ECEPR

Intellectual Property, Jobs & Prosperity in the Nordic Region

THIRD ANNUAL INDEX

YEAR 2023

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2023 Index

ECEPR

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Förord: Har vi råd med alla dessa intrång? (Swedish)

Sedan förra årets rapport publicerades, har mycket förändrats. Kriget som Ryssland för mot Ukraina skapar spänningar i hela världen. Energifrågan och ökande inflation genomsyrar nyhetsrapporteringar. Privatekonomiska tips för att klara de höjda elpriserna, bolånen och matkostnaderna såsom matlådor och vilken tid på dygnet det är billigast att tvätta duggar tätt. Samtidigt ser vi hur 73 000 arbetstillfällen trängs undan i Sverige av immaterialrättsintrång, och 177 000 i Norden som helhet. Känslan av att sila mygg och svälja kameler infinner sig och frågan om vi har råd med alla dessa intrång?

I denna rapport har vi vid sidan av statistik även genomfört intervjuer med representanter från dataspels-, film-, bok- och trä- och möbelbranschen. De är alla drabbade av intrång. Intervjuerna visar att en av anledningarna till att inte försvara sina rättigheter är att det ibland är förknippat med höga kostnader. Intrången innebär inte endast direkta kostnader i form av skador och minskade intäkter utan även mer svårmätbara kostnader såsom minskade investeringar och satsningar på nya affärsområden.

Jag tror ju på att de immaterialrättsintensiva branscherna fortsatt är en viktig framgångsfaktor för den framtida ekonomin men vi måste se till att förutsättningar förbättras för dessa. Några av de frågor beslutsfattare bör titta närmare på:

- En nationell immaterialrättsstrategi: Hur kan Sverige, och andra nordiska länder, förbättra möjligheterna för de immaterialrättsintensiva näringarna?
- Informationsinsatser till allmänheten: Gör det lätt att göra rätt. Idag har immaterialrättsmyndigheten Patent- och registreringsverket, inga särskilda utan resurser att kunskapshöja om piratkopiering (något som tidigare funnits).
- Gör det möjligt att agera mot intrång i live-evenemang: Det finns inga rättsliga möjligheter att stoppa intrång i live-evenemang, vilket är ett ökande problem

inte minst i sportsammanhang.

- Administrativ blockering: Utred förutsättningar för en myndighet att utfärda blockerings-beslut mot intrångsgörande tjänster för att skydda båda konsumenter och immaterialrättsägare. På så vis minskar kostnaderna för parterna och även mindre rättighetshavare, som annars inte har ekonomiska möjligheter, kan få skydd.
- Mellanhändernas ansvar bör göras tydligare, så att den aktör som är bäst lämpad att förhindra intrång gör det, till exempel sökmotorer, plattformar, betalningsförmedlare och annonsförmedlare.

Kort sagt finns det stor förbättrings-potential och vi måste få en långsiktigt hållbar och flexibel plan som förbättrar förutsättningarna få betalt för sitt arbete och gör att det går att agera mot alla typer av intrång, där är vi inte idag.

Denna rapports syfte är bland annat att få igång dialog, beslut och reformer som är behövliga för företagen, jobben och samhällsekonomin. Reformarbetet kommer att vara ständigt pågående och det är en diskussion vi gemensamt måsta ta, för att öka förståelsen och förbättra förutsättningarna för samhällsekonomin i Sverige och Norden. Något som är extra viktigt i dessa oroliga tider.

Trevlig läsning!

Sara Lindbäck, Nätverket för en modern immaterialrätt.

Nyckelbudskap (Swedish)

- Förfalskning och piratkopiering i Norden beräknas leda till utträngning av 177 000 jobb, 16,8 miljarder euro i värdeskapande samt 4,5 miljarder euro i skatteintäkter. Dessutom finns en indirekt effekt, av att företagande och innovationer hämmas.
- Förfalskning och piratkopiering beräknas tränga ut värdeskapande som uppgår till 6,1 miljarder euro i Sverige, 4,8 miljarder i Danmark, 3,2 miljarder i Norge och 2,7 miljarder i Finland. Antalet jobb som trängs ut av varumärkesförfalskning och piratkopiering uppgår till uppskattningsvis 73 000 i Sverige, 41 200 i Danmark, 30 300 i Norge och 32 700 i Finland. Utträngningen av skatteintäkter uppgår till 1,65 miljarder euro i Sverige på grund av varumärkesförfalskning och piratkopiering, jämfört med 1,3 miljarder i Danmark, 850 miljoner i Norge och 700 miljoner i Finland.
- Nordiska företag med intensivt beroende av immateriella rättigheter bidrar med 283 miljarder euro i värdeskapande, och med 3 miljoner jobb i Norden.
- Värdeskapandet per anställd är 21 procent högre i nordiska företag med intensivt beroende av immateriella rättigheter, jämfört med resten av näringslivet.
- Branschföreträdare tycker att det behöver avsättas större resurser i rättssystemet för att bekämpa piratkopiering och andra former av immaterialrättsintrång, inte minst för att mindre företag ska få bättre möjligheter att försvara sina immateriella rättigheter. Även förebyggande insatser, till exempel informationskampanjer om piratkopiering i skolorna, kan vara konstruktiva lösningar.
- Att minska piratkopiering och intrång i immateriella rättigheter, genom reformer i Sverige och genom EU-samarbete, är avgörande för att främja innovation och utveckling inom immaterialrättsintensiva företag.

Sammanfattning (Swedish)

Varumärken, patent, copyright och designrättigheter spelar en avgörande roll för de företag som finns i Norden. De allra flesta företag har åtminstone någon form av beroende av immaterialrätt, till exempel i form av skydd för företagets varumärke. Samtidigt finns också en del företag som är *intensivt beroende* av immateriella rättigheter, det vill säga verkar i branscher där immateriella värden är en avgörande del av affärsverksamheten. 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.

Företag med intensivt beroende av immaterialrätt bidrar med 283 miljarder euro i värdeskapande i Norden, och med 3 miljoner arbetstillfällen

En genomgång av samtliga branscher som har ett intensivt beroende av immaterialrätt visar att de totalt bidrar med strax under 3 miljoner jobb i Norden, varav cirka 1,23 miljoner i Sverige, 696 000 i Danmark, 552 000 i Finland och 512 000 i Norge (tabell 1). Totalt bidrar företagen med ett ekonomiskt värdeskapande på drygt 283 miljarder euro i Norden, varav knappt 104 miljarder i Sverige, 81 miljarder i Danmark, 45 miljarder i Finland, och 54 miljarder i Norge (tabell 2).

Tabell 1. Antal anställda i branscher med intensivt beroende av immaterialrätt, 2022

	Sverige	Danmark	Finland	Norge	Hela Norden
Informationsteknik	211 400	99 200	104 800	76 100	491 600
Kunskapsintensiv industri	370 500	229 200	179 100	132 400	911 200
Media	69 100	44 600	29 400	37 700	180 800
Mode	6 300	5 500	6 900	4 800	23 500
Varumärkesberoende handel	399 000	224 600	167 400	193 500	984 500
Kunskapsintensiva tjänster	177 000	92 700	64 000	67 700	401 500
Summa	**1 233 500**	**695 800**	**551 600**	**512 200**	**2 993 100**

Källa: Eurostat, och egna beräkningar.

Tabell 2. Värdeskapande (miljoner euro) i branscher med intensivt beroende av immaterialrätt, 2022

	Sverige	Danmark	Finland	Norge	Hela Norden
Informationsteknik	19 900	11 300	9 100	10 300	50 600
Kunskapsintensiv industri	35 700	33 200	15 700	13 000	97 700
Media	6 000	3 200	2 700	3 400	15 200
Mode	400	400	300	300	1 500
Varumärkesberoende handel	31 300	24 800	12 500	20 300	88 900
Kunskapsintensiva tjänster	10 300	7 900	4 600	6 600	29 500
Summa	**103 600**	**80 900**	**45 000**	**53 900**	**283 400**

Källa: Eurostat, och egna beräkningar.

