CPB Netherlands Bureau for
Economic Policy Analysis

National Productivity Board 2021 annual report

Productivity growth has dropped in 2020 in the Netherlands due to the Covid-19 pandemic and subsequent lockdowns. The services sector was hit hardest as the lockdowns affected this sector most.

The importance of Intangible capital has been rising in the Netherlands. During the lockdowns there was a wide uptake of new digital technologies in various sectors. The Netherlands was in a good position as use of technology such as broadband was already high. The effect on productivity will become clear in coming years.

CPB Communication

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Samenvatting

De coronapandemie heeft een grote impact gehad op de productiviteit in Nederland, maar ook in andere Europese landen. De arbeidsproductiviteit en de totale factorproductiviteit (TFP) daalden fors in 2020. De dienstensector werd het hardst getroffen door de lockdowns die tot doel hadden de verspreiding van het coronavirus tegen te gaan. Hieraan gekoppeld nam de kapitaalintensiteit scherp toe. Dit kan worden verklaard door een sterke daling van het aantal gewerkte uren door de coronapandemie en het lockdown-beleid. Daarentegen daalden de investeringen in vast kapitaal nauwelijks in 2020. Ten slotte bleven de onderzoeks- en ontwikkelingsuitgaven in Nederland stijgen. Deze zijn lange tijd achtergebleven bij de eurozone, maar lieten na 2010 een flinke stijging zien.

We richten ons op immaterieel kapitaal als thema, omdat immaterieel kapitaal steeds belangrijker is geworden in Nederland. De investeringen in immaterieel kapitaal zijn sinds de jaren negentig fors gestegen als aandeel van het bbp in Nederland. Deze stijging heeft er zelfs toe geleid dat de Nederlandse economie de koplopers, namelijk het Verenigd Koninkrijk en de Verenigde Staten, heeft ingehaald. De positieve trend van investeringen in immaterieel kapitaal wordt gestimuleerd door hogere investeringen in geautomatiseerde informatie en organisatorisch kapitaal. Dienstverlenende bedrijven maken intensiever gebruik van dit soort immaterieel kapitaal en zijn daarmee de aanjagers van de toename. Als gevolg hiervan wordt sinds 1995 gemiddeld een kwart van de Nederlandse bbp-groei verklaard door is immaterieel kapitaal; ook hier zijn geautomatiseerde informatie en organisatiekapitaal het belangrijkst.

Immaterieel kapitaal is nauw verbonden met digitale technologieën, die tijdens de lockdowns relatief veel zijn gebruikt. Veel werkenden moesten tijdens de coronapandemie noodgedwongen thuiswerken en vergaderden digitaal. Maar ook in andere sectoren, zoals onderwijs, gezondheidszorg en detailhandel, maakten lockdowns het noodzakelijk om digitale technologieën in te voeren. Het gebruik van deze technologieën nam daardoor in Nederland sterk toe. Om online detailhandel mogelijk te maken, maar ook contactloos te betalen in winkels, is het gebruik van digitale technologieën bij financiële transacties toegenomen. Nederland had al een goede uitgangspositie voor de acceptatie van deze nieuwe technologieën, want in ons land wordt het gebruik van digitale technologieën zoals internetbreedband en digitaal betalen al breed omarmd. Het is de vraag of deze ontwikkelingen effect zullen hebben op de productiviteit, en zo ja, hoe groot en standvastig dit effect zal zijn.

Summary

The Covid-19 pandemic has had a large impact on productivity in the Netherlands, but also in other European countries. There was a large drop in labour productivity and TFP in 2020. The service sector was hit hardest by the lockdowns aimed at containing the spread of the coronavirus. Linked to this is the sharp increase in capital intensity, which can be explained by a sharp decrease in the number of hours worked, which is again linked to the corona pandemic and the lockdown policy. In contrast, investments in fixed capital did not drop much. Finally, R&D expenditures in the Netherlands have continued to increase. These have lagged behind the Euro Area for a long time, but picked up after 2010.

We focus on intangible capital as special topic, as intangible capital has become increasingly important. Investments in intangible capital have risen sharply as a share of GDP in the Netherlands since the 1990s. This increase has even led to the Dutch economy to catch up with the frontrunners, the United Kingdom and the United States. The positive trend of investment in intangible capital is driven by higher investment in computerized information and organizational capital. Service companies are using these types of intangible capital more intensively and are therefore driving the increase. As a consequence, intangible capital has accounted on average for a quarter of Dutch GDP growth since 1995, here too automated information and organizational capital are the most important.

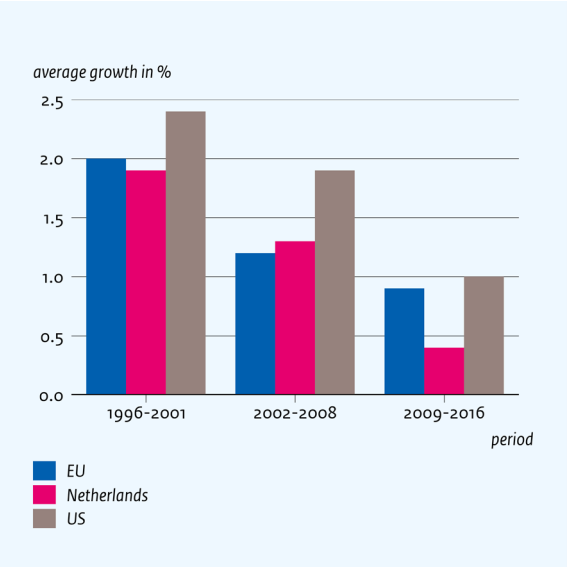
Intangible capital is closely linked to digital technologies, which have seen a relatively large uptake during the Covid-19 lockdowns. Many workers were forced to work from home, meeting digitally. But also in other sectors such as education, health and retail, lockdowns necessitated the uptake of digital technologies. There was a steep increase in the uptake of these technologies in the Netherlands. To facilitate online retail, but also contactless payments in shops, the use of digital technologies in financial transactions increased. The Netherlands was already in a good position for the uptake of these new technologies, as it was already quite advanced in the use of digital technologies such as internet broadband and digital payments. The question is whether these developments will have an effect on productivity, and if so, how large and persistent this effect will be.

1 Introduction

The CPB was designated a National Productivity Board by the Dutch Government in April 2017. As an NPB, the CPB's research focuses on the determinants of productivity development. The empirical research varies from international comparative research, for example how countries are affected by a financial crisis or trade agreements, to microeconomic research into companies or individuals. Ultimately, the CPB aims to better understand the driving and impeding factors for productivity growth in the Netherlands.

Productivity is broadly defined, namely as a measure of the efficiency of the use of available production factors. The primary focus here is on the national level, and attention is paid to both structural trends and cyclical variation in productivity growth. These insights into the driving and impeding factors are relevant for policy and an important step is to investigate which policy incentives can contribute to productivity growth.

Figure 1.1: Labour productivity growth is stalling in the Netherlands



Source: de Bondt et al., (2021)

Statistics Netherlands has shown that productivity growth in the Netherlands has stalled since 1996 and has lagged behind the EU average and the US since 2009 (see Figure 1.1). It provides an overview of reasons behind this productivity slowdown (de Bondt et al., 2021). They find that various commonly used reasons in the literature do not explain the slowdown in the Netherlands. The CPB has also done various analyses to examine some commonly used explanations for the Netherlands, which we will explain in brief:

1. divergence between frontier firms and laggards
2. markups
3. slowing business dynamics

First, in an analysis on the contributions of small and large companies to productivity growth in the Netherlands, we find no indications for divergence: that the productivity of frontier firms in the Netherlands is increasing faster than that of the lagging firms in the period 2006-2015 (van Heuvelen et al., 2018). It seems that a lack of technology diffusion between the frontier firms and laggards cannot explain the slowdown. We also find that for the Netherlands, small businesses show a different growth pattern, but do contribute to national productivity growth.

Second, we analysed whether increasing markups could explain the slowdown in productivity growth. Several seminal papers have shown that there is a trend of growing market power of a small number of companies (superstars), measured by rising markups in the US (De Loecker et al., 2020). The studies link this trend to the slowdown of productivity growth. Companies that are large and have market power may suppress new competitors or take anti-competitive measures, for example by driving up (entry) costs. These companies invest not in innovation, but in stifling innovative competition. Even though the company itself may have high productivity, it has little incentive to become even more productive. In an analysis on markups in the Netherlands, we find that the average (weighted) markup in the Netherlands has not risen over the past eleven years (van Heuvelen et al., 2019).

Finally, we examined business dynamics in the Netherlands. Business dynamism, including firm birth, growth, decline and exit, is important for overall productivity growth and reallocation, and therefore for economic growth (Decker et al., 2017). High dynamism enables resources to be reallocated from low-productivity to high productivity firms in the economy (Bartelsman and Doms, 2000). We find that the churn, the sum of entry and exit, has declined, mostly driven by a declining entry rate from 2006 (Freeman, Bettendorf, van Heuvelen, et al., 2021). The churn rate has declined more strongly in manufacturing than in services. We employ a Melitz and Polanec (2015) decomposition to find that firm dynamics contribute differently to TFP growth across industries. In services industries, entry of new firms, contribute most to overall TFP growth. This is less the case in manufacturing industries, where TFP growth is driven mostly by incumbent firms. In manufacturing, entry and exit dynamics contribute relatively little or negatively to TFP growth.

The COVID-19 pandemic that hit the Netherlands in March 2020, has had a widespread impact on the economy, including productivity through the different channels (see also D'Adamo et al., 2021):

- Hysteresis effects (Adema et al., 2020 in Dutch)
- Government support measures (Freeman, Bettendorf, and Adema, 2021)
- Intangible capital

In this Productivity Monitor, we focus on intangible capital in the Netherlands, and make the link between the COVID-19 pandemic and the increase in digitalisation across various sectors.

