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THE ECONOMIC IMPACT OF COVID-19 ON SPANISH  
FIRMS ACCORDING TO THE BANCO DE ESPAÑA  
BUSINESS ACTIVITY SURVEY (EBAE)

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## ABSTRACT

The COVID-19 health crisis had a highly uneven impact across sectors and regions in 2020. However, there is hitherto little evidence regarding the heterogeneous impact of the crisis on different firms within each sector and region. This article provides an initial description of the characteristics determining how severely firms have been affected by the pandemic. To this end, it uses the responses (just over 4,000) given in the first round of the Banco de España Business Activity Survey (EBAE), launched in November 2020. The results show that turnover and employment declined more markedly at smaller-sized firms. Moreover, within each sector and region, the crisis has had more adverse effects on younger firms, less productive firms and those located in urban areas. In the case of jobs, higher temporary employment ratios are associated with larger reductions in employment.

**Keywords:** COVID-19, business survey, employment, turnover.

**JEL classification:** D22, I15.

# THE ECONOMIC IMPACT OF COVID-19 ON SPANISH FIRMS ACCORDING TO THE BANCO DE ESPAÑA BUSINESS ACTIVITY SURVEY

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## Introduction

The COVID-19 health crisis is having a severe impact on the Spanish economy, with GDP falling by 11% in 2020, one of the steepest declines among developed countries. Aside from its enormous scale in aggregate terms, unprecedented in recent history, one particularly striking characteristic of this crisis is its uneven impact across sectors and regions. This asymmetry stems above all from the fact that the restrictions adopted by the authorities to contain the spread of the virus (and changes in the general public's behaviour in response to those measures) have primarily affected certain sectors of activity.<sup>1</sup> Further, this cross-sectoral heterogeneity has accentuated as the pandemic unfolded, with the gradual transition from the broader-based measures in the spring of 2020 to measures more focused on activities that involve a greater degree of social interaction. This asymmetric impact across the sectors has attracted considerable attention, including in the context of the economic policy debate, where it has been suggested that support measures should be redirected towards the hardest-hit activities. By contrast, the intra-sectoral heterogeneity of the effects of the pandemic has not been analysed to date, possibly owing to the paucity of sufficiently detailed information.<sup>2</sup>

This article explores the heterogeneity of the impact of the COVID-19 crisis across different types of firms, drawing on the information provided by the new Banco de España Business Activity Survey (EBAE). This survey was first launched in November 2020 with the aim of compiling data on non-financial corporations' activity around the time of the survey responses.<sup>3</sup> The results evidence that, setting aside the differences observed across the sectors of activity and regions, firm size is the

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1 For instance, at the sector level, the slump in gross value added during 2020 in trade, transportation and hospitality (-24.1%) and the arts, recreation and other services (-24.2%) contrasts with favourable figures for the primary sector (+4.8%), financial and insurance activities (+2.9%) and the public sector (+1.4%). At the geographical level, the sectoral heterogeneity also leads to some cross-province disparity in change in GDP based on the provinces' productive structure. See A. Fernández (2021), "The economic performance of Spanish provinces during 2020 and its determinants", Analytical Articles, Banco de España.

2 For an analysis of the impact of COVID-19 on the financial position of Spanish firms, see R. Blanco, S. Mayordomo, Á. Menéndez and M. Mulino (2020), "The impact of the COVID-19 crisis on the financial position of non-financial corporations in 2020: CBSO-based evidence", Analytical Articles, *Economic Bulletin* 4/2020, Banco de España.

3 See Box 3 of the Macroeconomic projections for the Spanish economy (2020-2023): *Spanish business survey on activity and the impact of COVID-19*.

characteristic most able to explain the cross-firm differences in the impact of the health crisis. Specifically, turnover and actual employment (calculated as total employees at the firm less workers subject to furlough schemes – ERTE by the Spanish initials –) declined more sharply at smaller-sized firms, even after controlling for the varying impact of the crisis across sectors of activity and regions. As regards other characteristics, within each sector and region, the crisis has had a more severe impact on younger firms, less productive firms and those located in urban areas.

## Brief overview of the survey and the data compiled

The purpose of the EBAE is to compile regular information on the activity of Spanish firms around the time of the survey being conducted. The survey is divided into two sections.<sup>4</sup> In the first section, firms are asked for information on turnover, actual employment and prices in the recent past, along with the outlook for these variables in the near future. The second section includes a series of questions on the impact of COVID-19 on turnover and actual employment. This article sets out to analyse the responses given in the first round of the survey to the section of questions on the effect of the pandemic on business activity. As indicated earlier, that round was conducted in November 2020.

