



CBB Working Paper No. WP/22/1

The Determinants of Job Losses Due to the COVID-19 Pandemic in Small Island Developing States

Winston Moore and Stephanie Pascal

June 8, 2022

The authors would welcome any comments on this paper. Citations should refer to the Central Bank of Barbados Working Paper. The views expressed are those of the author(s) and do not necessarily represent those of the Central Bank of Barbados, its Board of Directors or Central Bank of Barbados management.



The Determinants of Job Losses Due to the COVID-19 Pandemic in Small Island Developing States

Winston Moore¹ and Stephanie Pascal²

Abstract

This paper investigates the determinants of job losses due to the COVID-19 pandemic in small island developing states of the Caribbean. Utilising a survey of 1,979 firms in the Caribbean and a Probit regression model, the study identifies the key factors that might lead a firm to retrench staff. Two of the most important factors that impacted on job losses were the ease of doing business and innovation. Investing in the ease of doing business within the Caribbean therefore seems to be not only an economic good, but a social benefit as well. The findings of the study also support the use of innovation as a response to crises.

JEL Classifications: C25, J21, L52, O31

Keywords: COVID-19, Unemployment, Labour Market, Caribbean

¹ Corresponding Author: Prof. Winston Moore, The University of the West Indies, Cave Hill Campus, Bridgetown BB11000, Email: winston.moore@cavehill.uwi.edu

² Stephanie Pascal, Research Intern, Research and Economic Analysis Department, The Central Bank of Barbados, Bridgetown, Barbados, Email: stephanie.pascal@centralbank.org.bb

1. Introduction

The coronavirus disease 2019 (COVID-19) that originated in Wuhan, China in December 2019 was officially declared a global pandemic by the World Health Organisation (WHO) on March 11th 2020 (World Health Organisation, 2021). As of July 19, 2021, approximately 180 million persons had contracted the virus while 4.08 million succumbed to the disease. Coupled with the direct negative impact on human life and health, COVID-19 has also had negative externalities on all facets of life, particularly the economy.

The economic impact of COVID-19 has been particularly felt within the labour market in most countries. The World Bank (2021) estimated that in 2020, lost working hours were equivalent to 255 million full-time jobs, or approximately four times the losses incurred during the 2009 global financial crisis. The outcome in 2021 was quite similar. The International Labour Organisation (2021) estimated that global working hours were 4.3 percent below pre-pandemic levels, the equivalent of 125 million full-time jobs.

The impact on the labour market in the Caribbean has been quite severe as well. Garavito et al., (2020) conducted a survey of Barbadian households in the immediate aftermath of the COVID-19 pandemic and found that between January and April 2020 an estimated 46.3 percent of workers reported that they lost their jobs. These job losses were particularly prevalent in low-income households (more than half of all job losses) and women (one out of every three persons who lost their job was female) were significantly impacted. Most job losses were in tourism, accommodation and food services sectors, wholesale and retail trade, as well as construction. These job losses magnified already existing vulnerabilities in relation to poverty.

One of the shortcomings of these preliminary assessments is that they might not be representative of the true picture in the economy and the responses from workers cannot be matched with firm level data to see what other measures firms were employing to reduce job losses. This paper utilises a unique database from Compete Caribbean (2021), which conducted a survey of Caribbean firms to evaluate the impact of COVID-19 on their operations. This study sought to assess the determinants of COVID-19 job losses at the firm level. An understanding of why firms reduce their labour force during a crisis can help to identify potential policy responses to assist both households and firms. The results could also be useful as a means of documenting the impact of COVID-19 in the face of similar shocks in the future.

The study makes three main contributions to the literature. First, the paper provides estimates of the labour market impact of COVID-19 in a group of small island developing states. Second, using econometric techniques, the authors investigate the factors that might result in firms reducing employment during a crisis. Third and finally, the authors assess the extent to which innovation and the ease of doing business by firms has been used to minimise job losses.

Overall, this study comprises of five sections. Following an introduction, Section 2, summarises the literature on the labour market impact of crises. Section 3 outlines the methodological approach used while Section 4 presents the results and discusses the implications. Section 5 concludes with a summary of the findings and potential policy recommendations.

2. Literature Review

The COVID-19 pandemic has had widespread effects on labour markets. The International Labour Organisation (ILO) asserts that the pandemic has impacted labour markets in three key dimensions: 1) quantity of jobs 2) quality of work; and 3) effects on vulnerable groups (United Nations Sustainable Development Group, 2020). Drawing parallels to the HIV/AIDS and Ebola pandemics, there have been significant declines in productivity due to the loss of workers and workdays caused by battling the infection as well as the demands of caring (Franklyn, 2002). It is generally acknowledged that economic downturns are felt by everyone, not simply those directly affected (World Bank, 2014).

2.1 Main Sectors Negatively Impacted

The United Nations Economic Commission for Latin America and the Caribbean (UN ECLAC) highlights in its COVID-19 Special Report (ECLAC, 2020) that the impact of the virus is more catastrophic on sectors of the economy where operations are dependent on assemblage. This was due to the employment of non-pharmaceutical interventions (NPIs) used in the absence of a vaccine to limit the spread of the virus. NPIs employed in Barbados during this pandemic include, but were not limited to, social distancing practices, shutdown of all non-essential services, prohibiting of large gatherings, closure of schools and ports as well as the implementation of a curfew. These strategies, while necessary to control the contagion, significantly impacted several industries, including tourism services, hotels and restaurant, transport and commerce. Most of these industries are major contributors to economic activity in Barbados and account for a significant portion of annual gross domestic product (Howard, 2000; Worrell, 2017; Alvarez L., 2020).