2 Overview of productivity growth in the Netherlands

Productivity is one of the main determinants of economic growth. It is measured in several ways. It can be based on a single production factor (such as labour or capital) or a combination of several factors of production. Productivity can be measured for the economy as a whole, broken down by sectors or for a company.

Labour productivity is a common measure and is expressed as the ratio between production (or value added) and the number of employees (or hours worked). The advantage of productivity based on one production factor (e.g. labour) is that it is easy to understand. It must be borne in mind that such a measure is influenced by changes in the intensity with which other production factors (e.g. capital) are deployed. Therefore, productivity is often measured by total factor productivity (TFP). This is the residual of the variation in output that is not explained by changes in factors of production.

As in most countries, productivity growth has been slowing down in the Netherlands in the past decade (Grabska et al., 2017). Figure 2.1 shows the development of labour productivity 1995-2020 for the Netherlands and the Euro Area. From 1995 to 2006, growth in the Netherlands was slightly higher than in the Euro Area, but tapered off afterwards. Average growth in 1995-2019 is below that of the Euro Area. In 2020, when the Covid-19 pandemic hit, productivity growth fell steeply in all European countries (Figure 2.2), except Ireland.[1] The fall in the Netherlands, however, was less than the Euro Area.

[1] Data was downloaded on 30 November 2020. Preliminary estimates published by Eurostat earlier still showed a positive growth for many European countries

Figure 2.1: Real labour productivity per person 1995-2020 (below)

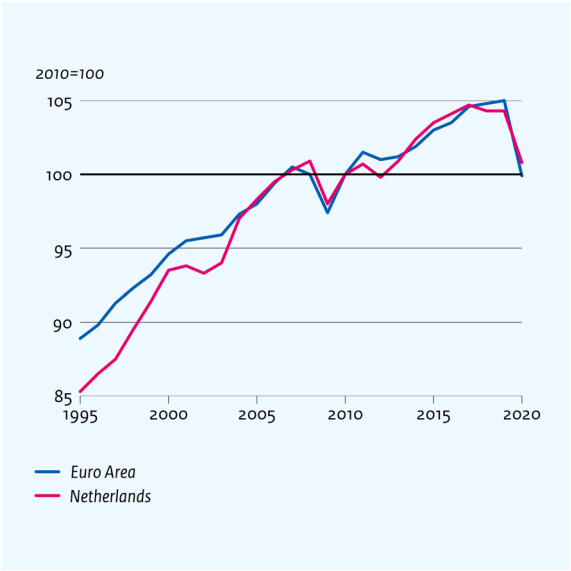
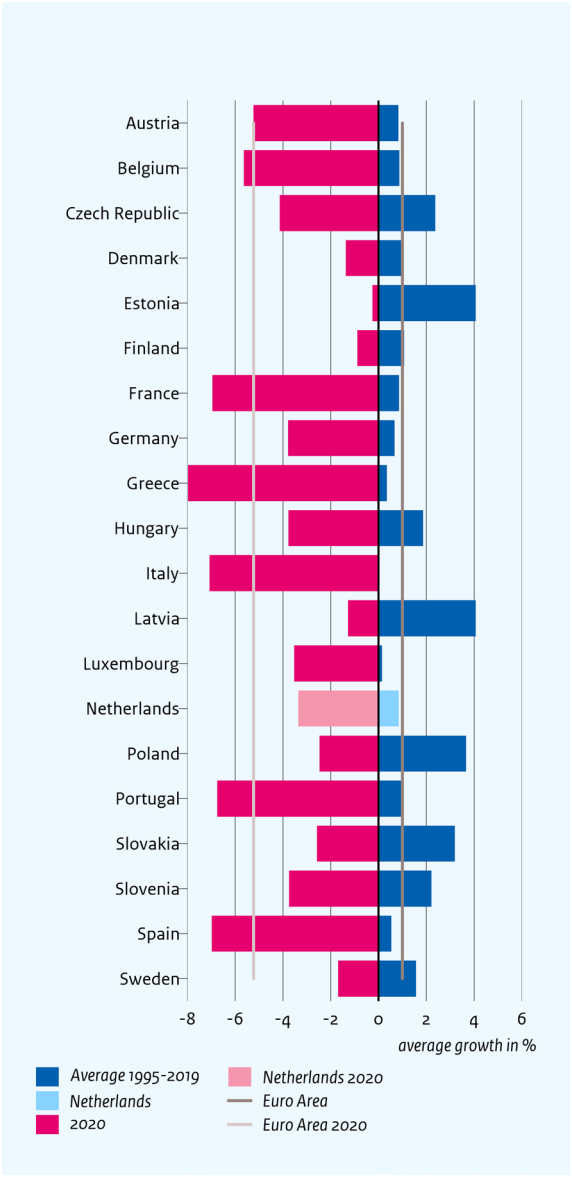


Figure 2.2: Average labour productivity growth 2010-2019 and 2020, Netherlands compared to other European countries (right)



Note: Ireland has been deleted from the dataset due to very high growth figures
Source: Eurostat database

Labour productivity in the Dutch manufacturing sector has been growing faster than in the services sector in the Netherlands (Figure 2.3). As the services sector is much larger, it has more weight in the total labour productivity growth. This pattern is not unique for the Netherlands but common across other European countries (Figure 2.4). In most countries, the productivity growth in the manufacturing sector has been greater than in the services sector. Productivity growth in 2020 slowed down more in the services sector (-3,1%) than in the manufacturing sector (-1,9%). This is not surprising, as the lockdowns mostly affected different services industries.

Figure 2.3: Labour productivity by main economic activity in the Netherlands 1995-2020 (below)

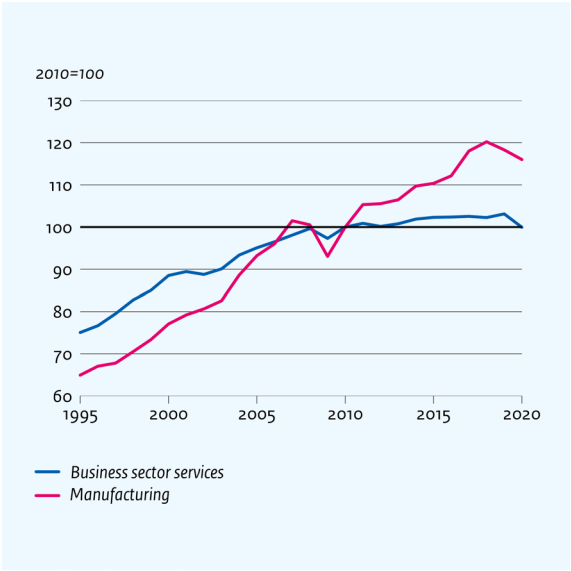
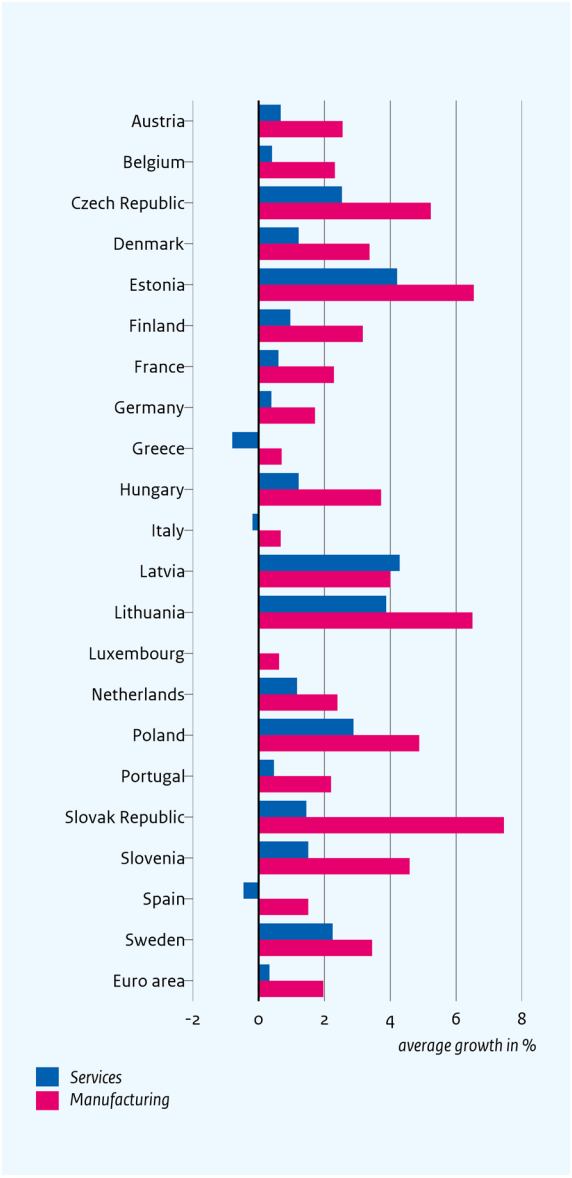


Figure 2.4: Average labour productivity growth 2010-2019, per sector Netherlands compared to other European countries (right)



Note: Ireland has been deleted from the dataset due to very high growth figures
Source: OECD STAN database

Labour productivity has two drivers: (i) Capital intensity and (ii) TFP. The use of capital (e.g. tools and machinery) makes labour more effective, so that in theory, rising capital intensity (or "capital deepening") should lead to rising labour productivity. Capital intensity (net capital stock per person employed) in the Netherlands has been steadily rising since 1995, just below the average of the Euro Area (Figure 2.5).

There are large differences between the average growth rates of different European countries. While the average for the Netherlands is just below that of the Euro Area, many Central and Eastern European countries find themselves well above the Euro Area average, which may be interpreted as catch-up growth (Figure 2.6).

