Chapter 2
Selected theme

2.1 Status on the productivity challenge in Denmark

The development in productivity is crucial to economic growth and hence to the development in living standards in the long run. This goes for the Danish economy too where increases in living standards over time to a large extent can be attributed to productivity advancements. This selected theme revisits the subject using national accounts data and detailed firm-level data from Statistics Denmark and looks at possible ways to increase productivity growth.

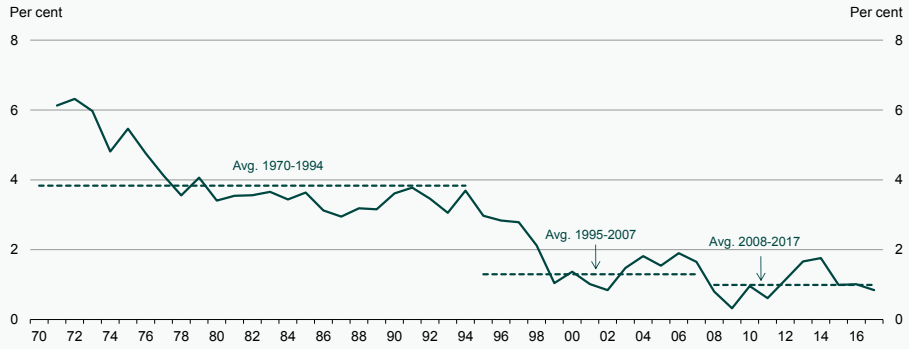
The development in Danish productivity

Productivity is a measure of how much we get out of the resources used in production. Denmark generally has a high productivity *level* and thus high standards of living. This is largely due to a well-educated workforce, effective markets (including access to venture capital), effective competition, a high degree of globalisation, good incentives, well-developed infrastructure, and a good institutional framework.

While the *level* of productivity is high, productivity *growth* rates have decreased sharply. Productivity – measured as GVA per hour worked – increased by almost 4 per cent annually until 1995. Thereafter, the rate of growth in productivity fell to around 1.3 per cent on average until 2007. Throughout the last ten years, the productivity growth rates have fallen just short of 1 per cent on average, *cf. figure 2.1*.

Figure 2.1

Growth in hourly productivity

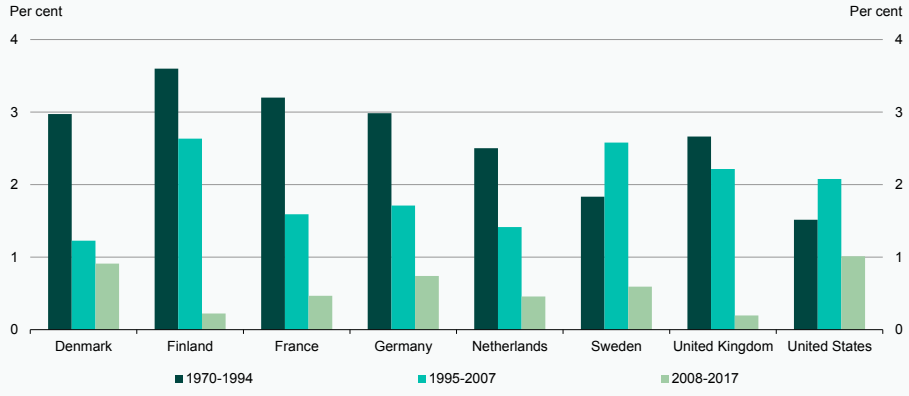


Note: Hourly productivity is measured by real value added in private sector excl. farming, mining and quarrying per hour worked. The series has been smoothed using a five-year moving average.
Source: Statistics Denmark and own calculations.

The weak development in productivity is not an isolated Danish phenomenon. Both at home and abroad, there has been a decline in the productivity growth. The decline in Denmark, however, was already pronounced from the middle of the 1990s while it has not been quite as outspoken for a range of other countries until the global financial crisis, *cf. figure 2.2*.

Figure 2.2

Average annual productivity growth for selected countries



Note: Hourly productivity is measured by GDP in real terms per hour worked.
Source: OECD and own calculations.

A weak development in productivity over the course of the last decades is, to a certain degree, counteracted by the fact that Denmark has reaped significant benefits from a fa-

vourable development in terms of trade with other countries. Denmark has, so to speak, imported productivity advancements in other countries, which have resulted in lower prices on for example electronics due to competition in the product markets. In addition to this, there has been a sizeable return on foreign assets so that Denmark has been able to maintain its position as one of the world's most wealthy countries over time.

Improvements in terms of trade are tied to the composition of foreign trade and the price development on traded goods – and hence not directly to economic policy. Unlike Denmark, many neighbouring countries have not experienced terms of trade improvements – and some have even experienced losses. In the future, it is not given that Denmark will be able to continually reap the wealth benefits attributed to better terms of trade as has been the case in the past. Higher productivity, on the other hand, is a more secure source of increased wealth.