Moreover, both the UN ECLAC and the ILO report that this pandemic is affecting both supply and demand. NPIs are disrupting several supply chains, impeding production processes worldwide (United Nations Sustainable Development Group, 2020; Guan, 2020; ECLAC, 2020). Conversely, the impacts in the economy are changing typical demand patterns due to the effects on consumers' wages as well as their preferences. The commerce and retail industries have and will continue to struggle immensely since preferences are more tailored around essential services.

While the literature has identified the sectors considerably hampered by the pandemic, little mention is made of sectors that thrived outside of the prototypical sectors. Nevertheless, there has been a surge during infectious pandemics of health and cleaning-related industries. There has been a noticeable boom in cleaning, takeout, and delivery services (Lemieux, Milligan, Schirle, & Skuterud, 2020; ECLAC, 2020; Dave, Freidson, Matsuzawa, & Sabia, 2021). In the US, the sale of hand sanitisers increased 80.7 percent and 57.9 percent in drug stores and convenience stores respectively, during the week of February 23rd 2020, as a response to the outbreak of COVID-19 (Sabanoglu, 2020) while hazmat suit sales increased significantly during the Ebola outbreak in 2014 (Pfeifer, 2014).

2.2 COVID-19 and Technological Advances

Crises, while catastrophic and detrimental in nature, may expedite the development and adoption of several key processes in its wake. Such processes are typically employed as a means of ameliorating the situation and may create positive externalities. While a considerable number of industries were

significantly impacted, the literature suggests that several businesses have benefited, such as information and communications technology (de Vet, et al., 2021; Magaro, 2021; Arora, 2020).

With the limitations of face-to-face interactions, the continuity of most jobs was only maintained using information and communications technology (ICTs). Azuara et al. (2020) argue that the pandemic compelled the labour force of Latin American and Caribbean countries to adopt teleworking, distance training and on-demand digital platforms, something they were reluctant to do prior to the COVID-19 pandemic. While these technologies are expected to produce net-positive externalities on the labour market, implementation will make several jobs obsolete, resulting in increased unemployment (Azuara et al., 2020).

Most of the literature on Latin America and the Caribbean have been extrapolated from Latin American countries such as Brazil. The World Health Organisation (WHO) reports Brazil as the country with the third highest number of confirmed cases (World Health Organisation, 2021). As of July 12, 2021, Brazil recorded 9,164 coronavirus cases per 100,000 population compared to Barbados' 1,467 cases. Consequently, the impacts described were felt to varying degrees.

2.3 Types of Workers Likely to be Most Affected by the COVID-19 Pandemic

Historical reports of other pandemics as well as initial coronavirus pandemic reports indicate that workers from low skilled and low-income groups suffer the most (Bottan, Hoffman, & Vera-Cossio, 2020; United Nations Sustainable Development Group, 2020; ECLAC, 2020). Alvarez F. et al. (2021) confirms and finds a positive correlation between remote working and specialised skill occupations.

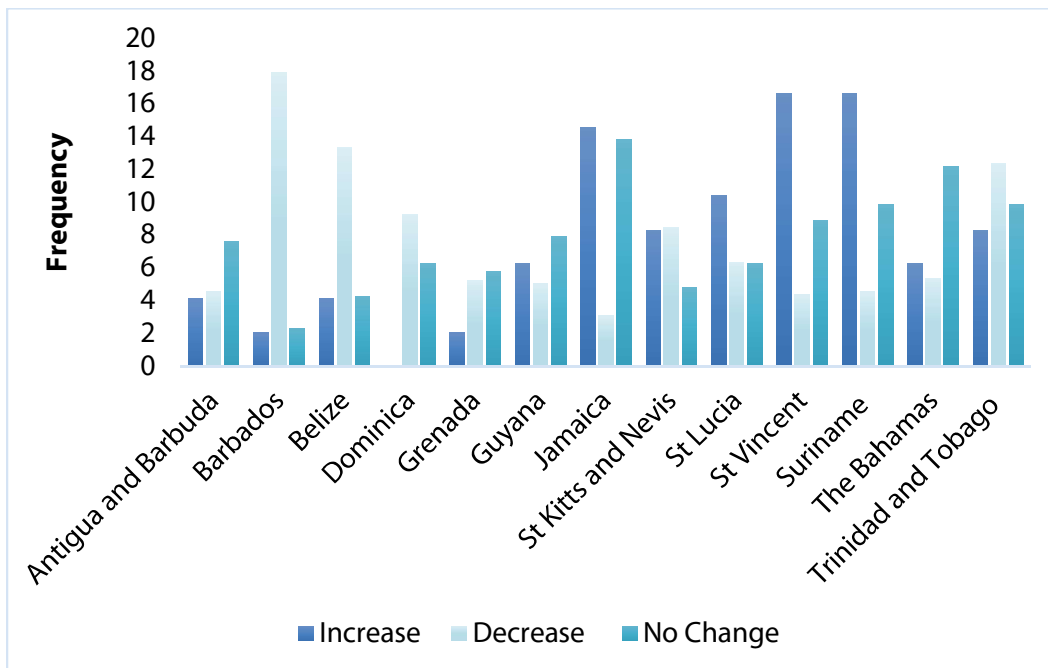
The World Bank (2019) finds that the majority of the labour force of developing nations are categorised within the informal economy with 'little access to technology', staying in low-productive employment. Micro, small and medium-sized enterprises (MSMEs), therefore, will be the most unfavourably impacted (ECLAC, 2020). This situation is likely to be magnified in Barbados due to labour market rigidities (Coppin, 2006; Archibald, Lewis-Bynoe, & Moore, 2005; Craigwell & Warner, 2000).

