The impact of COVID-19 on small and medium-sized enterprises in Armenia: Evidence from a labor force survey

El impacto de la COVID-19 en las pequeñas y medianas empresas de Armenia: Evidencias a partir de una encuesta de población activa

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Abstract

This paper assesses the impact of COVID-19 pandemic on small and medium-sized enterprises in Armenia. The analysis of representative nationwide survey data reveals that as compared with large-company employees, SME employees are more affected by the crisis, having been laid off or having reduced work hours and pay. Logistic regression results show that being employed by an SME doubles the likelihood of layoff and pay reduction. There is also support for the hypotheses that employees in sectors which allow for remote work, e.g., education and information and communication services, as well as those who have medium to high professional qualifications, have been less affected by the crisis. The findings call for more targeted government assistance to SMEs and low-skilled workers.

Keywords: COVID-19 pandemic; crisis; SMEs; employment; industry; occupation
JEL Classification: J21; J63; M21; M51

Resumen

Este documento evalúa el impacto de la pandemia de la COVID-19 en las pequeñas y medianas empresas de Armenia. El análisis de datos representativos de una encuesta a nivel nacional revela que, en comparación con los empleados de las grandes empresas, los empleados de las PYMEs se ven más afectados por la crisis, ya que han sido despedidos o han visto reducidas sus remuneraciones. Los resultados de la regresión logística muestran que ser un empleado de una PYME duplica la probabilidad de despido y reducción salarial. También se respalda la hipótesis de que los empleados de sectores que facilitan el teletrabajo, por ejemplo, la educación y los servicios de información y comunicación, así como las empresas que tienen trabajadores con una media-alta cualificación, se han visto menos afectados por la crisis. Los resultados reclaman un mayor apoyo gubernamental dirigido a las pymes y los trabajadores menos cualificados.

Palabras clave: pandemia COVID-19; crisis; PYMEs; empleo; industria; ocupación
Clasificación JEL: J21; J63; M21; M51

1. Introduction

The first case of infection with the novel coronavirus in Armenia was registered on March 1, 2020. With the aim to contain the contagion, the Government of Armenia introduced a state of emergency in mid-March, which entailed closure of all businesses except for grocery stores, pharmacies, and banks. By the time most of the restrictions were lifted in early to mid-May, eighteen programs aimed at mitigating the economic and social impact of the crisis were adopted, with a total value of AMD 84.4 billion (4.8% of GDP).

Scholars both abroad and in Armenia have tried to assess the economic and social costs that the pandemic imposes on national economies and the global economy (Atkeson, 2020; Avanesyan, 2020; Baldwin & Weder di Mauro, 2020; Fernandes, 2020; Gourinchas, 2020; McKibbin & Fernando, 2020). These analyses underscore that in its scale and scope, the current crisis surpasses the financial crisis of 2008-2009 and is comparable to the Great Depression of 1929-1933 in the United States and the wartime devastation of 1939-1945 in Europe. Not surprisingly, leaders of many countries have drawn parallels between fighting the pandemic and mobilizing for war, increasing public spending commensurately.

This paper aims to make a contribution to the discussion in academic and policy circles by assessing the extent to which the employees of small and medium-sized enterprises (SMEs) have been affected by the crisis. As SMEs account for most of the private-sector employment and value added in both advanced and emerging economies (European Commision, 2019; OECD, 2019; World Bank, 2020), targeted public assistance to those businesses is crucial to post-crisis recovery.

The paper is structured as follows. Section 2 below provides a review of the literature on SMEs and recent empirical studies on the impact of the pandemic in various countries. Based on that evidence, four hypotheses on the impact of the crisis on businesses in Armenia are advanced. In the third section, the methodology used for gathering and analyzing primary data is discussed. The fourth section is devoted to the results of data analysis, including both descriptive and inferential statistics. The final section offers a discussion of the findings, main conclusions, and policy implications of the study, as well as its limitations.

2. Literature Review and Hypotheses

2.1. SMEs across the World and in Armenia

Small and medium-sized enterprises (SMEs) are essential drivers of economic growth and development in both developed and developing economies. In Europe, those are defined as *"enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million and/or an annual balance sheet total not exceeding EUR 43 million"*(European Commission, 2003). In the United States, SMEs are firms that have fewer than 500 employees in manufacturing sectors and less than USD 7.5 million annual receipts in most non-manufacturing sectors (US Small Business Administration, 2020). Despite differences in conceptualization, SMEs represent over 95% of all businesses across the world, generating around half of the private-sector employment and 40% to 60% of value added (European Commision, 2019; OECD, 2019; World Bank, 2020).

