

Economic policy lessons from two years with the Covid-19 pandemic

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Abstract

The paper provides a discussion and summary of the main economic policy lessons learned from the Covid-19 pandemic. First, we discuss how managing the series of partial restrictions on activity and reopenings since March 2020 involves a complex trade-off between health, the economy, public well-being and constitutional rights, and provide insights on how the trade-offs can be operationalised to assist the political process. Second, we survey the literature on the effectiveness of various containment measures that have been implemented across the globe to constrain the corona pandemic. Third, we analyse the anatomy of the business cycle in the last two years, which significantly differs from standard business cycles due to the nature of the shock and the unconventional policy measures that have been used. Fourth, we discuss the value of the extensive short-time-work program (STW-program) introduced to preserve job matches. Fifth, a novel type of policy measures directed at supporting businesses are analysed. Sixth, we argue that since the prospect of a corona-free world probably is not imminent, it is advisable to maintain a well-designed emergency program that builds on revaccination programs, surveillance of the epidemic situation, and a package of relevant policy instruments that can be easily scaled if the situation escalates.

* The paper draws on various reports and papers to which a number of people have contributed, and we gratefully acknowledge their inputs and contributions. We also thank an anonymous referee for insightful and constructive comments.

1. Introduction

For more than two years Covid-19 has claimed attention, in the health sector, in the media, in policy and politics, in many business decisions, in the economy, and more often than we would like in the life of individuals. In this essay, we attempt to synthesize the economic policy lessons learned from this unprecedented episode in modern history. Our assessment is based on experience from expert committee work and government advice associated with Covid-19. Still, our insights might have a more general appeal. While the nature of any crisis is unique and unforeseen, we hope that the lessons we draw not only contain admonishing hindsight but also valuable foresight.

Crisis management – and the Covid-19 period is no exception – is dominated by reactive policies. Even if other parts of the world had some experience with pandemics, the OECD countries were largely unprepared for the event. The initial focus was naturally to navigate the health crisis, ensure essential supplies, and civil order. Policy tools addressing the distresses on workers, businesses and the economy at large had to be invented from scratch. Often under absurd time pressure and with grotesque informational deficits. This is why we think it is useful to collect some of the lessons learned. There are countless insights to be drawn from the past two years. Yet, we identify six specific lessons for economics and economists. Lessons that strike at least the authors as important and that we expect have appeal and relevance beyond the narrow Corona experience and the specific Danish context. The paper covers the period from the onset of the crisis in 2020 to late 2021.

First, we discuss how managing the series of partial restrictions on activity and reopenings since March 2020 involve a complex trade-off between health, the economy, public well-being and constitutional rights, and provide insights on how the trade-offs can be quantified to assist the political process. Second, we survey the literature on the effectiveness of various containment measures that have been implemented across the globe to constrain the corona pandemic. It is difficult to identify the effects of particular containment measures, and to disentangle effects from policy and behavioural changes. Our reading of the literature is that although voluntary actions of the population are extremely important for the development of the epidemic situation, so is the use of various containment measures, and both elements are crucial to »flatten the curve«. Third, we analyse the anatomy of the business cycle in the last two years, which significantly differs from standard business cycles due to the nature of the shock and the unconventional policy measures that have been used. The short-term conclusion is that the policies have basically fulfilled the target of ensuring a V-shaped recovery. Fourth, we discuss the value of the extensive short-time-work program (STW-program) introduced to preserve job matches. These programs have strongly supported the labour market, and the preliminary evidence indicates that well-designed STW-

programs are a useful complement to the unemployment insurance system in recessions. However, it is a temporary measure in a specific situation, and if maintained for too long it will hamper labour adjustment and an efficient allocation of labour. Fifth, a novel type of policy measures directed at businesses is analysed. We find that rescue packages for businesses have justification in the short run for a very unusual crisis, but in the long run the case for relief packages diminishes, as they distort the economy and dampen industry dynamics. We conclude that safety net type facilities for businesses are useful instruments that can rectify potential market failures and maintaining them as part of the longer term economic crisis toolbox may be worthwhile. Sixth, we argue that since the prospect of a corona-free world probably is not imminent, it is advisable to maintain a well-designed emergency program that builds on revaccination programs, surveillance of the epidemic situation, and a package of relevant policy instruments that can be easily scaled if the situation escalates.

2. Restricting and reopening: How to operationalize the health-economics trade-off

An almost universal mitigating policy by governments during the Covid-19 pandemic has been to restrict activity in society and hence to some extent in the economy (Lin et al., 2020; Hale et al., 2020; Kumar et al., 2021). Reduction in activity has been brought about through various tools, ranging from recommendations to outright lockdown measures and other non-pharmaceutical interventions, and may in part have been driven by the behavioural choices of individuals (see our discussion in the next section).

While initial policy responses were predominantly guided by epidemiological concerns, it soon became clear that such measures come at significant economic costs. Accordingly, policy makers had to balance the timing and extent of activity restricting protocols and subsequent reopening strategies against both their health and economic consequences.¹ The economic principle is straightforward (see e.g. Acemoglu et al., 2020; Alvarez et al., 2020; Norwegian expert group, 2020; Giannitsarou et al., 2021), and reflects the common understanding that a cure should never be worse than the disease. Formally, the additional cost from a marginal tightening of restrictions on activity, must not exceed the present value of the net gains from limiting the pandemic. Thus policy makers have to solve an intertemporal optimisation problem (see Giannitsarou et al. (2021) for an in-depth discussion and model on optimal social distancing policy in response to dampened immunity over time). Since an unchecked pandemic obviously has substan-

1. Andersen, Schröder and Svarer (2020, table 1) illustrates the Danish timetable of imposing and lifting lockdown measures during the first Covid-19 wave of 2020.

tial economic costs health objectives and economic objectives might in fact concord. To be explicit, even zero-Covid policies, such as those pursued by governments in China or New Zealand, could be economically optimal. Similar, swiftness in response might be optimal compared to delayed action, a finding presented *inter alia* by Mishra et al. (2021). The problem is that at the outset of a pandemic, or any given point in time during an ongoing wave, we simply do not know what constitutes the optimal policy path from here on. In other words, there is a huge leap in going from a theory of optimal policy response to a real time application able to produce inputs for the political decision process. First, one needs to establish a workable fulcrum in the health-economics trade-off that can be associated with both the health effects and the economic effects. Second, complex epidemiological models have to be collapsed into a one-dimensional health outcome. Finally, a meaningful outcome variable for economic as well as relevant non-economic dimensions must be present.

In the following, we provide – based on the case of Denmark in 2020 (Andersen, Schröder and Svarer, 2020; Andersen, Svarer and Schröder, 2020a) – a sketch of how we reduced complexity, and hence how it was possible to operationalize the inherent health-economics trade-off, such as to arrive at a weight bearing policy advice tool.²

In order to map mitigating measures onto both the health and economic outcomes, a fulcrum is needed fit to work in both dimensions. Mitigating measures *per se* turn out to be inapt for this role. They take a variety of forms, from maximum limits on the permitted number of participants at public gatherings, over travel restrictions, to specific prohibition of activities. While some restrictions, such as the closure of restaurants, are easily mapped onto observable firms and sectors, others – such as a general recommendation for remote work – are not. In the case at hand, the concrete solution was to settle at reasonable well-defined sectors (e.g. restaurants, schools, etc.) as the basis for the trade-off analysis. Obviously, this step of the operationalization requires *ad hoc* judgements on how the mitigating measures affect which sectors. While overall it proved feasible to accommodate various aspects, it is clear that a mapping from restrictions to sectors is associated with uncertainty.

Seeding the health dimension in the health-economics trade-off in real time through fully-fledged predictive epidemiological models (such as SIR or others) turns out to be impractical.³ First, it constitutes a considerable computational

2. This section contains in part material from a working paper (Andersen, Schröder and Svarer, 2020), which in turn is based on the Andersen, Svarer and Schröder (2020a) report on reopening prepared for the Danish Government.
3. Obviously, theoretically or *ex post* such assessment can be made. Acemoglu et al. (2020) employ a SIR model and quantitatively investigate optimal policies observing the trade-off between efforts needed to save lives and improve economic indicators.

