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# Intellectual Property, Jobs & Prosperity in the Nordic Region

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# Intellectual Property, Jobs & Prosperity in the Nordic Region

## 2022 Index

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# Sammanfattning

Nästan alla företag i Norden är i viss mån beroende av varumärken, patent, upphovsrätt och designrättigheter. Vissa företag är intensivt beroende av immateriella rättigheter i sin verksamhet. Denna studie undersöker hur många jobb och vilket ekonomiskt värde dessa företag skapar, i de olika nordiska länderna och regionerna inom dessa länder. Studien uppskattar också utträngningseffekten orsakat av varumärkesförfalskning och piratkopiering. Den senare beräkningen är gjord för Sverige, och genom att anta att effekten är av samma storlek uppskattas nivåerna även för de andra nordiska länderna.

## Värdeskapande och jobb i företag med intensivt beroende av immateriella rättigheter

En form av immateriella rättigheter är upphovsrätt. Upphovsrätten bygger på tanken att en person eller ett företag som har skapat ett originalverk har ensamrätt att bestämma hur det får kopieras och användas av andra. Sektorer med stort upphovsrättsberoende inkluderar telekommunikation, video- och tv-programproduktion, ljudinspelning och musikpublicering samt reklam och marknadsundersökningar. I Norden skapades 78 miljarder euro i ekonomiskt värde (bidrag till BNP) år 2021 i företag med intensivt upphovsrättsberoende. Av dessa skapades 29 miljarder euro i Sverige, 17 miljarder i Danmark, 17 miljarder i Norge och 14 miljarder i Finland. Samma företag sysselsätter 802 700 individer. Sverige står för 339 900 av de sysselsatta, Danmark 166 900, Norge 138 300 och Finland 157 600.

En av de främsta anledningarna till att konsumenter väljer en produkt framför en annan är tilltalande design. Designrättigheter skyddar en produkts utseende, vilket i sin tur beror på egenskaper som form, material och färg. Denna form av immateriella rättigheter är viktig för många tillverkningsindustrier. I Norden skapades 92 miljarder euro i värde 2021 i företag med ett intensivt designberoende. Av dessa skapades 37 miljarder euro i Sverige, 30 miljarder i Danmark, 10 miljarder i Norge och 15 miljarder i Finland. Samma företag sysselsätter 941 000 indivi-

der. Sverige står för 404 000 av de sysselsatta, Danmark 225 800, Norge 124 000 och Finland 187 100.

En tredje form av immateriella rättigheter är patent. Innan patenten utvecklades hölls tekniska framsteg ofta hemliga för att förhindra att plagiatorer drar nytta av dem. Detta hejdade den tekniska utvecklingen, eftersom tekniken inte spred sig, och minskade avsevärt incitamenten att investera i teknisk innovation. Patent stimulerar till uppfinnande genom att ge ägaren ensamrätten till en uppfinning under en begränsad tid, varefter uppfinningen kan kopieras av andra. Vetenskaplig forskning och utveckling, telekommunikation och många tillverkningssektorer är intensivt beroende av patent. I Norden skapades 181 miljarder euro i värde 2021 i företag med intensivt patentberoende. Av dessa skapades 67 miljarder euro i Sverige, 56 miljarder i Danmark, 31 miljarder i Norge och 28 miljarder i Finland. Samma företag sysselsätter 1 829 300 individer. Sverige står för 741 200 av de sysselsatta, Danmark 460 600, Norge 303 600 och Finland 324 000.

Varumärken är immateriella rättigheter som består av ett igenkännbart tecken, uttryck eller en design som identifierar produkter och eller tjänster som kommer från en källa. Varumärken spelar en viktig roll i det moderna samhället. Alla affärssektorer med ett intensivt beroende av patent, mönsterrätt och upphovsrätt är också starkt beroende av varumärken. I Norden skapades 276 miljarder euro i värde 2021 i företag med starkt varumärkesberoende. Av dessa 101 miljarder euro skapades i Sverige, 77 miljarder i Danmark, 54 miljarder i Norge och 44 miljarder i Finland. Samma företag sysselsätter 2 996 400 individer. Sverige står för 1 225 600 av de sysselsatta, Danmark 706 800, Norge 531 100 och Finland 532 900.

## Ekonomisk förlust av varumärkesförfalskning och piratkopiering

I **Sverige** beräknas varumärkesförfalskning och piratkopiering leda till minskat värdeskapande på 5,8 miljarder euro årligen och utträngning av nära 71 000 jobb i näringar med intensivt beroende av immateriella rättigheter. Skatteintäkterna påverkas också, med nära 1,6 miljarder euro i skatteintäkter som går förlorade på grund av att legala företag trängs ut genom varumärkesförfalskning och piratkopiering. För **Danmark** beräknas varumär-

kesförfalskning och piratkopiering leda till minskat värdeskapande på 4,5 miljarder euro årligen och att nära 41 000 arbetstillfällen trängs ut från industrier som är intensivt beroende av immateriella rättigheter. Förlusten av skatteintäkter uppgår till cirka 1,2 miljarder euro årligen i Danmark.

I fallet med **Norge** beräknas varumärkesförfalskning och piratkopiering leda till minskat värdeskapande på 3,1 miljarder euro årligen. Värdeskapandet i **Finland** minskar med cirka 2,5 miljarder euro på grund av varumärkesförfalskning och piratkopiering. I både Norge och Finland trängs nära 31 000 arbetstillfällen ut av varumärkesförfalskning och piratkopiering. Förlusten av skatteintäkter är cirka 820 miljoner Euro i Norge och 670 miljoner Euro i Finland.

Branscher med intensivt beroende av immateriella rättigheter tenderar att ha högre produktion per anställd än andra delar av näringslivet. I Finland och Danmark skapar den genomsnittliga anställde i näringar med intensivt beroende av immaterialrätt 34 procent högre ekonomiskt värde än den genomsnittliga anställde i resten av näringslivet. Samma förhållande i Sverige är 30 procent högre ekonomiskt värde. Endast i Norge, där mycket av det nationella välståndet skapas inom olje- och naturgassektorerna, är detta förhållande det omvända. En förändring mot en högre andel av ekonomin med ett intensivt immateriellt rättighetsberoende kommer sannolikt att öka BNP per capita i Norden.

# Summary

Nearly all businesses in the Nordic region to some extent depend on trademarks, patents, copyright, and design rights. Some businesses are *intensely dependent* on intellectual property rights in their operations. This study examines how many jobs and what economic value those businesses create, in the different Nordic countries and the regions within those countries. The study also estimates the crowding out effect caused by counterfeiting and piracy. The latter calculation is made for Sweden, and by assuming that the effect is of same size, used to estimate the levels also for the other Nordic countries.

## Value creation and jobs in immaterial rights intensive businesses

One form of immaterial rights is *copyright*. Copyright is based on the idea that a person or business that has created an original work has the exclusive right to determine how it may be copied and used by others. Sectors with large dependency on copyright include telecommunications, video and television program production, sound recording and music publishing activities as well as advertising and market research. In the Nordic region, 78 billion Euros in value was created in 2021 in businesses with intense dependency on copyright. Of this 29 billion Euro was created in Sweden, 17 billion in Denmark, 17 billion in Norway and 14 billion in Finland. The same businesses employ 802,700 individuals—with Sweden accounting for 339,900 of the employed, Denmark 166,900, Norway 138,300, and Finland 157,600.

One of the main reasons for why consumers choose one product over another is appealing design. *Design rights* protect the appearance of a product, which in turn result from attributes such as shape, materials, and colour. This form of immaterial rights is important for many manufacturing industries. In the Nordic region, 92 billion Euros in value was created in 2021 in businesses with intense dependency on design. Of this 37 billion Euro was created in Sweden, 30 billion in Denmark, 10 billion in Norway and 15 billion in Finland. The same business-

es employ 941,000 individuals—with Sweden accounting for 404,000 of the employed, Denmark 225,800, Norway 124,000, and Finland 187,100.

A third form of immaterial rights are *patents*. Before the evolution of patents, technological achievements were kept secret, to prevent plagiarizers from benefitting from them. This halted the pace of technological development, since technologies did not spread, and significantly reduced the incentives to invest in technological innovation. Patents incentivize invention by giving the owner the exclusive right to an invention for a limited amount of time, after which the invention can be copied by others. Scientific research and development, telecommunications and many manufacturing sectors are intensely dependent on patents. In the Nordic region, 181 billion Euros in value was created in 2021 in businesses with intense dependency on patents. Of this 67 billion Euro was created in Sweden, 56 billion in Denmark, 31 billion in Norway and 28 billion in Finland. The same businesses employ 1,829,300 individuals—with Sweden accounting for 741,200 of the employed, Denmark 460,600, Norway 303,600, and Finland 324,000.

*Trademarks* are intellectual property consisting of a recognizable sign, expression or design which identifies products and or services coming from one source. Trademarks play an integral role in modern society. All business sectors with an intense dependency on patents, design rights and copyright are also intensely dependent on trademarks. In the Nordic region, 276 billion Euros in value was created in 2021 in businesses with intense dependency on trademarks. Of this 101 billion Euro was created in Sweden, 77 billion in Denmark, 54 billion in Norway and 44 billion in Finland. The same businesses employ 2,996,400 individuals—with Sweden accounting for 1,225,600 of the employed, Denmark 706,800, Norway 531,100, and Finland 532,900.

## Economic loss of counterfeiting and piracy

In **Sweden**, counterfeiting and piracy are estimated to lead to reduced value creation of 5.8 billion Euros annually and crowding out of close to 71 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with close to 1,6 billion Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy. For **Denmark**, counterfeiting and piracy are estimated to lead to reduced value creation of 4.5 billion Eu-

ros annually and crowding out of close to 41 000 jobs in immaterial rights intensive industries. Tax revenues loss amounts to circa 1,2 billion Euros due to the crowding out of legal businesses by counterfeiting and piracy.

In the case of **Norway**, counterfeiting and piracy are estimated to lead to reduced value creation of 3.1 billion Euros annually. Value creation in **Finland** is reduced by circa 2.5 billion Euros due to counterfeiting and piracy. In both Norway and Finland, nearly 31 000 jobs are crowded out by counterfeiting and piracy. The tax revenue loss is circa 820 million Euros for Norway and circa 670 million Euros for Finland.

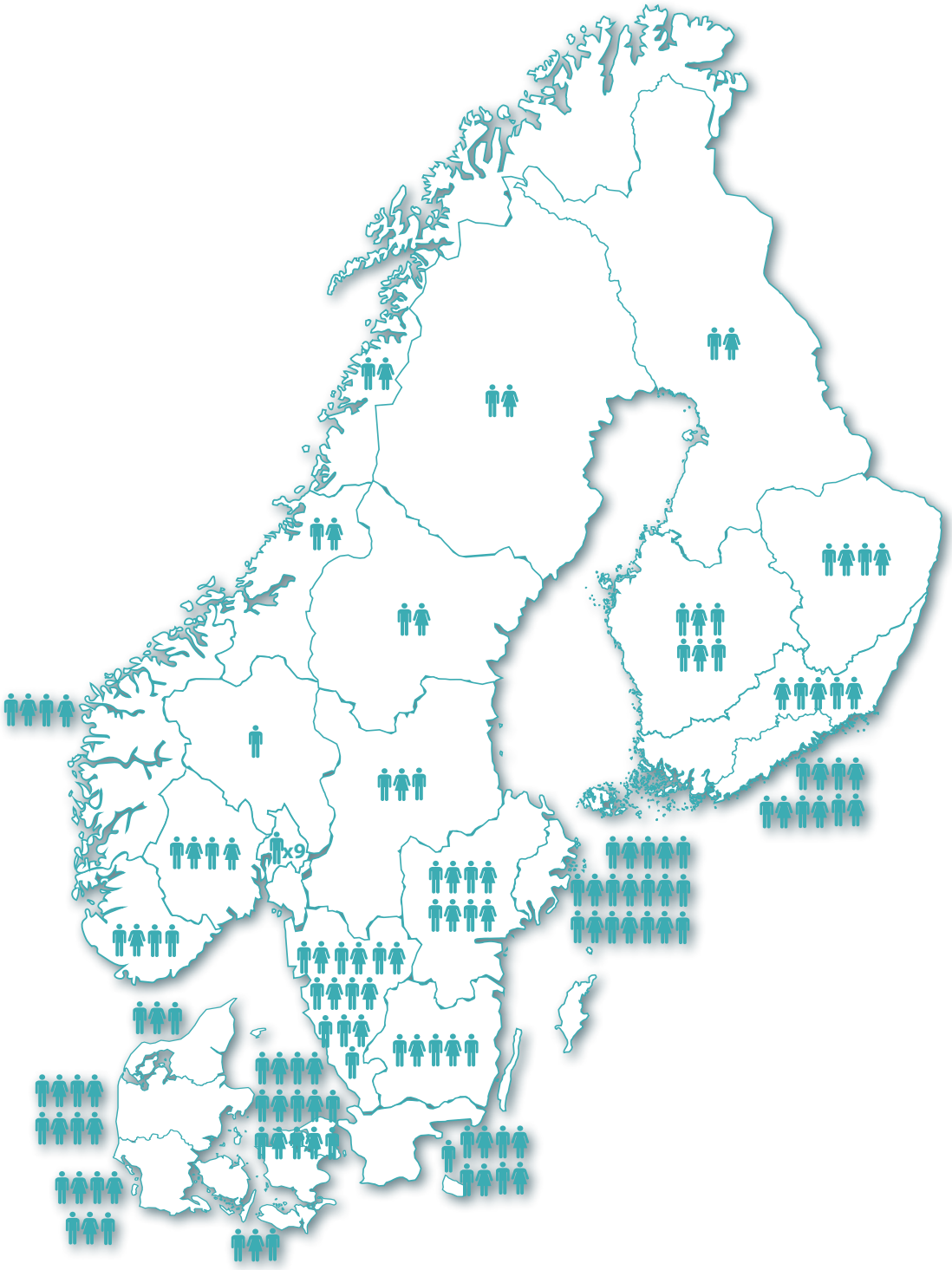
Sectors with intense dependency on immaterial rights tend to have considerably higher output per employee than other parts of the business sector. In Finland and Denmark, the average employee in immaterial rights intensive occupation creates 34 percent higher economic value than the average employee in the rest of the business sector. The same relation in Sweden is 30 percent higher economic value. Only in Norway, where much of national wealth is created in the oil and natural gas sectors, this relationship is the inverse. A shift towards higher share of the economy with intense immaterial rights dependency is likely to boost GDP per capita in the Nordic region.

**Figure 1. Societal benefits of immaterial value creation**

35% of the private sector jobs of the four Nordic economies exists in businesses with intense dependency on intellectual property rights.

The same businesses create 38% of the value added in the private sector economy.

**Map: Number of employees in immaterial rights intensive industries across the Nordics (each person represents 20 000 jobs in immaterial rights intensive industries)**



# Foreword: Intellectual property (IP) laws — a key to stimulating job growth in the Nordic region

The countries in the Nordic region continue their move from being dominated by traditional industries based on natural resources to knowledge-based sectors. Their innovative capacity is ranked highly in the world. At the same time rightsholders often experience a lack of understanding for IP when it comes to awareness and modern laws and regulation. The study that you are about to read wants to change that and be part of bringing knowledge in an area that creates important jobs and economic growth.

Since the last index was published in 2020, the corona pandemic has swept the world. It has changed many things in our lives, and our days are filled with solutions based on IP; our meetings are on digital platforms, we are vaccinated with vaccines based on years of research, and in our spare time we enjoy digital concerts, and our conversations revolves around the latest movies and tv-series that can be watched from home. The interest in home decoration is also increasing since we spend more time at home, so we redecorate and everything from our home-office chairs to the designer lamp are protected by IP.

Intellectual Property, Jobs & Prosperity in the Nordic Region index 2022, shows that the higher share of the economy that is intensely dependent on IP, the higher will BNP per capita be, since every employee gives a higher economic value with up to 34 percent. At the same time, these businesses are more sensitive to infringements. This year's index shows that Sweden loses 15,4 billion SEK in tax revenues annually and 174 000 jobs are crowded out due to infringements. It is like slowly draining water from a tub.

For these worrying times and for the future, IP laws and regulations need to be predictable, clear, and possible to use for those who they are there to protect.

Within the European Union a new copyright directive is being implemented. It was preceded by an intense discussion regarding balancing of interests in the

trilogue, between the Parliament, Commission, and Council. The question of how to best regulate the digital world is also currently being discussed in the Digital Markets Act (DMA) and Digital Services Act (DSA). IP intensive businesses such as pharmaceutical industries, publishers, software, movies, etc. are asking for clear laws on information about businesses also online (Know Your Business Costumer), which is where a big part of the infringements are taking place. Access to information on who is behind an online infringement is not only relevant for IP intense businesses but for society.

With the Intellectual Property, Jobs & Prosperity in the Nordic Region index 2022 we want to enlighten and inform about the potential within IP and the challenges we see. We do not claim to have all the answers on how to best regulate—that is a difficult task for the legislators. But we have a lot of knowledge about our businesses and how the different countries in the Nordic region work and are affected positively and negatively by the current IP laws.

Our ambition is that the Intellectual Property, Jobs & Prosperity in the Nordic Region index 2022, will lead to greater knowledge, understanding, and improved insights on how to best regulate IP in balance so that we can keep and attract more jobs in the Nordics and stop the drainage caused by infringements.

Sara Lindbäck,
Representing the network ”A modern intellectual property law”

# Introduction

This study is based on an in-depth analysis of the latest available structural business information for the Nordic countries Denmark, Finland, Norway, and Sweden. The purpose is to measure how much of the jobs, and economic value created, in the Nordic nations are linked to businesses that are intensely dependent on immaterial rights—in the form of trademarks, patents, copyright and design rights. This analysis is also carried out at a regional basis. The study finds that firms with intense dependency on immaterial rights play a key role in offering employment and are even more important when it comes to value creation, in the Nordic nations and their respective regions.

The study also estimates how much value is lost each year in Sweden due to immaterial rights violations, such as counterfeiting and piracy. This number is compared to the value created by immaterial rights intensive companies for the Swedish economy, to understand how much of the business activity is crowded out by immaterial rights violations. An assumption is made that the same crowding out effect as measured for Sweden also exists for the other Nordic countries, and the regions within those countries. Through this methodology, an estimate is given for how much economic value and how many jobs are crowded out by immaterial rights violations in the different Nordic countries and the regions within these countries.

Value added to the economy is a measure that exists on national level. To measure value added on a regional basis, the total value created and number of jobs in immaterial rights intensive industries (such as IT/technology, for example) is compiled for the Nordic nations and then compared with the number of employees in the different regions of the country. The assumption is made that the division of jobs is same as division of value created, so that if a region in for example Denmark has one tenth of the employees in IT/technology of the whole of Denmark, then also same share of value creation in this industry occurs in this region. Through this methodology, it becomes possible to measure the number of jobs created in immaterial rights intensive industries in the different Nordic regions, to estimate how much value is created for the regional economies by immaterial rights intensive industries, and how many jobs and how much value is crowded out by counterfeiting and piracy in each region.

