

De Økonomiske Råd  
Formandskabet

# PRODUCTIVITY 2021

SUMMARY AND  
RECOMMENDATIONS



**REPORT FROM  
THE DANISH NATIONAL PRODUKTIVITY BOARD**



## I.1

# SUMMARY AND RECOMMENDATIONS

The productivity report from the Chairmanship of the Danish Economic Councils, which constitutes the National Productivity Board, consists of four chapters. The following is a brief presentation of the conclusions in each of the chapters.

### THE PRODUCTIVITY REPORT 2021

- Chapter I Current Economic Policy
- Chapter II Productivity trends
- Chapter III Long-term effects of the COVID-19 crisis
- Chapter IV Cities and Productivity

Chapter 1 is presented in full, followed by a summary of chapters II-IV

## I.2

# CURRENT ECONOMIC POLICY

In the following, the current economic policy measures that may affect productivity are assessed. The measures are divided into the following main areas:

- The management of COVID-19 pandemic
- Economic support packages
- Liquidity support packages
- General economic policy
- Climate policy
- Transition to green passenger cars
- Cities and productivity

## MANAGEMENT OF COVID-19

**The Danish Government has used the so-called hammer and dance strategy**

Over the last year the Danish economy has been seriously affected by the global outbreak of COVID-19. Since March 2020, the Danish Government has used a suppression strategy in the form of the so-called hammer and dance to reduce the spread of infection. The first part of this strategy – the hammer – involves a rapid and aggressive response in the form of significant restrictions and lockdowns of parts of the economy, see Pueyo (2020). Once the infection rate has been reduced, the second part of the strategy – the dance - is introduced, in which various measures try to keep the spread of the infection down until a vaccine or effective treatment is available.

**Effective vaccines suggest that suppression strategies may be beneficial**

A number of epidemiological and economic factors are decisive for whether a suppression strategy or a mitigation strategy, which allows a greater degree of spread of infection, is the most appropriate response to a viral outbreak, see chapter V in the De Økonomiske Råds formandskab (2020b).<sup>1</sup> Factors that indicate that a suppression strategy, such as that used in Denmark, is the best policy include a rapid emergence of effective vaccines, high mortality rates and significant lasting effects of viruses, as well as a high valuation of human life.

**Sufficient testing capacity, effective contact tracing, and that infected self-isolate are essential**

Given the strategy, the spread of the infection should be reduced with as few economic costs as possible, which means it is essential that the need to use the hammer is limited as much as possible. This presupposes that the emergency preparedness, which must continually limit the spread of infection (dance), is as effective as possible. Three conditions are essential for 'coronavirus dancing' to be as effective as possible. First, it is crucial that the testing capacity is adequate. Second, there must be effective tracing of contacts of the people who test positive so these close contacts can be found, tested and isolated if infected, and the infection chains can thus be unravelled and broken. This requires both that sufficient resources are spent on contact tracing, and that the contact tracing follows best practice principles. Third, it is necessary to ensure that people who test positive go into isolation afterwards. A large proportion of those who become infected will do this on their own, but for some people this is made difficult because they live in close quarters to other people, meaning distancing themselves sufficiently is problematic. Therefore, an important element of the overall strategy is that there is easy access to publicly provided isolation facilities and that the population is informed about this.

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1) An English translation of the chapter is available at <http://www.dors.dk>.

**Restrictions that limit the freedom of some groups increase the freedom of others**

In the current situation some people would in the absence of restrictions have chosen to continue their way of life as it was before the outbreak of the virus because, for example, they do not perceive that they run a high risk of becoming seriously ill. Other people, who feel they would be more vulnerable if infected, would choose to limit their activities. Looking at the population as a whole, the outbreak of the virus thus imposes restrictions on freedom even in the absence of interventions by the authorities. The authorities' subsequent reaction is, to a considerable extent, a question of how the restrictions on freedom are distributed between different groups of people. If people have the freedom to opt out of testing, to avoid being registered in relation to contact tracing and to refrain from isolating themselves in the event of infection, this may lead to the spread of infection getting out of control. This will particularly affect vulnerable groups. At the same time, widespread lockdowns of society may become necessary, and this limits the freedom of all affected groups in the population.

**Transition to distance learning can lead to learning losses, ...**

In order to limit activity and the spread of infection in the community, there have been periodic closures of educational institutions, including schools, over the past year. It is difficult at present to say what the long-term consequences will be. For some students, there may be a gain from receiving tuition at home, but there is also a risk that the transition to distance learning will result in a permanent loss of learning for other students. This may be particularly the case for academically challenged students who do not have parents who are able to help them with their school work. In addition, all types of students, including academically strong ones, may be affected by the lack of social interaction.