Figure 2.5: Capital intensity 1995-2020 in the Netherlands and the Euro Area (below)

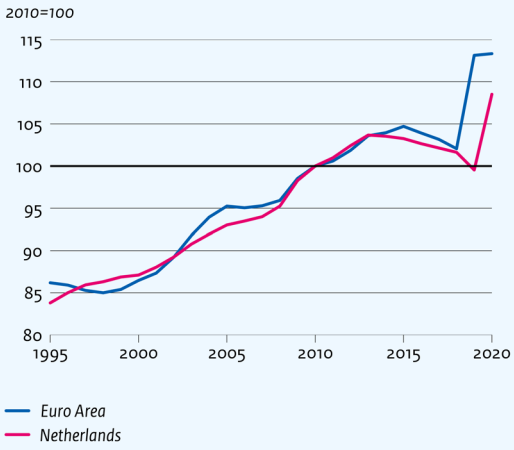
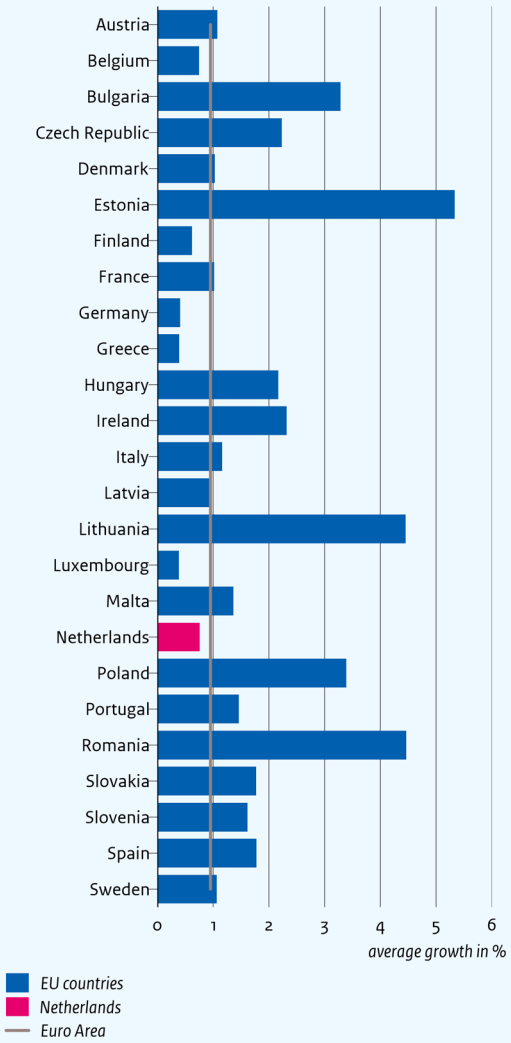


Figure 2.6: Average capital intensity growth 2010-2019, Netherlands compared to other European countries (right)



Note: capital intensity measured as net capital stock per person employed
Source: Ameco database

Figure 2.5 shows that in 2020 capital intensity jumped to an all-time high, which could be due to a decline in hours worked while capital growth remained more or less constant, or declined much less than hours worked. To test this, we include two graphs on hours worked. Figure 2.7 shows that the average hours worked annually has declined steadily, both in the Netherlands and the Euro Area, but declined steeply in 2020. Not only in countries in the euro zone, but in most European countries the hours worked declined steeply (Figure 2.8).

Figure 2.7: average hours worked 1995-2020 in the Netherlands and the Euro Area (below)

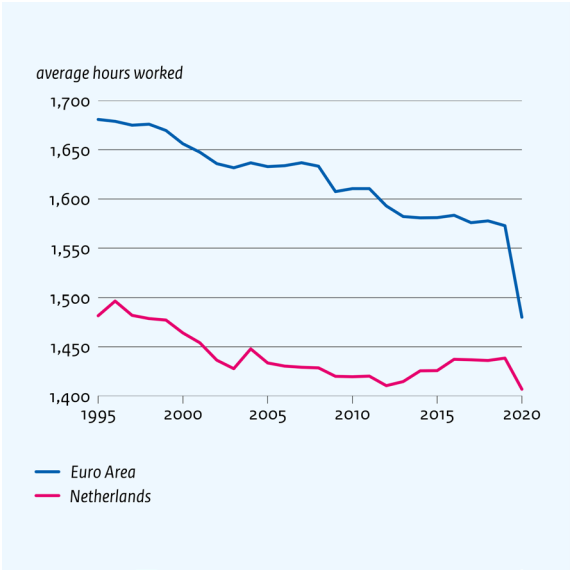
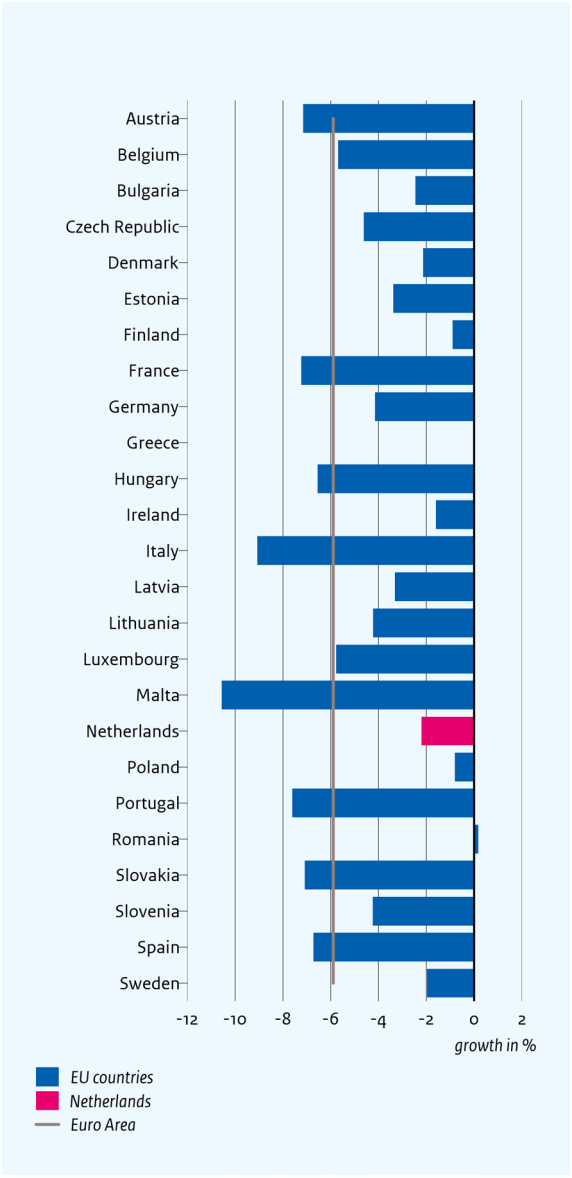


Figure 2.8: growth in hours worked in 2020 in the Netherlands compared to other European countries (right)



Source: Ameco database

Note that the capital intensity might not take into account capacity utilisation. Not only labour use decreased, but undoubtedly part of capital was also not used in sectors that were affected by lockdowns. Capital use corrected for capacity utilisation is more difficult to measure and has probably not been taken into account in Figure 2.5.

In addition, growth of the net capital stock in Figure 2.5 and Figure 2.6 is the *unweighted* growth of capital, which treats capital as a homogeneous good and does not take into account the compositional change of capital, which is driven by, amongst others, changes in the user cost on capital accumulation (see e.g. Fatica, 2018). The unweighted growth of capital underestimates the growth of capital corrected for user cost in the Netherlands.[2]

Gross fixed capital formation (GFCF) consists of investments in fixed assets during a specified period. Fixed assets are tangible or intangible assets that are used for more than one year as inputs to production processes. GFCF measures only the value of additions to fixed assets and excludes all types of financial assets, as well as

[2] Data available at Statistics Netherlands

inventories and other operating expenses (the latter included in intermediate consumption). Investments in intangible capital such as Intellectual Property Products or IPP (mainly software) have become increasingly important in the Netherlands (see section 3); it contributes to improving productivity in all sectors. Total GFCF as a fraction of GDP has remained more or less constant since 2011 (Figure 2.9). The breakdown between machinery and equipment, ICT equipment and IPP in 2020 resembles closely that of the Euro Area (Figure 2.10).

Figure 2.9 : Gross fixed capital formation by sector in the Netherlands 2011-2020 (below)