The Nordic region constitutes the 12th largest economy in the world.[1] While the strength of the Nordic economies historically has been an abundance of natural resources, today it is knowledge-intensity. The average Nordic nation has a higher concentration of brain business jobs, a measure of highly knowledge intensive jobs, amongst the working age population than countries in Western, Southern and Eastern and Central Europe.[2] The European Commission's 2021 European Innovation Scoreboard, which compares innovative output as well as the conditions for innovation to occur, finds that Sweden is the EU innovation leader, followed by Finland and Denmark on second and third place respectively.[3] Firms that rely on brain power tend to also be strongly dependent on immaterial rights, since these rights protect formalized investments in knowledge and digital creation. Therefore, it comes as no surprise that a significant share of the value creation in Nordic economies occurs in firms with an intense dependency on different forms of intellectual property.

As late as the end of the 19th century, the Nordic region was a relatively undeveloped outskirt of Europe. As business freedom was introduced in the region about this time, the nation's grew prosperous by relying on their wealth of natural resources, making trade free and fostering knowledge-based businesses.[4] Firms such as Atlas (today known as Atlas Copco), Novo Industri A/S (now known as Novo Nordisk), Nokia, Aker Kværner (today known as Aker Solutions), Electrolux and Vestjysk Stålteknik A/S (today known as Vestas) developed into internationally recognized knowledge-firms by relying on engineering skills combined with pragmatic Nordic problem solving. Like many Nordic firms, they begun to continuously invest in innovation processes, protecting their innovations with patents. Over time, Nordic firms gained an international reputation for their attention to detail, quality, and safety. The firms invested in building up brands trusted around the world. This investment in brands was protected by trademarks.

With time, the Nordics came to be known around the world for the works of designers such as Finn Juhl, Poul Kjærholm, Kaare Klint, Josef Frank, Hans Brattrud, Sven Ivar Dysthe, Alvar Aalto and Aino Aalto. Many Nordic businesses have thrived by promoting functionalistic design to an international audience. For firms in industrial design, furniture and fashion design

1 Nordic Council of Ministers (2018).

2 ECEPR (2021). Brain Business Jobs are knowledge-intensive occupations in the traditional tech-sector, ICT, advanced services, and creative professions.

3 European Commission (2021). The three Nordic nations that are EU-member states are thus the leading member states in terms of innovative capacity.

4 Adoption of business freedom and integration into the global marketplace happened earlier in Denmark, followed by Sweden, and later in Finland.

rights are an integral part of the business model. ABBA, A-ha, Roxette, Ace of Base, Whigfield, Aqua, Björk and Sigur Rós are some examples of the Nordic Music Wonder, made possible by the protection of the intellectual property created by creative individuals. The music wonder has been followed by Nordic success in film and television as well as a thriving programming and digital games industry, again businesses with strong reliance on immaterial rights protection.

Much of the Nordic success story, through which previously poor agrarian nations grew into prosperous welfare societies, has been fuelled by formalized knowledge and digital content. Nordic manufacturing firms would not have grown into international technology firms had they relied on simple manufacturing, rather than continuously working towards product and procedure innovations that gave them an international edge. These investments in turn were made since their fruits were protected by patents. If industrial innovations, designs, songs, and brands had not been protected, incentives would have been undermined for technological innovations, song-writing, furniture design, computer game programming and many other aspects of the Nordic knowledge economy.

> ***Today, many leading companies in the Nordics are intensely dependent on various forms of immaterial rights. This includes Nordic firms in technology and industry, engaged in making a transition to a green economy possible by developing new green technologies.***

Today, many leading companies in the Nordics are intensely dependent on various forms of immaterial rights. This includes Nordic firms in technology and industry, engaged in making a transition to a green economy possible by developing new green technologies. Investing in technology is costly and comes with significant risk of failure. The technology investments are made possible despite this since patents protect immaterial value creation. The Nordic success story continues still, driven by firms in IT & technology, knowledge intensive industries and services, media and entertainment, fashion & design, as well as trademark dependent trade. A common trait for companies in these fields is their intense dependence on immaterial value creation. Protecting the immaterial values created by Nordic firms remains an important challenge for policy makers, to promote transition to sustainable technologies, and to foster creativity and innovation in the economy.

**Immaterial values** differ from **physical values** simply in that they lack physical form. Earlier in history the great part of economic value was created in physical form—for example agriculture, manufacture of tools to work farms with and construction of buildings. Today the economy relies on a mixture of material and immaterial value creation. Example of immaterial values include innovation, business ideas, design, program code and digital content in the form of film and music.

*”Intellectual Property Rights (IPR) have been established to ensure that creative and inventive efforts are rewarded and that investments in new and more efficient products are encouraged. They greatly stimulate the creation of jobs in today’s knowledge-based economy.*

*Infringements of intellectual property rights are a widespread and worrying phenomenon. Reasons for its expansion are various, including the attractiveness of a ‘look-alike product’ at a cheap price, the ease of production of copies at minimal costs, the development of new forms of marketing such as e-commerce and the growth of international trade.*

*IPR infringements are harmful as they reduce business and government revenues, stifle investment and innovation and hinder economic growth.”*

*— European Commission on the importance of immaterial rights.*

# Value creation in modern society

How is value created in society? For a long time, the answer provided by economists was simple: capital, labour and natural resources are the three cornerstones of economic activity. The wealth of society will grow when the productivity of labour increases, either as consequence of investments in innovations or a better utilization of the natural resources available. The management consultant and author Peter Drucker, whose ideas have influenced the understanding of modern business operations, challenged this simple view of economics during the late 1960s. Drucker observed that many leading firms relied on the knowledge that existed amongst their employees and within the organization. Knowledge was the forgotten cornerstone of economic success.[5]

> ***The knowledge-based society has emerged in a state in which an increasing part of the economy is dependent on immaterial, rather than material, value creation.***

The theory of the knowledge-based economy, which is based on the observations that Drucker and others made, has with time become widely accepted. One example is the conclusions drawn in a study published at the end of the 1990s, in which Peter Klenow and Andrés Rodríguez-Clare examined why prosperity growth occurred faster in some economies than others. They found that the traditional model based on physical capital, labour, and natural resources only to a limited degree could explain the development. Instead, they claimed that 90 percent of the variation in growth could be explained by how efficiently investments were utilized, rather than by the size of the investments.[6] Later studies have confirmed the connection between innovation and growth. A combination of technological innovations, new ways of organizing work processes, organizational changes and service innovations drive long-term progress.[7] Immaterial rights play a key role in legalized technology transfer between firms, and between more economically to less economically developed countries.[8]

5 Drucker (2011). Originally published in 1969.

6 Klenow & Rodríguez-Clare (1997).

7 See for example Grossman and Helpman (1993), Hasan & Tucci (2010), Soete (2011) and Tamura et al. (2019)

8 Sundaram, Rajavenkatesan Prema (2020).

While a common idea according to the horizontal innovation model is that larger economies innovate more and grow faster, it has been shown that in fact smaller well-developed economies have significant innovative potential.[9] This is in line with the Nordic experience. The Nordic nations have relatively small populations, yet together they form a globally important innovation region. The knowledge-based society has emerged in a time in which an increasing part of the economy is dependent on immaterial, rather than material, value creation. Immaterial value creation in the form of business ideas, technological innovation and digital content is a key part of many modern businesses. Immaterial values typically result from investments in organized knowledge, made over a long period. In some businesses, such as film, music, programming, and computer game design, nearly all value created is in immaterial form since the output is digital content.

Immaterial value creation that depends on intellectual property rights is not limited to a few specialized parts of the modern economy. Rather, in the knowledge-based economies, such as the Nordic nations, intellectual property is important for broad parts of the business sector. For example, businesses in different sectors find that it is valuable to invest in strengthening the firm's reputation through trademarks and well-designed homepages. Such investments are of course particularly important for firms that provide their customers with superior products or services. The reason is that it is firms with a good base reputation that have most to win by enforcing their trademarks. For the same reason, firms that take social and environmental responsibility have a larger interest in protecting their trademarks, as sustainability strengthens the trademark of the firms.

Nearly all firms rely to a certain extent on intellectual property, while a significant share have an intense reliance on them. Firms that rely on new technologies, advanced design, digital content, service innovation and other forms of intellectual property can often gain a competitive advantage from these assets. This is important for European businesses that compete in global markets since intellectual property advantage can make it possible for the firms to compete with businesses from lower wage countries.

That modern economies are increasingly oriented towards immaterial value creation has several societal benefits. Given the very nature of ideas, they travel fast and can be scaled up. There are environmental benefits from an economic model in which growth

9 Latzer, Matsuyama, & Parenti (2019).

is not necessarily the result of manufacturing ever-increasing volumes of products, but instead is caused by a higher quality of goods produced and a greater importance of immaterial content. The transition towards an immaterial-oriented economy has been taking place since the early European industrial revolution—and can in fact be traced to the Middle Eastern industrial revolution that occurred a thousand years ago.[10] Digitalization is currently rapidly increasing the importance of immaterial value creation, and thus the transition is accelerating.

***The transition towards an immaterial-oriented economy has been taking place since the early European industrial revolution—and can in fact be traced to the Middle Eastern industrial revolution that occurred a thousand years ago.***

10 See Sanandaji (2018) for further discussion.

# Immaterial rights, innovation, and growth

Within the research literature, there are two viewpoints on immaterial rights protection. The first is that immaterial rights protect important values and that without such protection innovation would be considerably less rewarding and thus much rarer. The other perspective is that excessive utilization of, for example, patents can hinder growth, not least in cases where firms utilize patents to protect processes that competitors could readily discovered on their own. A study by Richard Gold, Jean-Frédéric Morin and Erica Shadeed actualizes the issue by studying the level of immaterial rights protection in 124 economies during the period between 1995 and 2011. The study finds that higher level of immaterial rights protection is indeed associated with higher rates of economic growth. The results are consistent with two casual pathways explored in other literature, namely that intellectual property leads to greater degree of technology transfer and increased domestic innovation activity. The study also finds that growth leads to a higher level of intellectual property protection, which does complicate the issue of causality.[11] The latter effect may be because policymakers in economies with economic progress put greater emphasis on immaterial rights protection, seeing that this protection is favourable to growth.

A similar study but on Chinese data has been conducted by Lily Fang, Josh Lerner and Chaopeng Wu. Their study focuses on the development of previously state-owned enterprises that were privatized. They find that the rate of innovation increased in the businesses following privatization and that this effect was stronger in those cities in China where immaterial rights protection was stronger. Advanced methodology was used in the study to find companies with very similar circumstances, to better capture the effect of immaterial protection. A positive relation was found between immaterial rights protection and the rate of innovation once firms are coupled to similar firms in cities with varying degrees of immaterial rights protection. Thus, the effect is likely to be casual.[12]

Pedro Cunha Neves and co-authors have in a study published in 2021 con-

11 Gold, Morin & Shadeed (2019).

12 Fang, Lerner & Wu (2017).

ducted a literature review and meta-analysis. Their finding is that while the empirical evidence of the effects on intellectual property rights on innovation and growth is mixed, overall intellectual property rights has a positive effect on innovation and growth. This effect is stronger in developed economies compared to developing economies.[13]

Modern research supports the idea that immaterial rights strengthen economic growth and innovation. It should also be noted that immaterial rights of course must be balanced, rewarding investments in ideas and digital content are protected, as well as allowing new innovators to enter the market. Immaterial rights are a balance, between protecting existing ideas and digital content from plagiarism, while encouraging novel innovation.

***Modern research supports the idea that immaterial rights strengthen economic growth and innovation.***

In 2021 the European Union Intellectual Property Office (EUIPO) and the European Patent Office (EPO) in cooperation published a study, based on analysing a sample of over 127 000 European firms, in order to compare the economic performance of firms that did own intellectual property rights. The intellectual property rights included in the study were patents, designs, trademarks, or any combination of the three. It found that firms that do own intellectual property rights generate on average 20 percent higher revenue per employee, compared to their counterparts without a portfolio of intellectual property. Also, the firms with intellectual property rights paid on average 19 percent higher wages, compared to firms without intellectual property portfolio.[14] Recent research thus confirms that firms with reliance on intellectual property rights can achieve higher economic output, and that this indeed also benefits the employees in the form of higher wages.

13 Neves et al. (2021).

14 EPO & EUIPO (2021).

# Historic context of intellectual property rights

History can help us better understand the importance of protecting immaterial as well as material value creation. A common modern misconception states that enterprise and market economy are relatively new historic innovations, which evolved around the renaissance in Europe. In fact, enterprise and market economy evolved already 4 000 years ago in ancient Babylonia and Assyria. The Middle Eastern market tradition however lacked intellectual property rights. The first intellectual property rights, in the forms of patents, evolved in the renaissance cities of Italy. Historically, it was not before the market economy was combined with intellectual property rights that the knowledge economy could emerge.

In the early Middle Ages, a Middle Eastern market renaissance coincided with the development of ground-breaking innovations. The Damascus swords forged in Syria were made of such advanced material that Europeans never managed to reproduce them. Somehow, the Middle Eastern steelmakers managed to incorporate carbon nanotubes in the steel structure.[15] This is an amazing feat of engineering, as carbon nanotubes are considered an advanced 20th century invention. What is interesting is that while the Middle East at the time had an advanced market economic model, with physical property rights, intellectual property rights did not exist. New advances in technology therefore did not spread and were instead kept secret.

The Middle Eastern market renaissance of the early Middle Ages also took place at a time when advanced manufacturing plants were set up to build and construct, amongst other things, astronomical instruments, ceramics, chemicals, distillation technologies, clocks, mechanical hydro- and wind-powered machinery, matting, mosaics, glass, pulp and paper, perfumery, petroleum, pharmaceuticals, ropes, silk, sugar, textiles, and weapons. Knowledge of these production processes, carried out in early factory complexes (tiraz) did to some extent survive and inspired the later European industrial revolution. Yet, much of the knowledge has been lost since then. Perhaps the most important example of a thing forgotten is the *Bagh-*

15 Reibold et.al (2006).

*dad battery* or *Parthian battery*, which is made up of a ceramic pot, a tube of copper, and a rod of iron. The artefacts found are believed to be close to two thousand years old and seem to be an early battery. It has been hypothesized that the object functioned as a galvanic cell, possibly used for the electroplating of metals.[16]

***Instead of inspiring future growth, these advances were however lost only to be discovered much later in history. One key reason is that while the Middle Eastern market model had an advanced protection of physical property rights, intellectual property rights did not exist.***

The discovery of carbon nanotubes and an early battery shows that ground-breaking advances, in the form of nanotechnology and electricity, occurred in the early Middle Ages. Instead of inspiring future growth, these advances were however lost only to be discovered much later in history. One key reason is that while the Middle Eastern market model had an advanced protection of physical property rights, intellectual property rights did not exist. Therefore, new technologies and ideas did not spread, as their creators elected to not speak of their existence. The lack of intellectual property rights also explains why the medical advances of the Middle East, China and India in part have been lost to history. If intellectual property had existed in these civilizations, it stands to reason that the technological advancement had been greater through history.[17]

Already during ancient times, some early attempts to introduce intellectual property rights were made in different parts of the world. A systematic form of this incentive seems, however, to first have been in place in the Italian city-states at the end of the 15th century. The first known patent was awarded in 1421 by the Republic of Florence. The receiver was the architect Filippo Brunelleschi, who had invented a barge with hoisting gear, which made it possible to carry marble along the Arno River. Brunelleschi was granted exclusive rights to the fruits of his invention for a three-year period.[18] Another important advancement was when, in 1665, the British and French simultaneously launched the first scientific journals of the world, the French *Journal des sçavans* and the British *Philosophical Transactions of the Royal Society*.[19] Before the invention of scientific journals, researchers often took credit for the ideas produced by others. Since it was difficult

17 Sanandaji (2018).

16 Keyser (1993).

18 MacLeod (2002).

19 Kronick (1976).

for an individual to prove that he or she was the first to formulate a new idea, researchers were reluctant to share their findings with each other, which impeded scientific progress. With the scientific journals, it became clear who was the originator of an idea or insight, thus creating incentives for sharing ideas and research findings.

***The historical evidence points to the conclusion that innovation and prosperity flourished when enterprise and physical property rights were combined with intellectual property rights.***

The scientific journal and the patent right were crucial to the scientific and industrial revolution of the Western world. In essence, they both granted property rights to ideas, and can thus be seen as an extension of market institutions from the area of material values to the area of immaterial values. Copyright, design rights and trademarks are other immaterial rights innovations that paved way for the modern knowledge economy. The historical evidence points to the conclusion that innovation and prosperity flourished when enterprise and physical property rights were combined with intellectual property rights. The early industrial revolution of the Middle East was a time of advanced technological breakthrough, but in the absence of patents the innovations did not spread.

When the European industrial revolution occurred, patents were in place and those who had invented new technologies encouraged them to be spread since they gained from that as patent holders. Investments in new technologies flourished since patents created a market for innovation. How the legislation concerning intellectual property rights should be structured and upheld is a complex matter, but that these rights play a key role in fostering technological and economic growth is strongly suggested by historical experience.

The modern economy is neither driven by solely physical or solely immaterial value creation. **Rather, these two forms of values go hand in hand.** One example is that smart phones are physicals product that needs to be manufactured. The manufacturing of smart phones would not be possible without the extensive immaterial investments that occur in the technology for smartphone production. Once the phone is produced, much of its utility comes from being connected via telephone and Internet services, which are immaterial in nature, as well as various applications that are also immaterial software. Thus, immaterial values make it possible to manufacture and utilize smartphones, which in turn are very much material products.

# Immaterial-intensive businesses in the Nordics

How important is the role of intellectual property rights in the Nordic nations? This study answers this by examining detailed structural business statistics, which asses the share of employment and value created related to the sector with intense reliance on intellectual property. A study published by EUIPO, the *European Union Intellectual Property Office*, has concluded that essentially all business sectors utilize intellectual property to a certain extent and that some can be categorized as intensely dependent on intellectual property. The study, which was originally published in 2011 and later updated in 2016, divides the business sector in two groups: sectors that are intensely dependent on intellectual property and sectors that are not.[20]

This study utilizes the EUIPO classification of business sectors, together with the latest available structural business information coupled with short-term business statistics for recent years, in order to examine the size of the share of the business sector in the Nordic countries and their regions that are intensely dependent on intellectual property.[21] Table 1 shows the division of the private sector in businesses that are intensely dependent on various forms of immaterial rights and those that are not. Structural business information has been gathered from the European Union's statistical agency Eurostat. An analysis of what share of economic activity occurs in firms with intense dependency on immaterial rights has been carried out for the business sector of each Nordic country excluding agriculture, forestry, fishing, and welfare services. On regional basis the same analysis has been done with regards to employment. The value added regionally has been calculated based on the assumption that the national rate of value added is spread regionally according to the regional division of employment.

The result of this analysis is discussed in the coming chapters, first divided into the four main different forms of immaterial rights and then on a national basis. The national analysis looks at the different broad groups of industries that are intensely dependent on

20 The previous name of the agency is OHIM, Office for harmonization in the internal market. See OHIM (2013, 2016).

21 The analysis has been limited to four forms of immaterial rights: trademarks, patents, design rights and copy right. The other two immaterial rights in the OHIM studies, geographical indicators, and plant rights, are specific cases whose importance mainly concerns parts of the food industry and are not included in this study.

immaterial rights. As can be seen in table 1, business sectors that are intensely dependent on immaterial rights tend to have dependency on several forms of immaterial rights. Trademarks are important for all firms with intense dependency on various forms of immaterial rights. Table 2 shows the division of economic activity, in six different immaterial rights intensive group of industries.