Denmark is on a growth path in these years. The economy is underpinned by a historically large increase in the labour force – while productivity growth is low. Looking a little further ahead, higher productivity will be the main driver behind Danish advancements in wealth. Presently, the Danish economy is boosted by considerable contributions from labour market reforms, but in the years after 2022 this effect will wear off in the absence of new policy measures. Growth in the slightly longer run is hence dependent on renewed productivity growth or on new policy measures that increase employment, *cf. figure 2.3 and 2.4.*

Figure 2.3

Contribution from employment to structural GDP growth

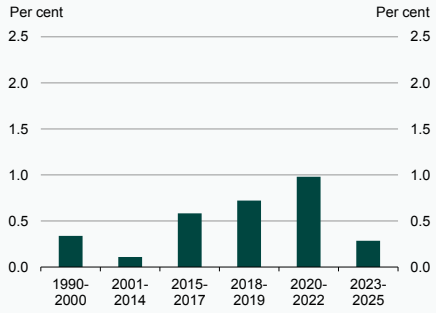
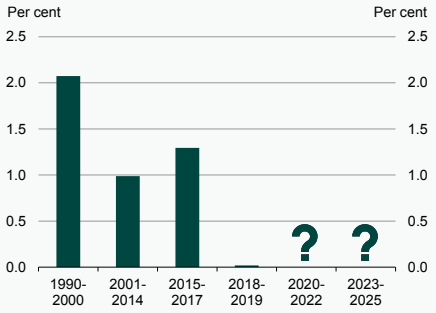


Figure 2.4

Contribution from productivity to structural GDP growth



Note: The development after 2020 is based on technical assumptions in the latest medium-term projection. Adopted reforms are included in the contribution from employment. In figure 2.4 the contribution from productivity is residually calculated, i.e. changes in potential GDP which cannot be explained by changes in structural employment measured in hours.

Source: Statistics Denmark, Ministry of Finance: *Opdateret 2025-forløb: Grundlaget for 2022-lofter* and own calculations.

The development in productivity should be seen in the context of competition, firm dynamics, and internationalisation which influence how easily resources are reallocated to more productive use. Ways to increase productivity can, for example, be the implementation of new and better technology or better organisation and planning of production processes.

Politically, the development in productivity can be influenced through, among other things, more appropriate regulation, the legal framework for competition, and tax reforms which provide incentives for larger investments in physical capital. Unlike labour market reforms that have a more direct impact on labour supply, productivity typically cannot be lifted directly by policy decisions, but only indirectly through, for example, business regulations. Changes in productivity are ultimately the result of a wide range of decisions, for example in private companies that affect value added and resource utilisation.

The development in productivity in Denmark has been investigated in numerous analyses, and a number of recommendations have been presented on this basis.[1] This analysis looks into ways of achieving higher productivity growth, partly by exploiting detailed firm-level data. The analysis shows, among other things:

- Denmark has long had a weak productivity development, but the productivity challenge has changed character in the sense that it is now no longer an isolated Danish phenomenon. If productivity growth does not increase, growth potential in the Danish economy will also be subdued in the coming years.
- There is no single reason behind the weak Danish productivity development, but the contribution to productivity growth from investments in new physical capital has fallen sharply both at home and abroad.
- In the past, focus has been on the domestically-oriented service industries, which, overall, have had weak productivity growth. This points to lack of competition as a significant explanation. However, major differences across companies in these industries indicate that there are other reasons as well.
- The shift toward services – where there typically is less reallocation of resources to more productive companies – has reduced overall business dynamics. In addition, service industries are often characterised by less potential for productivity gains through the introduction of new technology and physical capital.
- The increase in employment has been concentrated in industries with relatively low productivity per employed, which is also halting productivity. On the other

[1] See e.g. Ministry of Economic and Business Affairs (2009): *Den danske produktivitetsudvikling*. Økonomisk Tema nr. 8, The Economic Council (2013): *Dansk Økonomi, efterår 2013,* The Productivity Commission (2014): *Slutrapport: Det handler om velstand og velfærd*, Kraka (2017): Danmarks produktivitet, værdiskabelse og nationalindkomst pr. arbejdstime. Danmarks Nationalbank (2017): *Spredning af ny viden gavner virksomhedernes produktivitet*. Analyse nr. 18. The National Productivity Board (2017): *Produktivitet 2017.*

hand, the increase in employment is happening in the most productive companies within each industry.

- The diverse explanations for the weak productivity development call for a more general effort to boost productivity through well-shaped business conditions and remedies of market failures rather than selective policies that seek to target specific industries.

Where might causes to low productivity growth be found?

There has been great debate as to the causes of the recent decline in productivity growth across countries, and whether it is a permanent decline that will limit growth in the years to come.

The starting point for a closer understanding of the underlying causes of the productivity decline is often the so-called productivity accounts. Productivity accounts divide the development in aggregate productivity per hour into contributions from the quality of the labour input (i.e. the level of education) and the capital available for production. In addition to this is a contribution from the so-called total factor productivity. Total factor productivity reflects the efficiency of overall resource utilisation and captures productivity advancements which go beyond the effectiveness of the individual production factors by themselves, *cf. box 2.1*.