Nordiska it-företag bidrar med 492 000 jobb och 51 miljarder euro i värdeskapande

De företag som finns i informationsteknik (IT) verkar inom telekommunikationer, skapande av olika program och datorspel, relaterad konsultverksamhet, samt med att tillverka datorer, elektronik och optiska produkter. Generellt är dessa företag intensivt beroende av varumärken, designrättigheter, patent och copyright. För de som arbetar med utveckling av mjukvara är copyright av stor vikt för att skydda programkod. Ett framträdande mönster är att alla branscher som har ett intensivt beroende av någon form av immaterialrätt också är intensivt beroende av varumärken. Det kan förklaras med att företag som utvecklar ny design, nya patent och copyrightskyddat material inte bara har ett behov av att skydda dessa immateriella värden utan även behöver skydda sina varumärken så att konsumenter inte luras av plagiat. De företag som tillverkar datorer, elektronik och optiska produkter är intensivt beroende av designrättigheter, samt även av patent och copyright. Även företag inom telekommunikation har ett intensivt beroende av patent och copyright. Det finns totalt knappt 492 000 personer i Norden som jobbar i denna bransch, varav cirka 211 000 i Sverige, 99 000 i Danmark, 105 000 i Finland och 76 000 i Norge. Totalt bidrar företagen inom informationsteknik med ett ekonomiskt värdeskapande på nästan 51 miljarder euro i Norden.

Kunskapsintensiva industrier i Norden bidrar med 911 000 jobb och 98 miljarder euro i värdeskapande

Kunskapsintensiva industrier är företag i tillverkningsindustrin som är intensivt beroende av olika former av immaterialrätt. Gruppen omfattar olika industriföretag som framställer allt från läkemedel till motorfordon, möbler och livsmedel. Samtliga av branscherna är intensivt beroende av varumärken. De flesta har även ett intensivt beroende av patent för att skydda olika produktinnovationer samt processinnovationer. Många är även intensivt beroende av designskydd för sina produkter. Företagen är däremot inte intensivt beroende av copyright eftersom det värde som skapas i branscherna huvudsakligen sker i form av fysiska produkter. Det finns totalt drygt 911 000 personer i Norden som jobbar i kunskapsintensiva industrier, varav cirka 371 000 i Sverige, 229 000 i Danmark, 179 000 i Finland och 132 000 i Norge. Totalt bidrar företagen inom kunskapsintensiv industri med ett ekonomiskt värdeskapande på knappt 98 miljarder euro.

Mediaföretagen i Norden bidrar med 181 000 jobb och 15 miljarder euro i värdeskapande

Medieföretagen verkar med publicering och produktion av böcker, tidningar, film, datorspel och sändningsverksamhet. Liksom i andra branscher är företagen intensivt beroende av skydd för sina varumärken. Eftersom produktionen är immateriella värden, i form av till exempel musik, är företagen i dessa branscher även intensivt beroende av copyright. Det finns totalt knappt 181 000 personer i Norden som jobbar i media, varav cirka 69 000 i Sverige, 45 000 i Danmark, 29 000 i Finland och 38 000 i Norge. Totalt bidrar företagen inom media med ett ekonomiskt värdeskapande på knappt 15 miljarder euro.

Nordiska företag i modebranschen bidrar med 24 000 jobb och 1,5 miljarder euro i värdeskapande

Företagen inom mode är inriktade på tillverkning av textiler, kläder, läder och läderprodukter. Förutom intensivt beroende av skydd för sina varumärken, har företagen även intensivt beroende av skydd för designen av de kläder, tyger och andra modeprodukter som utvecklas. Företagen som tillverkar textiler är dessutom intensivt beroende av patent för skydd av sina produktionstekniker. Däremot är denna del av näringslivet inte intensivt beroende av copyright i och med att värdeskapandet huvudsakligen sker i form av fysiska produkter. Det finns totalt knappt 24 000 personer i Norden som jobbar i denna del av näringslivet, varav cirka 6 000 i Sverige, 5 000 i Danmark, 7 000 i Finland och 5 000 i Norge. Totalt bidrar de nordiska företagen inom mode med ett ekonomiskt värdeskapande på 1,5 miljarder euro.

Företag i varumärkesberoende handel bidrar med 985 000 jobb och 89 miljarder euro i värdeskapande

Varumärkesberoende handel omfattar partihandel och detaljhandel, samt även vattentransporter och lufttransporter. Det handlar om den del av handeln där varumärken spelar en avgörande roll. Företagen i denna del av näringslivet är intensivt beroende av varumärken, och i mindre omfattning även av patenträttigheter för de olika varor som säljs. Det finns totalt nästan 985 000 personer i Norden som arbetar i denna del av näringslivet, varav cirka 399 000 i Sverige, 225 000 i Danmark, 167 000 i Finland och 193 000 i Norge. Totalt bidrar

de nordiska företagen inom varumärkesberoende handel med ett ekonomiskt värdeskapande på 89 miljarder euro.

Kunskapsintensiva tjänster bidrar med 401 000 jobb och 29 miljarder euro i värdeskapande

Den sista gruppen av företag är de som erbjuder kunskapsintensiva tjänster. Detta omfattar företag som erbjuder informationstjänster, vetenskaplig forskning och utveckling, reklam och marknadsundersökning, resebyråer, leasing, samt kontorsadministration. Företagen är intensivt beroende av varumärken samt i mindre utsträckning även av designrättigheter, patent samt även copyright. Copyright är till exempel viktigt för företag som arbetar med informationstjänster samt reklam och marknadsundersökning. Patent är viktiga för kunskapsintensiva företag inom vetenskaplig forskning och utveckling. Designrättigheter är viktiga för företag inom reklam och marknadsundersökning, liksom för de som arbetar med vetenskaplig forskning och utveckling. Det finns totalt drygt 401 000 personer i Norden som jobbar i denna del av näringslivet, varav cirka 177 000 i Sverige, 939 000 i Danmark, 64 000 i Finland och 68 000 i Norge. Totalt bidrar företagen inom kunskapsintensiva tjänster med ett ekonomiskt värdeskapande på drygt 29 miljarder euro.

Tabell 3. Ekonomisk förlust av varumärkesförfalskning och piratkopiering, estimat för 2022 (miljoner Euro)

	Sverige	Danmark	Finland	Norge	Hela Norden
Utträngning antal jobb	73 000	41 200	32 700	30 300	177 200
Utträngning värdeskapande (miljoner euro)	6 100	4 800	2 700	3 200	16 800
Utträngning skatteintäkter (miljoner euro)	1 650	1 300	700	850	4 500

Källa: Eurostat, SCB, OECD och PRV (2019), Hardy (2017), och egna beräkningar.

Varumärkesförfalskning och piratkopiering i Norden tränger undan 177 000 jobb, 16,8 miljarder euro i värdeskapande och 4,5 miljarder euro i skatteintäkter

I **Sverige** beräknas varumärkesförfalskning och piratkopiering leda till minskat värdeskapande på 6,1 miljarder euro årligen och utträngning av 73 000 jobb i näringar med intensivt beroende av immateriella rättigheter (tabell 3). Skatteintäkterna påverkas också, med 1,65 miljarder euro i skatteintäkter som går förlorade på grund av att legala företag trängs ut genom varumärkesförfalskning och piratkopiering.

För **Danmark** beräknas varumärkesförfalskning och piratkopiering leda till minskat värdeskapande på 4,8 miljarder euro årligen och att 41 000 arbetstillfällen trängs ut från industrier som är intensivt beroende av immateriella rättigheter. Förlusten av skatteintäkter uppgår till cirka 1,3 miljarder euro årligen i Danmark.

Värdeskapandet i **Finland** minskar med cirka 2,7 miljarder euro på grund av varumärkesförfalskning och piratkopiering. Dessutom trängs nära 33 000 jobb ut, medan skatteintäkterna som går förlorade motsvarar cirka 700 miljoner euro.

I **Norge** leder varumärkesförfalskning och piratkopiering till att 30 000 jobb och ett ekonomiskt värdeskapande på 3,2 miljarder euro trängs ut, och till en skatteförlust på 850 miljoner euro. För hela Norden leder varumärkesförfalskning och piratkopiering till att 177 000 arbetstillfällen trängs undan. Förlusten i form av uteblivet värdeskapande motsvarar 16,8 miljarder euro, medan det är cirka 4,5 miljarder euro i skatteintäkter som trängs bort.

Värdeskapandet per anställd är 21 procent högre i branscher med intensivt beroende av immaterialrätt, än i övriga nordiska näringslivet

Branscher med intensivt beroende av immateriella rättigheter tenderar att ha högre produktion per anställd än andra delar av näringslivet. I genomsnitt för hela Norden skapar den genomsnittliga anställde i näringar med intensivt beroende av immaterialrätt 21 procent högre ekonomiskt värde än den genomsnittliga

anställde i resten av näringslivet. I Sverige rör det sig om 31 procent högre värde, i Finland 34 procent högre värde och i Danmark hela 45 procent högre värde per anställd. Endast i Norge, där mycket av det nationella välståndet skapas inom olje- och naturgassektorerna, är detta förhållande det omvända och siffran är 13 procent lägre värde per anställd. En förändring mot en högre andel av ekonomin med ett intensivt immateriellt rättighetsberoende skulle kunna öka BNP per capita i Norden.

