



IMMATERIAL VALUE CREATION IN EUROPE

By Dr. Nima Sanandaji
Foreword by Per Strömbäck

Summary

Immaterial value creation plays a key role in what is commonly referred to as the knowledge intensive economy. Intellectual property rights (IPR) – such as patents, design rights, trademarks and copyrights – are used to protect the intellectual property that results from immaterial value creation.

While nearly all businesses rely on IPR to some extent, some are intensely reliant on this form of protection. This study examines the European Union business sectors, to determine the share of economic value created and the share of jobs that exist in IPR-intensive businesses. The survey is based on data for 2011, 2012 and 2013. It covers the most detailed information available for the European Union business sector, collected from the Eurostat database.

The key finding is that 40 per cent of employment in the European business sector and 51 per cent of value created in the sector occurs in IPR-intensive businesses.

All business activity in publishing, film, music and software are classified as IPR-intensive. The reason is that the value produced mainly has the form of digital content, protected by copyright. The majority of value added in a number of other sectors is also IPR-intensive. This includes ICT, manufacturing, professional services, real estate and trade. Utilities as well as accommodation and food services on the other hand have negligible shares of IPR-intensive businesses.

Although differences exist among European Union member states, the share of IPR-intensive business activity is high across the union.

Besides the direct effect on job creation it is likely that, as pointed out by an American study, IPR-intensive businesses also indirectly stimulate job creation in the rest of the economy. This is in line with the observation that knowledge-intensive businesses are the driver for job growth in modern economies.

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Foreword

What is the "knowledge society"? We tend to think of knowledge as something connected to individuals and so we need better skills and education to develop in synch with the world. But is that all there is to it? It would seem that the post-industrial economy is more complex than the skills of its workers. Large organizations can have thousands of employees working for them and thus very sophisticated management structures. But it's not only about skills and organization, there is also institutional knowledge. Knowledge that various parts of organizations can access and use. Knowledge that others can be allowed to use on certain conditions. This is the formally organized knowledge.

It can be very valuable: it can be traded, it can be licensed, it can attract investment, it can give competitive advantages. As the knowledge society advances, the economy becomes increasingly reliant on intangibles. In fact, the more advanced an economy is, the higher the degree of investment is into immaterial assets. Knowledge can be used to improve processes in areas which traditionally relies more on physical production, such as raw materials or agriculture. The greatest productivity increases can often be made thanks to knowledge in such industries: better processes, better marketing, better energy use and so forth.

It is often said that the future is digital, and while that may be true, even more so is the future intangible. The knowledge society may have the answers to many of today's challenges, such as jobs, growth and to some extent energy and climate. In the knowledge society, there can be economic growth without exhausting resources. There can be new jobs, good jobs that rely on the work of the mind rather than the body. The common denominator for the intangible economy is intellectual property rights. That is the formalization of knowledge, which makes it possible to buy, trade, loan and sell.

This report shows that intellectual property rights underpin large and increasing parts of the economy across all sectors. If the future is digital but digital technology challenges intellectual property rights, those technologies must be made future-proof. The perceived conflict of intellectual property and technology must be solved with better technology, not with lesser value of knowledge. Only so can the knowledge society prosper.

Nima Sanandaji's report makes this case. I wish you an inspiring read.

Brussels, October 2016
Per Strömbäck
Editor Netopia

Introduction

While the European economies are amongst the most prosperous and innovative in the world, development in the region has stalled during recent time. A report by Eurostat shows that nearly a third (30.7 per cent) of global economic output was produced in the EU-28 countries as late as 2003. Ten years later, this share had dropped to less than a quarter of global output (23.7 per cent). Though the shift is partially explained by the catching up of developing economies, it also reflects stagnating growth in the European Union. During this period the EU-28 countries had lower growth rate than all but one of the non-European G20 countries.¹ It is evident that Europe needs growth-inducing reforms.

The European Commission's long-term strategy to boost economic development points out that "business as usual" would consign [Europe] to a gradual decline, to the second rank of the new global order. This is Europe's moment of truth. It is the time to be bold and ambitious". In order to achieve smart, sustainable and inclusive growth, the commission points out the importance of "strengthening knowledge and innovation as drivers of our future growth".² The Commission's annual growth strategy for 2016 builds upon this theme by stressing the need to promote innovation and entrepreneurship.³

Nearly a third of global economic output was produced in the EU-28 countries as late as 2003. Ten years later, this share had dropped to less than a quarter of global output [...] It is evident that Europe needs growth-inducing reforms.

Promoting innovation and entrepreneurship,

1 Eurostat (2015). The pace of growth in EU-28 countries was only marginally stronger than in Japan, which is noteworthy since this country contrary to the European Union has experienced a rapid reduction of the number of working-age adults.

2 European Commission (2010).

3 European Commission (2016).

and thereby shifting towards a higher knowledge intensity in the economy, is vital due to changes in the global marketplace. The slow pace of economic development in Europe reflects a shift in the global business landscape. Merely a few decades ago, European firms had strong global positions in manufacturing, information and communication technologies (ICT) and other advanced services. Today a new generation of successful firms, from developing countries such as China and India, have taken up the competition with European businesses. Competition from firms in other developed economies, such as the US, Canada, South Korea and Australia, is also increasing. While Europe in the long run benefits greatly from globalization and trade, it is evident that some European enterprises are struggling to succeed in the global marketplace.

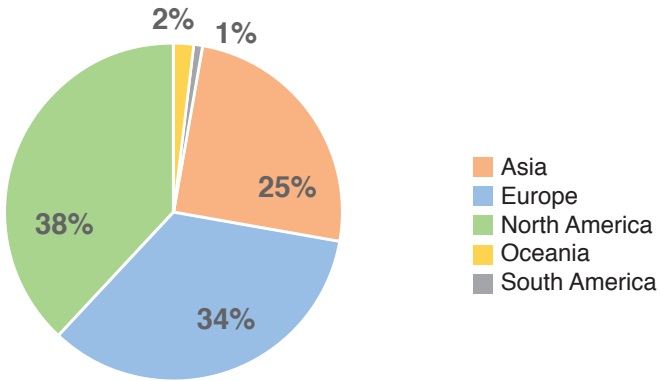
Examples are not difficult to find. Nokia, the leading tech company that recently played a key role for overall development in Finland and had a significant share of the world's mobile phone market, has rapidly fallen behind and no longer manufactures phones. Well-known European car brands such as Jaguar, Land Rover, Saab and Volvo have been bought by Chinese and Indian investors. Chinese networking and telecommunications equipment company Huawei has recently reached twice as high global sales as its European competitor Ericsson, and more than four times as high as its other European competitor Nokia.⁴ Chinese household appliances manufacturer Midea has recently made a bid for German robot maker Kuba. Forbes describes this move as a way of acquiring the latest technologies for full automation of industries.⁵

These examples are reflected in international enterprise statistics. As shown in the images on the next page, European firms made up 34 per cent of Forbes 500 fortune companies. Ten years later, the number of European firms

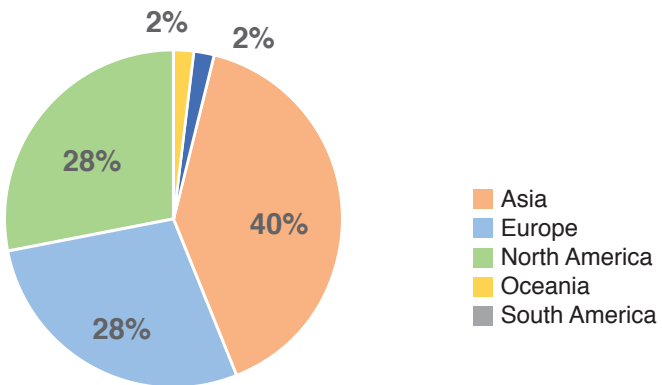
4 RCR Wireless News (2016).