SMEs are often characterized by informality, flat (horizontal), as opposed to hierarchical internal structures, and open and fluid communications between the owners and employees (Rothwell & Dodgson, 1991). Flexibility and adaptability to changing circumstances, as well as creativity and innovativeness are also among their defining features (Antony et al., 2005). Despite their inherent strengths, SMEs face a range of size-related challenges in attracting and retaining qualified workforce and accessing finance (Beck & Demirguc-Kunt, 2006; Dundon & Wilkinson, 2018; Harvie et al., 2013). National and cross-country data also suggest that as compared with large companies, SMEs have lower productivity and wage levels, being more vulnerable to supply and demand shocks (OECD, 2019, 2020). Thus, improvements in SME governance, aimed at reducing regulatory complexities and leveling the playing field, have been high on the policy agenda of many governments (OECD, 2019).

The RA Law on Small and Medium Entrepreneurship (National Assembly of the Republic of Armenia, 2000) was harmonized with the EU legislation in 2010 and defines SMEs as enterprises having up to 250 employees, with an annual turnover not exceeding AMD 1500 million and/or an annual balance sheet total not exceeding AMD 1000 million. According to this definition, there are around 70000 SMEs in the country, accounting for 99.8% of all businesses (Statistical Committee of the Republic of Armenia, 2019). SMEs are represented in all sectors of the economy, with a significant share in wholesale and retail trade (64% of all businesses), and account for 23.6% of gross value added in GDP (Ibid.). Their highest contribution in absolute terms (gross value added as % of GDP) is in wholesale and retail trade (7.4%), followed by manufacturing (4.4%), and construction (3.3%); the relative contribution (as compared with large companies) is the highest in real estate and repair of household goods (other services) (100% both), professional, scientific and technical services (99.2%), accommodation and food services (95.4%), and construction (93.3%).

The third edition of the Eastern Partner countries' SME Policy Index (OECD et al., 2020) states that "despite the lack of a comprehensive medium-term SME strategy," the institutional and regulatory framework for SME policy has improved in Armenia over the past years. The *Midterm Strategy for the Development of Small and Medium Entrepreneurship* (years 2020-2024) was discussed by the Government in October 2019 but is still under review (Government of the Republic of Armenia, 2019). As stated in the draft decision, the Government aims to *"facilitate entrepreneurship in Armenia, support the increase in productivity among SMEs, their competitiveness in local and international markets, as well as the introduction of productive technologies and innovative ideas."*

2.2. The Impact of COVID-19 on Small Businesses

The coronavirus pandemic engendered a global crisis that, unlike most other crises in world history, entails both supply and demand shocks. Worldwide, more than twenty million people have been infected as of August 2020, and due to lockdown measures, around 300 million full-time employees have become unemployed or have had a reduction in work hours and pay (International Labour Organization, 2020; World Health Organization, 2020). The pandemic has affected employment, investment, and growth prospects, and may result in permanent changes in consumption and work patterns (Baldwin & Weder di Mauro, 2020; Barrero et al., 2020; Barua, 2020; Coibion et al., 2020; Reeves et al., 2020).

Although both large companies and SMEs have been affected by the crisis, recent reviews (Balla-Elliott et al., 2020; Bartik et al., 2020; Dua et al., 2020; Lindsay et al., 2020; OECD, 2020) acknowledge that its effects are greater on SMEs. The OECD summary of 40 surveys in member states and partner countries (OECD, 2020) reveals that more than half of SMEs have had substantial revenue loss and fear to be out of business within a quarter unless public assistance is available and extended over the duration of the crisis. There is evidence that SMEs are increasingly digitizing operations to adapt to changing circumstances, but temporary closures, employment and wage reductions, and bankruptcies have occurred. The most widely used policy instruments directed at mitigating the effects of the crisis are income and profit tax deferrals, loan guarantees and direct lending to SMEs, and wage subsidies (Ibid.).

A McKinsey analysis of several small business surveys in the United States (Dua et al., 2020) suggests that if government support is unaccounted for, 1.4-2.1 million (25-36%) small businesses *"could close permanently as a result of the disruption from just the first four months of the COVID-19 pandemic."* According to this study, the most vulnerable are businesses which face both financial (liquidity) and COVID-related (revenue shock) challenges.

Some of the reasons why SMEs are more vulnerable to the crisis, as identified in the literature, are as follows: *first*, these businesses are overrepresented in sectors which were directly hit, e.g., tourism, retail trade, and transportation; *second*, as compared with large companies, SMEs in general have less cash in reserve, and thus, are more affected by human resource and capital underutilization; *third*, SMEs are more dependent on global and national supply chains, which were disrupted by the crisis (Bartik et al., 2020; Barua, 2020; Dua et al., 2020; OECD, 2020).