Policyreformer krävs och fokus bör vara att göra det enklare att försvara immateriella rättigheter och att arbeta mera med frågan inom EU – särskilt gentemot Kina och andra länder med omfattande piratkopiering

Under arbetet med denna rapport har intervjuer genomförts med företrädare för olika immaterialrättsintensiva branscher för att bättre förstå hur piratkopiering och andra former av intrång i immateriella rättigheter påverkar verksamheterna. En central slutsats är att större resurser behöver avsättas till rättssystemet för att bekämpa immaterialrättsintrång, och att det bör vara enklare och förknippat med lägre ekonomisk risk att försvara sig mot intrång, inte minst för att mindre företag ska få bättre möjligheter skydda sina immateriella rättigheter. Det är ofta de mindre företagen som drabbas hårdast eftersom de inte har samma möjligheter att försvara sina immateriella rättigheter, samt eftersom de större aktörerna förlitar sig på flera intäktskällor. Enskilda mindre företag som utsätts för immaterialrättsintrång kan få hela affärsverksamheten underminerad, vilket leder till att färre engagerar sig i skapandeprocessen.

En slutsats från intervjuerna är att branscher som drabbas hårt av immaterialrättsintrång får en situation där en omfattande risk kan skapas för nya eller växande företag. Medan immaterialrättsintrång för branscherna som helhet leder till att en del av värdeskapandet trängs undan, kan det för enskilda företagare finnas risken att en i grunden lönsam verksamhet vänds till att bli olönsam. Immaterialrättsintrång leder till att nyföretagande, expansion, och innovation associeras inte bara med risk, utan dessutom med osäkerhet. Kombinationen av risk och osäkerhet är svår att hantera, särskilt för mindre och växande företag. Resultatet är att piratkopiering och plagiering skapar en indirekt, dynamisk, förlust i form av att branschernas utveckling överlag hämmas.

Att minska piratkopiering och intrång genom politiska åtgärder i Sverige och genom EU-samarbete, är avgörande för att främja innovation och utveckling i immateriella rättighetsintensiva företag. Det bör därför ses som en strategiskt viktig del av affärspolitiken, som påverkar stora delar av ekonomin, och i synnerhet de högvärdiga och exportorienterade företagen som driver mycket av den ekonomiska utvecklingen. Parallellt med det reformarbete som behöver vidtas i Norden måste mer göras gemensamt via EU. EU är en av världens ledande ekonomier, och bör gemensamt agera för att sätta press på framförallt Kina, men också andra länder med omfattande förekomst av piratkopiering och plagiering, som till exempel Turkiet. Internationell samverkan och samförstånd behövs för att minska förekomsten av immaterialrättsintrång, och frågan behöver hamna högt upp i dagordningen för internationella handelssamtal, så att krafttag tas tillsammans med för EU viktiga handelspartners. Immateriella värden är tillsammans med materiella värden grunden för en modern kunskapsekonomi, och i förlängningen är det nödvändigt att alla länder som är integrerade delar av den globala handeln verkar för att respektera dessa rättigheter. Det är svårt för Sverige och de andra nordiska länderna att ensamt driva denna fråga, och därför bör det också vara fokus för EU:s internationella arbete.

Foreword: Can we afford all these infringements?

Since last year's report was published, much has changed. The war Russia is waging against Ukraine is creating tension worldwide. The energy issue and rising inflation pervade news reports. Personal finance tips to cope with the increased electricity prices, mortgages, and food costs, such as lunch boxes and what time of day it is cheapest to do laundry, are common in the papers. At the same time, we see how intellectual property rights infringements crowd out 73,000 jobs in Sweden, and 177,000 in the Nordics as a whole. The feeling of straining gnats and swallowing camels sets in, and the question is whether we can afford all these infringements.

In this report, in addition to statistics, we have interviewed representatives from the computer game, film, book, and wood and furniture industries. They are all affected by infringements. The interviews show that one of the reasons for not defending one's rights is that it is sometimes associated with high costs. The infringements entail not only direct costs in the form of damages and reduced income but also more difficult-to-measure costs such as reduced investments and ventures into new business areas.

I do believe that the intellectual property intensive industries continue to be an important success factor for the future economy, but we must ensure that the conditions for these are improved. Some of the issues decision-makers should look into are:

- A national intellectual property rights strategy: How can Sweden, and other Nordic countries, improve the opportunities for intellectual property-intensive industries?
- Information to the public: Today, the intellectual property rights authority, the Patent and Registration Office, has no dedicated resources to raise awareness about piracy (something that previously existed).
- Makes it possible to act against infringements in live content: There are no

legal possibilities to stop infringements in live content, which is an increasing problem, not least in sports.

- Administrative blocking: Investigate conditions for an authority to issue blocking orders against infringing services to protect consumers and intellectual property rights owners. In this way, the costs for the parties are reduced, and rights holders with smaller economic strength, who otherwise do not have financial means, can receive protection.
- The role of intermediaries should be made clearer, so that the actor best suited to prevent infringement does so, for example search engines, platforms, payment intermediaries and advertising intermediaries.

In short, there is great potential for improvement, and we must have a long-term sustainable and flexible plan that improves the conditions to get paid for one's work and makes it possible to act against all types of infringements. We are not there today.

The reforms will have to be ongoing in order to increase understanding and improve the conditions for the economy in Sweden and the Nordic region. Something especially important in these troubled times.

Enjoy the reading!

Sara Lindbäck, the Network for a modern IP legislation.

Key messages

- Counterfeiting and piracy in the Nordics are estimated to lead to crowding out of 177,000 jobs, 16.8 billion euros in value creation, as well as 4.5 billion euros in tax revenues. In addition, there is an indirect effect, that entrepreneurship and innovations are inhibited.
- Counterfeiting and piracy are estimated to have crowded out value creation amounting to 6.1 billion euros in Sweden, 4.8 billion in Denmark, 3.2 billion in Norway, and 2.7 billion in Finland. The number of jobs crowded out by counterfeiting and piracy amounts to estimated 73,000 in Sweden, 41,200 in Denmark, 30,300 in Norway, and 32,700 in Finland. The crowding out of tax revenues amounts to 1.65 billion euros in Sweden due to counterfeiting and piracy, compared to 1.3 billion in Denmark, 850 million in Norway, and 700 million in Finland.
- Nordic companies with intense dependence on intellectual property rights contribute with 283 billion euros in value creation (contribution to GDP), and with 3 million jobs in the Nordics.
- Value creation per employee is 21 percent higher in Nordic businesses with intense dependence on intellectual property rights, compared with the rest of the business sector.
- Industry representatives think that greater resources need to be allocated in the legal systems for combating piracy and other forms of intellectual property rights infringements, not least so that smaller companies gain better possibilities to defend their intellectual property rights. Even preventive efforts, for example information campaigns about piracy in schools, can be constructive solutions.
- Reducing piracy and intellectual property infringement, through policy action, and through EU cooperation, is vital for boosting innovation and development in intellectual property rights intensive businesses.

Summary

Trademarks, patents, copyrights, and design rights play a decisive role for the companies in the Nordic region. Most companies have at least some forms of dependence on intellectual property rights, for example in the form of protection for the company's brand. Some companies are *intensely dependent* on intellectual property rights, since they are in industries where intellectual property is a crucial part of business operations. This study examines how many jobs and what economic value these companies create, in the various Nordic countries and the regions within these countries. The study also estimates the crowding out effect caused by counterfeiting and piracy.

Companies with intense dependence on intellectual property rights contribute with 283 billion euros in value creation in the Nordics, and with 3 million jobs

A review of all industries that have an intense dependence on intellectual property rights shows that they contribute a total of just under 3 million jobs in the Nordics, of which approximately 1.23 million in Sweden, 696,000 in Denmark, 552,000 in Finland and 512,000 in Norway (table 1). In total, the companies contribute with an economic value creation of 283 billion euros in the Nordics, of which just under 104 billion in Sweden, 81 billion in Denmark, 45 billion in Finland, and 54 billion in Norway (table 2).

Table 1. Number of employees in industries with intense dependence on intellectual property rights, 2022

	Sweden	Denmark	Finland	Norway	All Nordics
Information technology	211 400	99 200	104 800	76 100	491 600
Knowledge intensive industries	370 500	229 200	179 100	132 400	911 200
Media	69 100	44 600	29 400	37 700	180 800
Fashion	6 300	5 500	6 900	4 800	23 500
Trademark dependent trade	399 000	224 600	167 400	193 500	984 500
Knowledge intensive services	177 000	92 700	64 000	67 700	401 500
Sum	**1 233 500**	**695 800**	**551 600**	**512 200**	**2 993 100**

Source: Eurostat and own calculations.