Box 2.1

Productivity accounts

Productivity is often measured as value added per employed or per hours worked. Value added is usually measured in real terms so that it is corrected for the part of the price development that is not related to effective or quality improvements.

Productivity per hour can be increased through more physical capital (machinery, buildings, software, etc.), through more productive physical capital, e.g. faster computers, through more productive employees, for example due to a higher educational level, and, finally, a higher total factor productivity. Total factor productivity reflects the efficiency of overall resource utilisation and captures productivity gains which go beyond the individual production factors becoming more effective. The so-called productivity account decomposes productivity per hour into contributions from increases in capital intensity (amount of physical capital per hour), increases in the education level, and growth in total factor productivity.

In Statistics Denmark's productivity accounts, the contribution from increases in the level of education is calculated based on the number of hours worked in five education groups: elementary education, vocational education, short-cycle higher education, medium-cycle higher education and long-cycle higher education.[a] The contribution from education is quality-corrected in the sense that it takes account of a composition effect that reflects an increasing level of education in the different education groups. However, it does not capture improvements related to the quality of education within the individual groups.

In practice it may be difficult to distinguish an increase in total factor productivity from the effect of individual production factors becoming more effective. For example, faster computers and a higher skilled workforce will both increase productivity because the production factors become more productive and through an interaction effect that results in higher total factor productivity. The Economic Council has found that companies with high total factor productivity also have a high proportion of highly skilled labour. The correlation can be due to the fact that a larger proportion of highly educated workers imply higher total factor productivity or that companies with high total factor productivity are more likely to hire people with high levels of education.[b]

In statistical reports of productivity developments, the full effect of technological advancements is usually included in total factor productivity, even though the effect is partly due to improvements in individual production factors (so-called built-in technological advancements). This applies, for example, to Statistics Denmark's account of total factor productivity. The level of education and stock of physical capital can thus also affect total factor productivity to the extent that productivity improvements associated with individual production factors are not perfectly measured – for example if the quality of vocational education is lifted.

Contrary to statistics, the calculation of total factor productivity depends on a number of methodological assumptions. There are also other ways of calculating total factor productivity that differ in method. For example, the KLEMS decomposition includes the interaction between several production factors: capital, labour and use of energy, materials, and services in production. It gives a more nuanced but not necessarily more precise decomposition.

Total factor productivity cannot be measured directly, but it can be influenced by several channels, including through a well-educated workforce, well-functioning markets and effective competition, well-developed infrastructure and sound institutions, as well as good framework conditions for innovation in, for example, entrepreneurship and research and development, and openness toward foreign countries that allows for the exploitation of comparative benefits and can help to spread new technology. It also includes more diffuse areas such as innovation and organisational relationships (management and organisation of work).

[a] See Statistics Denmark (2017): *Statistikdokumentation for produktivitetsudviklingen 2017*.
[b] See The Economic Council (2013): *Dansk Økonomi, efterår 2010*.

The decomposition of contributions from these three sources can only be tentative at best. In practice, it is associated with significant difficulties not only to measure the contributions of the individual factors, but also to distinguish the effect of interaction from one factor to the other. For example, evidence seems to support that companies with many highly educated employees also have high total factor productivity.

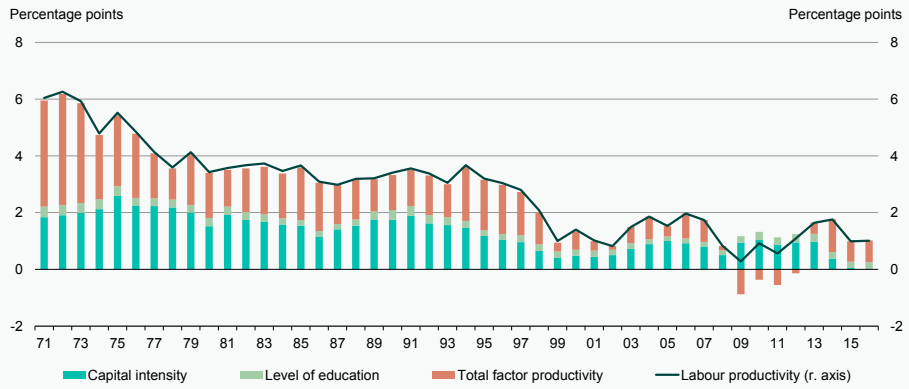
These reservations emphasise that the productivity accounts must be interpreted with caution, not least regarding the size of the individual contributions. However, the development over a longer period can indicate where to look for explanations for the subdued productivity growth in recent years.

Declining contribution from higher education?

One conclusion from the productivity accounts is that a higher education level in the population continues to contribute to higher productivity. The contribution from the educational level of the labour force is positive and approximately at the same level as in the 1970s, *cf. figure 2.5*.