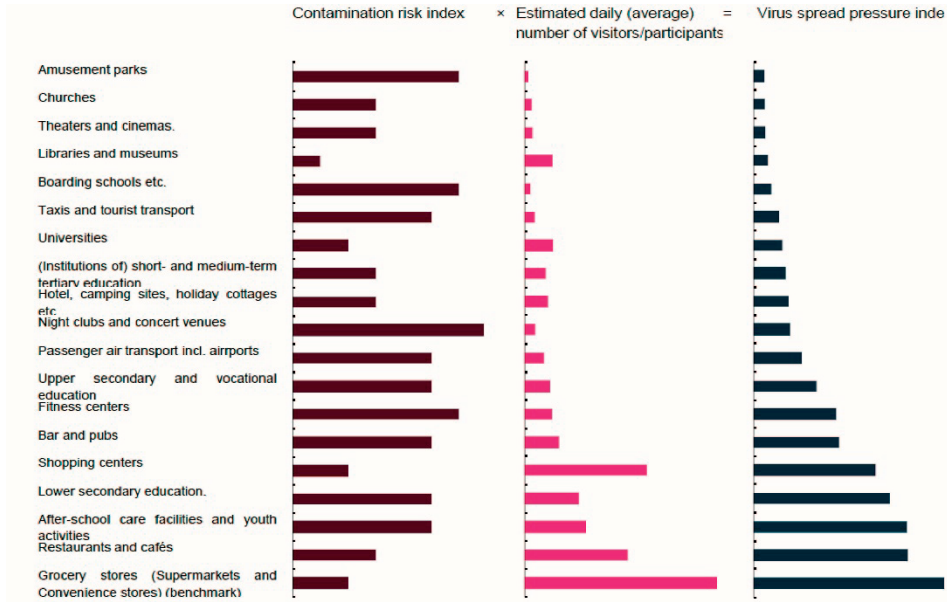
task, and epidemiological models do not easily lend themselves to marginal assessment. Second, available models are typically not structured by economic sectors. Third, the underlying differential equation systems of prediction models are in the early stages of a pandemic with sparse or volatile data fairly unstable. Finally, behaviour and not only lockdown restrictions appear to have empirically large effects on actual virus spread scenarios. Hence, the solution we settled on in Denmark was a reduced form approach to operationalizing epidemiological model insights into a composite one dimensional measure of virus spread risk for each sector, or rather per imposing or easing specific mitigating restrictions on a given activity and hence sector.

The approach we developed is inspired by Benzell et al. (2020). It establishes an indicator of the virus spread pressure by combining the risk of infection in various sectors (activities) with the extent of the activity in question, i.e. contacts. Thus, it only focuses on first round effects, and not the knock-on effects, which are a central focus of predictive epidemiological models. In the concrete case at hand, the starting point was an assessment of infection risks supplied by SSI (*Statens Serum Institut* under the Danish Ministry of Health) ranking the direct infection risks for a number of activities (which we could link to sectors affected by the various mitigating measures). This assessment is harvested on the basis of a coarse 7-step scale from the lowest to the highest contamination risk. For example, there is a low contamination pressure effect for libraries and museums etc., while the contamination risk is at a medium level in e.g. restaurants and cafes, and high in e.g. nightclubs and music venues, cf. Figure 1 column 1.

Importantly, the externally provided value on the 7-step scale is dealing only with infection risks associated with the activity itself, and thus does not take into account how widespread the activity is. Yet, the assessment includes important epidemiological features, such as the expected density of persons in a given activity, and the number of contacts between people from different contact networks, the extent of physical activity, etc. As can be seen from column 1 in Figure 1, this scale indicates that the contamination risk from visiting a nightclub is considerable; i.e. the risk of contamination for the individual guest is high. However, if only relatively few people go to nightclubs, the overall impact of the virus spread pressure on the country as a whole will be less severe than if it were an activity of greater prevalence. Accordingly, we arrive at our virus spread pressure index by including multiplicatively a measure of the number of people estimated to take part in a given sector activity (column 2 in Figure 1). Finally, column 3 in Figure 1 shows the resulting virus spread pressure index. While imperfect, the time pressure for political decision processes for both restricting and reopening speaks in favour of this coarse measure.⁴

4. Obviously, there are several important caveats to the construction and interpretation of the index. Reliable data for the number of people participating in the various activities is not al-

Figure 1: Assessment of contamination risks across sectors



Note: From Andersen, Schröder, Svarer (2020). Source: Statens Serum Institut SSI (contamination risk index), Statistics Denmark, and own calculations

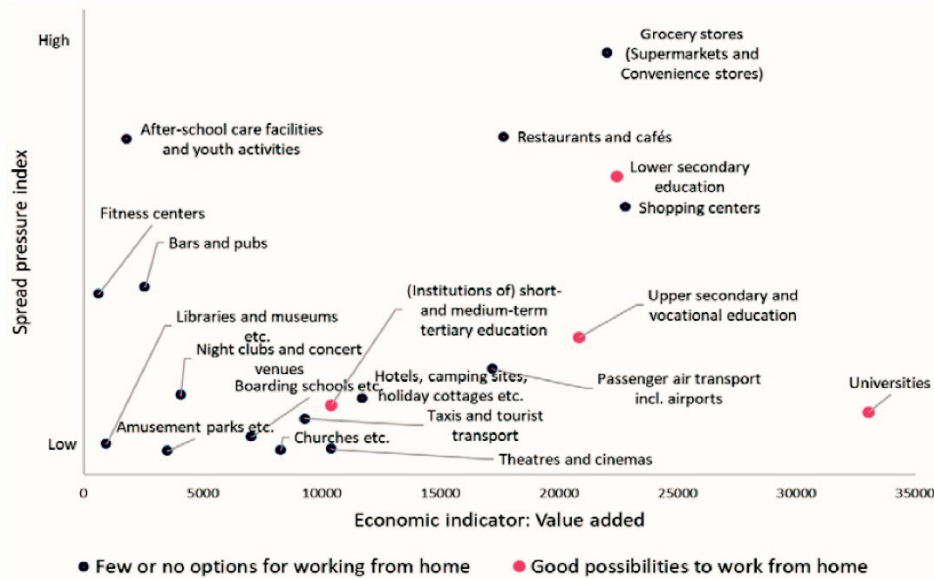
Finally, to complete the trade-off picture we decided – inter alia – to use sectors’ gross value added as the economic outcome variable. Other measures could be employed, see below. Moreover, the calculations can take into account that not all parts of the activity are affected by the lockdown measures in the industries.⁵ For example, corrections can be made to allow parts of the restaurant sector to continue selling food as take away. In the economic importance of the industry, value creation constitutes one part, but by means of input-output tables, the associated significance of the activity for subcontractors from other industries can be included. This was the case in Andersen, Svarer and Schröder (2020a). For example, activity associated with the hospitality industry and shopping centres has indirect activity effects for other sectors (such as food production), compared to e.g. hotels and cinemas with more moderate sub-supplier effects; see Navaretti et al. (2020)

ways available, and the dimension of age composition, which – at least for Covid-19 – plays an important role for the epidemiological dynamics is ignored. Furthermore, since infection risk is calculated on an ordinal scale and subsequently multiplied with number of participants, it can give a false impression of quantitative precision. In sum, this implies that such index does not predict the pandemic developments of imposing or lifting restrictions.

5. See Andersen, Schröder and Svarer (2020) and Andersen, Svarer and Schröder (2020a) for further detail.

for an in-depth discussion of the importance of using input-output tables to inform restriction and reopening strategies.

Figure 2: Different industries' economic importance and health risks



Note: From Andersen, Schröder, Svarer (2020). Gross value added is calculated incl. derived activity in other industries assessed on the basis of the national accounts' input-output table. Source: Statens Serum Institut SSI, Statistics Denmark, and own calculations.

Some activities and institutions may be affected by restrictions but can maintain production relatively easily in the short run using remote work (see e.g. Dingel and Neiman, 2020). In these situations, value creation can (to a great extent) be maintained while at the same time dampening the virus spread pressure. Hence, such sectors could be first during imposing restrictions and last during easing. One could include this consideration in the actual calculation of economic effect, or – the alternative chosen in Andersen, Svarer and Schröder (2020a) – simply include this type of information qualitatively in the policy advice tool.

Figure 2 shows one example of the resulting tool combining the above exercises from Andersen, Schröder and Svarer (2020). The figure illustrates the scope for political decisions on easing and imposing mitigating measures within the health-economics trade-off. In this space, indifference curves between spread pressure (a bad) and economic value (a good) are positively sloped, and the further they are positioned to the south-east, the larger the pay-off (utility). Depending on political preferences, such charts give guidance on the choice and sequences of mitigating measures. It also imposes consistency on the political prioritization. Consider a policy maker that in light of a slight easing of the health crisis has manoeuvre room to choose between either reopening all restaurants and cafes or all shopping

centres and department stores, respectively. By the logic of the above assessment tool, the reopening of all shopping centres dominates the reopening of all restaurants, since the former ranks higher in terms of economic value and lower in terms of virus spread pressure.