**... therefore, it is very important that national tests remain comparable to previous years' tests**

As the temporary transition to distance learning involves a risk of learning loss for some groups of students, over the next few years, it will be important to pay special attention to whether the academic level of students has deteriorated. In this way, targeted efforts can be directed towards those groups where a learning loss appears to have occurred. Among other things, this speaks in favour of benefiting from the knowledge gained from the national tests. The Ministry of Children and Education has announced that it expects to make adjustments to the national tests during 2021. If this happens, it is important to ensure that the test results remain comparable to previous years.

## ECONOMIC SUPPORT PACKAGES

**Economic support packages helped the Danish economy at the beginning of the crisis**

As the COVID-19 crisis intensified in the spring of 2020, a number of economic support packages were introduced. These helped reduce the insecurity triggered by the crisis, and support packages reduced the number of bankruptcies and limited the rise in unemployment. A significantly larger number of bankruptcies and redundancies could have led to a significant loss of intangible assets in the form of existing customer relationships, company-specific human capital and possibly research and development results. Such a scenario would not only have reduced productivity in the short run, but could also have had long-term negative consequences.

**There are inevitably unfortunate side effects of the support packages**

The economic support packages provide assistance to existing businesses, while new businesses do not have access to them, which is an inevitable part of the design. An unfortunate side effect, however, is that this creates a tendency for the business structure to become entrenched. The normal process whereby existing low-productivity enterprises close and are replaced by new ones with higher productivity is interrupted. This loss of productivity increases with the duration of the support packages.

**Argument for support packages depends on the duration of the health crisis**

A decision to introduce economic support packages in connection with a pandemic such as the current one should be viewed as a balancing act for several reasons. Extensive support packages may be appropriate, especially in the case of a rare health crisis that would give rise to a significant increase in unemployment and in the number of bankruptcies in the absence of government measures. The argument for support packages is particularly valid if the health crisis is expected to end in a relatively short period of time. Conversely, the argument for support packages is weaker if there is a prospect of a very long-term health crisis. In that case, economic support packages will have significant costs in terms of weakening the necessary structural adjustment process. Under all circumstances, it is an advantage if support packages focus on the parts of the economy that are affected by the health crisis through being locked down *de facto* or *de jure*.

**The crucial rule: The economic support packages should be phased out as soon as the restrictions are lifted**

Apart from the strain on public finances, the problems associated with support packages are limited as long as extensive restrictions hamper economic activity. On the other hand, when the restrictions are removed, the problems of maintaining the support packages increase significantly. Therefore, lifting the restrictions and phasing out the support packages should go hand in hand. There may be a few exceptions for industries in which returning to production is associated with large fixed costs, and where the production has large positive social returns.

**Payments to industries that have had few restrictions on their activities**

Businesses operating in industries that have not been forced to close should, therefore, not be able to access economic support packages, regardless of whether they have increased costs due to increased social distancing requirements or other measures put in place to reduce the spread of the virus. However, significant compensation has been paid to companies in industries that have only had limited restrictions placed on them; for example, manufacturing firms have received approximately 12 percent of the total salary compensation paid out and almost 5 percent of the compensation for fixed costs, despite the fact that the manufacturing industry has only, to a small extent, had actual bans on staying open.<sup>2</sup>

**A side effect of providing support is that unprofitable businesses are also supported**

Several of the support packages have also been available to businesses that have not been subject to restrictions. The only requirement for obtaining support for fixed costs was that the decrease in revenue was sufficiently large. This is a breach of normal Danish policy, where no direct business support is provided as a result of a fall in demand that is a natural part of any economic downturn. When the support is available to existing companies that are not, or only to a small extent, directly affected by the lockdown, this increases the risk of supporting businesses that would have gone bankrupt even in the absence of the COVID-19 crisis. It is the case, for example, that it is especially employees in job categories that were already under pressure before the crisis who have had their pay partly subsidised by the wage and salary compensation package when they have had to stay home due to the lockdowns, see Mattana et al. (2020). The businesses that have received assistance packages are firms that, on average, were already assessed before COVID-19 as having the greatest probability of defaulting on loans, see Danmarks Nationalbank (2020).

**Creating expectations that weaken the future resilience of the economy should be avoided, ...**

A further consequence of maintaining the economic support packages for too long is that it sends adverse signals to firms that the state will again step in with support should a similar situation arise. It weakens firms' incentives to take on costly adjustments that make them, and thus the economy as a whole, more resilient to future epidemics. Such a situation should be avoided as far as possible.

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2) The figures for compensation are from the Danish Business Authority, Statistik for kompensationsordninger, Regneark Uge 11 (Compensation Statistics, Spreadsheet, Week 11).