Figure 2.5

Contributions to growth in labour productivity



Note: The figure shows the contribution to real GVA per hour (market based part of the economy) as a five-year moving average. Total factor productivity is adjusted in 2015 and 2016 such that the contributions to labour productivity are consistent with the revised national accounts published on 7 November 2018. The adjustment does not take into account the distribution of the individual contributions. This potentially overestimates the growth of total factor productivity in 2015 and 2016 while the contribution from capital intensity is potentially underestimated.

Source: Statistics Denmark and own calculations.

Education does not seem to be a good explanation for the slowdown in productivity growth. However, part of the contribution from education might be included in total factor productivity which captures the quality improvements beyond an increasing level of education.

At some point it will be harder to continue to have the same rate of contribution from education to growth as an increasing proportion of cohorts completes higher education,

and the proportion of a cohort that does not complete a higher education shrinks. This reduces the effect from more highly educated generations replacing less educated generations. However, it will still be possible to improve the quality of education and thereby lift productivity.

The contribution from education to productivity growth has remained unchanged over time in many countries. In view of the still-increasing educational level in Denmark, the contribution from education to productivity growth is first expected to decline after 2030.[2]

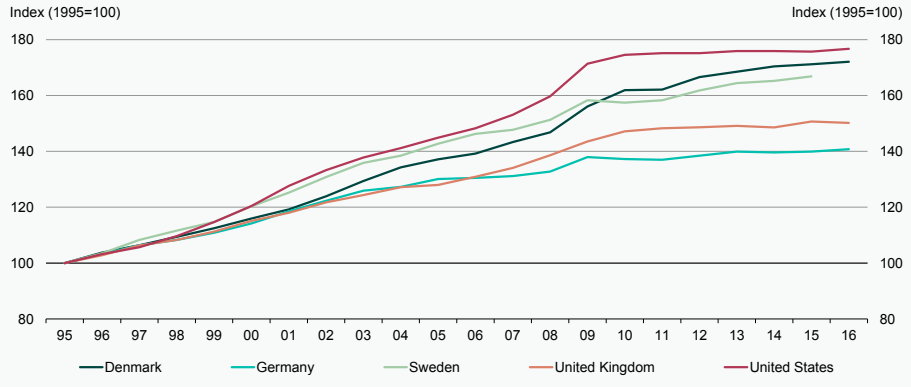
Subdued investment appetite?

Contrary to the level of education, the contribution from capital intensity has decreased considerably, especially since the mid-1990s, *cf. figure 2.5*. In recent years, the contribution has been limited. Capital intensity measures the ratio between capital and labour. The hourly productivity depends among other things on the amount of capital, in the form of buildings, machinery and software etc., the individual employee has available. In layman's terms, a worker with an excavator can dig holes faster than an employee with a shovel.

The productivity accounts indicate that dampened investment appetite is a central factor behind the productivity slowdown, and that more investment would help increase productivity growth in the future. Over time, capital intensity has grown in line with technological developments and investments in new capital stock. In the wake of the global financial crisis, the trend of increasing capital intensity has slowed down both at home and abroad, *cf. figure 2.6*.

Figure 2.6

Capital stock per hours worked in selected countries



Note: The figure shows capital intensity measured by the capital stock per hour worked.
Source: OECD Productivity Database and own calculations.

[2] See Ministry of Finance (2014): *Finansredegørelsen 2014*.

Low investments are thus not a distinct Danish phenomenon. The development is partly attributable to a significant build-up of capital prior to the global economic downturn in 2008 and the subsequent global financial crisis that led to high levels of available production capacity and therefore fewer investments. At the same time, a continuing rise in the amount of hours worked in the service industries has contributed to lower total capital intensity per hour, as many services do not require a large amount of capital.

The improved economic situation in recent years has increased the volume of investments. Employment, however, has risen at about the same rate. As a result, the stock of capital compared to employment has remained at an approximately unchanged level. Thus, the contribution from capital intensity to growth in hourly productivity remains modest. To the extent that the historical growth in capital intensity should not return, the growth in hourly productivity may more persistently be kept down.

Lack of competition?

Another key reason for lower productivity growth, both in Denmark and in other countries, is, according to the productivity accounts due to slower growth in total factor productivity (TFP). From the early 1970s to the mid-1990s, TFP growth was halved from around 4 per cent to around 2 per cent, and since then, TFP growth has further been halved to about 1 per cent.

The development in TFP is driven by innovation and renewal in the individual firms as well as well-functioning markets and a sufficiently dynamic economy which ensures that resources can be redistributed to more productive firms.

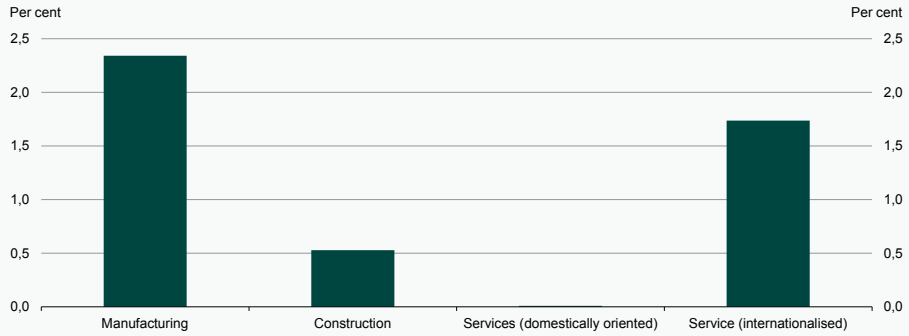
Lack of competition may hamper TFP growth and therefore also result in a weaker hourly productivity growth.[3] Weaker productivity growth is observed in service industries that are generally not exposed to the same level of competition as manufacturing because services to a larger extent are sold locally and also often do not have the same degree of uniformity, which is one of the prerequisites for perfect competition.