5 Forbes (2016).

Location of Forbes Fortune 500 countries in 2005



Location of Forbes Fortune 500 countries in 2015



Source: Forbes Fortune 500 lists, own analysis.

on this list of globally leading enterprises had shrunk to 28 per cent. The majority of the leading global firms are now found in China and other Asian economies.⁶

Previously, European businesses could stay ahead by having access to physical capital investments that eluded firms in many other parts of the world, and act in a business environment superior to much of the world. To a large extent, these advantages have already spread to competing nations. Instead, European businesses have to rely on the competitive advantage which is becoming increasingly important in the modern business environment: immaterial investments

The old world order, in which the know-how, technologies and capital for competitive businesses to grow was restricted to Europe, the US and a few other developed economies is gone. Competition from China, India, Brazil, Vietnam, Iran and other upstart economies is already strong and will most likely grow in the years to come. The big question is how European businesses can continue to maintain a leading position in this new environment. Previously, European businesses could stay ahead by having access to physical capital investments that eluded firms in many other parts of the world, and act in a business environment superior to much of the world. To a large extent, these advantages have already spread to competing firms in other parts of the world. Instead, European businesses have to rely on the competitive advantage which is becoming increasingly important in the modern business environment: immaterial values, which create intellectual properties.

As the global economy becomes increasingly knowledge-intensive, much of the development of manufacturing businesses, ICT businesses and modern service businesses occurs through

investments in immaterial rather than material assets. These immaterial assets take the form of technologies, patents, know-how, design rights, program code, digital media content and trademarks. The immaterial assets, which are the result of intellectual creation rather than physical creation, are protected by intellectual property rights (IPR).

IPR is becoming increasingly important for modern economies due to two long-term factors: firstly, that businesses that work with intellectual creation are becoming an ever larger part of the overall economy and secondly that intellectual value creation is becoming ever more important for firms in general. The first trend is exemplified by that software firms form a larger part of the overall business sector than in previous decades. The second trend is exemplified by that software is increasingly important not only to software firms, but also a range of other industries, such as manufacturing. This observation is also relevant for other forms of intellectual values, such as arts/graphics, music/film and design. Many firms for example today produce film not only for advertisement, but also for communication with stakeholders within and outside the organization (employees, investors, business partners) as well as for expressing long-term commitment to values such as environmental protection and socially sustainable growth.

The present report is based on a detailed analysis of the European business sector. It is found that already today more than half of value added and four out of ten jobs are found in businesses that are IPR-intensive, that is to say, strongly reliant on IPR. IPR-intensive businesses play a key role in a wide range of fields of economic activities, including manufacturing, media, ICT, retail and professional services. Another finding is that IPR-intensive businesses are of significant importance not only for some, but all European Union member states.

⁶ Forbes Fortune 500 lists, own analysis.

Immaterial values are distinct from **physical value** simply since the former do not have a physical form. Previously in history much of the focus of economic activity was on producing physical values – in the form of for example agricultural products, tools and buildings. In the modern economy much of value creation is immaterial/intellectual rather than physical. Examples are innovations, business ideas, design, computer programs and digital content such as movies and music.

Wealth creation in modern societies

How is wealth created in societies? During a long time, economists gave the simple answer that capital, labor and natural resources were the three cornerstones of economic activity. The level of prosperity could thus be increased by working more hours, investing in more manufacturing equipment and processing more natural resources. The management consultant and author Peter Drucker, whose ideas have had major influence on the current understanding of modern enterprises, challenged this simplistic perspective already during the late 1960s. Drucker observed that many leading firms relied on the knowledge that existed amongst its employees and within the organization. Knowledge was the forgotten cornerstone that was needed to succeed.⁷

“Knowledge is the main driver of today’s global economy”

- Angel Gurría, Secretary-General of the OECD

The theory of the knowledge-based economy, based on Drucker’s observation, has with time gained strong support in research. As an example, at the end of the 1990s Peter Klenow and Andrés Rodríguez-Clare explored why wealth was created more rapidly in some countries than others. It was shown that the traditionally accepted theory about capital, labor and natural resources had limited ability to explain the development. The two economists found that 90 per cent of the variation of growth could be explained by how efficiently investments were being used, rather than the size of the investments.⁸

Later studies have confirmed the link between innovation and growth: a combination of

technical innovations, new ways of organizing work processes, organizational changes and innovative services are driving long-term development.⁹ Angel Gurría, secretary-General of the Organisation for Economic Co-operation and Development (OECD), has summarized this insight by explaining: “Knowledge is the main driver of today’s global economy”.¹⁰

The evolution of the knowledge based society has concurred with a development in which the economy in greater degree is based on immaterial, rather than physical, value creation. A significant share of the value created in modern industries and service sectors is immaterial in its nature. Examples of immaterial value creation are new business ideas, inventions and digital content. Much like patents, design rights and trademarks these values do not take the shape of physical goods. Rather they are the result of investments in various forms of organized knowledge. Within film, music and computer game development nearly all of value creation occurs through immaterial values, since the result of the work is digital rather than physical content.

As this report discusses, immaterial value creation is however not restricted to limited parts of the economy. In modern knowledge based economies, such as the member states of the European Union, immaterial value creation is important for many businesses. For example, businesses in various field find it useful to invest in building up reputation through a trademark and a well-designed webpage. While nearly all businesses to some degree rely on immaterial values, an increasing share are strongly dependent on them. Enterprises that rely on new technologies, advanced design, digital content, service innovations and other immaterial assets often gain a competitive edge. By relying on this form of high-end value creation, businesses in countries with higher

7 Drucker (2011). Originally published in 1969.

8 Klenow och Rodríguez-Clare (1997).

9 See for example Grossman and Helpman (1993), Hasan and Tucci (2010) and Soete (2011).

10 OECD (2010a).

wages can compete with low-cost competitors in countries with lower wages.

The evolution of the knowledge based society has concurred with a development in which the economy in greater degree is based on immaterial, rather than physical, value creation.