**Tabel 1. Intense dependency on various forms of immaterial rights**

| | Trademark | Design | Patents | Copyright | No intense immaterial rights dependency |
|---|---|---|---|---|---|
| Manufacture of textiles | X | X | X | | |
| Manufacture of basic pharmaceutical products & preparations | X | X | X | | |
| Manufacture of rubber & plastic products | X | X | X | | |
| Manufacture of other non-metallic mineral products | X | X | X | | |
| Manufacture of computer, electronic & optical products | X | X | X | X | |
| Manufacture of motor vehicles | X | X | X | | |
| Manufacture of other transport equipment | X | X | X | | |
| Manufacture of electrical equipment | X | X | X | | |
| Manufacture of machinery & equipment | X | X | X | | |

| | | | | | |
|---|---|---|---|---|---|
| Manufacture of furniture | X | X | X | | |
| Other manufacturing | X | X | X | | |
| Scientific research and development | X | X | X | | |
| Manufacture of wearing apparel | X | X | | | |
| Manufacture of leather & related products | X | X | | | |
| Advertising and market research | X | X | | X | |
| Other professional, scientific and technical activities | X | X | X | | |
| Telecommunications | X | | X | X | |
| Wholesale trade, except of motor vehicles and motorcycles | X | | X | | |
| Manufacture of chemicals & chemical products | X | | X | | |
| Manufacture of food products | X | | X | | |
| Motion picture, video and television programme production, sound recording and music publishing activities | X | | | X | |
| Computer programming & consultancy | X | | | X | |

| | | | | | |
|---|---|---|---|---|---|
| Renting and leasing | X | | | X | |
| Information services | X | | | X | |
| Programming & broadcasting | X | | | X | |
| Printing and reproduction of recorded media | X | | | X | |
| Publishing | X | | | X | |
| Manufacture of beverages | X | | | | |
| Office administrative, office support and other business support activities | X | | | | |
| Air transport | X | | | | |
| Wholesale and retail trade and repair of motor vehicles and motorcycles | X | | | | |
| Travel agency, tour operator reservation service & related activity | X | | | | |
| Water transport | X | | | | |
| Remediation activities & other waste management services | | | | | X |
| Employment activities | | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| Architectural and engineering activities; technical testing and analysis | | | | | X |
| Waste collection, treatment & recycling | | | | | X |
| Sewerage | | | | | X |
| Civil engineering | | | | | X |
| Retail trade, except of motor vehicles and motorcycles | | | | | X |
| Electricity, gas, steam & air conditioning supply | | | | | X |
| Real Estate | | | | | X |
| Mining | | | | | X |
| Accommodation | | | | | X |
| Legal and accounting activities | | | | | X |
| Construction of residential & non-residential buildings | | | | | X |
| Land transport and transport via pipelines | | | | | X |
| Food and beverage service activities | | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| Postal and courier activities | | | | | X |
| Repair of computers and personal and household goods | | | | | X |
| Security & investigation activities | | | | | X |
| Specialised construction | | | | | X |
| Manufacture of fabricated metal products, except machinery & equipment | | | | | X |
| Manufacture of metals | | | | | X |
| Manufacture of paper & paper products | | | | | X |
| Manufacture of wood products except furniture | | | | | X |
| Services to buildings & landscape activities | | | | | X |
| Warehousing and support activities for transportation | | | | | X |
| Water supply; sewerage, waste management and remediation activities | | | | | X |
| Activities of head offices; management consultancy activities | | | | | X |
| Veterinary activities | | | | | X |

| Tabel 2. Division of economic activity in immaterial rights intensive group of industries | |
|---|---|
| Immaterial rights intensive group of industries | Economic activity (NUTS2 classification) |
| IT/technology | Manufacture of computer, electronic and optical products |
| IT/technology | Telecommunications |
| IT/technology | Computer programming, consultancy and related activities |
| Knowledge intensive industry | Manufacture of food products |
| Knowledge intensive industry | Manufacture of beverages |
| Knowledge intensive industry | Manufacture of chemicals and chemical products |
| Knowledge intensive industry | Manufacture of basic pharmaceutical products and pharmaceutical preparations |
| Knowledge intensive industry | Manufacture of rubber and plastic products |
| Knowledge intensive industry | Manufacture of other non-metallic mineral products |
| Knowledge intensive industry | Manufacture of motor vehicles, trailers and semi-trailers |
| Knowledge intensive industry | Manufacture of other transport equipment |
| Media/entertainment | Printing and reproduction of recorded media |
| Media/entertainment | Publishing activities |
| Media/entertainment | Motion picture, video and television programme production, sound recording and music publishing activities |

| | |
|---|---|
| Media/entertainment | Programming and broadcasting activities |
| Fashion/design | Manufacture of textiles |
| Fashion/design | Manufacture of wearing apparel |
| Fashion/design | Manufacture of leather and related products |
| Trademark dependent trade | Wholesale and retail trade and repair of motor vehicles and motorcycles |
| Trademark dependent trade | Wholesale trade, except of motor vehicles and motorcycles |
| Trademark dependent trade | Water transport |
| Trademark dependent trade | Air transport |
| Knowledge intensive services | Information service activities |
| Knowledge intensive services | Scientific research and development |
| Knowledge intensive services | Advertising and market research |
| Knowledge intensive services | Other professional, scientific and technical activities |
| Knowledge intensive services | Rental and leasing activities |
| Knowledge intensive services | Travel agency, tour operator reservation service and related activities |
| Knowledge intensive services | Office administrative, office support and other business support activities |

# Job multipliers in the Swedish economy

Previous research by US economist Enrico Moretti and Swedish economist Per Thulin has shown that every time a local economy generates a new job, by attracting a new business to the traded sector, a significant number of additional jobs are created in the non-traded sector. The multiplier effect is particularly high for jobs with high levels of human capital, and for high-tech industries. The authors find that "increasing employment in the tradable sector by 1 unit in a metropolitan area results in an increase in 0.49 additional units of employment in the non-tradable sector in the same metropolitan area". The result is highly dependent on what jobs are added, as it is the jobs with higher education level in traded sectors that are driving the job multiplier effect. The authors write: "One additional worker with lower or upper secondary education in the tradable sector causes employment in the local non-tradable sector to increase by an amount that is not statistically different from 0. In contrast, the multiplier effect on the local non-traded employment of 1 additional worker with tertiary education in the tradable sector is approximately 3. Hence, adding 1 high-skilled worker in the tradable sector generates 3 new jobs in the non-tradable sector."[22]

Economist Van Dijk has also shown that an exogenous increase in the number of jobs in the tradable sector of a region has a multiplier effect on the number of jobs in the non-tradable sector of the same region. This has been confirmed for the US counties as well as for European regions.[23] In a study from 2018, Maarten Goos, Jozef Konings and Marieke Vandeweyer examined employment growth in local labour markets across Europe. Their study finds that each worker in a high-skilled occupation creates up to five extra jobs in local less-skilled-intensive services in the same region. The multiplier effect is larger with regions with higher immigration, an abundance of less-skilled workers, and lower gross per capita output. The effects are overall larger in Southern Europe than in the rest of Europe.[24]

22 Moretti & Thulin (2013), quotes both from p. 355.

23 Van Dijk (2014).

24 Goss, Konings & Vandeweyer (2018).

> ***This estimation gives that while businesses with intense reliance on immaterial rights create over 1,2 million jobs directly in Sweden, they additionally indirectly create at least a further 368,000 jobs in non-tradable sectors, by stimulating economic activity.***

Those industries that are intensely dependant on immaterial rights protection in Sweden and other Nordic nations are overall characterized by being part of the traded sector and having high value creation per employee. It is reasonable therefore that a multiplier effect does exist. The research literature is too limited to make exact calculations possible. The best available data indicates that a multiplier effect the size of 0.49 exists for the traded sectors on average. A cautionary calculation is to use 0.3 as a lower end multiplier for all businesses with intense dependence on immaterial rights. This estimation gives that while businesses with intense reliance on immaterial rights create over 1,2 million jobs directly in Sweden, they additionally indirectly create at least a further 368,000 jobs in non-tradable sectors, by stimulating economic activity. While a rough estimation, it does provide an insight into the broader importance of businesses with intense dependency on immaterial rights, as these businesses contribute both directly and indirectly to job growth.

# The crowding out effect of counterfeiting and piracy

Those businesses that are intensely dependent on immaterial rights, are also more sensitive to immaterial rights violations, such as counterfeiting and piracy. Across countries and sectors, counterfeiting and piracy represents a multi-billion-dollar illegal industry, which creates a significant drain on the global economy. Counterfeiting and piracy crowds out legitimate economic activity and facilitate an underground economy, depriving public tax revenues and limiting legitimate private sector growth and job creation.[25] In 2019 the OECD in co-operation with the Swedish Patent and Registration Office (PRV) published a report, that estimates the total global trade of counterfeit goods, based on violating the immaterial rights of Swedish enterprises, to amount to 28.3 billion Swedish Kronor, amounting to two percent of the international sales of goods manufactured in Sweden. This estimate is for the trade in the year 2016. The same year, it is estimated that counterfeit and piracy reduced public tax revenues in Sweden by 7.54 billion Swedish Kronor.[26]

This estimate does, however, not give the full picture. As an OECD study concluded already in 2005, there are numerous ways through which counterfeiting and piracy disturb the economy. Therefore, strong protection of intellectual property rights (IPR), leads to increased economic performance: "In addition to the direct impact, counterfeiting and piracy can have significant indirect effects. These would include effects on GDP, employment, tax revenues, foreign investment, trade, and innovation. Most of the work that has been on this has focused on analysing the dynamic effects of reduced investments (caused by profit losses) on GDP, employment and tax revenues. Other research has focused on the effect of the strength of IPR on economic performance (i.e., economic growth, foreign direct investment, trade and innovation). Although evidence is mixed, the studies show that strong IPR regimes generally tend to be associated with positive effects in all areas."[27]

In a 2017 article published in World Trademark Review, Jeff Hardy, former director of the International Chamber

25 Frontier economics, ICC Bascap, International Trademark Association, and TECXIPIO (2016).

26 OECD and PRV (2019).

27 Olsen (2005), quote p. 6.

of Commerce, gives an estimate of how the total economic loss from counterfeiting and piracy relates to the direct trade loss. According to his estimates, each Euro loss in international trade corresponds to total loss of 1.73 Euro. The reason is that one also needs to account for domestic counterfeiting and piracy, for counterfeiting and piracy of film, music, and software (which are not included in direct trade loss measurements), since private sector activity in immaterial rights dependent sectors are undermined, jobs are lost, and international investments are limited by counterfeiting and piracy.[28]

> ***Sweden lost 58.0 billion Krona by piracy and counterfeiting in 2020, mainly through direct trade loss, but also digital piracy and undermining of private sector activity. With the same method, the total loss of tax revenues amounts to 15.4 billion Krona.***

According to SCB, Sweden's statistical agency, the volume of international exports in 2020 was 2,235.1 billion Swedish Krona, compared with 1,887.8 billion in 2016. By factoring in the trade growth during the period and utilizing the multiplier 1.73 to account for the overall economic impact, the previous OECD and PRV estimates from 2016 can be used to calculate the total economic impact of piracy and counterfeiting on the Swedish economy. The result is as follows: Sweden lost 58.0 billion Kronor by piracy and counterfeiting in 2020, mainly through direct trade loss, but also digital piracy and undermining of private sector activity. With the same method, the total loss of tax revenues amounts to 15.4 billion Krona, assuming that tax revenue loss percentage is the same for digital piracy and indirect effects of piracy and counterfeiting, as for the direct trade loss. These sums amount to circa 5.84 billion Euros of lost economic value, and a tax loss of 1.55 billion Euros, based on a 9.94 SEK/Euro value, which was the exchange rate for early November 2021.

As will be shown later in this study, the value creation in all businesses with intense dependency on immaterial values, amounted to about 101 billion Euros in Sweden during 2021. The economic loss of counterfeiting and piracy amounts to circa 5.785% of the total value created, in Sweden. This study assumes that the same share is true for the other Nordic countries and the regions within the countries. It is fur-

28 Hardy (2017).

ther assumed that same share of jobs as economic activity is lost due to piracy. Based on these assumptions, the total loss of jobs and economic activity due to piracy and counterfeiting is calculated for each country and region. For Sweden, the tax loss due to piracy and counterfeiting amounts to 1.535% of total economic value created by immaterial rights intensive businesses. This share is assumed to be same in the different countries and regions, and so also the tax loss of counterfeiting and piracy is calculated. These estimates are based on some simplifying assumptions, but hopefully they allow us to gain a better understanding of the total economic damage that piracy and counterfeiting cause in the Nordics.

# Nordic firms intensely dependent on Copyright

Copyright is based on the idea that a person or a business that has created an original work has the exclusive right to determine how it may be copied and used by others. For example, authors who write a book or musicians who compose a song have copyright on their creation. The concept of copyright developed in Britain following the appearance of the printing press. The subsequent rise in literacy and book publishing lead to a situation where book plagiarism became commonplace. In 1709, the British Statute of Anne gave writers and publishers exclusive rights to their work, ensuring that creative work rather than plagiarism was incentivized. The same principle is used in film, TV, and other forms of creative production. Copyright is granted for expression of ideas but not the ideas themselves. Currently, work is ongoing to create a harmonized regulations for copyright in the European Union, which could stimulate creative sectors.

In the Nordic region, 78 billion Euros in value was created in 2021 in businesses with intense dependency on copyright. Of this 29 billion Euro was created in Sweden, 17 billion in Denmark, 17 billion in Norway and 14 billion in Finland. The same businesses employ 802,700 individuals—with Sweden accounting for 339,900 of the employed, Denmark 166,900, Norway 138,300, and Finland 157,600.

> ***In the Nordic region, 78 billion Euros in value was created in 2021 in businesses with intense dependency on copyright … The same businesses employ 802 700 individuals.***

Figures 2 to 5 show how the number of jobs and value added in businesses with intense dependency on copyright have evolved over time in the Nordic countries. Value creation in businesses with strong reliance on copyright has risen over time, while employment has been relatively stable. This is in line with a growth of the value added per employee.

**Figure 2. Businesses with intense dependency on copyright in Sweden**

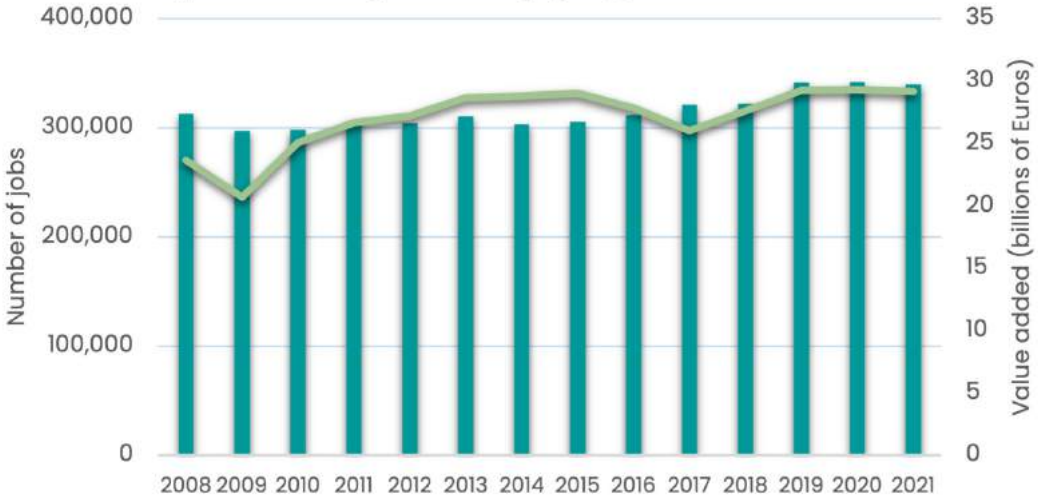
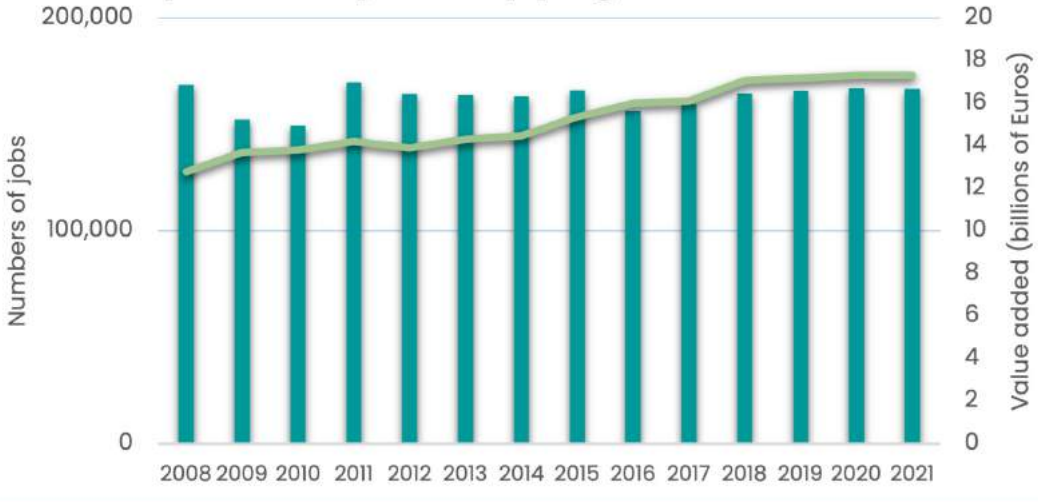
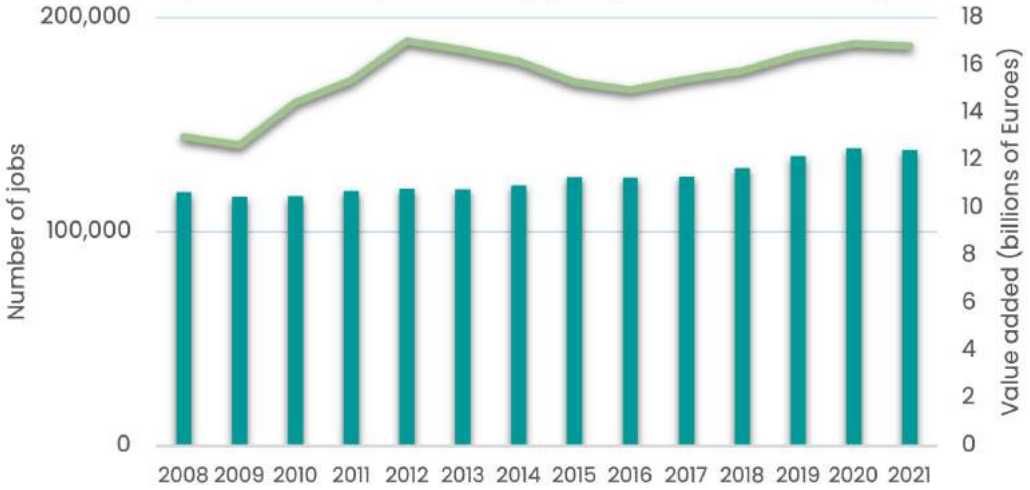


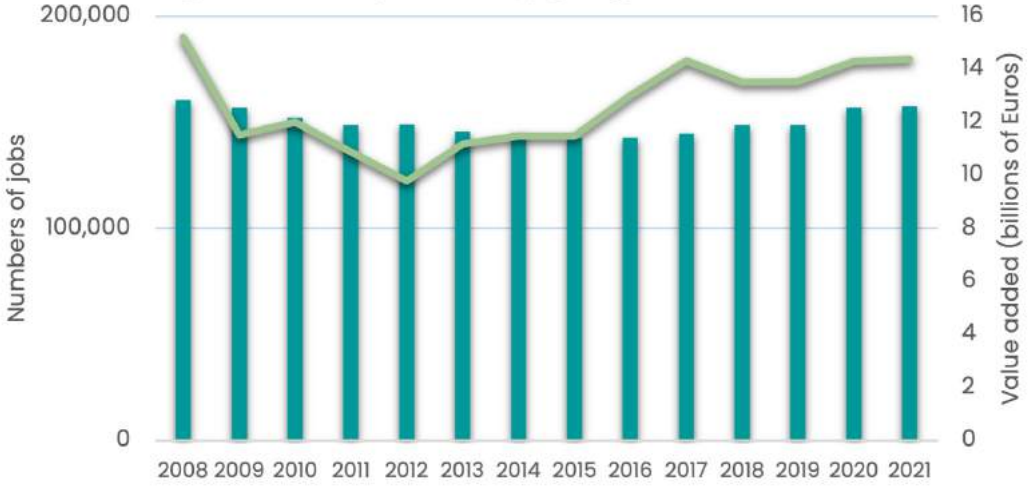

**Figure 3. Businesses with intense dependency on copyright in Denmark**

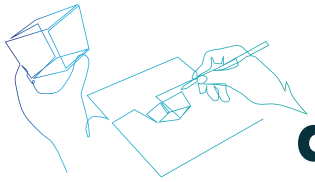


## Figure 4. Businesses with intense dependency on copyright in Norway




## Figure 5. Businesses with intense dependency on copyright in Finland





# Nordic firms intensely dependent on Design rights

One of the main reasons for why consumers choose one product over another is often appealing design. Design rights protect the appearance of a product, which in turn result from attributes such as shape, materials, and colour. Modern design rights can, like copyright, be traced to Britain. In 1787 the UK passed the Designing and Printing of Linen Act, to protect design created by textile manufacturers. Much like patents, design rights exist to encourage innovation and hinder plagiarism.