**... and this issue should also be taken into account in the Epidemic Act's compensation scheme**

It is also important to avoid weakening these incentives in the design of the compensation scheme for future interventions that is being prepared in the context of the recently adopted Epidemic Act. In connection with the Epidemic Act, it was agreed that a working group, based in the Ministry of Industry, Business and Financial Affairs, is to develop a model for compensation schemes for interventions of a non-expropriation nature. There are good economic reasons to make it clear to businesses in advance how they can expect to be compensated for future epidemics that require major, far-reaching restrictions. However, it is important that the actual design of the scheme does not give businesses disincentives to make adjustments, as failure to make adjustments would make firms less resilient to future epidemics. This is not an easy balancing act, but it is important to be aware that there is one.

## **LIQUIDITY SUPPORT PACKAGES**

**A number of temporary loan schemes have been introduced**

During the crisis, extended credit periods have been granted for the payment of, among other things, VAT and income taxes. This has eased the liquidity situation for businesses in the short run. The government has also made it possible to borrow the VAT paid in March 2020 and March 2021 interest-free as well as the income tax that should have been paid for August, September and December 2020 and January and February 2021.<sup>3</sup> To be eligible for the loan schemes, businesses only need to meet a few criteria and no credit assessment of these businesses is undertaken. The Government estimated that, overall, the business sector would seek just over DKK 30 billion in loans from these schemes. On March 24, the government presented a proposal to further expand the loan schemes for VAT and income tax, with the last loans to be repaid in May 2023.

**There may be arguments in favour of the state helping with liquidity**

In principle, there may be good arguments in favour of public sector measures that help to counteract fluctuations in liquidity in the private sector. Under certain circumstances, businesses in the private sector as a whole would not be able to raise sufficient liquidity to cover their own needs when they are hit by macroeconomic shocks, see Holmstrom and Tirole (1998). Therefore, it may be appropriate for the public sector to provide liquidity to businesses. The state can, thereby, provide insurance that the private market itself is not able to provide.

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<sup>3</sup> The option to borrow VAT and income tax paid for August 2020 only applies to small and medium-sized enterprises, while the other loan options apply to all enterprises.



**Easy access to interest-free state loans ...**

The easy access to extra interest-free loans was intended as a supplement to the normal financing of businesses that should guarantee them with sufficient liquidity. In Denmark's Nationalbank's lending survey, banks indicated that there has been a decline in the demand for business lending. It is obvious that part of this decline is due to the fact that private investment in machinery etc. has been reduced due to the generally low economic activity and the increased uncertainty.

**... seems to have crowded out private financing.**

However, it is obvious that the free government liquidity that businesses have obtained has also played a role in reducing the demand for liquidity from banks. With considerable uncertainty, it is estimated that, by the end of 2020, businesses had obtained extra liquidity through the extended credit periods and loans of between DKK 70 and 90 billion. This large boost to liquidity took place during the time that lending from the banks fell by approximately DKK 14 billion from February 2020 to February 2021, while deposits increased by almost DKK 45 billion.

**The state has taken on a potentially great risk**

The transition from financing on market terms by banks with risk assessment expertise, to a general and interest-free loan scheme under state auspices, means that the state has assumed a significant credit risk. While this may be appropriate in very special situations, assessment of creditworthiness and risks should be returned to banks as soon as possible.

**State funding should be rolled back ...**

As a starting point, payment deadlines should be normalised as soon as possible and the extraordinary government loan schemes should end as planned. Government funding should again be taken over by banks and based on actual assessments of creditworthiness. The banks are currently assessed to have sufficient reserves to be able to handle an increase in demand for credit from businesses. Not all affected businesses will continue to be rated as creditworthy on normal terms by the banks. In principle, if businesses cannot obtain credit, they must close; however, a situation may arise where a very large number of businesses risk closing at the same time.

**... and replaced by funding from the financial sector**

If the roll-back of government funding results in an imminent risk that a significant number of businesses would go bankrupt at the same time, it could lead to losses for other businesses and to the risk of greater spillover effects in the economy. The financial institutions will probably not take these secondary losses into account. Therefore there may be an argument in favour of the state temporarily providing a guarantee to the banks for part of the losses that they may experience, in order to increase the proportion of businesses that are approved for credit. In that case, there will continue to be an element of state support, but it

would ensure that an actual credit assessment of businesses is carried out before continued credit is granted.

