the higher education sector
	Mineral exploration and evaluation	Promoting corporate investment in innovation and R&D and cooperation with higher education, technology transfer, social and green innovation, marketing of new products, and other
	Copyright and licence costs	
	Development costs in the financial industry	
Economic competences	New architectural and engineering designs	Improving the responsiveness of the education and training systems to labour market needs and ensuring equal access to education, trainings and lifelong learning for all groups Promoting lifelong learning Strengthening vocational training and the competencies needed by companies, deeper co-operation with companies also in the training process
	Brand equity (advertising expenditure, market research)	
	Firm-specific human capital (continuing vocational training, apprentice training)	
	Organisational structure (purchased, own account)	
Key policy documents		
Key documents	(Operational Programme for the Implementation of the EU Cohesion Policy in the Period 2014 – 2020, n.d.; Republika Slovenija Gov.si, 2017; Služba Vlade Republike Slovenije za razvoj in evropsko kohezijsko politiko, 2017)	

Policy proposals

Following the early work on policy proposals associated with intangible investments, several important conclusions can be drawn from the initial policy work on intangibles in Europe (Eustace, 2000). As already cited, this early work already recognised the importance of a broad nexus of mutually reinforcing policy initiatives (Eustace, 2000). In the 2000s, the report stressed the following:

- (1) fostering an entrepreneurial business culture, which includes (Eustace, 2000):
- (2) raising awareness about the role of intangibles;
- (3) increasing the pace of economic restructuring towards the new knowledge economy, which includes institutional reform;



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- (4) reducing frictions in the labour market;
- (5) researching the management of intangible assets, which includes the strategic benchmarking of intangibles, using
 - (6) research on the EU level (as well as national);
 - (7) improving the “intellectual and organisational coherence” of the policy initiatives;
 - (8) the modernisation of government services in order to:
 - (9) incorporating entrepreneurial attitudes into bureaucratic processes, the modernisation of institutions and public services;
 - (10) improving the regulatory framework (e.g. see Thum-Thysen et al., 2017);
 - (11) increasing the role of the single market;
 - (12) better connecting public and private entities, notably in the field of R&D in order to promote faster innovation and also diffusion;
 - (13) while at the same time also focusing on market and competition policy in order to support development of the knowledge economy; and
 - (14) focusing on stimulating the necessary change/improvement in corporate governance.

Thum-Thysen et al. (in European Commission, 2017) study the following drivers of and barriers to intangible investments:

- (1) regulatory framework conditions;
- (2) financial conditions;
- (3) availability of human capital and knowledge stocks;
- (4) availability of public support; and
- (5) macroeconomic conditions

The regression results the authors present show that while it is true that tangible investments are more sensitive to macroeconomic conditions (as also confirmed by Roth, 2020), their empirical results confirm the importance of the regulatory framework, financial conditions, and especially (when comparing with tangible investments) of human capital (measured by tertiary education).

In their related work, Thum-Thysen et al. (2017) examine carefully several possible mechanisms also from the perspective of individual types of intangibles and their drivers and obstacles. Their discussion reveals that direct public support and tax incentives are particularly important for stimulating scientific R&D and firm-specific human capital, namely, assets with high social returns (relative to private). For computerised information, the mentioned authors suggest government support in promoting SMEs to invest in new technologies. Still, they add that the strengthening of economic competencies (e.g. brands) should not be supported given the fear of developing monopoly power. They also stress that it is important to support financial conditions due to risk and difficulties with collateralisation. Similarly, as mentioned (Eustace, 2000), the regulatory framework is important and should be flexible, competitive and support the intellectual property protection, which is especially important for the computerised information and innovative property categories.

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This is also one field where the EU was very active in 2019 and 2020 (European Commission, 2020a). Since intangible or knowledge-based capital is closely related to human capital accumulation, investment in human capital should also be supported by the states, different for various categories of intangibles.

The results of the Globalinto studies lead to several important policy implications presented in their policy brief. These are (Globalinto, 2020):

- (6) To prepare suitable policy measure to support investments in intangibles, intangibles should first be properly measured. The Globalinto Policy Brief stresses that national accounts currently exclude half of innovation property since they only include parts of R&D and ICT and completely exclude organisational capital.
- (7) The Globalinto results also show that the decrease in intangible investment can explain a large proportion of the productivity growth decline (flat-lining) and the cross-country differences can also be used to highlight possible solutions.
- (8) The competitive position of firms can also be assessed based on “innovation-labour” biased-technological change.
- (9) The Globalinto results also suggest that smart (environmental) regulation can help create a first-mover advantage in terms of environmental innovation.
- (10) It is important that the innovative capabilities of SMEs be included as well as while it is also important that
- (11) SMEs could need state support to promote the adoption of their digitalisation.

