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Employment dynamics across firms during COVID-19: The role of job retention schemes

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EMPLOYMENT DYNAMICS ACROSS FIRMS DURING COVID-19: THE ROLE OF JOB RETENTION SCHEMES

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ABSTRACT/RÉSUMÉ

Employment dynamics across firms during COVID-19: The role of job retention schemes

This paper analyses employment dynamics across firms during the COVID-19 pandemic and the role of job retention schemes (JRS) in shaping these dynamics. It relies on a novel collection of high-frequency harmonised micro-aggregated statistics, computed using administrative data on employment and wages from electronic payroll records across 12 countries linked to monthly information on policy support during COVID-19, as well as on a new indicator of JRS de-jure generosity. The analysis highlights four key findings: i) the employment adjustment margins varied over time, adjusting mainly through the intensive margin in 2020, while both the intensive and the extensive margins contributed to employment changes in 2021; ii) the reallocation process remained productivity enhancing, although to a lower extent on average compared to 2019; iii) JRS were successful in their purpose of cushioning the effect of the crisis on employment growth and firm survival; iv) JRS support did not distort the productivity-enhancing nature of reallocation.

Keywords: Reallocation, Productivity, Employment dynamics, Job retention schemes, COVID-19

JEL classification codes: D22, D24, J08, J2, O47.

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La dynamique de l'emploi au sein des entreprises pendant le COVID-19:
Le rôle des dispositifs de maintien dans l'emploi

Ce papier analyse la dynamique de l'emploi au sein des entreprises pendant la pandémie de COVID-19 et le rôle joué par les dispositifs de maintien dans l'emploi. L'étude s'appuie sur de nouvelles données de haute fréquence harmonisées et collectées au niveau micro-agrégé, qui ont été calculées à partir de données administratives sur l'emploi et les salaires provenant de registres électroniques de paie de 12 pays. Ces données ont été couplées à des données mensuelles sur les politiques de soutien durant le COVID-19, ainsi qu'un nouvel indicateur de générosité « de jure » des dispositifs de maintien dans l'emploi. L'analyse met en évidence quatre principaux résultats : i) les marges d'ajustement de l'emploi ont varié dans le temps, l'ajustement se faisant principalement par la marge intensive en 2020, tandis que les marges intensive et extensive ont toutes deux contribué aux changements de l'emploi en 2021; ii) le processus de réallocation a continué d'améliorer la productivité, bien que dans une moindre mesure en moyenne par rapport à 2019; iii) les dispositifs de maintien dans l'emploi sont parvenus à atténuer l'effet de la crise sur la croissance de l'emploi et la survie des entreprises; iv) ces dispositifs n'ont pas altéré les fonctions d'amélioration de la productivité associées à la réallocation.

Classification JEL: D22, D24, J08, J2, O47.

Mots-clés: Réallocation, Productivité, Dynamique de l'emploi, Dispositifs de maintien dans l'emploi, COVID-19.

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1. Introduction

1. In response to the massive drop in economic activity caused by COVID-19 and containment measures, governments in OECD countries quickly introduced widespread policy support to mitigate the negative employment and social consequences of the economic crisis, and to shelter firms from the shock. While effective in the short term in preserving jobs and avoiding losses to human capital, this support may actually distort the productivity enhancing nature of reallocation of labour across firms that underpins aggregate productivity growth.[2] Three years after the onset of the pandemic, its implications combined with the impact of policy interventions are yet to be fully understood. Providing novel evidence in this direction is key to inform policy design and action going forward. In particular, it is not yet clear whether policies have generated distortions and inefficient job preservation or if, on the contrary, they have preserved productive firms, efficient worker-employer relationships, and avoided human capital destruction in the most productive firms.

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The analysis is the result of a collaboration project between two OECD Departments, namely the Economics Department and the Directorate for Science, Technology and Innovation, and would not have been possible without the valuable contribution of national experts from the Central Bank, the Ministry of Economy and/or Finance, Revenues and Customs, or National Statistical Office of the countries participating to the project.

[2] On the importance of the reallocation of resources across firms for aggregate productivity growth, see for instance OECD (2015[29]) or Foster, Haltiwanger and Krizan (2001[30]).

2. While a direct analysis of the full implications of the crisis for productivity requires data that are not yet available on a cross-country basis and for longer time horizons, this paper aims to fill the gap in three ways. First, it explores employment dynamics over the crisis, considering the role of both employment growth of surviving firms (intensive margin) and firm survival (extensive margin), as well as the productivity-enhancing nature of the resulting reallocation of labour across firms within sectors.[3] It does so by collecting novel and timely data that circumvent limitations in the cross-country availability of direct information on productivity in a timely fashion. Second, it provides novel information on government support and its allocation across firms, according to firm size and position in the wage distribution (a relevant proxy for relative productivity). Third, it analyses the extent to which policy intervention and in particular job retention schemes (JRS, henceforth) cushioned the impact of the crisis on employment and firm survival in different sectors of the economy and how such government support may have affected the productivity-enhancing nature of reallocation.

3. The analysis relies on the novel collection and analysis of high-frequency harmonised micro-aggregated statistics using firm- or worker-level data across countries, based on a distributed approach (Berlingieri et al., 2017[1]) that relies on a common Stata routine prepared by the OECD. More specifically, administrative data at the worker (linked employer-employee) or firm-level (depending on availability) are first used to compute firm-level measures relevant to the analysis of employment reallocation during COVID-19 – including employment growth, job creation and destruction, hiring and separation rates, among others. These measures are then micro-aggregated (computing aggregates, averages, standard deviations or percentiles) according to relevant firm dimensions (including detailed economic activity by SNA-A38 sectors, size classes, wage quantiles, survival status and policy uptake) and different combinations of these dimensions.

4. The use of high-frequency data covering almost the universe of firms and/or workers, and almost the entire crisis period (i.e., until the end of 2021 for most countries) allows for a comprehensive analysis of employment dynamics. This includes exploring adjustments along the intensive and extensive margin, as well as labour reallocation along several characteristics (e.g., firms' size or the productivity distribution). Given the lack of information on firm-level productivity in the data for a substantial number of countries, the report considers the average wage paid by firms pre-crisis as a proxy for relative productivity, based on the observation that firm-level wages are highly correlated to marginal productivity in the private sector (Berlingieri, Calligaris and Criscuolo, 2018[2]).

5. To evaluate the role of JRS in shaping employment dynamics during COVID-19, we rely on two complementary measures: i) an in-sample, firm-level measure of JRS uptake to compare employment dynamics of firms that took up support with those that did not, and ii) a new cross-country and time-varying measure developed to benchmark the generosity of JRS across countries, which has both the advantage of allowing comparisons across countries for which firm-level JRS uptake data are not available or JRS were not in place, and of being less prone to endogeneity due to self-selection when used to evaluate employment responses to policy.

6. The analysis proceeds in several steps and leads to the following findings. First, employment dynamics is explored focusing on both the intensive (comparing net employment growth of surviving firms in 2020/21 with growth in 2019) and the extensive (comparing survival rates) margins. Results suggest that the margins according to which employment growth adjusted varied over time during the crisis. In 2020, employment adjusted to the shock mainly along the intensive margin: the overall employment growth of surviving firms was significantly lower than in 2019, while survival rates remained stable, or even increased in some countries. By contrast, in 2021 adjustments in terms of employment growth occurred

[3] This paper takes advantage of granular information on firm dynamics across several dimensions within sectors to explore patterns of reallocation within sectors. This complements existing studies that focus on cross-sectoral reallocation (Barrero, Bloom and Davis, 2020[20]; Barrero et al., 2021[21]).

along both margins, in opposite directions: net employment growth began to return into positive territory while survival rates started to decline compared to 2019.

7. Second, the paper examines whether these dynamics were enhancing or damaging for productivity, by comparing the relative employment growth of lower and higher productivity firms, also shedding light on the differences that arise with respect to the pre-crisis. Overall business dynamics remained productivity-enhancing in 2020, due in particular to a robust link between firm survival and relative productivity. However, the crisis and related support seemed to weaken the continuous process of productivity-enhancing labour reallocation relative to 2019 but did not distort it. Indeed, while overall employment reallocation in 2020 was still productivity enhancing, with larger net employment growth in high-productivity firms, the difference in net employment growth between firms in the middle- and high-productivity groups and those in the lowest productivity group was significantly smaller than in 2019. A similar pattern is observed in 2021 with respect to employment reallocation among surviving firms, while the positive contribution of the extensive margin to productivity-enhancing reallocation strengthens again.

8. Third, to complement the previous findings, the paper provides information on the uptake of JRS across firms and explores the role played by JRS in shaping employment dynamics and the reallocation patterns. The results show that JRS were successful in their purpose of cushioning the effect of the crisis on employment growth and firm survival. Thus, they potentially mitigated long-term scars from the crisis, as they helped preserve the connection between workers and firms and curbed the premature exit of firms, especially in sectors most exposed to the crisis (due to a lower potential for telework). However, this temporary "mitigation" effect did not result in distortions of the productivity-enhancing nature of reallocation. In the medium term (1-year horizon), instead, differences in survival rates between firms that took up support and those that did not receive support remain positive while differences in terms of employment growth tend to turn negative.

9. Regression analyses exploiting the new JRS indicator reinforce these findings and suggest that, following a tightening of the pandemic containment measures, employment growth was on average 2.2 p.p. lower and exit 0.16 p.p. higher in the absence of JRS, relative to when generous JRS were in place. Finally, our results suggest that job retention schemes did not significantly distort the productivity-enhancing nature of reallocation. JRS uptake at the bottom of the productivity distribution was on average lower than for other firms, though the relationship is heterogeneous across countries, and JRS support benefitted firms of all productivity levels in all countries considered. Point estimates suggest a higher 12-months survival rate for supported firms, to some extent especially for higher productivity ones.

10. This paper relates to several strands of literature, including those on the COVID-19 crisis (see Box 1 for a review). It contributes to it in two main ways. First, it proposes one of the largest cross-country analyses of employment dynamics during the COVID-19 crisis based on the universe of firms. This allows highlighting important trends that are common across countries, while disentangling country-specific dynamics that are related with each setting. Most papers on the topic are country specific, with a few exceptions such as Andrews et al. (2021[3]) covering three English-Speaking countries, Bighelli et al. (2021[4]), five European Union countries, and Harasztosi and Savšek (2022[5]) and Apedo-Amah et al. (2020[6]) who cover a large number of countries but rely only on a small subsample of firms. Second, the analysis is the first to exploit cross-countries differences in policy design of JRS, using a new indicator of the *de jure* generosity of support. Using information on support that is comparable across countries enables to assess its impact across different settings and to draw more general conclusions.

Box 1. The COVID-19 crisis, employment, and policies

This paper relates to the strand of literature analysing employment dynamics during COVID-19 and whether more productive firms continued to benefit from the resulting reallocation of labour. Harasztosi and Savšek (2022[5]) use survey data covering almost 19 000 firms in 32 countries and show that more productive firms coped with the crisis better in terms of closures and adjustments in production through remote work. Kozeniauskas et al. (2020[7]) find similar results based on a survey of Portuguese firms, reporting that high productivity firms were less likely to lay off employees. Andrews, Charlton and Moore (2021[3]), using near-real-time data for Australia, New Zealand and the United Kingdom, also show that while labour turnover fell in response to the pandemic, job reallocation remained connected to firm productivity, with high productivity and tech-savvy firms being relatively less harmed. Apedo-Amah et al. (2020[6]) rely on survey data covering 1 000 firms in 51 countries and find that smaller firms (likely less productive) were disproportionately impacted by the pandemic, particularly via financial constraints.

This paper is also linked to the strand of literature exploring whether the probability of firm exit remained inversely related to productivity during the pandemic, signalling limited distortions to the process of creative destruction. Cros et al. (2021[8]) show that factors that predicted firm failures (primarily productivity and debt) before the pandemic have also played a key role during the pandemic in France. Piette and Tielens (2022[9]) find similar results for Belgium. By contrast, Bettendorf et al. (2021[10]) find that government support disrupted the creative destruction process in the Netherlands by saving a disproportionately high number of low-productivity firms, though these conclusions were nuanced by Seip et al. (2022[11]).

Finally, the paper relates to the few papers that explored the impact of JRS during the pandemic and whether this impact changed over time. Aiyar and Dao (2021[12]) analyse the impact of JRS in Germany and show that support take-up significantly dampened the response of unemployment to the labour demand shock. Back-of-the-envelope calculations suggest that unemployment would have been 3 percentage points higher in the second quarter of 2020 in the absence of the program’s expansion. Konings et al. (2023[13]) use administrative data on the universe of firm subsidies during COVID-19 for the Flanders region in Belgium and show that exiting firms are on average less productive than surviving firms thanks to policy support. Andrews, Bahar and Hamburg (2021[14]) show that policy support has been productively distributed, but as the economy recovered, the scheme became more distortive, benefiting more low productivity firms.

2. Data collection: new micro-aggregated data and a new policy indicator

11. The analysis presented in this paper relies on the data collection effort undertaken during 2022 by the OECD Economics Department and the OECD Directorate for Science, Technology and Innovation, with the essential contribution of country delegates and experts. The list of participating countries, the participating institutions and researchers are laid out in Table A.1.

2.1. New data on employment dynamics using a distributed microdata approach

12. The project uses timely monthly or quarterly administrative data on employment and wages from electronic payroll records (henceforth “employment data”) linked to monthly information on policy support during COVID-19 (henceforth “policy data”) as the main source of information. The data are highly representative and cover almost the universe of firms or employer-employee relationships in the non-financial business sector – including manufacturing, non-financial market services and construction – over

the 2019 to 2021 period. This combination of timeliness, granularity and broad coverage provides a unique source of analysis, allowing us to look at the detailed micro level and at the same time to give conclusions that are relevant at the macroeconomic level.

13. As the data are based on confidential country-specific information at the firm or worker-level, the project is based on a distributed micro-aggregated data approach, to collect harmonised and non-disclosive data that can be used directly in cross-country analyses. The methodology follows closely similar distributed micro-aggregated data projects on employment and business dynamics (DynEmp), and on productivity dynamics (MultiProd) and Innovation Support Policies (MicroBeRD) led by the Directorate for Science Technology and Innovation for the Committee on Industry Innovation and Entrepreneurship (CIIE). Specifically, the OECD developed a flexible STATA routine that could run in a decentralised manner across different country-specific data settings and was executed by national experts from the Central Bank, the Ministry of Economy and/or Finance, Revenues and Customs, or National Statistical Office having access to the national micro-level data.

14. The program carries out a series of consistency checks and cleaning of the micro-level data, and computes firms measures of employment dynamics that shed light on reallocation during COVID-19 – including job creation and destruction, employment growth, hiring and separation and firm survival. These measures are then micro-aggregated (computing aggregates, averages, standard deviations or percentiles) in a harmonised way at a detailed level according to relevant firm dimensions: this includes SNA-A38 sectors (based on ISIC revision 4 at a detailed two-digit level, see appendix for further details and labels used throughout the report), size classes, wage level groups (quantiles), survival status and policy uptake. The routine prepares several output files sent back to the OECD (henceforth "OECD COVID-19 employment and business support dataset") for comparative cross-country analyses, each corresponding to a different breakdown of the data, i.e., different combinations of dimensions, to account for firms' heterogeneity when exploring reallocation dynamics. Annex A provides a detailed overview of all variables computed and breakdowns analysed.

15. Results have been collected for 12 participating countries: Australia, Belgium, Canada, Costa Rica, Denmark, Italy, Latvia, the Netherlands, New Zealand, Norway, the Slovak Republic and the United Kingdom.

16. The project leverages longitudinal data providing information on employment and wages either at the worker-firm-level, or at the firm-level (see Table 1).[4] All countries have employment and policy data at the monthly frequency, except for Belgium that has quarterly data. Nine countries have data on job retention schemes uptake (all except Belgium and Italy, as well as Costa Rica which did not have any JRS in place), seven countries on the uptake of direct subsidies (Canada, Denmark, Italy, Latvia, the Netherlands, New Zealand, and Norway), three countries on the uptake of loan facilities (Canada, Italy, New Zealand) and two countries on the uptake of moratorium facilities (Italy, the Netherlands). Thus, data coverage across countries is heterogeneous, especially with respect to the availability of policy data, and therefore the sample of countries may vary for specific exercises. Table 1 provides an overview of the level of aggregation and policy variables available for each country included in the sample.

[4] The original dataset underlying the micro-aggregated moments collected for the United Kingdom are worker-firm level. However, the worker-level data have been aggregated at the firm-level by national experts to alleviate computation constraints, and thus the data used in the analysis are based on statistics computed from firm-level information.

Table 1. Summary of data availability across countries

Data availability across participating countries						
Country	*Level*	*Frequency*	*JRS*	*Direct subsidies*	*Loan facilities*	*Moratorium*
Australia	Worker-firm	Monthly	Yes	No	No	No
Belgium	Firm	Quarterly	No	No	No	No
Canada	Firm	Monthly	Yes	Yes	Yes	No
Costa Rica	Worker-firm	Monthly	No	No	No	No
Denmark	Worker-firm	Monthly	Yes	Yes	No	No
Italy	Firm	Monthly	No	Yes	Yes	Yes
Latvia	Worker-firm	Monthly	Yes	Yes	No	No
Netherlands	Worker-firm	Monthly	Yes	Yes	No	Yes
New Zealand	Worker-firm	Monthly	Yes	Yes	Yes	No
Norway	Worker-firm	Monthly	Yes	Yes	No	No
Slovak Republic	Worker-firm	Monthly	Yes	No	No	No
United Kingdom	Firm*	Monthly	Yes	No	No	No

Note: The United Kingdom had originally worker-firm level data, which are ex-ante aggregated at the firm-level for participating in the project.

17. Enriching the dataset with yearly data providing information on firms' pre-COVID-19 productivity levels would have been possible only for a limited number of countries. Hence, in order to maximise comparability and cross-country coverage, but still be able to rank firms according to their position along the sector-level productivity distribution, the current analysis relies on existing evidence of a monotonic relationship between firm level productivity and its average wage in the private non-financial business sector (Berlingieri, Calligaris and Criscuolo, 2018[2]). Therefore, throughout the analysis, firms' relative position in the wage distribution is considered as a valid proxy for their relative position in the productivity distribution.[5]

2.2. A new cross-country indicator of JRS de jure generosity

18. Job retention schemes have been the most widespread policy instrument to support workers and firms across OECD countries. However, the implementation of the programs, in particular regarding eligibility requirements and provisions related to amounts dispensed, may be key to employment dynamics during the crisis. Yet, a database allowing researchers to systematically compare them across countries and over time does not exist, thus hampering efforts to understand how their specific institutional design may affect employment and more broadly labour market dynamics during the crisis. To further investigate the role of JRS in accounting for such differences, we propose a new cross-country and high frequency (monthly) synthetic indicator of job retention schemes de-jure generosity, which has also the advantage of being less prone to endogeneity than complementary measures of in sample policy uptake.[6]

[5] The literature has shown a strong connection between firm (average) wage and firm productivity for both manufacturing and non-financial market services; a similarly strong connection holds between productivity and size in manufacturing sectors, but tends to be weaker in services and this is why firm (average) wage is our main proxy for productivity (Berlingieri, Calligaris and Criscuolo, 2018[2]). Recent OECD research has further confirmed the relevant role of firms in wage dispersion (Criscuolo et al., 2020[35]; Criscuolo et al., 2021[34]). To some extent differences in wages between firms with different levels of productivity may reflect a sorting of workers with higher education and more experience into more productive firms paying higher wage. Moreover, the positive relation may also arise from the sharing of productivity-related rents between firms and workers.

[6] For a more general discussion on job retention schemes during the COVID-19 crisis, see for instance OECD (2020[38]), OECD (2021[15]) and OECD (2022[39]), while Demmou et al. (2022[37]) for an overview on their role in alleviating liquidity constraints. Moreover, note that, building on the framework developed by Hijzen and Venn

19. The indicator takes into account and aggregates information from three different types of JRS: wage subsidy (WS), short-time work (STW) and furlough (FS) schemes.[7] Most of the countries participating in the project had either a STW/FS (Belgium, Denmark, Italy, Norway, the United Kingdom) or a WS (Australia, Canada, the Netherlands, New Zealand) scheme during the most acute phases of the pandemic, but some had both (Latvia, the Slovak Republic) and others (Costa Rica) did not have any. While all WS schemes were designed anew for the pandemic, there is more heterogeneity among STW/FS schemes: some pre-dated it, whereas others were designed specifically to address the crisis.

20. To build the indicator, we recover relevant information on the design of the several JRS from statutory laws, text found on governments' websites explaining the programs and related OECD work (OECD, 2021[15]).[8] We divide relevant provisions into two broad categories: (i) eligibility requirements, and (ii) provisions related to the financial aid provided. The formers determine which firms qualify to the schemes, while the latter capture how much financial assistance is provided by the government. We then construct two area indices, which range between 0 and 1, and take the average between the two to create a synthetic indicator, measuring the overall generosity of JRS. The indicator takes higher values the easier it is for firms to access the scheme and the larger it is the financial aid provided.[9] When the same country has more than one scheme in place, we consider the most generous scheme as reference for the synthetic indicator. Annex B provides a detailed description of the provisions considered and of the methodology used to build the indicator.

2.3. Indicators on the intensity of the COVID-19 shock and sectoral exposure

21. Finally, the analysis further relies on measures that proxy for the intensity of the shock or exposure of firms respectively at the country-time and at the sector level: the Oxford Covid-19 Government Response Tracker, henceforth "containment stringency index" (Hale et al., 2021[16]), and a sector level measure of the organisational feasibility to telework at the SNA A38 level presented in (OECD, 2021[17]), in turn building on (Espinoza and Reznikova, 2020[18]). The containment stringency index is a composite measure based on nine indicators of the policy responses implemented by governments to contain the COVID-19 pandemic. Government responses had a direct impact on firms and could be considered as a time-varying proxy for the intensity of the shock faced by the corporate sector in each country. The sectoral teleworkability indicator is built using a task-based measure of potential for telework, aggregated to SNA A38 industries. Firms in sectors where the feasibility of telework is higher should have been better equipped to continue doing business despite the pandemic and the associated restrictions. Hence, the lack of ability

(2011[31]), Boeri et al. (2011[32]) made an earlier attempt to construct a synthetic indicator for short-time work schemes with the aim to study their effects during the global financial crisis.