Based on the reviewed literature, we advance the following hypothesis on the impact of the crisis on businesses in Armenia:

H1: SMEs in Armenia have been affected by the crisis to a greater extent than large companies.

As compared with large companies, SMEs generally offer lower-paying jobs but also account for most of the private-sector employment in a country (European Commision, 2019; OECD, 2019). This implies that SME employees are more likely to represent those in the middle of the income distribution, the middle class (Atkinson & Brandolini, 2014; Banerjee & Duflo, 2008). The latter, as some analysts argue, have been more affected by the crisis due to the lack of savings and wealth collateral (Reeves & Rothwell, 2020; Sawhill, 2020). Hence, we also hypothesize that

H2: As compared with large-company employees, SME employees are more inclined to think that the crisis has equally affected them and most people.

Irrespective of firm size, the effects of the pandemic on employment have been greater in industries that assume proximity, e.g., transportation, trade, arts and entertainment, and food and hospitality. By contrast, employees in services that can be provided remotely (e.g., education, information and communications, finance and insurance) have been less affected (del Rio-Chanona et al., 2020; Fernandes, 2020; Saltiel, 2020). Many observers also emphasize that apart from engendering poverty, the pandemic will increase income inequality within nations. This is because most of the jobs that can be performed remotely are relatively high-paying positions occupied by professionals with medium to high qualifications (Elliot Major & Machin, 2020; Furceri et al., 2020; Palomino et al., 2020; Sumner et al., 2020). Thus, we hypothesize that

H3: Employees of the sectors in which work can be carried out remotely (e.g., education and ICT services) have been less affected by the crisis, in both SMEs and large companies.

H4: Employees with medium to high professional qualifications have been less affected by the crisis, in both SMEs and large companies.

3. Method

This paper is based on primary data of a labor force survey conducted in May 2020 by the Paul Avedisian Center for Business Research and Development (CBRD) at the American University of Armenia. The respondents (around half a million employed people) were chosen through territorially stratified random sampling, and the resulting sample size (n=1312) is representative of the entire country.

The survey instrument (CBRD, 2020) has 22 items, covering both demographics (e.g., age, gender, education, income, and residence) and assessment of the effects of the crisis on employment (changes in employment status, work hours/pay, and personal/household finance). It follows the general logic of the *Pew Research Center's American Trends Panel Wave* 65 (7-12 April 2020) questionnaire (Pew Research Center, 2020) adding questions from the Armenian Labor Force Survey (Statistical Committee of the Republic of Armenia, 2019), such as regions, employment sectors, and occupations, and excluding questions that are not relevant in the Armenian context (political affiliation).

SME employment was captured by the eighth question in the questionnaire, which reads as follows: "*By your assessment, how many people work in your company?"* Four possible answers, (*a) 1-9 employees, b) 10-49 employees, c) 50-249 employees, and d) 250 and more employees*), were provided. The preceding question is on employment, indicating that those who were unemployed at the time the survey was taken did not answer Question 8. These cases are removed from the dataset used in this study. The resulting is a set of 944 cases, which accounts for 72% of the original dataset.

To establish associations between SME employment and the effects of the crisis, data on the following questions were extracted from the dataset: *gender* (male, female); *age* (absolute number); *laid off* (yes, no, no answer); *had a pay reduction* (yes, no, no answer); *perception of the impact of the crisis on personal finances* (impacted me more than others, less than others, about as much as most people, do not know); *residence* (capital Yerevan or the regions of Armenia (marzes)); *residence* (urban or rural area); *occupation* (own business, wage employee, private home worker, family business (excluding agriculture) with no pay, agriculture and/or horticulture, commercial fishing, hunting, and gathering, paid intern or apprentice, unemployed); *pre-crisis* (as of March 1, 2020) *employment status* (full-time, part-time, daily pay, did not work, refuse to answer); *pre-crisis monthly income* (in AMD, interval scale with up to AMD 92,000 at the lower end and more than AMD 1 million at the higher end); *education* (elementary, basic, middle and high school, pre-professional vocational, middle professional, BA, MA, five-year diploma, postgraduate); *industry of current* (date of survey) *employment* (according to NACE Rev.2 classification), and *current work title* (director/manager, professional with medium to high qualification, administrative staff, qualified worker in industry and agriculture, worker with no qualification).

Data were analyzed with MS Excel and STATA software. Replication data for statistical analysis are available upon request.