Moreover, tax advantages across intangibles have been suggested, not just for R&D where they are typically used. Human capital accumulation should also be encouraged as well as or in combination with the stimulating of technological development (European Commission, 2013).

From the perspective of the catch-up economies in the EU where the presented data show investment in intangibles is on average below the EU average, special attention should be paid to simultaneously promoting different types of investments by both raising awareness of the need for investments (tangible and intangible), technological progress, digitalisation and the implementation of Industry 4.0, creating policy packages that build on the complementarity between the investments, consequently accelerating the catching up process.

Conclusion

Intangible capital is important for productivity growth and development. Total factor productivity growth or the contribution made by technological progress has been studied intensely and intangible capital has been identified as one of the biggest contributors to productivity growth. Intangible capital includes three broader categories: (1) computerised information; (2) innovative property; and (3) economic competencies. While initial estimates date back to 1960 (with various definitions), more recent studies also stress the role of intangibles as being crucial for growth. Corrado et al.'s (2006a) estimates showed that intangible capital can contribute up to one-third to productivity growth. The importance of intangible aka knowledge capital (OECD, 2013) was confirmed in several later studies (Corrado, Haskel, & Jona-Lasinio, 2016; Goodridge et al., 2017, 2018; Haskel, 2015; Ilmakunnas & Piekkola, 2014; Piekkola, 2011, 2018a; Roth, 2020; Roth & Thum, 2013; van Ark et al., 2009). Data on investment in intangibles (European Investment Bank, 2020) show that on average in the EU investment in intangible assets represents around 36% of all investment. The share of intangible investments has even declined a little, by around 2 percentage points, while tangible investments have grown. According to the latest EIB survey (European Investment Bank, 2020), the recent pandemic will further impact all investments since almost 45% of European firms reported having invested less due to COVID-19.

Policy suggestions. To stimulate intangible investments, the literature suggests a number of measures, but often a “broad nexus of mutually reinforcing policy initiatives” (Eustace, 2000).

Generally, the proposals may be summarised within the following points:

- (1) providing suitable and stable macroeconomic conditions that foster economic development generally, which includes
- (2) supporting economic restructuring towards high-value added sectors
- (3) generally promoting entrepreneurship and the role of intangibles, raising awareness also about the importance of changes in the quality of the management of intangibles and corporate governance broadly;
- (4) improving the regulatory framework or business environment, notably in relation to the business environment (bureaucracy and a more entrepreneurial approach to public institutions and modernisation of the government);
- (5) improving the financial system or financial conditions. Even though often firms report that access to finance is not a major obstacle, research shows that for intangibles the lack of ‘tangibility’ can be an obstacle while seeking to obtain external financing;
- (6) supporting human capital investment generally to ensure availability as well as firm-specific human capital investment;
- (7) generating joint intangibles databases to serve as a basis for informed decision-making; and
- (8) creating smart policy packages that address a broad spectrum of mutually dependent and mutually reinforcing aspects to stimulate intangible and other (complementary) investments.