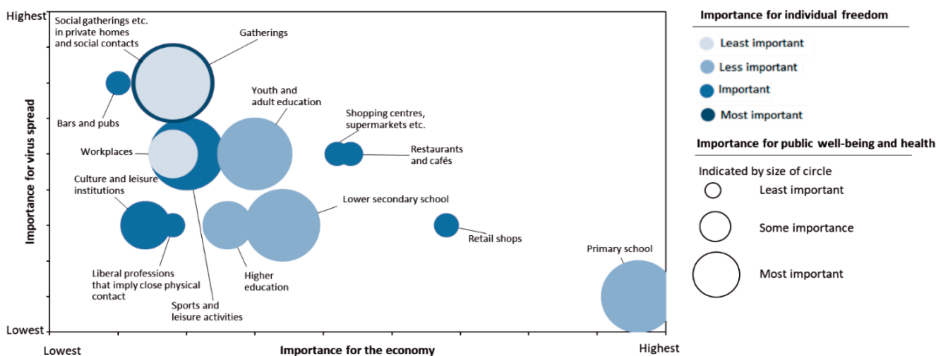
2.1. Adding further dimensions

As discussed in Andersen et al. (2021a), containment measures have effects beyond the speed at which the corona virus spreads and economic activity. Among the more obvious implications is the effect on public health from switching resources towards Covid-19 treatment in hospitals and thereby postponing or cancelling other treatments. In addition, physical and mental health may deteriorate from containment measures that restrict access to sport facilities and interaction with family, friends or colleagues. Moreover, there are both short- and long-run economic effects.

Containment measures affect individual rights to participate in society. Mitigating measures therefore also challenge fundamental constitutional rights, and will for part of the population be felt as an additional burden of restrictions on top of the economic and public health costs.

In sum, managing restrictions and reopenings of activity in society involves complex trade-offs between health, the economy, public well-being and constitutional rights. In order to provide an overview and information for political decisions, Figure 3 shows an example of how these considerations were condensed into a four-dimensional trade-off used to guide the reopening strategy in Denmark after the second wave of Corona virus in the winter of 2021; see Andersen et al. (2021a).

Figure 3: Trade-off between health, the economy, public well-being, and constitutional rights



Note: From Andersen et al. (2021a). Especially in relation to gatherings, the isolated economic effect is relatively small as long as other restrictions - including lockdown of restaurants and leisure and culture activities - prevail. However, the ban on gatherings may pose a significant barrier to, among others, the areas mentioned if they are reopened. The larger circle for gatherings is only illustrative and serves to show the assessment for »individual freedom«.

3. Containment policies: Evaluating their effect and uncertainty

In response to the Covid-19 pandemic, a range of non-pharmaceutical interventions (NPIs) have been deployed to contain the spread of the virus. This includes both containment (lockdowns, restrictions on gatherings, travel restrictions etc.) and health-oriented measures (test, trace and isolate, hygiene, masks etc.).⁶

During the first wave of the pandemic in the start of 2020, these measures were deployed hastily in response to an unanticipated and largely unknown situation. In subsequent waves, similar instruments have been evoked, although there have been some learning and adaptation in the use of these measures. In particular, there was no capacity to engage in widespread testing in the initial phases of the pandemic, but it has evolved gradually. Subsequently, improvements in treatments, testing capacity and the roll out of vaccines significantly changed the situation.

The choice of measures at the onset of the pandemic was largely an improvisation to a situation requiring acute action and where experience and knowledge of the effects of the interventions – both in relation to health and society more generally – were largely absent. There was no time for detailed planning, and most countries launched adjusted »packages« of unusual initiatives within a narrow time window in response to a new situation.

The knowledge void has prompted a vast amount of research⁷ to understand the new situation caused by the pandemic and to assess the effects of the various mitigating measures taken. The following is not a traditional literature review but gives a brief overview of specific aspects in the emerging literature. Namely, we provide a selective survey of the first wave of a growing empirical literature.⁸ The survey includes works from both life science and social sciences.

Analysing the effects of NPIs raises a number of challenges both in terms of data and empirical methods. The typical approach is a reduced form approach where some outcome metric is related to various NPIs; that is, variables capturing objectives are related to variables capturing instruments. The transmission mechanism from instruments to outcome is thus a black box.

Several additional challenges arise in such studies. It is generally difficult to separate the effects of policy interventions from voluntary behavioural responses.

6. The varieties of NPIs used are seen from the Oxford COVID-19 Government Response Tracker (OxCGRT) comprising eight main types of NPIs (further divided into 23 categories depending on stringency); see Hale et al. (2021) and <https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker>.
7. Google Scholar, July 4th 2021, identifies 184,000 entries including the term »Covid-19« since 2020. Commenting on the growing literature, Dixit (2020) notes: »If any pandemic spread faster than Covid-19, it is that of research about Covid-19«.
8. Model based quantification of effects are not covered, see e.g. Perra (2021) for references.

The pandemic per se triggers behavioural responses, and there is no simple way to disentangle the two. While panel models do take country differences into account via so-called country fixed effects, this is done in a very simple way. Although the pandemic is a common health shock, the effects are country specific depending on, among others, population age structure, degree of urbanization, economic structure (e.g. importance of the hospitality sector), and health care capacity.

Policy effects are likely interdependent – the effect of restricting activity in society depends on whether other containment policies have already been taken – implying that the estimated effects are conditional on other policies simultaneously applied. The way policy interventions are measured also makes it difficult to infer marginal from average effects, e.g. the effects of restricting gatherings with a cap set at 10 or more persons do not tell what the effects would be of a slightly higher or lower cap. Observe that when output is measured on a cardinal scale, while NPIs are measured on an ordinal scale (although a cardinalization is often imposed), the empirical analysis can at best tell something about the role of applying a given instrument but not about the effects of a marginal change in the instrument. Finally, note that the work summarized only considers the short-run effects of NPIs on societal and economic outcomes, since the data set does not allow an analysis of the long-run effect of e.g. school closures on learning.

3.1. Behavioural responses

The spread of the virus depends on behaviour (contacts), but the pandemic also influences behaviour. The risk of infection generally makes individuals more cautious in their behaviour, avoiding excessive risk taking. This may be via hygiene related changes (handwashing, avoiding handshakes, keeping distance etc.) or avoiding particular activities (not going to a restaurant, not travelling, working from home if possible, etc.). Hence, even in the absence of intervention, behavioural responses would affect not only the spread of the virus but also economic activity. It is an implication that the decline in economic activity in e.g. the first part of 2020 cannot solely be attributed to the NPI's deployed.

A number of studies consider the behavioural responses, finding that they may precede containment measures and in some cases be at least as effective in reducing the spread of the virus. Most studies use various mobility data and identify changes in the extent and nature of mobility preceding implementation of containment measures; see e.g. Gupta et al. (2020) for a discussion and references. These behavioural responses in turn contribute to reducing the spread of the virus, see e.g. Audirac et al. (2022), and reducing economic activity, see e.g. Caselli et al. (2020) and Goolsbee and Syverson (2021). Chudik et al. (2021) analyse the importance of containment measures, voluntary actions, and relief packages for the evolution of reproduction rates of Covid-19 and find that the behavioural responses contribute to explaining why countries with very different

health strategies have had relatively similar developments in the number of cases during the pandemic. Voluntary actions may be as important quantitatively for the evolution in reproduction rates as the NPIs, but both are generally needed to flatten the curve. It should be noted that it is in general difficult to separate the effects of voluntary behavioural responses from the effects of containment measures due to the clustering of events within a narrow time window. Moreover, policy discussions and initiatives may be important information signals triggering behavioural responses.

Behavioural responses are also relevant in terms of compliance to recommendations and containment measures. The information available to individuals and the reliability/trust attached to information sources matter; see e.g. Perra (2020) for a discussion and references. Containment measures impose costs on individuals, economic as well as non-economic (reduction in personal freedom), which can be important for compliance. Both Wright et al. (2020) and Papageorge et al. (2021) find that compliance with self-protective behaviour (social distancing, masks) has a clear socio-economic gradient. Lower compliance among low-income groups can, among others, be explained by circumstances making adoption self-protective behaviours more difficult, e.g. inability to tele-work. Empirical evidence shows that e.g. access to paid leave schemes increases the likelihood of workers staying home in case of illness, which in turn contributes to reducing the transmission rate for contagious illnesses; see Pichler et al. (2021). Hence, relief packages also reduce the private costs of limiting contacts, and constitute a separate argument for such relief packages. Finally, the behavioural responses may weaken over time, and there is evidence of lockdown fatigue; see e.g. Goldstein et al. (2021).