4. Results

4.1. Descriptive Statistics

The majority (77%) of respondents are employed by SMEs. Companies having less than ten employees ("micro" enterprises) account for more than half of the employment within the SME category, followed by those with 10-49 employees (see Figure 1). This finding is consistent with the national statistical data (Statistical Committee of the Republic of Armenia, 2019, p. 13), according to which SMEs account for the majority of wage employment (68%) in the Republic of Armenia.

Around half of the SME respondents (54%) are male, more than a third (39%) are from Yerevan, and a third (33%) are from urban areas other than Yerevan. Similarly, around half of the large-company employees (54%) are male, 65% are from Yerevan, and 23% are from urban areas other than Yerevan. The average age of SME employees is 34 (median=32), the youngest respondents being 18, while the oldest respondent aged 66. More than half of the respondents (60%, n=577 due to missing values) have tertiary education (bachelor's, master's, five-year specialization, and postgraduate degrees), and 15% have middle professional and vocational education. The average age of large-company employees is 34 (median=32), the youngest respondents being 19, and the oldest aged 69. The majority of respondents (79%) report having tertiary education.

Figure 1. Size of the Respondents' Employer Company (n=944)
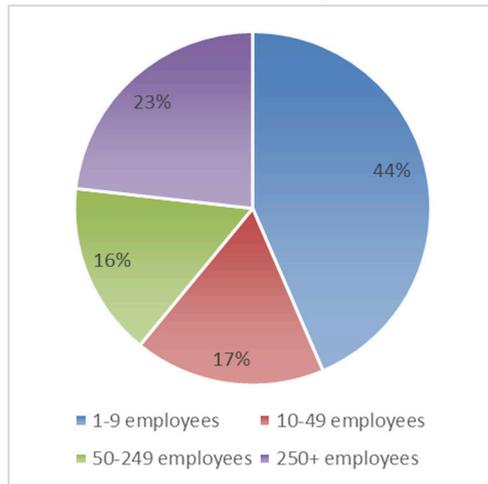
Source: CBRD survey data

Most (around 60%) of the SME respondents are wage employees, followed by those who own a business (are self-employed, 22%), and those who are in agriculture or horticulture (10%). Around 90% of the large-company respondents indicated that they work as wage employees. As of March 1, 2020, 51% of the SME employees were employed full-time, 10% were employed part-time, 13% report having daily pay, and 17% did not work. The majority (84%) of large-company employees for whom complete data are available (n=205) indicated that as of March 1, 2020, they worked full-time. Wage distribution data (see Figure 2, panels a and b) show that 26% of the SME employees had wages less than AMD 92 thousand, and about as many (27%) had wages in the range of AMD 92-120 thousand. Most (47%) of the large-company employees had monthly income in the range of AMD 180 to 500 thousand.

Figure 2. Respondents' Wage Distribution, early March 2020 (income unit in thousand)
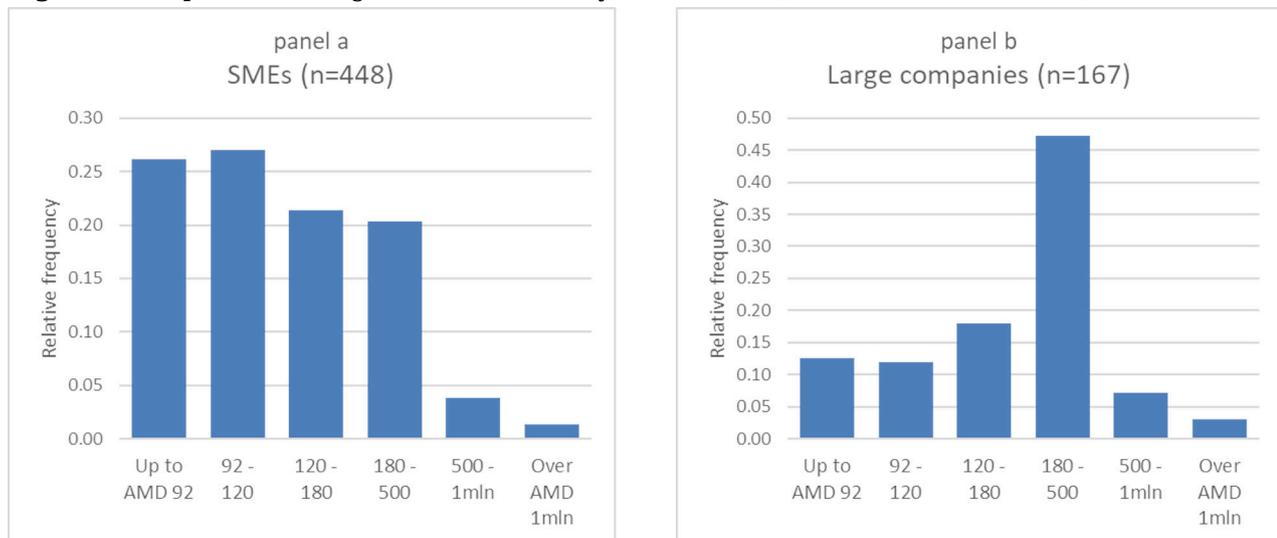
Source: CBRD survey data