The fact that modern economies are increasingly focused on immaterial value

creation has many benefits. Ideas travel faster over the borders and can more easily be scaled up. There are environmental benefits with a growth model which is not necessarily about manufacturing more products, but rather focused on smart solutions and immaterial content. The transition towards this new mode of economic activity has gradually been going on since early industrialism, and seems to have picked up pace recently.

How does growth occur?

Traditional Theory



Modern Theory



The modern economy is seldom solely driven by physical value creation or solely by immaterial value creation. **Often these two forms of value creation work together.** As an example, a smartphone wouldn't be possible without the physical value creation of actually manufacturing the phone. This in turn wouldn't have been possible without the immaterial value creation of developing the technologies for the phone. Once manufactured, the phone gains its use through the immaterial value creation of providing phone services. The apps used in phones are yet another example of how immaterial values are coupled with material ones.

Towards a knowledge economy

Today politicians, academics, journalists and entrepreneurs often refer to the knowledge economy. It is relevant to remember that although this might seem as a new buzz phrase it is far from a new phenomenon. In the influential book *The Age of Discontinuity*, Peter Drucker explains that the knowledge economy has gradually developed since early industrialism. Systematic use of knowledge in business was for example evident already among British toolmakers in the early 19th century. In contrast to traditional smiths, whose craftsmanship varied significantly in quality, the British toolmakers developed detailed plans for how each product would be developed. Thus it became possible for them to move towards a standardized production through which each tool produced was given the same measures and function. These tools were in turned used to build the early factories of the industrialized world, which made possible standardized manufacturing in larger scale.¹¹

The transition towards the knowledge intensive economy can be said to have occurred through two closely related trends. The first is that the skill sets and knowledge of individual workers have increased. The second is that enterprises and other organizations increasingly have been investing in various forms of knowledge capital. The toolmakers of the early 19th century Britain exemplify both trends. They were highly qualified experts with specialist knowledge about the cutting edge technology of the time. In addition, they worked in businesses where specific designs were produced for the products that were to be manufactured, while detailed plans were set up regarding how the work was to be conducted. Research and development continuously occurred in order to improve the products

and the work procedures. The tools that were being manufactured where physical products, but the knowledge of how to produce them was an early form of immaterial investment in knowledge. This combined focus on skill development amongst the employees and investments in immaterial knowledge capital amongst organizations was quite unique in the early 19th century, but has since become a key part of the operations of many modern enterprises.¹²

This combined focus on skill development amongst the employees and investments in immaterial knowledge capital amongst organizations was quite unique in the early 19th century, but has since become a key part of the operations of many modern enterprises

Throughout Europe, a transition from poor agrarian societies to prosperous welfare nations has been made possible through an increased knowledge content in the economy. Successful businesses, which contribute considerable revenues to European countries, are often knowledge intensive. This is certainly true of the modern start-ups in Europe, whose creations largely is based on immaterial values. It is also true of the industrial firms which set the foundations for Europe's wealth during the industrial era.

An illustrative example is the Swedish engineer Göran Fredrik Göransson who in 1857 bought the design for a new method of producing steel, two years earlier developed by British engineer Henry Bessemer. The early experiments to make the method to work in practice had failed. Göransson however managed to develop the Bassermethod so that it resulted in steel with good qualities, a highly demanded good at the time. This was the start of the industrial firm Sandvik, founded in 1862, which since continuously has been focused on research and development. The

¹¹ Drucker (2011). Originally published in 1969.

¹² Ibid.

Knowledge capital and physical capital co-operate to create growth



Investments in physical capital



Factories, buildings, roads and other physical infrastructure



Investments in knowledge capital



Business ideas, inventions, design, program code and trademarks

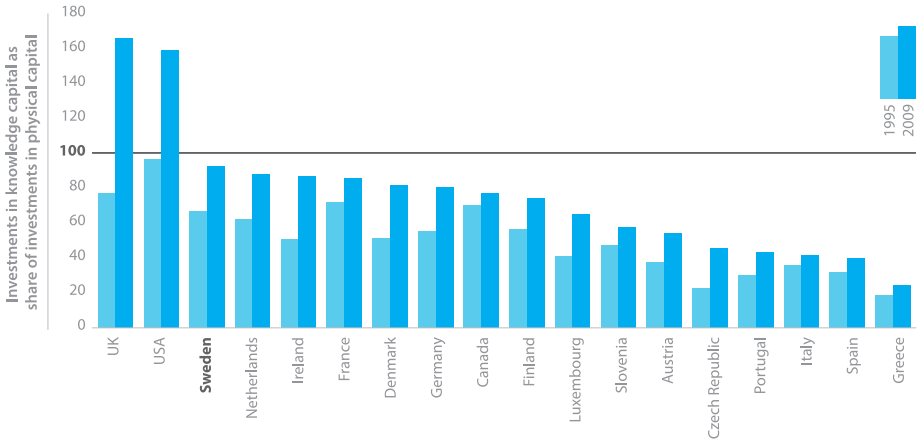
firm invests heavily in new ideas, illustrated by the fact that it was granted fully 800 new patents in 2014 alone.

Siemens – the German company that continues to push industrial development, smart energy and modern infrastructure around the world – was likewise founded on a new technology. Werner von Siemens and Johann Georg Halske founded the company in 1847. The pair developed the technology of the telegraph, at the time based on Morse code, so that it instead used a needle to point to the sequence of letters. This invention, which made the telegraph much easier to use, became the foundation for the company that throughout its history has been investing in new inventions. During recent years the firm has moved towards a number of innovations with environmental benefits, including improvements in clean energy provision, technologies for intelligent power grids and development of a system for comprehensive traffic management.

Unilever, the Anglo-Dutch multinational consumer goods company that is ranked amongst the most prosperous businesses in the world, can track its origins to 1872. In that year Antoon Jurgens founded the first margarine factory in the world in Oss, Netherlands. A new technology was used to produce a more affordable alternative to butter for the growing middle class. The margarine was promoted with ads stating that the product was both “economical” and “nourishing”; important values in times where many children in Europe were still malnourished. With time the firm would merge with other firms that used technological advancements in food production, such as fisheries, to form Unilever. Today the firm aims to help people improve their health and well-being with new food technologies, while reducing the environmental impact of food production.

Yet another example is Renault, formed in France by Louis Renault and his brothers

Immaterial capital increasingly important



Source: OECD (2013). “Supporting Investment in Knowledge Capital, Growth and Innovation”.

Marcel and Fernand. Louis was an aspiring young engineers who teamed up with his brothers, who had developed business skills working for their father’s textile firm. Together they developed their first car in 1898. Research and development in the firm has since focused ever more on increasing traffic safety, while reducing the environmental footprint of the cars.

Without knowledge investments Renault, Unilever, Siemens and Sandvik would not have grown to successful ventures. In today’s marketplace, immaterial value creation is even more important.