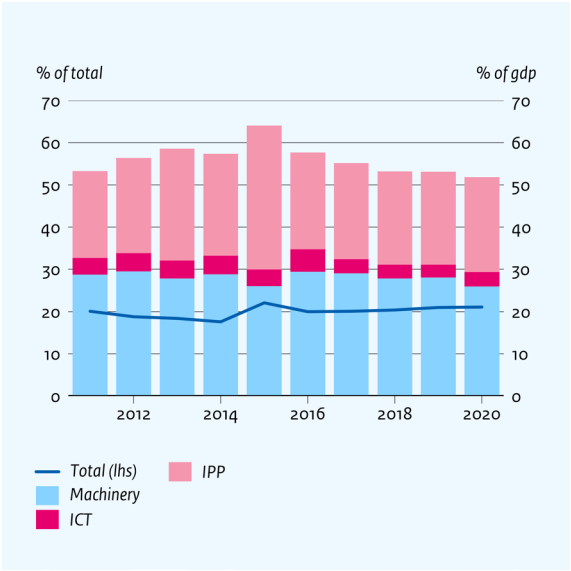
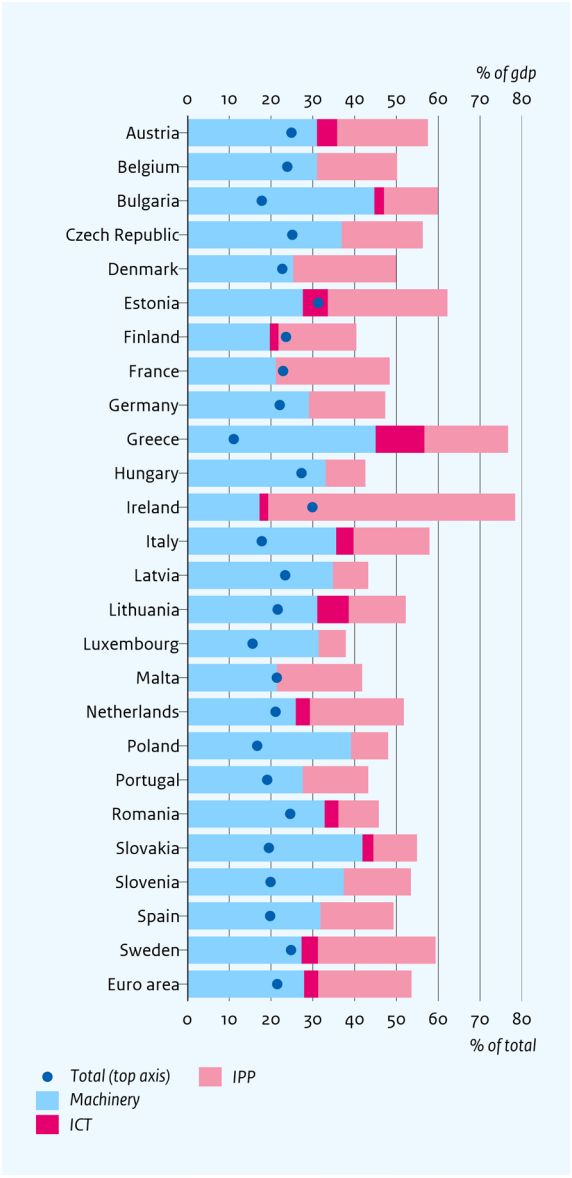


Figure 2.10: Average gross fixed capital growth 2010-2019, Netherlands compared to other European countries (right)



Source: Ameco database

Note: For Denmark, Germany, Latvia, Malta, Poland, Portugal and Spain no data for ICT is available

Figure 2.11 shows that TFP growth from 1995 to 2020 in the Netherlands has more or less followed the average of the Euro Area. Many Central and Eastern European countries have (much) higher TFP growth than the average (Figure 2.12).[3] In 2020, there was a large drop in TFP growth in many European countries, although the size of the drop varies. The drop in TFP growth in the Netherlands was below that of the Euro Area (Figure 2.11).

[3] Ireland too has shown much higher productivity growth

Figure 2.11: Total factor productivity Netherlands (index 1995-2020 (below)

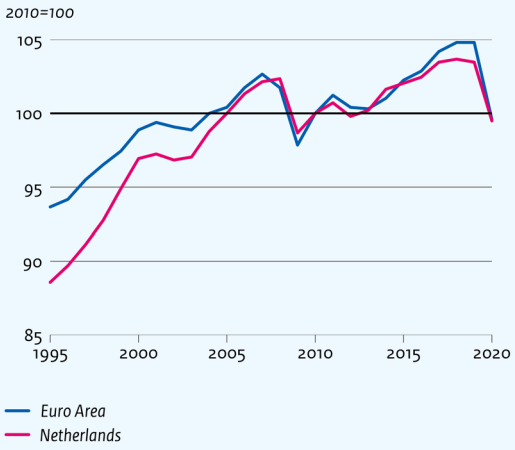
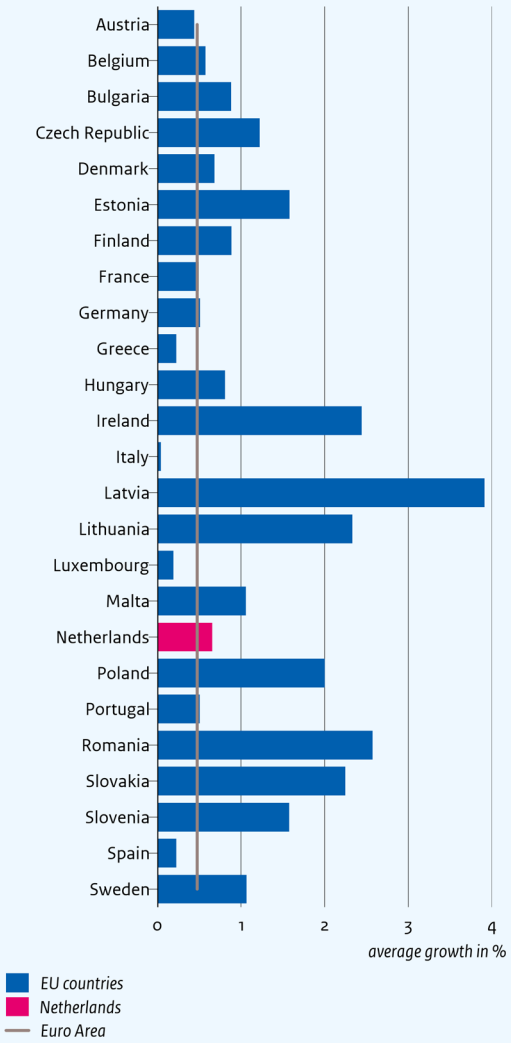


Figure 2.12: average TFP growth 1995-2020, Netherlands compared to other European countries (right)



Source: Ameco database

Figure 2.13 shows the contribution of factor inputs to GDP growth in the Netherlands[4] and Figure 2.14 in other European countries. In recent years, output growth has been fuelled by an increase in total hours worked and much less by investments in ICT or non-ICT capital or total factor productivity. Also when we take the average contribution over the past twenty-five years, total hours worked has been the most important contribution to output growth in the Netherlands. Total factor productivity (0.45) is followed by investments in ICT capital (0.42) and non-ICT capital (0.30).

[4] See also de Bondt et al., 2021 for an extensive analysis

Figure 2.13: Contribution to GDP growth in the Netherlands 1995-2019 (below)

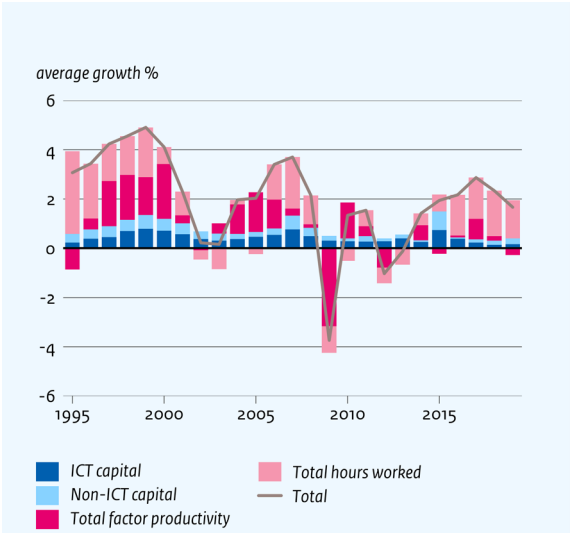
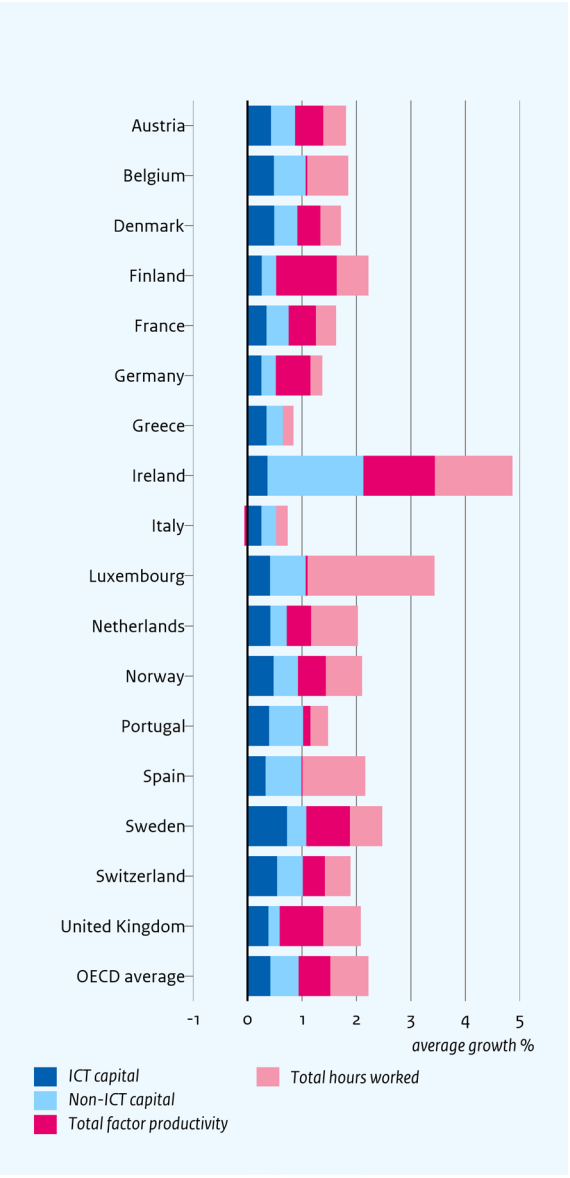