During epidemics and pandemics women are also likely to be disproportionately affected relative to men. Azuara et al. (2020) proposes that the labour force of the most adversely impacted sectors and business types – vendors and small business owners – are comprised predominantly of women. Alon et al. (2020) identifies the increase in needs of children during the pandemic and a woman's natural role as caretakers as the main cause of them being more impacted compared to men. Franklyn (2002) as well as Taub (2020) both argue that the extended time spent at home also exacerbates domestic abuse, particularly towards women. Victims tend to suffer tremendous declines in productivity and performance output (Oni-Ojo, 2014; Wathen et al., 2015; Oliver, 2019).

2.4 Job Losses in the Caribbean Due to COVID-19

Figure 1 showcases the responses of firms from CARICOM to the question, “In the advent of COVID-19, did your firm increase, decrease or keep constant their share of workers?”. Firms from several states increased their number of employees after the outbreak of COVID-19, defying the expected relationship, as they did not impose strict public health measures during the early outbreak of COVID-19. St Vincent never implemented curfews or any stringent lockdown procedures (Jamaican Observer, 2021) while St Lucia was the first Eastern Caribbean Island to record 100 percent recoveries and enjoyed early success in the fight against COVID-19 (Thorton, 2020; The Voice, 2020), which aligned with the time period when the survey was being conducted, whereby explaining the occurrence.

Figure 1: Number of Firms Reporting a Change in Employment as a Result of COVID-19, by Country



Source: Compete Caribbean (2021)

Suriname and Jamaica, however, both employed strict physical distancing protocols. Another explanation for the unexpected relationship in some countries could be the use of innovative responses to COVID-19 (See Table 1).

Table 1: Number of Firms Using Innovation as a Response to COVID-19

Country	Yes	No	Total
Antigua and Barbuda	5	145	150
Barbados	0	170	170
Belize	2	155	157
Dominica	2	135	137
Grenada	5	119	124
Guyana	6	149	155
Jamaica	10	162	172
St Kitts and Nevis	2	128	130
St Lucia	5	147	152
St Vincent	4	129	133
Suriname	14	148	162
The Bahamas	8	149	157
Trinidad and Tobago	8	172	180
Total	71	1908	1979

Source: *Compete Caribbean (2021)*

Across CARICOM, 3.6 percent of firms used innovation to mitigate against the impacts of COVID-19 (See Table 1). The highest ratios were in Suriname and Jamaica, the two countries which experienced the highest worker retention ratios during the COVID-19 crisis. Those Barbadian firms that experienced the highest job losses did not introduce any new goods or services, suggesting that there is an inverse relationship between worker retention and innovation as a response to COVID-19.

The literature suggests that unskilled females are the most adversely impacted classification of workers (Azura et al., 2020). Using the database, the authors calculated the change in skilled and unskilled labour employed by firm. Female skilled is segmented to show the impact of COVID-19 on this part of the labour market, while total skilled and unskilled is the aggregate of the male and female changes.³

³ In instances where the change in total skilled is less than the change in female skilled, this suggests that the change for males was negative.

While a few member states – Jamaica, The Bahamas, and Suriname – abide by this relationship, the majority seemingly refutes this assertion. There were no specific questions geared towards skilled and unskilled male workers in the survey, thus inferences about male workers are drawn by comparing female and total frequencies. Nonetheless, the data implies the differences between men and women were negligible. This is surprising considering that women typically dominate the hardest hit industries i.e. tourism, travel and hotel (See Table 2).

Table 2: Changes in Employment by Skill and Gender

Country	Female Skilled			Total Skilled			Female Unskilled			Total Unskilled		
	+	-	=	+	-	=	+	-	=	+	-	=
Antigua & Barbuda	2	11	39	6	15	38	0	11	30	1	19	30
Barbados	1	25	54	1	52	48	0	19	21	1	22	51
Belize	7	30	57	5	41	33	0	13	24	1	18	51
Dominica	3	23	55	9	39	43	0	15	20	0	30	39
Grenada	2	14	45	3	26	40	0	10	26	1	18	36
Guyana	2	15	50	3	19	36	0	3	30	4	25	35
Jamaica	6	5	53	22	9	53	2	9	34	1	12	41
St Kitts & Nevis	4	25	54	5	39	37	1	11	21	2	16	47
St Lucia	3	9	1	7	24	41	1	13	23	3	18	32
St Vincent	7	6	50	25	18	54	3	14	24	7	37	23
Suriname	6	4	53	15	13	50	1	6	31	4	21	34
The Bahamas	5	4	57	25	17	61	2	11	28	2	43	25
Trinidad & Tobago	2	24	66	7	39	51	1	12	31	2	22	53
+ means increase, - means decrease and = means no change												

Source: *Compete Caribbean (2021)*

One reason that there was little to no noticeable changes in COVID-19 related unskilled job losses could be due to the increased need for workers in cleaning and other related screening services. It appears that these workers were utilised for tasks such as cleaning, temperature checks and related activities.

3. Empirical Methodology

The preliminary review of the survey data suggests that COVID-19 impacted employment in the Caribbean. The severity of this impact, however, varied by industry, and to some degree the response by firms to the crisis (e.g., innovative activities). The methodology outlined in this section of the paper therefore attempts to identify the main determinants of job losses at the firm level. Understanding why firms might choose to shed labour during a crisis is important as employment has links to issues such as poverty and reduced purchasing power. An understanding of firm behaviour during a crisis can also help policymakers develop useful interventions at both the firm and household level.