Table 2. Value creation (millions of euros) in industries with intense dependence on intellectual property rights, 2022

	Sweden	Denmark	Finland	Norway	All Nordics
Information technology	19 900	11 300	9 100	10 300	50 600
Knowledge intensive industries	35 700	33 200	15 700	13 000	97 700
Media	6 000	3 200	2 700	3 400	15 200
Fashion	400	400	300	300	1 500
Trademark dependent trade	31 300	24 800	12 500	20 300	88 900
Knowledge intensive services	10 300	7 900	4 600	6 600	29 500
Sum	**103 600**	**80 900**	**45 000**	**53 900**	**283 400**

Source: Eurostat and own calculations.

Nordic IT companies contribute 492,000 jobs and 51 billion euros in value created

The companies found in information technology (IT) operate in telecommunications, creation of various programs and computer games, related consulting activities, as well as in the manufacture of computers, electronics, and optical products. These companies are intensely dependent on trademarks, design rights, patents, and copyrights. They all rely heavily on trademarks in their operations. In fact, a prominent pattern is that all industries that have an intense reliance on some forms of intellectual property are also heavily dependent on trademarks. This can be explained by the fact that the companies which develop new designs, new patents, and immaterial values protected by copyright, not only have a need to protect these properties, but also to protect their trademarks so that consumers are not deceived by plagiarism. The companies that manufacture computers, electronics and optical products are intensely dependent on design rights, as well as on patents and copyrights. The companies in telecommunications have an intense dependence on patents and copyrights. There is a total of just under 492,000 people in the Nordics who work in IT companies, of which approximately 211,000 in Sweden, 99,000 in Denmark, 105,000 in Finland and 76,000 in Norway. In total, the companies within IT contribute with an economic value creation of just under 51 billion euros, in the Nordic region.

Nordic Knowledge-intensive industries contribute 911,000 jobs and 98 billion euros in value creation

Knowledge-intensive industries are companies in the manufacturing industry that are intensely dependent on various forms of intellectual property rights, especially trademarks, design rights and patents. The group includes many different industrial companies, which operate in the production of everything from pharmaceuticals to motor vehicles, furniture, and food. All the industries are intensely dependent on trademarks. Most also have an intense dependence on patents, to protect various product innovations, as well as process innovations. Many are also intensely dependent on design protection for their products. Knowledge intensive industries are, on the other hand, not intensely dependent on copyright, since the value created in the industries mainly takes place in the form of physical products. There are a total of just over 911,000 people in the

Nordics who work in knowledge-intensive industries, of which approximately 371,000 in Sweden, 229,000 in Denmark, 179,000 in Finland and 132,000 in Norway. In total, the companies within knowledge-intensive industries contribute with an economic value creation of just under 98 billion euros.

The media companies in the Nordics contribute 181,000 jobs and 15 billion euros in value creation

Media companies operate with the publication and production of books, newspapers, films, computer games and broadcasting activities. As in other industries, media companies rely heavily on protection for their content and their trademarks. Since the production is focused on intangible value, in the form of music for example, the companies in these industries are also intensely dependent on copyright. There is a total of just under 181,000 people in the Nordics who work in media companies, of which approximately 69,000 in Sweden, 45,000 in Denmark, 29,000 in Finland and 38,000 in Norway. In total, the media companies contribute with an economic value creation of just under 15 billion euros.

Nordic companies in the fashion industry contribute 24,000 jobs and 1.5 billion euros in value creation

The companies in fashion are focused on the manufacture of textiles, clothing, leather, and leather products. In addition to heavy reliance on protection for their trademarks, companies also rely heavily on the design of the clothing, fabrics and other fashion products that are developed. The companies that manufacture textiles are also intensely dependent on patents to protect their production techniques. On the other hand, this part of business life is not intensely dependent on copyright, as the value creation takes place in the form of physical products. There is a total of just under 24,000 people in the Nordics who work in this part of business life, of which approximately 6,000 in Sweden, 5,000 in Denmark, 7,000 in Finland and 5,000 in Norway. In total, the Nordic companies in fashion contribute with an economic value creation of 1.5 billion euro.

The companies in trademark dependent trade contribute 985,000 jobs and 89 billion euros in value creation

Trademark dependent trade includes wholesale and retail trade, as well as water transport and air transport. It is about the part of trade where brands play a decisive role. The companies in this part of business are intensely dependent on trademarks, and to a lesser extent also on patent rights for the various goods that are sold. There is a total of just under 985,000 people in the Nordics who work in this part of business life, of which approximately 399,000 in Sweden, 225,000 in Denmark, 167,000 in Finland and 193,000 in Norway. In total, the companies within trademark dependent trade contribute an economic value creation of 89 billion euros, in the Nordic region.

Knowledge intensive services contribute 401,000 jobs and 29 billion euros in value creation

The last group of companies are those that offer knowledge intensive services. This includes companies that offer information services, scientific research and development, advertising and market research, travel agencies, leasing, and office administration. The companies are intensely dependent on trademarks, and to a lesser extent also on design rights, patents, and copyright. Copyright is, for example, important for companies in information services as well as advertising and market research - as the companies produce, for example, advertising films in their operations. Patents are important for knowledge intensive companies in scientific research and development. Design rights are important for companies in advertising and market research, as well as those involved in scientific research and development. There are a total of just over 401,000 people in the Nordics who work in this part of business life, of which approximately 177,000 in Sweden, 939,000 in Denmark, 64,000 in Finland and 68,000 in Norway. In total, the Nordic companies within knowledge intensive services contribute with an economic value creation of roughly 29 billion euros.

Tabel 3. Economic loss due to counterfeiting and piracy (millions of Euros), estimates for 2022

	Sweden	Denmark	Finland	Norway	All Nordics
Crowding out number of jobs	73 000	41 200	32 700	30 300	177 200
Crowding out value creation (millions of euros)	6 100	4 800	2 700	3 200	16 800
Crowding out tax revenues (millions of euros)	1 650	1 300	700	850	4 500

Source: Eurostat, SCB, OECD and PRV (2019), Hardy (2017), and own calculations.

Counterfeiting and piracy in the Nordics crowds out 177,000 jobs, 16.8 billion euros in value creation, and 4.5 billion euros in tax revenue

In **Sweden**, counterfeiting and piracy are estimated to lead to reduced value creation of 6.1 billion euros annually and the displacement of 73,000 jobs in industries with intense dependence on intellectual property rights (table 3). Tax revenues are also affected, with 1.65 billion euros in tax revenue lost due to legal businesses being crowded out by counterfeiting and piracy.

For **Denmark**, counterfeiting and piracy are estimated to lead to reduced value creation of 4.8 billion euros annually and to the crowding out of 41,000 jobs from industries that are intensely dependent on intellectual property rights. The loss

of tax revenue amounts to around 1.3 billion euros annually in Denmark.

Value creation in **Finland** is reduced by approximately 2.7 billion euros due to counterfeiting and piracy. In addition, close to 33,000 jobs are crowded out, while the tax revenue that is lost corresponds to around 700 million euros.

In **Norway**, counterfeiting and piracy lead to the crowding out of 30,000 jobs, an economic value creation loss of 3.2 billion euros, and to a tax loss of 850 million euros. For the entire Nordic region, counterfeiting and piracy lead to the crowding out of 177,000 jobs. The loss in the form of value creation corresponds to 16.8 billion euros, while it is approximately 4.5 billion euros in tax revenue that is lost.

Value creation per employee is 21 percent higher in industries with intense dependence on intellectual property rights, than in the rest of the Nordic business sector

Businesses with an intense dependence on intellectual property rights tend to have higher output per employee than other parts of the business sector. On average for the entire Nordic region, the average employee in industries with intense dependence on intellectual property rights creates 21 percent higher economic value than the average employee in the rest of the business world. In Sweden, the figure is 31 percent higher value, in Finland 34 percent higher value, and in Denmark fully 45 percent higher value per employee. Only in Norway, where much of the national wealth is created in the oil and natural gas sectors, is this relationship reversed, and the figure is 13 percent lower value per employee. A change towards a higher share of the economy with an intense dependence on intellectual property rights could increase GDP per capita in the Nordic region.

Policy reforms are needed and focus should be to make it easier to defend intellectual property rights and working more with the issue internationally via the EU - especially towards China and other countries with extensive piracy

During the work on this report, interviews were conducted with representatives

of the industries, with intensive dependence on immaterial rights, in order to better understand how piracy and other forms of infringement of intellectual property rights affect operations. A central conclusion is that greater resources need to be allocated to the legal system to combat intellectual property rights infringements, not least so that smaller companies will have better opportunities to defend their intellectual property rights. It should become easier and associated with less economical risk to defend intellectual property. It is often the smaller companies that are hit hardest because they do not have the same opportunities to defend their intellectual property rights, and because the larger players rely on multiple sources of income. Individual smaller companies exposed to intellectual property infringement can have their entire business undermined, resulting in fewer people engaging in the creative process.