[7] In general terms, WS are based on subsidies paid to the firm depending on whether it experiences a drop in sales relative to some reference period, and independently of whether workers are put on reduced working hours or not. Instead, STW and FS schemes are based on a reduction of working hours, where subsidies are paid only for those workers that are put on reduced hours, while the government is taking over part of the wage for the hours not worked. The main difference between a STW and a FS scheme is that under the latter subsidies are paid only for workers that are put on furlough (100% reduction in working hours), whereas STW schemes are more flexible and cover also workers that are on partially reduced hours.

[8] For an example of a webpage describing the program, see here: Canada Emergency Response Benefit (CERB) - Canada.ca.

[9] Note that, in building the indicator, we take the firm's and not the worker's perspective. While potentially overlapping over many dimensions, they may not always coincide with respect to the generosity of JRS – see OECD (2020[38]) and OECD (2021[15]) for a detailed discussion. As an example, the potential obligation for firms to top-up the government subsidy to maintain workers earnings unchanged implies a less generous scheme from the firm perspective but a more generous one from a worker perspective.

to telework could be used as a proxy for the exposure to the shock across sectors, allowing us to distinguish between most and less exposed sectors.

3. Employment dynamics and productivity-enhancing reallocation during the COVID-19 crisis

22. This section provides a broad overview of employment dynamics and the potential consequences for productivity via the resulting reallocation of labour across firms, also shedding light on the heterogeneity across sectors and countries. These dynamics are further decomposed into employment growth only for firms that remained in business for the entire period (thereby focusing on the intensive margin of employment dynamics) and survival rates of firms in the same period (thereby focusing on the extensive margin).

3.1. The intensive and extensive margins of employment growth

23. In order to assess the overall dynamics of employment along the intensive and extensive margins, the report provides estimates of changes in employment growth and survival rates in 2020 and 2021 relative to 2019. To this aim, we focus on a country-sector measure of employment growth and survival rates between January of each year and January of the next year, for firms active at the beginning of the period considered.[10] The change in employment growth and survival is then estimated with the equation below:

$$y_{c,s,t} = \alpha + \beta_1 1(year = j) \ + \delta_{c,s} + \varepsilon_{c,s,t} \tag{1}$$

24. Where $y_{c,s,t}$ is the measure of employment growth or survival rate in country *c,* sector *s,* and year t. The term $1(year = j)$ denotes a dummy variable equal to one for year j=2020 (or j=2021) and zero for year j=2019. The regression is weighted according to the average size of a sector within country, measured as the average share of a sector in terms of employment or number of firms (depending on the outcome $y_{c,s,t}$ analysed).[11] The term $\delta_{c,s}$ denotes country-sector fixed effects and controls for systematic differences in employment growth or survival rates across countries and sectors, and its inclusion implies that the model focuses on the time variation of the outcome within country-sector pairs. The coefficient $\beta_1$therefore

[10] For instance, overall employment growth in 2020 in a country *c*, sector *s* is measured as the aggregate employment growth between January 2020 and January 2021, for firms active in January 2020. Analytically, the employment growth from t to *t*+*k* (k=12) is defined as follows: $Empl^t_{c,s,t\rightarrow t+k} = (empl^t_{c,s,t+k} - empl^t_{c,s,t})/0.5(empl^t_{c,s,t+k} + empl^t_{c,s,t})$, where $empl^t_{c,s,t+k}$ is the employment at time *t*+*k* of firms active at time *t* in country *c*, sector *s* (employment at time t+k in exiting firms that exit between *t* and *t*+*k* is zero). The regression analysis allows us to estimate the change across countries and sectors in the 2020 employment growth relative to the 2019 growth, measured as the employment growth between January 2019 and January 2020, for firms active in January 2019. Note that the total employment growth accounts for the dynamics related to firms that are active at the beginning and end of period, but also related to the job destruction of firms that exit between the two points in time. Separate regressions are estimated to measure the change in employment growth and survival rates in 2021 and 2020 relative to 2019.

[11] For regressions focusing on employment growth as the outcome variable ($y_{c,s,t}$) observations are weighted according to the average share of sectors within countries in terms of employment, while for regressions focusing on survival rates observations are weighted according to the average share of sectors within countries in terms of number of units. Weights are time invariant.

measures the (weighted average) change in the outcome *y* in year *j* (either 2020 or 2021), relative to the pre-crisis baseline level in 2019.[12]

25. Comparing total employment growth between January of 2019 and January 2020 for firms active in January 2019, with employment growth between January 2020 and January 2021 for those active in January 2020, we find that overall employment growth in the year 2020 was significantly lower than employment growth in 2019. This decline in growth seems to be mainly the result of a change along the intensive margin. Employment growth declined markedly among surviving firms (those active throughout the entire period), while survival rates did not vary significantly (Panel A, Figure 1). On the contrary, 2021 saw a significant decrease in survival rates, while employment growth increased relative to 2019 levels, suggesting a (partial) recovery for firms that survived (Panel B, Figure 1).[13] This is in line with country specific studies covering the start of the pandemic and showing that at the beginning of the pandemic the majority of job destruction was attributable to job losses in continuing businesses and not to firm exits (Lafrance-Cooke, 2021[19]; Apedo-Amah et al., 2020[6]).

26. Differences in employment growth in 2020 and 2021 relative to 2019 are contingent on the ability of workers in different sectors to continue working by performing their tasks through telework.[14] Indeed, increases in job destruction rates were significantly higher in low-telework sectors in 2020 relative to 2019, and job creation rates seem to decrease relative to 2019 only in low-telework sectors. By contrast the increase in job creation rates in 2021 relative to 2019 appears more homogeneous across sectors, with slightly higher point estimates in low telework sectors. This suggests that dynamics related to the crisis and the recovery may have induced sectoral reallocation from sectors with a low capacity to telework to sectors with a higher capacity to telework, although such sectoral reallocation may be temporary as mitigated by the recovery of low telework sectors in terms of job creation rates in 2021.

Importantly, these aggregated results mask high cross-country heterogeneity. Decreases in overall employment growth in 2020 relative to 2019, accounting for both the dynamics of surviving and exiting firms, were larger in some countries, like Latvia or Costa Rica, but not significantly different from zero in others, like Belgium or the Slovak Republic (Panel A, Figure 2).[15] Differences in survival rates are even starker. In fact, while some countries, such as Costa Rica, saw their survival rates decreasing over the period, other countries, such as Italy, saw them increasing significantly over this period (Panel B, Figure 2).

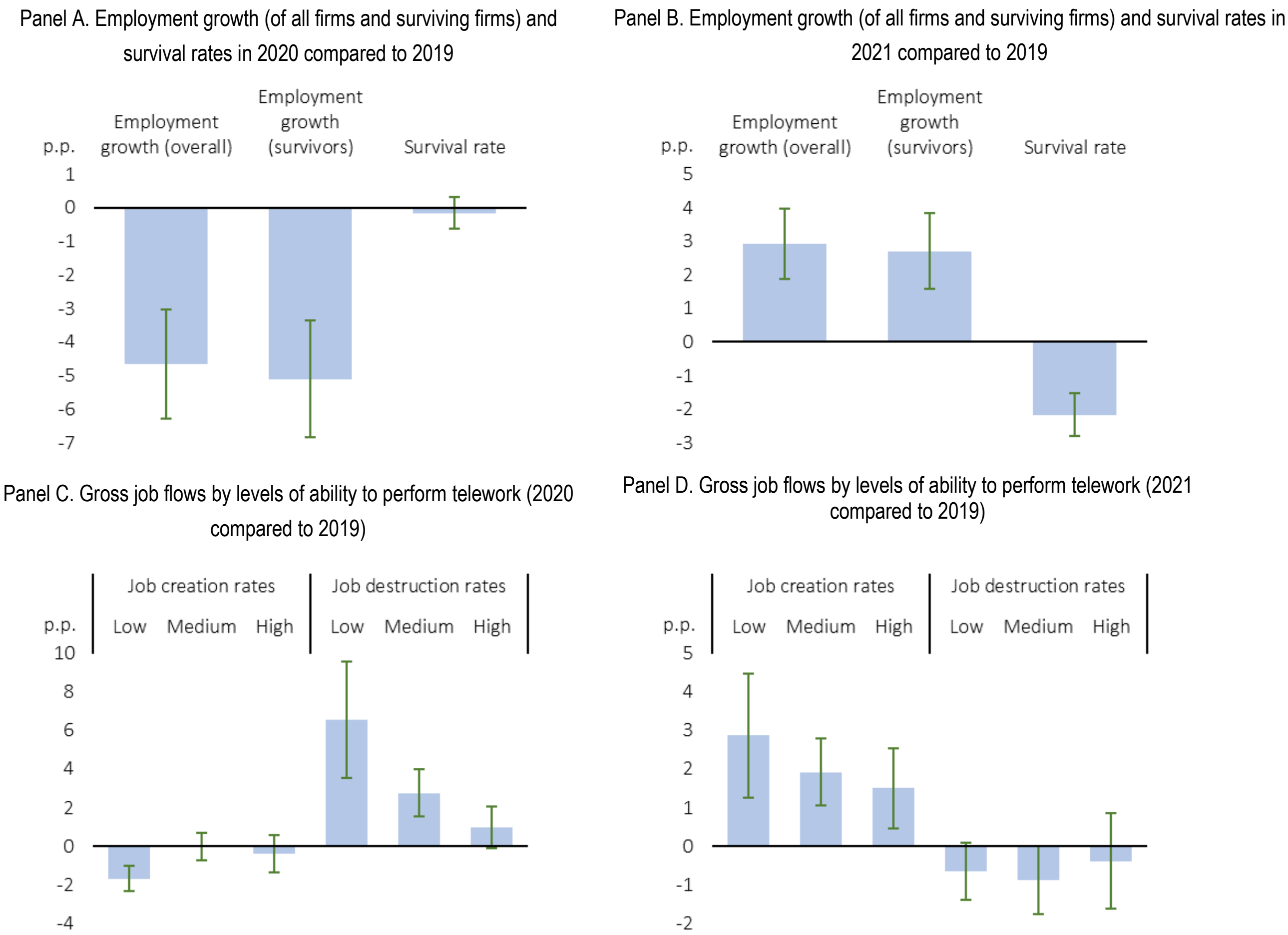
[12] The weighting implies that point estimates reflect aggregate changes. Separate regressions are estimated to assess the change in the outcome in 2020 and 2021 relative to 2019. Standard errors are clustered at the country-sector level.

[13] Additional unreported results suggest that the average decline in survival rates in 2021 relative to 2019 (reported in Panel B of Figure 1) is however associated with only a small change in the negative contribution of job destruction from exiting firms to overall employment growth. This also appears related to a significant decline in the average size of exiting firms, pointing to a larger increase in exit rates for small firms.

[14] Overall employment growth in 2020 was particularly low in the Hotel and Restaurants sector, while others, like Telecommunications, did not see a significant decline (Figure C.7).

[15] The dynamics presented may differ from officially published statistics owing to methodological differences. In particular, the measures of employment dynamics are based on specific “cohorts” of firms, focusing on the dynamics of firms active at a particular point in time, and abstract from firm entry over the period.

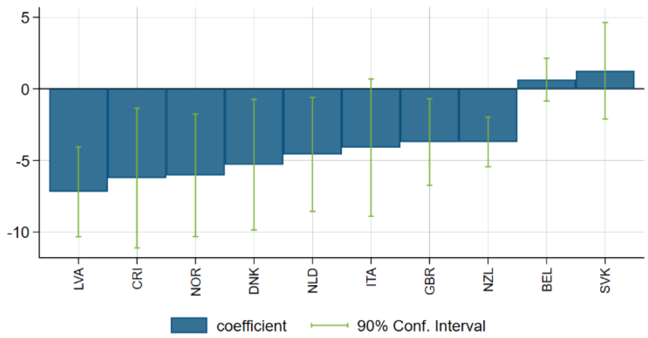
Figure 1. Within-sector employment dynamics and survival rates during the crisis



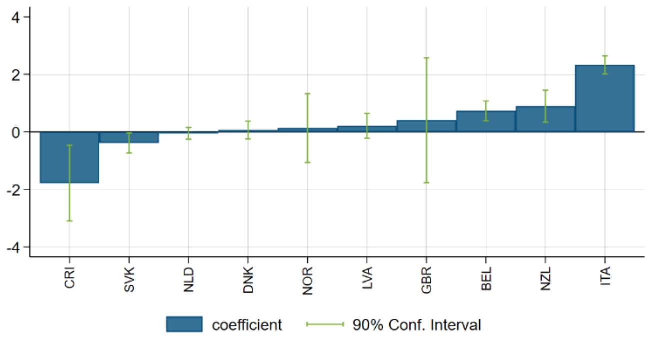
Note: Panels A and B: The figures present the comparison of a) employment growth rates, b) employment growth rates of surviving firms and c) survival rates between 2020 and 2019 (Panel A) and 2021 and 2019 (Panel B). The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each year of interest, along with country-sector fixed effects, and weighting the regression by country-sector shares in terms of employment (averaged over the period) or number of firms (for survival rates). Employment growth of surviving firms does not include GBR, as data were not available. Results are similar when excluding GBR also from overall employment growth and survival. Full regressions results are reported in Table D.1. Panels C and D: The figures show components of employment growth differences, decomposed into differences in gross job creation and gross job destruction rates, estimated in the same manner, for sectors of different abilities to telework (“Low”, “Medium”, “High”), between 2020 and 2019 (Panel C) and 2021 and 2019 (Panel D). The columns represent estimated coefficients and the green bars 95% confidence intervals. Full regressions results are reported in Table D.2Table D.2. Data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Figure 2. Employment growth and firms' survival rate during the crisis varied markedly across countries

Panel A: Change in overall employment growth in 2020 relative to 2019 (percentage points)



Panel B: Change in survival rate in 2020 relative to 2019 (percentage points)



Note: The figures present the comparison of employment growth rates (Panel A) and survival rates (Panel B) between 2020 and 2019 for each country. The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each year of interest, along with country-sector fixed effects, and weighting the regression by sectoral shares in terms of employment (Panel A) or number of firms (Panel B). The columns represent estimated coefficients and the green bars 90% confidence intervals. Full regressions in Table D.3, columns 1 and 3. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

3.2. Reallocation and productivity

27. An important issue pertains to how employment changes during the crisis differ across sectors and firms, leading to a reallocation of resources (Barrero, Bloom and Davis, 2020[20]; Barrero et al., 2021[21]), whether this reallocation was productivity enhancing or sullying, and how this compares to normal times. In principle, productivity-enhancing reallocation may be countercyclical if an economic downturn leads to cleansing effects, i.e. to the destruction of the least productive jobs (Mortensen and Pissarides, 1994[22]) or procyclical if the most productive firms or sectors disproportionally suffer and/or if the process of creative destruction slows down because of e.g. lower entry, due for instance to credit constraints (Barlevy, 2003[23]).

28. To investigate the productivity enhancing nature of reallocation during the crisis, we start by characterising the extent to which labour reallocation across firms within sectors was productivity enhancing before the crisis, i.e., whether firms with higher productivity displayed higher employment growth and lower probability of exit. The analysis then evaluates whether these patterns changed during and after the crisis period. This analysis relies on the estimation of the following baseline model:

$$y_{csq} = \alpha + \beta_1 Q_{25-75} + \beta_2 Q_{75-90} + \delta_{cs} + \varepsilon_{csq} \qquad (2)$$

29. where y_{csq} is the outcome variable (employment growth or survival rate) for a country *c,* sector *s* and quantile q. More specifically the productivity distribution is broken down into three groups, corresponding to firms in the first quartile (below the 25th percentile), firms in the second and third quartiles (25th to 75th percentiles) and firms in the fourth quartile (above the 75th percentile)[16]. The variable Q_{25-75} corresponds to a dummy variable that takes value one for the middle productivity group (i.e., when q corresponds to the middle quartiles) and 0 otherwise, and Q_{75-90} corresponds to a dummy variable that takes the value one for the top productivity group (i.e., when q corresponds to the top quartile). β_1 (β_2) corresponds to the difference in employment growth or survival rate in the middle (top) productivity group relative to the bottom productivity group (bottom quartile), i.e., relative to the reference category.[17]

30. In 2019 employment growth was significantly larger for firms in the middle and top of the productivity distribution relative to the least productive firms (bottom quartile). This signals that labour reallocation was productivity enhancing during the immediate pre-crisis period. Both the extensive and the intensive margins contributed to this productivity-enhancing reallocation, with a particularly high contribution of the extensive margin. The difference in survival rates between least and most productive firms was large, signalling a market selection mechanism, whereby the least productive firms were more likely to exit the market (Figure 3, Panel A).

31. Turning to the crisis period, labour reallocation remained productivity enhancing both in 2020 and 2021, mainly due to the higher survival of the more productive firms (i.e., due to the extensive margin, Figure 3, Panels B and C). Indeed, both in 2020 and 2021 firm survival remained higher for firms in the middle (group “25-75”) and top (group ”75-100”) of the distribution relative to firms at the bottom. However, comparing 2020 with 2019 we find a weakening of the productivity-enhancing nature of the reallocation process along the intensive margin, and to a lesser extent along the extensive margin (Figure 3, Panel D). This suggests the absence of a cleansing effect of the crisis but also the persistence of selection mechanisms.

32. This result masks relevant heterogeneity across countries. Three of the countries covered (Latvia, New Zealand, and the United Kingdom) fit the pattern of a decrease in productivity-enhancing reallocation during the crisis, despite reallocation remaining productivity-enhancing. On the contrary, six countries saw no significant differences (Figure 4).

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[16] Wage quantiles are computed at the detailed SNA A38 level. The findings pertaining to Canada and the United Kingdom are based on an earlier version of the code, which was shared with participants and mistakenly calculated wage quantiles at the macro-sector levels instead of the detailed A38 level when using firm-level data. However, it is noteworthy that the regression framework employed in the effectively accounts for systematic variations across industries, thereby minimizing the impact of this coding issue on the overall robustness of the results (also confirmed by some additional robustness checks). Additionally results for Belgium and Italy, originally derived from this earlier version, exhibited a high degree of similarity after updating the data to compute quantiles at the detailed industry level.

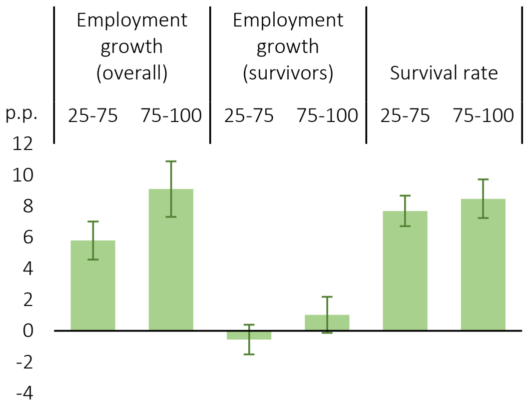
[17] Note that the baseline regression focuses on 12-month employment growth or survival rates, and is estimated year by year so that the time dimension is not used in these regressions, which instead focus on within country-sector differences across productivity groups (the regression includes country by sector fixed effects δ_{cs}). Regressions are weighted by the within-country sectors’ average share in terms of employment or number of firms. Standard errors are clustered at the country-sector level.

Figure 3. Productivity-enhancing reallocation took place in 2019 but weakened during the crisis

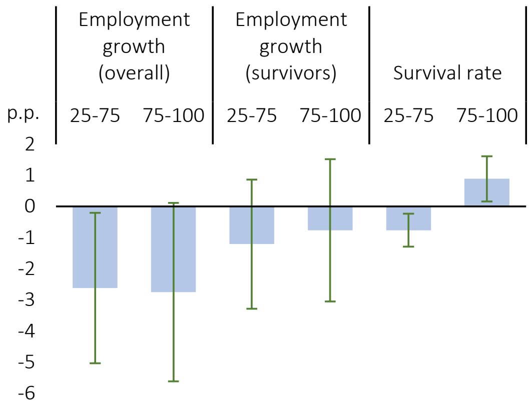
Panel A. Panel A. Difference in employment growth (of all firms and surviving firms) and survival rates relative to the bottom quartile of the productivity distribution, 2019

Panel B. Employment growth (of all firms and surviving firms) and survival rates in 2021 compared to 2019

Panel C. Difference in employment growth (of all firms and surviving firms) and survival rates relative to the bottom quartile of the productivity distribution, 2021



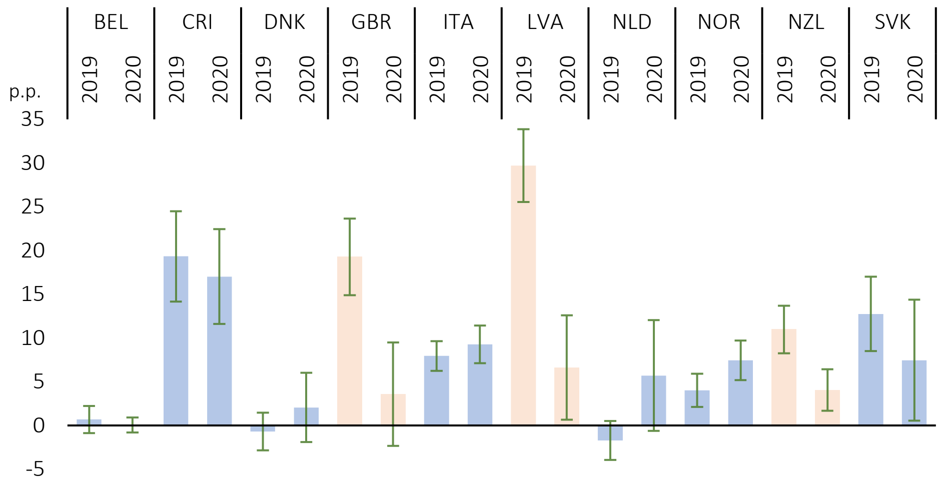
Panel D. Difference between 2020 and 2019 of the differential employment growth and survival rates relative to the bottom quartile of the productivity distribution



Note: The figures present the differential between low productivity firms (0-25) and middle (25-75) and high (75-100) productivity firms in a) employment growth rates, b) employment growth rates of surviving firms and c) survival rates in 2019 (Panels A, B, and D) and the difference in this differential between 2020 and 2019 (Panel C). The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each productivity quantile (Panels A, B, and D) and the same dummy interacted with a dummy for the year 2020 (Panel C) along with country-sector fixed effects, and weighting the regression by sectoral shares in terms of employment (or number of firms for survival rates). Employment growth of surviving firms does not include GBR, as data were not available. Results are similar when excluding GBR also from overall employment growth and survival. The columns represent estimated coefficients and the green bars 95% confidence intervals. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Figure 4. Reallocation of labour from least to most productive firms across countries

Reallocation of labour from least (0-25) to most (75-100) productive firms during 2019 and 2020



Note: The figure presents the differential between low productivity firms (0-25) and high (75-100) productivity firms in employment growth rates during 2019 and during 2020.The comparison is done by regressing the growth of employment between January of each year and January of the year after on a dummy for each productivity quantile along with country-sector fixed effects, and weighting the regression by sectoral employment. The coefficients presented are for the dummy for the 75-100 quantile (omitted category is 0-25). The columns represent estimated coefficients (one per regression) and the green bars 95% confidence intervals. In blue are countries where the difference between the two years was not statistically significantly different, whether the effect in each year is positive (CRI, ITA, NOR, SVK) or not significant (BEL, DNK); and in orange are countries for which the reallocation became significantly less productivity enhancing (GBR, LVA, NZL). Full results in Table D.5. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

33. Two main stylised facts emerge from the previous analysis. First, employment adjusted to the shock mainly through the lower employment growth of surviving firms while, at odds with dynamics observed in previous crises, survival rates remained stable and even increased in some countries during the first year of the crisis. Second, the reallocation process remained productivity enhancing, although to a lower extent on average. For several countries, however, the difference with the pre-COVID period is not found to be significant. These stylised facts raise several questions, in particular with respect to the role of policy support in shaping these dynamics. The rest of the paper explores the role of job retention schemes, one of the most widely policy tools used during the pandemic to support workers and businesses.