3.2. Effects of NPI

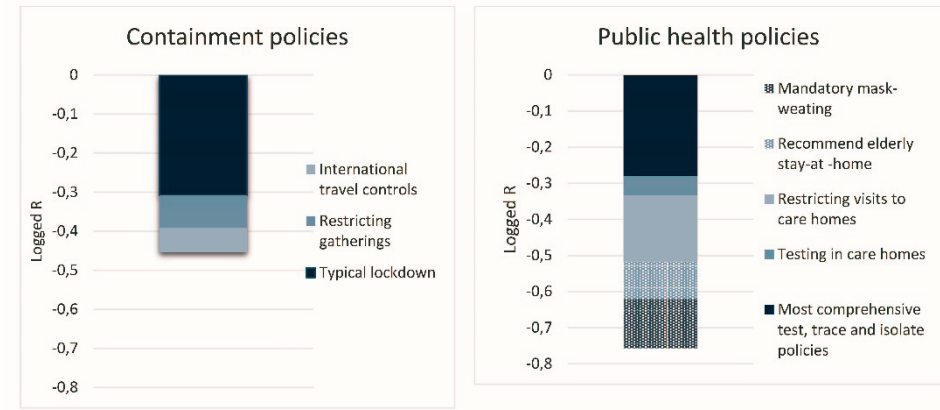
Identification of the NPI policy effects is a major challenge. Typically, several policy measures have been deployed at the same time as a response to the health situation. Only in few cases are there policy changes that come close to a quasi-experimental setting; see e.g. Diedrichs et al. (2021) on testing. The strong correlation between different policy initiatives taken more or less simultaneously makes it difficult to make inference on the effects of the specific instruments, and at best it is possible to say something about the effect of the entire package. In addition comes the problem of disentangling policy and behavioural effects; see above. Most studies are correlation or reduced form studies attempting to assess the effects on health or economic outcomes of the NPIs. There is a number of studies exploiting country variations to provide insights on the effects of particular policy measures.

A large number of studies have considered the implications of single NPIs; see e.g. Perra (2020), Égert et al. (2021), Turner et al. (2021) for references. The following focuses on empirical studies considering packages of NPIs in an attempt to

quantify their effects and provide information on the most effective instruments; see e.g. Islam et al. (2020), Koh et al. (2020), Haug et al. (2020) and Desvars-Larrive et al. (2020). Most studies focus primarily on the effects of NPIs on the spread of the virus, a few also consider the implications for mobility and economic activity, but none of the studies explicitly analyse the effectiveness of NPIs seen in relation to various societal costs beyond the health implications of implementing them, and thus none of the studies provide information on the policy trade-offs. The studies reviewed here use data from the first wave of the pandemic.

Two studies employ explicit panel models allowing to take account of some country differences. Ègert et al. (2021) study separately the effects of NPIs and health policies on the reproduction rate (a proxy for how the epidemic evolves) and mobility (a proxy for the economic effects) for 147 countries. A number of NPIs at different levels of stringency are included and divided between containment and health policies. The main findings are summarized in Figure 4 below. In accordance with other studies, they find that containment packages have a significant effect on the reproduction rate. Moreover, they find that health policies can have effects in the same order of magnitude or larger. The dependent variable in the study is the log-value of the reproduction rate (R), implying that the NPIs have a non-linear effect such that the measure has a quantitatively larger effect at high rates of R . The paper considers various scenarios and concludes that »... a package of additional public health measures would more than compensate for the removal of lockdown policies, such that their successful implementation would see a return to near normality of mobility, with R remaining below 1« (Ègert et al., 2021). The NPIs have a negative effect on mobility (Google mobility data), and the more stringent a particular NPI is applied, the more activity is reduced. As an example, the most stringent version (level 3 out of 3) of workplace closure has an effect on mobility which is nine times larger than for the least stringent form. Applying all the NPIs in their most strong form would reduce mobility by half, and about half of these effects can be attributed to workplace closures and stay-at-home requirements.

Figure 4: Effects of containment policies and public health policies on the Covid-19 reproduction rate (R)



Note: Typical lockdown refers to a package including school closures (level 2 or higher), stay-at-home requirement (level 1 or higher) and workplace closure (level 2 or higher).

Source: Ègert et al. (2021).

Turner et al. (2021) present a similar analysis but have a large dataset including the period January 2020 to May 2021 and thus several waves of the pandemic. The paper estimates a panel model for both the effective reproduction rate and weekly GDP on various NPIs, health policies, seasonal conditions, prevalence of virus variants, vaccinations and proxies for behavioural responses and natural immunity. For the reproduction rate it is generally found that the stricter the NPIs and the larger the reproduction rate, the larger the effect. Most effective are workplace closures, followed by restrictions on gatherings, school closures, stay-at-home requirements, and international travel conditions. Test and trace policies are also effective, and vaccinations have an effect proportional to the share of the population vaccinated. The negative output effects are ordered: workplace closures, closure of public transport, stay-at-home requirement, school closure, restrictions on gathering and restrictions on internal movement. The paper also includes some scenario analyses documenting the importance of reaching high vaccination rates, and that it effectively compensates for NPIs.

3.3. Pandemic strategies

The literature assessing the effects of NPIs mainly uses health related outcome measures. A few also consider effects on mobility and economic activity. Belonging to the class of multi-country studies discussed above, Ègert et al. (2021) consider the effects on mobility (a proxy for economic activity), and Turner et al. (2021) a weekly GDP indicator. Apart from these studies being conducted ex post, none of the works relate the health and mobility/activity findings to assess the trade-off between the two and thus to yield essential information for policy deci-

sions; i.e. how to achieve health objectives at the lowest societal costs (see our discussion in section 2 above).

Health strategies differed across countries at the onset of the pandemic with some countries pursuing an elimination strategy and others a mitigation strategy to flatten the curve to avoid too high case numbers and overburdening of the health system; see e.g. Baker (2021) for a definition of different health strategies. A more lenient version of this was to allow the virus to spread to gain herd immunity (Sweden) or await effective treatments and vaccines, see e.g. Han et al. (2020) for an early survey of strategies taken in various countries.

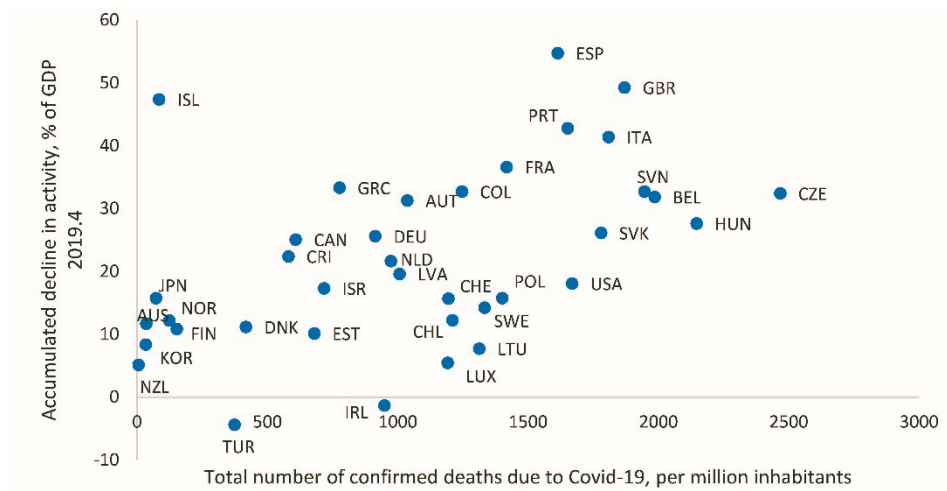
The experience shows a more nuanced development than captured by the theoretical taxonomy of strategies. Fine-tuning interventions to flatten the curve turned out to be difficult, and in some cases containment policies were so effective that the end result came close to an (temporary) elimination strategy (e.g. Denmark), but then later waves induced a need for reintroduction of containment measures. Even though the roll out of vaccines has changed the situation significantly, the strategic choices are still difficult due to the possibilities of new mutations and the delay in global roll out of vaccines; see discussion in section 7.

In Aghion et al. (2021 and Oliu-Barton et al. (2021), it is argued that an elimination strategy with strong lockdowns has lower costs than a mitigation strategy. While the elimination strategy has large costs (drop in economic activity), this applies to a short period only, and hence the overall economic costs are lower than when pursuing a longer lasting mitigation strategy. In other words, a trade-off is only apparent in the short-run; in the long-run the elimination strategy achieves both a better health and economic outcome. Along the same line, Caselli et al. (2021) argue: »Furthermore, we show that lockdowns substantially reduced Covid-19 cases, especially if they were introduced early in a country's epidemic. This implies that, despite involving short-term economic costs, lockdowns may pave the way to a faster recovery by containing the spread of the virus and reducing voluntary social distancing. Finally, we document that lockdowns entail decreasing marginal economic costs but increasing marginal benefits in reducing infections. This suggests that tight short-lived lockdowns are preferable to mild prolonged measures.«

In support of this, Aghion et al. (2020) and Oliu-Barton et al. (2021) present an empirical analysis comparing five countries (Australia, Iceland, Japan, New Zealand, and South Korea) pursuing the elimination strategy to 24 other OECD countries. This evidence is open for discussion. Country heterogeneity is large, and therefore the control group in the 24 countries is not well-defined. Moreover, the five countries constituting the »treatment« group are islands with, among others, means of controlling travel in a different way than most other countries. There is also huge uncertainty wrt. achieving elimination due to, among others, mutations and the timing and roll out of vaccines, as illustrated by later developments in e.g. Australia. Finally, to assess the economic and societal costs it is necessary to

control for differences in economic structures (e.g. the importance of service sectors and tourism) as well as relief packages, and there is considerable heterogeneity within the two groupings of countries. Figure 5 shows that four of the five countries (Australia, Japan, New Zealand, and South Korea) have performed better than most countries in terms of health and economic outcomes, but they did not achieve elimination and incurred substantial costs in terms of travel restrictions. Iceland is not among the best performers, whereas Norway and Finland belong to this group based on the indicators used in Figure 5.