This research employs the *Innovation – Firm Performance – Gender (IFPG): Issues in Enterprises in the Caribbean* (Compete Caribbean, 2021) database to assess the labour market impact of COVID-19. The survey was designed and conducted by Etude Economique Conseil (EEC Canada) on behalf of Compete Caribbean at the Inter-American Development Bank. All 1,979 respondents were firms and business selected across the 13 CARICOM member states, serving as a country-wide representative sample. The database was made assessable by the Compete Caribbean Partnership Facility (CCPF) to provide current and comparable data on the region's private sector as it relates to the survey-entitled issues of gender, productivity and innovation as well as the impact of the COVID-19 pandemic. Respondents' participation was fully voluntary through which they could either refute particular questions or the survey in its entirety.

Coupled with the IFPG database, data provided by the Central Bank of Barbados as well as Barbados' Statistical Office was also used. The main aim of this empirical research is to assess the impact of the COVID-19 pandemic on the labour market and explain why some firms would have reported greater job losses than others. The Probit regression model estimated is:

$$Covid\ Employment\ Losses_i = \beta_0 + \sum_{j=1}^k \delta_k X_{ki} + u_i \quad (1)$$

where the dependent variable represents the negative impact of COVID-19 on employment. A Probit model was selected by assigning by a value of 1 to firms who opted to decrease their share of workers and 0 to firms who either increased or kept constant the total number of employees.

The set of independent variables, represented by its sum ($\sum_{j=1}^k \delta_k X_{ki}$), are used to explain the decision of firms to reduce their labour force as a result of the pandemic. These were firm size, sector, innovative strategies employed, its classification as essential or non-essential, the top three obstacles they faced due to the advent of the global pandemic and the age of the institution. Factors that are expected to share a negative correlation with employment include the size and age of the firm and the implementation of innovative features.

Firm size is an important variable that will determine the severity of the impact of the coronavirus. It is expected that smaller firms will be more adversely impacted by the pandemic (ECLAC, 2020; United Nations Sustainable Development Group, 2020; Alvarez, L. 2020) due to their limited resources, poor crisis management (Runyan, 2006) and the hindrances to development. It is important to note that the

legal status of firm also alludes to the size of the institution. The respondents were able to choose from one of six options: the smallest being sole proprietorship and limited partnership to the largest being shareholding company with shares trade in the stock market and shareholding company with non-traded shares or shares traded privately. Previous studies confirm there exists a positive relationship between the age of a firm and its performance in time of crises (Lee, Chen, & Ning, 2017). Archibugi, Filippetti and Frenz (2013) concludes that both size and age are key determinants to strategic responses to crises. Smaller and younger firms are more inclined to focus on innovation while larger and more experienced firms will tend to utilise cost-minimising strategies.

Another control variable used in the regression model is innovation. The IFPG questionnaire notes that innovation can be derived in a multiplicity of ways. It can occur due to the introduction of new or improved goods, services, business processes, marketing strategies, distribution process and organisational structure. The UN Innovation Network (2020) establishes that for most firms, employing innovative strategies were a means for their survival particularly due to the many production disruptions that would have affected global supply chains.

In 2016, the Pan American Health Organisation (PAHO) defined essential services as activities absolutely necessary to maintain the health, welfare and functioning of a municipality and listed specific statutory bodies, food providers and health care providers amongst others as examples. They further explain that non-essential services are those that are likely to be closed during a pandemic, as they are not necessary for the municipality's survival. Barbados – similar to most nations – has given precedence to the continuation of essential services while being exceedingly stringent with the operations of non-essential ones. Consequently, it is imperative to factor this variable into the overall impact of the pandemic, given the expectation for essential businesses to experience gains and non-essential ones to suffer losses.

Beyond the classification of non-essential and essential services, the type of sector would also affect the overall trajectory of the labour market and the economy. Enterprises whose activities depend heavily on physical interaction will suffer exponentially (ECLAC, 2020) compared to those which are more flexible in nature.

4. Results

4.1 Econometric Findings

The descriptive statistics provided in the previous section give a good picture of the job losses that occurred in the Caribbean in the wake of COVID-19, but they do not explain why some firms decided to reduce their labour force and others did not. The study therefore estimates a binary choice model of the decision to reduce labour, estimated using a Probit model and the results are provided in Table 3.

The model's LR statistic is statistically significant, indicating that the coefficients in the model cannot all be set to zero and therefore provide some additional evidence beyond just a model with an intercept. The pseudo R-squared for the model is 0.207, which given the use of micro-econometric data suggests that the model does have reasonable predictive abilities. This is further supported by the ROC curve provided in Figure 2. This provides an assessment of the ability of the model to distinguish between true signals (sensitivity) and false signals (specificity). Normally a cut-off value of 0.5 is used, with this value being equivalent to the toss of a coin. The area under the ROC for our model is 0.8 which suggests that it can reasonably discriminate between signals.

Given that the model provides a reasonable description of the decision to reduce the labour force by firms, this section of the paper provides a description and discussion of the coefficient estimates. One of the most important factors that could lead to job losses is the ease of doing business (Canare, 2018). If firms find it difficult to operate during a crisis, this could amplify challenges being faced by the firm. This hypothesis is supported by the first variable in the table, which is a dummy variable that asked firms if they faced obstacles to doing business since the start of COVID-19. This variable was positive and statistically significant and provides a broad indicator of the impact of doing business. The positive coefficient also supports the notion that firms facing greater obstacles to doing business were more likely to reduce their labour force.