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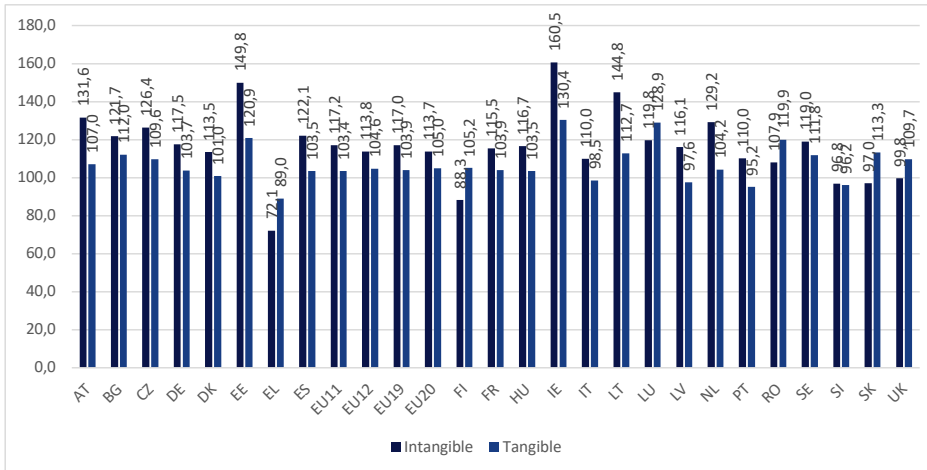
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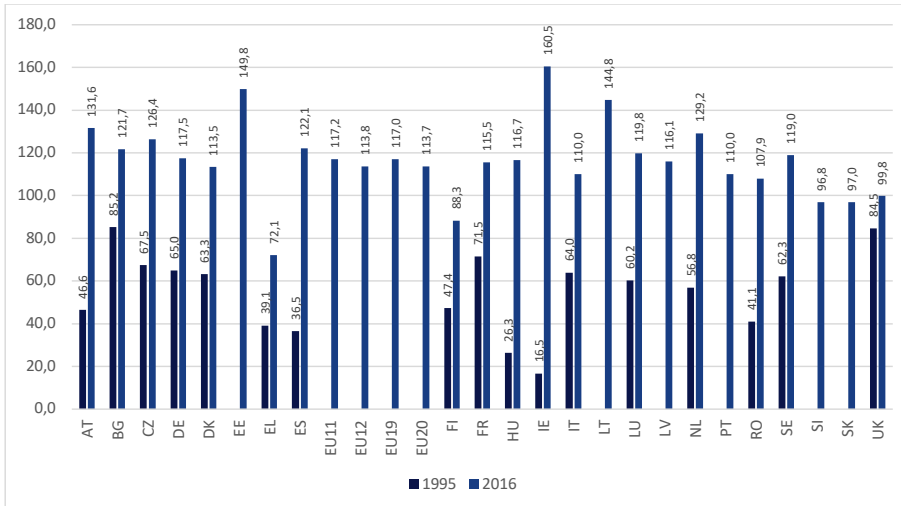
Appendix

Figure A 1: Index of tangible and intangible capital stock in the EU in 2016 (2010=100)



Data: (The Vienna Institute for International Economic Studies, 2019)

Figure A 2: Index of intangible capital stock in the EU in 1995 and 2016 (2010=100)



Data: (The Vienna Institute for International Economic Studies, 2019)



This project has received funding from the European Union's Horizon 2020 The mechanisms to promote smart, sustainable and inclusive growth under grant agreement No 822259.

Table A 1: Total intangibles as a share of total output in the EU economies on average, in %

year	Minimum	Maximum	Median	Mean
2000	1.04	9.50	3.30	3.71
2001	1.40	9.22	3.23	3.79
2002	1.46	8.84	3.34	3.85
2003	1.58	8.39	3.36	3.79
2004	1.61	9.28	3.43	3.84
2005	1.59	9.87	3.61	3.95
2006	1.66	9.77	3.62	4.02
2007	1.68	10.16	3.67	4.14
2008	1.76	12.20	3.85	4.42
2009	1.62	13.67	3.91	4.40
2010	1.75	13.91	3.96	4.36
2011	1.72	12.21	3.96	4.26
2012	1.79	12.48	4.06	4.33
2013	1.85	13.01	4.16	4.45
2014	1.82	13.49	4.26	4.55

Data: (Tsakanikas, Roth, et al., 2020; Tsakanikas, Vasileiadis, et al., 2020)



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Table A 2: Share of total intangibles in output, in %