Figure 5: The Covid-19 crisis, accumulated number of deaths and decline in economic activity per 2021.1



Note: Decline in economic activity between 2019.1 and 2021.1 is based in seasonally adjusted GDP statistics from www.oecd-ilibrary.org, and mortality data is total deaths due to Covid-19 from the start of 2020 to the end of March 2021, based on data from www.ourworldindata.org.

4. Rethinking the economic outlook: Fundamentals of astoundingly fast recoveries

The pandemic has caused an economic downturn which differs from standard business cycles by having its origin in a health shock, and by deploying some very unconventional policy instruments. As a response to the spread of the virus, various containment restrictions were imposed; restrictions that constrain the market mechanism. The imposition of containment restrictions was largely an unanticipated event. These restrictions may thus be interpreted as an unanticipated »market-closure« or »business interruption« shock. In relation to the standard

business cycle theory, it may be debated whether the shock should be interpreted as a supply or demand shock⁹; see Eichenbaum et al. (2021). On the one hand, the restrictions constrain the supply options of firms (obvious in the case of lockdown, but also in the form of e.g. restrictions on number of customers allowed), but there were also restrictions on demand (desired demand for e.g. services could not be realized). The demand response involves both intersectoral and intertemporal substitution. The former applies to demand shifting from contact intensive forms to other activities, e.g. construction. The latter applies to demand being shifted forward in time due to a more restricted choice set or value of particular activities due to restrictions¹⁰. Both play a role, and while some sectors have been severely affected (mainly the service sector), others have expanded even during lockdown (e.g. health care and construction), and some sectors are still affected (e.g. tourism related activities).

While the containment restrictions address a health externality and thus have a collective justification, specific firms, workers, and households carry the consequences and costs. Therefore, governments launched unconventional economic policy instruments in terms of so-called rescue and relief-packages, ranging from direct support to firms for loss of revenue, coverage of fixed costs, work-sharing arrangements, and liquidity and loan arrangements¹¹. This also involved existing tax and welfare schemes, which in some cases were extended. These schemes are collectively financed via the public budget. While activity declined – in part due to behavioural responses – traditional aggregate demand measures to support economic activity were not appropriate, since attempting to boost activity would conflict with the overriding health concern to reduce physical contacts and thus the spread of the virus.

The unconventional policy measures can be justified in terms of equal burden sharing (distribution and insurance), but from a macroeconomic perspective the key argument was to preserve production capacity to increase the likelihood that imposing of containment restrictions followed by reopening would result in a V-shaped path for economic activity. Perceiving the health situation and the containment restrictions to be temporary, it is important to minimize the risk that the economic repercussions become persistent. The negative effects of the containment restrictions cannot be avoided, but a removal of these restrictions will only

9. Guerrieri et al. (2020) show how lockdown of some sectors (a supply shock) can reduce demand for sectors still open, creating what they term a Keynesian supply shock, since the change in aggregate demand is larger than the initial supply shock. In a setting with capital market failures (borrowing constraint, incomplete insurance), firm closure and lay-offs may be excessive, giving a rationale for support to firms, including support to job matches.
10. Evidence indicates that sectors already facing declining employment prospects prior to the pandemic (including some activities prone to automatization) have been most severely hit, and the crisis may thus have accelerated ongoing structural changes; see Mattana et al. (2000).
11. For an overview of such policies in Denmark, see e.g. Erhvervsministeriet (2022).

result in a quick economic recovery if the production and demand capacity is intact. Layoffs of workers breaking job matches and closure of firms, to be followed by hiring and reopening of (new) firms and re-establishing of supply chains is associated with substantial transactions costs, time lags and loss of both real and human capital. From a societal perspective, these are frictional costs which can be reduced by relief-packages.

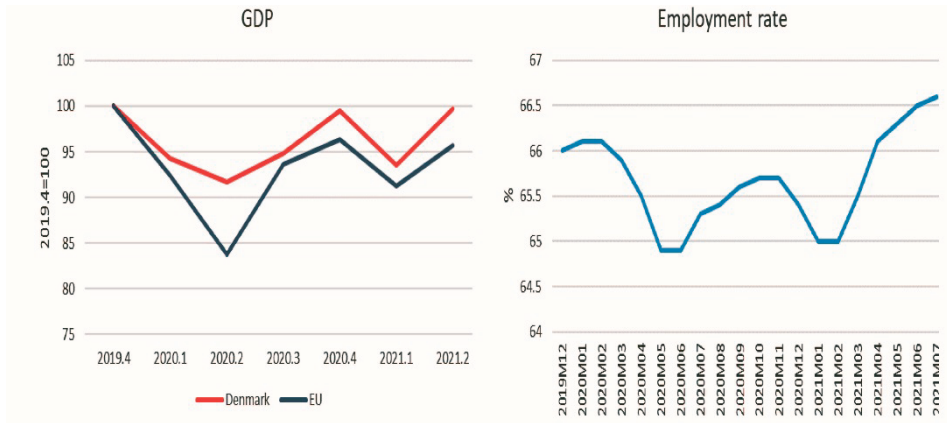
4.1. Not U-shaped, not L-shaped but V-shaped

The pandemic has had significant economic effects as summarized in Figure 6, showing both Danish GDP and employment, respectively. On impact, there was an unprecedented steep decline in economic activity in the second quarter of 2020, although less severe than in most other countries. Next, economic activity recovered alongside reopenings, followed by a new setback during the second lockdown period, though less severe than during the first lockdown period, showing an adaptability to the situation. By the second quarter of 2021, economic activity and employment are back to the end of 2019-levels. In comparative perspective, the health outcomes and economic consequences of the Covid-19 pandemic are less severe in Denmark than in most other countries; see e.g., Andersen et al. (2022).

It is now well understood that both the health and economic implications of the corona pandemic and lockdown policies depend not only on health and economic policies but also on behavioural responses, country characteristics, including population structure, urbanization, health care system, sector structure, degree of digitalization, and the economic situation at the eve of the corona pandemic; see e.g., Furceri et al. (2021). In the Danish case, it is important that the economy did not suffer from any major disequilibria at the onset of the pandemic, and operated at a high degree of digitalization that, among other things, contributed to resilience; see Zhuang (2021). Moreover, Denmark entered the pandemic with sound public finances, and at the outset political signals were made that there was fiscal space to cope with the crisis, which contributed to reduce uncertainty.¹²

12. The emergency packages supported consumer confidence and avoided increases in precautionary savings; see Andersen, Jensen and Christensen (2021).

Figure 6: Economic activity and employment during the Covid-19 pandemic, 2019.4 to 2021.3



Note: GDP-data from Eurostat and employment data (seasonally adjusted) for Statistics Denmark.

The cyclical response displays some standard patterns including declining consumption and investments and lower imports and exports (see discussion in Andersen et al. (2022)), although somewhat surprising housing prices were increasing over the period. There were also large sectoral differences, which as such is not unusual for a business cycle downturn, but the impact of the crisis was strong on service oriented sectors, while other sectors even experienced increasing activity.

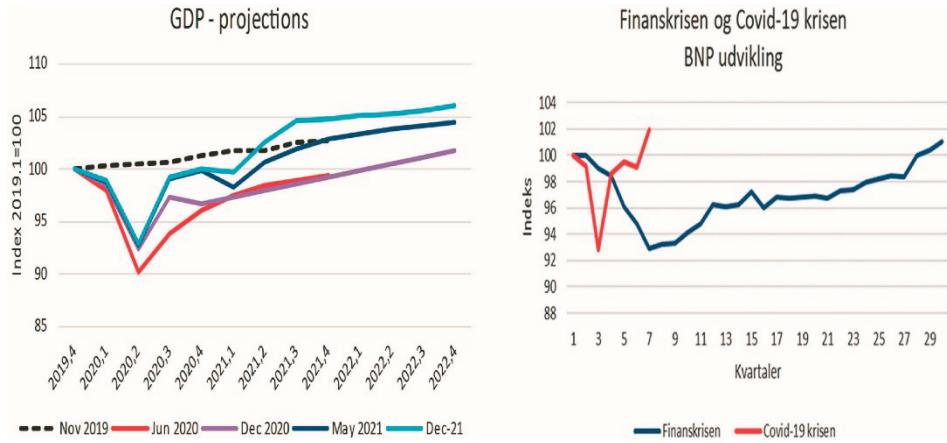
Assessed from standard statistics, the labour market response was unusual with a lower decline in employment and increase in unemployment than what should be expected from the historical relation between activity and employment; see below. A key reason is the wage compensation scheme, which at some point covered about 250,000 persons, and it contributed to avoid a steep increase in unemployment; see Bennedsen et al. (2020) and Finansministeriet (2021).