If the service industries are grouped according to whether they are primarily oriented towards the domestic market or the international market, one gets the clear impression that productivity growth is weakest in the domestically-oriented service industries. On the other hand, productivity growth is somewhat higher in the internationally oriented service industries and in an order of magnitude that is roughly comparable to manufacturing, *cf. figure 2.7.*

[3] See e.g. Ministry of Finance (2016): *Økonomisk Analyse: Produktivitet og konkurrence.*

Figure 2.7

Average annual productivity growth by industry, 2001-2016



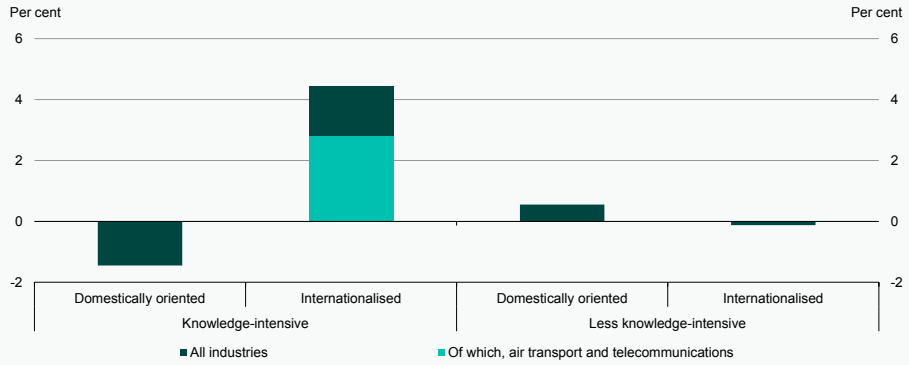
Note: The division into domestic and international service industries follows the division made by the Productivity Commission.
Source: Statistics Denmark and own calculations on detailed firm data.

The generally weak development in the service industries covers quite significant differences when looking at sub-industries. The differences must be seen in the light of the fact that the service industries consist of widely different occupations – from sea, air and land transport, cleaning, hotel and catering services to lawyers, architects, engineers and IT specialists.

The large diversity makes it relevant to consider productivity development in service industries based on other criteria than competition. For example, knowledge and ability to handle new technologies might make a difference. The knowledge-based service industries, which mainly provide services based on knowledge, e.g. in the form of counselling, generally have a better productivity development than the less knowledge-intensive service industries. However, differences between internationally and domestically oriented firms remain, *cf. figure 2.8*.

Figure 2.8

Annual productivity growth in service industries, 2001-2016



Note: The division of knowledge-intensive and less knowledge-intensive service industries follows the division of the European Commission and the division into domestic and international service industries follows the division made by the Productivity Commission.
Source: Statistics Denmark and own calculations on detailed firm data.

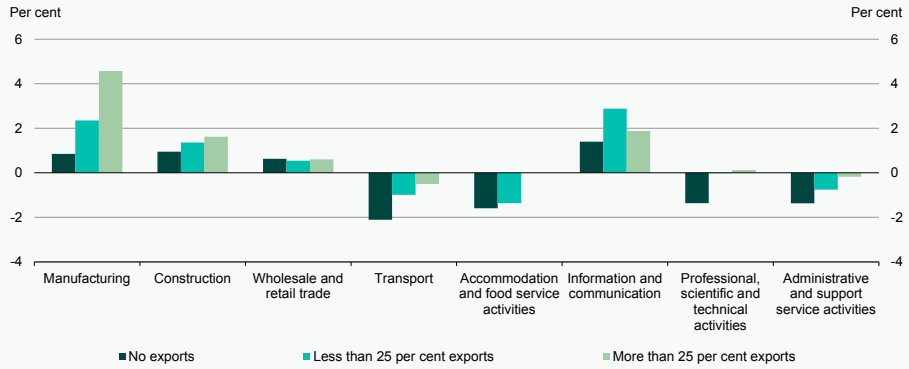
The breakdown shows that it is not only a matter of being internationally oriented or knowledge-intensive. Among the knowledge-intensive service industries for example, IT-consultants (internationally oriented) have had a stronger development than architectural and engineering services (domestically oriented). Among the less knowledge-intensive service industries, retailers (domestically oriented) have had a better development than wholesale trade (internationally oriented). Thus, other factors than international competition may be important for productivity development.

