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# IMF Working Paper

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What are the Economic Effects of Pandemic Containment Policies?  
Evidence from Sweden

by Jana Bricco, Florian Misch, and Alexandra Solovyeva

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I N T E R N A T I O N A L M O N E T A R Y F U N D

## IMF Working Paper

European Department

### What are the Economic Effects of Pandemic Containment Policies? Evidence from Sweden

Prepared by Jana Bricco, Florian Misch and Alexandra Solovyeva<sup>1</sup>

Authorized for distribution by Khaled Sakr

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#### Abstract

This paper examines the economic effects of policies to contain Covid-19, by extracting lessons from Sweden's experience during the 'Great Lockdown'. Sweden's approach was less stringent and based more on social responsibility than legal obligations compared to European peers. First, we provide an account of Sweden's strategy and the health outcomes. Second, drawing on a range of data sources and empirical findings, our analysis of the first Covid-19 wave indicates that a less stringent strategy can soften the economic impact initially. These benefits could be eroded subsequently, due to potentially higher infection rates and a prolonged pandemic, but in Sweden's case, the evidence remains mixed in this regard, and it is premature to judge the outcome of Sweden's containment strategy. In addition, the economic effects of the containment strategy also depend on social behavior, demographics and structural features of the economy, such as the degree of export orientation, reliance on global supply chains, and malleability to remote working.

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Author's E-Mail Address: [JBricco@imf.org](mailto:JBricco@imf.org), [FMisch@imf.org](mailto:FMisch@imf.org), and [ASolovyeva@imf.org](mailto:ASolovyeva@imf.org)

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### **Disclaimer**

The current Covid-19 pandemic and the associated economic crisis are rapidly changing. The analysis included in this paper is based on data available as of mid-July 2020, with a few exceptions where we used more recent data as indicated. Some of the conclusions of the paper may be updated in subsequent studies. The IMF Covid-19 page is periodically updated on the global outbreak, including country-specific information.

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## I. INTRODUCTION

Many countries have imposed aggressive containment and social distancing measures in an effort to slow the spread of Covid-19. While the pandemic and containment measures undoubtedly lead to significant economic fallouts, the effects of the latter are still debated. Sweden's strategy to contain the Covid-19 pandemic has been less stringent than in other advanced economies during the 'Great Lockdown' in Europe in March and April 2020. This makes Sweden an outlier in terms of its containment policies, even though the containment strategies implemented by Sweden and Nordic peers also shared many similarities. The objective of this paper is to examine the effects of containment policies on macroeconomic and health outcomes during the first wave of the pandemic, using various data sources and drawing on evidence from Sweden and its international peers.

Sweden's containment strategy has been based more on recommendations and social responsibility rather than legal obligations. Sweden has refrained from universal school closures, stay-at-home orders, and mandatory business closures. The death toll has been higher than in regional peers and has been concentrated along geographical and demographic lines.

By contrast, the economic ramifications of a less stringent containment strategy remain uncertain. As of September 2020, IMF staff, the Swedish authorities, the National Institute of Economic Research (NIER), and commercial banks all project a severe recession in Sweden, ranging from around -5 to -3 percent. Although the range of the projected contraction is less steep than the average forecast for advanced economies, it is not much different from some other Nordic countries.

There is a rapidly growing number of recent papers that examine the effects of containment policies on economic outcomes. Building on the canonical Susceptible Infected Recovered (SIR) model by Kermack and McKendrick (1927), recent theoretical studies argue that targeted containment measures can generally achieve the same health outcomes at a lower economic cost.<sup>2</sup>

One strand of the empirical literature looks at the effects of containment measures on employment. Aum et al. (2020) present causal evidence on the effects of the spread of the pandemic on labor markets and shows that the number of infections, regardless of lockdown policies, result in job losses, which underlines the role of voluntary social distancing. Cajner

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<sup>2</sup> See Avery (2020) for a survey of the literature on SIR models. For example, Eichenbaum et al. (2020) develop a single-group SIR model where people's decision to reduce consumption and work moderates the severity of the epidemic but exacerbates the recession. They show that test-based quarantines have larger social benefits than broad-based containment policies like lockdowns. Ellison (2020) argues that allowing for heterogeneity in contact rates is important because calibrating the classic SIR models to data generated by heterogeneous models can lead to biased forecasts and understatement of the forecast uncertainty. Acemoglu et al. (2020) find that in a model with infection/fatality rates varying across age, policies differentially targeting age groups significantly outperform uniform policies with most of the gains realized by having stricter lockdown policies on the elderly. Favero et al. (2020) show that policies of gradual reopening that take into account age-specific and sector-specific risks may save many lives with limited economic costs.

et al. (2020) document that the decline in employment has been much larger at the bottom of the wage distribution in the U.S. Chen et al. (2020) do not find significant effects of containment policies on state-level unemployment claims in the U.S.

Other empirical papers examine the effects on private consumption using financial transaction data. Andersen et al. (2020) estimate that the decline in aggregate spending in Sweden was 26 percentage points, only 4 percentage points less than in Denmark despite the stark differences in the stringency of containment policies, potentially highlighting the importance of voluntary changes in behavior. By contrast, Baker et al. (2020) show that consumer spending in the U.S. changed more strongly in states with shelter-in-place orders.

Another strand of the empirical literature examines the effects on non-traditional indicators and mobility.<sup>3</sup> Deb et al. (2020a) find the dynamic cumulative effects of containment to have a significant impact on Nitrogen Dioxide emissions, mobility, and other indicators, although they show that fiscal and monetary stimuli can soften the adverse economic effects. Maloney and Taskin (2020) examine the effects of closing nonessential businesses, sheltering in place, and school closures mostly on presence at work. They show that these interventions are effective, but that voluntary actions also matter. Fang et al. (2020) find that the lockdown of Wuhan reduced mobility within, into, and out of Wuhan significantly. Born et al. (2020) find that the decline in mobility in Sweden was only slightly lower than in a synthetic control group comprising countries that had a more stringent lockdown. Chen et al. (2020) also find that trends in electricity usage between March and April 2020 was broadly similar across Nordic economies, including Sweden.

We contribute to the debate on the effects of containment policies by presenting an array of evidence and data using Sweden's role as an outlier. First, we examine a range of economic outcomes and present novel stylized facts. Second, we expand earlier regression analysis methodologically by exploiting within-week country variation in containment policies that are measured using a continuous index.

To preview our results, we show that based on Sweden's experience, milder containment measures can soften the economic impact of the pandemic initially as suggested by evidence on aggregate growth in the first quarter of 2020 (which was stronger than in most other advanced economies), mobility indicators, and indicators measuring economic activity in non-tradeable sectors. At the same time, some of these economic benefits could be eroded subsequently, possibly because of higher infection rates that had varying effects across sectors. In Sweden's case, the evidence on erosion remains mixed, not least because GDP growth in 2020:Q2 was worse than in peers, while the cumulative performance in 2020:H1 remains relatively favorable. We also argue that the economic impact of the containment strategy depends on social behavior, demographics and the structure of the economy, and it is

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<sup>3</sup> Mobility indicators are typically based on cell phone data.

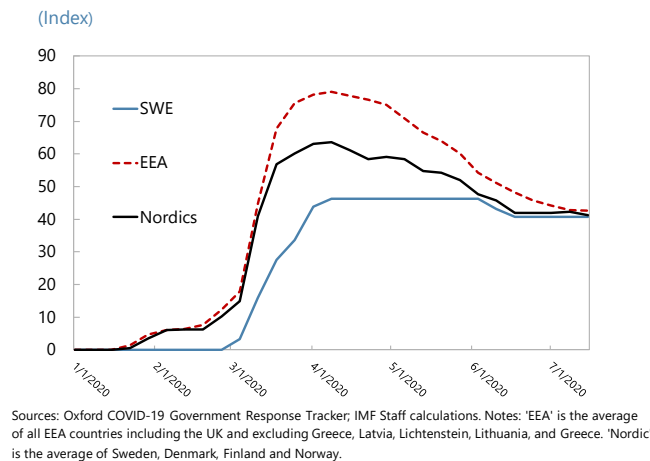
still premature to judge the outcome of Sweden’s containment strategy as it will depend on developments in the next quarters.

The remainder of the paper is organized as follows. First, we discuss Sweden’s containment strategy in an international perspective. Second, we compare health outcomes. Third, we examine the economic impact by analyzing several types of conventional and non-conventional indicators. Finally, we discuss policy implications.