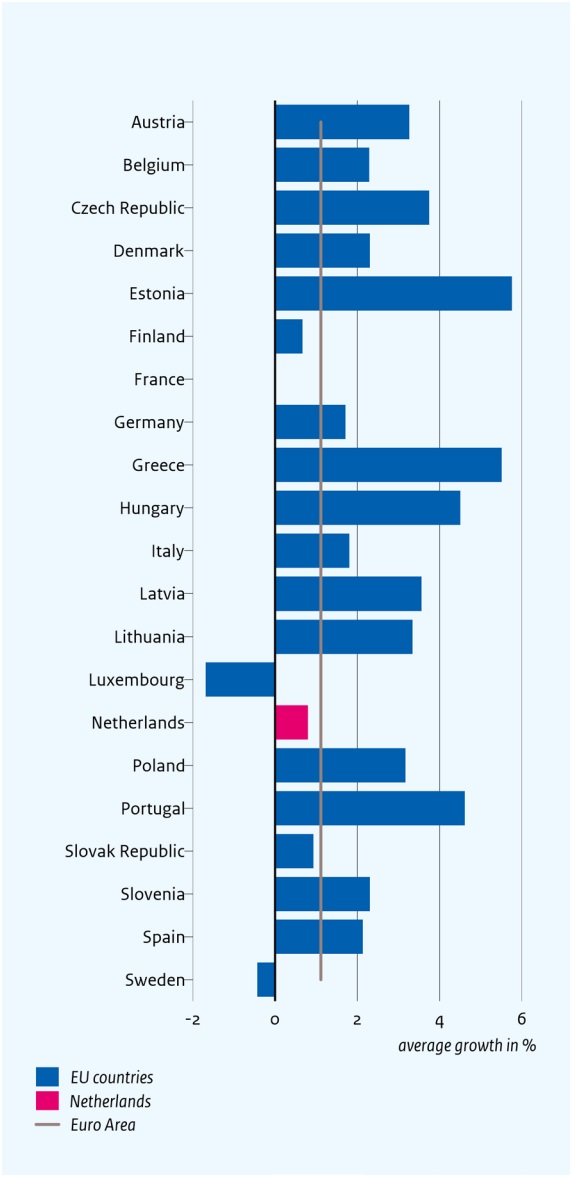
Figure 2.14: Average contribution to GDP growth 1995-2019, Netherlands compared to other European countries (right)



Source: OECD STAN database

Figure 2.15: R&D expenditure (% of GDP) in the Netherlands 1995-2019 (below)

Figure 2.16: average growth of R&D expenditure 1996-2018 Figure 3.2Netherlands compared to other European countries (right)



Source: Worldbank database

Finally, Figure 2.15 shows the increase in R&D expenditures in the Netherlands compared to the Euro Area and Figure 2.16 compares the average growth of R&D expenditures over a period of almost 30 years. Compared to the Euro Area, the Netherlands has been lagging behind, although the sharp increase from 2010 onwards is noteworthy – it seems the Netherlands is starting to catch-up with the Euro Area average.[5]

Research and development is connected to intangible investments, which are discussed in the special topic (see section 3) on intangible capital.

[5] Although these figures should be interpreted with caution; the rise could be attributable to fictitious booking of R&D by MNE's for reasons of profit shifting

3 Highlight: intangible capital

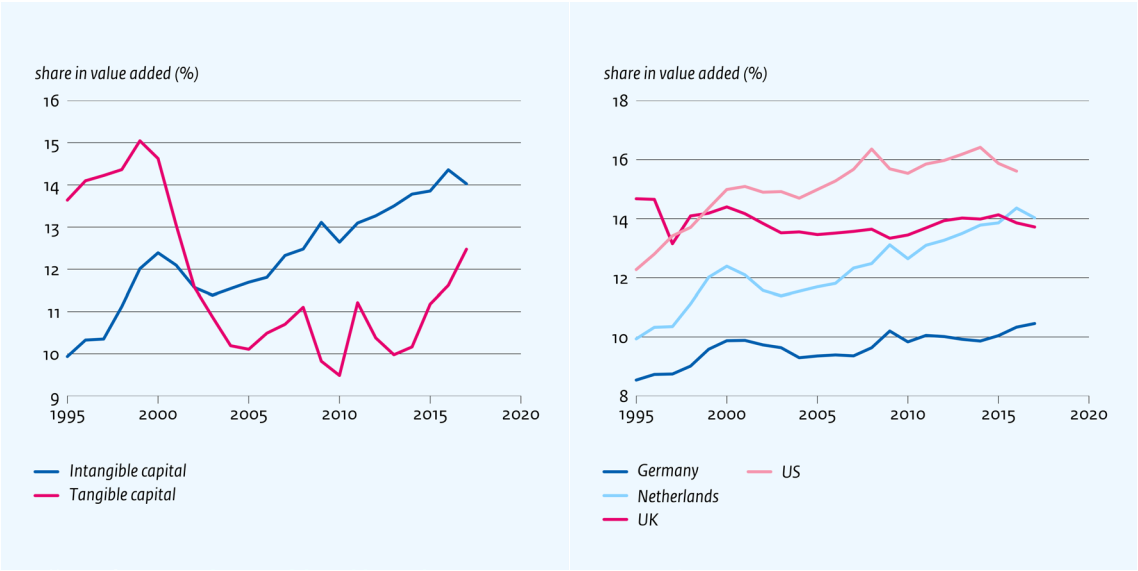
3.1 Intangibles in the Netherlands[6]

Intangible capital plays an increasingly important role in the economies of advanced countries (Haskel and Westlake, 2017). Corrado et al. (2005) divides intangible capital into three groups: computerized information, innovative ownership and organizational capital. The first group includes software and databases. This form of intangible capital has much synergy with tangible IT capital, but is seen here as separate assets. Innovative property mainly includes patents, copyright and investments in R&D. Organizational capital includes investments in, among other things, training, organizational or management structures, and brand names.[7] The continued growth of globalization and the emergence of new technologies such as automation and artificial intelligence require additional investments in intangible capital (Brynjolfsson et al., 2002; Chen et al., 2016, 2017; Corrado et al., 2017). The COVID-19 pandemic may have led to higher levels of digitalisation, and therefore an increase in intangible capital as well. We will delve into this in section 4.

In 2008, van Rooijen-Horsten et al. (2008) noted that Dutch investments in intangible capital had increased steadily between the late 1980s and 2005. Despite this positive trend, the level of investment in intangible capital still lagged behind the United States and the United Kingdom (Van Ark and Hulten, 2007; van Ark et al., 2009). However, recently, Dutch investments in intangible capital (as a share of added value) have increased significantly, even when we exclude the peaks in 2007 and 2015.[8] Figure 3.1(a) shows that investments in intangible capital are considerably higher than in tangible capital. Figure 3.1(b) shows that by the end of 2010 Dutch investment in intangible capital caught up with stagnating British investment and is steadily approaching the level of intangible investment in the US. In contrast, intangible investments in Germany are at a much lower level and are increasing less rapidly.

[6] Part of this chapter has been published in Dutch, in Freeman (2021).
[7] Of the three groups of intangible assets, organizational capital is not included in standard national accounts. The main source for data on this is the INTAN-invest database set up by Corrado et al. (2016). Certain assumptions have therefore been made when compiling this data. Data for the other groups of intangible capital as well as tangible capital, labour and added value come from the KLEMS database, which connects to the data from the national accounts (Streher et al., 2019).
[8] These peaks reflect large incidental R&D investments in the administrative and support services sector, which indicate major international acquisitions of R&D assets, possibly asset shifts by multinationals (Jansen et al., 2020).

Figure 3.1: Intangible investments in the Dutch market sector compared with (a) tangible investments and (b) with other countries



Source: CPB, based on INTAN Database

Figure 3.2 shows that the investments in computerized information and organizational capital have increased, while the value added share of investments in innovative property has remained relatively stable (outside the two peaks in 2007 and 2015) .

Figure 3.2: Dutch intangible investments as share of added value, market sector (below)

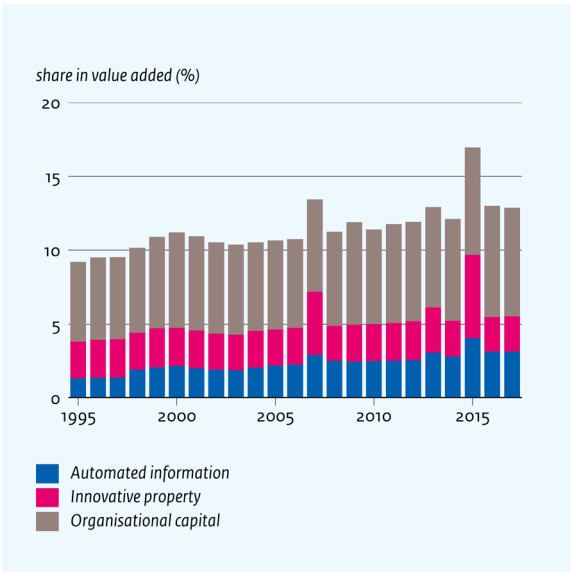
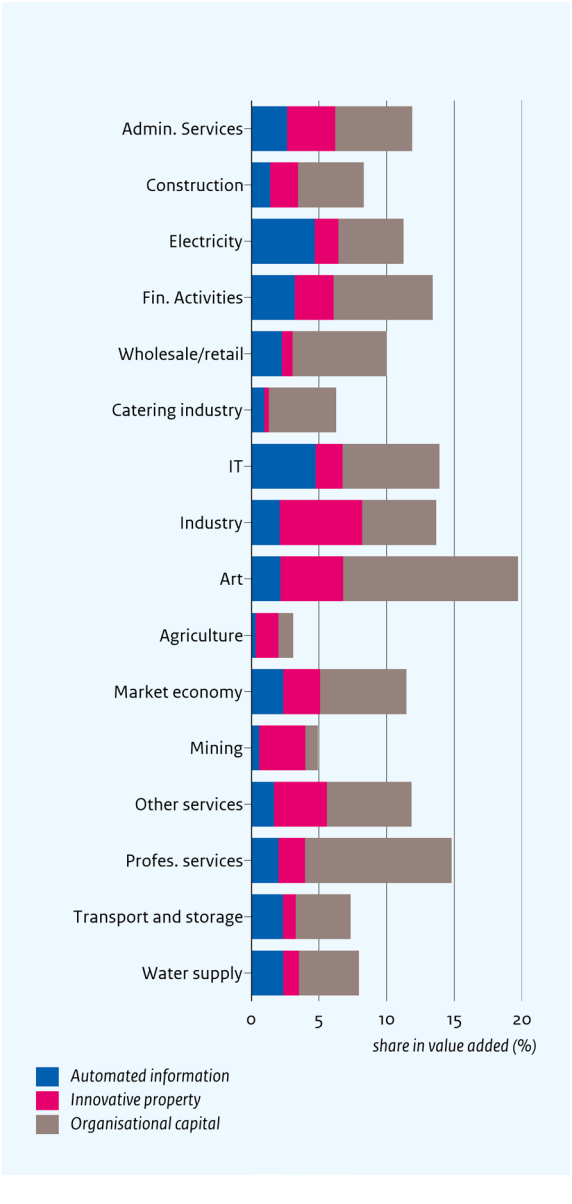