While design continues to be important in textile manufacture and the clothing industry, it is also of great importance to manufacturing firms, not least manufacturers of consumer goods. Today it is not enough that a manufacturer creates a product that works well, it also need an appealing design to be chosen by customers. The European Union has harmonized industrial design protection, to foster creation and competition on a level playing field.

In the Nordic region, 92 billion Euros in value was created in 2021 in businesses with intense dependency on design. Of this 37 billion Euro was created in Sweden, 30 billion in Denmark, 10 billion in Norway and 15 billion in Finland. The same businesses employ 941,000 individuals—with Sweden accounting for 404,000 of the employed, Denmark 225,800, Norway 124,000, and Finland 187,100.

> ***In the Nordic region, 92 billion Euros in value was created in 2021 in businesses with intense dependency on design...***
>
> ***The same businesses employ 941,000 individuals.***

Figures 6 to 9 show how the number of jobs and value added in businesses with intense dependency on copyright have evolved over time in the Nordic countries. Value creation and employment in these businesses have been relatively unchanged during latest years.

**Figure 6. Businesses with intense dependency on design rights in Sweden**

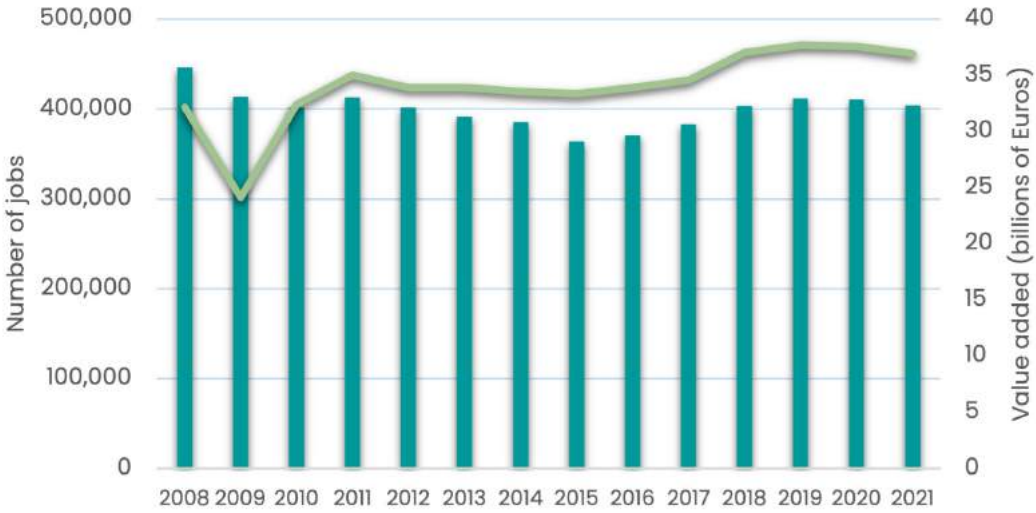
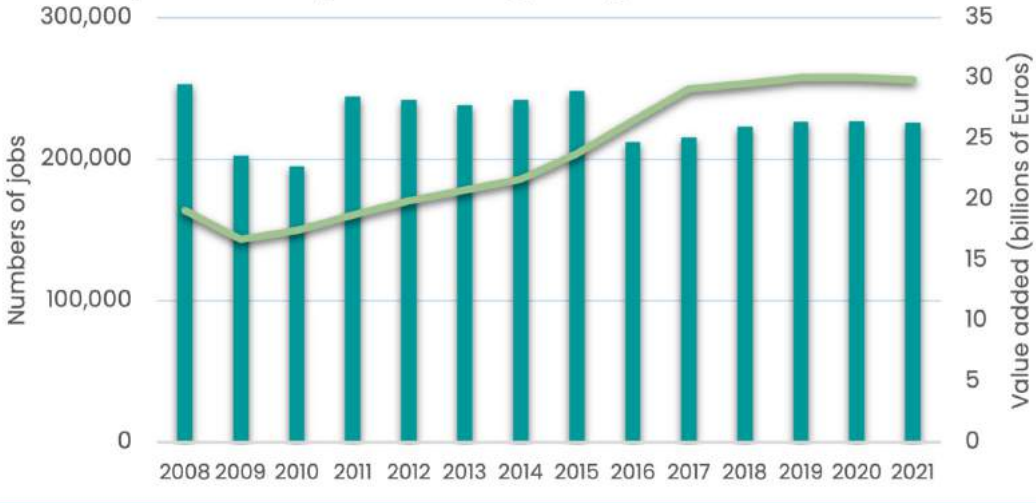
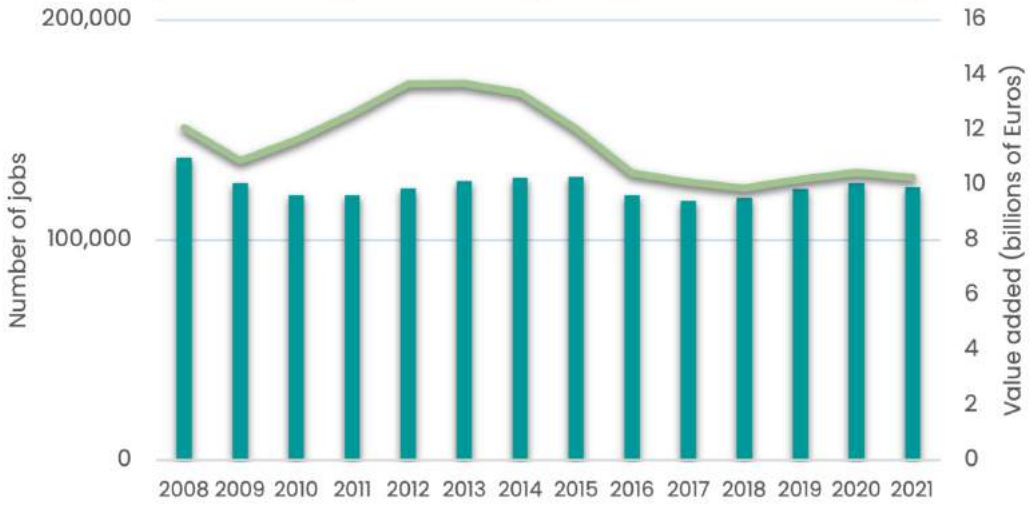


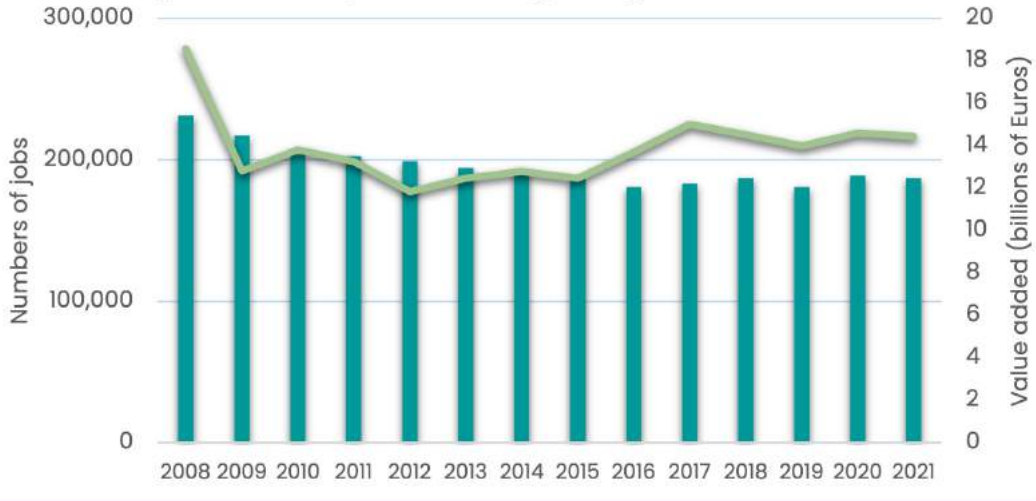

**Figure 7. Businesses with intense dependency on design rights in Denmark**

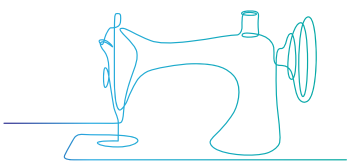


## Figure 8. Businesses with intense dependency on design rights in Norway




## Figure 9. Businesses with intense dependency on design rights in Finland





# Nordic firms intensely dependent on Patents

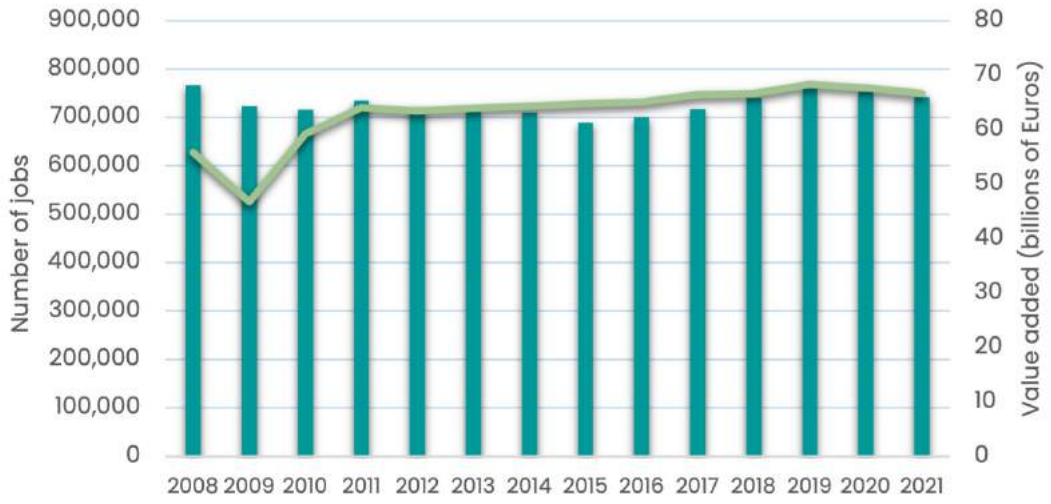
Patents are a form of intellectual property that play a key role in technological advancement. They give the owner the exclusive right to an invention for a limited amount of time, after which the invention can be copied by others. Before the evolution of patents technological achievements were kept secret, to prevent plagiarizers from taking advantage of them.

In the Nordic region, 181 billion Euros in value was created in 2021 in businesses with intense dependency on patents. Of this 67 billion Euro was created in Sweden, 56 billion in Denmark, 31 billion in Norway and 28 billion in Finland. The same businesses employ 1,829,300 individuals—with Sweden accounting for 741,200 of the employed, Denmark 460,600, Norway 303,600, and Finland 324,000.

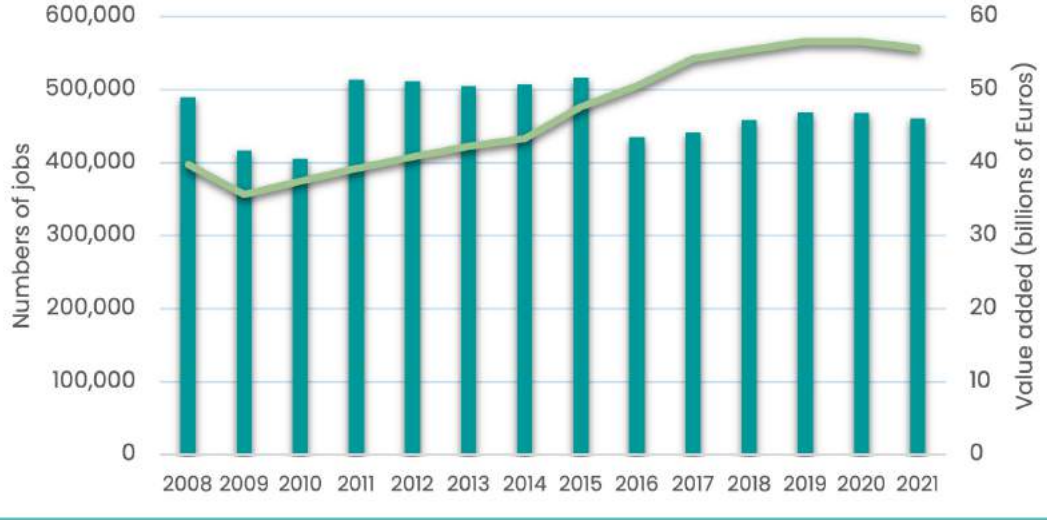
> ***In the Nordic region, 181 billion Euros in value was created in 2021 in businesses with intense dependency on patents... The same businesses employ 1,829,300 individuals.***

Figures 10 to 13 show how the number of jobs and value added in businesses with intense dependency on patents have evolved over time in the Nordic countries. Denmark has a progress where value added has increased, while the number of jobs has fallen. Rationalization processes are occurring in businesses with patent dependency. Many of these businesses are industrial manufacturers, that are outsourcing services previously part of the main business operation to external service firms and increasing productivity of each employee by introducing new automation techniques. Finland and Sweden also show sign of rationalization in patent dependent businesses over time.

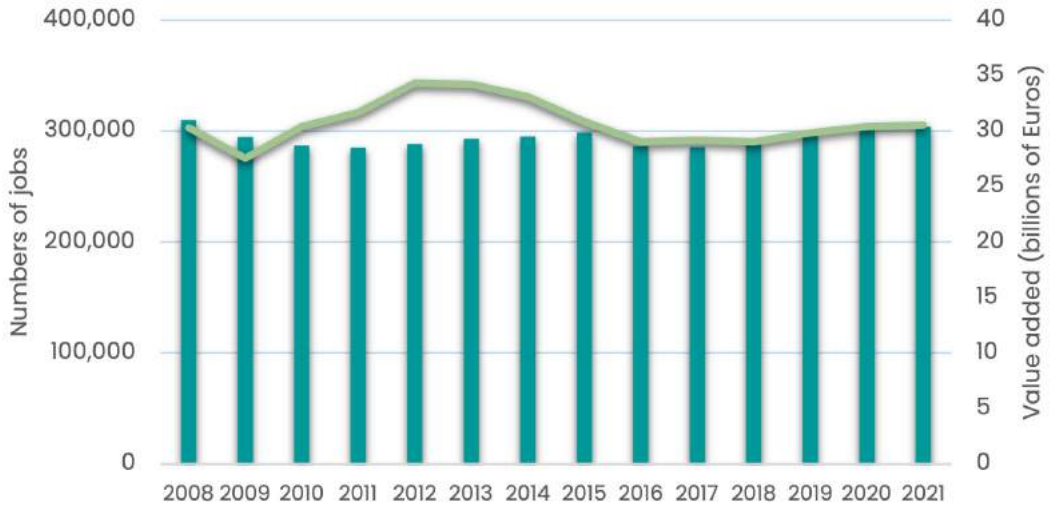
## Figure 10. Businesses with intense dependency on patents in Sweden



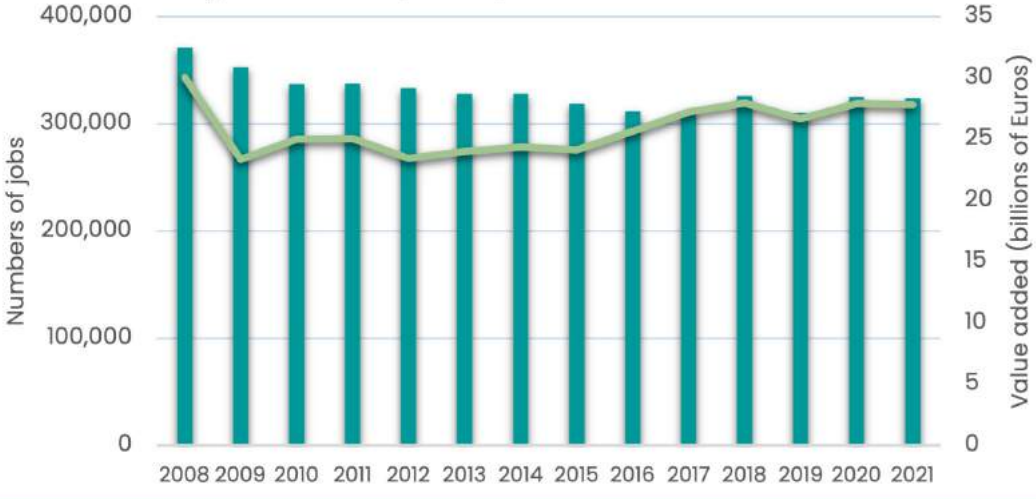

## Figure 11. Businesses with intense dependency on patents in Denmark



## Figure 12. Businesses with intense dependency on patents in Norway




## Figure 13. Businesses with intense dependency on patents in Finland



# Nordic firms intensely dependent on Trademarks

Trademarks are intellectual property consisting of a recognizable sign, expression or design which distinguishes products and or services from one source from others. Trademarks play an integral role in modern society. If this form of intellectual property did not exist, businesses that have low quality products or services could fool customers into thinking that their offer was coming from a reputable firm. Since trademarks protect the identification of businesses, incentives are created for investing in quality and innovation. Trademarks further incentivize firms to act responsibly when it comes to social and environmental issues, since such actions strengthen their trademarks towards the customers. The EU trademark system creates a unified trademark registration system in Europe, in which one registration provides protection in all member states of the EU.