## II. SWEDEN’S CONTAINMENT STRATEGY IN INTERNATIONAL PERSPECTIVE

Similarly to other countries, the Swedish government’s overarching goal from the onset of the Covid-19 pandemic has been to safeguard people’s lives and health and to maintain health care capacity, by flattening the curve of infections and limiting the number of people that are infected at the same time.<sup>4</sup> While Sweden has put in place a range of social distancing and other containment measures, starting from early March—around the same time when most other European countries started ramping up containment measures—its overall strategy remained less restrictive than by its peers. In addition, Sweden never entered a period of a stringent lockdown with compulsory stay-at-home orders, school-closures and mandatory business closures. Data from the Oxford Covid-19 Government Response Tracker, which seeks to quantify the stringency of containment measures, suggest that there was a substantial difference between Sweden and the other Nordics as well as the average of the European Economic Area (EEA) and the UK in terms of stringency of social distancing measures during the Great Lockdown (Figure 1).<sup>5</sup>

Figure 1. Strictness of Social Distancing Measures



<sup>4</sup> <https://www.government.se/articles/2020/04/strategy-in-response-to-the-covid-19-pandemic/>

<sup>5</sup> The Government Response Stringency Index published daily by Oxford’s Covid-19 is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest response); see Hale et al. (2020) for details.



This clear difference in the stringency index during the period of the lockdown can be mainly ascribed to the fact that the containment strategy has been based to a larger extent on recommendations rather than legal requirements, appealing to common sense and social responsibility. Social responsibility has been a corner stone of Sweden's strategy, which called on the population to exercise more caution based on their risk assessment regardless of the de jure regulations. This is believed to have complemented the legal restrictions and, thus, moderated the public health impact.

While Sweden's containment strategy has attracted much attention, it is sometimes not characterized completely accurately.<sup>6</sup> For instance, several articles and reports portray that Sweden has not put in place any restrictions; see for instance Krueger et al. (2020). In addition, while it has often been reported that restaurants remained opened in Sweden, it is rarely mentioned that they actually operated under several restrictions, including mandatory social distancing rules. Retailers, sports clubs, and hair salons were also subject to a set of guidelines.<sup>7</sup> Finally, there are also similarities in the containment measures across the Nordic countries which are sometimes ignored. For instance, no Nordic country mandated closures of manufacturing plants, and secondary schools were closed throughout the region (Table 1).

Table 1. Containment Measures in the Nordics

Containment measures	Visiting elderly	Closed Borders	Assemblies	Secondary school & higher	Restaurants	Primary Schools & earlier	Retailers	Sports Clubs	Hair Salons	Construct., Manufact.
Sweden		Non-EU	>50		Open with restrictions		Open with restrictions	Open with restrictions	Open with restrictions	
Denmark (lockdown)			>10		Take out only		Retailers partly open			
Finland (lockdown)			>10		Take out only	Grade 0-3 open			Open with restrictions	
Norway (lockdown)			>5		Open with restrictions		Retailers partly open			

Notes: Color coding refers to strictness of measures implemented in each category. The darker the red the more stringent is the containment measures. Lockdown refers to the period of mid-March/beginning April.

### III. SWEDEN'S HEALTH OUTCOMES SO FAR

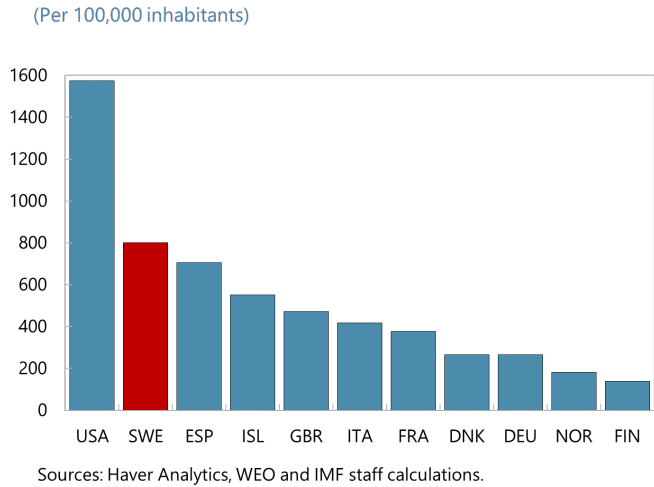
As of mid-August, Sweden's reported Covid-19 cases per capita have surpassed those of Nordic peers and countries heavily impacted by Covid-19 such as Italy, Spain, and the UK but not the U.S. (Figure 2). There is robust cross-country evidence that the stringency of containment strategies affects the number of Covid-19 cases, especially in countries like the

<sup>6</sup> For more on the strategy and its rationale see public statements by Sweden's health ministry and [interviews](#) by the country's chief epidemiologist.

<sup>7</sup> [https://www.folkhalsomyndigheten.se/globalassets/publicerat-material/foreskrifter/konsoliderade/hslf-fs\\_2020\\_12.pdf](https://www.folkhalsomyndigheten.se/globalassets/publicerat-material/foreskrifter/konsoliderade/hslf-fs_2020_12.pdf)

Nordics (Deb et al., 2020b).<sup>8</sup> The number of recorded daily infections has peaked in end-June, much later than in other Nordic countries (Figure 3). However, the recorded number of cases is affected by the scale of testing which has increased significantly in Sweden, suggesting that the actual peak of the first wave has occurred much earlier.

Figure 2. Number of Reported Covid-19 Cases (August 12, 2020)



While Sweden’s death toll per capita remains below that of the UK, Spain, and Italy, it is much higher than in other Nordics (Figure 4). The number of daily deaths has been falling since its peak in April (Figure 5) which occurred later than in other Nordic countries. Errors in the attribution of deaths in Sweden are unlikely as reported Covid-19 deaths explain a large share of currently observed excess mortality, suggesting that official statistics are rather accurate and do not underreport Covid-19 deaths contrary to statistics in some other countries (Figure 6).

Figure 3. Daily Infections

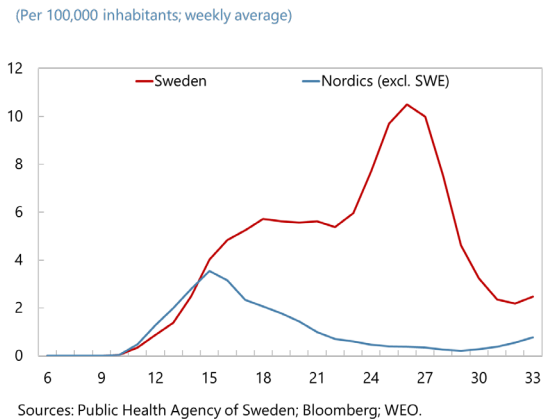
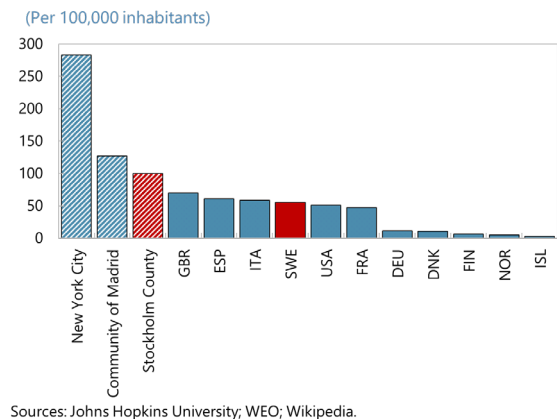


Figure 4. Total Number of Reported Covid-19 Deaths (August 13, 2020)



<sup>8</sup> In the case of Sweden, other factors may have affected the spread of the pandemic that are not related to containment policies, such as a higher number of imported Covid-19 cases at the onset of the crisis from people returning from skiing holidays; see Public Health Agency of Sweden (2020c) for evidence that a large share of infections in February and March can be linked to travelling to Austria and Italy.