Specifically, the survey questionnaire was sent on 4 November to a total of 12,494 firms, 46% of which typically respond to Banco de España Central Balance Sheet Data Office (CBSO) surveys. The responses received to 19 November were compiled and a total of 4,004 were considered valid, meaning a response rate of 30.9%. The response rate was higher among CBSO-respondent firms (49%) than among non-CBSO-respondents (15.5%); no appreciable differences were observed in the response rate across sectors of activity.

This article combines the survey responses given by the firms with the annual information on their characteristics held in the integrated CBSO database (CBI), which compiles firms' financial statements.<sup>5</sup> Combining the two data sources allows an as yet largely unanalysed aspect to be explored: the heterogeneity in the effects of the COVID-19 crisis based on a series of firm characteristics.

Table 1 sets out descriptive statistics by sector of activity for the main variables analysed. Specifically, figures are provided for two sets of variables: changes in turnover and employment – drawn from the EBAE – (columns 1 and 2) and the firms' characteristics – drawn from the CBI – (columns 3 to 9). Table 1.A, showing

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4 The survey questionnaire can be found [here](#) (in Spanish).

5 The CBI database is sourced from firms' voluntary responses to CBSO surveys and Mercantile Registry data; the ultimate sources of the data are therefore the Banco de España and the Spanish Mercantile and Property Registrars' Association.

Table 1

**DESCRIPTIVE STATISTICS BY SECTOR OF ACTIVITY**

	(1) Y-o-y change in turnover	(2) Y-o-y change in employment	(3) log TFP	(4) Age (years)	(5) Rural (%)	(6) Temporary employment (%)	(7) Intangible assets (%)	(8) Debt ratio (%)	(9) Liquidity ratio (%)	(10) Size (staff headcount)
A: Arithmetic means										
Manufacturing	-12.7	-5.5	1.28	29.03	44	12	9	31	12	142
Construction	-12.2	-5.2	1.18	21.86	27	30	16	28	15	40
Wholesale and retail trade	-15.6	-7.3	0.84	25.67	26	13	13	30	15	63
Transportation	-16.3	-8.3	1.99	24.15	29	20	11	35	14	120
Hospitality	-45.5	-35.0	0.95	20.76	26	29	10	36	17	38
Information & communication	-11.3	-3.3	1.51	18.57	8	16	42	22	22	78
Real estate services	-10.3	-3.2	1.11	23.37	14	5	5	26	12	6
Professional services	-10.0	-5.0	1.70	19.34	13	12	25	24	24	46
Administrative services	-16.8	-11.9	1.77	17.98	16	22	26	31	23	255
Other services	-32.2	-19.4	1.30	19.36	21	24	19	28	24	51
Total	-16.1	-8.6	1.25	23.71	27	17	15	29	16	85
B: Interquartile range (75th percentile - 25th percentile)										
Manufacturing	22.5	7.5	0.20	17.00	100	17	4	45	16	66
Construction	22.5	2.5	0.36	16.00	100	50	3	48	21	31
Wholesale and retail trade	22.5	7.5	0.17	18.00	100	18	6	53	19	36
Transportation	22.5	7.5	0.39	16.00	100	26	2	56	16	43
Hospitality	20.0	52.5	0.23	17.00	100	30	1	61	20	32
Information & communication	22.5	2.5	0.52	14.00	0	21	96	40	33	63
Real estate services	12.5	0.0	0.71	14.00	0	0	0	42	14	2
Professional services	22.5	2.5	0.36	14.00	0	15	39	41	35	30
Administrative services	40.0	12.5	0.54	17.00	0	32	50	53	31	48
Other services	52.5	40.0	0.50	16.00	0	30	14	53	32	45
Total	22.5	7.5	0.64	17.00	100	24	7	51	21	42
Source	EBAE	EBAE	CBI	CBI	CBI	CBI	CBI	CBI	CBI	CBI

**SOURCE:** Banco de España.

**NOTE:** TFP: Total Factor Productivity, calculated according to Woolridge (2009), "On estimating firm-level production functions using proxy variables to control for unobservables", *Economics Letters*, 104, pp. 112-114. Age: years since firms were created. Rural: percentage of firms with headquarters in municipalities not located in a "functional urban area" as defined by Eurostat. Debt ratio: "interest-bearing borrowing" (includes "funding from credit institutions" and "other external funding") to total assets. Liquidity ratio: cash and cash equivalents to total assets.

sector averages for the variables, reveals the high level of heterogeneity in the impact of the crisis. For instance, according to the survey results, at end-2020 turnover at the average manufacturing firm fell by 12.7% compared with the same period in 2019, while in hospitality that drop surpassed 45%. The declines were smaller in employment, but the disparity between the sectors remained, with respective drops in manufacturing and hospitality of 5.5% and 35%. The comparatively larger decline in turnover than in employment is widespread across the sectors, confirming the evidence from other sources, such as National Accounts, that employment has withstood the effects of the crisis better than value

added.<sup>6</sup> The relatively moderate impact on employment may be related to the fact that – though persistent – the crisis is predominantly perceived as a temporary event, as appears to have been reflected by the extensive use of furlough schemes.