While the decline in activity over a short period of time was larger than any crisis in the past, the recovery was also unusually quick. In short, the pandemic released the deepest and shortest economic crisis on record. Economic forecasts have also systematically been too pessimistic¹³; see Figure 7a. The recovery has been swifter than even the most optimistic forecasts at the onset of the crisis, and the economic policy quickly shifted to focus on the risk of overheating and shortage of labour, which may seem surreal given the agenda just a few months earlier. A comparison to the Financial Crisis brings out the striking differences be-

13. Forecasting in this unusual situation was difficult, especially in the early phase, and therefore different scenarios were published by the Economic Council, the Ministry of Finance and the Central Bank.

tween the two crises; see Figure 7b. While the decline in activity was of comparable magnitude, the decline and recovery were much more swift compared to the Financial Crisis.

Figure 7: Economics projections during the pandemic, and the Covid-19 Crisis compared to the Financial Crisis



Note: www.oecd-ilibrary.org, Economic Outlook various issues, and Statistics Denmark.

Supporting production capacity is a necessary condition for a swift recovery, but it is not sufficient, since aggregate demand should also be in place, and therefore an important lesson is that a two-handed approach was required: maintaining capacity and supporting demand. If successful, this prevents a sharp and deep decline in economic activity from turning into a prolonged downturn. It is a classical business cycle mechanism that recessions are persistent via several mechanisms, including frictions in job matching and decreases in aggregate demand. These mechanisms were muted or neutralized by the policy initiatives. As noted, Denmark entered the Covid-19 crisis with a well-performing economy, including low unemployment and sound public finances due to previous consolidation and reforms. Consequently, there was fiscal space to pursue rather aggressive policies in terms of rescue packages, but also more traditional fiscal policy measures. Moreover, there are no disequilibria to resolve as during, e.g., the Financial Crisis. Particularly noteworthy is the »unfreezing« of holiday allowances in two rounds (autumn 2020 and early 2021). Since holiday allowances are taxable income, this measure is thus an example of an (unconventional) aggregate demand policy which simultaneously improved disposable income of households and tax revenue. In the autumn 2020, holiday pay corresponding to 31 billion DKK (1.4 % of GDP) were paid out, and in early 2020 22 billion DKK (1 % of GDP) – in total, a rather large, and also unconventional, demand stimulus.

In retrospect, the macroeconomic development has largely been consistent with the V-logic underlying the emergency packages that they would make a quick recovery possible, although the actual development (see Figure 6) looks more like a W-path due to the two lockdown rounds. The various emergency packages allowed many firms to retain valuable job matches and production capacity (avoiding bankruptcy), but they also protected the income of workers and hence consumers. In that sense they have been successful, although many details on the design can be discussed, but they should be weighed against the urgency of the interventions and the costs of a prolonged downturn.

Clearly, this outcome is not all by design. The pandemic has proven rather unpredictable with respect to the number and length of waves, and further waves could not be ruled out. A more prolonged lockdown period could thus have resulted in different outcomes. In hindsight, it is probably better to have experienced two relatively short lockdown waves rather than one with the same total overall length. The period between the two waves allowed firms to recover, while a longer lockdown period may have brought more firms to solvency limits. The development and availability of effective vaccines also contributed to control the pandemic (and much faster than expected) and reduced uncertainty. There are elements of both luck and design in the outcome.

The interventions are far from fine-tuning. When the measures were implemented, the knowledge of their effects was very scant, and far into the reopening process there were concerns that there was a need for more expansionary policies to support the recovery and worries that the support measures were being phased out too quickly. Moreover, there was uncertainty about the ability of the private sector to adapt to the new situation, and it is interesting that the economic effects of lockdowns during the second wave were significantly smaller than during the first wave, despite lockdowns being rather similar. Finally, many firms have a large debt overhang from the crisis, and it is still uncertain how many are capable of overcoming this problem. The jury is still out on the overall assessment of the economic consequences of the pandemic.

5. Temporarily laid off due to Covid-19: What to do and what not to do

Since March 2020 an extensive series of labour market policies have been introduced to mitigate the effects of the Covid-19 pandemic on workers. The initiatives were both directed towards those in jobs (insiders) and the unemployed or sick-listed (outsiders). The most prominent instrument to protect the insiders was a new wage compensation scheme (*lønkompensationsordningen*), which is a publicly supported short-time-work-program (STW-program) that enables companies to maintain the employee at reduced working hours, and where a substantial part of

the wage is publicly financed. Two years into the pandemic more than 350,000 workers have been enrolled in the wage compensation scheme, and the total public subsidy of the program amounts to close to 20 billion DKK.

To provide increased insurance for unemployed and sick-listed, the maximum length of the benefit period was extended, and the work-requirement for receiving social assistance was loosened.

Although labour market policy focused both on providing extended insurance for the unemployed and saving jobs by large subsidies to the STW-program, the main innovation compared to business-as-usual in the labour market was the introduction of the wage compensation scheme.

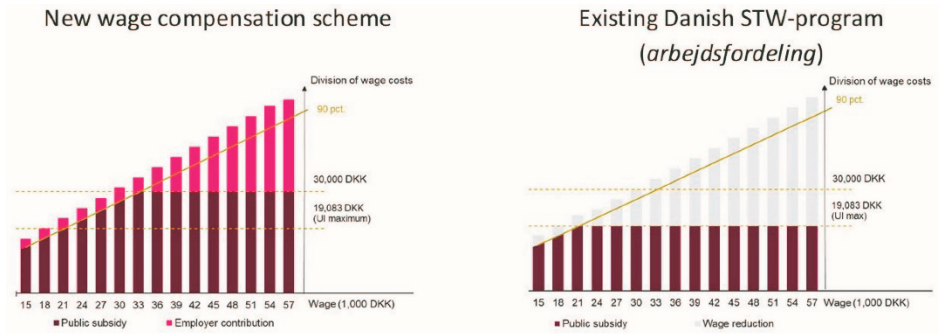
Denmark is not the only country that relied heavily on STW-programs. As presented in Giupponi et al. (2021), most European countries relied on labour market policies that were focused on protecting jobs through labour hoarding subsidies, whereas in the US the focus was on insuring workers through increased generosity of the unemployment insurance. Although, the literature on the effects of STW-programs is relatively scarce, a comparison between the relative performance of the EU and the US labour markets reveals interesting observations.

5.1. Design and implications of STW-programs

For many years/decades, Denmark has maintained an STW-program called »Arbejdsfordelingen«, which allows firms to reduce the working hours if there is a temporary reduction in demand. Workers are entitled to unemployment insurance during periods when they are not working if they are members of an unemployment insurance fund, and the company does not have to pay wages. The workers keep their job, but face a reduction in the earnings, while companies can reduce their wage bill.

For various reasons this pre-Covid-19 tool was not considered to be appropriate to handle the implications of the Covid-19 pandemic, and a new wage compensation scheme was introduced in March 2020. Under the rules of the new scheme, companies that had to notify redundancies for a minimum of 30 % of staff or more than 50 employees as a result of Covid-19 could receive wage compensation. Moreover, the wage compensation scheme did not include an explicit requirement that the company must experience a loss of revenue or income. Figure 8 shows the key properties of both the wage compensation scheme and the STW-program, and also shows that the former is more generous. For more details on the two SWT-programs, see Andersen, Svarer and Schröder (2020a).

Figure 8: Two Danish STW-programas



Note: The wage compensation scheme is illustrated for »ikke-funktionærer«; see Andersen, Svarer and Schröder (2020a) for further details

Compared to the traditional STW-program, the wage compensation scheme is much more favourable for workers; they maintain a higher fraction of their normal earnings, and as a consequence workers have an increased incentive to stay with their current employer. Firms receive a substantial subsidy to their wage bill, and compared to both the traditional STW-program and a world without STW-programs, they have a strong incentive to maintain job matches.

There is little doubt – that is our lesson learned - that the STW-programs have had an effect on labour market performance. A crude comparison between Denmark and the US labour markets shows remarkable differences in e.g. the unemployment rate. Whereas the unemployment rate in Denmark increased from around 3.7 % to 5.4 % in the spring of 2020, the unemployment rate increased from around 4 % to more than 14 % in the US. Similar patterns emerge if other European countries are compared to the US labour market statistics. These numbers strongly suggest that STW-programs protect jobs, although there have been other relief packages working in the same direction. This is corroborated by e.g. Bennedsen et al. (2020), who, based on Danish surveys, find large job preserving effects of the wage compensation scheme, which is also in line with analyses based on the use of STW-programs during the Great Recession in 2008-2010 (e.g. Cahuc et al., 2021).