Figure 5. Daily Covid-19 Deaths

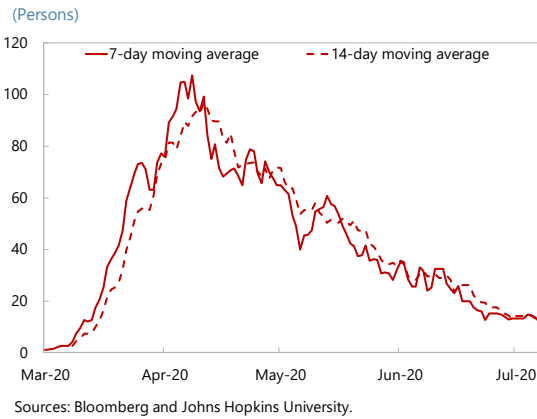
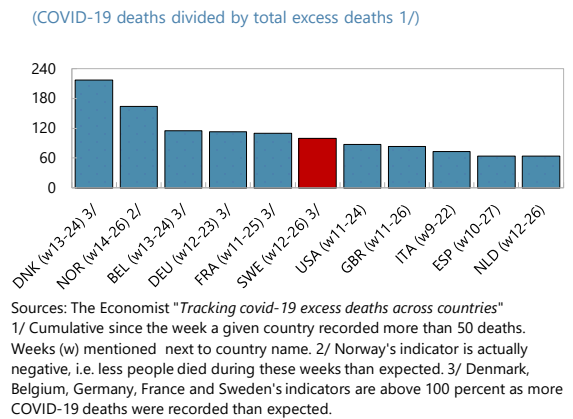


Figure 6. Excess Covid-19 Mortality Rates



Favorable demographic characteristics may have helped contain the number of deaths compared to Italy, the UK and Spain. Sweden has a very high share of single-person households (Figure 7), and the share of elderly in the total population is lower than in some of its European peers (Figure 8). This implies that other countries with less favorable demographics that apply the Swedish containment strategy could have even worse health outcomes.

Figure 7. Distribution of Single Person Households

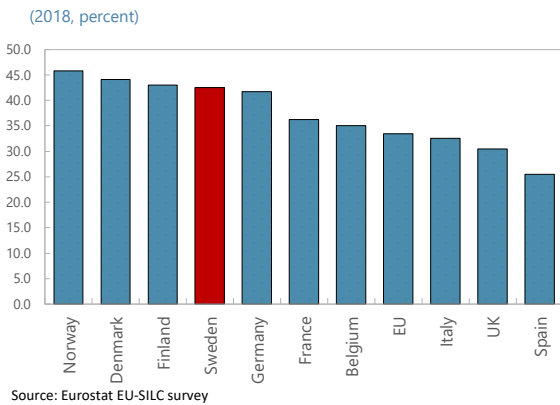
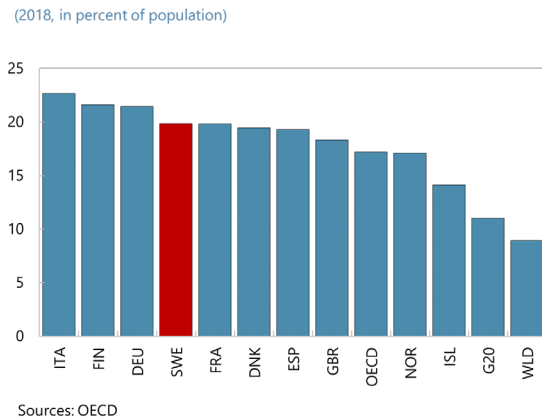


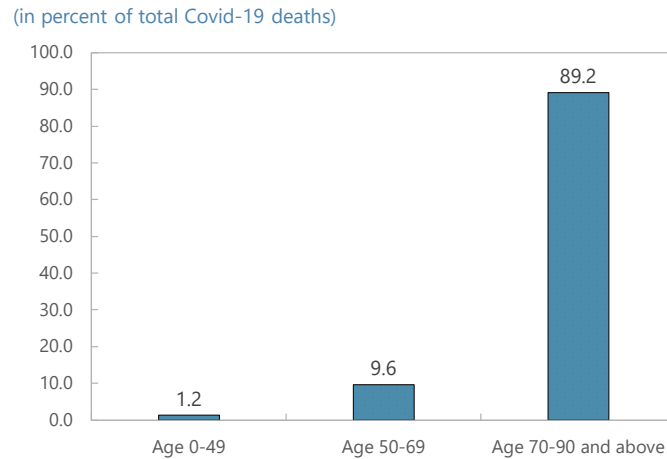
Figure 8. Elderly Population



The Covid-19 deaths appear to be concentrated among certain segments of the population. While those aged 65 or older represent close to 20 percent of the population, they account for more than 88 percent of Covid-19 deaths in Sweden, with the remaining deaths primarily concentrated in the 50 and older age group (Figure 9). In other Nordic countries including Denmark, Finland, and Norway, the elderly account for an almost identical share of deaths. It is also important to note that about half of Sweden's deaths were in elderly nursing facilities. Both Denmark and Sweden issued a recommendation not to visit nursing homes in early March, but, compared to Finland and Norway, a legally binding ban was only implemented later in Sweden (see Figure 10). A government inquiry on how Sweden handled the

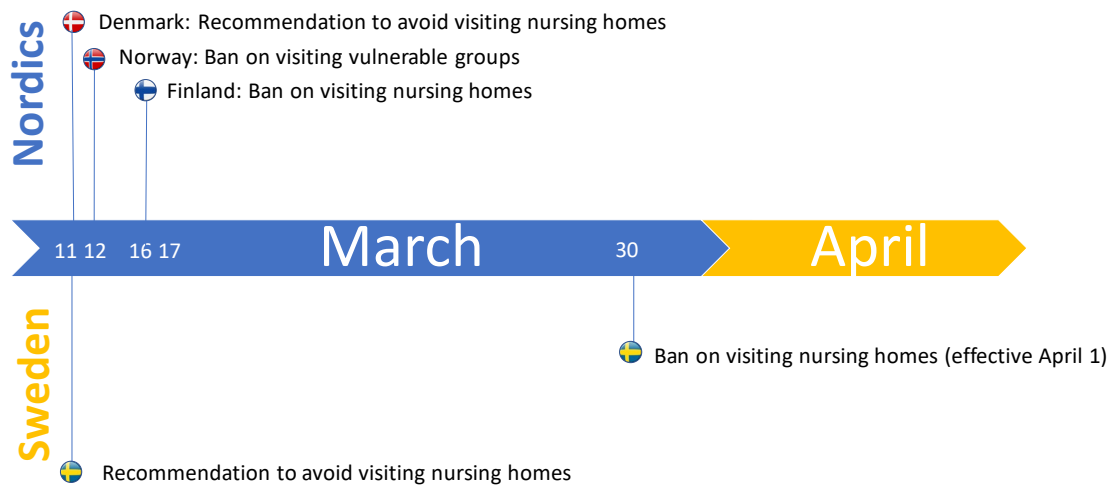
pandemic may bring more clarity about the underlying causes of the high death rates in elderly nursing facilities, including whether the timing of the ban played any role.<sup>9</sup>

Figure 9. Sweden: Death by Age Groups



Sources: Swedish Institute of Health

Figure 10. Timeline on Restrictions to Visit the Elderly

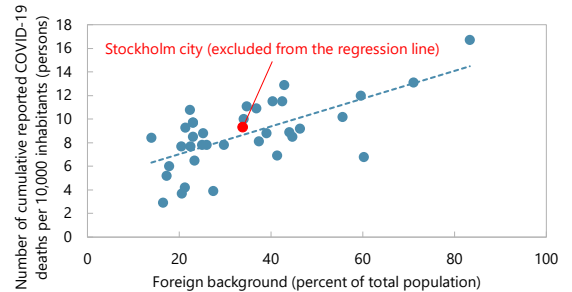


There is also a heavy concentration of deaths among the residents of the Stockholm region. The Stockholm region accounts for half of Sweden's Covid-19 deaths but only for 23 percent of the country's population. The number of deaths per capita in Stockholm remains below Madrid and New York City as of mid-August (Figure 4). Within the Stockholm region, the death toll was also unevenly distributed, possibly reflecting economic inequities and social patterns. There appears to be a correlation between the number of reported deaths and the share of the residents that were either born abroad or are children of parents born abroad

<sup>9</sup> See press release on inquiry for more information: <https://www.government.se/press-releases/2020/06/mats-melin-to-chair-covid-19-inquiry-in-sweden/>

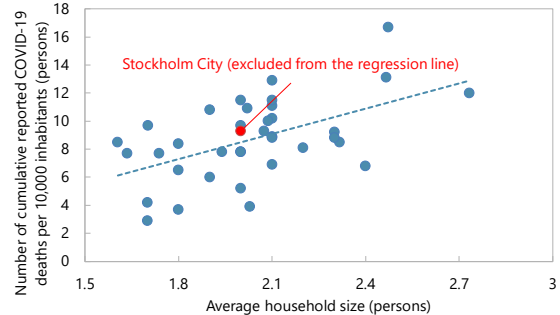
(Figure 11), in line with the findings of the Public Health Agency.<sup>10</sup> Likewise, there appears to be a correlation between the number of reported deaths and household size, indicating that demographic characteristics matter (Figure 12).