4.2. Bivariate Descriptive Statistics

4.2.1. Cross-tabulations with Pay Reduction and Layoff Data

The analysis of SME data (n=714 complete answers) reveals that 175 employees (25% of the total, males and females) have been laid off due to the crisis, and around half have had a reduction in pay. Men are harder hit by the crisis than women (see Figure 3, panel a). The analysis of large-company respondents' data (see Figure 3, panel b) reveals that 32% have experienced a reduction in pay as a result of the crisis, and 11% have been laid off. In this case as well, male employees are harder hit by the crisis than females.

Figure 3. Changes in Employment, total and by gender (%)
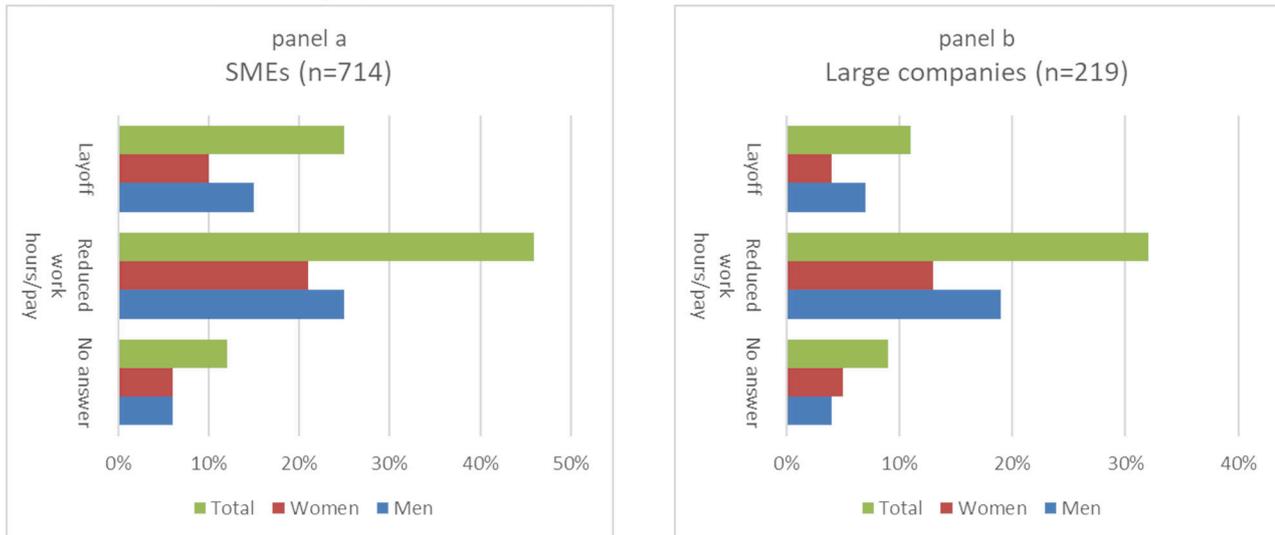
Source: CBRD survey data

Most SME employees think that the crisis has affected their personal finances about as much as anyone else: in this, as well as other regards (more than others/less than others), men tend to emphasize the impact of the crisis more than women. By contrast, 45% of the large-company employees think that the crisis has affected their personal finances *less* than most people, and 37% think that they have been affected as much as most people (see Figure 4, panels a and b).