## GENERAL ECONOMIC POLICY

**Investment window can distort investment decisions**

To help the Danish economy get back on track, an agreement has been reached on a green tax reform that includes an investment window. This allows businesses to increase the tax deduction rate for most investments made before the end of 2022. On the one hand, this will increase economic activity at a time when the Danish economy has spare capacity. On the other hand, there is currently a great deal of uncertainty about future; therefore, it may be rational for businesses to postpone investments to a time when there is full or partial clarity. By providing an incentive to make investments in an uncertain period, there is a risk that investments will be made that subsequently prove to be unprofitable. In that case, a welfare loss arises, which is ultimately borne by the taxpayers. An incentive to increase private investment through state support is thus not an unconditional gain.

**Increased working from home is probably a phenomenon that will persist**

In connection with the COVID-19 crisis, the prevalence of working from home among both public and private sector employees has increased. It is likely that the increased extent of working from home will be a lasting phenomenon. There is, therefore, an opportunity to consider what trade-offs the use of work from home entails and whether the existing legislation that affects the possibilities for working from home is appropriate.

**Working from home can increase efficiency**

Several international empirical studies indicate that working from home can bring productivity gains. This may, for example, be due to the individual employee being able to carry out their work to a greater extent in a calm and familiar environment without interruptions and being able to structure their own work day. This can increase the individual's effective working time and efficiency.

**May be relevant to examine work environment rules for working from home**

Therefore, it is important to safeguard against legislation that puts unnecessary obstacles in the way of the use of working from home. Among other things, it may be relevant to have a review of the provisions of the work environment legislation with regards to working from home. The purpose of the work environment legislation is to ensure that conditions in workplaces, including home workplaces, have a standard that is satisfactory from a health point of view. If the work environment legislation contains unnecessarily strict requirements for

the creation of home workplaces, it will limit businesses' and employees' opportunities to achieve efficiency gains.

**Working from home can also affect knowledge dissemination, climate and congestion**

In addition to the effects of the increased extent of working from home mentioned above, there may also be broader economic effects that employees and businesses do not take into account in their decisions about forms of work. For example, less physical presence in the workplace can lead to a reduction in the dissemination of knowledge. This pulls in the direction of weakening the overall productivity of society. On the other hand, increased remote work can have positive environmental and climate effects and affect traffic congestion. To the extent that these both positive and negative externalities of working from home turn out to be substantial it provides, in principle, reasons to seek to influence the extent of remote work through political measures. However, externalities should be regulated as directly as possible. For example, road pricing is the instrument that is the most targeted in terms of regulating traffic congestion.

**Early retirement partly financed through a tax on the financial sector**

As part of the cross-party agreement on the right to early retirement, a new tax on the financial sector was introduced as part of the financing. Taxes that serve a revenue purpose should be based on broad and uniform tax bases. If a special tax on a single sector is to be justified on the basis of economic efficiency, it must, therefore, be possible to show that it corrects for other tax-induced distortions that affects the sector in particular, or on actual market failures related to the sector. The latter may, for example, consist of above-normal profits as a result of weak competition in the sector.

**ACE tax is more targeted at any above-normal profit**

Regardless of whether there is above-normal profit in the financial sector, it would be more appropriate to tax businesses on the basis of a so-called ACE tax (Allowance for Corporate Equity). With this, a tax deduction is given for normal returns on equity in the businesses, so that the only the pure profit in the sector is taxed - contrary to what applies to corporate tax, see the De Økonomiske Råds formandskab (2019b). Such a tax would be able to tax above-normal profits and be neutral in relation to businesses' investment decisions. Conversely, a special corporation tax on the financial sector, which is planned, is not aimed at reducing above-normal profit in the sector. The corporation tax also entails a number of distortions, including the risk of inappropriately high borrowing and, thereby, low solidity in the financial sector.

**Important to closely follow the state of competition**

The debate on taxation of the financial sector highlights the need for a thorough analysis of the competitive conditions in the sector so that policy decisions can be made on an informed basis. More generally, it

is also important to closely follow the competition trends in society. Effective competition is a significant driving force behind productivity growth, and thus long run growth in prosperity. De Økonomiske Råds formandskab (2020a), finds signs that net profit in Danish, non-financial enterprises has increased in recent years, which may indicate that competition across the business sectors in Denmark has weakened. It is important to find out whether this is the case so that action can be taken in sectors that have experienced weakened competition. Naturally, this work has the focus of the competition authorities, but it will also be addressed in future reports from the Chairmanship.

**Increasing funding for senior secondary schools ...**

In the 2020 Budget, the ongoing funding cuts in the government spending on upper secondary and vocational education and training were abolished, and in the 2021 Budget, the funding cut from 2019 to upper secondary and vocational education and training was reversed. In principle, an increase in funding can strengthen the quality of teaching through the employment of more and better skilled teachers.