Figure 11. Covid-19 Deaths and Population with Foreign Background



Notes: Foreign background population includes foreign-born citizens and those who were born in Sweden with two foreign parents. Data points include 26 municipalities in Stockholm region (including Stockholm city) and 14 districts in Stockholm city. Death data as of May 31st 2020. Sources: Statistics Sweden, Region Stockholm and Stockholms Stad.

Figure 12. Covid-19 Deaths and Household Size



Notes: Data points include 26 municipalities in Stockholm region (including Stockholm city) and 14 districts in Stockholm city. Data as of May 31st 2020. Sources: Statistics Sweden, Region Stockholm and Stockholms Stad.

Although the authorities did not include herd immunity as a goal of their containment strategy, they reasoned that it could be achieved as a by-product of the strategy. The authorities' SEIR model predicted that 26 percent of the population in the Stockholm region will have been infected with Covid-19 by May 1, but it remains unclear whether herd immunity is being established. First, while empirical estimates vary, antibody rates are likely low.<sup>11</sup> A study on antibodies in blood donors that was published by the Swedish Public Health Authority in mid-June suggests that 6.3 percent of the blood donors had antibodies to the virus by end-May, with the highest share, 10 percent, found in the Stockholm region.<sup>12</sup> It is unclear to what extent these results can be generalized to the entire population. Other countries which had stricter containment measures seem to have achieved antibody rates that are not far off from those reported in the Swedish study. For example, a recent antibodies study in Spain found that 5 percent of the population tested positive.<sup>13</sup> A subsequent survey that was conducted by the Swedish authorities end-June and published in September found that in a district of Stockholm 18 percent of the population developed antibodies.<sup>14</sup> However, some studies have shown that a form of immunity can exist without creating antibodies

<sup>10</sup> According to the Public Health Agency of Sweden (2020a), the incidence of confirmed cases was generally higher among people born outside Europe. Similar results have been reported for Denmark; see <https://files.ssi.dk/COVID19-epi-trendogfokus-07052020-4eu7>

<sup>11</sup> [Public Health Agency of Sweden \(2020b\)](https://www.ssi.se/nyheter-och-press/nyhetsarkiv/2020/september/nya-resultat-om-antikroppar-mot-covid-19-i-olika-grupper-i-befolkningen/)

<sup>12</sup> <https://sverigesradio.se/sida/artikel.aspx?programid=2054&artikel=7498860>

<sup>13</sup> <https://www.reuters.com/article/us-health-coronavirus-spain-idUSKBN22P1IK>

<sup>14</sup> <https://www.folkhalsomyndigheten.se/nyheter-och-press/nyhetsarkiv/2020/september/nya-resultat-om-antikroppar-mot-covid-19-i-olika-grupper-i-befolkningen/>

(Sekine et al, 2020). Second, whether infection with the virus generates sufficient protective immunity is still under investigation (Randolph et. al, 2020).

Sweden's experience highlights the challenge of protecting the vulnerable in the absence of a more stringent lockdown, but the exact effects on the number of deaths are unclear, and the relatively high number of infections and deaths could also be attributed at least partially to other factors. For example, Conyon et al. (2020) compare Denmark's and Norway's lockdown measures in a difference-in-difference model to Sweden's approach and find that stricter lockdown policies in Sweden would have been associated with fewer Covid-19 deaths. By contrast, Born et al. (2020) use a synthetic counterfactual for Sweden which is a weighted average of other European countries to conclude that Covid-19 infections and deaths would not have been significantly different in Sweden under a lockdown.

## IV. CONTAINMENT POLICIES AND ECONOMIC OUTCOMES

### A. Aggregate Economic Activity

In this subsection, we consider the effects of containment policies on aggregate economic activity. The growth outcome in the first quarter of 2020 provides some initial clues about the effects of containment policies on economic activity. By August 2020, all advanced economies have released first-quarter GDP data, although some of the estimates could be substantially revised. The simple average of these estimates is a QoQ GDP decline of 2.5 percent.

Sweden did not record an economic contraction in the first quarter of 2020 contrary to almost all other advanced economies.<sup>15</sup> 2020:Q1 data show positive GDP growth of 0.2 percent QoQ. While this was mainly driven by exports (Figure 13), private consumption and investment (which can be assumed to be more affected by containment policies) also performed better than in most advanced economies, although they experienced negative growth (Figure 14). Obviously, the first quarter coincides with the onset of the crisis, which started to intensify only in March.

Figure 13. GDP QoQ Growth, 2020:Q1

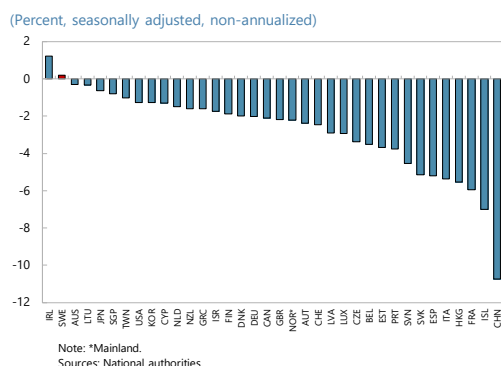
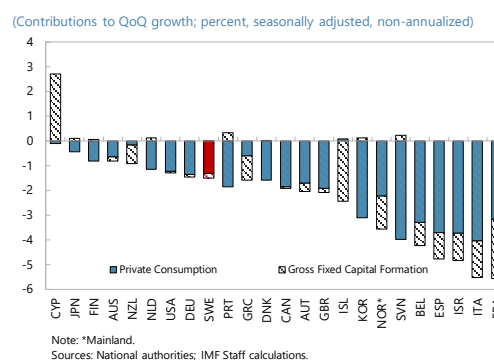


Figure 14. Private Consumption and Investment, 2020:Q1



<sup>15</sup> The other exception was Ireland.

2020:Q1 growth outcomes across advanced economies appear to be correlated with the length and intensity of containment measures. More stringent containment measures are associated with larger output losses: The correlation coefficient between the average level of the Oxford Stringency Index (which reflects both the number of days containment measures were in place and their intensity) and output growth in the first quarter of 2020 is about -0.6 (Figure 15). Using alternative samples and measures of GDP growth as robustness checks in the Appendix I, we find statistically significant correlation coefficients ranging from -0.4 to -0.6, implying that the finding is robust. However, there remain several caveats, and it is too early to draw definitive conclusions. There is a large variation in growth outcomes across advanced economies that cannot be explained by differences in containment strategies alone, and a range of other factors, including infection rates, supply chain disruptions or declining exports, may matter as well. The sample size is small, and hence it is not possible to control for confounding unobserved effects.<sup>16</sup>

Figure 15. Stringency of Containment and GDP QoQ Growth, 2020:Q1

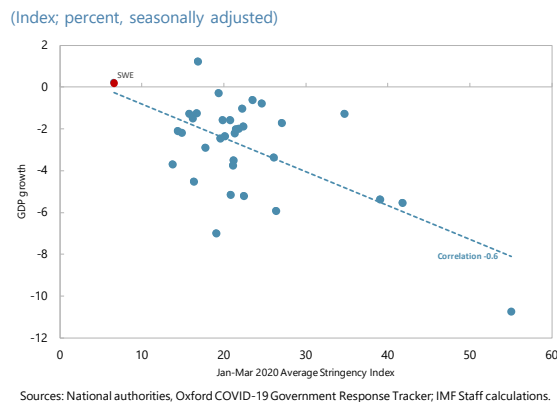
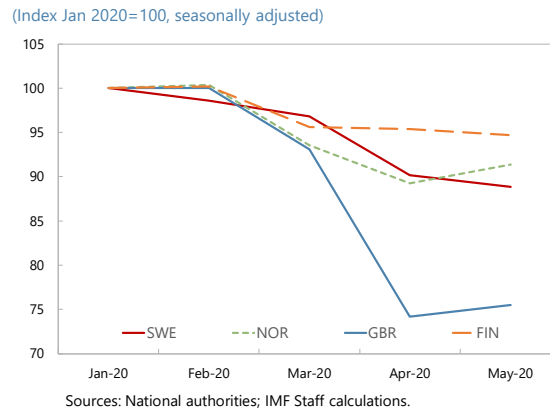


Figure 16. Economic Activity Indicators



It remains unclear whether any economic benefits from avoiding a lockdown have been subsequently eroded by relatively weaker economic activity. Sweden's monthly activity indicator suggests that the economic contraction accelerated in April and continued (albeit at a slower pace) in May, which stands in contrast to Norway, the UK, and (to a lesser extent) Finland, where activity appears to have rebounded in May (Figure 16). These patterns would be consistent with the view that Sweden's high infection rates in May relative to other countries have depressed economic activity.