Figure 4. Perception of the Impact of Crisis on Personal Finances. Impacted me… (%)
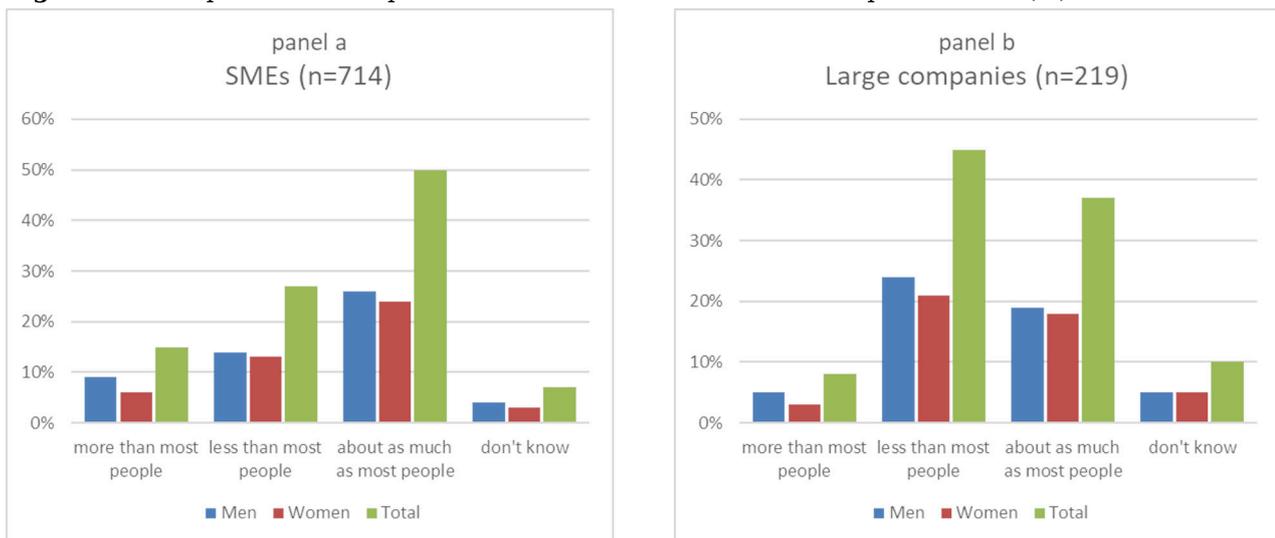
Source: CBRD survey data

### 4.2.2. Analysis of Employment Sector and Occupation Data

Respondents who worked at the time the survey was conducted (May 2020) were asked two additional questions – on the sector of employment and their work title. The majority of SME employees (69%, n=490) report working in services, and 14% report working in industry (including energy) and construction. Within the trade and services (n=340), relatively high shares are accounted for by wholesale and retail trade (17%), education (16%), and healthcare and social work (12%) (see Figure 5, panels a and b). At the same time, most of the large-company employees (76%, n=154) worked in trade and services, and 11% worked in industry (including energy), construction, water, and waste management. Within the trade and services (n=117), almost half were employed in finance and insurance (see Figure 6, panels a and b). About half of the SME respondents (43%) and the majority of large-company respondents (56%) are employed as professionals with medium to high qualifications (see Figure 7, panels a and b).
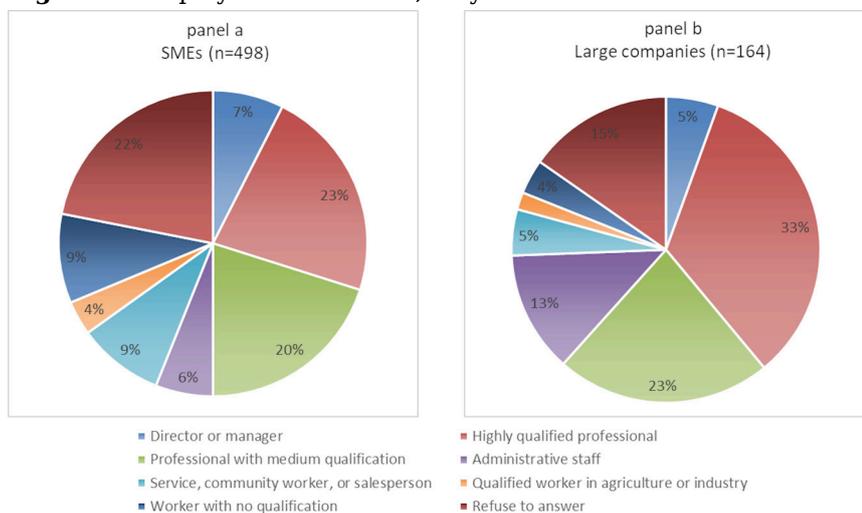
Figure 5. SME Employees by Sectors, May 2020
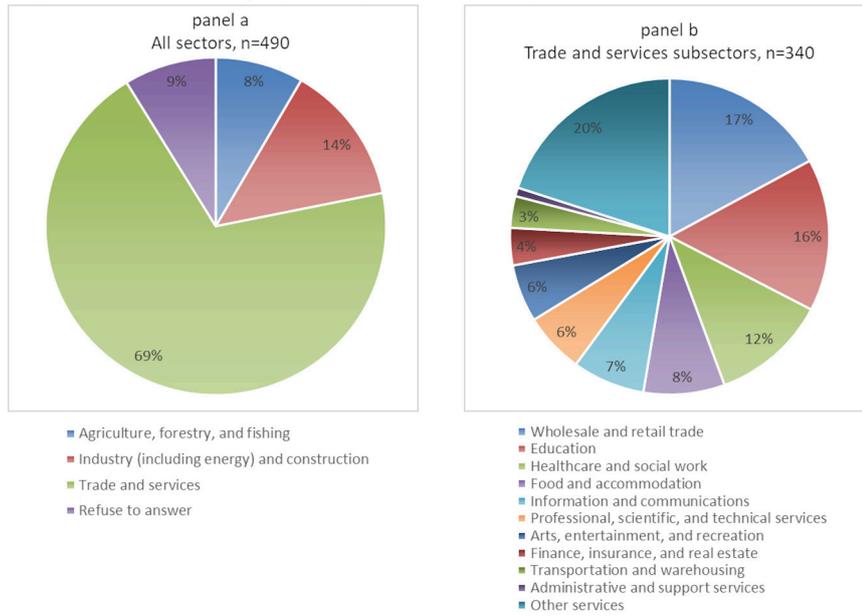
Source: CBRD survey data