These early examples of industrial firms, developed many generations ago, owe their success to a combination of immaterial and

material value creation. Without knowledge investments Renault, Unilever, Siemens and Sandvik would not have grown to successful ventures. In today’s marketplace, immaterial value creation is even more important. Fashion companies rely on design rights, software companies on program code, entertainment companies on digital recordings and specialized service firms on service innovations and novel business models in order to thrive. It is also increasingly important for firms to invest in trademarks, through which they signal social and economic responsibility.

The top ten list of the fastest growing private companies in Europe, compiled by business magazine Inc. in 2016, shows that the new successful firms are equally focused on new

technologies and ideas. The number one spot for example goes to Spanish firm M P Vat Services, built upon the simple idea of creating new information technology tools, which simplify paying tolls and taxes for transport firms. The programs patented by the firm simplify trade throughout Europe, creating widespread societal benefits. The second spot goes to Latvian firm Creamfinance. The online consumer finance company uses scoring techniques to offer loans in a speedier way. Better use of information thus benefits both businesses and families in need of loan.¹³

The third fastest growing business in Europe is German B2X Care Solutions. The global tech company providing customer care for smart phones and other electronic devices to manufacturers, insurance providers as well as carriers and retailers. The fourth fastest growing firm is Malta-based Co-Gaming, providing online-gaming. The fifth place goes to Leapp Group International, supplier of refurbished Apple products with stores in the Netherlands, Germany and Belgium as well as online. Next in line is Avicii Music, the production company behind Swedish electronic musician Tim Bergling, better known by his stage name Avicii, who recently retired.¹⁴ None of these businesses would have been able to thrive without innovative business ideas and without protection of the immaterial value production which is vital for them.

With time immaterial investments have gone from being important for a few innovative businesses to being of widespread importance for European enterprises. This is in line with international trends, wherein immaterial investments are increasingly important as a supplement to physical capital investments. As illustrated below, international statistics shows that immaterial assets have grown significantly during later years. In some economies, such as the UK and the US, such investments even

exceed investments in physical capital. A general finding is that the more developed an economy is, the higher is the share of investments in immaterial values compared to physical ones. The result of the immaterial investments, so called intellectual property rights, play a key role for European businesses. This is supported by the data presented in this report.

¹³ Inc. (2016).

¹⁴ Ibid.

“An **immaterial right** gives the owner right to the result of an intellectual performance, which can be in the form of an invention, a trademark, a design, a novel, a picture, etc. Among the immaterial values are copyright, patent, trade mark protection, design protection, firm protection and plant breeders’ rights but also for example the licenses to said protections. **Immaterial assets** is a broader concept which includes all rights that are not physical. Immaterial assets can besides immaterial rights also be in the form of business methods, customer registries, business secrets, working methods, goodwill, etc.”

A Swedish Government Official Report (SOU 2015:16) explains the concept of immaterial rights and immaterial assets. Own translation from Swedish.

IPR-intensive businesses in the EU

How big a role does intellectual property rights play for businesses in the European Union? One way of examining this is to look at detailed data over the business activities in the union, and sort out the business sectors that are very reliant on immaterial property rights. A previous study by the Office for harmonization in the internal market (OHIM) has previously noted that “all industries use [intellectual property] rights to some extent” but that some can be categorized as being strongly reliant on such rights. The researchers who conducted the study used the NACE classification system, wherein detailed information is given for European businesses, to carry out their survey. The most precise level of NACE classification (4-digit level) divides economic activity within the European Union business sector into 615 different classes. The researchers at the OHIM make a judgement on which of these classes that are strongly dependent on intellectual property (IPR-intensive) and which are not.¹⁵

The categorization has been conducted for nearly the entirety of the European Union business sector, with the exception of a few fields such as agriculture. For example, within “mining” the activities of “mining of hard coal” and “mining of lignite” are not identified as being IPR-intensive. Extraction of natural gas is however identified as IPR-intensive, since it relies significantly on patents for new technologies. A key point is that most if not all mining activities do rely on new technologies, and thus often patents. The categorization however attempts to separate businesses with some IPR-dependence from

those which can be defined as IPR-intensive, that is to say strongly dependent on IPR in the form of patents and other forms of intellectual property.

As another example, within ‘construction’, the activity construction of residential and non-residential buildings is not defined as being IPR-intensive. The reason is that these businesses are not strongly dependent on intellectual property. On the other hand, development of building projects is defined as IPR-intensive. The reason is that businesses in this field are strongly dependent on trademark.¹⁶ This present study utilizes the division of business classes made by the study from the OHIM, and couples it with latest available data from Eurostat.

Data for this study has been gathered during May and June 2016, from Eurostat databases. The following Eurostat sources have been used: “Annual detailed enterprise statistics for industry”, “Annual detailed enterprise statistics for construction” and lastly “Annual detailed enterprise statistics for trade”. The most precise NACE classifications (4-digit level) have been used in order to calculate what share of the European Union business sector, and what share of each broad category of the business sector (for example construction) that is IPR-intensive.

Eurostat does not publish SBS statistics for primary sectors, such as agriculture, forestry and fishing. Therefore, the data given is for the business sector excluding primary sectors. Data for financial and insurance activities is of low quality, and is therefore excluded from the survey. Besides these exceptions, the data present in this study covers the business sectors of all European Union member states. Data for the three latest available years, 2011, 2012 and 2013 have been pooled and an average of available data calculated. Based on this, the number of employees in each sector class of businesses, as well as value added

¹⁵ Office for harmonization in the internal market (2013). The measurements in this study are similar to that presented in this referred study. A number of differences do exist, such that the focus of this study is the business sector, not the entire economy, and that more up-to-date data is used in the analysis. The results are also in line with the above cited study.

¹⁶ Ibid.

Division of EU-28 business sector

| | Value added at factor cost | Employment |
|---|-------------------------------|------------|
| Manufacturing | 26.4% | 24.6% |
| Wholesale and retail trade | 18.8% | 23.8% |
| Professional services (including scientific and technical services) | 9.7% | 7.3% |
| Construction | 8.0% | 8.8% |
| Transportation and storage | 7.9% | 8.3% |
| Administration and support | 6.9% | 10.8% |
| ICT | 6.6% | 3.4% |
| Utilities (electricity, gas, water) | 5.2% | 2.2% |
| Real estate | 4.0% | 1.5% |
| Accomodation and food services | 3.4% | 7.5% |
| Publishing, film, music, software | 1.8% | 1.2% |
| Mining and Quarrying | 1.4% | 0.5% |

Source: Eurostat database, own analysis. Excludes agriculture, forestry and fishing as well as financial and insurance activities due to data availability.

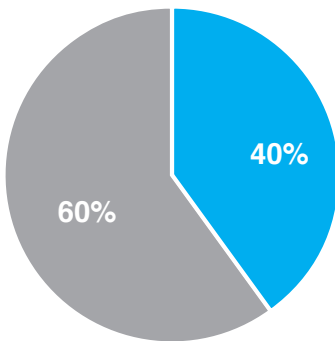
at factor cost in each sector class, has been calculated. Lastly, the share of employment and value added in the sector classes deemed to be strongly dependent on intellectual property have been compared to their respective broad category of the business sector as well as for the entire business sector examined in this study.¹⁷

The figure above shows how the business sector in the European Union (with the exceptions listed above) is divided in terms of contribution to total employment and total value added at factor cost. The latter is a measure which captures the contribution of each sector to GDP. Some business sectors within Europe have limited reliance on intellectual property. For example, within the utilities sector, that is to say production and distribution of electricity, gas and water to households, the business sectors are classified in this study of not being IPR-intensive.