Table 1 also shows the existence of substantial differences in the characteristics of firms across sectors. For example, as compared with the hospitality sector, manufacturing sector firms are, on average, 40% more productive<sup>7</sup> and eight years older, located more often in rural areas,<sup>8</sup> less indebted and, in terms of headcount, larger.

In addition to the average cross-sectoral differences, Table 1.B reveals that, in terms of both the impact of the crisis and firms' characteristics, cross-firm heterogeneity within the same sector is also very significant. Specifically, the interquartile range (IQR), defined as the difference between the 75th and 25th percentiles of the distribution of each variable in the different sectors, is considered as the indicator of such intra-sectoral heterogeneity. For example, the IQR for the decline in turnover in the administrative services sector is 40 percentage points (pp). With regard to employment, the IQR in the hospitality sector is 52.5 pp.<sup>9</sup> Turning to the variables drawn from the CBI, the IQR for TFP in the administrative services sector (0.54) is larger than in wholesale and retail trade (0.17); therefore, the intra-sectoral heterogeneity is higher in the former than in the latter.<sup>10</sup> These figures illustrate the value of conducting a detailed analysis of the intra-sectoral heterogeneity of the effects of the COVID-19 shock in each sector, despite a priori expectations that all firms operating in a given sector would have been affected similarly.

## The impact of the crisis on Spanish firms

This section analyses the impact of the COVID-19 shock on Spanish firms, attempting to disentangle the characteristics which show a closer relationship with the decline observed in activity and employment.

The first significant variable when explaining the severity of the effects of the pandemic in 2020 is firm size, measured by headcount. Chart 1.1 shows the year-on-year

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6 According to the National Statistics Institute, full-time equivalent jobs fell by 7.5% in 2020, compared with GDP shrinking by 11%.

7 Business productivity is measured as total factor productivity (TFP).

8 Specifically, a firm is considered to be located in a rural area if its headquarters are located in a municipality that is not part of a functional urban area as defined by Eurostat: <https://ec.europa.eu/eurostat/web/cities/spatial-units>.

9 For the year-on-year changes in turnover and employment, firms were asked to provide data in intervals. The average rates were calculated using the central values of each of the intervals considered.

10 The interpretation of these figures is that the 75th percentile firm in the administrative services sector is 72% ( $e^{0.54} = 1.72$ ) more productive than the 25th percentile firm in the same sector, while the 75th percentile firm in the wholesale and retail trade sector is 19% ( $e^{0.17} = 1.19$ ) more productive than the 25th percentile firm in the same sector.

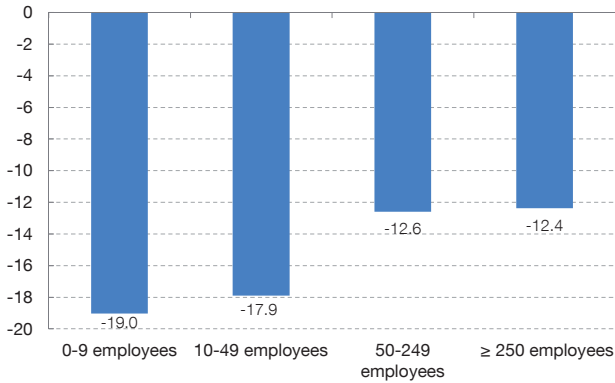
Chart 1

**SIZE IS A KEY FACTOR WHEN DETERMINING THE IMPACT OF THE PANDEMIC ON BUSINESS ACTIVITY**

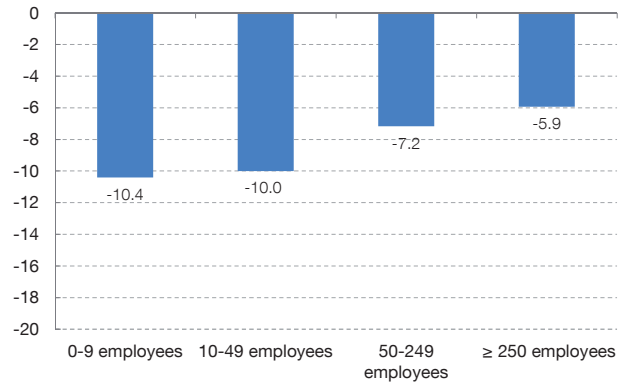
Responses to the EBAE show that small firms have endured a steeper drop in turnover and employment as a result of the health crisis.