Figure 6. Large-company Employees by Sectors, May 2020
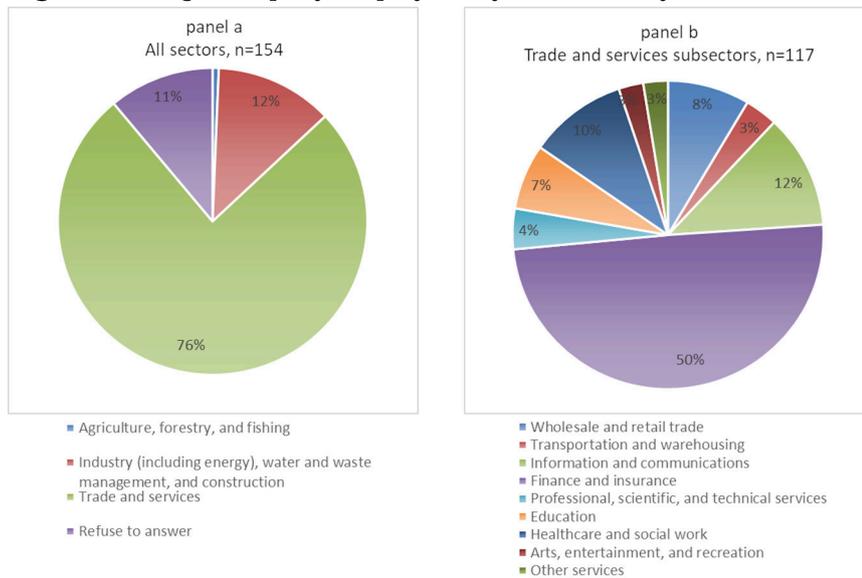
Source: CBRD survey data

Figure 7. Employees' Work Title, May 2020

Source: CBRD survey data

4.3. Inferential Statistics

Table 1 provides summary descriptive statistics of the independent variables of the study, and Table 2 provides the matrix of pairwise correlations between the independent and the dependent variables. It can be observed from the pairwise correlation matrix that although weakly, SME employment is significantly positively correlated with both layoff and pay reduction (r=0.15 and 0.14, respectively, p=0.00 for both). The highest correlations of primary interest to this study are as follows: layoff is significantly negatively associated with full-time employment (r=-0.25) and income (r=-0.22), while pay reduction is significantly negatively associated with full-time employment (r=-0.17) and age (r=-.10). The two variables measuring employment changes due to the pandemic (layoff and pay reduction) are significantly positively correlated (r=0.42, p =0.00).

Table 1. Summary Descriptive Statistics of the Independent Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Gender	944	.54	.50	0	1
Age	944	33.9	9.60	18	69
Residence 1	944	.45	.50	0	1
Residence 2	944	.75	.43	0	1
SME	944	.77	.42	0	1
Full-time	918	.58	.49	0	1
Wage employee	944	.66	.47	0	1
Income	675	2.59	1.33	1	6

Notes: Variables measurements: binary (gender, residence 1 and 2, SME, full-time and wage employee), continuous (age) and ordinal scale (income)[1].