Although patents for technologies and trademarks do certainly play a role in this field, the ventures are not intensely reliant on IPR. Another example is accommodation and food services. Although restaurants and hotels do indeed depend on trademarks, these sectors are not either IPR-intensive.¹⁸

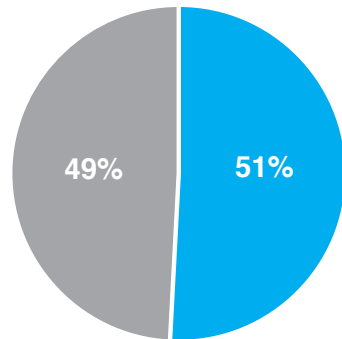
Overall however, a significant share of business activity in the European Union is found in IPR-intensive fields. As shown in the images below 40 per cent of employment and 51 per cent of value added in the European union business sector is within IPR-intensive businesses. In the following chapters, more detailed data for each individual sector is shown. An overall trend is that IPR-intensive businesses stand for a larger share of value added than their share of employment. This is in line with the concept that knowledge-intensive enterprises have more value added per employee than other enterprises.

Entire EU-28 Business Sector Employment



■ IPR-intensive
■ Not IPR-intensive

Entire EU-28 Business Sector Value added



■ IPR-intensive
■ Not IPR-intensive

¹⁷ Eurostat database, own analysis. or individual countries, the 4-digit level data is not always of high enough quality. In order to gain data for IPR-intensity of each country, 2-digit level data on the size of each broad category of the business sector (for example construction) is calculated. The assumption is made that these categories in member states have the same IPR-intensity as has been calculated based on 4-digit level data for the entire European Union.

¹⁸ This study finds that 0 per cent of employment in utilities and 0.4 per cent in accommodation and food services is IPR-intensive, compared to 0 per cent and 0.5 per cent of value added in the corresponding sectors.

Mining and manufacturing

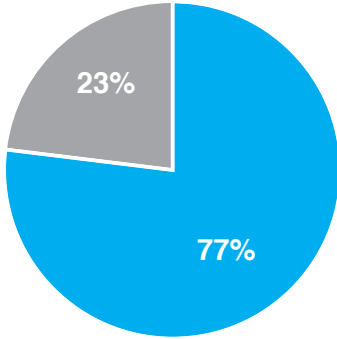
The manufacturing sector plays a key role in European economies. During the studied time period some 28.3 million jobs, corresponding to 24.6 per cent of total employment in the European Union business sector, were found to be in manufacturing. The same is true of 26.4 per cent of value added in the data on which this study is based. Mining and quarrying is a smaller sector, with around 0.6 million jobs and contributing 1.4 per cent of value added.

As shown in the images on the next page, more than three quarters of employment and over four fifths of value creation occurs in IPR-intensive manufacturing. Manufacturing businesses often rely on a mixture of trademarks, patents and design rights in their operations. This is particularly true amongst knowledge intensive manufacturing fields. The exception is more simple forms of manufacturing. Businesses involved in classes such as manufacture of wooden containers, manufacture of coke oven products and

manufacture of lime and plaster are not identified as being IPR-intensive. Although intellectual property, in the form of trademarks and patents, do play a role for these ventures, the businesses cannot be said to be strongly reliant on this form of property.

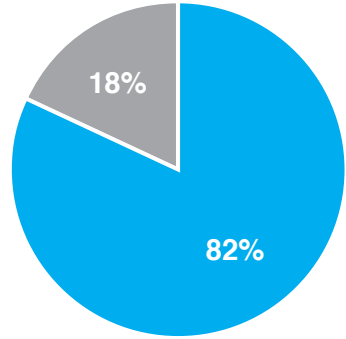
Within mining and quarrying a somewhat different picture is found. As shown in the image, almost the same share of value added (79 per cent) in mining and quarrying is found in IPR-intensive fields compared to in manufacturing (82 per cent). However, a much smaller share of the employment in mining and quarrying is found in the same businesses (36 per cent) as compared to manufacturing (77 per cent). This reflects the fact that much of mining and quarrying employment is found in less complex operations which are not IPR-intensive, such as quarrying of stone, sand and clay. The small share of ventures which are IPR-intensive, such as extraction of natural gas and crude petroleum (dependent on patents and trademarks) have considerably higher wealth creation per employee.

EU-28 Manufacturing Employment



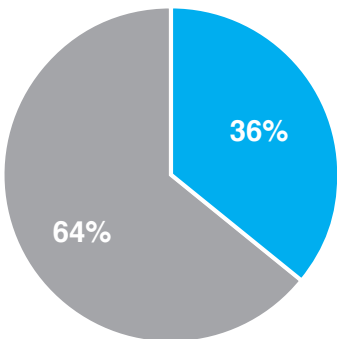
■ IPR-intensive
■ Not IPR-intensive

EU-28 Manufacturing Value added



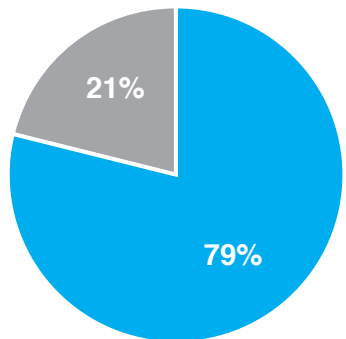
■ IPR-intensive
■ Not IPR-intensive

EU-28 Mining and Quarrying Employment



■ IPR-intensive
■ Not IPR-intensive

EU-28 Mining and Quarrying Value added



■ IPR-intensive
■ Not IPR-intensive

Transportation and trade

Some 9.6 million jobs are found in the European Union transportation and storage sector and additionally 27.5 million in retail and wholesale. Transportation and storage comprises 7.9 per cent of value added compared to 18.8 per cent for retail and wholesale.

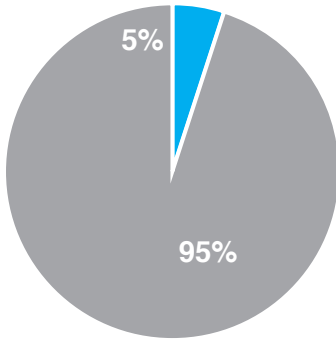
Transportation and storage is a field in which merely one out of twenty employees is found in IPR-intensive businesses. As shown in the images on the next page, however, the same is true of one tenth of value added. The IPR-intensive businesses in this field are those engaged with sea, costal and air transport. These forms of transportation, with higher value creation per employee, are strongly dependent on trade marks.