1 AVERAGE YEAR-ON-YEAR CHANGE IN TURNOVER AND EMPLOYMENT, BY FIRM SIZE

1.1 TURNOVER

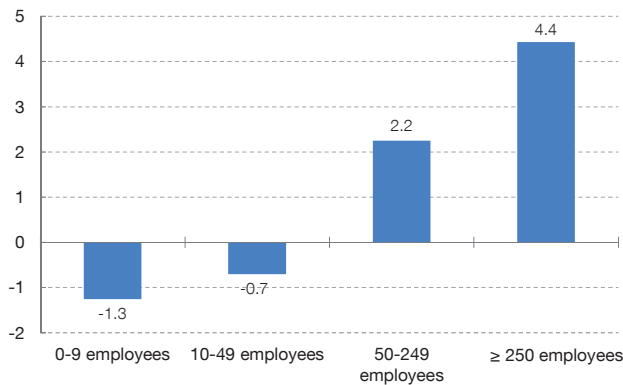


1.2 EMPLOYMENT

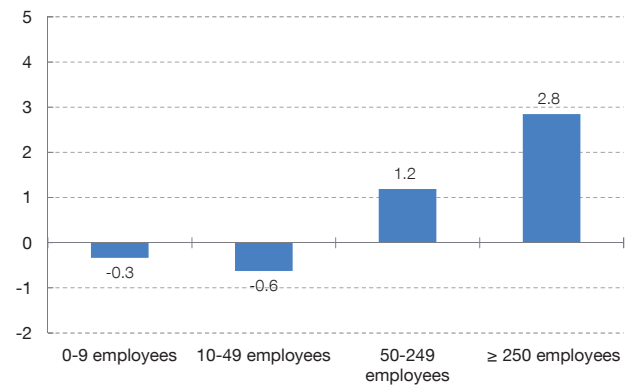


2 AVERAGE YEAR-ON-YEAR CHANGE IN TURNOVER AND EMPLOYMENT (DEVIATION FROM SECTOR MEAN), BY FIRM SIZE

2.1 TURNOVER



2.2 EMPLOYMENT



SOURCE: Banco de España.



change in turnover and employment for the different size brackets. Smaller firms endured a steeper decline in terms of turnover; -19% year-on-year at firms with fewer than ten employees and almost -18% at those with between ten and 49 employees. While medium-sized and large firms also severely felt the effects of the crisis, they reported somewhat more moderate declines (close to -12%). As regards actual employment (subtracting workers subject to furlough schemes), the crisis likewise had a smaller impact on larger firms, with declines of -6% and -7.2%, respectively, at firms with 250 or more employees and those with between 50 and 249 employees, as compared with the decrease of approximately 10% at smaller firms.

This greater impact of the crisis on small firms could be considered to owe to these firms being more prevalent in those services sectors, such as hospitality, that have endured steeper declines in their activity. To control for this composition effect, Chart 1.2 shows the changes in turnover and employment for each size bracket in deviations from the average change in the sector. As can be seen, smaller firms suffered a steeper decline in their activity in 2020 than larger firms belonging to the same sector of activity. In particular, turnover fell by 1.3 pp more than the sector mean at firms with fewer than ten employees, while at large firms it was 4.4 pp higher than the average. Small firms also reported a greater drop in terms of actual employment than large firms. The likeliest explanation for these differences is the greater vulnerability to shocks such as that triggered by COVID-19, which in turn owes to small firms having less access to borrowed funds and to their reduced product and market diversification. Other international papers are also finding that smaller firms are bearing the brunt of the effects of the pandemic,<sup>11</sup> above all in the case of less digitalised firms.<sup>12</sup>

A regression analysis was conducted in order to analyse more systematically the role that firms' characteristics play in the firm-level heterogeneity of the impact of the pandemic. Specifically, the relationship between the year-on-year change in turnover and employment of each firm in 2020 and a set of variables, such as size, age, productivity level, urban or rural location, temporary employment ratio and level of indebtedness, is identified. A key ingredient of these regressions is the inclusion of a set of sectoral (to two digits of the Spanish National Classification of Economic Activities), regional and sectoral-regional fixed effects, basing the estimation on the comparison between firms from the same sector and region. Thus, the coefficients estimated capture the relationship between the change in turnover (and employment) and the firms' characteristics, after stripping out the sectoral and regional composition effects.