Besides the general measure of the impact of the ease of doing business on job losses, the authors also considered the impact of competition from informal firms, the macroeconomic environment, telecommunications, access to finance, transportation, access to land, the political environment, tax rates, business licensing and permits, customs and trade regulations, an inadequately trained labour force as well as crime, theft, and disorder. Those firms indicating that the practices of competitors in the informal sector was an obstacle to doing business were more likely to reduce their labour force. This suggest that the severity of competition forces firms in the formal sector to reduce jobs as a means of competing with more nimble firms in the informal sector. In addition to competition from informal competitors the results suggest that tax rates as well as the process of obtaining business licences and permits can exacerbate the impact of crises on job losses. These results suggest that governments should focus on reducing any bottlenecks that firms might face as they attempt to retool in the middle of the crises. Such policy interventions are particularly useful as they tend not to require major investments by the government, which might also be suffering from liquidity shortages at the same time. The other ease of doing business measures all seem to reduce the likelihood of a firm making the decision to reduce their labour force.

A priori it was expected that service companies would experience less job losses since some of these jobs can be done at home while others require a significant amount of labour to offer the product. The services dummy variable was not significant at normal levels of testing. However, the various types of corporate structures were all positive and statistically significant. These included privately held shareholding companies, sole proprietorships, and limited partnerships. These companies are less likely to be able to access equity financing and may have therefore suffered from liquidity challenges (Moore, Broome, & Robinson, 2009). There are costs, however, associated with adjusting the labour force (Sharpe, 1994). These costs are related to hiring, training, and firing employees. The presence of these costs, therefore, might dampen fluctuations in the labour force. Smaller firms are more likely to experience greater cyclicity of sales and therefore might have more procyclical variations in employment.

One of the possible ways firms could have responded to the COVID-19 pandemic is to innovate within their organisations. Such innovations could not only increase the likelihood of the firm surviving the crisis but also maintain jobs. Several measures of innovations are considered in the analysis: energy use, new goods, new methods of producing goods and new methods of using materials. In general firms that did not introduce innovations to reduce costs were more likely to experience job losses. Firms that introduced new goods were also able to minimise job losses. These results could have occurred since the introduction of new goods allowed firms to diversify their product offerings and appeal to changing customer demands. Contrary to a priori expectations firms that introduced innovations to reduce material use experienced an increase in job losses during the COVID-19 pandemic. While this innovation reduces the cost of production, it does not increase demand for the product. These investments reduce the cost of production per unit but in during a crisis where borders are closed all firms would be affected by supply shortages.

It should be expected that firms with a greater online presence would be more resilient to the effects of the COVID-19 pandemic. As would be expected, firms without a website were more likely to experience job losses. Due to the effects of lockdowns, customers would not be able to access physical locations and hence sales of the firm would be likely to fall. In addition to a website, the social media presence of firms has also become a critical part of the marketing toolkit of firms. With individuals working from home, and other physical distancing protocols in place, it should be anticipated that individuals would use social media more often to offset the lack of face-to-face human interactions. The marginal effect for the social media presence of the firms was similar to the marginal effect of a website. These results imply that a company's social media presence has become just as important as a website. The percentage of sales of the firm paid online, however, seems to have been positively associated with job losses as these firms might have suffered from supply chain shortages.

Gender has been previously identified as an important determinant of firm behaviour during a crisis. Female-led firms are more likely to face financial constraints due to credit rationing (Naranchimeg & Bernasek, 2013) and the organisational culture (Dwyer, Richard, & Chadwick, 2003). However, in the Caribbean, the results suggest that female-led firms are less likely to experience job losses. This suggests that these female-led firms in the Caribbean have implemented alternatives to retrenchment during the COVID-19 pandemic.

The other demographic variables considered in the study included the firm's age, wages, export status and local market share. The age of the firm was a statistically insignificant determinant of retrenchment by firms. This is surprising as previous literature has noted that younger firms are likely to be more affected by the crisis and hence more likely to engage in retrenchment (ECLAC, 2020) but this could be due to small firms being more nimble and better able to adapt to the crisis. Engagement in direct exports was not significant, suggesting that these firms substituted to the domestic market. The local market share was statistically significant and positive, indicating that firms with a greater domestic market share were more likely to engage in retrenchment as a reaction to the downturn in firm sales. Not surprisingly, firms with a larger wages bill were more likely to retrench staff, potentially as a means of addressing liquidity challenges posed by the pandemic.