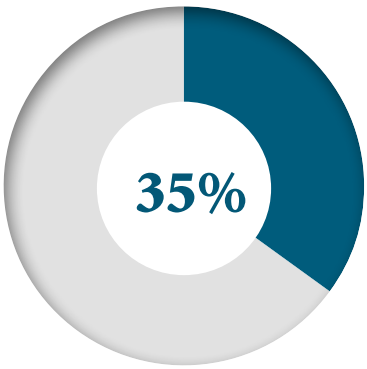
One conclusion from the interviews is that industries that are hit hard by intellectual property rights infringements have a situation where an extensive risk can be created for new or growing companies. While infringement of intellectual property rights for the industries as a whole lead to a part of the value creation being crowded out, for individual entrepreneurs there may be the risk that a fundamentally profitable business is turned to become unprofitable. Infringement of intellectual property rights means that new entrepreneurship, expansion, and innovation are associated not only with risk, but also with uncertainty. The combination of risk and uncertainty is difficult to manage, especially for smaller and growing companies. The result is that piracy and plagiarism create an indirect, dynamic, loss in the form of the industry's overall development being inhibited.

Reducing piracy and infringement through political measures in Sweden and through EU cooperation is crucial to promoting innovation and development in intellectual property-intensive companies. It should therefore be seen as a strategically important part of business policy, which affects large parts of the economy, and in particular the high-value and export-oriented companies that drive much of the economic development. Parallel to the reform work that needs to be undertaken in the Nordic countries, more must be done jointly via the EU. The EU is one of the world's leading economies and should act jointly to put pressure on China above all, but also other countries with widespread

occurrences of piracy and plagiarism, such as Turkey. International cooperation and consensus are needed to reduce the incidence of intellectual property rights infringements, and the issue needs to be high on the agenda for international trade talks, so that efforts are made together with the EU's important trading partners. Intangible values, together with tangible values, are the basis of a modern knowledge economy, and by extension it is necessary that all countries that are integral parts of global trade act to respect these rights. It is difficult for Sweden and the other Nordic countries to pursue this issue alone, and therefore it should also be the focus of the EU's international work.

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 40% of the value added in the private sector economy.

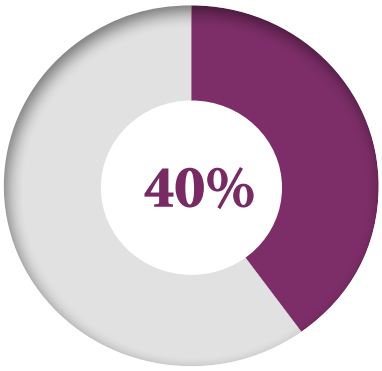
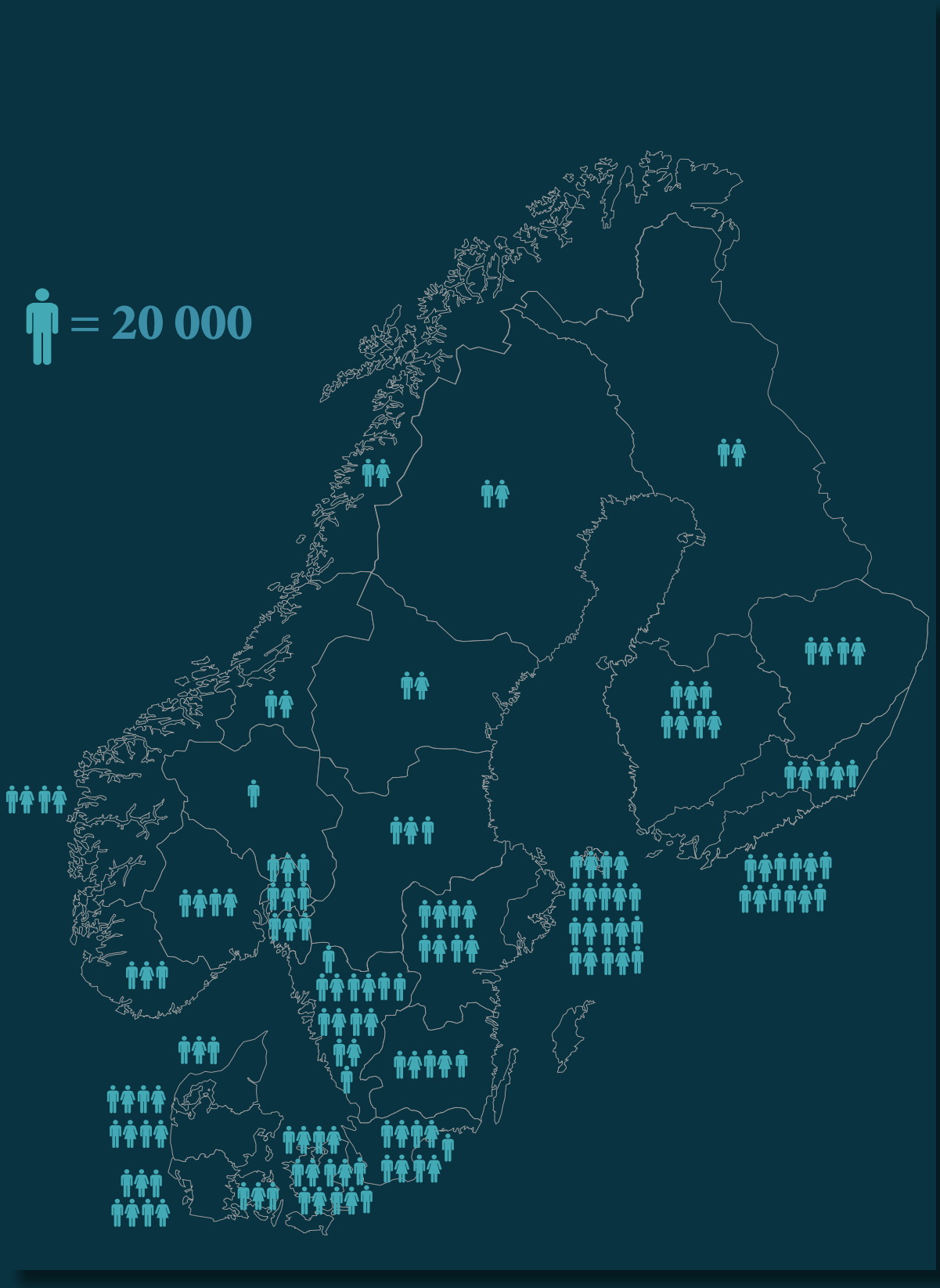


Figure 2. Number of employees in intellectual property-rights intensive businesses across the Nordics



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 intellectual property 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.

The importance of intellectual property rights for the Nordic economy

The purpose of this study 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 intellectual property rights—in the form of trademarks, patents, copyright and design rights. This analysis is also carried out at a regional basis. The study, which is published in the form of recurring index, finds that firms with intense dependency on intellectual property 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. Another aspect of the study is to estimate how much value is lost each year due to intellectual property rights violations, such as counterfeiting and piracy.

A brief overview of the Nordic economies is relevant to understanding the context of this study. The Nordic region taken together constitutes the 12th largest economy in the world.[1] 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 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] The Nordic region is highly knowledge intensive, with many firms relying on intellectual property rights.

Together with capital, labour, and natural resources, knowledge is a cornerstone of economic activity.[4] A combination of technological innovations, new ways of organizing work processes, organizational changes and service innovations

1 Nordic Council of Ministers (2018).

2 ECEPR (2022). Brain Business Jobs are knowledge-intensive occupations in the traditional tech-sector, ICT, advanced services, and creative professions.

3 European Commission (2022). The three Nordic nations that are EU-member states are thus the leading member states in terms of innovative capacity.

4 Drucker (2011, originally published in 1969); Klenow & Rodríguez-Clare (1997); Latzer, Matsuyama, & Parenti (2019).

drive long-term progress.[5] 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. Intellectual property rights additionally play a key role in technology transfer between firms, and between countries.[6]

"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. Intellectual property rights additionally play a key role in technology transfer between firms, and between countries."