Table 2. Pairwise Correlations

	gender	age	resid1	resid2	sme	ft	wage	inc	layoff	paycut
gender	1.00									
age	-0.06*	1.00								
resid1	-0.07*	0.05	1.00							
resid2	-0.12*	0.08*	0.48*	1.00						
sme	0.00	0.00	-0.22*	-0.16*	1.00					
ft	0.00	0.12*	0.15*	0.14*	-0.26*	1.00				
wage	-0.09*	0.03	0.17*	0.20*	-0.27*	0.25*	1.00			
inc	0.13*	0.11*	0.34*	0.25*	-0.32*	0.29*	0.08*	1.00		
layoff	0.08*	-0.06	-0.07*	-0.01	0.15*	-0.25*	-0.02	-0.22*	1.00	
paycut	0.02	-0.10*	0.09*	0.09*	0.14*	-0.17*	0.00	-0.08*	0.42*	1.00

Note: All correlations significant at 1-5% levels are displayed with an asterisk.

Logistic regression results (see Table 3) show that being an SME employee increases the likelihood of layoff and pay reduction. The odds ratios are 2.5 and 2, respectively. The regression models do not have a good fit, but the SME variable is significant at 1 to 5% levels in both cases, and accounts for more of the variance in the dependent variable (layoff or reduction in pay) than the other independent variables. Other variables that are significantly associated with layoff are gender, full-time employment, and monthly income; in the pay reduction equation, those are age, residence in the capital city, residence in an urban area, and full-time employment.

Table 3. Logistic Regression Results

	1 (layoff)	2 (pay reduction)
Gender	1.92*** (0.43)	1.01 (0.18)
Age	0.98 (0.01)	0.97*** (0.01)
Residence 1	1.04 (0.25)	1.60** (0.32)
Residence 2	1.51 (0.42)	1.50* (0.35)
SME employee	2.49** (0.82)	2.00*** (0.43)
Full-time employee	0.44*** (0.10)	0.49*** (0.10)
Wage employee	0.94 (0.21)	0.93 (0.18)
Income	0.69*** (0.07)	0.95 (0.07)
Constant	0.43 (0.26)	1.47 (0.69)
LR χ^2 (8)	78.25***	55.55***
Pseudo R^2	0.12	0.06
Observations	652	638

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

5. Discussion

Cross-tabulation data show that a quarter of the SME employees have been laid off, as compared with 11% of large-company employees; around half of the SME employees report having a pay reduction, as compared with 32% of large company employees. Logistic regression results confirm that there is a statistically significant relationship between being employed by an SME and having been laid off or having a reduction in pay. Thus, hypothesis 1, which stated that SMEs have been affected by the crisis to a greater extent than large companies, is supported.

Cross-tabulations show that SME employees are more inclined to think that the crisis has affected their personal finances as much as most people's: half of the SME employees think so, as opposed to 45% of large-company employees, who state that the crisis has affected their finances *less* than most people's. This perception is supported by the wage distribution data, which reveal that SME employees predominantly have low to average monthly incomes, while large company employees mostly earn high. Hence, hypothesis 2 is also supported.

Among SME employees who reported being employed at the time the survey was conducted, most are in retail trade, education, and healthcare and social work. Among large company employees, they are in finance and insurance and information and communications. Thus, there is partial support for hypothesis 3, stating that employees in industries that allow for remote work have been less affected by the crisis, in both SMEs and large companies.

Finally, there is some support for hypothesis 4, according to which most of the employees who continue to work – in both SMEs and large companies – are professionals with medium to high qualifications. The support for this hypothesis is partial, as non-response rates are high (22% for SMEs and 15% for large companies).

Our findings, similar to those on SMEs in other countries, suggest that these businesses have been more affected by the crisis, cutting wages and employment to a greater extent than large companies. A policy implication is that government assistance would be crucial to keeping small and medium-sized businesses open, especially in the sectors that were closed down due to containment measures, e.g., trade, transportation, food, accommodation, and recreation. Another implication is that targeted assistance should be provided to low-skilled employees who have been laid of due to the pandemic and cannot find remote jobs.

Our study differs from most studies on the impact of COVID-19 on SMEs in other countries, as reviewed in OECD (2020), in that employee, not company director or manager (employer) survey data are analyzed. This may be considered a limitation but we are also inclined to think that owner-managers might had understated the extent to which they laid off workers or reduced work hours and pay. In addition, as the respondents were chosen through stratified random sampling from all regions of Armenia and sectors of employment, we believe that some confidence in the results is apposite. Our findings can be generalized to other developing countries where SMEs account for most of the private-sector employment and have a significant share in value added to GDP.

Footnotes

[1] Notes: Variable measurements: gender-binary (0=female, 1=male), age-continuous, residence 1-binary (0=regions, 1=capital city), residence 2-binary (0=rural, 1=urban), sme-binary (0=large-company employee, 1=SME employee), full-time-binary (0=part-time employee, 1=full-time employee), wage employee-binary (0=no, 1=yes), income-ordinal scale (ascending, 1=up to AMD 92 thousand, 6=over AMD 1 million).

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