4. Job retention schemes: policy design and uptake across countries and sectors

34. To evaluate the role of JRS in shaping employment dynamics during the COVID-19 crisis we rely on two main measures: a new cross-country measure developed in the context of this project to benchmark countries in terms of the generosity of their JRS, and an in-sample firm-level measure of actual JRS uptake. The two data sources are complementary. The in-sample measure of JRS uptake allows us to compare the survival and employment dynamics of firms receiving support to those that did not at a granular level but may suffer from selection bias because firms presumably choose whether to apply for support partly based on their performance. The new indicator on *de jure* generosity, available at the country-time level, has the advantage of being less prone to such endogeneity issues but is available at the country-time level

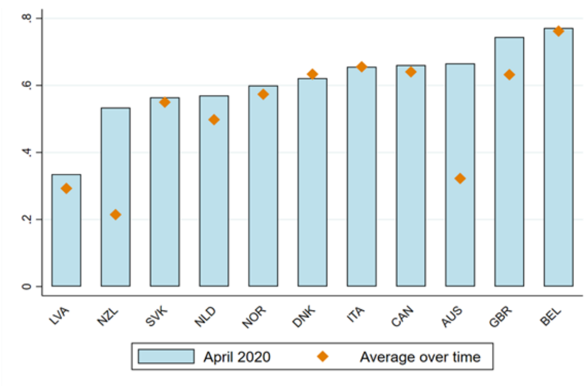
only. A further advantage is that it allows for comparisons across countries for which data on actual firm-level uptake is not available.

4.1. De jure generosity of job retention schemes

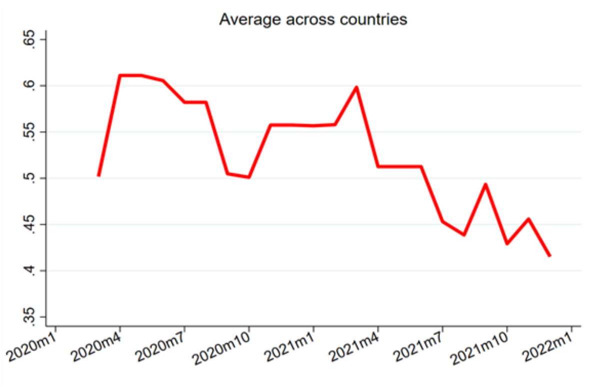
35. Focusing on the indicator of *de jure* generosity of job retention schemes, the left panel of Figure 5 shows that there has been some heterogeneity in the institutional design of JRS across countries.[18] Belgium displays the most generous provisions both at the peak of the pandemic and on average over time, while Latvia had the relatively most restrictive settings. Australia had a quite generous setting at the start of the pandemic, but the generosity of the scheme tightened sharply over time. The right panel of Figure 5 depicts the evolution of the indicator over time on average across countries. After the initial phase of the pandemic, the indicator declines, consistent with the decrease in the intensity of the pandemic and the progressive withdrawal of government support.

Figure 5. De-jure generosity of COVID-19 related job retention schemes across countries and over time

Panel A: JRS generosity across countries
(average over 2020-21)



Panel B: JRS generosity over time



Note: Details on the construction of the job retention scheme de-jure indicator are provided in Annex B. Note that term "generosity" accounts for both eligibility requirements and provisions related to the financial aid provided, and that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the OECD de-jure indicator of job retention schemes.

4.2. Uptake of job retention schemes

36. Turning now to the analysis of the micro-aggregated database, we find that the actual uptake of job retention schemes in the sample varies markedly across countries and over time.[19] At peak, around 60% (80%) of firms received support in Australia (New Zealand), and more than 20% of firms were supported in European countries such as Denmark, Latvia and the Slovak Republic (Figure 6).[20] On

[18] Note that the term "generosity" accounts for both eligibility requirements and provisions related to the amounts provided.

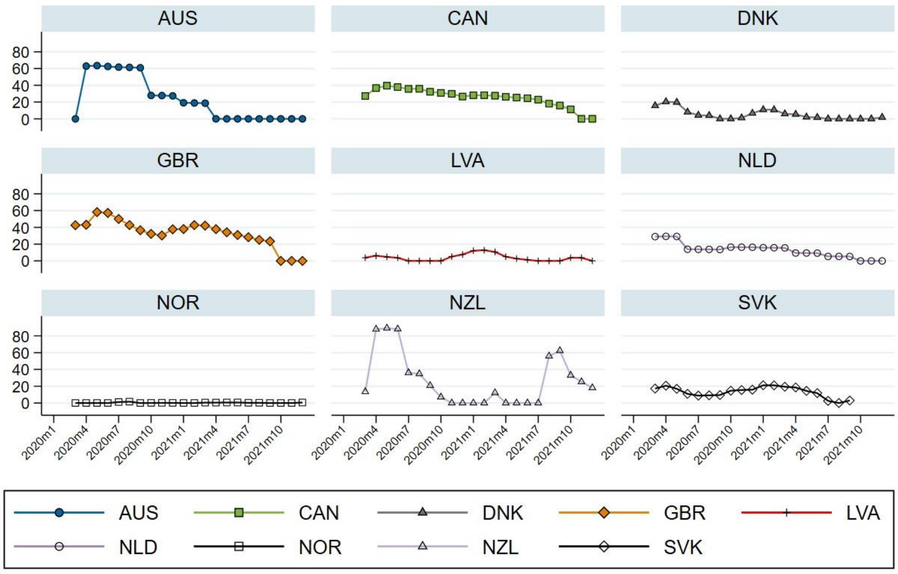
[19] In the analysis, a firm is considered to have received support either when support is granted directly to the firm or paid to at least one worker employed in the firm.

[20] The data for Norway refer exclusively to salary subsidies paid to bring back laid off employees. More information on the scheme is available here.

average and consistent with priors, uptake was higher at the time when the COVID-19 pandemic hit the hardest and was reduced over time, when countries lifted mobility restrictions and tightened the eligibility requirements to access the schemes. This is consistent with our additional findings that uptake is positively correlated with the severity of the pandemic shock (measured by the Oxford containment stringency index) as well as with the overall generosity score of the de-jure JRS policy indicator, suggesting that also the design of the schemes has been a relevant driver of uptake (Figure 7).

Figure 6. Job retention schemes: uptake across countries and over time

Percentage of firms



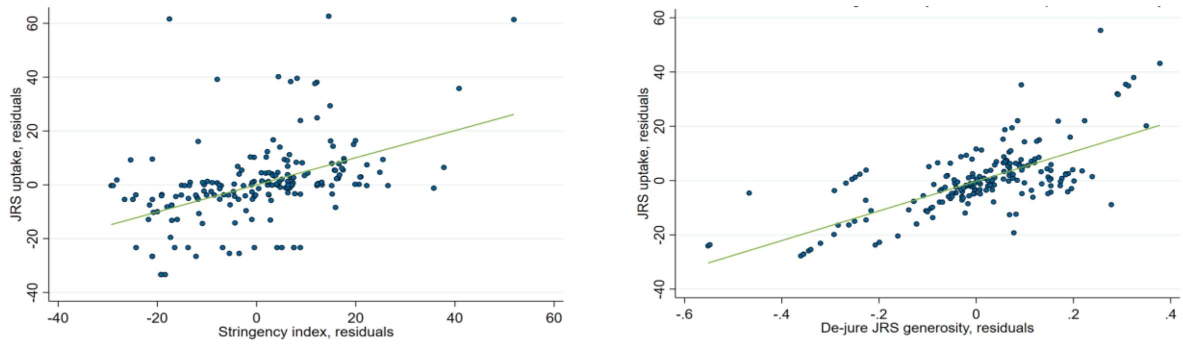
Note: Data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

37. The amount of financial support provided by the schemes also differed across countries and over time (Figure 8). Governments covered on average 20% of the average wage for each worker in firms that took support. This percentage reached almost 50% in New Zealand, though for a very limited time span, while it remained close to or below 10% for a large portion of 2021 in Denmark. These differences are linked to JRS design, with wage subsidy schemes covering all workers in New Zealand but covering only hours not worked in Denmark.

Figure 7. Actual JRS uptake is positively correlated with the stringency of containment measures and the de-jure generosity of JRS

Panel A: Correlation between stringency of containment measures and JRS uptake

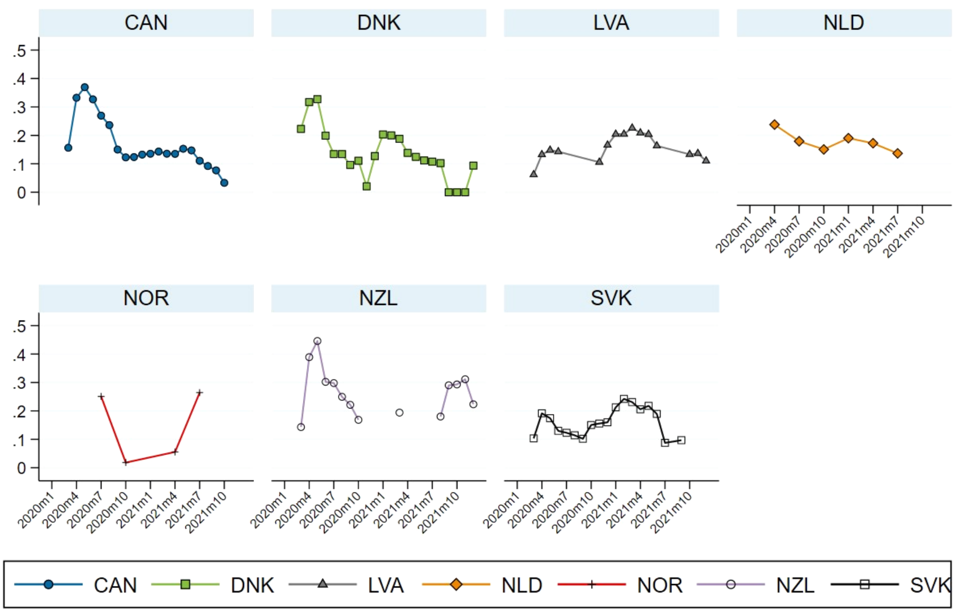
Panel B: Correlation between JRS uptake and de-jure JRS generosity



Note: The left panel illustrates the correlation between i) the residuals obtained from regressing the containment stringency index on country fixed effects and ii) the residuals obtained from regressing the percentage of firms that took up JRS on country fixed effects. The right panel illustrates the correlation between i) the residuals obtained from regressing the percentage of firms that took up JRS on country fixed effects and the containment stringency index and ii) the residuals obtained from regressing the JRS de-jure indicator on country fixed effects and the containment stringency index. The stringency index is used as a proxy for the severity of the pandemic shock. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset", the OECD de-jure database of job retention schemes and the Oxford Covid-19 Government Response Tracker.

Figure 8. Job retention schemes: generosity across countries and over time

Ratio over the average wage

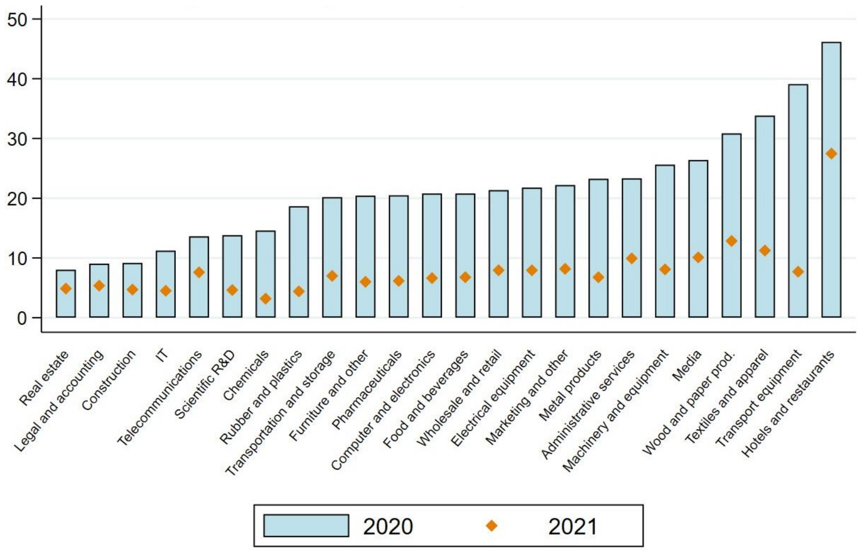


Note: The figure plots the average amount per employed worker granted to treated firms (i.e., firms with at least one employee on the job retention scheme), normalised by the average wage in the country at the end of 2019. Data on the amounts granted to firms via JRS was not available for AUS and GBR. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

38. There is also significant heterogeneity in the uptake of job retention schemes across sectors (Figure 9). Uptake has been by far the highest in the "Hotels and restaurants" sector (ISIC rev. 4 55-57), which was extensively supported both in 2020 (45% of uptake for the median country) and in 2021 (25% for the median country), while sectors like "IT" (ISIC rev. 4 62-63), "Legal and accounting activities" (ISIC rev.4 69-71) and "Pharmaceuticals" (ISIC rev. 4 21) benefitted from job retention schemes only marginally. In all sectors, support in 2021 was much lower than in 2020, but support in food and accommodation services ("Hotels and restaurants") remained significantly high and larger than in other sectors. Finally, Box 2 provides some insights on the uptake of other policy support measures that were deployed at the same time of JRS, such as direct subsidies, loan guarantees and moratorium facilities.

Figure 9. Job retention schemes uptake across sectors

Average monthly JRS uptake across industries, by A38 industry classification, median across countries



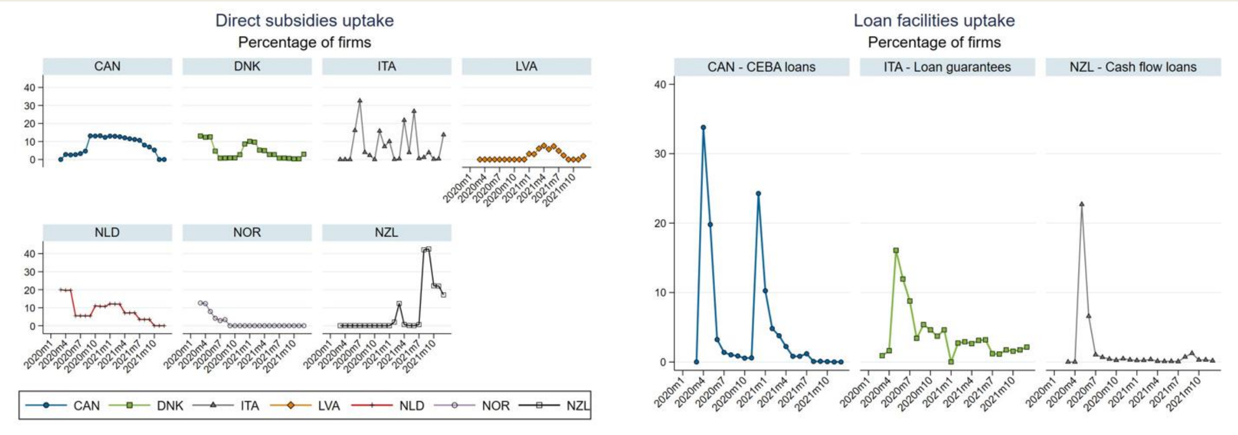
Note: Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Box 2. Direct subsidies, loan and moratorium facilities: an overview

Direct subsidies, mainly aimed at covering a portion of firms' fixed costs (e.g., rental or energy expenses), have also been used extensively across countries in our sample, though in a less systematic way compared to JRS, with support being relatively more targeted to specific time periods and firms (i.e., mandate closures, most hit firms) (Figure 10, left panel). Uptake has been noticeably high in Italy, with peaks at a maximum of over 30% of firms, and prolonged over time in Canada. It was as high as 10% in most countries at its peak. While less widespread compared to job retention schemes, the amounts received by firms were substantial in several countries, covering often more than half of the average wage of each worker in the firm in many instances.

Data on loan and moratorium facilities are available for fewer countries in our sample, making it more difficult to draw general conclusions. Uptake of guaranteed loans in Italy occurred mainly in the initial phase of the pandemic (i.e., 15% of firms in May 2020 and below 5% from July onwards), and a similar pattern could be observed for the small business cashflow loans in New Zealand,[21] which were provided to more than 20% of firms at peak and essentially stopped completely from July onwards (Figure 10, right panel);[22] the uptake of CEBA loans in Canada reached 35% of firms in April 2020 and displayed a second peak (i.e. 25% uptake) at the beginning of 2021.[23] Facilities allowing the moratorium of payments such as debt reimbursement and taxes were also used by a wide range of firms: 20% of Italian companies relied on the debt moratorium to ease their liquidity constraints, with most of the uptake occurring in June 2020.

Figure 10. Direct subsidies and loan facilities uptake



Note: Data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

The difference in policy uptake between the "Hotels and restaurants" sector and all others is even more striking when looking at direct subsidies, with a 20% uptake in both 2020 and 2021 for the median country compared to 5% on average for other sectors. More generally, as expected, overall policy uptake has been inversely related to sectors exposure to the shock, proxied by teleworkability, and this holds also for loan and moratorium facilities (Figure C.1).

5. Job retention schemes and employment: a mitigation role

39. In this section we explore whether and to what extent JRS have helped to mitigate the impact of the crisis in terms of employment and firm survival. We first rely on granular information on JRS uptake to compare the performance of firms that received support through JRS with those that did not within each country, sector and period. This provides evidence on the differences of employment growth and survival across the two groups, which may arise from the impact of JRS support on these two outcomes, but also from selection as some firms that were more hit by the crisis may have also been more likely to uptake support. Furthermore, JRS uptake could be correlated with other characteristics of firms that directly affect their performance, such as their financial conditions (i.e., firms "self-select" into receiving support or not).

[21] According to the scheme, the New Zealand government provided loans to small businesses (less than 50 employees) impacted by COVID-19 (at least 30% revenue drop over the reference period) to support their cash flow needs at null or low interest rate.

[22] For a more detailed discussion on the role of loan guarantees during the COVID-19 crisis, see for instance Demmou and Franco (2021[36]).

[23] The CEBA program offered interest-free loans of up to CAD 60 000 (Canadian dollars) to small businesses and not-for-profits. Firms in good standing that reimburse the loan by the end of 2023 are forgiven one third of the loan.

Then, to estimate the role of support for employment dynamics, we use the new JRS synthetic indicator to compare how employment growth varied with the intensity of the shock related to the COVID-19 pandemic, conditional on different degrees of JRS generosity – an approach that allows to get closer to causal estimates by reducing endogeneity (i.e., self-selection) concerns.[24]

5.1. Employment dynamics of supported vs non-supported firms

40. As a first step to understand the role of JRS, we compare the performance of firms that received JRS and firms that did not, both on the survival rates and employment growth (net job creation rates), by estimating the following baseline model (at the level of a cell defined by a country, sector, and uptake status):

$$y_{c,s,p,t+k} = \alpha + \beta_1 \, Pol_{c,s,p,t} + \delta_{c,s,t} + \varepsilon_{c,s,p,t} \qquad (3)$$

where $y_{c,s,p,t}$ is the outcome corresponding to either net job creation or survival rates for country *c*, sector *s*, uptake status *p* and period *t* computed over the subsequent 3 or 12 months (denoted *k*). $Pol_{c,s,p,t}$ is a dummy variable taking value one for the group of firms that took up JRS support in a given country-sector-month and zero otherwise. Country by sector by time fixed effects allow to control for any shock at the country-sector level, restricting the comparison within each country-sector-period cell and therefore leveraging the variation across firms with different uptake status while allowing to partial out a large number of confounding factors. Equation 3 is estimated by weighted OLS, where the weights are: i) the country-sector employment shares (averaged over time) when analysing employment performance; ii) the share of firms in each country-sector (averaged over time) when the dependent variable is firm survival rates. Standard errors are clustered at the country-sector level.