country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	3.37%	3.52%	3.66%	3.70%	3.77%	3.86%	3.98%	4.01%	4.10%	4.06%	4.03%	4.08%	4.07%	4.22%	4.24%
Belgium	4.14%	4.35%	4.34%	4.32%	4.23%	4.34%	4.30%	4.43%	4.44%	4.40%	4.48%	4.45%	4.45%	4.58%	4.73%
Bulgaria	2.14%	2.14%	2.18%	2.14%	2.25%	2.30%	2.40%	2.40%	2.19%	2.85%	2.27%	2.23%	2.23%	2.21%	2.47%
Croatia	1.40%	1.40%	1.49%	1.58%	1.71%	1.82%	1.93%	2.03%	2.28%	2.33%	2.35%	2.45%	2.58%	2.75%	2.72%
Cyprus	1.97%	1.89%	1.90%	1.71%	1.63%	1.59%	1.66%	1.68%	1.76%	1.62%	1.75%	1.72%	1.86%	1.90%	1.96%
Czechia	2.67%	2.64%	2.77%	3.00%	2.97%	3.15%	3.08%	3.34%	3.45%	3.69%	3.51%	3.48%	3.46%	3.51%	3.44%
Denmark	3.86%	3.96%	4.27%	4.09%	4.23%	4.55%	4.53%	4.83%	5.05%	5.14%	4.94%	5.02%	4.90%	4.82%	4.90%
Estonia	2.83%	2.99%	3.18%	3.10%	2.99%	3.06%	3.10%	3.02%	3.37%	3.53%	3.45%	3.48%	3.54%	3.73%	3.93%
Finland	3.23%	3.20%	3.32%	3.42%	3.51%	3.81%	3.80%	3.82%	4.26%	4.18%	4.07%	3.97%	4.11%	4.17%	4.44%
France	6.95%	7.11%	7.09%	6.99%	6.98%	7.03%	7.17%	7.12%	7.21%	6.29%	5.63%	5.60%	5.57%	5.56%	5.72%
Germany	4.95%	5.01%	4.76%	4.83%	4.85%	5.06%	4.89%	5.01%	5.10%	4.97%	4.95%	4.93%	5.09%	5.26%	5.24%
Great	5.74%	5.88%	5.96%	6.03%	5.93%	5.75%	5.80%	5.82%	6.11%	5.76%	5.64%	5.65%	5.72%	5.65%	5.88%
Greece	2.33%	2.36%	2.51%	2.33%	2.25%	2.21%	2.29%	2.27%	2.46%	2.39%	2.02%	1.93%	1.88%	1.85%	1.82%
Hungary	3.43%	3.72%	3.82%	4.08%	3.90%	4.03%	4.04%	4.14%	4.35%	4.47%	4.15%	4.02%	3.67%	3.76%	3.83%
Ireland	9.50%	9.22%	8.84%	8.39%	9.28%	9.87%	9.77%	10.16%	12.20%	13.67%	13.91%	12.21%	12.48%	13.01%	13.49%
Italy	4.32%	4.51%	4.64%	4.60%	4.54%	4.58%	4.54%	4.59%	4.52%	4.60%	4.39%	4.43%	4.33%	4.24%	4.28%
Latvia	2.73%	2.74%	2.60%	2.61%	2.67%	2.97%	3.43%	3.30%	3.47%	3.60%	3.88%	3.78%	4.06%	4.23%	4.32%
Lithuania	1.38%	1.41%	1.46%	1.63%	1.61%	1.72%	1.74%	2.12%	2.01%	1.99%	1.86%	1.81%	1.79%	1.90%	1.90%
Luxembourg	3.46%	3.78%	3.55%	3.79%	4.11%	4.18%	4.14%	4.59%	6.31%	5.69%	6.22%	6.15%	6.98%	7.69%	7.90%
Malta	7.10%	7.27%	7.40%	7.31%	7.37%	7.78%	8.57%	8.97%	10.42%	9.50%	9.37%	9.74%	9.69%	10.17%	10.29%
Netherlands	6.02%	6.13%	7.10%	5.82%	5.82%	5.85%	5.86%	6.00%	6.04%	5.85%	5.51%	5.54%	5.61%	5.64%	5.82%
Poland	2.68%	2.85%	2.83%	2.81%	2.77%	2.76%	2.75%	2.84%	2.86%	2.82%	2.79%	2.82%	2.73%	2.94%	2.98%
Portugal	3.36%	3.26%	3.24%	3.31%	3.35%	3.41%	3.45%	3.52%	3.61%	3.76%	3.75%	3.64%	3.62%	3.58%	3.58%
Romania	1.04%	1.42%	1.54%	1.80%	1.65%	1.76%	2.04%	2.15%	2.09%	2.10%	2.37%	2.33%	2.42%	2.65%	2.80%
Slovakia	2.20%	2.02%	1.91%	1.76%	1.81%	1.95%	1.96%	2.02%	2.24%	2.59%	3.36%	2.20%	2.63%	2.69%	2.70%
Slovenia	2.95%	3.06%	3.36%	3.15%	3.36%	3.30%	3.37%	3.51%	3.58%	3.69%	3.88%	3.96%	4.08%	4.14%	4.28%
Spain	3.05%	2.99%	3.03%	2.99%	2.98%	3.02%	3.10%	3.25%	3.20%	3.21%	3.27%	3.31%	3.32%	3.30%	3.34%
Sweden	5.04%	5.22%	4.96%	4.88%	4.89%	4.87%	4.85%	5.00%	5.03%	4.44%	4.15%	4.34%	4.42%	4.35%	4.41%

Data: (Tsakanikas, Roth, et al., 2020; Tsakanikas, Vasileiadis, et al., 2020)

Kommenterede [MB1]: Delete all the % in the columns?



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