In the Nordic region, 276 billion Euros in value was created in 2021 in businesses with intense dependency on trademarks. Of this 101 billion Euro was created in Sweden, 77 billion in Denmark, 54 billion in Norway and 44 billion in Finland. The same businesses employ 2,996,400 individuals—with Sweden accounting for 1,225,600 of the employed, Denmark 706,800, Norway 531,100, and Finland 532,900.

> ***In the Nordic region, 276 billion Euros in value was created in 2021 in businesses with intense dependency on trademarks... The same businesses employ 2,996,600 individuals.***

Figures 14 to 17 show how the number of jobs and value added in businesses with intense dependency on trademarks have evolved over time in the Nordic countries. Sweden has since 2008 experienced an increase of value added in businesses with intense dependence on trademarks, while employment has increased slightly. Denmark has experienced a significant rise in value added, with same levels of employment. In Norway and Finland value added as well as employment have been relatively stable during the period.

**Figure 14. Businesses with intense dependency on trademarks in Sweden**

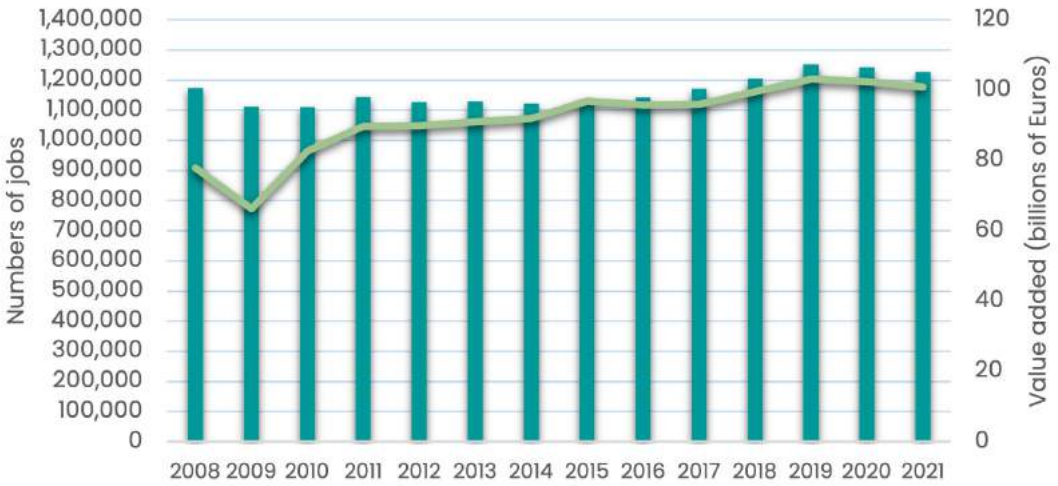
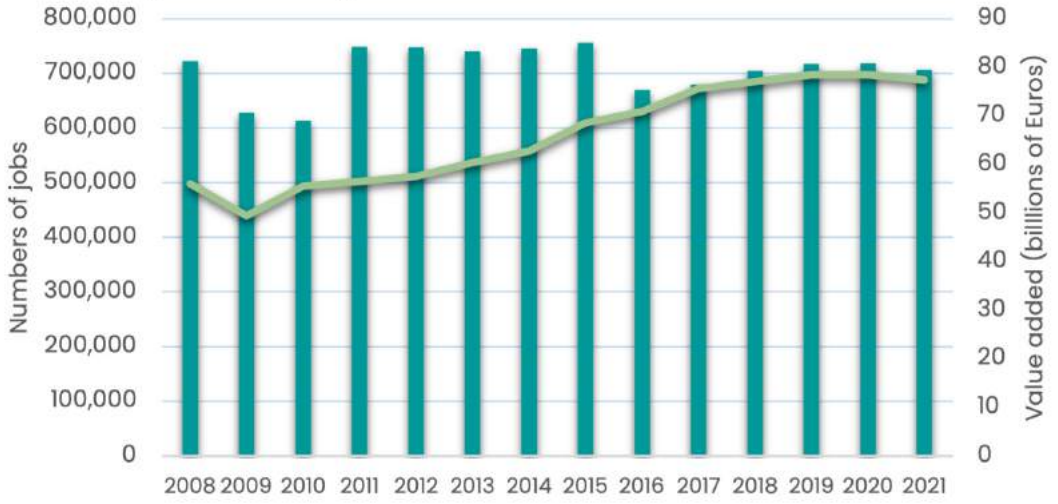
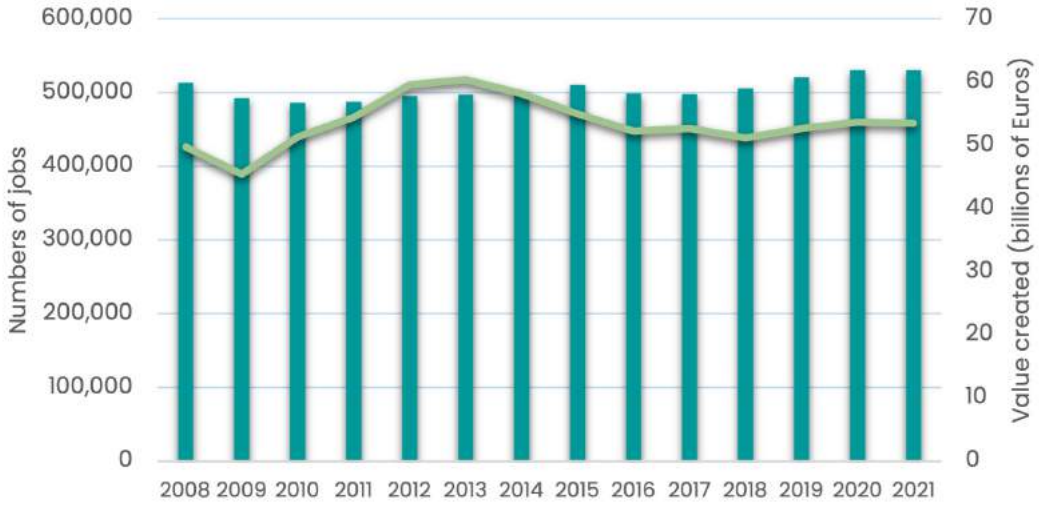


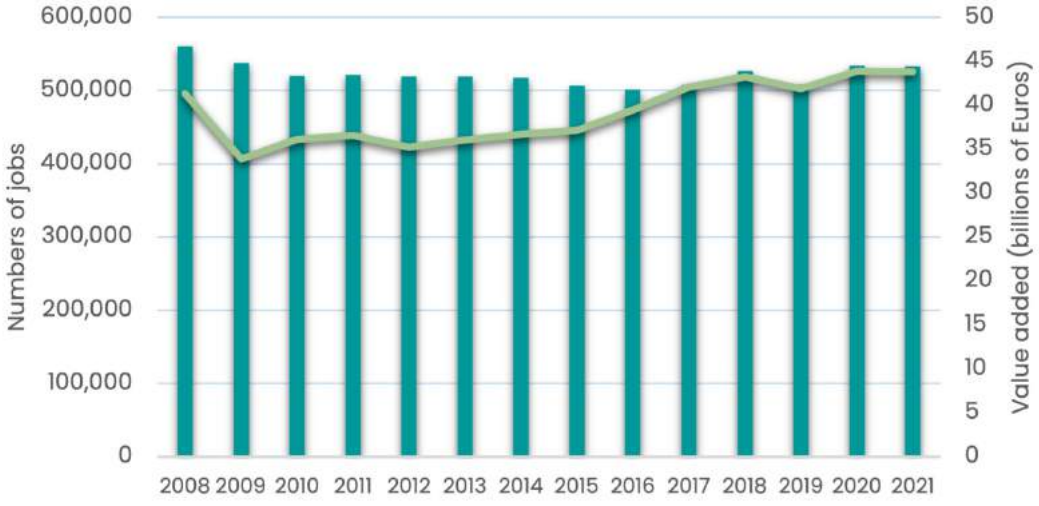

**Figure 15. Businesses with intense dependency on trademarks in Denmark**



## Figure 16. Businesses with intense dependency on trademarks in Norway




## Figure 17. Businesses with intense dependency on trademarks in Finland



# Sweden, industries with intense dependence on immaterial rights

In Sweden, firms with an intense dependency on immaterial rights during 2021 create an added value of 101 billion Euros in total and employ over 1,2 million persons. Figures 18 to 23 show the different broad business sectors in which Swedish firms with an intense dependency on immaterial rights are found. IT/technology firms create an added value of 19 billion Euros and employ 208,500 persons. Since 2008, their value added has risen by 23 percent while the number of employees has risen by 20 percent. Knowledge intensive industries create an added value of 38 billion Euros in 2021 and employ 390,500 persons. Since 2008 their value added has risen by 27 percent, while the number of employees has been reduced by four percent.

Swedish firms in media/entertainment contribute 5 billion Euros annually to Sweden´s GDP (gross domestic product) and employ 72,200 persons. Since 2008 their value added has risen by 15 percent, while the number of employees has been reduced by twelve percent. Fashion/design firms contribute 0,4 billion Euros in added value, same as in 2008, and employ 7,200 persons, 29 percent less than in 2008. While Sweden has several world leading fashion and design companies, many of the employees work and live abroad.

Firms in trademark dependent trade create an added value of 28 billion Euros in 2021, 29 percent more compared to 2008, and employ 372,100 people, up by nine percent. Firms in knowledge intensive services, another category of firms intensely dependent on immaterial rights, employ 175,000 persons in Sweden, an increase of eleven percent since 2008, and add 11 billion Euros to the GDP of Sweden, an increase of 70 percent over time.

Table 3 shows the number of people employed by the various broad business sectors with intense dependency on immaterial rights, on a regional level. The table also shows an estimate of total jobs crowded out by piracy and counterfeiting. In total 22 000 jobs are crowded out by piracy and counterfeiting in the capital Stockholm region, 9 200 in the Eastern middle Sweden region, 6 000 in the Småland and islands region, 10 100 in the Southern Sweden region, 15 700 in Western Sweden, 3

600 in North Middle Sweden, 1 800 in Middle Norrland and 2 300 in Upper Norrland.

Data on value added per region is shown in table 4, and this table also shows an estimate of economic value crowded out by piracy and counterfeiting. In total economic value creation of 1.7 billion Euros was crowded out by piracy and counterfeiting in the capital Stockholm region, 780 million Euros in Eastern middle Sweden, 510 million Euros in Småland and islands, 830 million Euros in Southern Sweden, 1,3 billion Euros in Western Sweden, 290 million Euros in North Middle Sweden, 140 million Euros in Middle Norrland and 190 million Euros in Upper Norrland.

***In Sweden, counterfeiting and piracy are estimated to lead to reduced value creation of 5.8 billion Euros annually and crowding out of close to 71 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with close to 1,6 billion Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.***

In Sweden, counterfeiting and piracy are estimated to lead to reduced value creation of 5.8 billion Euros annually and crowding out of close to 71 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with close to 1,6 billion Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.