Table 3: Probit Model of Job Losses in the Caribbean

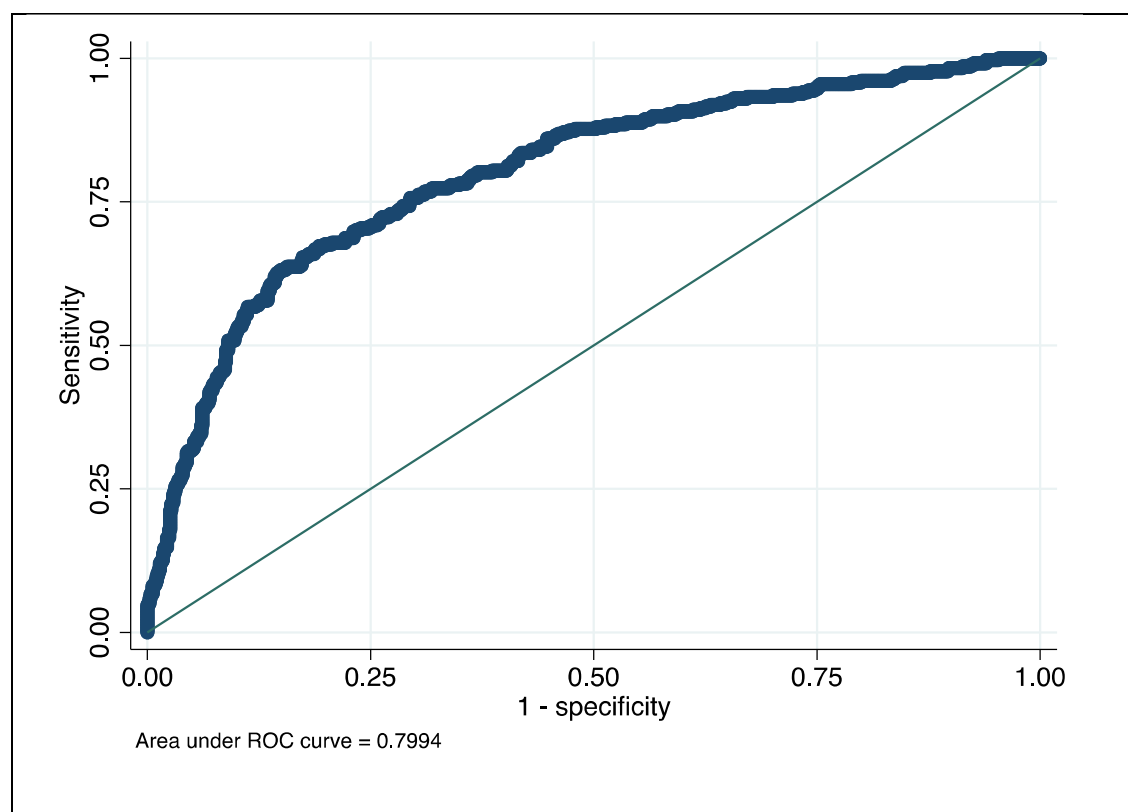
Variable	Coefficient Estimate	Marginal Effects
Any obstacle to doing business since COVID	0.02 (0.008)*	0.01 (0.003)*
Practices of competitors in informal		
Minor obstacle	0.17 -0.11	0.05 -0.03
Moderate obstacle	0.30 (0.113)***	0.10 (0.036)***
Very severe obstacle	0.23 -0.15	0.07 -0.05
Macroeconomic environment as obstacle to doing business	-0.17 (0.104)*	-0.06 (0.033)*
Telecommunications as obstacle		
Minor obstacle	-0.17 (0.098)*	-0.05 (0.031)*
Moderate obstacle	-0.24 (0.132)*	-0.08 (0.042)*
Access to finance as obstacle		
Minor obstacle	-0.27 -0.17	-0.09 -0.05
Moderate obstacle	-0.33 (0.135)**	-0.11 (0.043)**
Major obstacle	-0.33 (0.097)***	-0.11 (0.031)***
Access to electricity as obstacle		
Major obstacle	-0.34 (0.001)***	-0.11 (0.033)***
Very severe obstacle	-0.55 (0.128)***	-0.17 (0.041)***
Transportation as an obstacle		
Major obstacle	-0.20 (0.116)*	-0.06 (0.037)*
Access to land		
Major obstacle	-0.36 (0.109)***	-0.11 (0.033)***
Very severe obstacle	-0.38 (0.125)***	-0.12 (0.040)***
Political environment		
Minor obstacle	-0.25 (0.100)**	-0.08 (0.032)**
Major obstacle	-0.40 (0.123)***	-0.13 (0.039)***
Very severe obstacle	-0.35 (0.155)**	-0.11 (0.049)**
Tax rates		
Very severe obstacle	0.17 (0.104)*	0.06 (0.033)*
Business licensing and permits		
Minor obstacle	0.33 (0.105)***	0.10 (0.033)***
Very severe obstacle	0.29 (0.143)**	0.09 (0.046)**

Table 4 (Cont'd): Probit Model of Job Losses in the Caribbean

Variable	Coefficient Estimate	Marginal Effects
Customs and trade regulations		
Moderate obstacle	-0.60 (0.161)***	-0.19 (0.052)***
Major obstacle	-0.41 (0.133)***	-0.13 (0.043)***
Very severe obstacle	-0.42 (0.142)***	-0.14 (0.045)***
Inadequately trained labour force		
Major obstacle	-0.18 (0.098)*	-0.06 (0.031)*
Crime, Theft and Disorder		
Major obstacle	-0.14 -0.11	-0.04 -0.03
Services	-0.14 -0.09	-0.04 -0.03
Private shareholding company	0.53 (0.179)***	0.17 (0.057)***
Sole proprietorship	0.34 (0.169)**	0.11 (0.054)**
Partnership	0.41 (0.186)**	0.13 (0.059)**
Limited partnership	0.31 -0.21	0.10 -0.07
No overdraft	0.17 -0.11	0.05 -0.04
Age	-0.10 -0.07	-0.03 -0.02
Innovations reduced energy use		
No	0.42 (0.158)***	0.13 (0.050)***
Introduced new good since COVID	-0.59 (0.366)*	-0.19 (0.117)*
Introduced new methods of producing		
No	0.21 -0.15	0.07 -0.05
Since COVID reduced material use		
No	-0.29 (0.164)*	-0.09 (0.052)*
Does not have a website	0.17 (0.094)*	0.05 (0.030)*
Does not have a social media presence	0.16 (0.087)*	0.05 (0.028)*
Percentage of sales paid online	0.01 (0.006)*	0.00 (0.002)*
Female top manager	-0.22 (0.106)**	-0.07 (0.034)**
Wages	-0.17 (0.038)***	-0.06 (0.012)***
Direct exports	0.00 0.00	0.00 0.00
Local market share	0.01 (0.006)**	0.00 (0.002)**
Intercept	2.44 (0.668)***	-
Observations	1220.00	
LR	306.420***	
Pseudo R2	0.21	

Authors' Calculations

Figure 2: Area Under ROC Curve



Authors' Calculations

4.2 Discussion

The econometric results reported in the previous section provide numerous areas for policy intervention to preserve jobs during a crisis. By and large governments have a significant influence over the ease of doing business. Both the speed and time it takes to get business done can be critical during a crisis. Given the declining demand for goods and services firms need to be agile to retool and take advantage of any opportunities for survival. Caribbean governments, however, are usually well behind the leaders in this regard.