Figure 3.3: Use of intangible capital per industry (average share 1995-2017) (right)



Source: CPB, based on INTAN Database

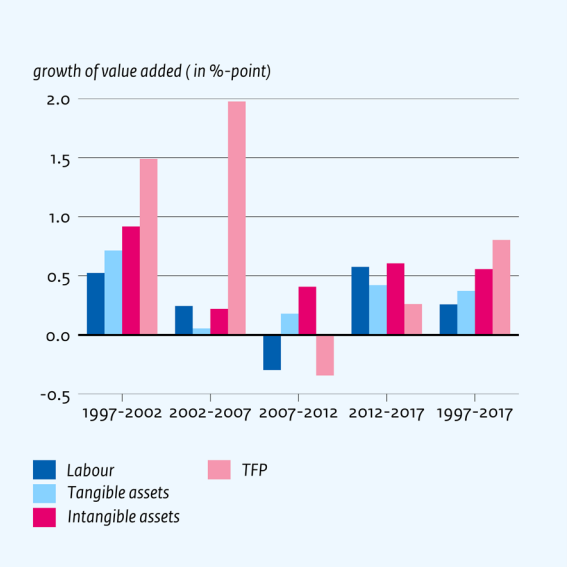
As expected, the intangible investments differ between industries (Figure 3.3). Industries such as agriculture and mining invest little in intangible capital. The manufacturing industry invests mostly in R&D, while the utilities sector and unsurprisingly, the IT sector invest mostly in software. Business services industry invest mostly in organizational capital, although it appears to be important in almost all industries of the market economy. The share in value added in intangible capital is highest in the arts, entertainment and recreation industries. Much of this is innovative property, which includes copyright and art. Organizational capital is also important here, including, for example, brand awareness.

Each industry has increased its investment in intangible capital but the distribution across industries has not changed much over time. This development can also be seen in other countries where often the same industries make intensive use of (the same types of) intangible capital. What sets the Netherlands apart from other countries is the fact that in almost all industries, relatively large investments are made in automated information. This may indicate a higher degree of digitization of Dutch industries. It could also be an indication of further asset shifts by multinationals.

3.2 The contribution of intangible capital to economic growth

To calculate the contribution of intangible capital to economic growth we use standard methods based on Thum-Thysen et al. (2017) and Streher et al. (2019). We analyse to what extent the growth of the production factors (labour, material and tangible and intangible capital stocks) contribute to production and can then attribute the growth of added value to the production factors or to the growth of total factor productivity (TFP).[9]

Figure 3.4: Contributions of labour, TFP, tangible and intangible capital to average annual value added growth in the market sector (in percentage point value added growth).



Source: CPB, based on INTAN Database

Figure 3.4 shows that the average contribution of intangible capital to the growth of value added is above that of material capital and higher than or comparable to that of labour. The contribution of intangible capital fluctuates around 0,55 percentage points. This amounts to a quarter of the average annual growth in value added (2.2%) in the market sector between 1997 and 2017.[10]

[9] The growth contribution of intangible capital to added value depends on the growth of the intangible capital stock and how productively it can be used. The capital stock increases through investment in intangible capital and decreases through depreciation. The growth contribution is therefore not directly related to the growth of investments, as depreciation plays an important role. There is not yet a broad consensus on what exactly the depreciation rates of intangible capital are (Andrews and Criscuolo, 2013). We used data from Corrado et al. (2005).

[10] Some caveats are appropriate here. Large international transfers of intangible capital may distort the picture, as can be clearly seen for the Netherlands in 2007 and 2015. In addition, the definition of organizational capital and valuation of intangible capital will influence the results (Andrews and Criscuolo, 2013; Garanina et al., 2021).

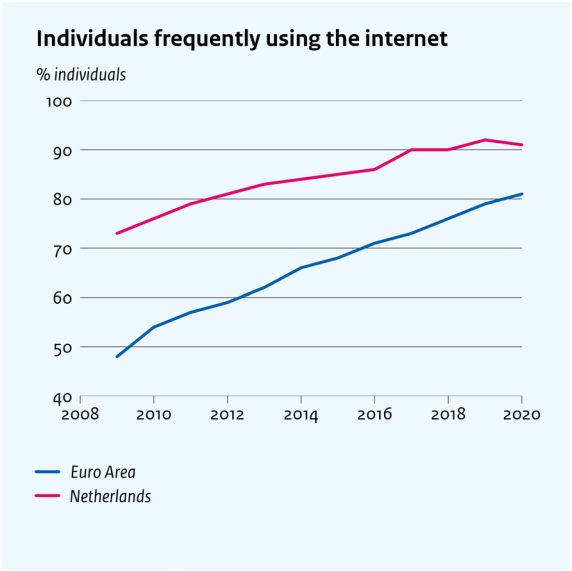
4 COVID-19 pandemic and digitization

The IMF (2021) has identified two key channels through which the pandemic might influence productivity: accelerated digitalization and a reallocation of workers and capital (e.g. machines and digital technologies) between different firms and industries. The lockdown measures, which led to an increase in working from home and contactless trade, accelerated investments in digitalization and automation that may make people more efficient at work. They show for a sample of 15 countries in the period 1995–2016, a ten percent rise in intangible capital investment is associated with about a 4,5 percent rise in labour productivity—likely reflecting the role of intangible capital in improving efficiency and competencies (Christiansen et al., 2021; IMF, 2021). In this section, we provide an overview of the investments in digitalisation in the following sectors of the Dutch economy: education, health and retail.

In general, the Netherlands has a high degree of digitalisation. In 2019, before the corona pandemic hit, over 90% of Dutch citizens used the internet daily, which makes internet use in the Netherlands, together with the Nordic countries, one of the highest in the European Union (see Figure 4.1 and Figure 4.2). Broadband access is also high: 98% of households have broadband in the Netherlands, compared to 88% in the Euro Area.[11] The Netherlands was, therefore, already in a good position to face lockdown measures such as working from home.

[11] Eurostat data base: Household internet connection type: broadband

Figure 4.1: Frequency of daily internet users, Netherlands and Euro Area (below)



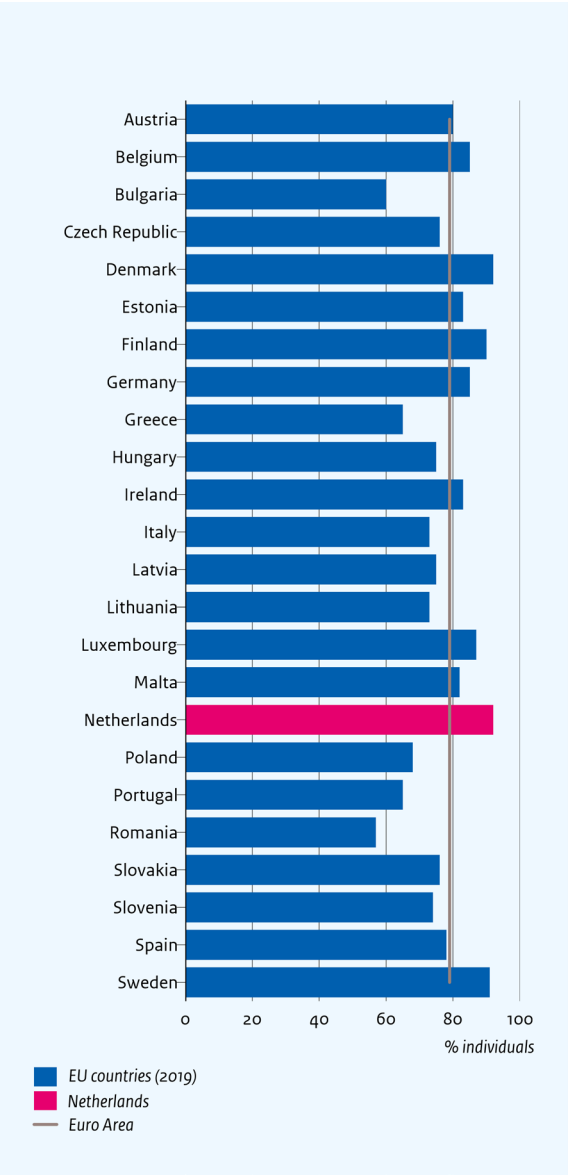


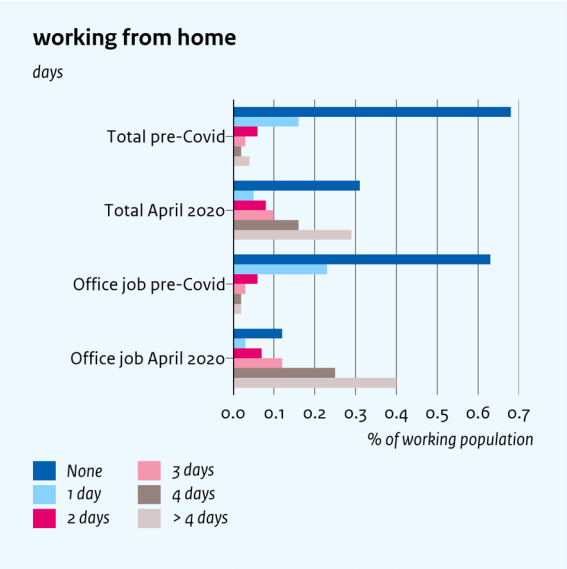
Figure 4.2: Frequency of daily internet users, Netherlands compared to other European countries in 2019 (right)

Source: Eurostat database

Note: data for France is missing

It is not surprising that when the Covid-19 pandemic hit, Dutch employees transferred seemingly effortlessly to working from home: Figure 4.3shows that 40% worked from home full-time during the lockdown. Not only did working from home increases with help from technologies such as those facilitating digital meetings, also in other sectors digital technologies increased during Covid-19.