**... will probably have a limited effect on the completion rates, grades and further education entry of students in general upper secondary schools**

It is doubtful whether the increase in the grant will have a significant effect on the learning outcomes of the students in the general upper secondary schools, measured by grade point averages, completion rates and whether the students subsequently go on to further education. Thus, in the De Økonomiske Råds formandskab (2019a), no effect of changes in the general upper secondary schools' funding was found on the aforementioned goals for learning outcomes. The analysis also concluded that the average funding level had been reduced to a level, which is at the lower end of the spectrum covered by the analysis; thus, it was uncertain whether further savings could continue to be implemented without affecting the quality of teaching. With the proposed increase in the grants for upper secondary and tertiary education, the funding level moves back up to the earlier higher level; hence, there is no reason to assume that it will have a significant effect on the aims for learning outcomes mentioned above.

**Effects on other quality goals and on the other upper secondary and tertiary education programs cannot be ruled out**

However, it cannot be ruled out that the grant increase will not have other beneficial consequences. It is possible, for example, that well-being will be affected, as targets for this were not included in the study from 2019. If there are effects on well-being or other conditions that are not included in the analysis, it must be the case that these effects do not significantly affect the learning outcome measures included in the analysis. The study only dealt with the general upper secondary school system, and the experience from this area cannot be directly transferred to the vocational upper secondary schools.

## CLIMATE POLICY

**The CO<sub>2</sub>e tax must be credible to work as intended**

The Chairmanship has repeatedly recommended, most recently in the De Økonomiske Råds formandskab (2021), that a uniform CO<sub>2</sub>e tax be introduced on all greenhouse gas emissions, and that this should be the driving force in the green transformation. The level of this tax should be announced as quickly as possible, including the rate of increase towards the climate targets for 2030 and 2050. However, it is not necessary for high and uniform greenhouse gas taxation to be introduced immediately. As long as the announcements are credible, businesses and households will have incentives to take the tax into account when making investments before the actual introduction of the tax. The CO<sub>2</sub>e tax gives businesses and households the right incentives in their investment decisions and, to the extent that businesses and households consider the plan for the introduction of the CO<sub>2</sub>e tax to be credible and sufficient to achieve the goal, investments in technologies with low greenhouse gas content will not be postponed due to uncertainty about future CO<sub>2</sub>e regulation.

**Until the announcement, there is great uncertainty**

The uncertainty about the specific details of the climate policy will, conversely, give businesses and households an incentive to wait for further clarification. The longer it takes before the specific details for the green transition towards 2030 are determined, the more expensive the transition will be. In the worst case, this uncertainty can lead to such big delays in necessary green investments that, approaching 2030, a choice between implementing very expensive measures to reach the 70 percent target or postponing fulfilment of the target would have to be made. Conversely, an announcement of the initial tax rate and the increments between now and 2030 that credibly ensures that the 70 percent goal is achieved could be made quickly. Such an announcement does not have to wait for the detailed design of any regulations for deductions in the tax payment for reasons of leakage or for specific details of the tax calculations for agriculture, as long as these details are finalised prior to implementation of the tax.

## TRANSITION TO GREEN PASSENGER CARS

**Car taxes should target the externalities of driving**

The externalities from passenger cars in the form of congestion, accidents, air pollution and CO<sub>2</sub> emissions are due to driving and fuel consumption. Therefore, taxes to regulate these externalities should be levied on fuel consumption and driving. Targeted regulation of externalities thus dictates that registration and ownership taxes should be replaced by road pricing charges. Such charges should be imposed

during rush hour driving in large urban areas such that they correspond to the externalities of driving in the form of air pollution, congestion and accidents, etc. created during the trip, while the fuel tax should be set such that it corresponds to the social costs of CO<sub>2</sub> and other emissions, see the De Økonomiske Råds formandskab (2018).

**Broad political agreement promotes the number of electric cars**

In December 2020, a cross-party agreement was reached by the Parliament on the future of car taxation. The agreement increases consumer incentives to choose zero- and low-emission cars. In total, it is estimated that, on the basis of the tax change, there will be 775,000 zero and low emission cars by 2030, which is 375,000 more than was estimated on the basis of the previous taxation. According to the political agreement, the taxation of private motoring is largely based on the purchase and ownership of cars, activities that do not in themselves generate negative externalities.

**Retention of registration tax makes the transformation expensive**

Taxes and duties collected primarily for revenue reasons are most appropriately levied on broad tax bases to avoid distortions in households' and businesses' decisions. To the extent that it is politically desirable to take distributional considerations into account when collecting taxes, these are dealt with in a more targeted way through, for example, the income tax system, than through a progressive registration tax. The retention of registration and ownership taxes thus risks making the green transition of the car fleet more expensive.