Within the research literature, there are two viewpoints on intellectual property rights protection. The first is that intellectual property 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 intellectual property rights protection in 124 economies during the period between 1995 and 2011. The study finds that higher level of intellectual property rights protection is indeed associated with higher

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

6 Sundaram, Rajavenkatesan Prema (2020).

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.[7]

A similar study but on Chinese data has been conducted by Lily Fang, Josh Lerner and Chaopeng Wu, who focus 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 intellectual property rights protection was stronger.[8] Pedro Cunha Neves and co-authors have in a study published in 2021 conducted 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 have a positive effect on innovation and growth. This effect is stronger in developed economies compared to developing economies.[9] Modern research supports the idea that intellectual property rights strengthen economic growth and innovation. Intellectual property rights need to be balanced, rewarding investments in ideas and digital content are protected, as well as allowing new innovators to enter the market.

"Modern research supports the idea that intellectual property 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, 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 coun-

7 Gold, Morin & Shadeed (2019).

8 Fang, Lerner & Wu (2017).

9 Neves et al. (2021).

terparts 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.[10] Recent research thus confirms that firms with reliance on intellectual property rights tend to achieve higher economic output, and that this indeed also benefits the employees in the form of higher wages.

10 EPO & EUIPO (2021).

Need for increased policy action against piracy and infringement

It is evident that businesses with intense reliance on intellectual property 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 intellectual property 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 the Nordic region. Combating piracy and counterfeiting and stimulating business growth in firms with intense dependence on intellectual property rights, is an important ant integral part of economic policy.

"A key conclusion is that greater resources need to be allocated in the juridical system for combating piracy and other forms of intellectual property rights infringements, not least so that smaller companies gain better possibilities to defend their intellectual property rights."

Interviews with representatives for different intellectual property rights intensive industries in Sweden have been carried out, during October and November 2022, to better understand the challenges faced by different parts of the economy, as a result of infringement. A key conclusion is that greater resources need to be allocated in the juridical system for combating piracy and other forms of intellectual property rights infringements, not least so that smaller companies gain better possibilities to defend their intellectual property rights.

Businesses engaged in movies and television production in Sweden have considerable problems with piracy. This affects all segments of this industry, but particularly so the smaller businesses. Often it is smaller production companies that come up with the idea for a movie or TV program, and the production happens in partnership with a larger production company. The larger production companies have multiple revenue streams, from different projects, and from production as well as distribution. The smaller businesses are more reliant on single projects, and often their annual revenues are strongly linked to one particular movie or TV program. Some movies and TV programs are more affected by piracy than others, and the result is that those smaller businesses whose projects suffer strongly from piracy suffer significant economic damage. Therefore, the influx of new ideas through new companies is limited significantly by piracy. For larger companies piracy reduces revenues, and this in turn leads to smaller possibilities to invest in new projects. In the Swedish TV and movies business, piracy therefore leads to a limitation of new projects developed and proposed by smaller businesses, and a more limited opportunity of larger actors to finance new projects.

A conclusion is that the easier it is for the consumer to use the material illegally, the more risk is created for the industry. If some of the consumers of a new film watch it illegally, instead of paying to see it legally, it can have a significant impact on the profitability of the project. It can be the difference between the project running with a surplus, and it just turning around, or running at a loss. In particular, uncertainty and risk are created for smaller players in the industry - who live on individual projects for a longer period of time. In order to reduce the problem of piracy, more resources should be allocated to preventing piracy, for example through information campaigns in schools. Prevention, for example through informing pupils in schools about the detrimental effects of piracy, is an important aspect, of how government agencies can strive towards strengthening intellectual property rights.

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Another sector that is strongly affected by piracy in Sweden is the computer games developers. The original impulse to make games is artistic, combining feeling and reason. Creators may experience their work being distorted by intellectual property infringement. The economic driving force decreases, it affects the conditions of production and the conditions of competition. Intellectual property infringement undermines the business model. There are numerous forms of intellectual property infringement in computer games. Stolen games can be downloaded, cracked or stolen keys to games can be sold, or entire illegal servers can be set up for pirated games. There is also plagiarism, where a game is produced that imitates an original, and where consumers looking for the original can be tricked into paying for the plagiarized game instead. Plagiarism can be more difficult to protect against, it can be borderline if a game is similar to another, or if it is plagiarism. Also in the computer games industry, smaller actors can be hit more harshly by piracy and plagiarism than larger actors, since larger actors have better possibilities to protect themselves and also more diversified revenue streams.

Intangible assets found in the games are described as, for example, program code, trademarks, graphic elements. In practice, it is a whole, which also includes, for example, the players' relationship to the game series, and it is the whole that needs to be protected. In practice, it needs to be protected by copyright and trademarks, sometimes patents. By extension, there are reasons to broaden perspectives, for example when game mechanics are largely plagiarized. Another development that is requested is increased international cooperation to better access the breaches. For example, those who steal keys often are registered outside the EU, and although there is international cooperation to access crime, access is still limited because resources are limited. At the national level in the Nordic countries, and through EU cooperation, greater resources need to be put into

following up infringements of intellectual property that occur across borders. Intermediaries also have great responsibility, such as platforms that sell apps. The trading places may need to be developed, so that they act more strongly against plagiarism, even when committed against smaller games developers.

"At the national level in the Nordic countries, and through EU cooperation, greater resources need to be put into following up infringements of intellectual property that occur across borders. Intermediaries also have great responsibility, such as platforms that sell apps."

In the music and publishing industries, piracy is more limited, since much of the business happens through platforms that give users access to large libraries of material. For a subscription fee to for example Spotify or Youtube Music, users can get access to many different forms of music to listen to, and a similar situation exists with books and audio books, through actors such as Swedish Storytel. However, there is still international infringement. When for example Swedish music is played in China, it is rare that fees are paid to compensate the owner of the music rights. The issue of infringement of intellectual property rights is therefore a global issue but limited in the Nordics because streaming is so widespread. Legislation needs to be designed so that the rules online are the same as offline. For example, a store that sells vinyl records digitally needs to clearly register who is behind the operation, as in other businesses. So that whoever is compromised online can access it.

For books, there has been a market development in which platforms that offer many books and audio books to subscribers are becoming more dominant in the market, and these subscription services have reduced piracy. Illegal copying and spreading does continue to occur. It is common that webpages are set up that offer pirated books, audio books, and course literature – but the real purpose is

to obtain for example credit card information from the user so that the accounts can be hacked (phishing). Course literature is a part of the market where piracy is a more common problem. In closed networks (social media) and the darknet, there is a lot of copying of course literature. Course literature is often more expensive, students have to buy it, and the books are typically purchased individually rather than accessed through subscription services – these factors explain why this segment of the publishing market is more affected.

"On the same day that a new chair is launched by a Swedish company, the same chair can be ordered on Chinese websites at a significantly lower price, and even customers in Sweden buy the plagiarized product at a lower price. Infringement of intellectual property rights thus strikes against the core business, the idea of combining form and function in a new piece of furniture."

Also, industries such as manufacturers of furniture, are routinely exposed to the effects of piracy. The core business of furniture production is the intangible idea, the pattern of the furniture to be developed. It is associated with large development costs. On the same day that a new chair is launched by a Swedish company, the same chair can be ordered on Chinese websites at a significantly lower price, and even customers in Sweden buy the plagiarized product at a lower price. Infringement of intellectual property rights thus strikes against the core business, the idea of combining form and function in a new piece of furniture. The companies that are affected by piracy come under significant pressure. It takes a long time with legal processes, and it is associated with large costs. Therefore, many times those companies whose immaterial rights have been infringed are not able to protect their rights, and piracy continues. This, in turn, leads to a reduction in the power of innovation. The prerequisite for financing new products, and the driving forces for it, are undermined by piracy.

Regarding policy, much has improved over time. Special courts have been set up in Sweden for infringement of intellectual property rights, and there is thus increased knowledge about infringement of intellectual property rights in the legal system. In addition, the punishment has been toughened. The need for further reform however exists. Penalties need to be raised for infringement. Since much of piracy is international, there is also the need to work with governments in other parts of the world, such as China for example, to reduce infringement that takes place across borders. The EU needs to push for change through trade talks and diplomatic talks, using the weight of the union as one of the leading global economies, to achieve change. Reducing piracy and infringement, through policy action in Sweden, and through EU cooperation, is vital for boosting innovation and development in intellectual property rights intensive businesses. It should therefore be seen as a strategically important part of business policies, which influences large parts of the economy, and in particular the high-value and export-oriented companies that drive much of economic progress. Lastly, resources to courts that follow up immaterial rights infringement needs to increase, so that the legal system can better follow up this important issue.

"Reducing piracy and infringement, through policy action in Sweden, and through EU cooperation, is vital for boosting innovation and development in intellectual property rights intensive businesses. It should therefore be seen as a strategically important part of business policies, which influences large parts of the economy, and in particular the high-value and export-oriented companies that drive much of economic progress."