Wholesale and retail trade has a higher share of IPR-intensity compared to transportation,

as four out of ten jobs and the majority of value added is found in businesses that rely on trademarks, patents and design rights. The higher reliance on IPR in the trade sector can be explained by the fact that decisions on which goods to buy, regardless of it is clothes or basic items such as foods, is increasingly coupled to issues such as how highly the customer values the trademark. Customers are not only looking for trademarks they know from advertisement, but also those that they associate with high quality, social responsibility and environmental responsibility. Trademarks exist, but are less important, in the transportation sector.

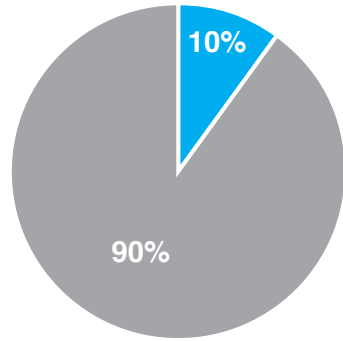
Within the trade sector many wholesalers as well as retail traders rely intensely on IPR. This illustrates the need of traders to rely on trademarks when dealing both with private customers and business customers. Wholesalers and retailers in fashion are in addition depend on protection of intellectual property in the form of design rights.

EU-28 Transportation and Storage
Employment



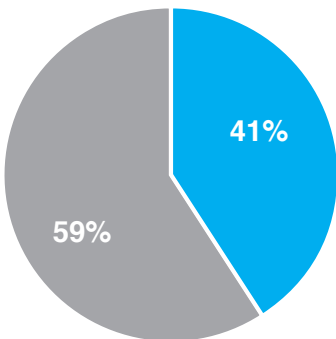
■ IPR-intensive
■ Not IPR-intensive

EU-28 Transportation and Storage
Value added



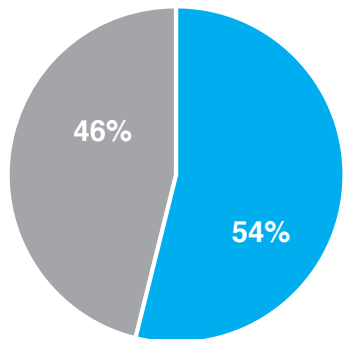
■ IPR-intensive
■ Not IPR-intensive

EU-28 Wholesale and Retail Trade
Employment



■ IPR-intensive
■ Not IPR-intensive

EU-28 Wholesale and Retail Trade
Value added



■ IPR-intensive
■ Not IPR-intensive

Construction and Real Estate

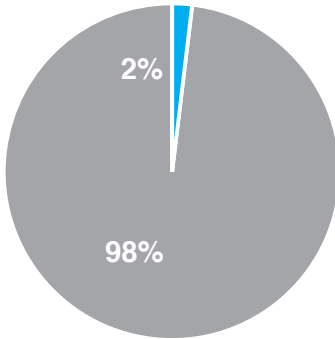
Some 10.1 million jobs are found in the European Union construction sector, compared to 1.7 million in real estate. The two sectors account for 8.0 and 4.0 per cent respectively of value added. Construction and real estate activities are interconnected, since real estate business is made possible by the fact that properties are constructed and renovated.

As shown in the images on the next page, only a small share of construction business activity is IPR-intensive. Development of building projects is the only field within construction which is intensely dependent on IPR, in the form of trademarks. Most other construction activities have more limited use of IPR, in the form of trademarks, patents and design rights, and are thus not classified as IPR-intensive.

Within real estate however the majority of jobs and the vast majority of value added is found in IPR-intensive businesses. This is since real estate businesses rely more on trademarks as well as on design rights. A similarity can be drawn between to transportation, which like construction, has limited IPR-intensity. Wholesale and retail, which in turn is dependent on transportation, is however a sector with high IPR-intensity, as is real estate which is dependent on construction.

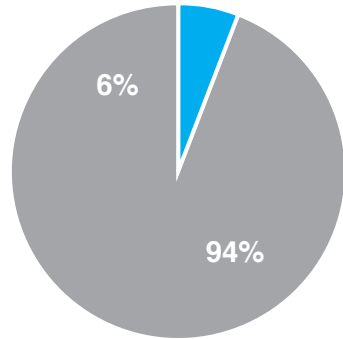
In both cases, the closer to the customer the business is, the higher is the IPR-intensity. This is at least true for trademarks and design rights. It is worth keeping in mind that the manufacturing sector, which produces much of what is used in construction and sold in retail, is also IPR-intensive, mainly since it relies on technologies which are protected by patents.

EU-28 Construction Employment



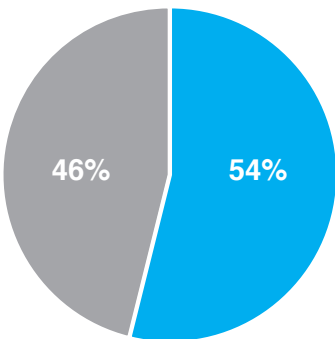
■ IPR-intensive
■ Not IPR-intensive

EU-28 Construction Value added



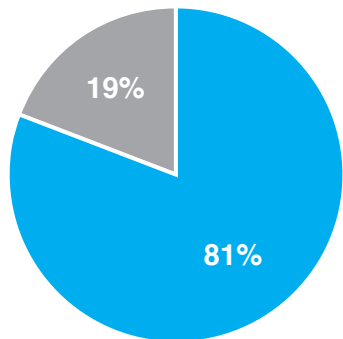
■ IPR-intensive
■ Not IPR-intensive

EU-28 Real Estate Employment



■ IPR-intensive
■ Not IPR-intensive

EU-28 Real Estate Value added



■ IPR-intensive
■ Not IPR-intensive

Administration, support and professional services

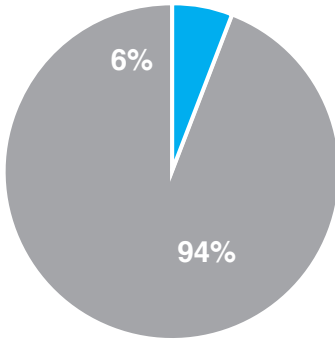
In the European Union business sector, there are 12.5 million jobs to be found in administrative and support service activities and support compared to 8.4 million in professional, scientific and technical activities. The two sectors account for 6.9 and 9.7 percent of value added respectively. Professional services are more specialized and high-end, which explains why this sector although having fewer employees has more value added.

There are a number of activities within administration and support which are deemed to be IPR-intensive, such as rental and leasing of air transport equipment, office machinery and other machinery. Leasing of intellectual property, travel agencies, tour operators, office administrative services and organization of conventions and trade shows are other examples. Overall however, most of administration and support is not IPR-intensive. Examples of ventures within this field that do not strongly rely on IPR are: employment firms, human resource firms and firms that offer supporting

services to other firms. The share of value added of IPR-intensive parts of administration and support is almost three times as high as the share of employment. Thus much higher value is created in the more IPR-intensive part of the field.