**Figure 18. IT/technology, with intense dependence on immaterial rights, in Sweden**

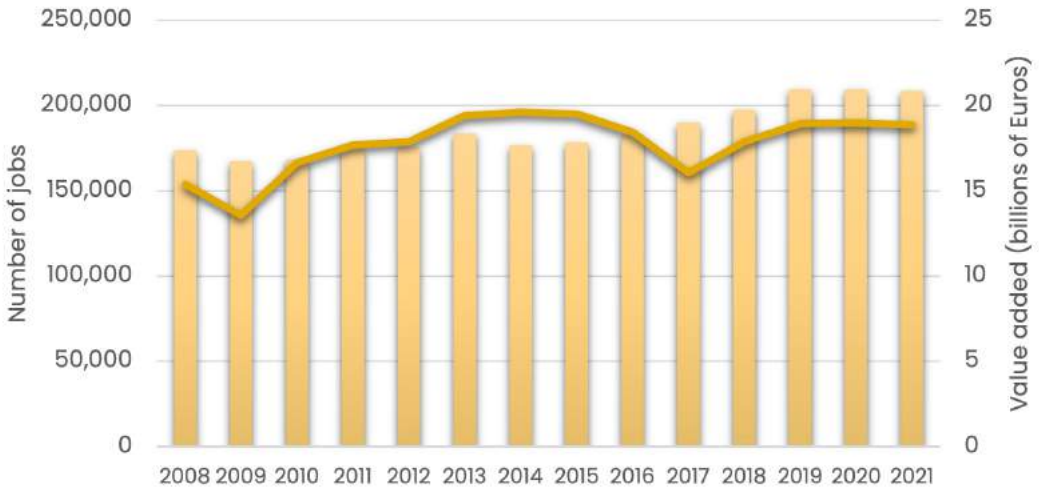



**Figure 19. Knowledge intensive industry, with intense dependence on immaterial rights, in Sweden**

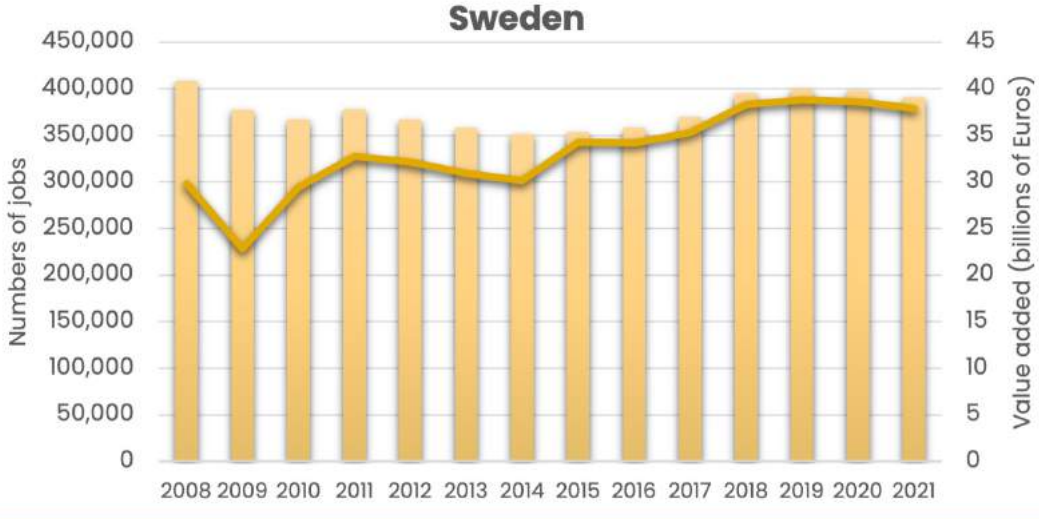


**Figure 20. Media/entertainment, with intense dependence on immaterial rights, in Sweden**

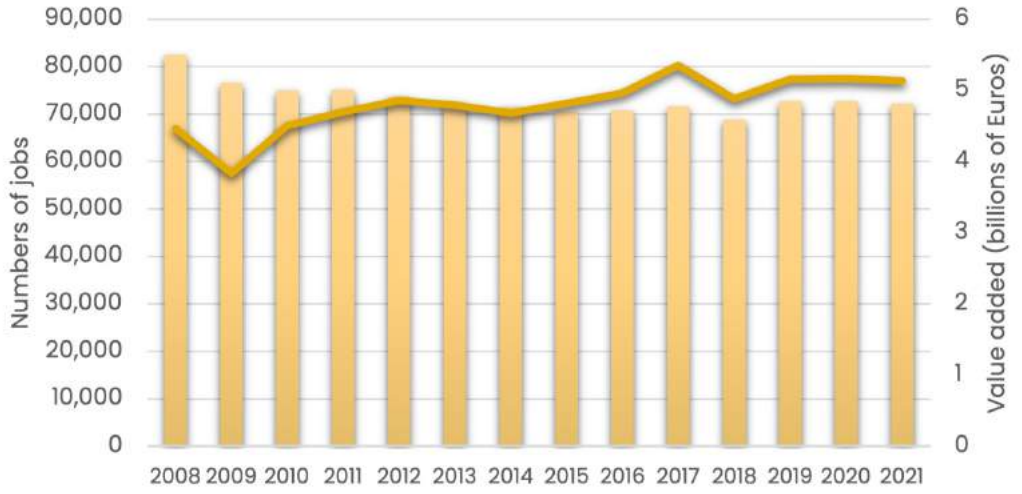



**Figure 21. Fashion/design, with intense dependence on immaterial rights, in Sweden**

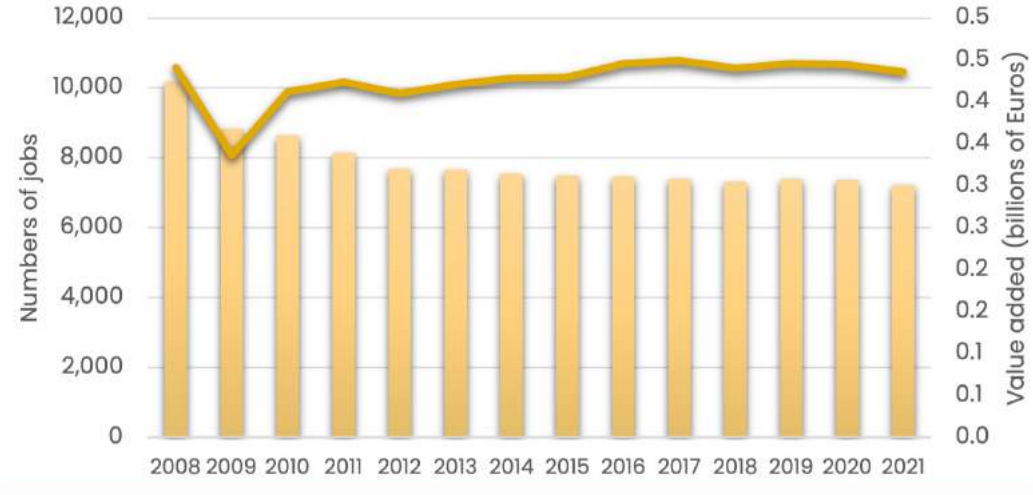


**Figure 22. Trademark dependent trade, with intense dependence on immaterial rights, in Sweden**

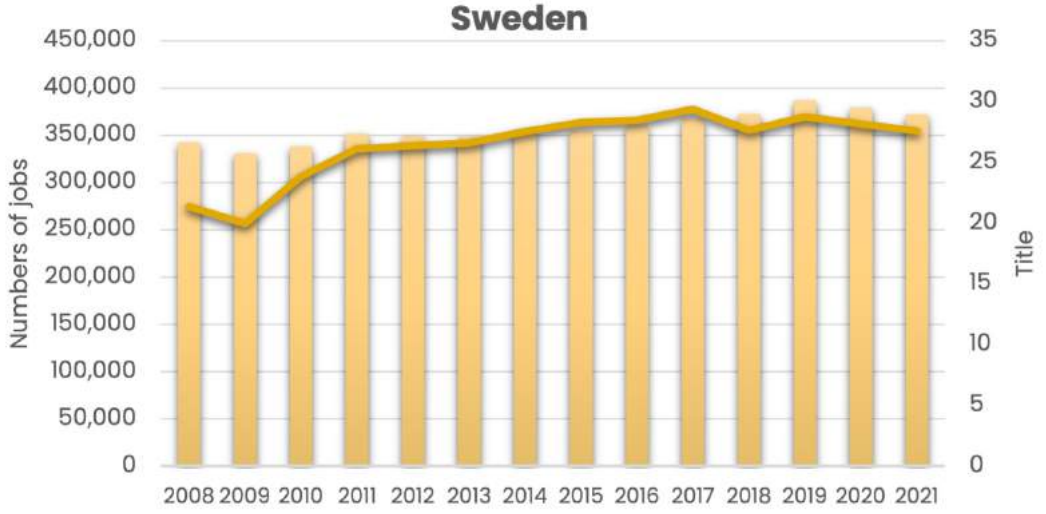



**Figure 23. Knowledge intensive services, with intense dependence on immaterial rights, in Sweden**

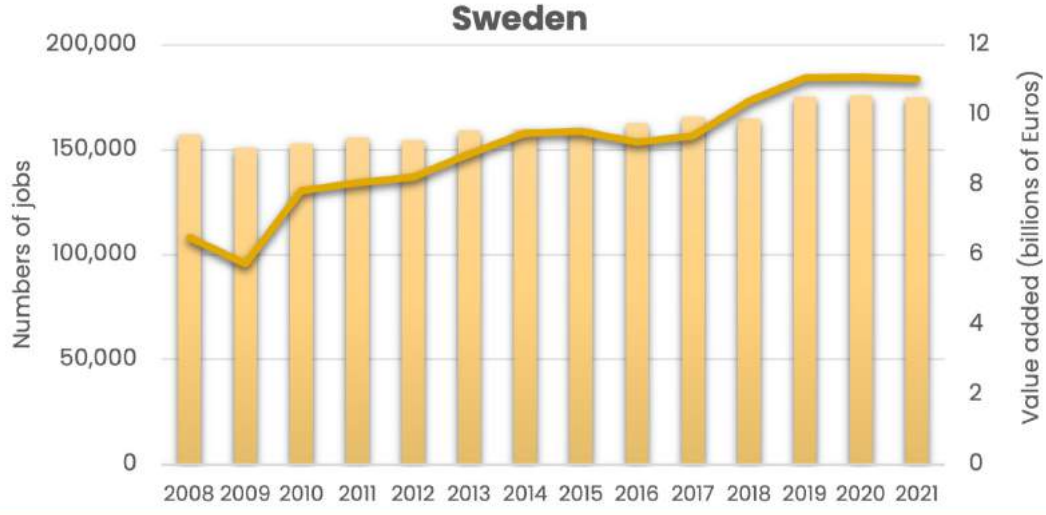


**Table 3. Number of people employed in businesses with intense dependence immaterial rights.**

**Regional data for Sweden 2021, number of jobs.**

| Region | IT/ technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Stockholm | 97 115 | 57 676 | 68 445 | 36 002 | 701 | 119 843 | 21970 |
| Eastern middle Sweden | 21 878 | 65 622 | 19 687 | 5 540 | 1 133 | 45 800 | 9236 |
| Småland and islands | 8 507 | 51 110 | 10 863 | 5 283 | 702 | 26 821 | 5975 |
| Southern Sweden | 25 114 | 56 346 | 23 737 | 10 813 | 677 | 57 706 | 10089 |
| Western Sweden | 35 432 | 113 024 | 30 828 | 10 259 | 3 020 | 78 641 | 15689 |
| North middle Sweden | 8 350 | 19 850 | 8 887 | 2 224 | 395 | 21 902 | 3564 |
| Middle Norrland | 5 587 | 8 851 | 5 776 | 765 | 251 | 9 085 | 1754 |
| Upper Norrland | 6 463 | 13 323 | 6 652 | 1 930 | 195 | 11 444 | 2314 |

**Table 4. Value added in businesses with intense dependence immaterial rights.**

**Regional data for Sweden 2021 (millions of Euros).**

| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Stockholm | 8 788 | 5 594 | 4 313 | 2 558 | 42 | 8 892 | 1746 |
| Eastern Middle Sweden | 1 980 | 6 365 | 1 241 | 394 | 68 | 3 398 | 778 |
| Småland and islands | 770 | 4 958 | 685 | 375 | 42 | 1 990 | 510 |
| Southern Sweden | 2 273 | 5 465 | 1 496 | 768 | 41 | 4 281 | 829 |
| Western Sweden | 3 206 | 10 963 | 1 943 | 729 | 182 | 5 835 | 1322 |
| North Middle Sweden | 756 | 1 925 | 560 | 158 | 24 | 1 625 | 292 |
| Middle Norrland | 506 | 859 | 364 | 54 | 15 | 674 | 143 |
| Upper Norrland | 585 | 1 292 | 419 | 137 | 12 | 849 | 191 |

# Denmark, industries with intense dependence on immaterial rights

In Denmark, firms with an intense dependency on immaterial rights during 2021 created an added value of 77 billion Euros in total and employ close to 707,000 persons. Figures 24 to 29 show the different broad business sectors in which Danish firms with an intense dependency on immaterial rights are found. IT/technology firms create an added value of 11 billion Euros and employ 90,500 persons. Since 2008, their value added has risen by 27 percent while the number of employees has increased by 8 percent. Knowledge intensive industries create an added value of 31 billion Euros in 2021 and employ 228,300 persons. Since 2008 their value added has risen by 49 percent, while the number of employees has been reduced by 13 percent. This sector shows a major rationalization process, likely due to both automation and outsourcing to local and international firms.

Danish firms in media/entertainment contribute 3 billion Euros annually to Denmark´s GDP and employ 43,400 persons. Since 2008 their value added has risen by two percent, while the number of employees has been reduced by 13 percent. Fashion/design firms contribute 0,5 billion Euros in added value, a couple of percent more than in 2008, and employ 5,900 persons, 24 percent less than in 2008.

Firms in trademark dependent trade create an added value of 25 billion Euros in 2021, 25 percent more compared to 2008, and employ 244,400 people, up by one percent. Firms in knowledge intensive services, the last category of firms intensely dependent on immaterial rights, employ 94,400 persons in Denmark, an increase of 21 percent since 2008, and add 8 billion Euros to the GDP, an increase of fully 120 percent over time.

Table 5 shows the number of people employed by the various broad business sectors with intense dependency on immaterial rights, on a regional level. The table also shows an estimate of total jobs crowded out by piracy and counterfeiting. In total 16 400 jobs are crowded out by piracy and counterfeiting in the capital Copenhagen region, 3 100 in the Sjalland region, 7 700 in the South Denmark region, 9 500 in the Midtjylland region and 3 300 in the Nordjylland region.

Data on value added per region is shown in table 6, and this table also shows an estimate of economic value crowded out by piracy and counterfeiting. In total economic value creation of 1.7 billion Euros was crowded out by piracy and counterfeiting in the capital Copenhagen region, 340 million Euros in the Sjalland region, 890 million Euros in the South Denmark region, 1.1 billion Euros in the Midtjylland region and 380 million Euros in the Nordjylland region.

> ***In Denmark, counterfeiting and piracy are estimated to lead to reduced value creation of 4.5 billion Euros annually and crowding out of close to 41 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with 1,2 billion Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.***

In Denmark, counterfeiting and piracy are estimated to lead to reduced value creation of 4.5 billion Euros annually and crowding out of close to 41 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with 1,2 billion Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.

**Figure 24. IT/technology, with intense dependence on immaterial rights, in Denmark**

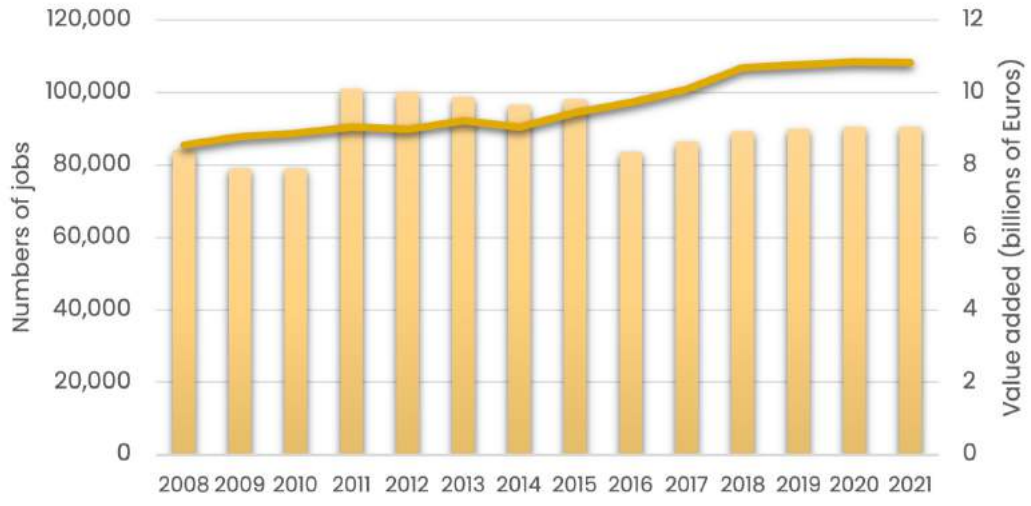


**Figure 25. Knowledge intensive industry, with intense dependence on immaterial rights, in Denmark**

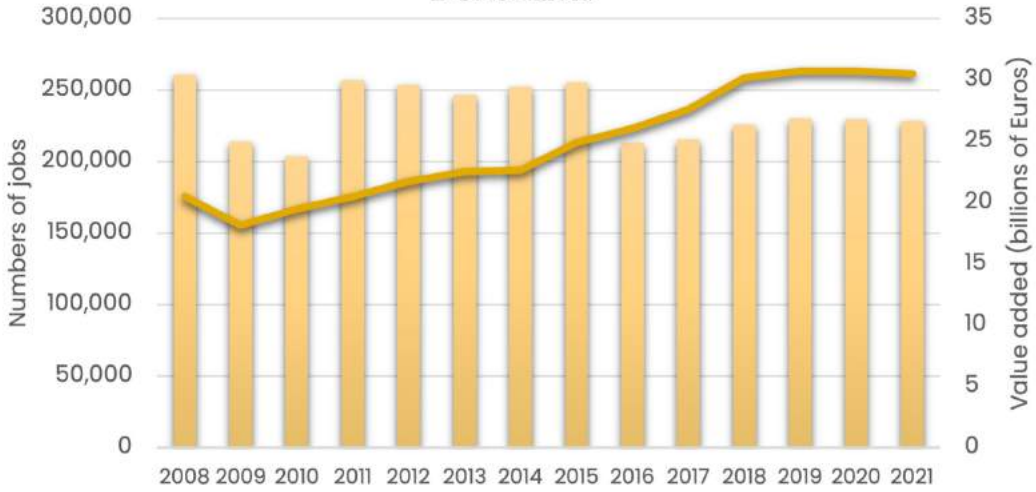



**Figure 26. Media/entertainment, with intense dependence on immaterial rights, in Denmark**

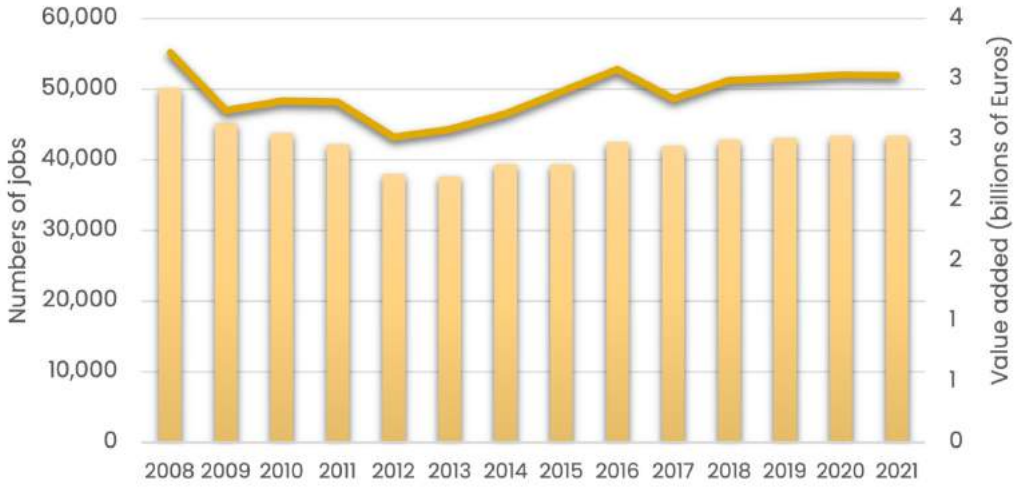


**Figure 27. Fashion/design, with intense dependence on immaterial rights, in Denmark**

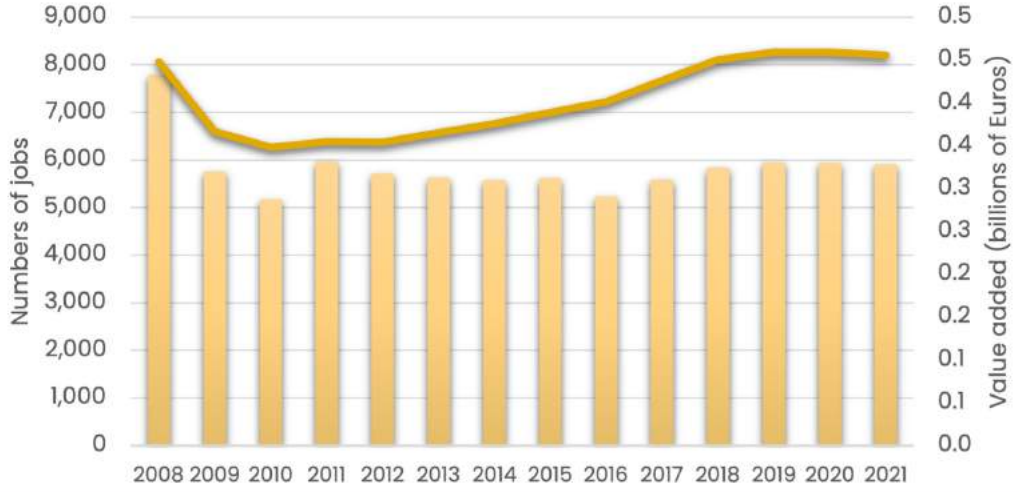



**Figure 28. Trademark dependent trade, with intense dependence on immaterial rights, in Denmark**

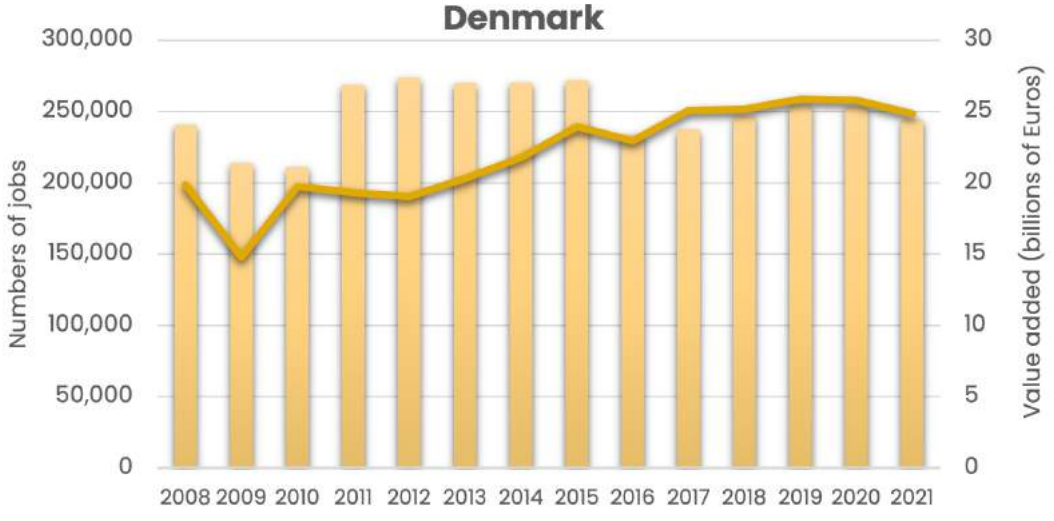


**Figure 29. Knowledge intensive services, with intense dependence on immaterial rights, in Denmark**

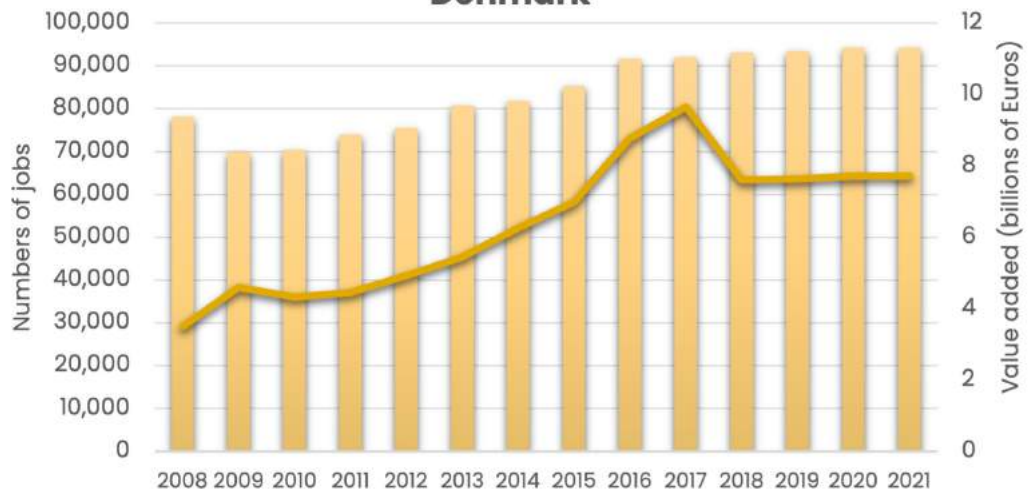



**Table 5. Number of people employed in businesses with intense dependence immaterial rights.**

**Regional data for Denmark 2021, number of jobs.**

| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Copenhagen | 52918 | 50520 | 52164 | 25983 | 626 | 100510 | 16355 |
| Sjalland | 3228 | 19675 | 5079 | 1947 | 156 | 22906 | 3065 |
| South Denmark | 7828 | 55767 | 11221 | 4648 | 1303 | 51535 | 7654 |
| Midtjylland | 17656 | 60185 | 19496 | 6655 | 2867 | 56668 | 9460 |
| Nordjylland | 6354 | 23836 | 4335 | 2289 | 914 | 19504 | 3311 |

**Table 6. Value added in businesses with intense dependence immaterial rights. Regional data for Denmark 2021 (millions of Euros).**

| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Copenhagen | 6331 | 6751 | 4262 | 1814 | 48 | 10215 | 1702 |
| Sjalland | 386 | 2629 | 415 | 136 | 12 | 2328 | 342 |
| South Denmark | 937 | 7453 | 917 | 325 | 101 | 5238 | 866 |
| Midtjylland | 2112 | 8043 | 1593 | 465 | 221 | 5759 | 1053 |
| Nordjylland | 760 | 3185 | 354 | 160 | 71 | 1982 | 377 |

# Norway, industries with intense dependence on immaterial rights

In Norway, firms with an intense dependency on immaterial rights during 2021 create an added value of close to 54 billion Euros in total and employ 531,000 persons. Figures 30 to 35 show the different broad business sectors in which Norwegian firms that are intensely dependent on immaterial rights are found. IT/technology firms create an added value of 10 billion Euros and employ 73,500 persons. Since 2008, their value added has risen by 41 percent while the number of employees has increased by 34 percent. Knowledge intensive industries create an added value of 13 billion Euros in 2021 and employ 141,000 persons. Since 2008 their value added has fallen by eleven percent, while the number of employees has been reduced by ten percent.