The service industries of telecommunication and aviation stand out with a very strong development in productivity. These industries are characterised by having a large capital stock which itself supports a more productive use of labour. At the same time, both telecommunications and aviation have been liberalised, giving access to more entrants, increased competition and reduced prices for consumers. In addition, telecommunications has undergone enormous technological development in recent decades and it can be particularly difficult for that industry to measure the real value added.

Although other factors are also important, it does not change the key conclusion that international competition promotes productivity. Based on firm level data, the same tendency shows up again within the individual sub-sectors, companies with the greatest productivity gains also have a certain volume of exports. The trend is most pronounced in manufacturing and in construction but also applies to exporting firms in the service industries, *cf. figure 2.9*.

Figure 2.9

Average annual growth in hourly productivity, by volume of exports since the beginning of the 2000s



Note: Export volume is calculated as the share of a firm's total revenue being exported. To increase robustness, an average has been calculated over the period 2000-2002 to 2014-2016.
Source: Statistics Denmark and own calculations on detailed firm data.

Insufficient firm dynamics?

It is crucial for productivity growth that resources are used efficiently. This requires a continuous redistribution among firms.

Previous analyses have shown that redistribution of resources from low-productivity to high-productivity firms have had a limited improvement on productivity from year to year. Thus, changes in productivity growth must be attributed mainly to a change in resource utilisation within the individual firms (i.e. internal growth).[4]

The limited redistribution across companies can indicate that the firm dynamics that help ensure productive utilisation of resources are insufficient. In the short term, however, there may be some sluggishness in adapting the workforce due to uncertainty and adjustment costs, and it is not easy to vary the firms' capital stock from one year to another.

Looking instead at the extent of redistribution among firms over several years, there is a fair degree of redistribution among firms, *cf. figure 2.10* and *2.11*. This point at resources not being locked in low-productivity firms in the long run.

[4] See e.g. The Economic Council (2013): *Dansk Økonomi, efterår 2013,* The Productivity Commission (2014): *Konkurrence, internationalisering og regulering*, Ministry of Finance (2016): *Økonomisk analyse: Produktivitet og konkurrence.*

Figure 2.10

Decomposition of hourly productivity growth, manufacturing

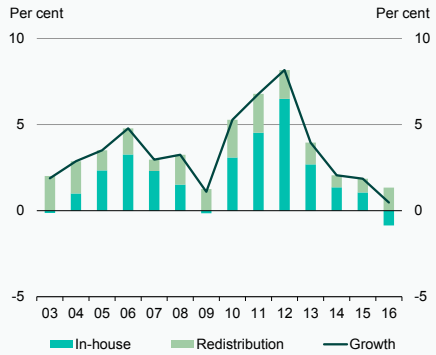
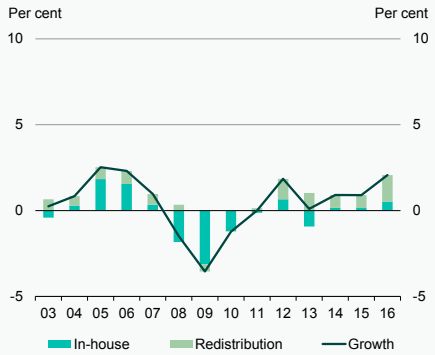


Figure 2.11

Decomposition of hourly productivity growth, services



Note: The figures show redistribution over three years. The method used is based on Dansk Økonomi, efterår 2013, where aggregate productivity growth consists of contributions from company-wide productivity growth and contribution from redistribution between companies.
Source: Statistics Denmark, The Danish Economic Councils: *Dansk Økonomi, efterår 2013* and own calculations on detailed firm data.

Redistributions have a greater scope in manufacturing than for service firms. The greater degree of redistribution in manufacturing supports the conclusion that competition is stronger in manufacturing than among service firms in general. For both manufacturing and service firms there are no systematic signs that the scope of redistribution has declined over time, and that the firm dynamics consequently should have been weakened.

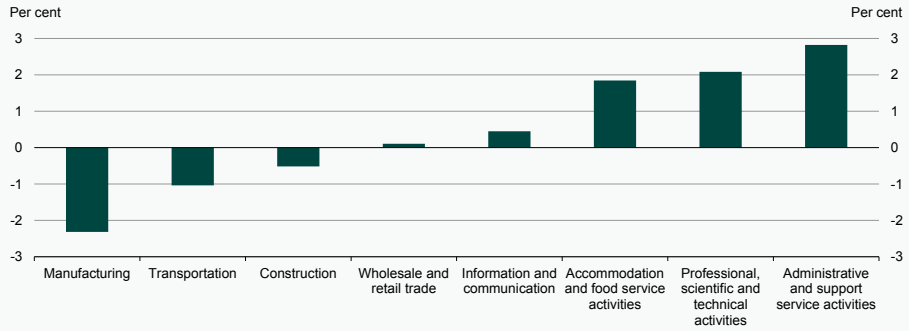
Firm dynamics, on the other hand, have been weakened by the fact that service industries which have a smaller degree of redistribution make up a larger part of the economy, and thus overall less dynamics are observed.