The GDP contraction in 2020:Q2 was significantly larger in Sweden than in other Nordics, supporting this view (Figure 17). However, this difference was largely driven by a decline in exports rather than in private consumption and investment. In addition, the cumulative fall of GDP in the first six months of 2020 has been smaller in Sweden compared to other Nordic countries (Figure 18). These data could still be revised, and it is important to note that other factors may have been at play.

<sup>16</sup> It may also be worthwhile to repeat this exercise once data for 2020:Q2 are available, given that many advanced economies implemented containment measures only at the end of 2020:Q1.

Figure 17. GDP QoQ Growth, 2020:Q2

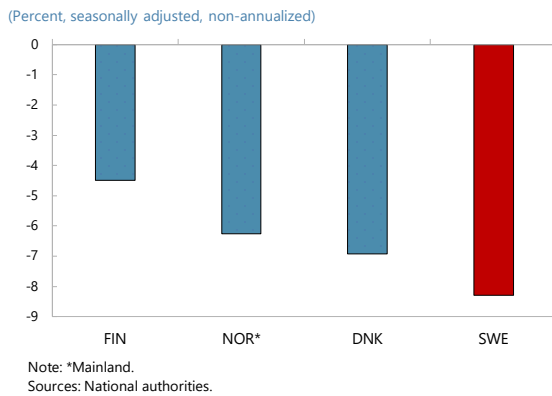
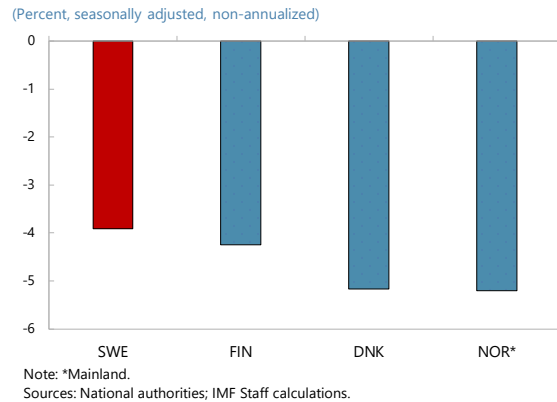


Figure 18. GDP HoH Growth, 2020:H1



### B. Sectoral Economic Activity

The impact of containment policies appears to have been heterogeneous across sectors. The latest manufacturing data show similar trends across the Nordics and in the Euro Area as a whole, mainly reflecting a drop in external demand and disruptions in supply chains. Sweden’s manufacturing sector, which has not been directly constrained by domestic social distancing and containment measures, has been impacted by the external environment. In April, the PMI manufacturing index sunk by 17 points compared to February, broadly in line with Germany and the Euro Area average (Figure 19). As of July 15, the manufacturing sector accounted for 30 percent of all temporary layoffs, although it only provides 15 percent of total employment (Figure 20).

Figure 19. Purchasing Managers Index: Manufacturing

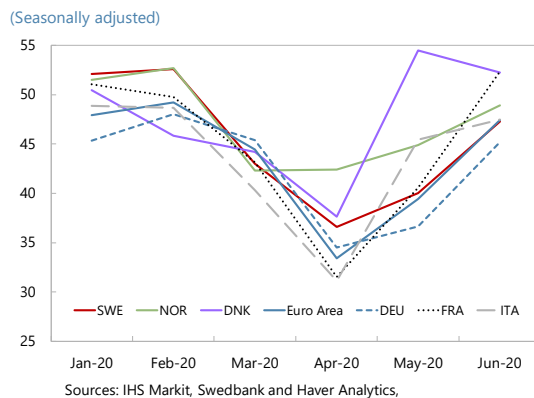
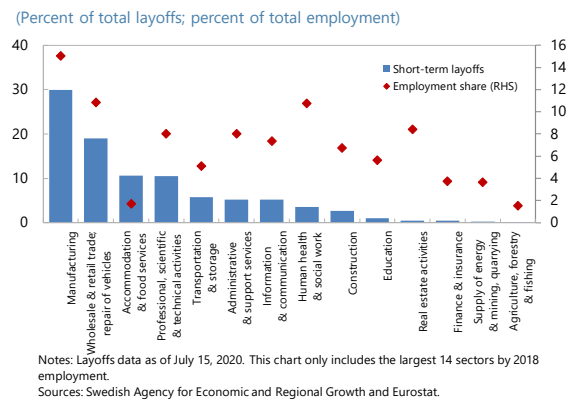


Figure 20. Sweden: Short-term Layoffs and Employment Share by Sector



By contrast, at the peak of the lockdown, the services sector has been less severely affected in Sweden compared to international peers, likely reflecting both the differences in mitigation strategies and the sectoral composition of the services sector. Figure 21 shows that the services sector’s PMI fell by 17 points between February and April, while the decline in Germany, France and Italy was much larger (there is no data for the other Nordic countries).



Hotel revenue declined less than in other countries, further confirming that the non-tradable sectors are more directly affected by the severity of containment policies (Figure 22).

Figure 21. Purchasing Managers Index: Services

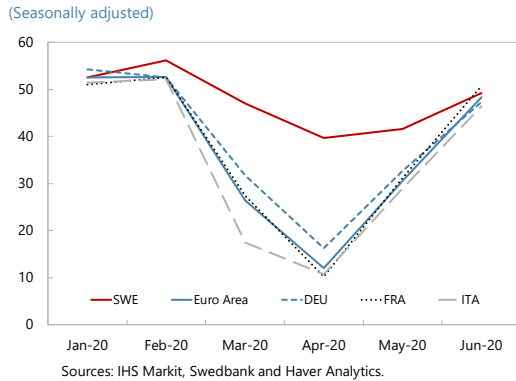
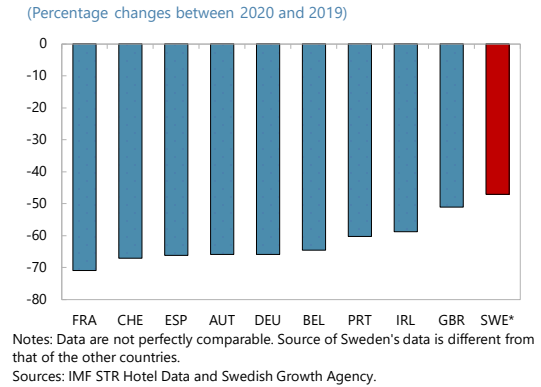
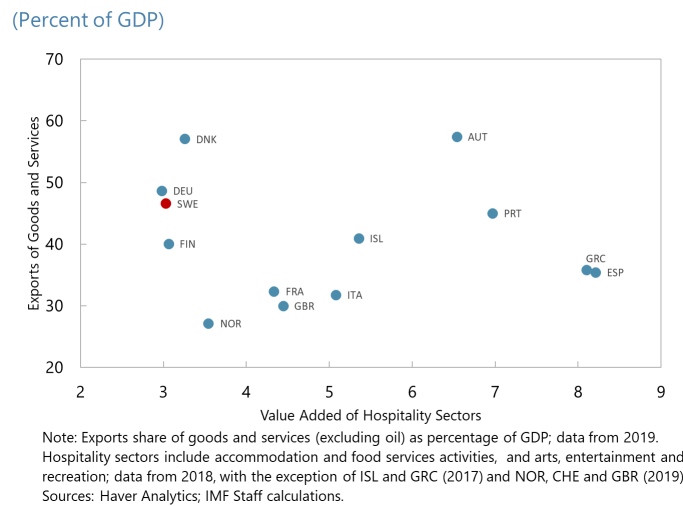


Figure 22. Europe: Hotel Revenues in March



As Figure 23 shows, the structure of Sweden's economy makes it less vulnerable to the pandemic and containment measures. Its share of the hospitality and recreation sectors (which is likely to be most affected by the pandemic) is relatively small, similar to Nordic peers, but in contrast to other European countries.<sup>17</sup> In addition, the country's reliance on exports is almost as strong as Germany making it more vulnerable to fluctuations in external demand and global supply chain disruptions.