Norwegian firms in media/entertainment contribute 3 billion Euros annually to the nation´s GDP and employ 40,100 persons. Since 2008 their value added has fallen by seven percent, and the number of employees has been reduced by the same rate of seven percent. Fashion/design firms contribute 0,3 billion Euros in added value, three percent more than in 2008, and employ 5,000 persons, ten percent less than in 2008.

Firms in trademark dependent trade create an added value of 20 billion Euros in 2021, six percent more compared to 2008, and employ 198,700 people, up by four percent. Firms in knowledge intensive services employ 73,300 persons in Norway, an increase of 18 percent since 2008, and add 7 billion Euros to the GDP, an increase of 34 percent over time.

Table 7 shows the number of people employed by the various broad business sectors with intense dependency on immaterial rights, on a regional level. The table also shows an estimate of total jobs crowded out by piracy and counterfeiting. In total 10 900 jobs are crowded out by piracy and counterfeiting in the capital Oslo region, 1 500 in the Innlandet region, 5 000 in the Sor-Ostlandet region, 4 100 in the Agder og Rogaland region, 4 800 in the Vestlandet region, 2 400 in the Trondelag region, and 2 100 in the North Norway region.

Data on value added per region is shown in table 8, and this table also shows an estimate of economic value crowded out by piracy and counterfeiting. In total economic value creation of 1,1 billion Euros was crowded out by piracy and counterfeiting in the capital Oslo region, 150 million Euros in the Innlandet region, 500 million Euros in the Sor-Ostlandet region, 410 million Euros in the Agder og Rogaland region, 470 million Euros in the Vestlandet region, 240 million Euros in the Trondelag region, and 200 million Euros in the North Norway region.

While Norway has a widespread geography, with low population density outside of the capital region, industries with intense dependence on immaterial rights still contribute significantly to the regional economies of all parts of the nation. This is a good example of how immaterial rights are important for jobs and prosperity throughout the Nordics, even in more remote regions with limited population concentration.

> ***In Norway, counterfeiting and piracy are estimated to lead to reduced value creation of 3.1 billion Euros annually and crowding out of close to 31 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with 820 million Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.***

In Norway, counterfeiting and piracy are estimated to lead to reduced value creation of 3.1 billion Euros annually and crowding out of close to 31 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with 820 million Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.

**Figure 30. IT/technology, with intense dependence on immaterial rights, in Norway**

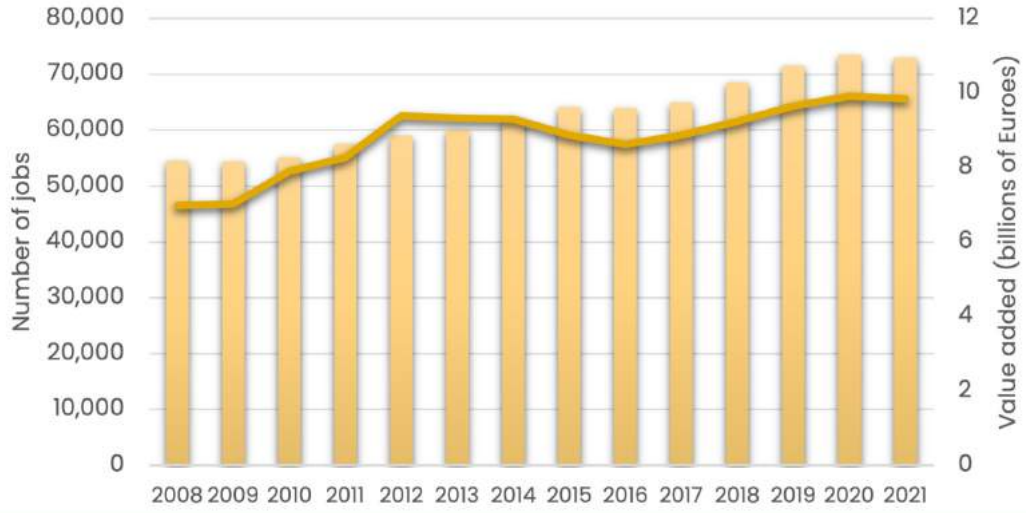



**Figure 31. Knowledge intensive industry, with intense dependence on immaterial rights, in Norway**

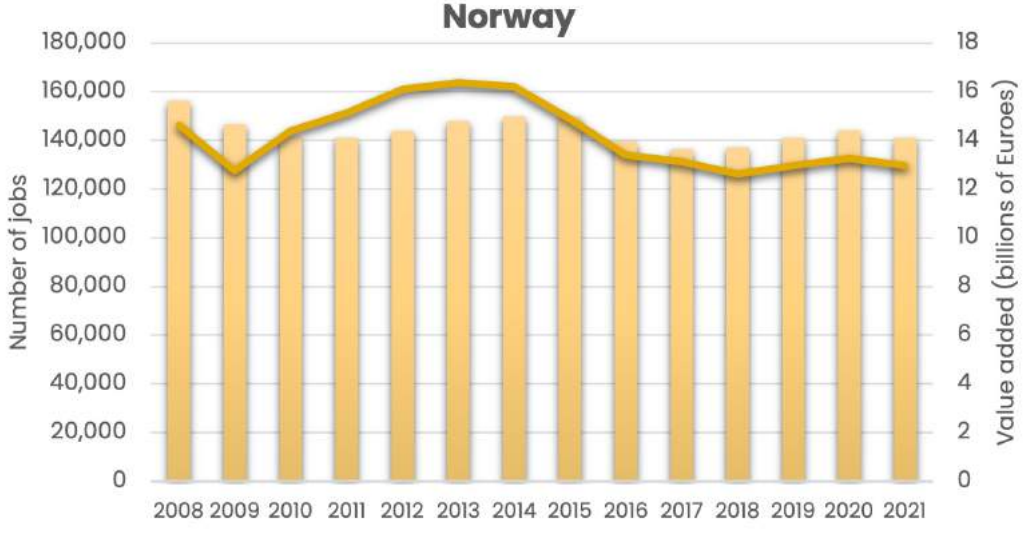


**Figure 32. Media/entertainment, with intense dependence on immaterial rights, in Norway**

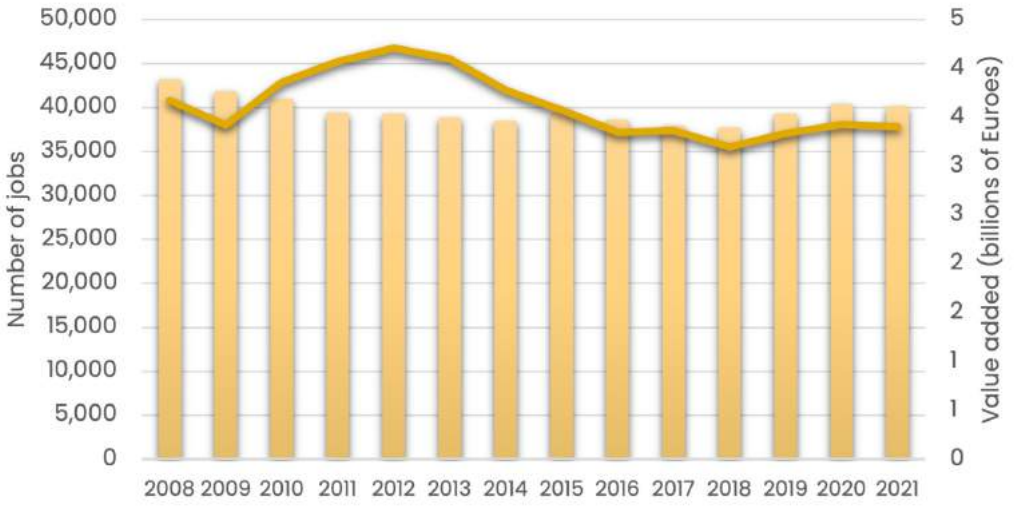



**Figure 33. Fashion/design, with intense dependence on immaterial rights, in Norway**

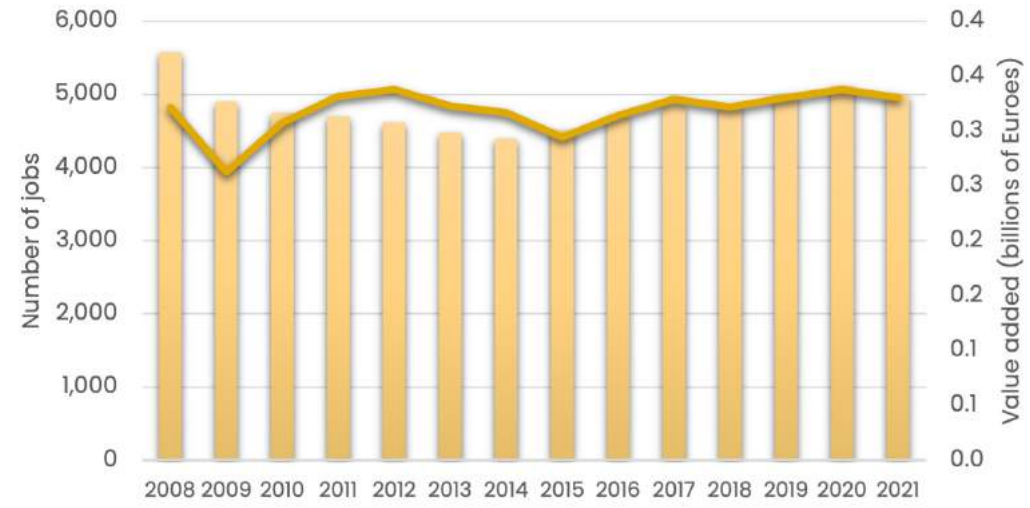


**Figure 34. Trademark dependent trade, with intense dependence on immaterial rights, in Norway**

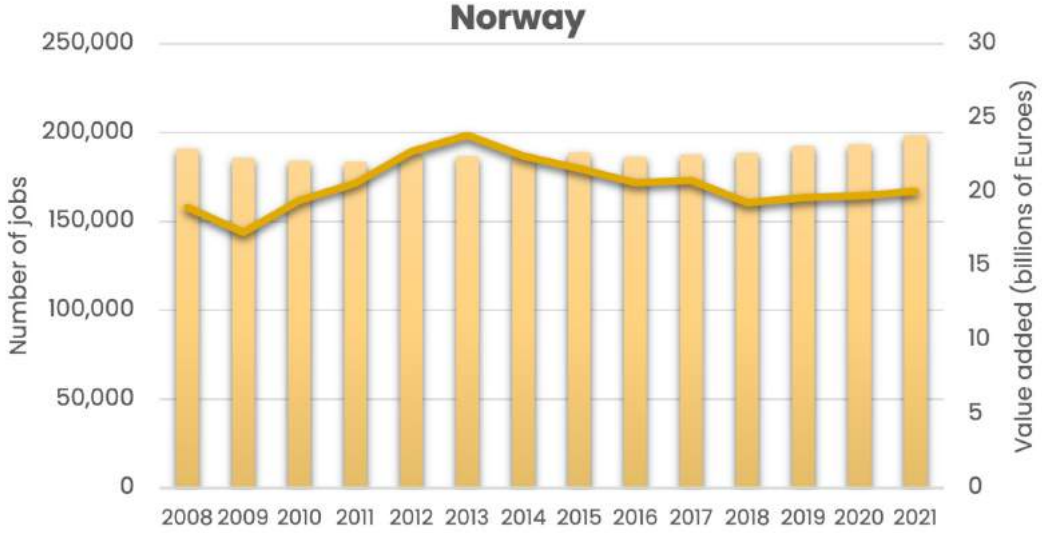



**Figure 35. Knowledge intensive services, with intense dependence on immaterial rights, in Norway**

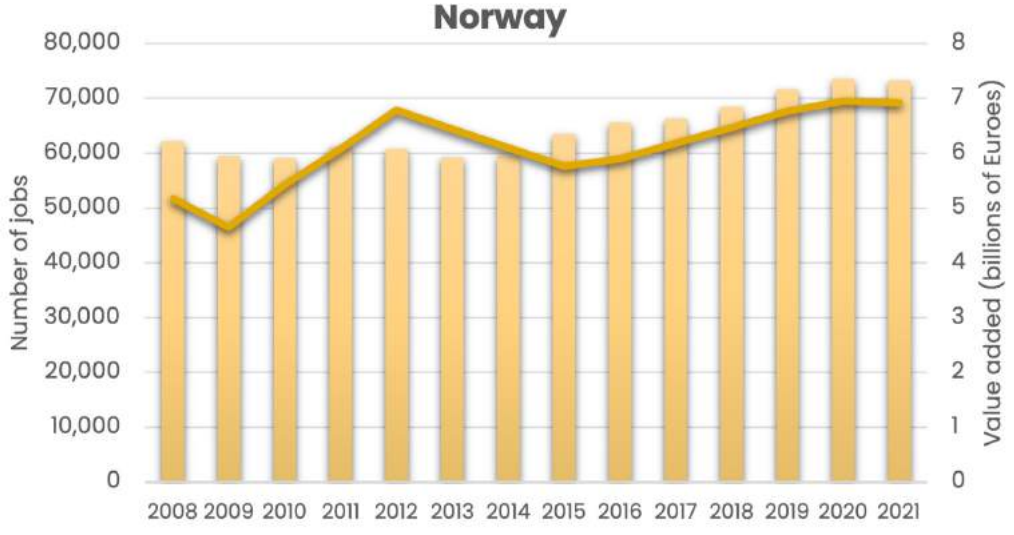


**Table 7. Number of people employed in businesses with intense dependence immaterial rights.**

**Regional data for Norway 2021, number of jobs.**

| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Oslo | 40234 | 17929 | 34791 | 21949 | 714 | 72540 | 10885 |
| Innlandet | 2359 | 8796 | 2828 | 1342 | 242 | 10166 | 1489 |
| Sor-Ostlandet | 8503 | 29667 | 9786 | 4083 | 715 | 33605 | 4996 |
| Agder og Rogaland | 8169 | 23829 | 8032 | 2893 | 795 | 26286 | 4050 |
| Vestlandet | 6355 | 34067 | 8303 | 4537 | 1650 | 28363 | 4817 |
| Trondelag | 5588 | 12370 | 7282 | 2726 | 443 | 12818 | 2385 |
| North Norway | 1850 | 12100 | 4336 | 2658 | 397 | 14938 | 2099 |

**Table 8. Value added in businesses with intense dependence immaterial rights.**

**Regional data for Norway 2021 (millions of Euros).**

| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Oslo | 5429 | 1650 | 3286 | 1861 | 47 | 7311 | 1133 |
| Innlandet | 318 | 809 | 267 | 114 | 16 | 1025 | 147 |
| Sor-Ostlandet | 1147 | 2730 | 924 | 346 | 47 | 3387 | 496 |
| Agder og Rogaland | 1102 | 2192 | 759 | 245 | 53 | 2649 | 405 |
| Vestlandet | 858 | 3134 | 784 | 385 | 109 | 2859 | 470 |
| Trondelag | 754 | 1138 | 688 | 231 | 29 | 1292 | 239 |
| North Norway | 250 | 1113 | 410 | 225 | 26 | 1506 | 204 |

# Finland, industries with intense dependence on immaterial rights

In Finland, firms with an intense dependency on immaterial rights during 2021 create an added value of close to 44 billion Euros in total and employ 533,000 persons. Figures 36 to 41 show the different broad business sectors in which Finnish firms with an intense dependency on immaterial rights are found. IT/technology firms create an added value of 9 billion Euros and employ 99,500 persons. Since 2008, their value added has fallen by 22 percent while the number of employees has increased by one percent. Knowledge intensive industries create an added value of 16 billion Euros in 2021 and employ 177,400 persons. Since 2008 their value added has risen by eight percent, while the number of employees has been reduced by 14 percent. This is an example of an industry with rationalization process, through automation and outsourcing.

Finnish firms in media/entertainment contribute 3 billion Euros annually to the nation´s GDP and employ 31,700 persons. Since 2008 their value added has risen by 19 percent, while the number of employees has been reduced by 24 percent. Fashion/design firms contribute 0,4 billion Euros in added value, 26 percent less than in 2008, and employ 7,300 persons, 38 percent less than in 2008.
Firms in trademark dependent trade create an added value of 11 billion Euros in 2021, 16 percent more compared to 2008, and employ 152,400 people, up by one percent. Firms in knowledge intensive services employ 64,700 persons in Finland, an increase of 27 percent since 2008, and add 5 billion Euros to the GDP, an increase of 71 percent over time.

Table 9 shows the number of people employed by the various broad business sectors with intense dependency on immaterial rights, on a regional level. The table also shows an estimate of total jobs crowded out by piracy and counterfeiting. In total 7 300 jobs are crowded out by piracy and counterfeiting in the Länsi-Suomi region, 13 200 jobs in the capital Helsinki region, 5 600 jobs in the Etelä-Suomi region, 4 200 in the Pohjois- ja Itä-Suomi region and 230 jobs in the Åland region.

Data on value added per region is shown in table 10, and this table also shows an estimate of economic value crowded out by piracy and counterfeit-

ing. In total economic value creation of 610 million Euros was crowded out by piracy and counterfeiting in the Länsi-Suomi region, 1,1 billion Euros in the capital Helsinki region, 460 million Euros in the Etelä-Suomi region, 340 million Euros in the Pohjois- ja Itä-Suomi region and 18 million Euross in the Åland region.