Over time, and especially since the mid-1990s, there has been a shift in industries towards services. The development must be seen in conjunction with higher demand for goods and services from these industries. The shift is not problematic in itself but the lower productivity growth in the service industries is a problem to the extent that it is due to lack of competition in the primarily domestically oriented industries or inadequate firm dynamics.

The counterpart to weak productivity growth is to some extent a larger increase in working hours and employment in service industries compared to manufacturing, *cf. figure 2.12*.

Figure 2.12

Average annual increase in working hours since 2000

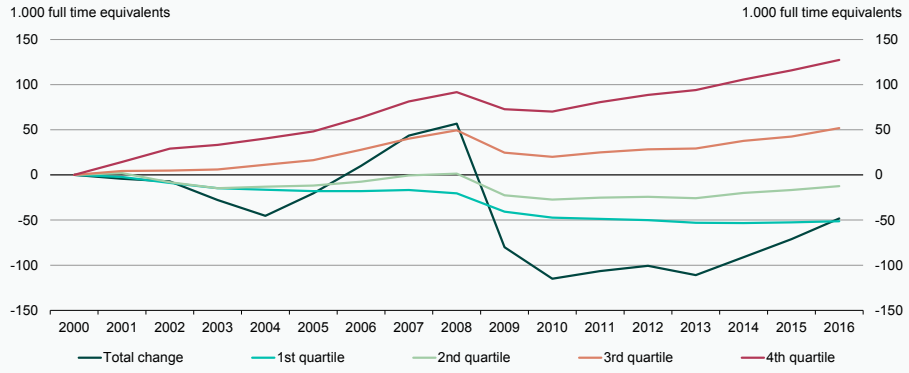


Source: Statistics Denmark and own calculations on detailed firm data.

On the other hand, increases in employment within each industry takes place in the most productive firms. Over time, the most productive firms in each industry have contributed the most to employment growth while the least productive firms have not contributed to overall employment growth at all, *cf. figure 2.13*. Thus, growth happens in the firms that contribute most to productivity growth.

Figure 2.13

Accumulated increase in employment by firm productivity level



Note: The least productive firms are in the first quartile and the most productive firms are in the fourth quartile. The data set contains approximately 890,000 employees in the private sector (excl. agriculture) in 2000. Employment changes in firms that enter or leave the data set in a given year are excluded. The four quartiles therefore do not account for the total change.

Source: Statistics Denmark and own calculations on detailed firm data.

Other explanations?

The decline in productivity growth may seem contra-intuitive because it has happened in a period of rapid technological advancement, increased participation of firms and countries in global value chains and an increasing educational level of the workforce, all of which are generally associated with higher productivity growth.

The current explanations of the lower pace of TFP growth and hourly productivity at home and abroad relate to the fact that low levels of investments in the wake of the financial crisis have kept the stock of capital down and that service industries make up a larger share of total industry. However, other possible explanations have also been proposed to explain the weaker productivity growth.[5]

A large part of the decline in hourly productivity is linked to developments in TFP. Significant variations in TFP over time are natural and historically there have been several episodes where TFP growth has slowed down for a couple of years before increasing again. For example many countries, including Denmark, actually experienced a decline in TFP during the financial crisis.

A pessimistic interpretation of the slowdown in productivity growth is that the inventions in the 19th and the first part of the 20th century have had a greater real impact on productivity and living standards (e.g. electricity and cars) than those that have followed since (e.g. social media and smartphones). According to this interpretation, productivity growth will remain lower in the future. There have, however, also been signs of falling productivity growth since the financial crisis in the emerging economies which remain likely to have significant untapped potential for implementing new technology. Therefore, lesser importance of IT-related progress is hardly the only explanation for the slowdown in TFP growth.

The growth slowdown can also be related to measurement problems when compiling economic statistics such as the national accounts. Measurement problems arise, among other things, because it can be difficult to correct for quality improvements in the estimated productivity development.

Another reason for measurement problems is that GDP might not reflect the real progress in livings standards due to new technology. Thus, a number of services such as information technology, as well as access to music, movies and television are now available to such an extent that consumption opportunities have increased significantly without this gain being captured in GDP, due to prices often being very low. Hence, GDP is not a measure of the gain that consumers obtain by purchasing at a lower price than their marginal willingness to pay (consumers' surplus), but instead reflect the registered marked activity.

[5] See e.g. OECD (2016): *Compendium of Productivity Indicators 2016*, Chad Syverson (2016): Challenges to Mismeasurement Explanations for the US Productivity Slowdown, NBER Working Paper 21974, OECD (2016): *Economic Outlook 100*, November 2016 and Andrews et al. (2016): The Global Productivity Slowdown, Technology Divergence and Public Policy: A Firm Level Perspective, Brooking Institution Hutchins Center Working Paper No. 24.

At the same time, software and computers have improved to a degree that is not necessarily fully reflected in GDP (and capital assets), although the national accounts do include some correction for quality improvements.