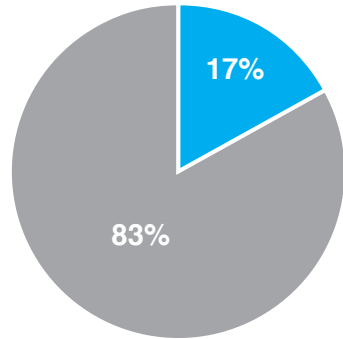
Professional services are to a larger degree based on IPR-intensive activities. Interestingly, in this case the IPR-intensive enterprises stand for a somewhat lower share of value added (58 per cent) than of employment (60 per cent). While the difference is small, this illustrates that the general rule of IPR-intensive activities having higher output per employee does not always hold. Professional services that are IPR-intensive include public relations and communication, media representation, business and management consultancy, technical testing, research and development, specialized design activities and translation and interpretation services. These represent high-value services. Also the non IPR-intensive activities within professional services, such as veterinary activities, activities of head offices and legal activities, are however high-value services. This explains why the share of employment and value added of IPR-intensive parts of this field are roughly the same.

**EU-28 Administration
and Support
Employment**



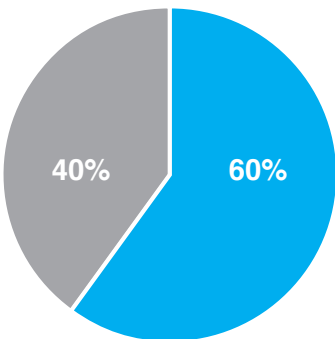
■ IPR-intensive
■ Not IPR-intensive

**EU-28 Administration
and Support
Value added**



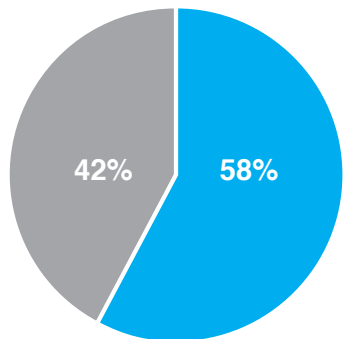
■ IPR-intensive
■ Not IPR-intensive

**EU-28 Professional Services
Employment**



■ IPR-intensive
■ Not IPR-intensive

**EU-28 Professional Services
Value added**



■ IPR-intensive
■ Not IPR-intensive

Publishing, film, music, software and ICT

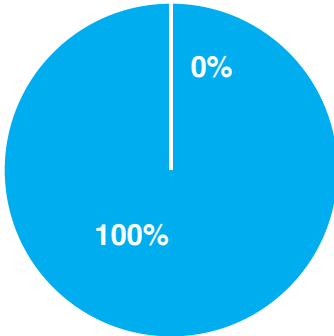
Around 1.4 million jobs are found in European Union enterprises engaged in publishing activities, film and music, programming and broadcasting. These firms contribute 1.8 per cent of value added. Additionally, 3.9 million jobs are found in firms within ICT, or more specifically firms within telecommunications, computer programming/consulting and information service activities. The latter sector contributes 6.6 per cent of value added.

Production and publishing of books, magazines, film, music and software stands out compared to other fields. The reason is that all value creation and employment occurs in IPR-intensive businesses. This is explained by the simple fact that these businesses are

about producing digital content, and thus strongly reliant on copy-right protection. While many or even the majority of businesses in other fields are strongly dependent on IPR-protection, the same is true for all book and magazine publishers, software developers, music developers and film producers.

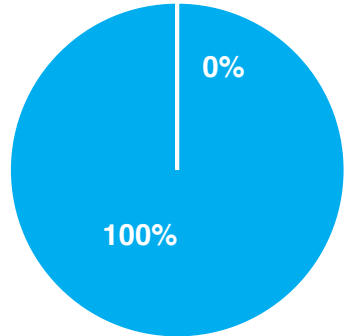
ICT activities are also strongly IPR-intensive. Various forms of telecommunications activities, computer programming, computer consultancy, computer facilities management, data processing and web portal activities rely on copyrights as well as on trademarks. A small part of the sector, in wired telecommunications, is not deemed to be IPR-intensive. This reflects that the methodology used in this paper is conservative in defining IPR-intensity. With a more generous definition, all of the ICT sector would have been defined as being strongly reliant on IPR.

**EU-28 Publishing, Film,
Music, Software
Employment**



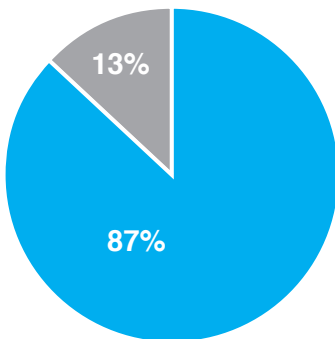
■ IPR-intensive
■ Not IPR-intensive

**EU-28 Publishing, Film,
Music, Software
Value added**



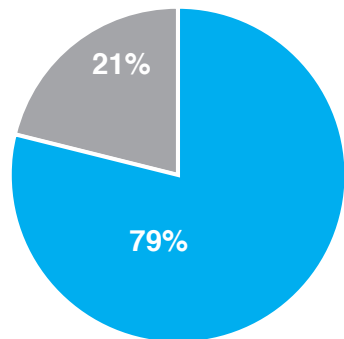
■ IPR-intensive
■ Not IPR-intensive

**EU-28 ICT
Employment**



■ IPR-intensive
■ Not IPR-intensive

**EU-28 ICT
Value added**



■ IPR-intensive
■ Not IPR-intensive

Importance of IPR for Europe

Some business sectors, such as movie production and ICT, are evidently considerably more IPR-intensive than others. Other sectors, such as administration, construction and transportation are less IPR-intensive. Different sectors are of different importance for various European Union member states. Therefore, it comes as no surprise that the IPR-intensity of the member states differ from one another. One could perhaps expect that the Western European countries, which have higher GDP per capita levels, would also have higher share of IPR intensity. As shown on the next page however, this is not necessarily the case.

The first observation that can be drawn from the images on the next page is that intellectual property right play a key role across the union. The second is that Central- and East European countries are found both on top and the bottom of the lists. The highest IPR-intensity in Europe, in terms of value added, is found in Hungary. In this country the IPR-intensive businesses stand for 59 per cent of value added. The lowest rate is found in Latvia, where the corresponding figure is 41 per cent. The reason for why several Eastern and Central European countries have high IPR-intensity is that their manufacturing sectors, which rely on patents as well as trademarks and to a smaller degree on design rights, are large.

While IPR-intensive fields stand for 40 per cent of employment in the European Union business sector, they create 51 per cent of value added within the same sector. A simple calculation shows that if the rest of the business sector was as efficient in creating value, per employee, then the business sector would create 29 per cent higher value.

Of course, manufacturing is also important for a country such as Germany, which has the second highest IPR-intensity in its business sector (57 per cent of value added). In Western European countries a large share of IPR-intensive businesses is also found in ICT and professional services. While some differences exist, all European countries are significantly dependent on IPR-intensive businesses, in manufacturing, ICT, trade and specialized services.