41. We then estimate two variations of Equation 3. First, we estimate the regression separately for each cohort of "uptakers", comparing employment growth and survival of firms that took up support in a given month with those that did not, thereby losing the time dimension of the panel. Second, we interact the policy uptake dummy variable with country fixed effects to investigate heterogeneous effects across countries.

42. On the extensive margin, considering both a 3-month (short-term) and a 12-month (medium-term) horizon, we find that on average the survival rate of firms that took up support was significantly larger than those that did not (Figure 11, Panel A). This is particularly the case at the peak of the pandemic (April 2020), suggesting that firms receiving support were likely shielded from the crisis.[25] According to our estimates, the survival rate of supported firms was approximately 2.5 p.p. higher than the one of non-supported firms after 12 months (Figure 11, Panel A), though point estimates suggest that this advantage

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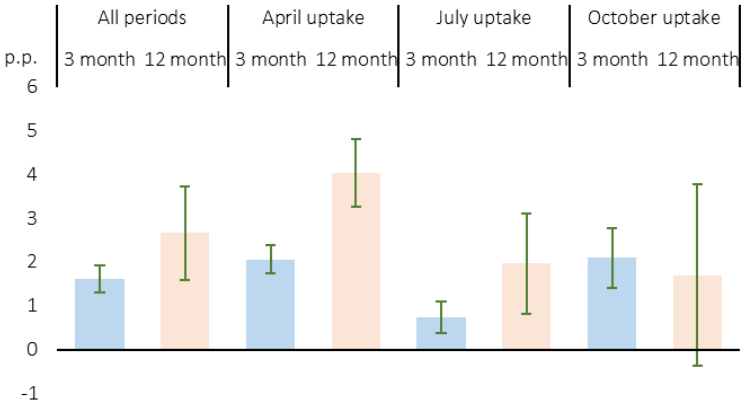
[24] However, to the extent that actual uptake varies across countries and sectors, the JRS policy indicator (which varies only across countries and over time) can be a noisy measure for the support that is actually received. Therefore, both approaches – the use of in-sample information on actual support at a granular level and information on *de jure* generosity – are complementary. Moreover, while addressing selection related endogeneity concerns leads closer to causal estimates, the analysis may need still to be interpreted with caution, as it does not account explicitly for the potential role of other policies (such as subsidies and/or debt instruments) in altering the relationship between pandemic intensity and employment growth.

[25] Note that firms receiving support were likely more severely hit by the crisis. Although we are not able to directly measure the severity of the crisis for individual firms, eligibility for support was often based on differences between performance in 2020-21 and pre-crisis performance, rendering most hit firms those more likely to take up support.

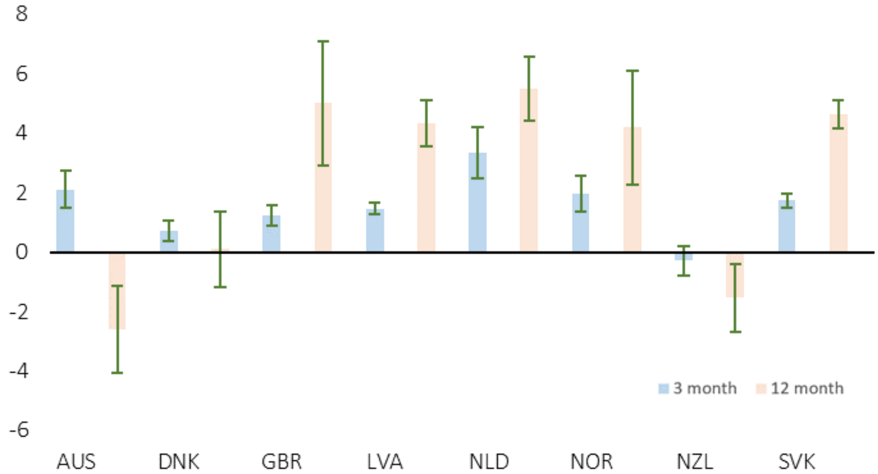
was stronger for initial uptakes (e.g. April 2020) and tends to vanish in the second half of 2020.[26] Higher survival rates for firms that took up JRS are found in all countries in the sample with the exception of Australia and New Zealand in the medium-term (Figure 11, Panel B), where uptake was particularly high.[27]

Figure 11. Firms that received support through JRS exited the market less than those that did not, with differences across countries

Panel A: Difference in survival rate between firms that took up JRS in 2020 and those that did not



Panel B: Difference in survival rate between firms that took up JRS in 2020 and those that did not, by country



Note: The regressions estimate the difference in survival rates for firms that took up support ("uptakers") and those that did not uptake support ("non-uptakers"), respectively 3 and 12 months after taking up support at a given date. "All periods" considers as uptakers firms that received JRS support at any point in time; "April/July/October uptake" considers as uptakers firms that received JRS support respectively in April, July, and October 2020. The regressions estimated are based on Equation 3 and leverage information on survival rates for groups of firms in a given country, sector, uptake status (i.e., "uptaker" vs. "non-uptaker") and time period. The columns represent the estimated coefficients and the green bars the 95% confidence intervals around them (based on standard errors clustered at the country-sector level). Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

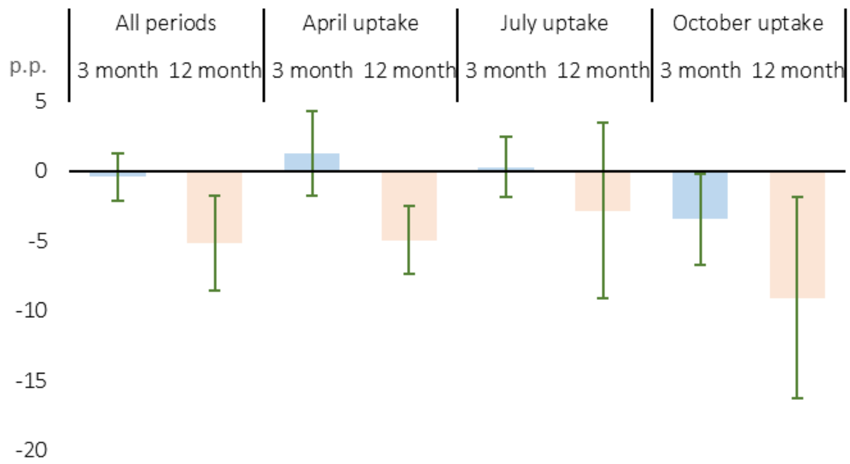
[26] Indeed, the difference is no longer significant for the "cohort" of firms that received support in October. This may to some extent be related to changes in the generosity of support over time, as well as higher heterogeneity across countries over this later period – note however that coverage changes across cohorts due to data availability.

[27] Unreported results suggest that for these countries the difference between uptakers and non-uptakers has become statistically negative over time, while point estimates suggested a positive difference for some earlier cohorts.

43. These results provide some evidence that JRS contributed to a mitigation of the effects of the crisis on the corporate sector, by reducing the potential premature exit from the market of the hardest hit firms and thereby contributing to prevent job destruction along the extensive margins.[28] This mitigation seemed to some extent temporary and concentrated in periods where the shock was most severe, alleviating concerns that policy support led to a more persistent freeze of survival rates.

Figure 12. After 12 months firms taking up support generally displayed significantly lower employment growth than non-uptakers

Difference in employment growth of surviving firms between firms that took up JRS and those that did not after 3 and 12 months



Note: The regressions estimate the difference in employment growth of firms that stayed in the market and took up support and those that stayed in the market and did not uptake support, respectively 3 and 12 months after taking up support at a given date. "All periods" considers as uptakers firms that received JRS support at any point in time; "April/July/October uptake" considers as uptakers firms that received JRS support respectively in April, July, and October 2020. The regressions estimated are Equation 1. The columns represent the estimated coefficients and the green bars the confidence intervals around them. GBR is excluded as not enough statistics were available for surviving firms. The regressions estimated are Equation 1 and leverage information on employment growth for groups of firms in a given country, sector, uptake status (i.e., "uptaker" vs. "non-uptaker") and time period. The columns represent the estimated coefficients and the green bars the 95% confidence intervals around them (based on standard errors clustered at the country-sector level). Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

44. Turning to the analysis of the intensive margin, we find that employment growth in the short run (over a 3-month horizon) for firms that took up support was generally not statistically different from employment growth in firms that did not take up support. As mentioned above, presumably, the worst hit firms were more likely to take up support, hence this suggests that support contributed to cushion the impact of the crisis for less resilient firms. On the contrary, in the medium-to-long term (at a 12-month horizon), firms taking up support displayed significantly lower employment growth than firms not receiving it (Figure 12). One possible explanation for this is that, as support progressively decreased, these firms that were initially more exposed to the shock may have eventually experienced lower employment growth. This may also be related to the higher survival rates for firms that received support, suggesting that most hit firms may have experienced lower employment growth but remained active thanks to policy support.

[28] These results are in line with the literature providing evidence of job preserving benefits associated with JRS, and in particular STW -- Hijzen and Venn (2011[31]); Brey and Hertweck (2020[33]); Apedo-Amah et al. (2020[6]) – as well as with early estimates in OECD (2021[15]).

Another possibility, however, may be that JRS support may have been directed to ex-ante relatively worse-performing firms, whose lower employment growth compared to firms not taking support was not only COVID-19 related and was simply postponed by policy support. The evidence presented below suggests that the latter is not systematically true across countries and that JRS uptake was widespread across firms with different productivity levels. Further, this hypothesis is also not confirmed by the higher survival rates of supported firms discussed above. The next section will further investigate this question to address the potential issue of the selective uptake of JRS by firms.

5.2. The impact of JRS on employment growth: a cross-country comparison

45. In order to further estimate the role of JRS on employment growth, we now use the *de-jure* JRS indicator built in-house, which allows us to exploit ex ante differences in the generosity of support and therefore to address potential endogeneity issues, in particular related to selection. It allows to analyse whether cross-country differences in generosity could explain differences in employment growth and survival rates. Further, the use of the indicator also allows to include all countries in the analysis, including those with no available firm-level data on JRS uptake.

46. We estimate the dynamic response of employment growth and survival to a change in the index of the stringency of containment measures, used to proxy the intensity of pandemic containment measures. To do so, we use the local projection method pioneered by Jordà (2005[24]) and derive 6-month cumulative impulse response functions. To compare how the response of employment growth to an increase in pandemic intensity varies depending on JRS generosity, we interact the change in the containment stringency index with the level of our JRS indicator. Specifically, we estimate the following equation for each $k = \{0, \ldots, 6\}$:

$$\begin{aligned} Employmentgrowth_{c,s,t+k} = \\ = \alpha_k + \mu_{c,s,k} + \beta_k \Delta X_{c,t} + \theta_k \Delta X_{c,t} * JRS_{c,t-1} + \gamma_k JRS_{c,t-1} \\ + \sum_{h=1}^{k} \varphi_h leads_{c,s,t+h} + \sum_{h=1}^{3} \rho_h lags_{c,s,t-h} + \varepsilon_{c,s,t+k} \end{aligned} \quad (4)$$

where the dependent variable, is the sectoral employment growth (net job creation rate), in country *c* in sector *s* between months *t+k* and *t-1*, with $k = \{0, \ldots, 6\}$.[29] The term $\Delta X_{c,t}$ is the change in the Oxford stringency indicator described in Section 2. The variable $JRS_{c,t-1}$, is our de-jure indicator, which ranges between 0 and 1 with larger values indicating more generous JRS support and enters the regression at time *t-1* to avoid endogeneity. Finally, $\sum_{h=1}^{k} \varphi_h leads_{c,t+h}$ and $\sum_{h=1}^{3} \rho_h lags_{c,t-h}$ include the leads and lags of the change in the stringency Indicator, the JRS indicator, as well as their interactions. Coefficients are estimated through weighted OLS, where weights are given by country-sector employment shares, and standard errors are clustered at the country-time and country-sector levels. To ease interpretation, we present results through impulse response functions using the estimated coefficients for the point estimate and their standard errors to derive 90% confidence bands. We show impulse response functions for country-month observations with no JRS support (JRS=0) and those with high JRS support (JRS=0.75). We use the β_k coefficients to evaluate the response in each year when JRS support is zero and the combination of β_k, θ_k and γ_k evaluated at JRS=0.75.

47. First, results show that employment was relatively better preserved during the crisis in countries where generous JRS support was implemented. Figure 13, Panel A reports the cumulative effect of a one standard deviation increase in the containment stringency index when there is no JRS support (dashed light blue line) and in countries with high JRS support (solid dark blue line). A one-standard deviation increase in the stringency index implies a sharp decrease of employment growth when JRS support is

[29] $Employmentgrowth_{c,s,k,t+k} = (EMP_{c,s,t+k} - EMP_{c,s,t-1})/(0.5 * (EMP_{c,s,t+k} + EMP_{c,s,t-1}))$, where $EMP_{c,s,t}$ stands for total employment in country *c*, sector *s*, at time *t*.

absent, reaching a maximum of 2 percentage point reduction after five months, but the negative impact is significantly attenuated by JRS support. JRS schemes thus seem to have cushioned the shock to employment. Figure 13, Panel B further reports the same cumulative effect dividing sectors by how much the crisis is likely to have affected them, given how easily tasks could be performed by teleworking. It shows that, as expected, in sectors more exposed to the crisis – those where the feasibility of telework is low – and where employment losses were larger overall, the cushioning role of JRS support is much more pronounced.

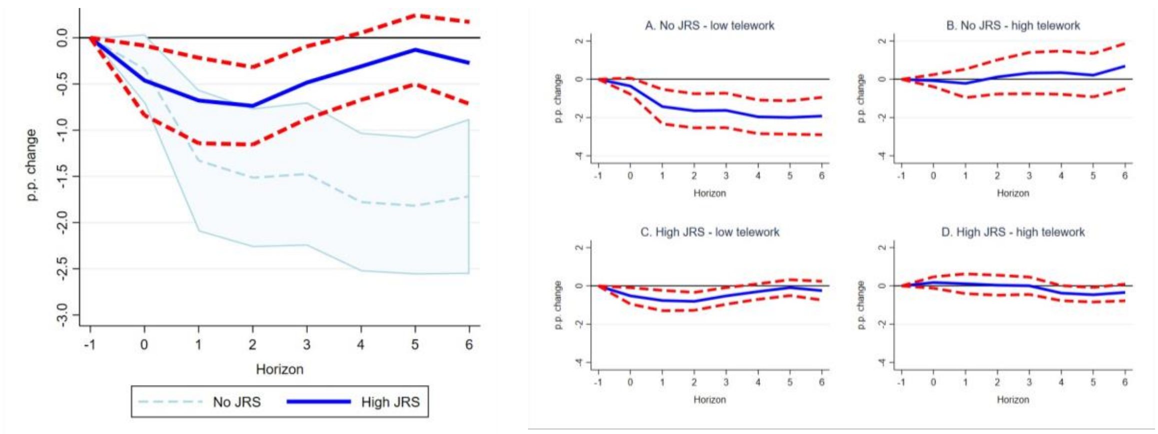
48. In what follows, we rely on the assumption that low telework sectors were more exposed to the COVID-19 shock and compare the differential effect of the pandemic shock on employment growth between sectors with low and high ability to telework. This allows us to enrich the fixed effects structure of our model to control for any shock at the country level, by including country-year fixed effects, and to focus instead on the differential effects of the crisis across sectors according to the level of JRS.

49. Consistent with previous findings, the differential response of employment growth between least and most exposed sectors (i.e., between high- and low-telework sectors) is very pronounced when no JRS is in place (with a larger decline in employment growth in most exposed sectors relative to least exposed sectors) but is significantly reduced in the presence of generous JRS (Figure 14). This indicates that JRS were successful in their purpose of preserving the connection between workers and firms, and especially so in more exposed sectors.

Figure 13. JRS contributed to employment preservation in more exposed sectors

Panel A: Effect of a tightening in the containment stringency index on employment growth

Panel B: Effect of tightening in the containment stringency index on employment growth by level of ability to telework of the sector

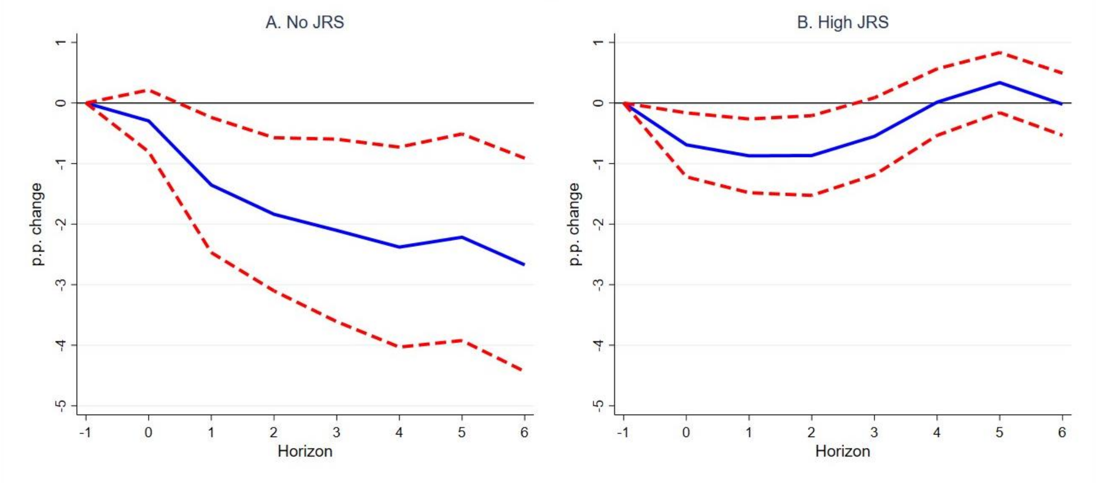


Note: No JRS refers to JRS indicator equal to zero, and high JRS to the 75th percentile. Panel A: The dotted blue line represents the effect of a tightening in the containment stringency index between 0 and 6 months after the change if the JRS indicator was zero in the month before the change in severity (coefficients β_k in Equation 2**Error! Reference source not found.** for each month). The shaded area represents the 90% c onfidence interval around the estimates. The thick blue line represents the effect of a change in the severity of the pandemic shock between 0 and 6 months after the change if the JRS indicator was equal to the 75th percentile in the month before the change in severity (sum of coefficients β_k, θ_k, and γ_k in Equation 2 evaluated at JRS=75th percentile). The red dotted lines represent the 90% confidence interval around the estimates based on standard errors clustered at the country-sector level. Panel B: Each of the sub-panels presents the effect of a change in the severity of the pandemic between 0 and 6 months after the change estimated through Equation 2 if the JRS indicator in the month before the change in severity was zero (sub-panels A and B) or equal to the 75th percentile (sub-panels C and D) and estimated separately for sectors less capable of telework (sub-panels A and C) and more able to telework (sub-panels B and D). Note that data and results may be preliminary and subject to revisions.

Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset", the OECD de-jure indicator of job retention schemes and the Oxford Covid-19 Government Response Tracker.

Figure 14. JRS preserved jobs, particularly in most exposed sectors

Differential effect of a tightening in the containment stringency index on employment growth between low- and high-telework sectors, according to the level of JRS



Note: No JRS refers to JRS indicator equal to zero, and high JRS to the 75th percentile. The thick blue line represents the differential effect for more versus less exposed sectors of a tightening in the containment stringency index between 0 and 6 months after the change if the JRS indicator in the month before the change in severity was equal to 0 (Panel A) or the 75th percentile (Panel B), estimated through Equation 2 augmented with an interaction with the variable measuring teleworkability and adding country x time fixed effects. The red dotted lines represent the 90% confidence interval around the estimates based on standard errors clustered at the country-sector level. Note that data and results may be preliminary and subject to revisions.

Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset", the OECD de-jure indicator of job retention scheme, OECD (2021[17]), and the Oxford Covid-19 Government Response Tracker.

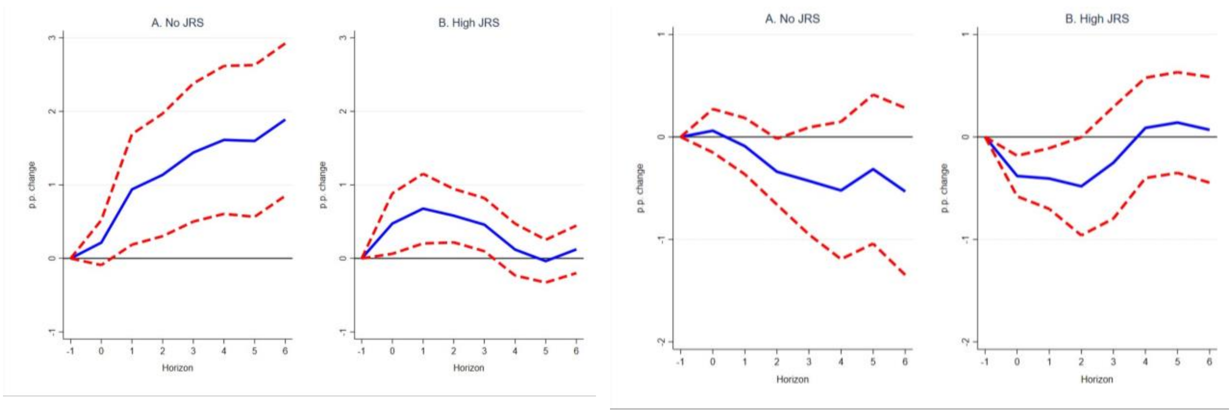
50. JRS were designed to maintain worker-firm relationships and hence avoid losses of human capital. We therefore expect their impact on employment growth to have taken place mainly through avoiding job destruction, as opposed to spurring job creation. We find that an increase in pandemic-response intensity increased job destruction rates in most exposed relative to least exposed sectors in the absence of JRS. Instead, generous provisions related to JRS virtually eliminated this effect (Figure 15, Panel A). Conversely, JRS appear not to affect job creation rates significantly, except for a few months initially (Figure 15, Panel B). JRS support may have made it more attractive for firms to keep current workers instead of hiring new ones, explaining the initial drop in hiring rates (Sub-panel B).