**Subsidies for electric cars increase the number of electric cars, ...**

A reduction in greenhouse gas emissions associated with transportation can occur in several ways. The type of fuel can be changed from fossil fuels (petrol and diesel) to electricity or other zero-emission fuels (e.g., biodiesel), and use of conventional cars can be reduced or replaced by other means of transport, e.g., public transport. A subsidy for electric cars will only provide an incentive to switch to electric cars, while a CO<sub>2</sub> tax will provide an incentive for all reduction options to be utilised. Therefore, a CO<sub>2</sub> tax on fuels provides incentives for a cost-effective green transition of transport, while this is not the case for subsidies for electric cars.

**... but makes the green transformation more expensive**

The CO<sub>2</sub> tax on petrol and diesel used for driving should correspond to the general tax on greenhouse gas emissions. Previous analyses also indicate that CO<sub>2</sub> reductions from cars are significantly more expensive than reductions in other areas, e.g., in agriculture, see the De Økonomiske Råds formandskab (2018). Reduced targets for cars secured through special rules would, therefore, lead to a significant increase in the cost of the green transformation.

**The roll out of charging infrastructure should, as far as possible, take place on market terms**

In February 2021, the Commission for a Transition to Green Passenger Cars published its second and final interim report. The Commission recommends that, as far as possible, the roll out of the infrastructure for charging electric cars should occur under market conditions. The Chairmanship shares this recommendation. Government initiatives, such as support for the roll out of infrastructure for charging electric cars, should be justified and directed at specific market failures that are not already regulated. The Commission further recommends that taxes on electricity for charging electric cars be uniform and independent of whether or not it is used for business purposes and of the source of home heating. The Chairmanship shares this recommendation and has previously recommended that the electricity tax be reduced to the EU minimum limit.

**In the longer term, road pricing should be introduced**

The Commission considers it necessary to introduce regulations to reduce congestion in major cities due to the expected increase in the car fleet leading up to 2030. Against this background, the Commission recommends that a preliminary study be launched that could potentially be a stepping stone to a national road pricing system that can ensure more efficient utilisation of the infrastructure through reductions in congestion, accidents, noise and air pollution etc. The Chairmanship has previously recommended road pricing charges, see De Økonomiske Råds formandskab (2018), and on this basis recommends that work be initiated to assess various models for road pricing in Denmark.

## **GEOGRAPHICAL PRODUCTIVITY DIFFERENCES**

**Regulation that reduces the supply of property in cities reduce productivity**

Chapter IV is dedicated to a thorough analysis of cities and productivity. The results indicate that regulations that reduce space for businesses has productivity costs, especially in large cities. For example, local government planning regulations, the Planning Act and other regulation of the property stock may, in certain cases, limit the supply of commercial premises. If such regulation limits the supply of properties in general, in addition to lower productivity, there will also be welfare costs in the form of reduced housing supply. The costs must be weighed against any benefits of the regulation. Local planning regulations in cities, for example, ensure that the aesthetics and history of the area are preserved. From a welfare perspective, such regulations can be justified by the fact that they are externalities, as visitors and residents benefit from the value of these things without paying directly for them. Likewise, there is a value in preserving green spaces that serve recreational purposes for the city's residents and visitors.

**Commercial-use property taxes distort and reduce productivity**

The use of properties is distorted by a tax (called *dækningsafgift* in Danish) that is imposed by some local governments on properties that are used for most types of business activity.<sup>4</sup> This means that the building stock used for business purposes is disproportionately low relative to housing, which reduces productivity. The commercial-use tax is not the same across municipalities. It is typically higher in urban municipalities and is zero in many rural municipalities. Thus, the distortion will typically be worst in the urban municipalities.

**Commercial-use tax compensates municipalities for expenses, ...**

The purpose of the tax on properties used by businesses is to compensate the municipality for a number of expenses associated with the business community, for example, expenses associated with the use of the municipality's roads, parking lots and other infrastructure.

**... but a direct charge ...**

However, if increased use of infrastructure entails costs for society, it would be more appropriate to impose a tax directly on the use of the infrastructure corresponding to the increased costs associated with it. Thus, the business and other users would take into account the increased costs to society of using the infrastructure. There may also be infrastructure costs that do not depend directly on use, for example, construction costs for a new road. It would be appropriate to finance such expenses through broad based taxes (e.g., through the income tax system) and not by usage-dependent taxes. If there is a desire to compensate the municipalities for expenses related to the infrastructure that are not use-dependent, this can be done for instance through the municipal equalization system.

## I.3

## SUMMARY OF CHAPTERS II-IV

The following is a summary of the remaining three chapters in the productivity report.