An important observation is that while IPR-intensive fields stand for 40 per cent of employment in the European Union business sector, they create 51 per cent of value added within the same sector. A simple calculation shows that if the rest of the business sector was as efficient in creating value, per employee, then the business sector would create 29 per cent higher value. While this calculation is of course simplified, it does point to the link between higher knowledge-content in the economy and greater level of prosperity.

Share of value added at factor cost in IPR-intensive fields

| | |
|----------------|-----|
| Hungary | 59% |
| Germany | 57% |
| Czech Republic | 54% |
| Slovenia | 52% |
| Denmark | 52% |
| Poland | 52% |
| Netherlands | 51% |
| EU-28 average | 51% |
| Italy | 51% |
| Sweden | 50% |
| Belgium | 50% |
| Bulgaria | 50% |
| Romania | 49% |
| Ireland | 49% |
| Austria | 49% |
| Slovakia | 49% |
| Croatia | 48% |
| United Kingdom | 48% |
| France | 48% |
| Estonia | 47% |
| Greece | 46% |
| Spain | 45% |
| Portugal | 45% |
| Lithuania | 43% |
| Finland | 42% |
| Latvia | 41% |

Share of employees in IPR-intensive fields

| | |
|----------------|-----|
| Czech Republic | 47% |
| Slovenia | 46% |
| Slovakia | 45% |
| Hungary | 44% |
| Romania | 43% |
| Poland | 43% |
| Denmark | 43% |
| Germany | 43% |
| Bulgaria | 43% |
| Italy | 42% |
| Sweden | 40% |
| EU-28 average | 40% |
| Estonia | 40% |
| Croatia | 39% |
| Greece | 39% |
| Austria | 38% |
| Portugal | 38% |
| Belgium | 38% |
| Latvia | 36% |
| Spain | 36% |
| Lithuania | 35% |
| United Kingdom | 35% |
| Netherlands | 35% |
| France | 34% |
| Finland | 34% |
| Ireland | 32% |

IPR and the future of European business

Today economists and public policy experts widely agree that IPR-intensive businesses play a key role in fostering long-term development. A study on the importance on IPR in the US for example reaches the conclusion: “IP is used everywhere in the economy, and IP rights support innovation and creativity in virtually every U.S. industry. [...] Direct employment in the subset of most IP-intensive industries identified in this report amounted to 27.1 million jobs in 2010, while indirect activities associated with these industries provided an additional 12.9 million jobs throughout the economy in 2010, for a total of 40.0 million jobs, or 27.7 percent of all jobs in the economy.”¹⁹

That the estimated share of IPR-intensive jobs is found to be lower than in the present report is likely partially due to that also public sector jobs are included and that different definitions are used. A noteworthy finding is that IPR-intensive businesses do not only directly contribute to job creation, but also have an important role in indirect job creation. This most likely also holds true for the European labor market.

A noteworthy finding is that IPR-intensive businesses do not only directly contribute to job creation, but also have an important role in indirect job creation. This most likely also holds true for the European labor market.

That knowledge-intensive businesses are the key for job development in the marketplace is in line with the research conducted by Enrico Moretti, one of the leading authorities on how growth occurs in modern economies.

In the influential book *The New Geography of Jobs* Moretti studies the geographical division of job growth in the US. The study, which includes 11 million individuals in 320 regions in the US, shows that growth occurs mainly in those regions which have a high knowledge intensity. The jobs created in knowledge intensive businesses, not least those oriented towards international exports, are the driver for job creation in more simple services.²⁰ A similar conclusion is found in a study that Moretti has conducted together with researcher Per Thulin on the Swedish economy.²¹

The importance of immaterial value creation for prosperity and employment will most likely continue to increase over the years. The reason is that the global economy shifts towards greater knowledge-content. This explains why the European Commission points out the importance of strengthening knowledge and innovation.²² It also explains why policymakers around the world are increasingly focusing on creating a business climate which does not only promote investments in physical capital but also immaterial assets.

In order for European economies to retain their globally leading positions, the form of value creation that is increasingly important for innovative and growing businesses – namely intellectual value creation – must be strengthened. Intellectual value creation is also the driver for global growth. The reason is that ideas tend to rapidly spread between regions and countries, with low transaction costs. The more Europe develops with new knowledge, the greater will the potential be for other countries to draw benefit from and expand on this knowledge.

Until recently governments around the world competed to create favorable business

²⁰ Moretti (2012).

²¹ Moretti and Thulin (2012).

²² European Commission (2010, 2016).

¹⁹ Economics and Statistics Administration and United States Patent and Trademark Office (2012).

environments, in order to attract physical capital. Today also knowledge capital and the people who create new knowledge are increasingly flowing over the borders. Innovative firms, as well as entrepreneurs, researchers, designers, programmers and researchers are today willing to move from one region or country to another if offered better conditions to succeed. The globalization of innovation processes fosters global growth, but also means that countries have to strengthen their attractiveness to stay on top.

Creating a good system for protection of IPR is all about finding a balance, between allowing knowledge to spread and for those who have created intellectual values to benefit from it

Creating favorable business climates, funding education and research, and encouraging knowledge-formation through protection of IPR, are all policies that play a key role in strengthening European countries as knowledge economies. European nations can also draw on a number of other inherent advantages, including a skilled workforce, an advanced business sector with substantial hidden capital in the form of organizational know-how and significant investments in research and development by the public and private sector. The cultural heritage and diversity of Europe can additionally benefit creative enterprises.

In one respect, one can regard immaterial value creation as quite similar to material value creation, with two key differences: The first is that immaterial values have to be protected by IPR rather than physical property rights. The second is that immaterial values are often created in a more knowledge-intensive way as physical values. However, there is also

an added complexity, as knowledge is more difficult to lock in place.

In 1984 Silicon Valley futurist Stewart Brand famously remarked “information wants to be free”, in response to a point made by Steve Wozniak, the co-founder of Apple. This quote has become a slogan of activists who criticize the concept of IPR. The full quote is however more balanced: “On the one hand information wants to be expensive, because it’s so valuable. The right information in the right place just changes your life. On the other hand, information wants to be free, because the cost of getting it out is getting lower and lower all the time.”²³ The dilemma is how to protect the ownership right of knowledge, that often requires massive investments and the effort of entrepreneurs and qualified workers to be created, while at the same time encouraging it to spread. Creating a good system for protection of IPR is all about finding a balance, between allowing knowledge to spread and for those who have created intellectual values to benefit from it. Smart policy design is required in order to balance these two needs.

²³ Quoted by Jennifer Lai in Forbes (2009).



About the author

Dr. Nima Sanandaji is the president of the European Centre for Entrepreneurship and Policy Reform. He has written over twenty books about public policy issues, a number of which have been translated to numerous languages. His writings includes “Debunking Utopia”, “The Nordic Gender Equality Paradox” and “SuperEntrepreneurs”.

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