Overall, measurement problems are only considered to explain a small part of the decline in productivity growth. The sectors that use new technology make up too small a fraction of the economy to explain more than a limited share of the observed decline. In addition, measurement problems also posed a problem in the 1990s where productivity growth was higher.

Globalisation can also play a part in terms of measured productivity. Savings caused by outsourcing of production of e.g. subcomponents are registered as an increase in TFP and not in lower import prices because it counts as a new product instead of the same input having become cheaper. This means that growth in a period of acceleration of outsourcing and trade liberalisation was overestimated and should instead have been registered as terms of trade gains. This may imply that the decline in TFP growth is not as large as measured, but linked to changes in outsourcing and increasing international trade.

What are the opportunities to increase productivity growth?

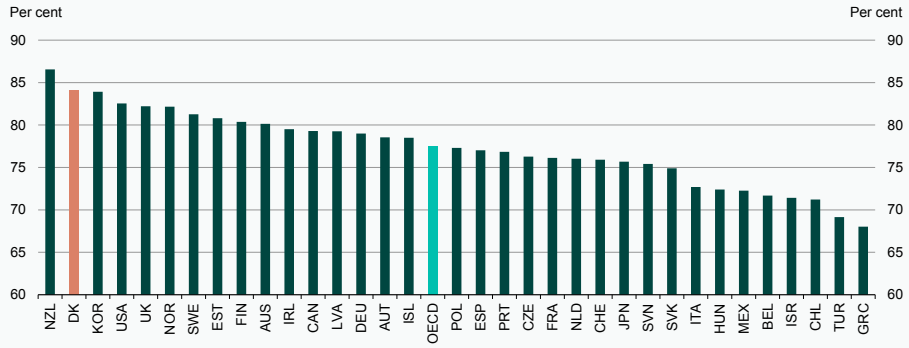
Danish productivity development is not unambiguously weak, but the large variation in productivity development across sub-sectors points to some potential for a better development. The variation applies to both the internationally oriented service industries and the domestically oriented service industries, so it is most certainly not only a matter of lack of competition.

Productivity ultimately relies on resources being put to the best possible use. That is, productivity is best promoted by removing barriers for efficient resource allocation. This is, among other things, ensured through good framework conditions.

Generally, Danish framework conditions are considered good in an international comparison. This applies, for example, to the World Bank's Ease of Doing Business index, which measures how easy it is to run a business, *cf. figure 2.14*. Although Denmark is one of the easiest countries to operate in, it does not preclude that there are still opportunities for improvement.

Figure 2.14

Danish framework conditions are generally good

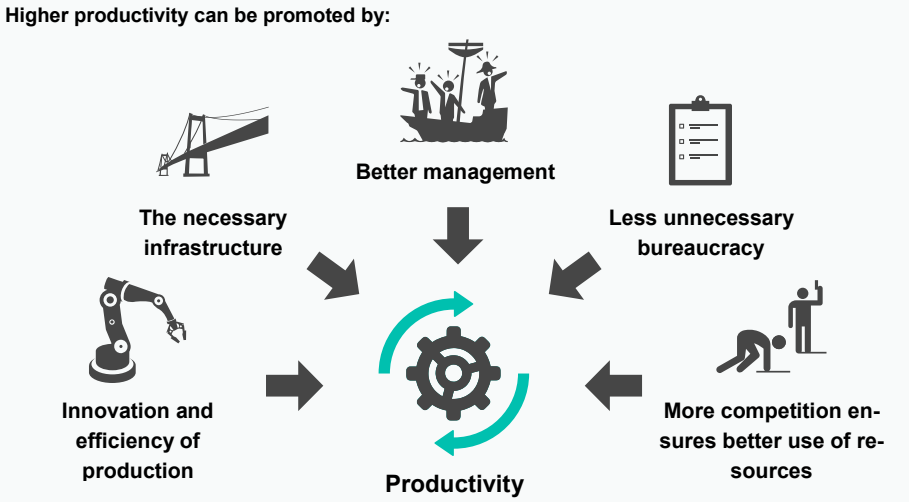


Note: World Bank's Ease of doing business index for 2018. The index measures, among other things, the countries on corporate tax payments, access to credit, customs rules and bureaucracy when starting a new business. The index can take values from 0 to 100 where a value of 100 indicates the best performance across all countries and over time.
Source: The World Bank.

Some general ways to boost productivity are outlined in figure 2.15. Stronger competition is one way but there are also other possibilities in, for example, strengthening incentives to invest, eliminating unnecessary bureaucracy and reducing business burdens, including taxation. This may include lower taxes on capital which promotes investments and other measures that improve investment conditions, thus making it more attractive for foreign companies to invest in Denmark.

In addition initiatives which support innovation and healthy competition will also increase productivity. For example, there might be initiatives that strengthen the relevance of the education programs to the private labour market, or increase the quality of higher education.

Figure 2.15



Another important source of productivity improvements is through international trade, openness to cross-country investments, including participation in global value chains, and labour mobility across borders. Productivity gains arise in this context, among other things, through opportunities for specialisation and diffusion of technology and knowledge.