Figure 4.3: Working from home, before Covid-19 pandemic and one year after



Source: Statistics Netherlands Statline database

4.1 Education

The education sector underwent several changes since the outbreak of the COVID-19 pandemic. During the pandemic, the majority of education and assessment forms were offered online (Brink et al., 2021). For one in three university students, education was completely remote. In higher professional education, this applies to 17 percent of the students. In a survey of 17,041 students, 76 percent of students in higher professional education, indicated that they had followed more than 70 percent of their education remotely. In university education, 85 percent of students said they followed over 70 percent of their education remotely. The COVID-19 pandemic lead to a faster shift in the introduction of innovation plans aimed at blended education, more digitization and flexibility.

Primary schools were partially closed during the lockdown periods, forcing staff to quickly shape distance education and make a 'digital leap'. The use of online tools for students and teachers has thus received a significant boost during the COVID-19 pandemic. Most school leaders indicated they will continue to use the new resources deployed during distance learning in the post-Covid-19 period (Brink et al., 2021). However, this has not prevented the fact that there have been learning deficits and greater inequality (Gielen et al., 2021).

The ICT infrastructure at schools has been improved and/or scaled up at a rapid pace. Many institutions have had to purchase new educational software. Especially in the early days, the ICT skills of teachers varied considerably. But progress has been made with additional resources, educational support, professionalization meetings and the sharing of good practices (Inspectorate of Education, 2021).

Figure 4.4 shows the share of Dutch citizens who do an online course, which is higher than the Euro Area average. Although the share has been increasing steadily, it shows a clear jump in 2020, when the corona pandemic hit – especially in the Euro Area. Figure 4.5 shows the share in 2020 for other European Union countries. The Netherlands scores higher than average, but still below several other countries.

Figure 4.4: Individuals using the internet for doing an online course in the Netherlands and the Euro Area (below)

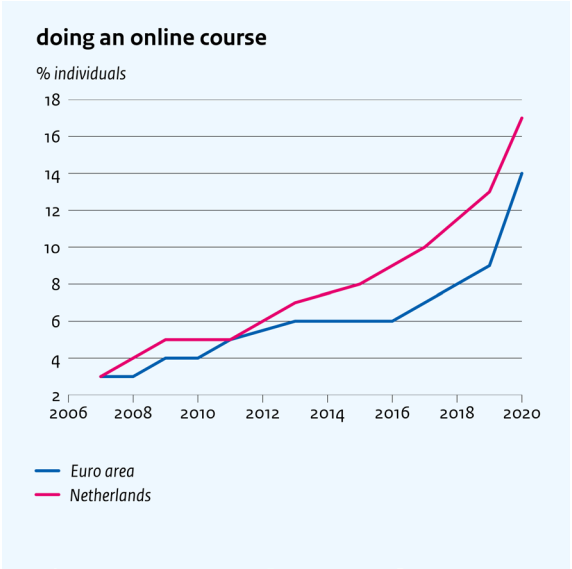
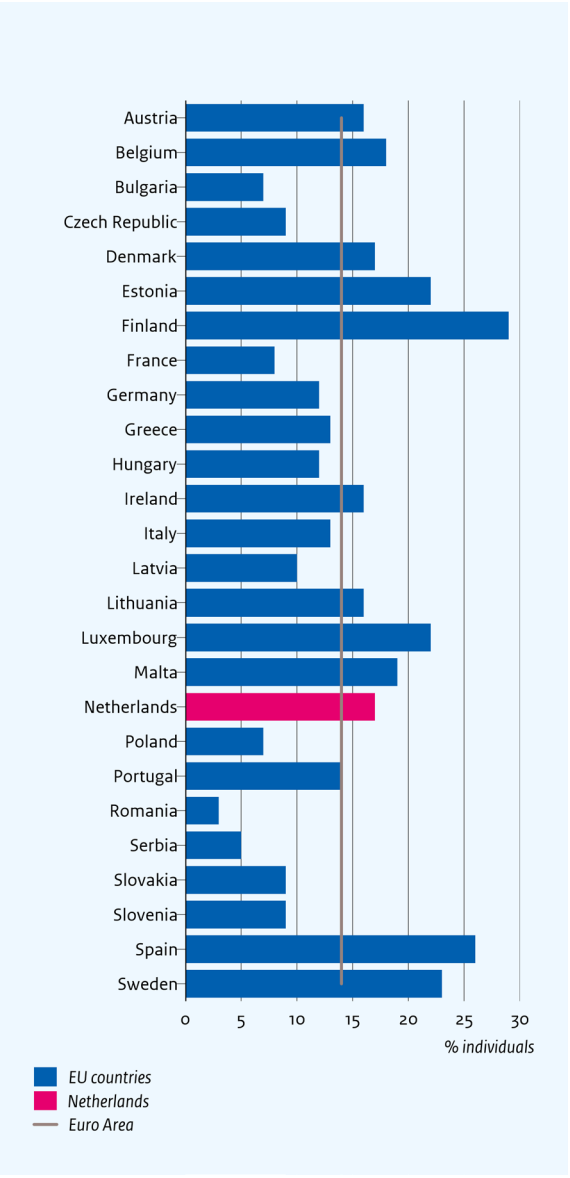


Figure 4.5: Individuals using the internet for doing an online course in the European Union (right)



Source: Eurostat database

Note: for France, 2019 data is used

4.2 Health

The COVID-19 pandemic hit the health care sector hard due to a sudden increase of patients. At the same time, the pandemic and lockdowns also led to an increase in digital care. The Dutch Council for Public Health and Society[12] uses the following classification of digital care:

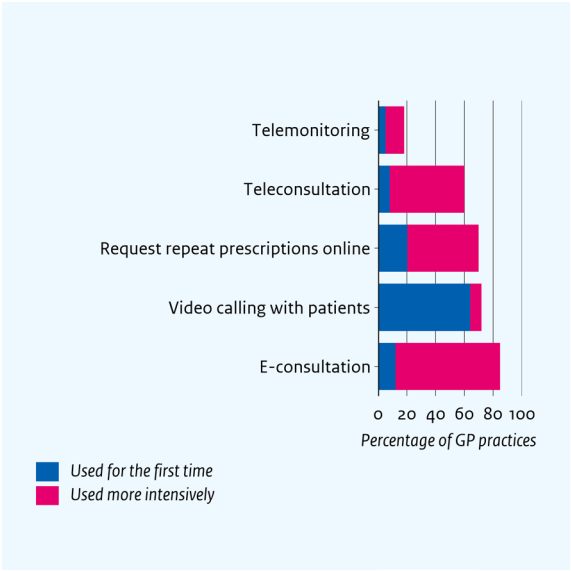
1. E-care: e-diagnosis, e-consultations, e-care such as monitoring, e-prevention intervention in case of high risk in an individual.
2. E-support: e-access to patient records, e-management such as making appointments online.
3. E-public health: e-health information, e-prevention such as identifying certain risk groups.

In 2019, the Netherlands already scored, on average, higher than other countries in the use of e-health applications, see Figure 4.7, although scores on individual elements of health information technologies vary.

[12] Raad voor Volksgezondheid en Samenleving (link)

The Netherlands scores relatively high on online requesting repeat prescriptions (77 out of 100) and low on video consultations (4 out of 100) (Doty et al., 2020). The main bottleneck is not the digitalisation of healthcare, but the importance of privacy, which limits the possibilities of data use in digital care and thus the development of Dutch digital care (Rutten et al., 2020).