The highest ranked Caribbean country in the Ease of Doing Business Rankings of the World Bank⁴ was Jamaica at 71 out of 190 countries. St. Lucia was the only other Caribbean country to be ranked within the top 100. The other Caribbean islands were all ranked 105 (Trinidad) and lower, with the lowest ranked country being Grenada at 146. While the ease of doing business might be an important determinant for growth in the Caribbean (Ruprah, Melgarejo, & Sierra, 2014), the study also shows that it can also be an important policy response to crises. The obstacles flagged as being important in this study and under the control or influenced by governments in the region include the political

⁴ <https://www.doingbusiness.org/en/rankings?region=latin-america-and-caribbean>

environment, tax rates, licensing and permits, as well as customs and trade regulations. There is also a double-dividend of addressing the ease of doing business issues related to these areas. During the crisis, there is the benefit of reducing job losses, but after the crisis these areas also support business competitiveness and economic growth. Investing in the ease of doing business within the Caribbean therefore seems to be not only an economic good, but a social benefit as well.

The findings of the study also support the use of innovation as a response to the COVID-19 pandemic. The study suggests that both process and product innovations introduced before and during the crisis can reduce job losses. These innovations reduced the cost of doing business during the crisis as well as allowed the firms to diversify their product lines. Firms that introduced new goods during the period of the pandemic were 18 percent less likely to retrench workers, while firms that did not introduce innovations to save energy prior to the pandemic were 13 percent more likely to trim their labour force during the crisis. These findings are not surprising but suggest that one approach firms can use during crises is to invest in innovations. During such downturns, however, firm liquidity suffers, and lenders may be unwilling to lend, even for such long-term innovative activities. In recent years many governments have utilised government guarantees to assist with corporate liquidity during crises (Core & De Marco, 2021). Linking these guarantees to investments in innovation increases the probability that the firm will survive the crisis as well as preserve jobs. Such public guarantees should therefore be evaluated in this broader context as a tool to address social outcomes during crises.

The findings of the study also support the importance of investments in ICTs as an important part of a firm's investment. Both a firm's social media presence and the existence of a website reduced the number of jobs lost during the COVID-19 pandemic. Surprisingly, the ability to pay for goods online was not an important determinant of the job losses. There are many reasons why this might be the case. It could be that the e-commerce platform is not user-friendly, or that their customers have limited access to the internet. Many firms invested significantly to boost their online presence during the COVID-19 pandemic allowing them to reduce the number of sales persons within their physical operations. This is an area for future research, as this question was beyond the scope of this study.

5. Conclusions

This research investigates the determinants of job losses due to the COVID-19 on the labour market in the Caribbean. Utilising a survey of 1,979 firms in the Caribbean and a Probit regression model, the study identifies the key factors that might lead a firm to retrench staff. One of the most important factors that resulted in job losses related to the ease of doing business. The results suggested that firms facing obstacles in relation to the practices of competitors in the informal sector, tax rates as well as the process of obtaining business licences and permits were more likely to have retrenched staff during the pandemic.

One of the possible ways firms could have responded to the COVID-19 pandemic is to innovate within their organisations. The results of the study support the benefits of innovation as it relates to job losses. In general firms that did not introduce innovations to reduce costs or new goods were more likely to retrench staff. Costs associated with adjusting the labour force (Sharpe, 1994) are related to hiring, training, and firing employees. The presence of these costs, therefore, might dampen fluctuations in the

labour force, particularly for smaller companies. The findings of this study support the literature, with the marginal effect of being a sole proprietor being smaller than for any other corporate structure.

As would be expected, firms without a website were more likely to experience job losses, as customers would not be able to access physical locations and hence sales of the firm would have likely fallen. In addition to a website, the social media presence of firms seems to have also become a critical part of the marketing toolkit of firms, with the marginal effect for the social media presence of the firms being almost similar to the marginal effect of a website.

In addition to firm characteristics, managerial characteristics such as gender also proved to be important. This suggests that these female-led firms in the Caribbean seem to have implemented alternatives to retrenchment during the COVID-19 pandemic. Other predictors of the decision to retrench staff variables such as firm age, wages, export status and local market share.

The econometric results reported in the previous section provide numerous areas for policy intervention to preserve jobs during a crisis. By and large governments have significant control over the ease of doing business. Both the speed and time it takes to get business done can be critical during a crisis. However, the highest ranked Caribbean country in the Ease of Doing Business Rankings of the World Bank⁵ was Jamaica at 71 out of 190 countries. St. Lucia was the only other Caribbean country to be ranked in the top 100. The other Caribbean islands were all ranked 105 (Trinidad) and lower, with the lowest ranked being Grenada at 146. Investing in the ease of doing business within the Caribbean therefore seems to be not only an economic good, but a social benefit as well.