### CHAPTER II, PRODUCTIVITY TRENDS

Chapter II illustrates the overall trends in productivity and competitiveness. The chapter focuses on the effects of the COVID-19 pandemic on productivity and competitiveness over the past year.

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<sup>4</sup> The commercial-use property tax (*dækningsafgift*) is paid on the value of the buildings and thus does not include the land value. It is also paid on certain types of public property. Here, however, the focus is on the tax on properties used for private businesses.



**Higher productivity growth in the 2010s than in the 2000s**

Hourly productivity in the non-agricultural private sector grew by an average of 1.6 percent per year in the 2010s, and particularly in the three years immediately leading up to the COVID-19 crisis, productivity growth was relatively high. Productivity growth through the 2010s was half a percentage point higher than through the 2000s, due to the high and increasing contribution from TFP growth over the past ten years. Productivity growth in the Danish manufacturing industry was higher over the past ten years than in a number of other advanced countries. This contributed to productivity in the private sector in Denmark growing, on average, half a percentage point more than the average in the EU countries.

**Statistics for productivity in 2020-21 are subject to uncertainty**

The statistics for production and employment are currently subject to more uncertainty than usual, and trends in productivity must be interpreted with caution as long as economic support packages, restrictions and other unusual circumstances affect the picture. The special circumstances during the COVID-19 pandemic also mean that productivity per worker and productivity per hour worked have quite different trends, with a markedly greater decrease in productivity per worker than productivity per hour worked. The uncertainty is not only related to the Danish statistics: various statistics in other countries are also affected by greater uncertainty than usual. Therefore, more caution is required when interpreting the differences across countries in the current situation.

**Asymmetric impact on industries in 2020**

The pandemic has hit the sectors in the economy asymmetrically, with particularly large declines in production in a number of service industries. The decline in production has led to adjustments in employment, which, however, have not been of a corresponding size. Against this background, productivity in, for example, the Arts and Leisure sector fell significantly in 2020. Economic downturns usually have as a consequence that there is a reallocation of productive resources. In the beginning, this happens primarily within each industry, while over time there are shifts between industries. The COVID-19 crisis is unusual due to the significant asymmetry and significant impacts of individual sectors. It reduces reallocation within the sectors, especially while the lockdown is on and the economic support packages are available. There are signs of continued high turnover in the Danish labour market, and there are indications that a certain amount of reallocation across sectors was possible during 2020.

**Wage competitiveness improved up to the crisis, ...**

**... and subject to uncertainty in 2020-21**

Wage competitiveness in manufacturing has improved since the financial crisis. This applies regardless of whether wage competitiveness is calculated as the relative unit wage cost, i.e., the wage cost of producing one unit of output relative to that of other countries, or as the relative wage that also takes into account exchange rate effects. In 2020 labour costs in most countries rose more than hourly productivity, partly as a result of the widespread use of job retention schemes. The impact of the pandemic on the economy as well as the design of the schemes varies across countries and are sources of uncertainty in estimations of relative unit wage costs. The trends must, therefore, be interpreted with caution.

### **CHAPTER III, LONG-TERM EFFECTS OF THE COVID-19 CRISIS**

Chapter III discusses various reasons why the COVID-19 crisis can have long-term effects on productivity and prosperity in the economy, even when the actual health crisis is over at some point and the restrictions are removed. The chapter discusses the following channels:

- Reallocation of production resources
- Loss of human capital
- Increased use of work from home
- Lower investments
- Deglobalisation
- Increased automation
- Emergence of zombie firms

**Several factors point to lower productivity in the wake of the COVID-19 crisis ...**

Several of these factors suggest that there may be negative productivity and prosperity effects. For example, the COVID-19 crisis may contribute to a loss of physical and human capital that is specifically related to the individual job or industry, likewise, there may be a decrease in investment in physical capital and research and development. However, there are also factors that can pull in the direction of increased productivity.

**... but some factors can lead to higher productivity**

Increased productivity can occur, for example, if the COVID-19 crisis reinforces existing trends, such as the increased extent of e-commerce and the automation of production processes. The COVID-19 crisis may also lead to increased working from home, which may be associated with efficiency gains.

## CHAPTER IV, CITIES AND PRODUCTIVITY

**What do cities mean for productivity and welfare?**

Chapter IV examines the importance of cities for productivity and welfare. In cities more people work closely together, and this has a number of advantages and disadvantages for productivity and for welfare in general. The effects on productivity and welfare are elucidated on the basis of existing knowledge in the field and own analyses.

**How are decisions about residence and workplace locations best regulated?**

The advantages and disadvantages of living in cities have an impact on how regulation in a number of areas is best designed from a welfare perspective. Households' and businesses' decisions about residence and workplace locations are affected by various regulations, such as taxes, local plans and education policies.