Table 2 shows the results of the estimation. In the first three columns of the table the dependent variable of the regressions is the change in turnover; in the last three it is the change in employment. In the case of turnover, the results obtained indicate that the finding that the crisis had a greater impact on smaller firms holds true even after controlling for differences in the effects of the pandemic due to productive sector (column 1), region (column 2) and sector and region (column 3), with medium-sized firms (50 to 249 employees) and larger firms (250 or more employees) being found to have fared more favourably. With regard to the other characteristics, the most productive firms, like the oldest ones and those located in rural areas, appear to have fared better in this crisis. Conversely, after controlling for these characteristics, no significant differences are found in the change in turnover on the basis of firms'

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11 M. C. Apedo-Amah et al. (2020), "Unmasking the Impact of COVID-19 on Businesses: Firm Level Evidence from Across the World", *Policy Research Working Paper* No. 9434, The World Bank, Washington, DC.

12 N. Bloom, R. Fletcher and E. Yeh. (2021), "The Impact of COVID-19 on US Firms", *NBER Working Paper* No. 28314.



Table 2

**IMPACT OF COVID-19 ON THE ACTIVITY OF SPANISH FIRMS**

Dependent variable	(1) Y-o-y change in turnover	(2) Y-o-y change in turnover	(3) Y-o-y change in turnover	(4) Y-o-y change in employment	(5) Y-o-y change in employment	(6) Y-o-y change in employment
log TFP	2.90** (1.18)	2.79** (1.16)	2.90** (1.23)	2.63*** (1.01)	2.47** (1.00)	2.04** (1.01)
Age	0.06** (0.03)	0.04 (0.03)	0.05* (0.03)	0.04* (0.03)	0.03 (0.03)	0.04 (0.03)
Rural	2.86*** (0.87)	2.66*** (0.90)	2.71*** (0.97)	1.62* (0.85)	1.22 (0.89)	1.52 (0.93)
Temporary employment (%)	-1.31 (1.96)	-1.17 (2.00)	-1.00 (2.16)	-7.53*** (1.87)	-7.34*** (1.85)	-7.87*** (1.88)
Intangible assets (%)	-1.64 (1.74)	-1.77 (1.72)	-1.34 (1.83)	2.11 (1.48)	2.07 (1.50)	1.82 (1.60)
Debt ratio	0.12 (1.45)	-0.22 (1.45)	-0.26 (1.53)	0.33 (1.28)	-0.03 (1.26)	0.45 (1.32)
Liquidity ratio	-1.50 (2.41)	-1.64 (2.39)	-1.22 (2.55)	2.80 (1.79)	2.75 (1.77)	3.30* (1.84)
10-49 employees	1.19 (0.98)	1.28 (0.98)	1.16 (1.04)	0.41 (0.90)	0.59 (0.90)	0.06 (0.94)
50-249 employees	5.19*** (1.30)	5.34*** (1.28)	4.96*** (1.38)	2.48** (1.06)	2.75*** (1.06)	2.73** (1.10)
≥ 250 employees	6.75*** (1.95)	7.75*** (2.00)	8.53*** (2.28)	4.25*** (1.48)	5.08*** (1.48)	5.21*** (1.52)
Observations	2,715	2,715	2,715	2,715	2,715	2,715
R <sup>2</sup>	0.27	0.29	0.37	0.05	0.27	0.29
Sectoral fixed effects	Yes	Yes	No	Yes	Yes	No
Regional fixed effects	No	Yes	No	No	Yes	No
Sectoral-regional fixed effects	No	No	Yes	No	No	Yes

**SOURCE:** Banco de España.

**NOTE:** Standard errors in brackets grouped by sector and region. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Omitted category in size: 0-9 employees.

indebtedness, their temporary employment ratio, their ratio of investment in intangibles or their liquidity ratio.

In the case of employment, similar conclusions are drawn from the results as regards the effect of firm size, with steeper declines at the smaller firms. Specifically, the drop in actual employment was 5.2 pp smaller in the case of firms with 250 or more employees than in the case of firms with fewer than ten employees. Greater resilience in terms of actual employment is also observed at the firms with higher productivity levels, such that a 1% increase in TFP is associated with a 2 pp smaller decrease in employment. Lastly, higher temporary employment ratios are associated with larger reductions in employment.

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