How municipalities and public agencies can support intellectual property rights

There is much that can be done on the international, and national, levels for strengthening protection of intellectual property rights. The EU can for example put pressure on countries such as China to stop infringement and piracy against European firms, during trade negotiations and other diplomatic contacts. National policymakers can strengthen the legal protection for intellectual property rights by updating legislation, and by providing better funding for the legal system so that for example the courts have greater resources for following up intellectual property rights infringements. However, there is also an important role that municipal business offices can play. Municipal business offices have a role in supporting local businesses with advice, and this advising role can be expanded so that each municipal business office has one or more staff who themselves are educated in providing advice related to protection of intellectual property rights.

In Sweden and other Nordic nations, much of the contact that businesses, particularly small and medium-sized businesses, have is with the municipal business offices. The role of these offices is not only to regulate the local firms, but also to support them with advice. Knowledge about managing and developing intangible assets is crucial for businesses, and it is often smaller and newer businesses that lack this knowledge. One constructive step is that municipal business offices start providing advice to local companies on how to better protect their intellectual properties. By doing so, they can provide valuable aid to local businesses, helping them to deal with important challenges, and promoting the ability and incentives of businesses to grow locally.

Additionally, the municipalities and government agencies themselves need better education on the importance of these rights, and how to deal with them in relation to public procurements. A considerable share of the economic activity occurs through public procurements, in which municipalities and government agencies

are key actors. During 2022, the Confederation of Swedish Enterprise carried out an analysis of 197 randomly selected public procurements advertised by Swedish municipalities and government agencies, based on procurements containing the heading "intellectual property rights". It was found that the municipalities and government agencies asked for the ownership of the intellectual property rights in 94 percent of the cases.[11] While in some circumstances this can be a relevant request, overall the role of municipalities and government agencies is not to themselves conduct business activities. Routinely asking for the intellectual property rights to be transferred during public procurements signals that municipalities and government agencies have a limited understanding of how the issue should be handled. These requests can be difficult for many firms, who wish to provide various solutions and services, while retaining their intellectual property rights.

If municipal business offices increase their own competency about intellectual property rights, this could fill the dual role of supporting local businesses with knowledge, and also supporting the municipalities themselves to find ways of procuring services and solutions, without typically requiring providing firms to give up ownership of their intellectual properties. Government agencies similarly would need better education on intellectual property rights amongst their staff, so that their own public procurements can be more aligned with the ability of businesses to retain their intellectual properties.

11 Confederation of Swedish Enterprise (2022).

Intellectual property rights in historic context

Enterprise and market economy evolved already 4,000 years ago in ancient Babylonia and Assyria. This ancient 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.[12] Throughout history, in places such as the Middle East and India, advanced technologies have existed that were either lost or not improved on, since they existed in economies without intellectual property rights. One example is steel with carbon nanotubes incorporated in the structure, which while often assumed to be a modern form of nanotechnology in fact is found in historical artifacts.[13] Another example is that galvanic cells, in the form of early batteries, have existed long in the Middle East[14], yet the concept for electricity was not further developed. A key reason is that these developments happened in economic systems with strong protection for physical property rights, but where intellectual property rights did not yet exist.

Already during ancient times, some early attempts to introduce intellectual property rights were made in different parts of the world. The first systematic protection evolved 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.[15]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*.[16] This development is closely linked

12 Sanandaji (2018).

13 Reibold et.al (2006).

14 Keyser (1993).

15 MacLeod (2002).

16 Kronick (1976)

to that of patents, and fostered the sharing of ideas, in contrast to the previous situation in which scientists would keep their findings secret, in order to not be plagiarised. 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 intellectual property rights innovations that paved way for the modern knowledge economy.

"Thomas Edison revolutionized innovation and played a key role in laying the ground for much of the digital revolution, by establishing the first industrial research laboratories in the late 19th century USA, which also included the world´s first film studio. This was possible because the business model was not about making one invention, manufacture and sell it, but to create value through the invention process itself, via patents."

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. Music could evolve as a business in Europe, once copyright existed, and the intellectual property rights protection that evolved for protecting music notes would later be important for laying the groundworks for intellectual property rights protection of computer code.[17] Since intellectual property rights existed and evolved, the European market model, as well as the US market model, could push for systematic innovation. Thomas Edison revolutionized innovation and played a key role in laying the ground for much of the digital revolution, by establishing the first industrial research laboratories in the late 19th century USA, which also included the

17 Sanandaji (2021).

world´s first film studio. This was possible because the business model was not about making one invention, manufacture and sell it, but to create value through the invention process itself, via patents. This form of broad-scale innovation was simply not possible before intellectual property rights existed, which explains why two millennia before Thomas Edison the technology to make batteries existed, but not the framework for developing the concept of electrification. The modern knowledge-based economy has evolved with the gradual formation and expansion of intellectual property rights, which is an important background for understanding the development happening in our time.

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 – which are protected by intellectual property rights.

Methodology for calculations

This study examines detailed structural business statistics, coupled with quarterly indicators of recent development, to estimate the role that industries with intense dependence on intellectual property right have in the Nordic economies. 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.[18] 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.[19]

Table 4 shows the division of the private sector in businesses that are intensely dependent on various forms of intellectual property 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 intellectual property 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 value added per job is the same for the different regions that make up the various countries. Table 5 shows the division of economic activity, in six different intellectual property rights intensive group of industries, that is used in this study.

18 See EUIPO (2013, 2016).

19 The analysis has been limited to four forms of intellectual property: trademarks, patents, design rights and copy right. The other two intellectual property in the EUIPO 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.

Tabell 4. Intense dependency on various forms of intellectual property rights

	Trademark	Design	Patents	Copyright	No intense intellectual property 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		
Manufacture of tobacco products	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 5. Division of economic activity in intellectual property rights intensive group of industries

Intellectual property 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	Manufacture of tobacco products
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

Crowding out due to counterfeiting and piracy

Businesses that are intensely dependent on intellectual property rights, are also more sensitive to intellectual property rights violations, such as counterfeiting and piracy. Globally counterfeiting and piracy represents a multi-billion-dollar illegal industry, which creates a significant drain on the real 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.[20] 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 intellectual property rights of Swedish enterprises, to amount to 28.3 billion SEK, amounting to two percent of the international sales of goods manufactured in Sweden. This estimate is for the trade in the year 2016. For the same year, it is estimated that counterfeit and piracy reduced public tax revenues in Sweden by 7.54 billion SEK.[21]

The above estimate is about measuring the direct cost of counterfeiting and piracy, but there are also indirect costs to consider. As an OECD study concluded already in 2005, there are numerous ways through which counterfeiting and piracy disturb the economy: "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."[22]

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

21 OECD and PRV (2019).

22 Olsen (2005), quote p. 6.

Jeff Hardy, former director of the International Chamber of Commerce, has in a 2017 article published in World Trademark Review, published 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 intellectual property rights dependent sectors are undermined, jobs are lost, and international investments are limited by counterfeiting and piracy.[23]

"For the entire Nordic region, there are 177,000 jobs and 16.8 billion euros that are crowded out by counterfeiting and piracy in 2022."

According to SCB (Sweden's statistical agency) database, the volume of international exports in 2020 was 2 507 billion SEK, compared with 1,888 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 65.0 billion SEK by piracy and counterfeiting in 2021, 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 17.3 billion SEK, 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 5.94 billion euros of lost economic value, and a tax loss of 1.58 billion euros, based on a 10.94 SEK/euro value, which was the exchange rate for mid-October 2022 when this calculation was carried out.

23 Hardy (2017).

As shown in this study, the value creation in all businesses with intense dependency on intellectual property values, amounted to about 100.4 billion euros in Sweden during 2021. The economic loss of counterfeiting and piracy amounts to circa 5.92% 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 further 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 1.58% of total economic value created by intellectual property 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.

The calculations are used, to estimate the crowding out of jobs and value added in businesses with intense reliance on intellectual property rights, based on the 2022 data presented in this study. For Sweden in 2022, counterfeiting and piracy are estimated to have crowded out 6.1 billion euros in value creation and 73,000 jobs, and lead to a tax loss of 1.65 billion euros. For the entire Nordic region, there are 177,000 jobs and 16.8 billion euros that are crowded out by counterfeiting and piracy in 2022. These estimates are based on some simplifying assumptions but allow us to gain a better understanding of the total economic damage that piracy and counterfeiting cause in the Nordics.

Sweden, regional data

In Sweden, firms with an intense dependency on intellectual property rights during 2022 created an added value of nearly 104 billion euros in total and employed over 1,2 million persons. Tables 6 and 7 show the breakdown of these jobs, and economic value creation, in the different regions of the country. The tables also show how many jobs, and the extent of economic value, that is crowded out by piracy and counterfeiting. In the Stockholm capital region, for example, approximately 22,700 jobs and an economic value of nearly 1,9 billion euros is crowded out due to violations of intellectual property rights.