Figure 23. Trade Openness and Hospitality Industry



<sup>17</sup> Other factors matter for vulnerability as well. The international travel restrictions were imposed on Sweden for a relatively long period and may have limited the number of foreign visitors, although increased domestic tourism may have partially compensated for that if people in Sweden travelled less abroad. In addition, Sweden is among countries with the highest share of jobs that can be performed from home, thereby increasing resilience to containment measures. Dingel and Neiman (2020) estimate that in Sweden 44 percent of jobs can be done from home, the third-highest rate in the world after Luxembourg and Switzerland.

### C. Job Seekers and Beneficiaries of Short-Term Work Schemes

Newly available weekly data on the number of registered job seekers in Nordic and other countries provide valuable insights into the impact of the crisis and containment policies. Such data are typically constructed from applications for social assistance and may therefore deviate from Labor Force Survey (LFS) estimates of the unemployment rate which are normally released at a monthly frequency and may not capture short-term or temporary spikes in the number of job seekers. These data come with caveats, including that they are subject to revisions, not seasonally adjusted and possibly inaccurate: In times of a severe shock, government agencies may be slow in processing applications, thereby understating the true extent of the number of job seekers. The latter may also be overstated if some applications are invalid, for instance if some individuals submit multiple applications. That said, weekly register-based figures of job seekers are one of the few high frequency indicators that directly measures a key macroeconomic outcome and has attracted much interest, including in the U.S. and other countries.

The increase in the number of jobseekers in Denmark, Norway, and Sweden (for which comparable weekly data are available) has followed different trends (Figure 24). In Sweden, the increase in job seekers has been somewhat slower, but contrary to Denmark and Norway, where the peak appears to have been reached, Sweden remained on a steady upward trend as of mid-July. In Sweden, the increase in jobseekers between early March and June has been almost 2 percentage points of the labor force in contrast with Denmark and especially Norway, where it has been much lower. This figure excludes employees that were given dismissal notices

Figure 24. Jobseekers

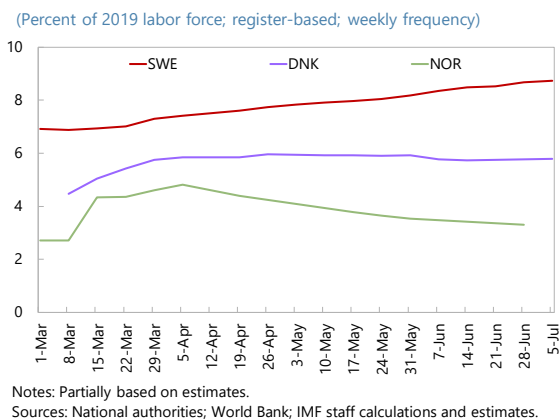
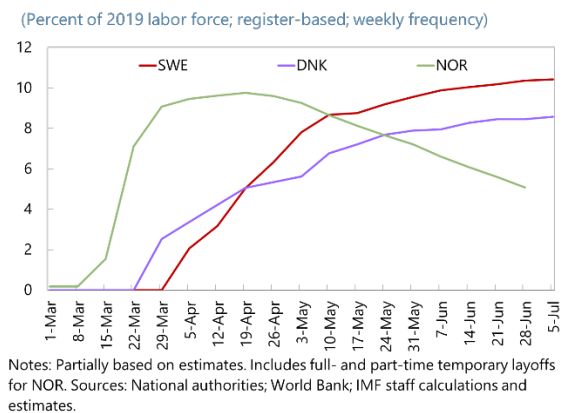


Figure 25. Beneficiaries of Short-term Work Schemes



However, ignoring workers that receive wage subsidies understates the adverse effects of the crisis on the labor market. Norway, Denmark, and Sweden have implemented wage subsidy schemes whereby firms can reduce the wage of employees that they pay, and the government

pays a subsidy that covers part of the reduction of the wage.<sup>18</sup> While the implementation differs in administrative terms (e.g., in Sweden, the subsidy is paid to the employer, whereas in Norway employees who are laid off temporarily on a part or full-time basis can apply for partial or full unemployment assistance), the economics of the schemes are similar.<sup>19</sup> They share common objectives: In addition to providing social protection by financing part of the wages of employees who work less or not at all, they avert permanent job losses, and enable firms to quickly start operating again as the crisis abates. Denmark, Norway, and Sweden have periodically published detailed information on the number of beneficiaries of these schemes. There are some gaps in the dataset, so some missing observations had to be estimated, and comparability is not perfect given differences in the schemes. For example, given that the reduction in the hours worked is different across countries, the fall in employment cannot be compared across countries and be inferred from comparing the number of beneficiaries.

The increase in the number of all beneficiaries of short-term work (for which rules differ across countries) as a share of the labor force amounts to around 10 percentage points in Sweden (Figure 25).<sup>20</sup> This figure still excludes applications for short-term work not yet processed. The initial increase in the number of job seekers and beneficiaries of short-term work schemes has been somewhat slower in Sweden than in Norway, possibly because a new short-term work scheme had only been implemented by early April, somewhat later than in Denmark and Norway.<sup>21</sup> Of course, at least some of the increase in the number of beneficiaries of short-term work schemes is temporary as the latter are generally expected to eventually return to work.

#### **D. Mobility Indicators**

Mobility indicators, which are based on cell phone data, are increasingly being used to track the effects of the pandemic. They measure the percentage change in mobility relative to a pre-determined baseline and are provided by the Apple Mobility Trends Reports and Google Covid-19 Community Mobility Reports. The indicators we use for the purpose of this paper include percentage changes in visits of workplaces, retail and recreation outlets, and transit stations provided by Google relative to the median value of the January 3–February 6 period

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<sup>18</sup> For Denmark, we have only considered the wage compensation scheme which has by far most beneficiaries.

<sup>19</sup> LFS unemployment statistics typically do not or not fully capture beneficiaries of short-term work schemes. See Riksbank (2020a) for a discussion.

<sup>20</sup> Another factor that potentially affects employment statistics by reducing the labor force and employment/unemployment numbers could be early retirement as pointed out by IMF (2020). The authors find that economic crises are typically associated with significant acceleration in the numbers opting for early retirement as well as disability claims. However, monthly data on early retirement applications for Denmark in March and April 2020 were in line with the same months in 2019 and did not suggest a surge in applications.

<sup>21</sup> Other countries show broadly similar patterns. New Zealand, which had at least temporarily one of the strictest lockdowns among all advanced economies, also publishes weekly unemployment. While the number of jobseekers increased only slowly and remained constant from around mid-May, the number of beneficiaries of wage subsidies increased much more rapidly.

in 2020. We also use the changes in requests for driving and transit directions relative to January 13, 2020 provided by Apple.

Compared to peers, the decline in mobility in Sweden was milder during the most severe lockdown period between mid-March and mid-April (Figure 26). Also, presence at workplaces and at retail and recreation outlets declined by much less in Sweden during this period. Transaction-level data from Swish, Sweden’s leading mobile payment provider, which is a popular means of payment for commuter services show a significant decline in payments for travel services.<sup>22</sup> Mobility indicators are certainly not a perfect measure of broad-based economic activity as at least some jobs continue to be performed irrespective of containment measures (for instance in critical areas, or those jobs that are suitable for telework). There is actually little correlation between the weekly number of job seekers and overall weekly employment. However, there is a strong correlation for example between weekly credit card purchases of services and visits to workplaces, indicating that mobility indicators at least partially measure economic activity (Figure 27).