STW-programs offer insurance to employed workers by supporting the ongoing job match, and at the same time enable companies to avoid inefficient job separations. A productive job match may end in separation if e.g. the firm is liquidity constrained or if wage or hour rigidities prevent the firm and the worker from maintaining the current match. Access to STW-programs may alleviate these barriers to avoid inefficient job separations. In addition, STW-programs enable firms to keep workers with firm-specific skills, and to avoid the costs of recruiting and training new employees. In the absence of STW-programs, the alternative for many workers would be to register as unemployed. This would imply expenses to unemployment-benefits and risk of long-term scar effects from unemployment.

Kopp and Siegenthaler (2021) find that the costs to STW-programs in Switzerland during the Great Recession almost summed to the amount of the saved unemployment insurance benefits.

Importantly, the benefits of STW-programs should be weighted against the costs, which besides the large public subsidy consist of reduced labour market mobility and the risk of slowing down the structural change from declining sectors to growing sectors and from unproductive to productive jobs. Moreover, SWT designs have to be incentive compatible, such as to avoid labour hoarding and other distortions. Giupponi et al. (2021) find, based on Italian data, suggestive evidence that low productivity firms to a larger degree hold on to the labour force, and hereby reduce growth through reallocation.

There is no current cost-benefit analysis of the newly introduced wage compensation scheme in Denmark, but there appears to be good arguments to investigate whether the traditional Danish STW-program (*Arbejdsfordelingsordningen*) should be modernized to better match the need in future recessions. The recent and growing literature on the effects of STW-programs could be a valuable guide in that process. Based on a thorough reading of the literature, Giupponi et al. (2021) conclude that SWT-programs are a useful instrument to support the labour market in recessions and complement the unemployment insurance system.

6. Rescue packages for businesses: A new policy tool?

A novel type of policy responses during the Covid-19 crisis was the widespread emergence of business directed rescue measures and relief-packages, ranging from direct transfers, over tax breaks, to guarantees (see e.g. OECD (2021) for an international perspective, or Erhvervsministeriet (2022) for the case of Denmark). In contrast, during the Financial Crisis, where sectors such as travel and hotels and restaurants shrank in terms of gross value added by approximately 10 % from 2008 to 2009 followed by a rather slow rebound, no such policy response materialized.

The logic of rescue packages for businesses under Covid-19 stems from various sources: a sense of natural catastrophe, unexpected and beyond the control of businesses, much like tornados or freak-floods. Legal arguments dictate compensation for temporary de-facto expropriation (which in turn is balanced by state-aid rules). Economic arguments highlight the value of preserving businesses and value chain structures, such as to facilitate a swift post-crisis rebound. Finally, a sense of fairness exists that the relatively few sectors and businesses with people and interaction intensive production and consumption methods should not have to shoulder the burden of stopping Covid-19 (a common good) alone.

While all these arguments may have their merits, it is also clear that their validity fades with time. For example, two years into the crisis, mitigating measures

in response to reignited Covid-19 outbreaks are hardly unexpected. Moreover, and that is the aspect we highlight below, certain tools preserve pre-crisis industry structures and will hinder industry dynamics, i.e. adjustments in production and consumption patterns, shrinking and growing firms and sectors, etc. Finally – but not the subject of the current lesson learned – business rescue packages are not free. In Denmark the total direct cost of rescue packages accumulates at the time of writing to more than 50 billion DKK.¹⁴ Hereof, the lions' share went to wage compensation (STW measures) and direct transfer payments to businesses, covering part of their fixed costs. Each tool accounts for approximately 20 billion DKK. Moreover, even programs without direct transfers, such as delayed tax payments or repayable loans, have costs, such as administration and monitoring, not to speak of fraud and abuse.

All in all, and this is the finding of Andersen, Svarer and Schröder (2020b, 2021b) and Erhvervsministeriet (2022), rescue packages directed at businesses have a justification in the immediate short run, but if maintained too long their costs will over time – and probably sooner than later – outweigh their benefits. In what follows we briefly illustrate this underlying problem of business directed rescue packages, i.e. the risk of distorting the economy and dampening industry dynamics. Second, we turn to the lesson learned, namely a ranking of the different types of tools in terms of their interference with normal market dynamics. In particular, given that the new business directed policy tools had to be invented ad hoc and within a very short period of time, this lesson also contains an indication of which institutional set-ups might be worth maintaining. A theme we will elaborate in section 7.

The taxonomy by Andersen, Svarer and Schröder (2021b) of Covid-19 rescue packages that may count as economic policy – but clearly are distinct from traditional stimulus policies – identifies the following main groups: Employee directed (see also the previous lesson) versus employer/business directed. Within the latter, one can separate tools into non-repayable direct compensation (e.g. partial refund of fixed cost expenditures), liquidity providing (e.g. postponed VAT payment or increased and favourable loan conditions and volumes) and safety net providing (e.g. building up insurance pools for the travel industry or investor of last resort facilities). While all direct compensation measures, and some of the safety net tools, had to be invented from scratch, including their institutional set-up, other policy responses, such as postponed tax due deadlines or increasing guarantee volumes in Denmark's Export Credit Agency, required little additional institutional set-up.¹⁵ The range of tools we observe in Denmark mirrors interna-

14. The Danish Business Authority provides updated statistics on <https://erhvervsstyrelsen.dk/statistik-kompensationsordninger> (accessed 1.3.2022).

15. Although postponement of tax payment at a later point in time may require credit assessments. See Erhvervsministeriet (2022) and Andersen, Svarer and Schröder (2021b) for a more

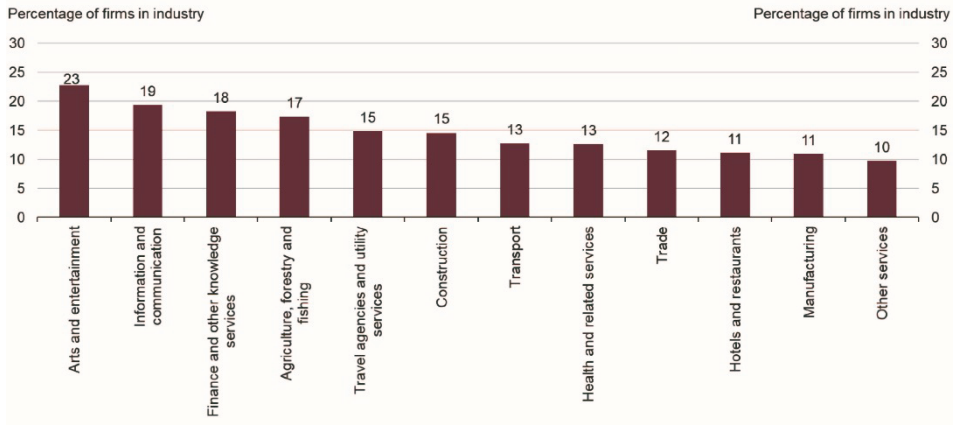
tional experiences (see OECD, 2021).¹⁶ Importantly, countries did vary with respect to their pre-crisis available intuitional set-up suitable to channel and administer the policy response.

Two problems with indiscriminate support for businesses are the risk of giving support to firms that might not need it and the dulling of industry dynamics. Such dynamics are an important driver for productivity (see Syverson, 2011), and in the case of Denmark they account for roughly half of the long-term growth in productivity in the private sector (see Finansministeriet, 2016, chapter 4). Forces of entry, exit, growing and shrinking market shares and selection are dampened when giving indiscriminate tax or other credit to businesses without assessment of their future earnings prospects. The same is true when issuing direct transfers conditioned on having previously been active in a certain line of business (which by definition omits newly founded firms) or having suffered certain levels of losses in turn-over. In particular, the latter criterion – attempting to solve the problem of supporting thriving firms – has potentially harmful effects. It favours badly run firms and firms that do not re-adjust their business model to the Covid-19 shock. To be concrete, for several of the direct compensation tools evoked in Denmark, such as partial non-repayable compensation of fixed costs, the level of compensation depended on the level of sales decline, measured on a year earlier, starting from a 35 % decline. Figure 9 applies this criterion to the period 2012 to 2016, which are business cycle neutral no Covid-19 years. As can be seen, independent of sector, at least 10 % of firms will in a no Covid-19 year have a decline in turnover of more than 35 %. The phenomenon is even more pronounced in the area of arts and entertainment, one of the main recipients of Covid-19 rescue packages designed as direct transfers.

complete overview of the various rescue packages and policies developed and employed during 2020 and 2021.

16. A particular hard hit sector was the travel and hospitality sector, and correspondingly we find here a large variety of state-aid type rescue measures; see Sanabria-Díaz et al. (2021) for a discussion on the landscape in Europe.