Table 6. Number of people employed in businesses with intense dependence intellectual property rights, regions of Sweden 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Stockholm	98,200	57,200	68,100	33,600	600	126,200	**22,700**
Östra Mellansverige	22,200	64,600	19,400	6,100	1,200	49,000	**9,600**
Småland med öarna	8,300	47,600	10,200	4,600	600	29,400	**6,000**
Sydsverige	25,500	53,800	22,900	10,000	600	63,400	**10,400**
Västsverige	37,800	106,000	35,200	9,000	2,700	85,200	**16,300**
Norra Mellansverige	7,600	20,800	9,000	2,500	300	23,400	**3,800**
Mellersta Norrland	5,400	7,600	5,600	1,100	200	10,000	**1,800**
Övre Norrland	6,400	12,800	6,700	2,300	200	12,400	**2,400**

Table 7. Value added (millions of euros) in businesses with intense dependence intellectual property rights, regions of Sweden 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Stockholm	9,230	5,520	3,960	2,930	40	9,890	**1,870**
Östra Mellansverige	2,080	6,230	1,130	530	70	3,840	**820**
Småland med öarna	780	4,590	590	400	40	2,300	**520**
Sydsverige	2,400	5,190	1,330	870	30	4,970	**880**
Västsverige	3,550	10,230	2,050	780	160	6,680	**1,390**
Norra Mellansverige	710	2,010	530	220	20	1,840	**320**
Mellersta Norrland	500	740	320	90	10	780	**150**
Övre Norrland	610	1230	390	200	10	970	**200**

Denmark, regional data

In Denmark, firms with an intense dependency on intellectual property rights during 2022 created an added value of nearly 81 billion euros in total and employed nearly 700,000 persons. Tables 8 and 9 show the breakdown of these jobs, and economic value creation, in the different regions of the country. The tables also show how many jobs, and the extent of economic value, that is crowded out by piracy and counterfeiting. In the Copenhagen capital region, for example, approximately 16,900 jobs and an economic value of nearly 1,9 billion euros is crowded out due to violations of intellectual property rights.

Table 8. Number of people employed in businesses with intense dependence intellectual property rights, regions of Denmark 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Copenhagen	59,400	58,400	51,200	28,100	600	87,400	**16,900**
Sjalland	3,500	22,400	4,900	1,900	100	20,600	**3,200**
South Denmark	8,800	58,100	11,000	6,000	1,200	47,400	**7,800**
Midtjylland	20,800	65,100	20,900	6,400	2,600	51,500	**9,900**
Nordjylland	6,700	25,200	4,700	2,300	900	17,600	**3,400**

Table 9. Value added (millions of euros) in businesses with intense dependence intellectual property rights, regions of Denmark 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Copenhagen	6,750	8,470	4,380	2,000	50	9,660	1,850
Sjalland	400	3,240	420	130	12	2,280	380
South Denmark	1,000	8,420	940	430	100	5,240	960
Midtjylland	2,370	9,450	1,790	460	210	5,700	1,180
Nordjylland	760	3,650	400	160	70	1,940	410

Finland, regional data

In Finland, firms with an intense dependency on intellectual property rights during 2022 created an added value of 45 billion euros in total and employed over 550,000 persons. Tables 10 and 11 show the breakdown of these jobs, and economic value creation, in the different regions of the country. The tables also show how many jobs, and the extent of economic value, that is crowded out by piracy and counterfeiting. In the Helsinki capital region, for example, approximately 14,400 jobs and an economic value of close to 1,2 billion euros is crowded out due to violations of intellectual property rights.

Table 10. Number of people employed in businesses with intense dependence intellectual property rights, regions of Finland 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Helsinki	59,200	44,500	34,900	17,400	1,800	85,600	14,400
Länsi-Suomi	18,800	63,500	11,400	4,800	2,200	30,100	7,700
Etelä-Suomi	10,700	46,700	9,400	3,300	1,000	29,400	6,000
Pohjois- ja Itä-Suomi	15,600	23,700	8,200	3,700	1,900	21,600	4,400
Åland	600	700	100	200	20	700	100

Table 11. Value added (millions of euros) in businesses with intense dependence intellectual property rights, regions of Finland 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Helsinki	5,160	3,900	2,520	1,590	90	6,390	1,160
Länsi-Suomi	1,640	5,560	820	440	110	2,250	640
Etelä-Suomi	930	4,090	680	300	50	2,200	490
Pohjois- ja Itä-Suomi	1,360	2,080	590	340	90	1,610	360
Åland	50	60	10	14	1	50	10

Norway, regional data

In Norway, firms with an intense dependency on intellectual property rights during 2022 created an added value of 54 billion euros in total and employed over 510 000 persons. Tables 12 and 13 show the breakdown of these jobs, and economic value creation, in the different regions of the country. The tables also show how many jobs, and the extent of economic value, that is crowded out by piracy and counterfeiting. In the Oslo capital region, for example, approximately 10,700 jobs and an economic value of nearly 1,2 billion euros is crowded out due to violations of intellectual property rights.

Table 12. Number of people employed in businesses with intense dependence intellectual property rights, regions of Norway 2022

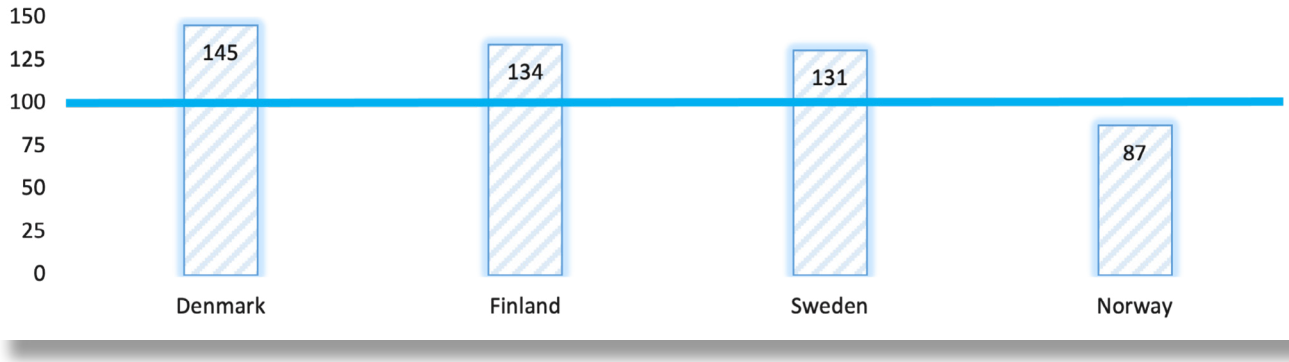
	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Oslo	42,400	17,200	31,700	17,700	700	70,200	10,700
Innlandet	2,500	8,400	2,500	1,100	200	9,900	1,500
Sor-Ostlandet	8,600	28,100	8,800	3,600	600	32,700	4,900
Agder og Rogaland	8,100	22,000	6,900	2,500	800	25,800	3,900
Vestlandet	6,600	33,100	7,400	3,600	1,600	27,100	4,700
Trondelag	5,900	11,900	6,400	2,300	400	12,800	2,400
North Norway	1,900	11,800	4,000	2,100	400	15,100	2,100

Table 13. Value added (millions of euros) in businesses with intense dependence intellectual property rights, regions of Norway 2022

	IT	Knowledge intensive industry	Knowledge intensive services	Media	Fashion	Trademark dependent trade	**Total estimate crowded out by piracy & counterfeiting**
Oslo	5,750	1,690	3,110	1,570	50	7,350	1,160
Innlandet	340	820	250	100	20	1,040	150
Sor-Ostlandet	1,170	2,760	870	320	40	3,420	510
Agder og Rogaland	1,090	2,170	680	220	50	2,700	410
Vestlandet	900	3,260	720	320	110	2,840	480
Trondelag	800	1,170	630	210	30	1,340	250
North Norway	260	1,160	390	190	30	1,590	210

Intellectual property intensive sectors tend to have higher output per employee than other parts of the business sector. In Denmark, the average employee in intellectual property rights intensive occupation creates 45 percent higher economic value compared to the average employee in the rest of the business sector. In Finland the number is 34 percent higher, and in Sweden 31 percent. 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 intellectual property rights dependency is likely to boost GDP per capita in the Nordic region.**

Figure 3. Value created per job in businesses with intense dependence on immaterial rights, in 2022, compared to rest of business sector (rest of business sector = 100)



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Graphic design and layout:
Andreea-Ioana Șutac

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Dataspelsbranschen

Sveriges Filmuthyrareföreningen

Ifpi Sverige

Läromedelsförfattarna

Medieföretagen

Musikförläggarna

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