51. Finally, looking at the impact of JRS on the extensive margin, our results show that when no JRS are in place, an increase in the stringency of pandemic containment measures is linked to an increase in exit rates in the most exposed sectors relative to the least exposed ones. With generous JRS provisions, the dynamics are reversed, confirming that JRS played an important role also in the survival of firms in most exposed sectors (Figure 16). This is in line with the findings in Section 5.1, describing that survival was higher for firms that took up JRS support.

Figure 15. JRS prevent job destruction and have no significant effects on job creation

Panel A: Differential effect of a tightening in the containment stringency index on job destruction rate between low- and high-telework sectors, according to the level of JRS

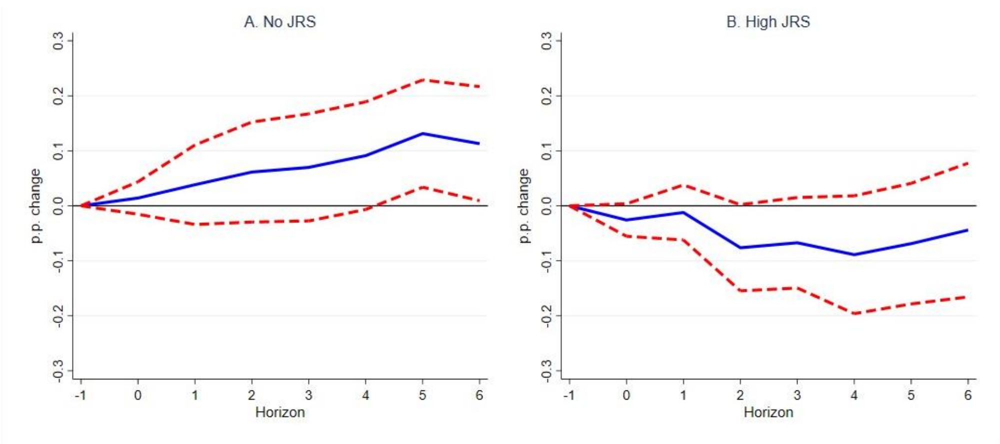
Panel B: Differential effect of a tightening in the containment stringency index on job creation rate between low- and high-telework sectors, according to the level of JRS



Note: No JRS refers to JRS indicator equal to zero, and high JRS to the 75th percentile. The thick blue line represents the differential effect for more versus less exposed sectors of a tightening in the containment stringency index between 0 and 6 months after the change if the JRS indicator in the month before the change in severity was equal to 0 (sub-panels A) or the 75th percentile (sub-panels B), estimated through Equation 2 augmented with an interaction with the variable measuring teleworkability and adding country x time fixed effects. The red dotted lines represent the 90% confidence interval around the estimates based on standard errors clustered at the country-sector level. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset", the OECD de-jure indicator of job retention schemes, OECD (2021[17]), and the Oxford Covid-19 Government Response Tracker.

Figure 16. The impact of JRS on exit rates

Differential effect of pandemic shock on exit rates between low- and high-telework sectors according to the level of JRS



Note: No JRS refers to JRS indicator equal to zero, and high JRS to the 75th percentile. The thick blue line represents the differential effect for firms in more versus less exposed sectors of a change in the containment stringency index between 0 and 6 months after the change if the JRS indicator in the month before the change in severity was equal to 0 (sub-panels A) or the 75th percentile (sub-panels B), estimated through Equation 2 augmented with an interaction with the variable measuring teleworkability. The red dotted lines represent the 90% confidence interval around the estimates based on standard errors clustered at the country-sector level. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset", the OECD de-jure indicator of job retention schemes, OECD (2021[17]), and the Oxford Covid-19 Government Response Tracker.

6. Job retention schemes and productivity: mitigating the impact of the crisis without distorting the reallocation process

52. Policy support has the potential to affect the efficiency of the reallocation process both along the intensive and the extensive margins. Along the intensive margin, if policy support is disproportionately distributed toward less productive firms and provides them a cost advantage to grow (or to not downsize), job retention schemes may contribute to the deterioration of the overall allocation of resources. Symmetrically, they could contribute to enhance productivity-enhancing reallocation across surviving firms if more productive firms gain relatively more from their deployment. Along the extensive margin, job retention schemes may weaken the creative-destruction process by favouring the survival of low productivity firms, reducing incentives for an orderly restructuring of firms (Acharya et al., 2020[25]; Andrews, Adalet-McGowan and Millot, 2017[26]; Banerjee and Hofmann, 2018[27]). On the contrary, they could favour the survival of productive companies, particularly newer, smaller firms, that would otherwise exit the market due to credit frictions (Barlevy, 2003[23]).

53. To shed light on these issues we proceed in two steps. First, we examine how JRS was allocated along the size and productivity distribution. Next, we examine whether the relative performance (employment growth) of firms according to the uptake of support varies depending on their position in the productivity distribution, in order to understand whether the effectiveness of reallocation of labour across firms of different relative productivity was impacted by the availability and generosity of JRS.

6.1. Who took the support? Allocation along the productivity and size distribution

54. Relevant heterogeneities in the allocation of support occurred across firms within sectors, in particular along the productivity and the size distribution. First, we compare the extent of uptake across productivity quantiles (Figure 17, Panel A). We find that on average across countries and sectors, uptake was relatively higher for firms in the middle quartiles and in the top quartile of the productivity distribution relative to the bottom quartile, hinting that support was not disproportionately directed towards unproductive companies. The differences in uptake across productivity quantiles tends to decrease over time, as the pandemic intensity reduced and the need for support diminished. Moreover, looking at heterogeneity across sectors, the analysis also shows that within more exposed (low-telework) sectors with higher uptake, support was generally mostly taken up by higher productivity firms, while the opposite tends to be true for less exposed (high-telework) sectors (Figure C.3). This further reinforces the idea that JRS uptake did not seem to be biased towards the least productive firms when and where the economy was severely constrained (in most severely hit periods and sectors).

55. These findings are confirmed for most countries in the sample, also when considering detailed quantiles to classify firms according to their pre-pandemic productivity–- Figure 17, Panel B. Indeed, in all countries but New Zealand, the uptake in the bottom quantile (0 to 10th percentile) has been the lowest. Uptake in the rest of the productivity distribution (relative to the bottom decile) is more heterogeneous across countries, but differences are generally not statistically significant, suggesting that JRS was aimed at absorbing the sectoral shock without targeting firms with higher productivity.[30]

56. Overall, JRS did not directly include eligibility requirements that depended on firms' productivity, and the allocation of pandemic-related support appears to have not been distortive from a productivity perspective. This is also in line with the analysis of Bighelli et al. (2021[4]), based on a similar distributed

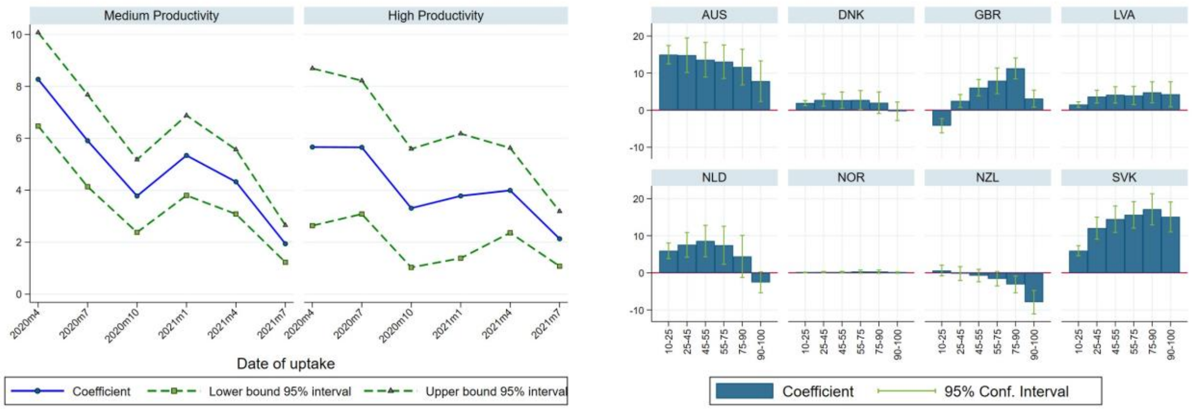
[30] We obtain similar findings when comparing, for countries with available data, the pre-crisis average productivity of firms that took up JRS support at least once during the years 2020 and 2021 and the productivity of firms that never received it: on average, uptake was tilted to the middle of the productivity distribution. The pattern is different for countries with moderate uptake (LVA and SVK), which display a share of uptake that increases linearly with firms' productivity (Figure C.4).

approach covering five European countries (Croatia, Finland, the Netherlands, the Slovak Republic, and Slovenia). A potential explanation for the lower uptake at the very bottom of the distribution is that the least productive firms were less able to deal with the administrative burden required by JRS. Another (potentially complementary) explanation may be related to eligibility for support being often based on differences between performance in 2020-21 and pre-crisis performance, hence implicitly making access relatively more difficult for ex-ante worst performing firms.[31]

Figure 17. Uptake was lower for (very) low-productivity firms

Panel A: Differential JRS uptake by productivity quantile with respect to the low productivity quantile, by date, across countries and sectors

Panel B: Differential JRS uptake by detailed productivity quantile with respect to the low productivity quantile by country across sectors and time



Note: The left panel plots the coefficient and related 95% confidence intervals of a regression of JRS uptake on the aggregated productivity quantile (proxied by the wage quantile) categorical variable, on a cross-country sample evaluated repeatedly at different points in time (April 2020, July 2020, October 2020, January 2021, April 2021, July 2021), controlling for country by industry fixed effects. Each sector is weighted according to its average size in terms of employment over the year. The right panel plots, for each country, the coefficient and related 95% confidence intervals of the regression of JRS uptake on detailed productivity quantile (proxied by the wage quantile) categorical variable, controlling for sector by date fixed effects – standard errors are clustered at the industry level and each sector is weighted according to its average size in terms of employment over the year. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

57. Second, we replicate the analysis to check whether the intensity of uptake varied depending on firms' pre-pandemic size. On average across countries, micro firms (1 to 9 employees) took up support relatively less than firms in other size bins throughout the whole period. Point estimates suggest that this differential in uptake was reduced over time, though not to a large extent and not always statistically significant (Figure 18, Panel A). Small firms (10-19 employees), medium-small (20-49) and medium sized firms (50-249) are the groups displaying slightly higher shares of uptake, while the estimates for the largest firms are less precise and would hint to higher uptake compared to the group of micro firms but lower than the one of small and medium sized companies, in line with the patterns found along the productivity distribution.[32] There is, however, some heterogeneity across countries: while in most countries the intensity of uptake tend to increase with firms' size (especially relative to the micro firms), we observe the opposite

[31] An in-depth analysis aimed at identifying the determinants of the allocation of JRS across firms, as well as their relative relevance, could be valuable for policy makers, but is beyond the scope of this paper and thus left for future research.

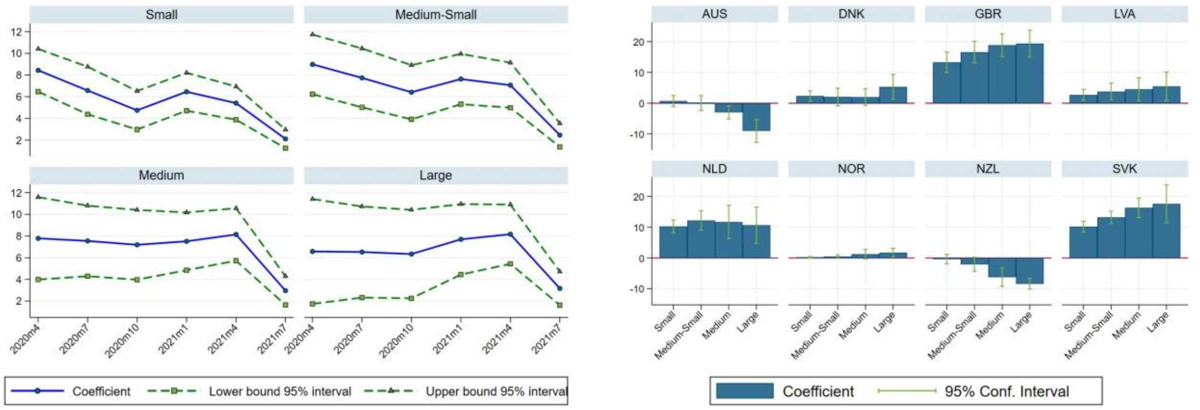
[32] Note that the precision of estimates for the group of large firms may be affected by the relatively more frequent data suppression for confidentiality reasons in this group, as reflected in the larger confidence intervals.

pattern in Australia and New Zealand, two countries characterised by the highest overall levels of uptake (Figure 18, Panel B).[33]

Figure 18. Uptake was higher for medium-sized firms

Panel A: Differential JRS uptake by size bin with respect to the micro firm category (1-9 employees), by date, across countries and sectors

Panel B: Differential JRS uptake by size bin with respect to the micro firm category (1-9 employees), by country, across sectors and over time



Note: The left panel plots the coefficient and related 95% confidence intervals of a regression of JRS uptake on the size bins categorical variable regressed on a cross-country sample evaluated repeatedly at different points in time (April 2020, July 2020, October 2020, January 2021, April 2021, July 2021), controlling for country by industry fixed effects. Each sector is weighted (within countries) according to its average size in terms of employment over the year. The right panel plots, for each country, the coefficient and related 95% confidence intervals of a regression of JRS uptake on the size bins categorical variable regressed, controlling for sector by date fixed effects – standard errors are clustered at the industry level and each sector is weighted according to its average size in terms of employment over the year. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

6.2. Employment dynamics of supported vs non-supported firms: does productivity matter?

58. We now explore whether the differences in terms of employment and survival performance between firms that took up support during 2020 and firms that were not – highlighted in Section 5.1 – varies depending on firms' relative productivity levels. Specifically, we estimate the following equation:

$$y_{c,s,q,p,t+k} = \alpha + \beta_1\, Pol_{c,s,p,t} * ProdQuant_{c,s,q} + \delta_{c,s,q,t} + \varepsilon_{c,s,p,t} \quad (5)$$

where notation is consistent with the one of Equation 3 $ProdQuant_{c,s,q}$ stands for the pre-COVID productivity quantile.[34] The model is an extension of the one corresponding to Equation 3 and we follow a

[33] Again, as for the productivity bins, these findings are confirmed when looking at the pre-crisis average size of firms that took up JRS support at least once during the years 2020 and 2021 and the size of firms that never received it (Figure C.5).

[34] Particularly, $y_{c,s,q,p,t+k}$ stands for either net job creation or survival rates between *t* and *t*+*k* (3,12 months) of firms in country *c*, sector *s*, productivity quantile *q*, uptake group *p* at time *t*, and Pol_{cspt} is a dummy variable taking value 1 for firms that took up support in a given country-sector-month and zero otherwise.

similar estimation strategy. The main difference is that, by including the interaction of the policy variable with the wage quantile (as a proxy for relative productivity) and controlling for any shock at the country-sector-quantile-time level (with the fixed effects $\delta_{c,s,q,t}$), we focus on the relative employment growth and survival of supported vs non-supported firms separately for each quantile of the productivity distribution.[35]

59. In the short term (over a 3-month horizon), policy uptake is associated with higher survival rates along the whole productivity distribution, and this is generally valid for firms supported at different points in time during the pandemic (Figure 19, Panel A). On the contrary, in the medium term (over a 12-month horizon), survival rates were statistically significantly higher in supported firms relative to non-supported firms generally in the highest productivity quantiles, while this was not systematically the case for the lowest quantiles. The difference between supported and non-supported firms in terms of survival rate tends to vanish in all but the highest productivity quantile in the second half of 2020, when pandemic intensity and support generosity was reduced (see Box 3 for a detailed country-specific example).[36, 37]

60. Along the intensive margin, the dynamics outlined in section 5.1, showing a temporary mitigation of the effects of the crisis on supported firms, are confirmed across productivity quantiles. In each productivity quantile, firms that received support experienced similar employment patterns relative to non-supported firms in the short term, but lower employment growth over the longer 12-month horizon (Figure 19, Panel B).

61. Overall, these findings would provide preliminary evidence against concerns that JRS disproportionately benefited low productivity firms. Rather, taken together with the fact that the lowest productivity firms tended to have lower JRS uptake (Section 6.1), they would provide suggestive evidence that JRS support did not distort the productivity-enhancing nature of reallocation.[38]

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[35] As in section 5.1, this methodological setting does not allow to disentangle the causal impact of policy uptake and the crisis impact on specific firms and is therefore aimed at highlighting differences in dynamics according to policy uptake, but results may not be interpreted in a causal way.

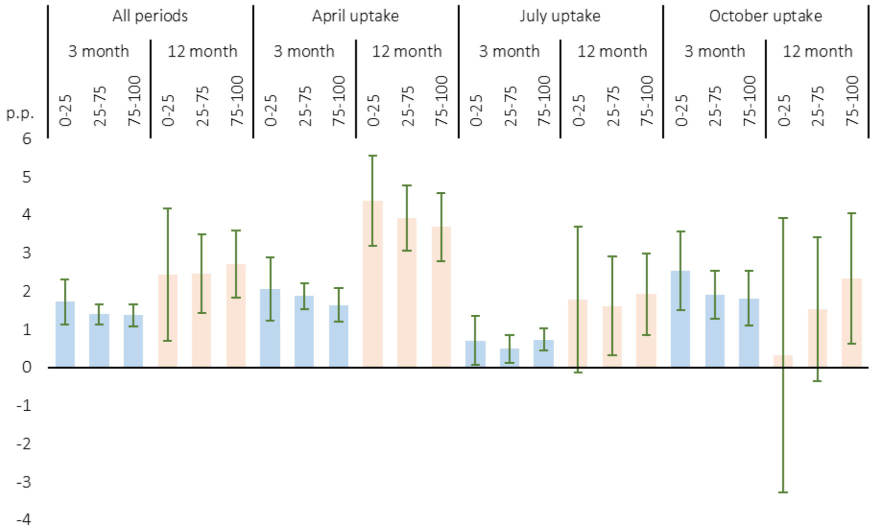
[36] Cross-country comparisons display significant heterogeneities, as shown in Figure C.6. These differences may be related to differences in policy design, which can impact the distribution of policy support across productivity quantiles but can also be linked to differences across countries in the pre-crisis level of misallocation (Aiyar and Dao, (2021[12])).

[37] Unreported results suggest that the extent to which the difference between supported and non-supported firms changes over time varies significantly across countries. Some countries display large changes in this difference over time, while in other countries the difference persists for all “cohorts” of policy uptake.

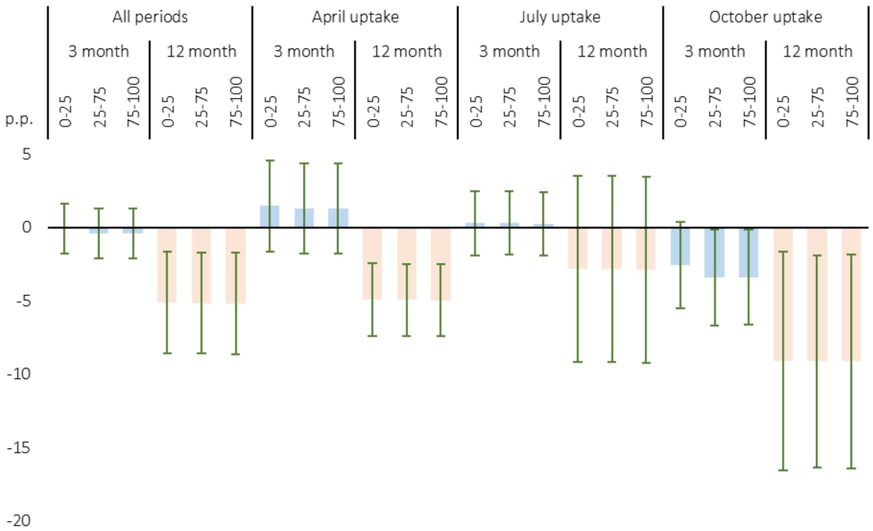
[38] This evidence is consistent with preliminary and complementary analysis by OECD (2021[15]) looking at vacancy rates and job filling rates during 2020.

Figure 19. JRS uptake status affected firms differently along the extensive margin across productivity groups

Panel A: Difference in survival rate for firms taking vs not taking JRS 3 and 12 months after uptake



Panel B: Difference in employment growth for firms taking vs not taking up JRS 3 and 12 months after uptake



Note: The regressions estimate the difference in survival rates (Panel A) and employment growth of surviving firms (Panel B) for firms that took up support and those that did not uptake support, respectively 12 and 3 months after taking up support at a given date and divided by the firms' pre-crisis productivity levels. "All periods" considers as uptakers firms that received JRS support at any point in time; "April/July/October uptake" considers as uptakers firms that received JRS support respectively in April, July, and October 2020. The regressions estimated are Equation 1. The columns represent the estimated coefficients and the green bars the 95% confidence intervals around them. Panel B excludes GBR, as data were not sufficient. Results are similar when excluding GBR also from survival in Panel A. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

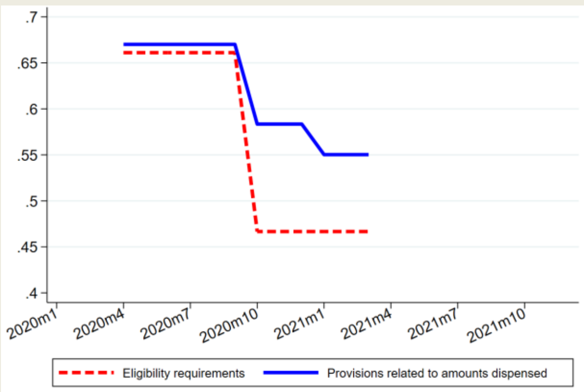
Box 3. JRS: a temporary freeze of cleansing? Evidence from Australia

The JobKeeper Payment program, a wage subsidy scheme, officially entered into force in Australia on 30 March 2020 and was initially slated to last until 27 September 2020. The program was then extended for additional six months, though progressively tightening eligibility criteria and reducing the subsidy rates (Figure 20, Panel A). We exploit the discontinuities in the generosity of the scheme to investigate more deeply the mitigation strategy and its consequence for productivity via the extensive margin in Australia Figure 20, Panel B).