Figure 26. Nordics: Changes in Mobility

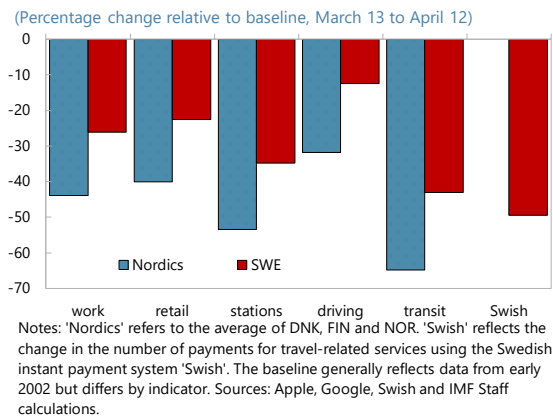
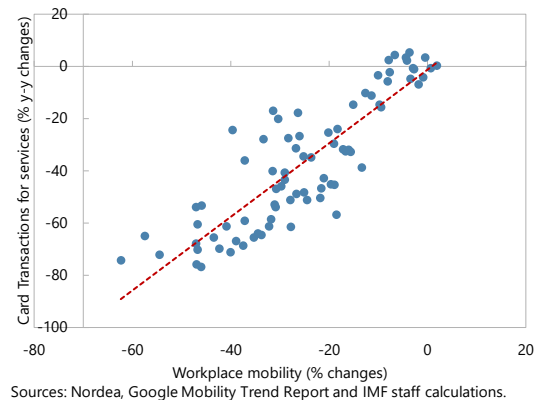


Figure 27. Nordics: Workplace Mobility and Card Transactions for Services



We run regressions at the country-day level to examine the correlation between containment policy and cell phone-based mobility:

$$M_{i,t} = \beta C_{i,t} + \delta Z_{i,t} + \varepsilon_{i,t}$$

where  $M_{i,t}$ ,  $C_{i,t}$  and  $Z_{i,t}$  denote the percentage change in cell phone-based visits to workplace mobility, the stringency of containment policy as measured by the Oxford Covid-19 Government Response Tracker and a range of control variables, including the number of infections and deaths, whether there is income support and other relief from governments, and whether there is comprehensive testing and contact tracing available (see Appendix II for details), respectively, and where indices  $i$  and  $t$  refer to the country and day. All regressions

<sup>22</sup> Cell phone-based mobility data come with caveats. They are not necessarily representative or comparable across countries, so they are only indicative.

control for unobserved county-week and country-day-of-week effects (to capture effects of country-specific holidays for instance). Our baseline sample includes 24 EEA countries for which data are available and the UK.

The results show that the stringency of containment policies has significant effects. In our baseline specification (first column in Table 2), an increase from 0 (no containment) to 100 (maximum containment) results in a decline of more than 50 percentage points in the presence of people at workplaces. Of course, this is a hypothetical scenario as only 5 countries within the EEA and no country in the Nordic region scored values above 90 in the stringency of containment at any point in time. The coefficient estimate is robust to different samples. In specifications 2 and 3, we only use Nordic countries and advanced economies, respectively, whereas in specification 4, we use all countries for which data are available.

Interestingly, when only including Nordic countries, the predicted decline in mobility as a result of moving from a scenario with no containment to one with the maximum level of containment increases (specification 2). This is plausible as in Nordic countries, it is likely that a relatively large share of jobs can be performed from home so that people are more willing to follow containment measures, and there is plausibly a stronger tradition of abiding by government rules and recommendations (specification 2).

The magnitude and the signs of coefficients of the control variables that are significant are plausible. The number of new infections and Covid-19-related deaths both dampen mobility. The availability of income support enables individuals to stay at home, implying that the negative sign of the coefficient is plausible as well. The coefficients on the availability of financial relief, testing and tracing are not significant (and the sign is not robust across specifications).

The results also imply that presence at workplaces decreased in Sweden by more than what would be expected from the regressions. When considering the approximate period of the most severe lockdown in the Nordic region as a whole, from March 13 until April 12, the average decrease in presence at retail and recreation outlets was somewhat larger in Sweden (by up to 8 percentage points which amounts to a third of the actual decline depending on the specification) than what would be expected from the regression (Figure 28). This suggests that individuals decided to voluntarily scale back certain activities above and beyond official recommendations and requirements that are reflected by the Oxford Covid-19 Government Response Tracker and implied by the other explanatory variables.

Table 2. Effects of Containment on Visits of Workplaces

VARIABLES	(1) workplaces	(2) workplaces	(3) workplaces	(4) workplaces
Containment policy (index)	-0.510*** (0.0543)	-0.612** (0.181)	-0.510*** (0.0511)	-0.519*** (0.0277)
New infections (7-day ave.)	-1.076*** (0.254)	-5.413*** (0.771)	-1.000*** (0.233)	-0.420*** (0.143)
New deaths (7-day ave.)	-5.628*** (1.609)	2.570 (17.71)	-5.659*** (1.628)	-6.228*** (1.550)
Income support	-5.875* (3.125)	9.521 (4.850)	-5.309* (2.909)	-2.000 (1.265)
Financial relief	-0.159 (2.751)	-3.168 (5.686)	-1.326 (2.673)	-1.894 (1.151)
Comprehensive testing	0.332 (1.534)	4.439 (4.691)	-0.309 (1.966)	-0.440 (1.152)
Comprehensive tracing	3.029 (1.835)	-1.132 (2.068)	2.724* (1.554)	0.0147 (0.905)
Observations	4,089	580	4,396	17,841
R-squared	0.860	0.796	0.873	0.903

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The dependent var is the percentage change in the cell-phone based visits of workplaces.

All specs include country-week and country-day-of-the-week FEs

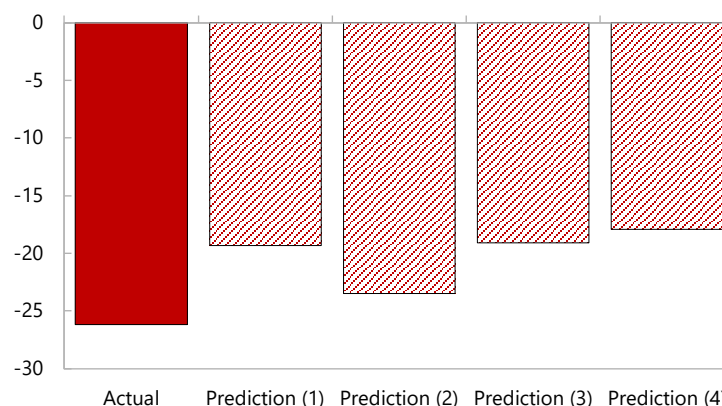
Errors in brackets clustered at the country level.

Data as of July 16.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 28. Sweden: Changes in Visits to Workplaces

(Percentage change rel. to baseline; actual vs. regresion-based prediction)



Notes: 'Actual' refers to the actually observed change in visits to workplaces; whereas the predictions are regression-based and refer to specifications (1) to (4). Baseline refers to data from early 2020. Sources: Google and IMF Staff calculations.

Our baseline coefficient estimates are robust to using alternative mobility indicators. In Table 3, specification (1), we use visits to transit stations; in specification (2), we use visits to retail and recreation outlets; in specification (3), we use the Apple driving indicator; and in specification (4), we use the Apple transit indicator (which is available for fewer countries). The coefficient estimates are remarkably robust and even increase relative to our baseline estimate.

Table 3. Robustness Checks

VARIABLES	(1) stations	(2) retail	(3) driving	(4) transit
Containment policy (index)	-0.561*** (0.0417)	-0.742*** (0.0697)	-0.654*** (0.0453)	-0.754*** (0.0946)
New infections (7-day ave.)	-0.836*** (0.150)	-0.621*** (0.178)	-0.529*** (0.128)	-0.479*** (0.126)
New deaths (7-day ave.)	-1.682 (1.468)	-3.173* (1.780)	-1.678 (1.221)	0.249 (1.034)
Income support	-5.479** (2.502)	-4.563 (2.865)	-3.922 (2.904)	-8.391* (4.289)
Financial relief	-2.466 (1.797)	-2.544 (2.349)	-3.129 (1.927)	-6.808* (3.665)
Comprehensive testing	0.144 (0.806)	1.222 (1.516)	-2.291* (1.182)	0.0214 (1.962)
Comprehensive tracing	2.983* (1.574)	1.819 (1.723)	1.464 (2.073)	6.153* (3.407)
Observations	4,089	4,089	4,019	2,453
R-squared	0.958	0.946	0.977	0.979

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The dependent var is the percentage change in cell-phone based mobility indicators.

All specs include country-week and country-day-of-the-week FEs

Errors in brackets clustered at the country level.

Data as of July 16.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## V. CONCLUSION AND POLICY IMPLICATIONS

Our preliminary findings indicate that at the time when other countries imposed a strict lockdown in March and April, economic activity appears to have declined less in Sweden. Sweden's private consumption and investment in 2020:Q1 fell only slightly, in contrast to more substantial declines in most other advanced economies. Sweden also experienced a smaller decline in mobility indicators and in the service sector compared to other advanced economies. Our analysis shows that these effects can be attributed to differences in containment strategies between Sweden and its peers.