Figure 4.6: Use of e-health applications in general practices in the Netherlands in 2020 (below)



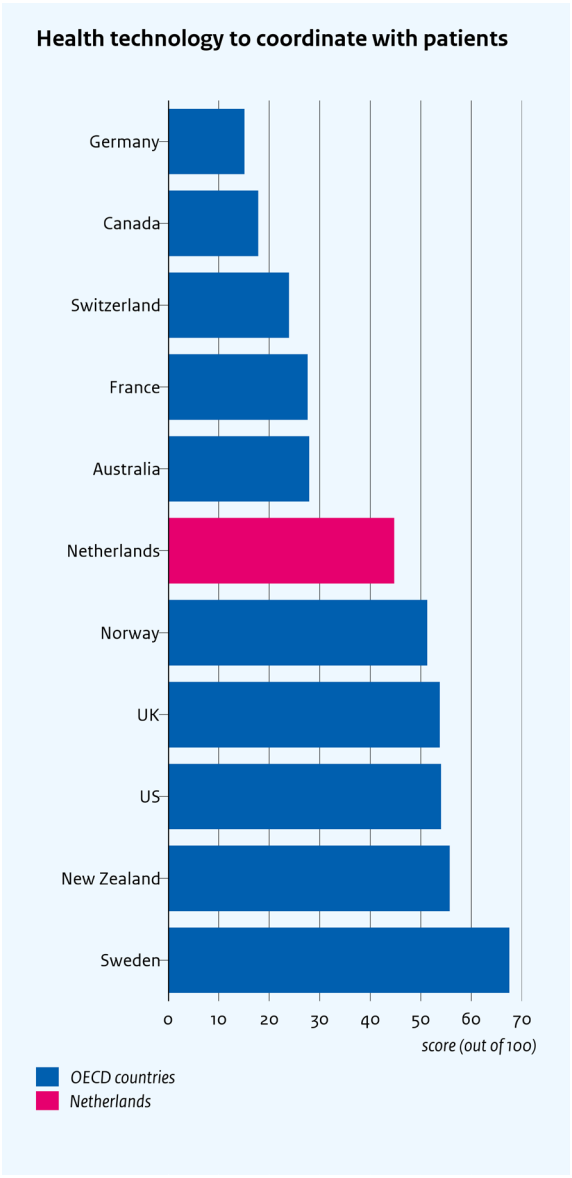


Figure 4.7: Combined index of e-health indicators (2019), the Netherlands compared to other OECD countries (right)

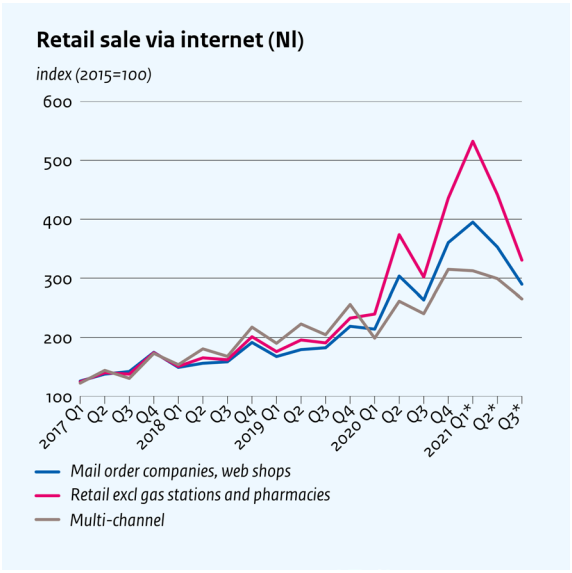
Note: N=1083 for both graphs
Source: McKinsey (Rutten et al., 2020)

4.3 Online retail

The Covid-19 pandemic and lockdowns necessitated many shops to turn to sales via the internet. Figure 4.8 shows for the Netherlands that retail sales via internet took a huge leap after the first quarter in 2020 when the pandemic hit. Not only mail order companies and web shops increased turnover but especially retail shops. Also multi-channel retail, that does not have a focus on internet sales, such as supermarkets, increased its turnover via internet sales. Also interesting is that after the first quarter of 2021, when lockdown restrictions were eased, internet sales decreased substantially, but still remain high. Figure 4.9 shows that already in 2018,

the share of enterprises that engage in retail sale via mail order houses or via Internet was already rather high in the Netherlands: over 50%, well above the Euro Area.

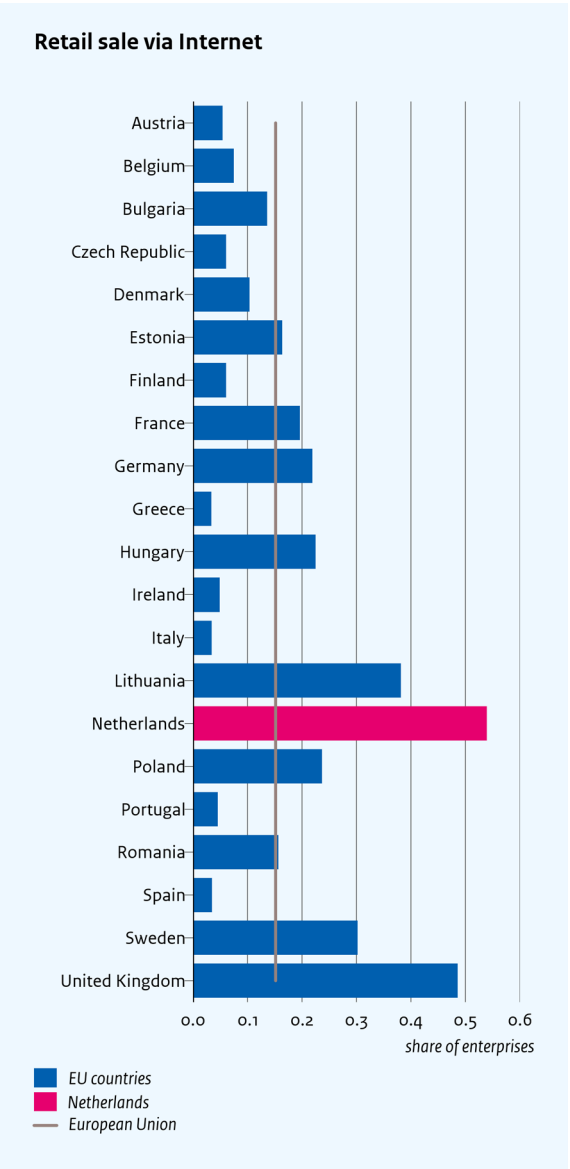
Figure 4.8: Retail internet sales in the Netherlands (turnover) (below)



Note: quarters marked with an asterisk are provisional

Figure 4.9: Retail sale via mail order houses or via internet in the Netherlands and EU countries (share of total enterprises) 2018 (right)

Source: Statistics Netherlands statline database (top) and Eurostat database (right)



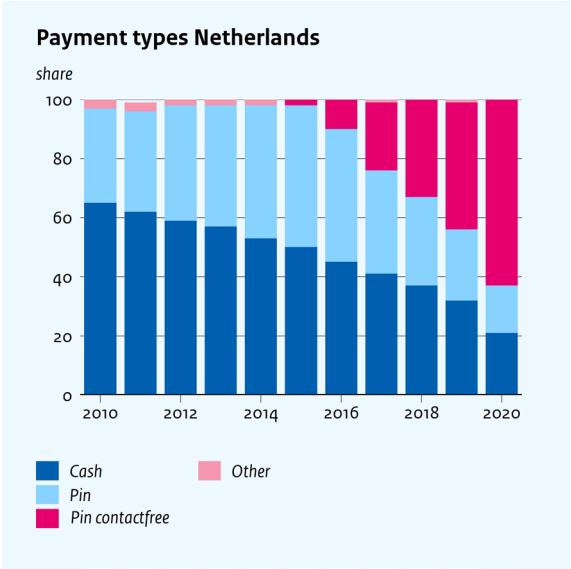
4.4 Financial transactions

The Covid-19 pandemic and subsequent lockdowns led to people using less cash and more digital payment systems, such as pin and contactless pin (where there is no need to type a pincode), not only because people were buying more via the internet, but also in physical shops. In the Netherlands the use of cash was already decreasing in favour of digital payment modes, but in 2020 it decreased even more. Especially the use of contactless pin has increased (Figure 4.10).

The use of digital payment modes in the Netherlands is high compared to other European countries. Not only is the use of a debit card common use, but also payment by mobile telephone is gaining traction (categorised

in "other"), see Figure 4.11). The Dutch Association for Payment Transactions[13] has broken down the digital payments to show that using pin payments decreased from 31% in December 2019 to 15% in December 2020, in favour of contactless pin payments and payment by mobile phones (which increased from 7% to 13%).

Figure 4.10: payment systems in the Netherlands 2010-2020 (below)



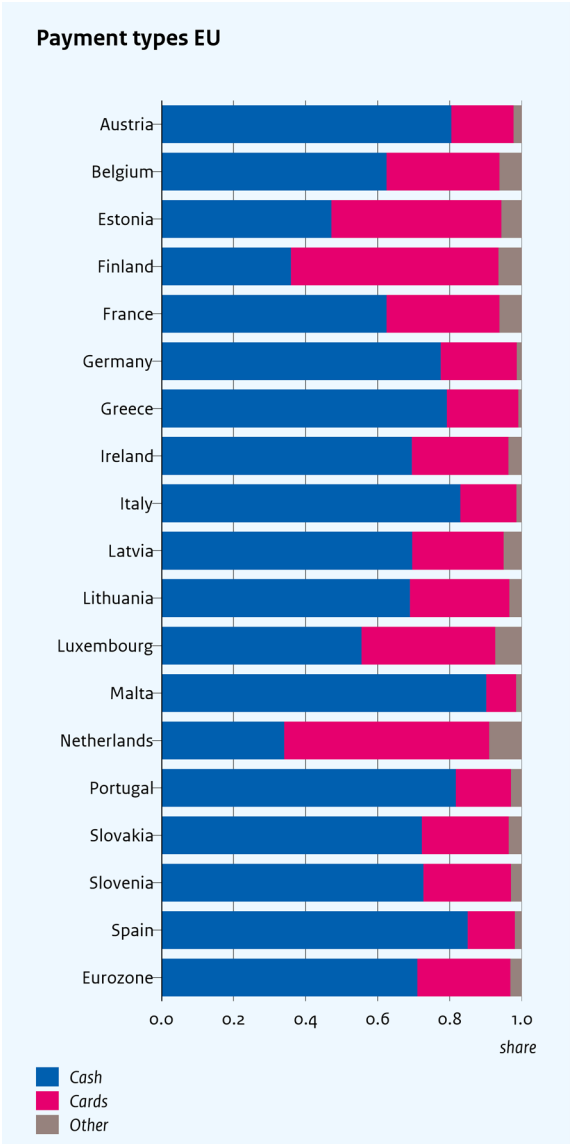


Figure 4.11: Different payment systems in the EU (right)

Source: Betaalvereniging Nederland (top) (link); Eurostat database (right)

[13] Factsheet Vereniging voor Betaalverkeer 2020 (link)

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