**Advantages and disadvantages of cities**

There are both advantages and disadvantages of living in cities. The advantages can, for example, come from increased knowledge sharing, a larger and thus more varied market for goods and services, a larger labour market and thus better match between employer and employee as well as better access to institutions, such as education, public administration or cultural offerings. The disadvantages can, for example, stem from increased congestion and pollution in the local area or less space for businesses and homes.

**Externalities from density can, in principle, justify regulation**

Some of the advantages and disadvantages of cities arise from externalities, and these can, in principle, be an argument for regulating the location of inhabitants and workplaces. For example, the local job market becomes larger when jobs move to the city, and this can make it easier to find a good job match. However, individual newcomers do not take into account that they thus have a positive effect on other employees and businesses. This is a positive externality from increased density, which, in isolation, may justify the provision of support for more jobs to move to the cities. However, effective regulations will also have to take into account negative externalities in the affected area as well as the negative and positive externalities in the areas from which the individual moves.

**In practice, however, externalities are difficult to determine**

There is extensive empirical literature on the productivity gains of cities, and there is some agreement that both positive and negative externalities exist with increasing density. However, there are methodological problems associated with determining externalities from increased density, which means that, in practice, it is difficult to take these into account in the regulations. First, it is difficult to establish a causal relationship between density and productivity. Another chal-

lenge is that, as mentioned, it is necessary to know the size of the externalities in both the areas that workers are moving to and moving from.

**Income analyses find small direct productivity gains from relocation of workers, ...**

Two analyses of incomes are performed to examine the productivity differences across municipalities, and the conclusions are in line with the results from existing surveys in Denmark and abroad. In the first analysis, it is found that wages only change slightly when workers move between different municipalities within a country, including from rural to urban areas. There are indications that there are limited direct productivity gains when the workers move between municipalities.

**... but in the long run, there can be significant gains for the highly educated to be in a big city**

The second wage analysis examines the long-term productivity gains for individuals with post graduate degrees in Copenhagen. It is concluded that post graduates who remain in the metropolitan area achieve a salary gain of approximately 10 percent five to ten years after graduation. In the analysis, a number of methodological steps are taken to ensure the results are not driven by a tendency for the most talented post graduates living in the city. The gradual wage gains may be due to the fact that more experience is gained in jobs in a big city, or that more job changes make it possible to find a better job match.

**High commercial rents in the big cities indicate productivity gains for business**

A third analysis finds that the price of renting commercial property is highest in the Copenhagen area, second highest in the other large cities and lowest in rural municipalities, even when differences in the nature of the tenancies are taken into account. The analysis argues that businesses that lease space in office buildings may be willing to pay a higher rent because they are more productive in the big cities - for example, due to gains from greater density. At the same time, a high commercial rent indicates that there are particularly large gains for the business community from increasing the effective supply of properties in the cities. These gains must be weighed against the cost of increasing the supply of property.

**The results from the three empirical analyses are combined in one model ...**

The estimated productivity differences from the empirical analyses are part of a model that is used to examine the effects of two various changes in the economy: First, an increase in the supply of property is considered, which may be due to changes in regulations or supply of new land. The increase is roughly equivalent in size to the new island, Lynetteholmen, that is planned to be built in Copenhagen. Second, a reduction in commuting costs is considered, which may, for example, be due to better opportunities for working from home. The model sheds light on how the location and use of property by businesses and workers reacts to the changes. These reactions have an impact on productivity and welfare and must, therefore, be taken into account in order to

assess the full effect of the changes. As the model is based on a number of simplifying assumptions about the behaviour of businesses and workers and does not include, for example, taxes or regulation of the housing market, the results are subject to uncertainty.

**... which indicates increased productivity through increased property supply - especially in Copenhagen ...**

The results of the model show that increasing the supply of property in the City of Copenhagen would have positive effects on productivity and welfare. The effects stem primarily from the fact that more space will be available for businesses in Copenhagen and, to a lesser extent, from the fact that more jobs will be moved there. If the same increase in property supply is spread across the country, the effect on productivity is approximately 50 percent less, as productivity in other municipalities is lower. The model highlights the benefits of increased property supply, but not the costs, which must be expected to be higher in Copenhagen than elsewhere in the country.

**... and a small effect on productivity from cheaper commuting as a result of more working from home**

The model is also used to examine the consequences of increased work from home, focusing on the productivity effects that arise from lower commuting costs that follow when workplaces are relocated. There is only a limited effect on productivity here. This result must be seen in light of the fact that there are a large number of possible effects of working from home on productivity that are not included.

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