Figure 9: Firms with at least 35 % year-on-year decline in turnover (average year, by industry in %)



Note: From Andersen, Svarer and Schröder (2020a). The figure reports the share of firms per industry experiencing a year-on-year decline in turnover of more than 35 %. Average across 2012-2013, 2013-2014, 2014-2015, 2015-2016, excluding entities with less than one employee, public enterprises and commercial and civil foundations.

An immediate observable outcome of slowing industry dynamics would be a reduction in exit rates, such as insolvency or mergers. While bankruptcy rates in Denmark during the first wave of Covid-19 in 2020 were clearly below 2019 levels, in a longer term comparison they are not exceptionally low (see Statistics Denmark, Covid-19 indicators). However, at the time of writing, several business support tools (postponed VAT) are not fully phased out. Hence, a final assessment of the empirical effects is still future work. Interestingly, for France Cros et al. (2021) find that – despite lower insolvency rates – the selection process per se, identified by the characteristics of failing firms, is not distorted.¹⁷

It is instructive to compare a potential dampening of industry dynamics and hence partial preservation of 2019 structures in certain sectors during the Covid-19 crisis with developments of newly established firms in the aftermath of the financial crisis. Here, new firms, that is, firms established between 2008 and 2010, made up more than 1/3 of firms in sectors such as restaurants, cafes, and entertainment in 2010 and accounted for more than 20 % of turnover in that year (see Andersen, Schröder and Svarer, 2020a, chapter 5 for data and further description).

Against this backdrop, we can rank the newly developed type of policy tools (business rescue packages) in terms of their distortive risks and their relevance as

17. Lehmann (2021) reports lower insolvency rates during Covid-19 across Europe, in part because EU countries suspended normal insolvency law in response to the crisis.

backup for future crises; see Andersen, Svarer and Schröder (2021b). Safety net type credit guaranties and investor of last resort facilities are the least distortive policies, since they maintain an actual assessment of the prospects of the businesses in question or link up to financial sector assessments of the respective applicant. Accordingly, such tools will not hamper industry dynamics, they can rectify potential market failures that materialize during a crisis, and they are in fact cost neutral. Here the assessment in Andersen, Svarer and Schröder (2021b) shows that such tools and their institutional set-up could be worthwhile to maintain, potentially at zero volume. Next, tools that provide liquidity indiscriminately, through for example postponed tax due dates, are clearly more distortive, due to the absence of an actual case by case assessment. Still, given their nature as de facto loans, their actual distortion and cost are limited. In addition, these policies were very fast to implement. Finally, the most distortive and least attractive tool – viewed in terms of costs and dampening dynamics – are direct non-repayable compensation transfers to businesses. Obviously, some of these direct compensation schemes were required for legal reasons or other more political considerations. Importantly, and probably the better for Denmark, a system of EU state-aid rules limits their use here and in EU partner countries.

Maybe a final observation after two years of Covid-19 is that, despite clear and early economic evidence, proposing a swift phase-out of the most distortive of the new policy tools, some of the programs have proven to be surprisingly hard to unwind. One reason could be that business and industry associations of affected sectors quickly developed a sense of entitlement to rescue packages.

7. The design of future pandemic preparedness

It is unlikely that the corona virus will be fully eliminated in the short run. Many people around the world are still not vaccinated, vaccine efficiency is waning over time, and there are virus reservoirs in animals. It is therefore to be expected that periodical corona epidemics will occur, especially during the winter season, in the coming years.

To secure an optimal reaction to a future potential pandemic situation, it is relevant to formulate an emergency strategy that ensures that authorities have sufficient information on the current status of the corona virus and have considered the relevant instruments to handle an increasing spread of the corona virus.

In this section, we discuss the design of an optimal emergency strategy based on the experience gathered during the first two years of the Covid-19 pandemic, and provide more general insights for other crises situations and pandemics. The discussion is to a large extent based on the more elaborate analysis presented in Andersen et al. (2021c).

Managing an epidemic involves trade-offs between health, the economy, public well-being and constitutional rights. These trade-offs are not always easy to pin down. As e.g. Andersen et al. (2021c) point out, countries that have imposed non-pharmaceutical interventions like school closing, travel restriction etc. at early stages of an increasing epidemic situation have often performed better in terms of economic costs than countries that have waited longer and, as a consequence, have experienced more corona virus. An uncontrolled epidemic both affects the actions of the population and imposes stronger uncertainty for consumers and firms, and in addition requires stronger actions to fight the health threat. The trade-offs are therefore complex.

The long-term emergency strategy consists of a basic package of instruments that can be scaled if the epidemic evolves. The most important parts of the basic model is to secure that a large proportion of the population is vaccinated, and that the corona virus is under appropriate surveillance. The latter is crucial to ensure that the correct measures can be initiated in due time if the virus situation escalates.

To secure a timely response to an increased spread of the corona virus, a set of scalable measures must be readily available. These measures range from e.g. testing capacity over hospital capacity to re-vaccination.

First, it is crucial to monitor relevant indicators on the severity of the health situation. This implies that there should be updated and publicly available data on a series of health indicators like the number of test-corrected contaminated by different sub-populations, e.g. vulnerable individuals, the number of patients admitted to hospital, the fraction of these admitted to an intensive care unit, and number of deaths due to Covid-19. Updated and publicly available data corroborates that decisions on potential non-pharmaceutical interventions are supported by the population, and that individual behaviour with respect to e.g. hygiene and physical distance measures is adequate.

Based on a precise overview of the health situation, different strategies can be implemented to address an increasing epidemic situation. There are a number of dilemmas when choosing the appropriate actions. As mentioned, the measures should balance the trade-offs between health, the economy, public well-being and constitutional rights, which are not always clear-cut. In addition, there is a fundamental dilemma between individual self-interest and the societal benefits from individual decisions in the presence of strong externalities both regarding vaccination and physical distance.

Precise data on the evolvement of the epidemic situation enables a timely reaction to changes in the severeness of the situation, and increases the likelihood that containment measures will work appropriately. Firm and quick actions have potential drawbacks. One is that planning by firms and citizens requires predictability, and sudden changes can be extra costly for the economy. The optimal spacing between observations on a changing epidemic situation and the change in con-

tainment policy is consequently complicated. Complications are further increased by the trade-off between acting early to slow down a potential increasing epidemic and the goal to implement evidence-based policy tools. It takes time to gather both valid evidence on the severeness of a given variant of corona virus, and on the effectiveness of potential containment measures, the effects of which depend on the degree of public compliance and behaviour in general.

These trade-offs are genuine and hard to resolve, but the first step is to provide appropriate data on the evolvement of the corona virus, the effectiveness of containment measures, the behaviour of the population, and the public support for containment measures. The second step is to have a set of instruments that can be easily scaled to ensure a proportional reaction to a changing epidemic situation. The instruments include: vaccination strategy, hospital capacity, surveillance strategy, tests, isolation requirements, containment measures, and communication efforts.

Measures can be scaled in three dimensions: geography, population, and intensity. Some outbreaks of corona virus happen in restricted geographical areas, and a proportional response would be to focus containment measures to the relevant area and avoid national measures. A similar focused effort applies when only a sub-group of the population is affected, e.g. elderly in nursing homes. Here a directed effort is the appropriate measure. Lastly, the intensity of containment measures should vary from suggestions and recommendations at low stages of an epidemic to requirements at higher stages.

Overall, as long as the corona virus continues to be a significant threat to public health around the world, the experience from the last two years shows that a focused and fast effort to combat an increasing spread of corona virus is effective in keeping the number of deaths due to Covid-19 down, and at the same time in lowering the costs for the economy and public well-being.

8. Conclusion

Two years of reactive policies and intervention in the realm of health and economics have generated a host of insights and lessons learned. This paper is a first and early attempt at extracting some lessons.

Maybe most importantly, the overarching theme that emerges from our six lessons is the value and importance of maintaining emergency preparedness, not just in case of pandemics, but also beyond. However, broad emergency preparedness and rapid response capabilities – be it hospital capacity, credit facilities for businesses, or maintaining a sober and solid public fiscal stance in good times – come at a cost. Costs that may be politically hard to justify in times of calm, and with certainty can become the subject of political haggling during budget struggles. The risk is that the insights from the Covid-19 crisis are quickly forgotten

and the option value of preparedness ignored. Hence, an important step forward would be to institutionalize and constitutionalize emergency preparedness – in the broadest possible sense - while memory of the Covid-19 crisis is still fresh.

A final remark is in order, inventing ad hoc policy responses – while clearly needed and often successful – has triggered political economy dilemmas in Denmark and abroad. As observers we can only note that – for example – business directed rescue packages have been surprisingly hard to unwind. Policy makers and politics move on a slippery slope, where hard won principles of checks and balances on issues ranging from state-aid to fiscal budget rules are under siege. Ultimately, this could be the dearest long-term consequences of the Covid-19 pandemic.

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