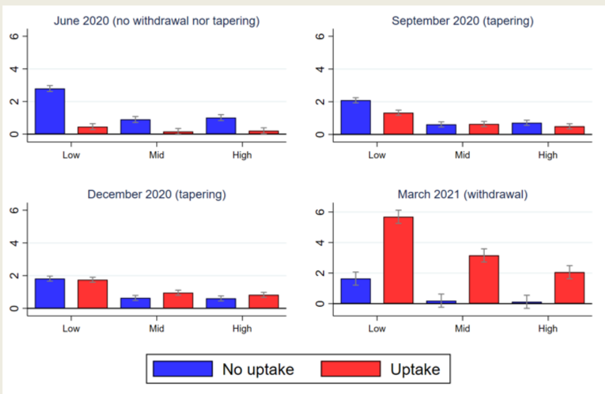
In June 2020, when policy support was the most generous, the exit rate was very low for all firms that took up support, independently of their productivity levels, reflecting the effectiveness of the mitigation strategy. During the JRS tightening period, cleansing started resuming for firms that received support, particularly for the lowest-productive firms. Finally, following policy withdrawal in 2021, exit rates of firms that took up support the previous month were significantly higher, and the more so for low productivity firms. This hints that the market selection mechanism was fully at work again, as some low productivity firms which had benefited from the support but turned out to be non-viable were not kept alive for long.

Figure 20. JRS design and exit rates in Australia before and after JRS withdrawal

Panel A: JobKeeper program: de-jure generosity over time.



Panel B: Exit rate (%) in the three months following the uptake, by productivity quantile – within sector



Note: Panel A reports the variation in both eligibility requirements and provisions related to amounts dispensed of the JobKeeper program according to the JRS indicator built in-house. Panel B reports the average monthly exit rate in the three months following a change in the design of the Australian job retention scheme. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset" and the OECD de-jure database of job retention scheme

6.3. The role of JRS for productivity-enhancing reallocation

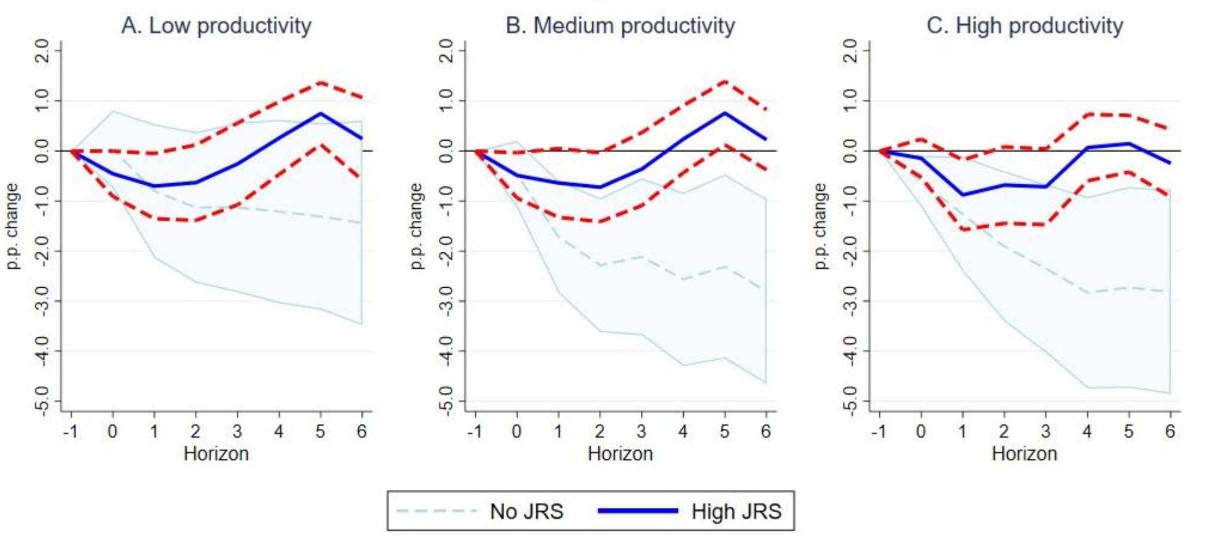
62. Finally, we make use of the indicator on JRS *de jure* generosity and a local projection analysis to isolate the role of JRS for productivity-enhancing reallocation. We use the specification in Equation 4 augmented by country-time fixed effects, and focus on the differential role of JRS in mitigating the COVID-19 shock (measured by the Oxford stringency indicator) in more versus less exposed sectors (proxied by

their ability to telework) along the productivity distribution.[39] To this aim, Figure 21 shows the response to a tightening in the severity of the restrictions associated with the pandemic at different levels of JRS generosity, separately for each productivity quantile.

63. Our results show that, in the absence of support, in both the middle- and the high-productivity quantiles employment growth would have declined significantly more in the absence of JRS (light blue line) relative to when more generous JRS were in place (dark blue line) (Figure 21). Although point estimates suggest similar patterns for the lowest productivity quantile, the difference is not statistically significant. Therefore, JRS support seems to have mitigated the impact of the crisis, acting as a buffer for employment losses, especially for medium and high productivity firms.

Figure 21. JRS may have weakened reallocation but not productivity

Employment growth as a response to a 1sd increase in the containment stringency index, separately for each productivity group



Note: No JRS refers to JRS indicator equal to zero, and high JRS to the 75th percentile. The lines represent the differential effect on employment growth for firms in more- versus less exposed sectors of a change in the containment stringency index between 0 and 6 months after the change if the JRS indicator in the month before the change in severity was equal to 0 (light blue dotted line) or the 75th percentile (blue filled line), estimated through eq. (2) augmented with an interaction with the variable measuring teleworkability. The red dotted lines and the thick light blue lines represent the 90% confidence interval around the estimates. Note that data and results may be preliminary and subject to revisions. The analysis excludes the United Kingdom and Canada due to excessive blanking that did not allow us to perform the analysis.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset", the OECD de-jure indicator of job retention schemes, OECD (2021[17]), and the Oxford Covid-19 Government Response Tracker.

64. This initial evidence suggests that JRS did not weaken productivity-enhancing reallocation, but rather were an efficient tool to countervail COVID-19 related distortions that could have potentially plagued the reallocation process. Indeed, the COVID-19 crisis hit firms over the whole productivity distribution. However, allowing the market selection mechanism to operate freely could have led to a disproportionate downsizing of medium and high productivity firms, with relevant losses from a productivity standpoint and no evident productivity enhancing cleansing effects.

[39] The analysis by month and wage quantiles in this section excludes Canada and the United Kingdom, because of data availability limitations at this granular level, related the extensive blanking of data points due to confidentiality rules.

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Annex A. Micro-aggregate data collection

Country teams

Table A.1. Members of country teams

Country	Team	Institution
AUS	David Hansell; Elif Bahar	Treasury
BEL	Emmanuel Dhyne	Central Bank
CAN	Danny Leung; Hassan Faryaar; Huju Liu	StatCan
COL	Andrea Rios	Ministry of Finance
CRI	Alonso Alfaro	Central Bank
DNK	Søren Sørensen; Mads Haarup Nødgaard	Ministry of Economic Affairs
GBR	Philip Murfitt; Alexandra Torok; Benjamin Saxton; Alexander Matthews; Keiran Dowdall; Christopher Robinson; Robert Waddell; Kerry Booth, Matthew Watts	HM Revenue and Customs
IRL	Donough Lawlor; Jean Acheson	Revenue Commissioners
ISR	Yoav Friedmann; Edith Sand	Central Bank
ITA	Andrea Petrella	Central Bank
LVA	Konstanstins Benkovskis	Central Bank
NLD	Henry van der Wiel; Brenda Bos; Tommy Span	Ministry of Economic Affairs
NOR	Kenneth Schnelle	Statistics Norway
NZL	Corey Allan; Shaan Badenhorst	Ministry of Business, Innovation and Employment
SVK	Vladimír Peciar	Ministry of Finance

Data requirements to run the decentralised STATA routine

1. The project leverages on two data sources: *employment data* and *policy data.* These two data sources should be merged into a single dataset. All information should be converted to a monthly or quarterly basis.[40] All input data respect the following prerequisites:

- Structure: the main data source must be a longitudinal dataset providing information on employment and wages at the worker-firm level (preferred option), or at the firm level.
- Frequency: data should be at the monthly frequency. If the pay period is not monthly, this should be converted to a monthly basis. Quarterly frequency is also supported, with similar syntax for the settings.
- Sectoral coverage: the aim is to cover the full non-financial sector, including manufacturing, non-financial market services and construction.

[40] For instance, if the raw database reports firm-worker units at a higher frequency (i.e., weekly or fortnightly rather than monthly), the user would need to aggregate up each worker-firm pair at the monthly frequency before running the code.

- Time coverage: the aim is to cover the period from January 2018 to the last available data point. The routine works also with later starting periods.
- Panel dimension: individual units (workers and firms) need to be identified by a unique longitudinal identifier (*id*) that must be constant over time. If an active firm exits the data, its identifier must not be reassigned to another firm. In case data are at the worker-level, workers holding jobs in different firms are allowed. However, a *worker-id* and *firm-id* pair should uniquely define observations within a given time period.[41]

Variables definition

2. The program uses the following variables:

- Unique identifiers:
  - A unique firm identifier.
  - A unique worker identifier (*worker-level data only*).
- **Month** or quarter.
- Calendar year.
- **Industry code** identifying the main economic activity of the firm, following the ISIC Rev. 4 classification, preferably at the 4-digits aggregation level.
- **Wage:**
  - Individual wage over the working period (*worker-level data*)
  - Total monthly wage bill (*firm-level data*)
- **Employment variable** (*firm-level data only*)**:** either the number of employees in headcounts (preferred option) or the full-time equivalents.

3. The program is designed to use a set of additional variables, mainly related to policy support during COVID-19 and workers' characteristics, allowing a more in-depth analysis of specific research questions. In particular:

- Full Time Equivalent employees
- Location of the firm or of the worker
- For worker-level data only:
  - **Female worker dummy.**
  - **Self-employed dummy.**
  - Worker **age**, in years.
  - Worker **tenure**, in years.
- For firm-level data only:
  - Number of **female employees** in the firm.
- Variables related to policy support during COVID-19:
  - Job retention schemes uptake dummy.
  - Job retention schemes uptake amount.
  - Loan facilities uptake dummy.
  - Loan facilities uptake amount.

[41] In case a worker holds multiple jobs in a firm in a given period, the information should be collapsed to a single observation.

- Subsidies uptake dummy.
- Subsidies uptake amount.
- Moratorium uptake dummy.
- Moratorium uptake amount.

4. Based on the above variables, the program computes a set of measures to better study employment dynamics across firms:

- **Employment growth (net job creation rates)** is calculated following the measure introduced by Davis, Haltiwanger and Schuh (1996[28]): the numerator is the change in employment over the period over which growth is computed, while the denominator equals half of the sum of the employment at the beginning and at the end of the period of interest. The standard 1-period DHS growth rate is bounded between -2 (for exitors) and +2 (for entrants). The program computes four variations of the DHS growth rate at the firm-level: 1-period backward, 1-period forward, 3-periods forward and 12-periods forward. Additional measures are computed ex-post to compute measures reflecting cell-level aggregate employment growth, used in the analysis.
- **Job creation and job destruction.** The job creation (destruction) backward-looking variable takes value equal to the 1-period change in employment headcounts if this is positive (negative) and value 0 otherwise. Similarly, the job creation (destruction) forward-looking variable taking value equal to the h-period change in employment headcounts if this is positive (negative) and value 0 otherwise; it takes value missing (zero) for firms entering between *t* and *t+h*, while value zero (missing) for firms exiting over the same period.
- **Hiring and separation rates.** They are defined only when worker level data are available. Hirings are defined with a dummy variable taking value 1 if the firm-worker pair is observed at time *t* but not at time *t-1*; separations are defined dummy variable taking value 1 if the firm-worker pair is observed at time *t-1* but not at time *t*. Both variables take value missing in the first year of the data; moreover, the dummy variables are set to zero for hirings (separations) if the firm is not observed at time *t-1* (*t+1*) because of a "gap" and new observations are created by the program to fill the gap. The sum of hirings (separations) in a firm delivers firm level hirings (separation) and the firm hiring (separation) rate is defined as the number of hirings (separations) over the DHS employment denominator. The program computes four variations of the worker churning: 1-period backward, 1-period forward, 3-periods forward and 12-periods forward.
- **Worker churning.** It is defined only when worker level data are available and computed as the ratio of the sum of hirings and separations over DHS employment denominator. The program computes four variations of the worker churning: 1-period backward, 1-period forward, 3-periods forward and 12-periods forward.
- **Excess workers turnover.** It is defined only when worker level data are available and computed as the ratio of the sum of hirings and separations, minus the absolute value of the change in employment during reference period, over DHS employment denominator. The program computes 4 variations of the worker churning: 1-period backward, 1-period forward, 3-periods forward and 12-periods forward.
- **Policy uptake and amounts.** For any policy (JRS, loan, moratorium, or subsidy):
  - *Uptake*. A dummy variable taking value equal to 1 if a firm receives support at time *t* and 0 otherwise. The variable takes missing value if information on support is unknown. When the policy is at the worker-level, the dummy variable is equal to 1 if at least one worker within the firm receives support.
  - *Uptake next period*. A dummy variable taking value equal to 1 if the firm receives support at time *t+1* and 0 otherwise. The variable takes missing value if information on support is unknown.

- *Future uptake*. A continuous variable recording the number of times a firm received support between times *t+1* and *t+h* (*h*=3,12 for monthly data, *h*=4 for quarterly data).
- *Support over wage bill*. A variable taking value equal to the amount of policy support received by the firm at time t divided by the wage bill at time *t*.
- *Support over number of workers*. A variable taking value equal to the amount of policy support received by the firm at time *t* divided by the number of employees in headcounts at time *t*.

Data preparation

Basic consistency checks

5. The program carries out the following series of basic consistency checks and cleaning of the data:

- **Units of measurement**. A pop-up question at the very beginning of the program asks whether all monetary values are in local currency, nominal values, and single unit (not thousands).
- **Variable availability**. The program checks that all the required variables and additional specified variables exist in the micro-data. The program stops and issues an error if some variables do not exist.
- **Duplicates**. Duplicates are observations with identical values on a specified list of variables. The program checks for duplicates in terms of firm ID, worker ID, year and month (i.e., observations with same firm and worker identifiers in the same period). The program stops and issues an error if duplicates are found.
- **Identifiers.** The program stops and issues an error if some observations have missing values for the firm or worker longitudinal identifiers.
- **Industry variables**. The program checks the consistency of the industry variables. If the industry variable changes over time or across workers for a firm, the program assigns a fixed value corresponding to the mode, computed across periods and workers (the most recent one in case of multiple modes). This adjusted variable is used to compute SNA A7 and A38 sector variables. Unknown industry codes and observation with missing code (after taking the mode) are assigned to an SNA 38 sector "Unknown or missing".
- **Location.** Missing values are assigned to the "_XXX" unknown location code category. If the location variable changes over time or across workers for a firm, the program assigns a fixed value corresponding to the mode, computed across periods and workers (the most recent one in case of multiple modes).
- **Periods observed and "gaps".** The program allows for "gaps" in the data, i.e., when firms are not observed in all periods and fills these gaps. For instance, when a firm is in the sample at time *t*, and *t+2* but not at time *t+1*, the program creates an additional observation for this period (all time varying variables are set to missing). No similar adjustment is done for workers.

Data cleaning and preparation

- **Deflation of nominal variables.** The program uses the consumer price index (CPI) to transform every nominal monetary variable into real 2015 local currency. CPI data is sourced from the OECD Main Economic Indicators database.

- **Conversion of monetary variables.** The program uses 2015 purchasing power parity (PPP) exchange rates to equalise monetary values across countries.[42] PPP exchange rate data is sourced from the OECD PPPs and Exchange Rates database.
- **Negative and missing employment (firm-level data only).** Observations with negative employment (either headcounts *or* full-time equivalents) are dropped. Firms with always missing employment are dropped. Observations before (after) the first (last) time firms are observed with non-missing employment are dropped.
- **Self-employment (worker-level data only).** Missing values for the self-employment dummy variable are set to 0 (i.e., worker is assumed to be an employee). The program stops if the variable takes other values than zero, one or missing. When aggregating worker-level data at the firm level, the resulting employment variable is adjusted to record the number of employees.
- **Negative wages.** Negative wage values are set to missing.
- **Censoring of low wage observations (worker-level data only).** The program drops from the sample low wage observations. This is done in two ways. When the full-time equivalent variable is available, observations where the full-time equivalent variable takes value below 0.4 and the hourly wage is below 75% of the hourly reference wage are dropped. When the full-time equivalent variable is not available, observations where the reported monthly wage is below 30% the monthly reference wage are dropped. The reference wage is the statutory de-jure minimum wage for country-year observations where this exists and 40% of the average wage in the country for country-year observations where a minimum wage does not exist. Data on minimum and average wages is sourced from the OECD Employment and Labour Market Statistics database. When government support received during the COVID-19 pandemic via job retention schemes is not included in the wage variable and information on uptake amount is not available, the censoring is not applied.
- **Winsorisation of high wage observations (worker-level data only).** The program winsorises observations in the top 99.5 percentiles of the wage distribution. Thresholds are calculated within the specific A38 industry, year and month.
- **Winsorisation of extreme average wage values (firm-level data only).** The program calculates the average wage in the firm using information on the wage bill and the employment variables. Observations in the bottom 0.5 and top 99.5 percentiles of the average wage distribution are winsorised. Thresholds are calculated within the specific A38 industry, year and month.
- **Additional wage cleaning (worker-level data only).** The program sets to missing negative wage values as well as the wage of the self-employed.
- **Adjustment of wage during short employment spells (worker-level data only).** The program adjusts low values of wages related to short employment spells in a given month (or quarter) when workers join or leave a firm. Whenever a worker joins a firm at time *t* and their time *t* wage is lower than¾4 the time *t+1* wage, the time *t* wage is replaced by the time *t+1* wage. Similarly, if workers leave the firm at time *t* (i.e., they are employed in the firm at time t but not at time *t+1*) and their time *t* wage is lower than¾4 their time *t-1* wage, the time *t* wage is replaced by their time *t-1* wage. If information on FTE is available, the FTE variable is adjusted following the same routine.

[42] For more information, see www.oecd.org/std/ppp/manual.

Resulting micro-aggregated datasets

6. The STATA routine never collects data on individual firms, but groups firms across various dimensions into cells and for each cell aggregate data are collected. Table A.2 details the firm-specific variables that are used to define a cell, in addition to the industry A38 sector, year and month.

Table A.2. Dimensions for data aggregation

Dimensions	***Categories***
Sizeclass 6 Firms are grouped according to their size (employees headcounts), either contemporaneously (i.e., firms size varies at each date) or using pre-crisis (i.e., 2019) values	0-1
	1-9
	10-19
	20-49
	50-249
	250+
	Missing
	All excluding 0 & missing
Sizeclass 2 Firms are grouped according to whether they have more than 1 employee or they are self-employed businesses	0-1
	All excluding missing and 0
	Missing
Demographics[43] Firms are grouped according to their demographic status	Entry
	Surviving firms
	Exit
	All active (entry and surviving firms)
Survival (*t+h*, *h*=1,3,12) Firms are grouped according to their survival status over 1, 3 or 12 months	Surviving
	Exiting
	Unknown
	All
Policy uptake Separately for each policy measure available, firms are grouped according to whether they took the given support in the specific month or not	0 (did not receive support at time t)
	1 (received support t)
	Missing
Any policy uptake Separately for each policy measure available, firms are grouped according to whether they took the given support at least once over the observed period or never took support	0 (never received covid-19 support)
	1 (received at least once covid support)
	Missing
Wage quantiles detailed Firms are grouped according to their position in the 2019 distribution of the average wage per employee paid by the firm	0-10
	10-25
	25-45
	45-55
	55-75
	75-90
	90-100
	All
	Missing
Wage quantiles aggregate Firms are grouped according to their position in the 2019 distribution of the average wage per employee paid by the firm	0-25
	25-75
	75-100
	All
	Missing

Source: OECD.

[43] An entering unit is defined as a unit that is not present in the data at time *t-1* but appears at time *t* with non-missing employment (i.e., the date of entry corresponds to the first period in the data with non-missing employment). An exiting unit is defined as a firm that is present in the data at time *t-1* with non-missing employment, but disappears at time *t* (i.e., the date of exit corresponds to the period following the last period with non-missing employment in the data). A surviving unit is defined as a unit present in the data at both time *t-1* and *t*.

7. Note that the SNA A38 industry classification used in the analysis corresponds to aggregations of two-digits ISIC revision 4 industries. More specifically the following sectors are included (labels used in the paper are in parenthesis): 10-12 ""Food and beverages"), 13-15 ("Textiles and apparel"), 16-18 ("Wood and paper products"), 20 ("Chemicals"), 21 ("Pharmaceuticals"), 22-23 ("Rubber and plastics"), 24-25 ("Metal products"), 26 ("Computer and electronics"), 27 ("Electrical equipment"), 28 ("Machinery and equipment"), 29-30 ("Transport equipment"), 31-33 ("Furniture and other"), 35 ("Electricity and gas"), 36-39 ("Water and, sewerage"), 41-43 ("Construction"), 45 ("Wholesale and retail"), 49-53 ("Transportation and storage"), 55-56 ("Hotels and restaurants"), 58-60 ("Media"), 61 ("Telecommunications"), 62-63 ("IT"), 68 ("Real estate"), 69-71 ("Legal and accounting"), 72 ("Scientific R&D"), 73-75 ("Marketing and other"), 77-82 ("Administrative service"").