> ***In Finland, counterfeiting and piracy are estimated to lead to reduced value creation of 2.5 billion Euros annually and crowding out of close to 31 000 jobs in immaterial rights intensive industries. Tax revenues are also affected, with 670 million Euros in tax revenue lost due to the crowding out of legal businesses by counterfeiting and piracy.***

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**Figure 36. IT/technology, with intense dependence on immaterial rights, in Finland**

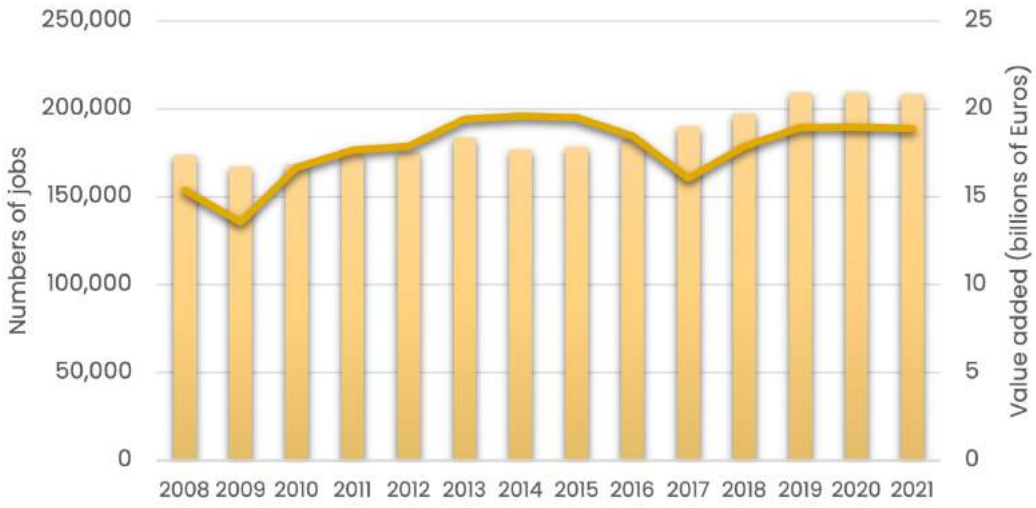


**Figure 37. Knowledge intensive industry, with intense dependence on immaterial rights, in Finland**

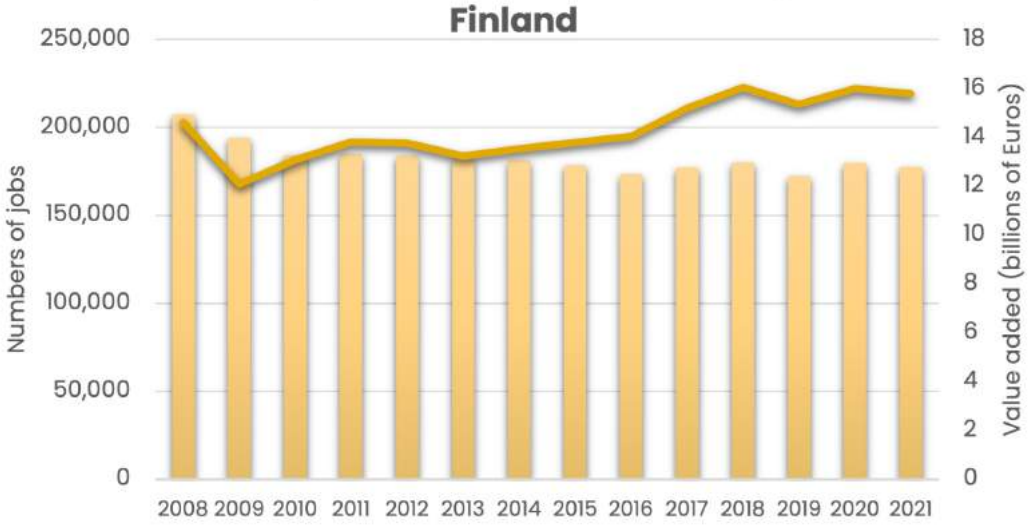



**Figure 38. Media/entertainment, with intense dependence on immaterial rights, in Finland**

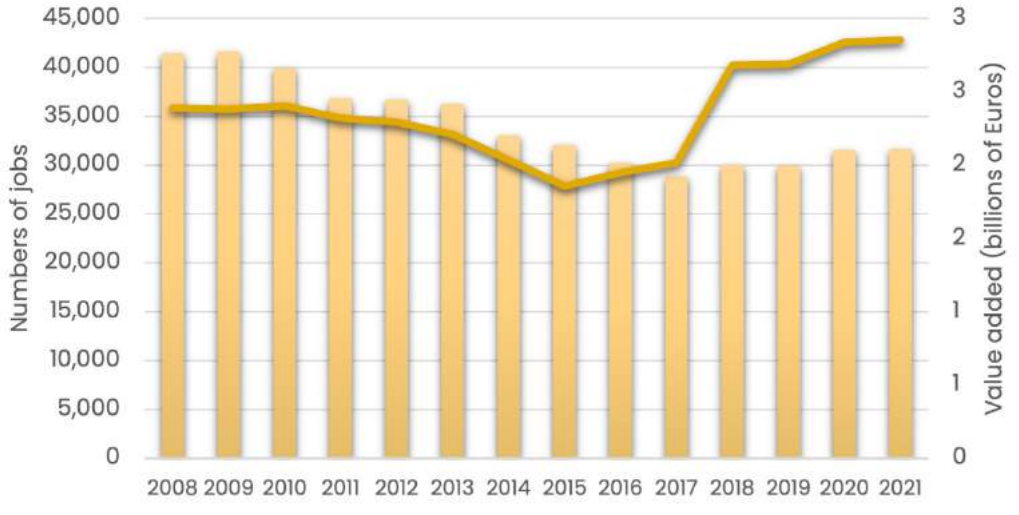


**Figure 39. Fashion/design, with intense dependence on immaterial rights, in Finland**

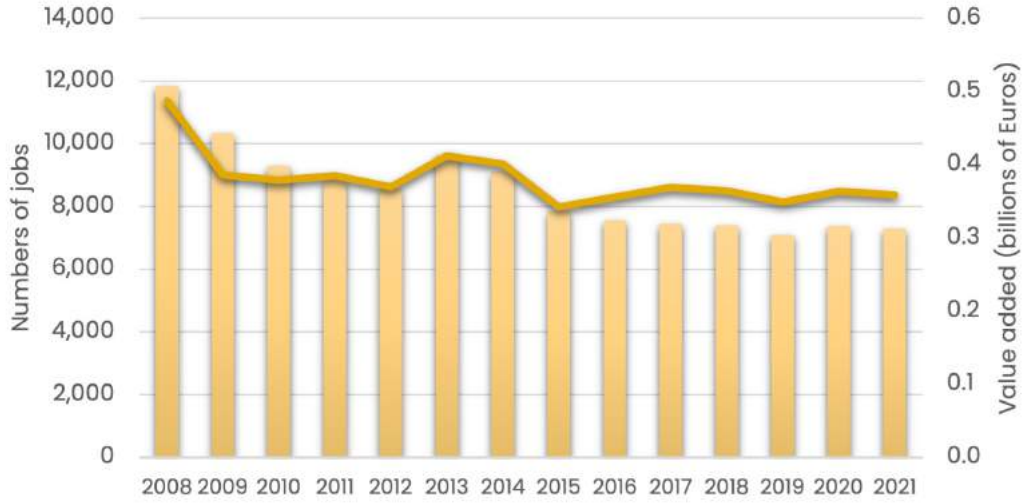



**Figure 40. Trademark dependent trade, with intense dependence on immaterial rights, in Finland**

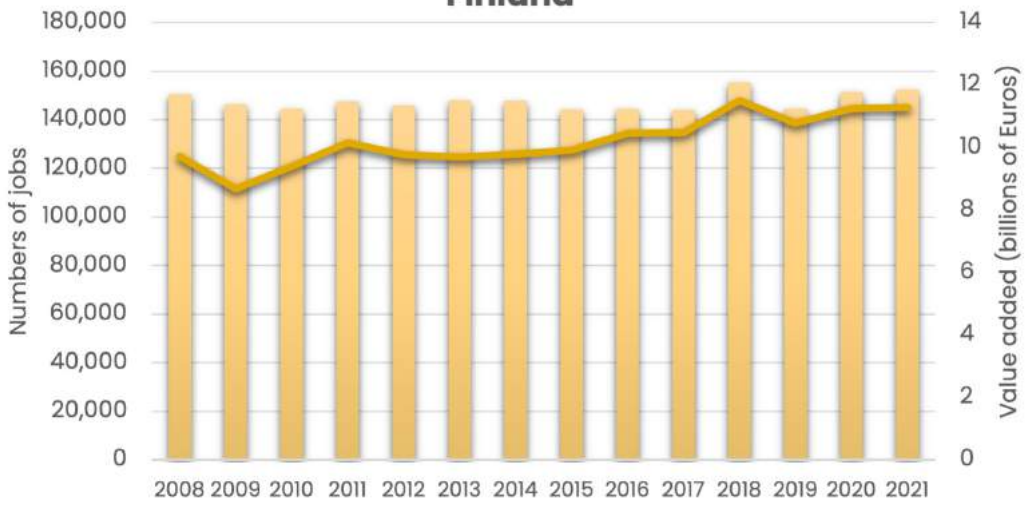


**Figure 41. Knowledge intensive services, with intense dependence on immaterial rights, in Finland**

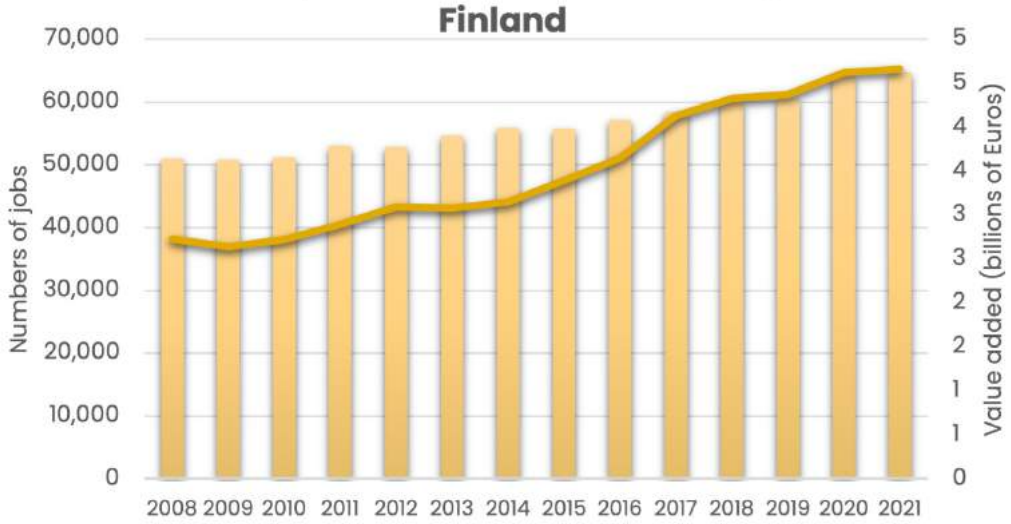



**Table 9. Number of people employed in businesses with intense dependence immaterial rights.**

**Regional data for Finland 2021, number of jobs.**

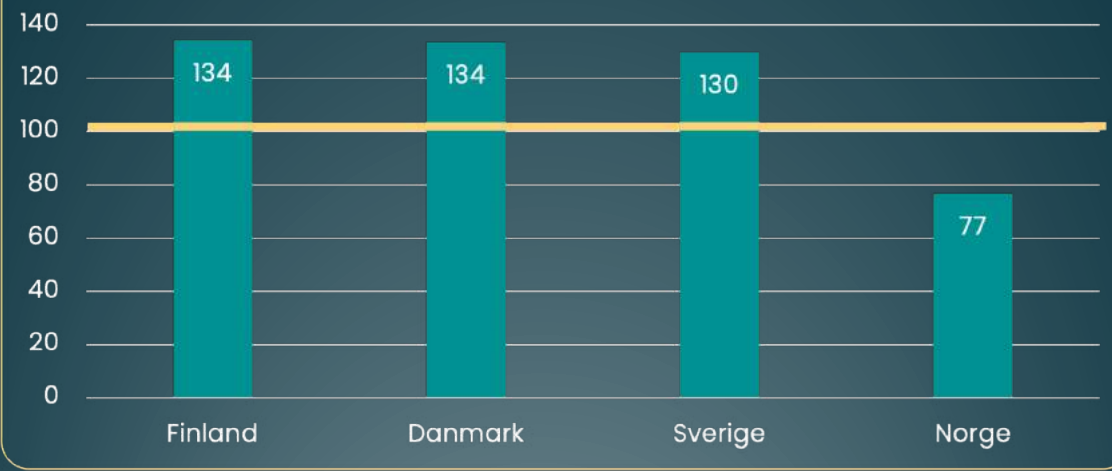
| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Länsi-Suomi | 18178 | 61958 | 11230 | 5218 | 2376 | 27372 | 7308 |
| Helsinki | 56076 | 42098 | 34161 | 18723 | 1312 | 76348 | 13231 |
| Etelä-Suomi | 9972 | 46403 | 8761 | 3825 | 1132 | 26216 | 5571 |
| Pohjois- ja Itä-Suomi | 15257 | 23471 | 8299 | 3867 | 1975 | 19582 | 4191 |
| Åland | 533 | 641 | 93 | 158 | 8 | 2478 | 226 |

**Table 10. Value added in businesses with intense dependence immaterial rights. Regional data for Finland 2021 (millions of Euros).**

| Region | IT/technology | Knowledge intensive industry | Knowledge intensive services | Media/ entertainment | Fashion/ design | Trademark dependent trade | Total estimate crowded out by piracy & counterfeiting |
|---|---|---|---|---|---|---|---|
| Länsi-Suomi | 1615 | 5515 | 810 | 470 | 117 | 2026 | 610 |
| Helsinki | 4983 | 3747 | 2464 | 1687 | 65 | 5650 | 1076 |
| Etelä-Suomi | 886 | 4130 | 632 | 345 | 56 | 1940 | 462 |
| Pohjois- ja Itä-Suomi | 1356 | 2089 | 599 | 349 | 97 | 1449 | 344 |
| Åland | 47 | 57 | 7 | 14 | 0.4 | 183 | 18 |

Immaterial intensive sectors tend to have higher output per employee than other parts of the business sector. In Finland and Denmark, the average employee in immaterial rights intensive occupation creates 34 percent higher economic value compared to the average employee in the rest of the business sector. The same relation in Sweden is 30 percent higher economic value. Only in Norway, where much of national wealth is created in the oil and natural gas sectors, this relationship is the inverse. **A shift towards higher share of the economy with intense immaterial rights dependency is likely to boost GDP per capita in the Nordic region.**

Figure 42. Value created per job in businesses with intense dependence on immaterial rights, compared to rest of business sector (rest of business sector = 100)



# Conclusions

In conclusion, we can see that businesses with intense reliance on immaterial rights play a key role in job and value creation throughout the Nordic nations. These companies are typically active in the trading sector, and have a high value creation for each employee, and their jobs are thus the form of jobs that stimulate growth of other jobs in non-tradable sectors. Both directly and indirectly, firms with intense dependence on immaterial rights play a crucial role for economic development. At the same time, the total economic loss and the tax revenue loss of piracy and counterfeiting amounts to significant figures in Sweden. It is very likely that the same situation exists also in the other Nordic nations, as the effects of piracy and counterfeiting are largely similar in the various Nordic economies.

> ***Combating piracy and counterfeiting and stimulating business growth in firms with intense dependence on immaterial rights, is an important ant integral part of economic policy.***

Combating piracy and counterfeiting and stimulating business growth in firms with intense dependence on immaterial rights, is an important and integral part of economic policy. It is important to remember the distinction between what is seen and what is not seen. While the number of jobs and value creation in businesses with intense dependence on immaterial rights is substantial, it is worth remembering that many other businesses also rely on these rights, even though they are not included in the intensely dependent group. Increasingly, more firms rely on immaterial values for example in the form of their trademarks.

It is also vital to understand that while immaterial rights violations are difficult for firms of all sizes to deal with, the damage can be more significant to smaller firms. The reason is that smaller firms have more limited knowledge on how to defend themselves and less resources to combat immaterial rights infringements. Some smaller businesses might be forced to shut down or limit their operations, when their immaterial rights are violated, as they do not possess the tools to combat the infringement. Limited protection for im-

material rights might even discourage potential entrepreneurs to create new businesses. It is important to have the small business perspective in mind, when formulating government policy, so that also smaller sized businesses are given appropriate legal protection for their immaterial value creation.

# Sources


Drucker, P.F. (2011). “The age of discontinuity: Guidelines to our changing society”, Transaction Publishers, Piscataway, USA. Ninth edition of the book originally published in 1969.

ECEPR (2021). “The Geography of Europe’s Brain Business Jobs: 2021 Index”.

EPO & EUIPO (2021). “Intellectual property rights and firm performance in the European Union – Firm-level analysis report, February 2021”.

European Commission, “Counterfeit, piracy and other IPR violations”. https://ec.europa.eu/taxation_customs/business/customs-controls/counterfeit-piracy-other-ipr-violations/a-serious-problem-everyone_en

European Commission (2021). “European Innovation Scoreboard 2021.”

Eurostat databases, regional and national structural business data, and quarterly labour input in industry data .

Fang, L.H., J. Lerner & C. Wu (2017). ”Intellectual property rights protection, ownership, and innovation: Evidence from China”, The Review of Financial Studies 30;7:2446-2477.

Frontier economics, ICC Bascap, International Trademark Association, and TECXIPIO (2016). “The economic impacts of counterfeiting and piracy”.

Gold, E.R., J.-F. Morin & E. Shadeed (2019). “Does intellectual property lead to economic growth? insights from a novel ip dataset”, Regulation & Governance 13;1:107-124.

Goos, M., Konings, J., & Vandeweyer, M. (2018). ”Local high-tech job multipliers in Europe. Industrial and Corporate Change”, 27;4:639-655.

Grossman, G.M. & E. Helpman (1993). ”Endogenous innovation in the theory of

growth", NBER Working Paper nr. 4527, National Bureau of Economic Research.
Hardy, J. (2017). "Estimating the global economic and social impacts of counterfeiting and piracy", World Trademark Review, 18 may 2017.
https://www.worldtrademarkreview.com/anti-counterfeiting/estimating-global-economic-and-social-impacts-counterfeiting-and-piracy

Hasan, I. & C.L. Tucci (2010). "The innovation–economic growth nexus: Global evidence", Research Policy, 39;10:1264-1276.

Keyser, P. T. (1993). "The purpose of the Parthian galvanic cells: a first-century AD electric battery used for analgesia", Journal of Near Eastern Studies, 52;2:81-98.

Klenow, P.J. & A. Rodríguez-Clare (1997). "The neoclassical revival in growth economics; Has it gone too far?", pp. 73-103 in Bernanke B. and J. Rotemberg (Ed.) "NBER Marcoeconomics Annual", MIT Press.

Kronick, D. A. (1976). "History of Scientific and Technical Periodicals", Bulletin of the Medical Library Association, 64;4:441-449.

Latzer, H., K. Matsuyama, & M. Parenti (2019). "Reconsidering the Market Size Effect in Innovation and Growth", Global Poverty Research Lab Working Paper, (19-106).

MacLeod, C. (2002). "Inventing the Industrial Revolution: The English Patent System, 1660-
1800", Cambridge University Press.

Moretti, E., & P. Thulin (2013). "Local multipliers and human capital in the United States and Sweden", Industrial and Corporate Change, 22;1:339-362.

Neves, P.C., O. Afonso, D. Silva & E. Sochirca (2021). "The link between intellectual property rights, innovation, and growth: A meta-analysis", Economic Modelling, 97:196-209.

Nordic Council of Ministers (2018). "State of the Nordic Region 2018, Theme 3: Economy".

OECD and PRV (2019). “Counterfeiting and Piracy and the Swedish Economy: Making sure ‘Made in Sweden’ always is”.

OHIM (2013). “Intellectual property rights intensive industries: contribution to economic performance and employment”.

OHIM (2016). “Intellectual property rights intensive industries and economic performance in the European Union”.

Olsen, K. (2005). “Counterfeiting and Piracy: Measurement Issues”, Background report for the WIPO/OECD Expert Meeting on Measurement and Statistical Issues Geneva, 17-18 October 2005.

Reibold, M., P. Paufler, A. A. Levin, W. Kochmann, N. Pätzke, & D. C. Meyer (2006). “Materials: Carbon nanotubes in an ancient Damascus sabre.” Nature 444;7117: 286-286.

Sanandaji, N. (2018). ”The Birthplace of Capitalism: The Middle East”, Timbro, Stockholm.

SCB. “Sveriges export”, latest updated 2021-09-14 when information was gathered.

Soete, L. (2011). ”Regions and innovation policies: the way forward”, in “Regions and Innovation Policy”, OECD Reviews of Regional Innovation, OECD.

Sundaram, A.S., D.P. Rajavenkatesan & D.E. Prema (2020). ”The role of intellectual property rights in technology transfer in the context of engineering sector”, International Journal of Advanced Research in Engineering and Technology (IJARET) 11;4.

Tamura, R., J. Dwyer, J. Devereux & S. Baier (2019). “Economic growth in the long run. Journal of Development Economics”, 137:1-35.

Van Dijk, J. (2014). “Local multipliers in OECD regions”, presented at 54th Congress of the European Regional Science Association: “Regional development & globalisation: Best practices”, 26-29 August 2014, St. Petersburg, Russia.

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