However, at the time when other countries started opening up their economies in 2020:Q2, observed infection and death rates continued to be relatively high in Sweden, with potentially adverse economic effects. In 2020:Q2, Sweden's GDP fell by more than in Nordic peers, the number of jobseekers and beneficiaries of short-term work schemes remained high and the monthly economic activity indicator declined for longer than in international peers. However, the cumulative fall of GDP in the first six months of 2020 has been smaller in Sweden compared to other Nordic countries, and some of the decline in 2020:Q2 was driven by a fall in exports.

In addition, based on evidence from Sweden and Nordic peers, our analysis also suggests that other factors were important. Mobility in Sweden may have decreased more than what would

be expected from the relaxed de jure containment measures, suggesting that there was voluntary practice of social responsibility and distancing. In addition, external demand from trading partners and supply chain disruptions impact output regardless of the severity of the containment policies. This is reflected in the sharp contraction in manufacturing activity and the high share of its employees on short-term work. Finally, other structural features of the economy such the relative importance of the hospitality industry and the share of jobs that can be performed from home determine the economic effects of the containment strategy as well.

Looking ahead, it remains unclear how Sweden's containment strategy and its avoidance of a strict lockdown in particular will play out over the medium term.<sup>23</sup> Despite the relatively benign 2020:Q1 GDP outcome, almost all observers project a decline for the year that is similar to other Nordic countries. Any final verdict will also depend on whether, as a by-product of its approach, Sweden will be closer to achieving herd immunity, thereby increasing its resilience in the event of another wave of infection. While medical knowledge about Covid-19 is still accumulating, immunity gains—although on the rise—have been lower than initially projected.

The large number of deaths, particularly among elderly and in areas with a higher share of persons that are foreign-born or have foreign-born parents highlights the challenge of protecting the vulnerable in the absence of a more stringent lockdown, even in a country with favorable socio-demographic characteristics, including a very high share of single-person households. The outcome could have been worse in countries that may replicate Sweden's strategy but have different demographics, resources, or history of abiding by social contracts. Swift decisive macroeconomic policy action remains critical to avert more dire economic outcomes. Sweden's policy response to combat the economic impact of the pandemic has been prompt, large, and well-designed. Given its comfortable fiscal space, Sweden was in a good position to provide timely and substantial support to companies and households through various compensation schemes, guarantees, and tax deferrals.<sup>24</sup>

Future work could examine the effects of containment strategies in greater detail, including any differential effects of particular measures. The distributional effects of social distancing in Sweden and other Nordics could also be further explored. The evidence so far implies highly unequal effects. Recent research in this area include Furceri et al. (2020), who show that past epidemics led to increases in inequality; and Alstadsæter et al. (2020), who use

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<sup>23</sup> Riksbank (2020b) notes that the relationship between GDP growth in Sweden and that of its major trading partners may deviate from the pre-Covid patterns even in the longer run—in ways either more or less beneficial from a Swedish perspective.

<sup>24</sup> The IMF website provides a comprehensive list of fiscal, monetary and macro-financial measures that were implemented across the globe. See <https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/06/15/pp041118-assessing-fiscal-space> for a discussion on the concept of fiscal space.



register-based data from Norway, show that temporary layoffs affected financially vulnerable parts of the population to a relatively large extent.

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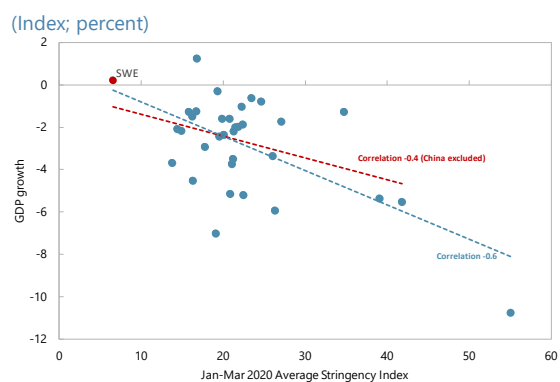
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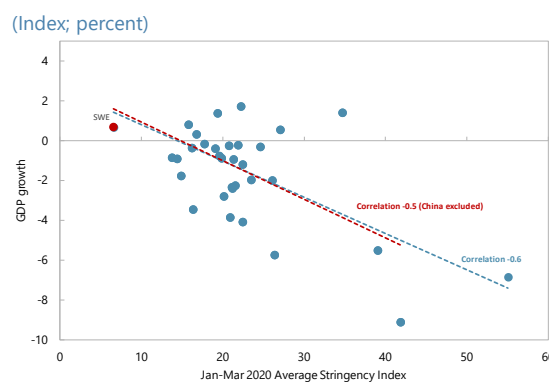
## APPENDIX I. CORRELATION BETWEEN 2020:Q1 GROWTH AND CONTAINMENT POLICIES

Figure A.1. Stringency of Containment and GDP QoQ Growth, 2020:Q1



Sources: National authorities, Oxford COVID-19 Government Response Tracker; IMF Staff calculations.

Figure A.2. Stringency of Containment and GDP YoY Growth, 2020:Q1



Sources: National authorities, Oxford COVID-19 Government Response Tracker; IMF Staff calculations.

In this Appendix, we present a few alternative scatter plots and the associated correlation coefficients of containment measures and GDP growth in 2020:Q1, using different sample and YoY GDP growth. Excluding China from the sample weakens the inverse relationship between growth and the stringency of containment, and the correlation coefficient between QoQ growth and the stringency of containment increases to  $-0.4$  but remains statistically significant. This possibly reflects the strict enforcement of containment measures in China. The YoY GDP growth and the stringency of containment measures seem to be more robust to outliers, with the correlation coefficient increasing from  $-0.6$  to  $-0.5$  when China is omitted from the sample.

## APPENDIX II. DESCRIPTION OF VARIABLES USED FOR THE ECONOMETRIC ANALYSIS

Variable	Description	Source
Containment policy (index)	Index measuring the stringency of containment on scale from 0 to 100	Hale et al. (2020)
New infections (7-day ave.)	7-day rolling average of new daily infections per 100,000 inhabitants	Johns Hopkins University
New deaths (7-day ave.)	7-day rolling average of new Covid-19-related deaths per 100,000 inhabitants	Johns Hopkins University
Income support	Dummy; indicates whether government provides any type of income support to individuals	Hale et al. (2020)
Financial relief	Dummy; indicates whether the government provides any type of relief from financial obligations	Hale et al. (2020)

Comprehensive testing	Dummy; indicates whether there is at least testing for anyone showing Covid-19 symptoms	Hale et al. (2020)
Comprehensive tracing	Dummy; indicates whether there is comprehensive contact tracing for all identified cases	Hale et al. (2020)
workplaces	Percentage change relative to baseline in visits to workplaces	Google
stations	Percentage change relative to baseline in visits of transit stations	Google
retail	Percentage change relative to baseline in visits of retail and recreation outlets	Google
driving	Changes in requests for driving directions relative to baseline	Apple
transit	Changes in requests for transit directions relative to baseline	Apple

### APPENDIX III. ANNOUNCED FISCAL, MONETARY AND MACRO-FINANCIAL POLICY RESPONSES AS OF JUNE 2020

	Fiscal Policies (% 2019 GDP)		Monetary Policies				Macro-Financial Policies			
	Discretionary Measures	Government Guarantees	Policy Rate Deduction	Liquidity Provision	Quantitative Easing	Swap Lines	Release CCyB/Systemic Risk Buffer	Easing Liquidity Buffers	Easing Amortization Requirement	Advice against Dividend Payouts
Sweden	5.6	4.6	-	x	x	x	2.5%	x	x	x
Norway	5.2	4.3	125	x	x	x	1.5%	x	x	x
Denmark 1/	5.7	7.7	*	x		x	1.0%	x		x
Finland 2/	2.9	5.4	**	x	x	x	1.0%	x	x	x

Notes:  
1/ Denmark is pegged to the Euro. \* Danmarks Nationalbank (DNB) is selling/buying foreign currency when the exchange rate is deviating from its bands. In March the DNB increased interest rates by 15 bsp to defend the fixed exchange rate regime.  
\*\* Finland is part of the Euro Area with the ECB in charge of monetary policy.