8. The STATA routine produces a set of "micro-aggregated moments": it first computes a set of relevant firm-level quantities (e.g., total employment, employment growth, total number of separation and hiring, etc) and then aggregate these quantities by computing statistics (sums, averages, percentiles, standard deviation) across firms belonging to the same cell. A cell is defined according to relevant dimensions for the analysis and each output file collected for cross-country analysis corresponds to a distinct cell definition, based on a combination of dimensions. In particular, the OECD collected the files described in Table A.3, each containing similar moments but differently aggregated.

Table A.3. Collected output files

File Code	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5
11	SectorA38-Date	demographics	sizeclass6 (contemporaneous)		
12	SectorA38-Date	sizeclass6 (contemporaneous)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)		
21	SectorA38-Date	wage quantiles detailed (fixed)	sizeclass6 (fixed)		
31	SectorA38-Date	sizeclass6 (fixed)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)		
32	SectorA38-Date	sizeclass6 (fixed)	JRS uptake	survival groups (3 groups : *t+1*; *t+3*; *t+12*)	
33	SectorA38-Date	sizeclass6 (fixed)	loan uptake	survival groups (3 groups : *t+1*; *t+3*; *t+12*)	
34	SectorA38-Date	sizeclass6 (fixed)	subsidy uptake	survival groups (3 groups : *t+1*; *t+3*; *t+12*)	
35	SectorA38-Date	sizeclass6 (fixed)	moratorium uptake	survival groups (3 groups : *t+1*; *t+3*; *t+12*)	
41	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)	
42	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	JRS uptake (monthly)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)
43	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	loan uptake (monthly)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)
44	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	subsidy uptake (monthly)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)
45	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	moratorium uptake (monthly)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)
51	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	All policy uptake interactions (monthly)	survival groups (3 groups : *t+1*; *t+3*; *t+12*)
61	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	JRS uptake (at least once vs never)	survival groups (*t+1* only)
62	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	Subsidy uptake (at least once vs never)	survival groups (*t+1* only)
63	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	Loan uptake (at least once vs never)	survival groups (*t+1* only)

64	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	Moratorium uptake (at least once vs never)	survival groups (*t+1* only)
71	SectorA38-Date	sizeclass2 (fixed)	wage quantiles aggregate (fixed)	All policy uptake interactions (at least once vs never)	survival groups (*t+1* only)

Note: Date stands for year-month for countries with monthly data and year-quarter for countries with quarterly data.
Source: OECD.

9. Each output file is computed and collected twice, with different weighting. In the first version, all statistics (e.g., average, quantiles, standard-deviation, etc.) are unweighted across firms. In the second version, moments are weighted across firms, using employment as weight.

10. Finally, Table A.4 reports the number of firms as well as firms' average size as of January 2020, at the outset of the COVID-19 pandemic.

Table A.4. Number of firms and firm average employment, by country and wage quantile

Country	Number of firms	Firm average size (headcounts)			
		Whole sample	Bottom wage quartile	Middle wage quartiles	Top wage quartile
AUS	475 474	12.72	4.51	12.00	21.82
BEL	145 247	14.42	6.11	13.43	24.52
CAN	637 140	15.32	9.21	10.99	19.27
CRI	49 053	12.33	1.95	6.62	31.79
DNK	116 238	14.43	4.73	16.78	18.36
GBR	1 208 178	12.45	1.52	7.56	32.02
ITA	1 141 335	9.82	4.00	6.79	19.47
LVA	59 893	9.52	2.02	5.91	22.79
NLD	309 935	17.33	9.69	21.05	16.85
NOR	139 544	10.66	6.08	11.60	12.47
NZL	106 245	12.32	4.29	11.02	21.14
SVK	101 840	12.75	3.01	8.30	30.12

Note: Statistics are reported as of January 2020, with the exception of Australia (July 2020) due to incomplete coverage in the first months of the data. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Annex B. Job retention schemes in COVID-19 times: a cross-country database

11. The novel cross-country and high frequency (monthly) de-jure database of job retention schemes covers the 12 OECD countries currently involved in the project and spans the 2020-21 period. The countries covered are Australia, Belgium, Canada, Costa Rica, Denmark, Italy, Latvia, the Netherlands, New Zealand, Norway, the Slovak Republic and the United Kingdom.

12. Information on the design of the several JRS is gathered from statutory laws as well as text found on governments' websites explaining the programs. Provisions are categorised in two broad categories: (i) eligibility requirements, and (ii) provisions related to generosity. The overall indicator is obtained by averaging these two sub-indices.

Eligibility requirements

13. Eligibility requirements determine which firms qualify to the schemes and are the result of combining information on the following provisions:

- The extent of minimum revenue drop (as % change in revenue relative to the reference period) required to access the scheme.
- Whether the drop in revenues can be only expected (as a 0-1 binary variable).
- Whether the reference period can be chosen (as a 0-1 binary variable).
- The number of months over which the revenue drop conditions should be met (as number of months over a semester).
- The number of months for which the subsidies are granted, once the firm qualifies to access the scheme (as number of months over a semester).
- Whether firms in all sectors of the economy can qualify for the scheme (as a 0-1 binary variable).
- Whether the firm that accesses the scheme is prohibited from laying off workers (as a 0-1 binary variable).
- Whether larger firms face higher eligibility requirements such as, for instance, a higher revenue drop (as a 0-1 binary variable).
- Whether there exists any other additional requirement for the firm to qualify for the scheme (e.g., the obligation for the firm to negotiate the reduction in working hours with workers' representatives or the prohibition for the firm to hire new workers; coded as 0-1 binary variable).

14. All variables are coded so that higher values imply easier access to the scheme for the firm. The various provisions are then aggregated by weighting their relative importance to provide an overall eligibility score. More specifically, provision 1) accounts for one third of score, provisions 4) and 5) for another one third of the score and all other provisions for the remaining third. Figure B.1 provides an overview of cross-country differences (average over time) in eligibility requirements according to our indicator.

Figure B.1. De-jure JRS indicator: Eligibility requirements across countries

Note: Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the OECD de-jure indicator of job retention schemes.

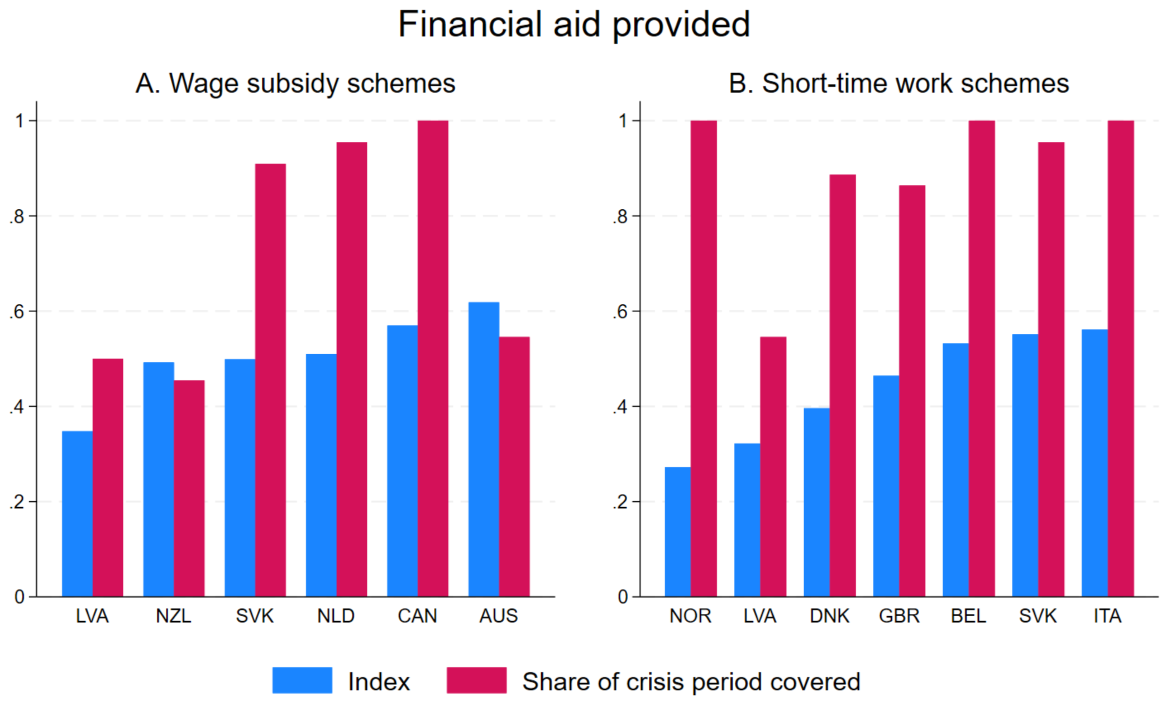
Provisions related to financial aid

15. The provisions considered to determine the generosity of government subsidies to firms are:

- The subsidy amount for a worker earning the average wage (as subsidy over the average wage paid in the country). It is calculated to account the subsidy received for workers with different levels of reduced working hours, hence making WS and STW comparable.
- The existence of a maximum subsidy amount that can be paid per worker (as amount over the average wage paid in the country).
- Whether the firm has to top-up the government subsidy to maintain workers earnings unchanged (as a categorical variable taking value 0 if yes, 0.5 if recommended and 1 if no).
- Whether there exists a cap on the maximum amount of subsidies that can be paid to a single firm (as a 0-1 binary variable).
- Whether subsidies are larger in certain sectors that are most exposed to the pandemic (as a 0-1 binary variable).
- Whether smaller firms are paid relatively larger subsidies (as a 0-1 binary variable).

All variables are coded so that higher values imply more generous transfers from the government to firms. The various provisions are then aggregated by weighting their relative importance to provide an overall generosity score. More specifically, the subsidy amount paid per worker (provision 1) accounts for half of the score, firms top-up (provision 3) for a quarter of the score and the remaining provisions (2, 4, 5, 6) contribute equally for the remaining quarter. Figure B.2 provides an overview of cross-country differences (average over time) in provisions related to the financial aid provided according to our indicator.

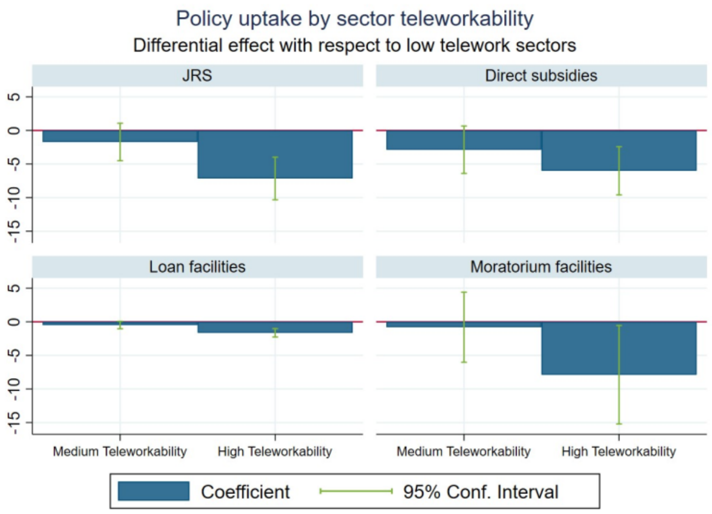
Figure B.2. De-jure JRS indicator: Provisions related to financial aid across countries



Note: Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the OECD de-jure indicator of job retention schemes.

Annex C. Additional figures

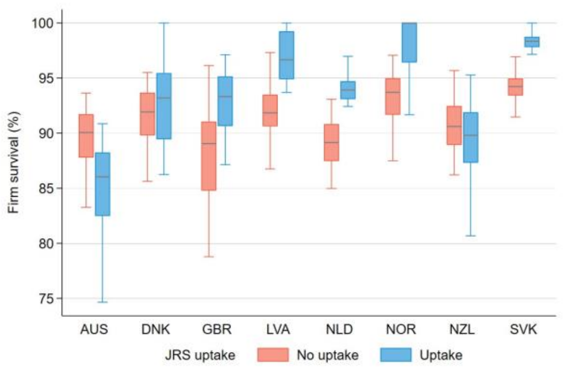
Figure C.1. Policy uptake has been significantly lower in less exposed (high telework) sectors



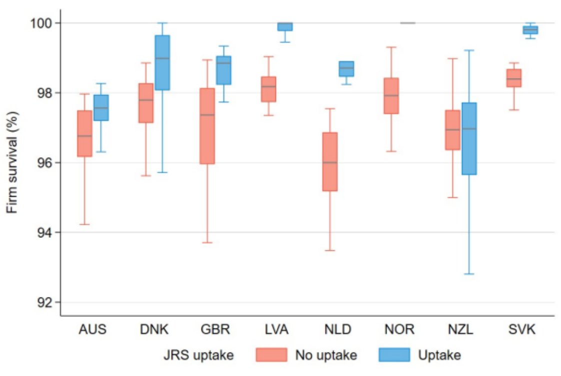
Note: The figure plots the coefficient and related 95% confidence intervals of the telework categorical variable regressed over policy uptake, controlling for country by date fixed effects – standard errors are clustered at the country-industry level and each sector is weighted according to its average size in terms of employment over the year. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset" and OECD (2021[17]).

Figure C.2. Survival rates by country and JRS uptake status

Panel A: 12-month survival rates, by country and JRS uptake status – distribution across sectors



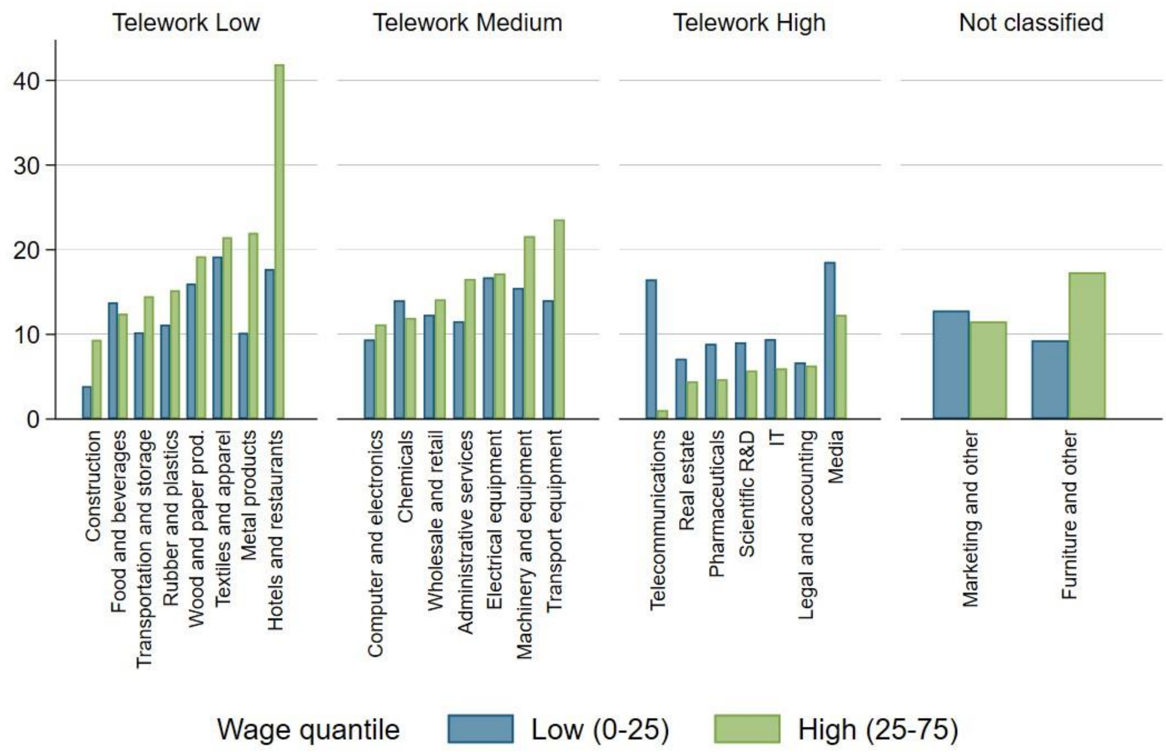
Panel B: 3-month survival rates, by country and JRS uptake status – distribution across sectors



Note: The figure plots firms' survival rates at 12-months (left panel) and 3-months (right panel) by country and JRS uptake status. The box plot shows the distribution of survival rates across sectors in each group: the small horizontal lines inside the boxes are the median of the distribution, the boxes the 25th to 75th percentile of the distribution and the vertical lines the minimum and maximum value. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

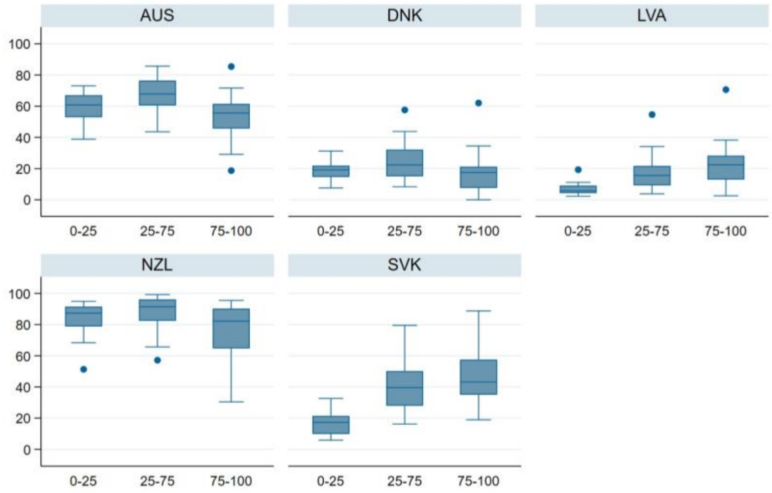
Figure C.3. High productivity firms relative uptake was the highest in most exposed sectors

Share of firms receiving support through job retention schemes, by industries (according to teleworkability) and productivity quantile



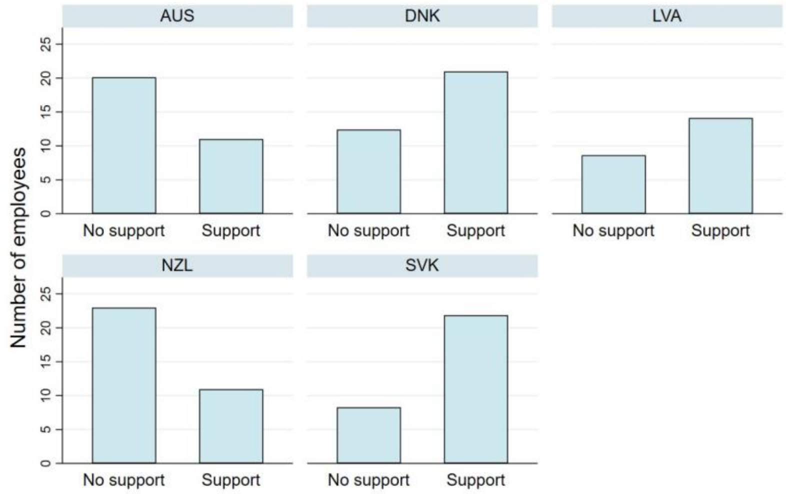
Note: The figure plots the median JRS uptake across countries of the sector average uptake over 2020, for both low productivity and high productivity firms – productivity is proxied with the average wage paid in the firm. Note that data and results may be preliminary and subject to revisions. The figure is based on available data for AUS, DNK, LVA, NLD, NZL, and SVK.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset" and OECD (2021[17]).

Figure C.4. JRS uptake at least once, by productivity quantile



Note: The figure plots the share of firms that took up JRS at least once during the COVID-19 pandemic by country and productivity quantile (proxied by the wage quantile). The cohort of firms active in January 2020 is the reference group. The box plot shows the distribution of survival rates across sectors in each group: the small horizontal lines inside the boxes are the median of the distribution, the boxes the 25th to 75th percentile of the distribution and the vertical lines the minimum and maximum value. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

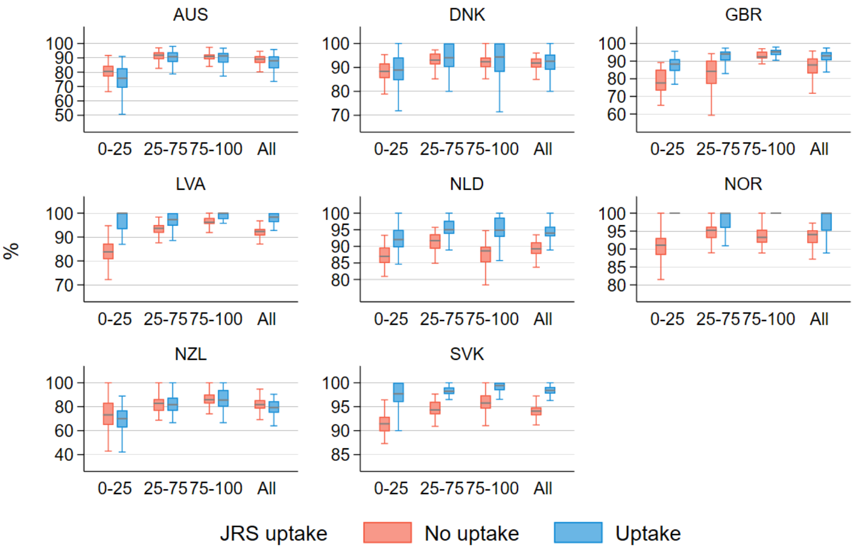
Figure C.5. Average pre-COVID-19 firm size by uptake status



Note: The figure plots the pre-pandemic average size (number of employees, headcounts) of firms that took up JRS at least once during the COVID-19 pandemic as well as of firms that never took up support. The cohort of firms active in January 2020 is the reference group. Note that data and results are still preliminary and may be subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Figure C.6. Survival rates by country, productivity quantile and JRS uptake status

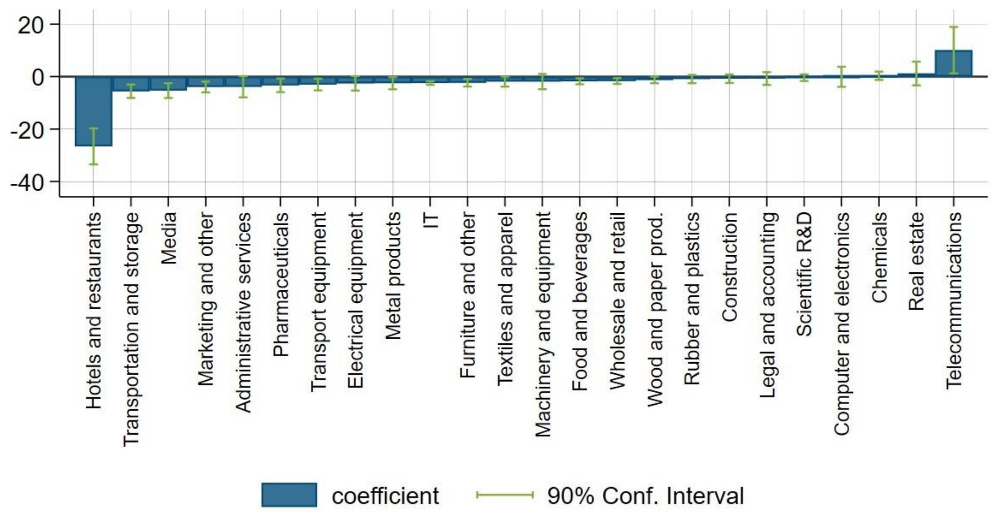
12-month survival rates – distribution across sectors



Note: The figure plots firms' survival rates at 12 months by country, productivity quantile (proxied by wage quantile) and JRS uptake status. The box plot shows the distribution of survival rates across sectors in each group: the small horizontal lines inside the boxes are the median of the distribution, the boxes the 25th to 75th percentile of the distribution and the vertical lines the minimum and maximum value. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Figure C.7. Reallocation of labour across sectors during the COVID-19 crisis

Difference in employment growth in 2020 and 2019 across sectors



Note: The figure presents the comparison of overall employment growth rates between 2020 and 2019 by sector. The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each year of interest interacted with a dummy for each sector, along with country-sector fixed effects, and weighting the regression by country-sector employment (averaged over the year). Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Annex D. Additional tables

Table D.1. The crisis impacted employment growth through the intensive margin

Growth of employment and change in survival rates between 2020/2021 and 2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Employment (overall)		**Employment (surviving firms)**		**Survival**	
	2020	2021	2020	2021	2020	2021
Crisis dummy	-4.667***	2.924***	-5.094***	2.700***	-0.165	-2.163***
	(0.828)	(0.535)	(0.884)	(0.576)	(0.242)	(0.326)
Constant	-2.075***	-1.844***	1.019**	1.410***	90.977***	90.724***
	(0.414)	(0.268)	(0.442)	(0.288)	(0.121)	(0.163)
R2	0.619	0.612	0.590	0.625	0.872	0.877
Observations	504	466	470	422	496	450
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weighted	Yes	Yes	Yes	Yes	Yes	Yes
Weights	Total employment	Total employment	Total employment	Total employment	Number of firms	Number of firms
No. of countries	11	10	10	9	11	10
Country list	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL	BEL CAN CRI DNK ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK ITA LVA NLD NOR NZL	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL

Note: The regressions compare a) employment growth rates, b) employment growth rates of incumbent firms and c) survival rates between 2020 and 2019 (columns 1, 3, and 5) and 2021 and 2019 (columns 2, 4, and 6). The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each year of interest, along with country-sector fixed effects, and weighting the regression by country-sector employment (averaged over the year). Employment growth of surviving firms does not include GBR, as data were not available. Results are similar when excluding GBR also from overall employment growth and survival. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Table D.2. The crisis impacted sectors differently depending on their ability to telework

Job creation and job destruction rates

	(1)	(2)	(3)	(4)
	Job creation rates		Job destruction rates	
	2020	2021	2020	2021
Crisis dummy x Low telework	-1.687***	2.877***	6.559***	-0.657*
	(0.337)	(0.822)	(1.548)	(0.379)
Crisis dummy x Med. telework	-0.010	1.920***	2.768***	-0.877*
	(0.360)	(0.445)	(0.620)	(0.447)
Crisis dummy x High telework	-0.389	1.506***	0.971*	-0.383
	(0.494)	(0.529)	(0.546)	(0.631)
Crisis dummy x Not classified	-1.706**	1.460*	2.005***	-1.024
	(0.840)	(0.803)	(0.638)	(0.727)
Constant	7.701***	7.800***	9.777***	9.644***
	(0.108)	(0.187)	(0.322)	(0.129)
R2	0.873	0.837	0.776	0.845
Observations	504	466	504	466
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weighted	Yes	Yes	Yes	Yes
Weights	Total employment	Total employment	Total employment	Total employment
No. of countries	11	10	11	10
Country list	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL

Note: The regressions compare a) job creation rates and b) job destruction rates between 2020 and 2019 (columns 1 and 3) and 2021 and 2019 (columns 2 and 4). The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each year of interest, along with country-sector fixed effects, and weighting the regression by country-sector employment (averaged over the year). Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Table D.3. Employment and survival rates across countries

Growth of employment and change in survival rates between 2020 and 2019 by country

	(1)	(2)	(3)
	Employment (overall)	**Employment (surviving firms)**	**Survival**
Dummy x BEL	0.640	0.603	0.732***
	(0.905)	(0.921)	(0.207)
Dummy x CRI	-6.230**	-7.021***	-1.781**
	(2.953)	(2.692)	(0.795)
Dummy x DNK	-5.294*	-5.191*	0.065
	(2.766)	(2.748)	(0.187)
Dummy x GBR	-3.716**		0.405
	(1.833)		(1.315)
Dummy x ITA	-4.107	-5.116*	2.330***
	(2.908)	(2.941)	(0.189)
Dummy x LVA	-7.193***	-7.586***	0.212
	(1.901)	(1.842)	(0.261)
Dummy x NLD	-4.577*	-5.182**	-0.049
	(2.415)	(2.618)	(0.124)
Dummy x NOR	-6.042**	-5.927**	0.135
	(2.594)	(2.508)	(0.727)
Dummy x NZL	-3.712***	-4.229***	0.894***
	(1.048)	(1.006)	(0.336)
Dummy x SVK	1.259	1.285	-0.386*
	(2.040)	(2.046)	(0.209)
Constant	-2.075***	1.019***	90.977***
	(0.371)	(0.391)	(0.084)
R2	0.676	0.656	0.930
Observations	504	470	496
FE	Country-Industry	Country-Industry	Country-Industry
Weighted	Yes	Yes	Yes
Weights	Total employment	Total employment	Number of firms
No. of countries	11	10	11

Note: The regressions compare a) employment growth rates, b) employment growth rates of surviving firms and c) survival rates between 2020 and 2019 for each country. The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for the year 2020 interacted with a dummy for each country, along with country-sector fixed effects, and weighting the regression by country-sector employment (averaged over the year). Employment growth of surviving firms does not include GBR, as data were not available. Results are similar when excluding GBR also from overall employment growth and survival. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Table D.4. Within-year labour reallocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Employment (overall)			Employment (surviving firms)			Survival		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
25-75 dummy	8.002***	4.895***	5.803***	1.295**	-0.302	-0.561	5.852***	5.463***	7.696***
	(0.910)	(0.723)	(0.621)	(0.503)	(0.828)	(0.486)	(0.420)	(0.268)	(0.500)
75-100 dummy	9.858***	6.219***	9.105***	1.858***	0.222	1.029*	5.482***	6.480***	8.480***
	(1.173)	(0.977)	(0.910)	(0.562)	(1.103)	(0.593)	(0.567)	(0.336)	(0.634)
Constant	-11.096***	-11.342***	-6.869***	-0.563	-3.314***	3.633***	86.553***	86.508***	82.287***
	(0.688)	(0.540)	(0.499)	(0.342)	(0.617)	(0.346)	(0.310)	(0.184)	(0.366)
R2	0.569	0.739	0.710	0.501	0.701	0.720	0.787	0.848	0.847
Observations	740	819	725	653	733	632	731	812	698
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weighted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weights	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment	Number of firms	Number of firms	Number of firms
No. of countries	11	12	11	10	11	10	11	12	11
Country list	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	AUS BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	AUS BEL CAN CRI DNK GBR ITA LVA NLD NOR NZ	BEL CAN CRI DNK ITA LVA NLD NOR NZL SVK	AUS BEL CAN CRI DNK ITA LVA NLD NOR NZL SVK	AUS BEL CAN CRI DNK ITA LVA NLD NOR NZL	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	AUS BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	AUS BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL

Note: The estimations reflect the differential between low productivity firms (0-25) and middle (25-75) and high (75-100) productivity firms in a) employment growth rates, b) employment growth rates of surviving firms and c) survival rates in 2019 (columns 1, 4, and 7), 2020 (columns 2, 5, and 8) and 2021 (columns 3, 6, and 9). The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each productivity quantile along with country-sector fixed effects, and weighting the regression by sectoral employment. Employment growth of surviving firms does not include GBR, as data were not available. Results are similar when excluding GBR also from overall employment growth and survival. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Table D.5. Employment reallocation became less productivity enhancing in 2020

Employment reallocation during 2020 compared to 2019

	(1)	(2)	(3)
	Employment (overall)	Employment (surviving firms)	Survival
25-75 dummy	8.099***	1.429***	5.853***
	(0.909)	(0.506)	(0.419)
75-100 dummy	9.942***	1.961***	5.482***
	(1.172)	(0.566)	(0.567)
Crisis dummy	-1.690	-4.091***	0.023
	(1.324)	(1.204)	(0.408)
Crisis x 25-75	-2.563**	-1.143	-0.756***
	(1.229)	(1.059)	(0.272)
Crisis x 75-100	-2.565*	-0.565	0.846**
	(1.465)	(1.170)	(0.361)
Constant	-11.130***	-0.648	86.560***
	(0.854)	(0.569)	(0.387)
R2	0.496	0.411	0.744
Observations	1505	1331	1491
FE	Country-Industry	Country-Industry	Country-Industry
Weight	Yes	Yes	Yes
Weight var	Total employment	Total employment	Number of firms
No. of countries	11	10	11
Country list	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK ITA LVA NLD NOR NZL SVK	BEL CAN CRI DNK GBR ITA LVA NLD NOR NZL SVK

Note: The estimations reflect the differential between low productivity firms (0-25) and middle (25-75) and high (75-100) productivity firms in a) employment growth rates, b) employment growth rates of surviving firms and c) survival rates in 2020 compared to 2019. The comparison is done by regressing the growth of each variable between January of each year and January of the year after on a dummy for each productivity quantile and an interaction between these and a dummy for 2020 along with country-sector fixed effects, and weighting the regression by sectoral employment. Employment growth of surviving firms does not include GBR, as data were not available. Results are similar when excluding GBR also from overall employment growth and survival. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Table D.6. Productivity-enhancing reallocation before and during COVID-19

Overall employment growth, comparison with firms in the 0-25 productivity quantile

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)
	BEL	CRI	DNK	GBR	ITA	LVA	NLD	NOR	NZL	SVK
Dummy 25-75	0.478	11.718***	2.845	12.978***	5.396**	24.359***	0.64	4.589**	8.765***	10.584***
	(1.062)	(3.309)	(1.925)	(2.142)	(2.706)	(2.299)	(2.055)	(2.067)	(1.450)	(2.805)
Dummy75-100	0.681	19.324***	-0.707	19.215***	7.936***	29.705***	-1.729	4.015*	10.980***	12.744***
	(0.582)	(3.408)	(1.977)	(2.263)	(2.652)	(2.191)	(2.166)	(2.131)	(1.599)	(2.851)
Dummy 2020	0.599	-3.871	-5.949***	8.741***	-5.115	14.271***	-9.819***	-8.006***	1.616	6.125
	(0.555)	(3.647)	(1.636)	(2.006)	(3.173)	(3.190)	(3.389)	(1.773)	(1.856)	(3.970)
2020 x 25-75	0.476	-3.941	-1.169	-9.621***	1.183	-21.445***	5.299	1.615	-4.280**	-5.161
	(1.329)	(4.425)	(2.857)	(3.100)	(3.762)	(3.781)	(4.228)	(2.875)	(2.039)	(4.475)
2020 x 75-100	-0.637	-2.303	2.762	-15.616***	1.338	-23.091***	7.441*	3.437	-6.942***	-5.288
	(0.652)	(4.769)	(3.068)	(3.653)	(3.958)	(3.825)	(4.039)	(2.866)	(2.297)	(4.585)
Constant	-1.354***	-18.211***	-3.200***	-20.385***	-8.367***	-28.919***	-2.739*	-5.372***	-11.430***	-15.439***
	(0.498)	(2.809)	(1.199)	(1.535)	(2.195)	(1.809)	(1.539)	(1.501)	(1.264)	(2.574)
R2	0.466	0.609	0.590	0.580	0.595	0.731	0.558	0.621	0.638	0.465
Observations	142	144	137	127	144	144	136	144	143	144
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weighted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weights	Total employ.	Total employ.	Total employ.	Total employ.	Total employ.	Total employ.	Total employ.	Total employ.	Total employ.	Total employ.

Note: The estimations reflect the differential between low productivity firms (0-25) and middle (25-75) and high (75-100) productivity firms in employment growth rates, estimated separately for each country. The comparison is done by regressing the growth of each variable between January of each year 2019 and 2020 and January of the year after (2020 and 2021) on a dummy for each productivity quantile, a dummy for the year 2020, and an interaction of both, along with country-sector fixed effects, and weighting the regression by sectoral employment. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business support dataset".

Table D.7. Survival and employment growth by JRS uptake status

Difference in survival rates and employment growth of surviving firms between firms that took up JRS and those that did not

	1	2	3	4	5	6	7	8
	Survival							
	All		M4		M7		M10	
	12	3	12	3	12	3	12	3
Uptake	2.657***	1.613***	4.036***	2.052***	1.966***	0.735***	1.701	2.098***
	(0.541)	(0.158)	(0.398)	(0.164)	(0.584)	(0.184)	(1.059)	(0.348)
Constant	90.072***	96.918***	90.304***	96.979***	90.271***	97.541***	89.457***	96.123***
	(0.271)	(0.079)	(0.199)	(0.082)	(0.292)	(0.092)	(0.530)	(0.174)
R2	0.765	0.728	0.843	0.832	0.769	0.771	0.730	0.663
Observations	882	938	340	340	326	322	216	276
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weight var	Number of firms	Number of firms	Number of firms	Number of firms	Number of firms	Number of firms	Number of firms	Number of firms
No. of countries	9	9	8	8	8	8	6	7
Country list	AUS CAN DNK GBR LVA NLD NOR NZL SVK	AUS CAN DNK GBR LVA NLD NOR NZL SVK	AUS CAN DNK GBR LVA NLD NZL SVK	AUS CAN DNK GBR LVA NLD NZL SVK	AUS CAN DNK GBR NLD NOR NZL SVK	AUS CAN DNK GBR NLD NOR NZL SVK	AUS CAN GBR NLD NOR NZL	AUS CAN GBR NLD NOR NZL SVK
	Employment (surviving firms)							
	All		M4		M7		M10	
	12	3	12	3	12	3	12	3
Uptake	-5.147***	-0.398	-4.957***	1.281	-2.817	0.300	-9.084**	-3.438**
	(1.754)	(0.872)	(1.249)	(1.564)	(3.225)	(1.109)	(3.685)	(1.650)
Constant	12.892***	5.082***	10.431***	6.816***	14.513***	4.294***	14.248***	3.794***
	(0.877)	(0.436)	(0.625)	(0.782)	(1.612)	(0.554)	(1.843)	(0.825)
R2	0.668	0.639	0.621	0.625	0.746	0.633	0.398	0.641
Observations	672	684	272	260	252	238	148	186
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weight var	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment
No. of countries	7	7	6	6	6	6	4	5
Country list	AUS DNK LVA NLD NOR NZL SVK	AUS DNK LVA NLD NOR NZL SVK	AUS DNK LVA NLD NZL SVK	AUS DNK LVA NLD NZL SVK	AUS DNK NLD NOR NZL SVK	AUS DNK NLD NOR NZL SVK	AUS NLD NOR NZL	AUS NLD NOR NZL SVK

Note: The regressions estimate the difference in survival rates and employment for firms that took up support and those that did not uptake support, respectively 12 and 3 months after taking up support at a given date. “All periods” considers as uptakers firms that received JRS support at any point in time; “April/July/October uptake” considers as uptakers firms that received JRS support respectively in April, July, and October 2020. The regressions estimated are Equation 1. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Table D.8. Survival by uptake by country

	(1)	(2)
	12 months	3 months
	2020	2020
Uptake dummy x AUS	-2.604***	2.116***
	(0.744)	(0.315)
Uptake dummy x DNK	0.104	0.728***
	(0.647)	(0.175)
Uptake dummy x GBR	5.009***	1.251***
	(1.072)	(0.174)
Uptake dummy x LVA	4.325***	1.462***
	(0.400)	(0.098)
Uptake dummy x NLD	5.500***	3.336***
	(0.552)	(0.442)
Uptake dummy x NOR	4.199***	1.969***
	(0.981)	(0.316)
Uptake dummy x NZL	-1.538***	-0.288
	(0.584)	(0.255)
Uptake dummy x SVK	4.627***	1.731***
	(0.244)	(0.115)
Constant	90.072***	96.918***
	(0.114)	(0.044)
R2	0.897	0.801
Observations	882	938
FE	Country-Industry	Country-Industry
Weight	Yes	Yes
Weight var	Number of firms	Number of firms
No. of countries	9	9

Note: The regressions estimate the difference in survival rates for firms that took up support and those that did not uptake support, respectively 12 and 3 months after taking up support at a given date, by country. “All periods” considers as uptakers firms that received JRS support at any point in time; “April/July/October uptake” considers as uptakers firms that received JRS support respectively in April, July, and October 2020. The regressions estimated are Equation 1 augmented by uptake-country interactions. Note that data and results may be preliminary and subject to revisions; moreover, owing to methodological differences, figures may deviate from officially published national statistics.
Source: OECD calculations based on the “OECD COVID-19 employment and business support dataset”.

Table D.9. Survival and employment growth differences by productivity quantile

	1	2	3	4	5	6	7	8
	Survival							
	All	All	M4	M4	M7	M7	M10	M10
	12	3	12	3	12	3	12	3
Uptake x 0-25	2.432***	1.721***	4.372***	2.060***	1.791*	0.711**	0.311	2.533***
	(0.883)	(0.304)	(0.606)	(0.421)	(0.975)	(0.331)	(1.837)	(0.524)
Uptake x 25-75	2.451***	1.392***	3.925***	1.875***	1.613**	0.485**	1.533	1.907***
	(0.527)	(0.140)	(0.438)	(0.176)	(0.659)	(0.192)	(0.965)	(0.318)
Uptake x 75-100	2.711***	1.375***	3.685***	1.638***	1.923***	0.725***	2.333***	1.817***
	(0.455)	(0.149)	(0.456)	(0.226)	(0.546)	(0.147)	(0.874)	(0.365)
Constant	89.299***	96.779***	89.407***	96.940***	89.820***	97.412***	88.338***	95.845***
	(0.288)	(0.083)	(0.213)	-0.109	(0.308)	(0.092)	(0.579)	(0.185)
R2	0.821	0.764	0.869	0.755	0.794	0.795	0.822	0.770
Observations	2284	2380	910	858	850	848	524	674
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weight var	No of firms	No of firms	No of firms	No of firms	No of firms	No of firms	No of firms	No of firms
No. of countries	9	9	8	8	8	8	6	7
Country list	AUS CAN DNK GBR LVA NLD NOR NZL SVK	AUS CAN DNK GBR LVA NLD NOR NZL SVK	AUS CAN DNK GBR LVA NLD NZL SVK	AUS CAN DNK GBR LVA NLD NZL SVK	AUS CAN DNK GBR NLD NOR NZL SVK	AUS CAN DNK GBR NLD NOR NZL SVK	AUS CAN GBR NLD NOR NZL	AUS CAN GBR NLD NOR NZL SVK
	Employment growth (incumbents)							
	All	All	M4	M4	M7	M7	M10	M10
	12	3	12	3	12	3	12	3
Uptake x 0-25	-5.119***	-0.076	-4.924***	1.463	-2.832	0.282	-9.104**	-2.545*
	(1.780)	(0.865)	(1.263)	(1.586)	(3.234)	(1.112)	(3.799)	(1.504)
Uptake x 25-75	-5.163***	-0.395	-4.957***	1.281	-2.827	0.291	-9.143**	-3.424**
	(1.756)	(0.873)	(1.250)	(1.564)	(3.226)	(1.109)	(3.695)	(1.654)
Uptake x 75-100	-5.188***	-0.406	-4.987***	1.278	-2.876	0.240	-9.140**	-3.407**
	(1.760)	(0.875)	(1.250)	(1.565)	(3.235)	(1.112)	(3.720)	(1.660)
Constant	12.920***	5.098***	10.411***	6.810***	14.520***	4.301***	14.389***	3.843***
	(0.882)	(0.431)	(0.626)	(0.786)	(1.616)	(0.555)	(1.868)	(0.781)
R2	0.668	0.640	0.622	0.625	0.746	0.633	0.395	0.643
Observations	2064	2164	812	794	788	788	464	582
FE	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Weight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weight var	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment	Total employment
No. of countries	7	7	6	6	6	6	4	5
Country list	AUS DNK LVA NLD NOR NZL SVK	AUS DNK LVA NLD NOR NZL SVK	AUS DNK LVA NLD NZL SVK	AUS DNK LVA NLD NZL SVK	AUS DNK NLD NOR NZL SVK	AUS DNK NLD NOR NZL SVK	AUS NLD NOR NZL	AUS NLD NOR NZL SVK

Note: The regressions estimate the difference in survival rates and employment for firms that took up support and those that did not uptake support along different productivity quantiles, respectively 12 and 3 months after taking up support at a given date. "All periods" considers as uptakers firms that received JRS support at any point in time; "April/July/October uptake" considers as uptakers firms that received JRS support respectively in April, July, and October 2020. The regressions estimated are Equation 1 augmented by uptake-quantile interactions. Note that data and results may be preliminary and subject to revisions.
Source: OECD calculations based on the "OECD COVID-19 employment and business.