The findings of the study also support the use of innovation as a response to the COVID-19 pandemic. The study suggests that both process and product innovations introduced before and during the crisis can reduce job losses. These innovations reduced the cost of doing business during the crisis as well as allowed the firm to diversify their product line. Firms that introduced new goods during the period of the pandemic were 18 percent less likely to retrench workers, while firms that did not introduce innovations to save energy prior to the pandemic were 13 percent more likely to trim their labour force during the crisis. These findings are not surprising, suggesting that one approach firms can use during crises is to invest in innovations.

⁵ <https://www.doingbusiness.org/en/rankings?region=latin-america-and-caribbean>

References

- Alon, T., Doepke, M., Olmstead-Rumsey, J., & Tertilt, M. (2020). *The Impact of COVID-19 on Gender Equality*. Cambridge, MA: National Bureau of Economic Research.
- Alvarez, F., Argente, D., & Lippi, F. (2021). *A Simple Planning Problem for COVID-19 Lock-Down, Testing, and Tracing*. *American Economic Review: Insights*, 3(3), 367-382.
- Alvarez, L. (2020, March 31). *Barbados Caribbean Economies in the Time of Coronavirus*. Retrieved June 2021, from flagships.iadb.org/en/caribbean-region-quarterly-bulletin-2020-q1/barbados
- Archibald, X., Lewis-Bynoe, D., & Moore, W. (2005). *Labour Market Flexibility in Barbados*. Bridgetown: Central Bank of Barbados.
- Archibugi, D., Filippetti, A., & Frenz, M. (2013). *Economic Crisis and Innovation: Is Destruction Prevailing Over Accumulation?* *Research Policy*, 42(2), 303-314.
- Arora, R. (2020, June 30). *Which Companies Did Well During the Coronavirus Pandemic?* Retrieved December 2021, from <https://www.forbes.com/sites/nicholasreimann/2021/12/27/arizona-bowl-latest-in-jeopardy-after-boise-state-drops-out-due-to-covid/?sh=7f58d87a33a2>
- Azuara Herrera, O., Fazio, M. V., Hand, A., Keller, L., Rodríguez Tapia, C., & Silva Porto, M. T. (2020). *The Future of Work in Latin America and the Caribbean*. Washington: Inter-American Development Bank.
- Bottan, N., Hoffman, B., & Vera-Cossio, D. (2020). *Coronavirus Survey Results Show Big Impacts, Linkages between Labor Markets and Inequality*. Retrieved December 2021, from <https://blogs.iadb.org/ideas-matter/en/coronavirus-survey-results-show-big-impacts-linkages-between-labor-markets-and-inequality/>
- Canare, T. (2018). *The Effect of Ease of Doing Business on Firm Creation*. *Annals of Economics and Finance*, 19(2), 555-584.
- Central Bank of Barbados. (2021, June 21). *Research and Publications*. Retrieved June 21, 2021, from www.centralbank.org.bb
- Compete Caribbean. (2021). *IFPG DATASET- The Impact of COVID-19, Innovation, Firm Performance and Gender in the Caribbean*. Washington: IDB.
- Coppin, K. (2006). *Labour Market Flexibility in Barbados: A Structural Time Series Approach*. Bridgetown: Central Bank of Barbados.

Core, F., & De Marco, F. (2021). *Public Guarantees for Small Businesses in Italy During COVID-19*. London: Centre for Economic Policy Research.

Craigwell, R., & Warner, A.-M. (2000). *Unemployment in Barbados: 1980-1996*. In A. Maurin, & P. Watson (Eds.), *Empirical Studies in Caribbean Economy* (pp. 43-91). Port of Spain: Caribbean Centre for Monetary Studies.

Dave, D., Freidson, A., Matsuzawa, K., & Sabia, J. (2021). *When Do Shelter-In-Place Orders Fight COVID-19 Best? Policy Heterogeneity Across States and Adoption Time*. *Economic Inquiry*, 59(1), 29-52.

de Vet, J. M., Nigohosyan, D., Ferrer, J. N., Gross, A.-K., Kuehl, S., & Flickenschild, M. (2021). *Impacts of the COVID-19 Pandemic on EU Industries*. Brussels: European Parliament.

Dwyer, S., Richard, O., & Chadwick, K. (2003). *Gender Diversity in Management and Firm Performance: The Influence of Growth Orientation and Organisational Culture*. *Journal of Business Research*, 56(12), 1009-1019.

ECLAC. (2020). *Sectors and Businesses Facing COVID-19: Emergency Reactivation*. Santiago: Economic Commission for Latin America and the Caribbean.

Franklyn, L. (2002, January 25). *Labour Market and Employment Implications of HIV/AIDS*. Retrieved June 2021, from www.ilo.org/moscow/information-resources/publications/WCMS_247865/lang--en/index.htm

Garavito, M., Beuermann, D., Alvarez, L., & McCaskie, A. (2020). *The Consequences of COVID-19 on Livelihoods in Barbados: Results of a Telephone Survey*. Washington: Inter-American Development Bank.

Guan, W.J. (2020). *Clinical Characteristics of Coronavirus Disease 2019 in China*. *New England Journal of Medicine*, 382(18), 1708-1720.

Howard, M. (2000). *The Financial Structure of Barbados*. *Savings and Development*, 24(4), 405-422.

International Labour Organisation. (2021, October 27). *ILO: Employment Impact of the Pandemic Worse than Expected*. Retrieved December 30, 2021, from https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_824098/lang--en/index.htm

Jamaican Observer. (2021, January 19). *Jamaica Observer*. Retrieved June 2021, from www.jamaicaobserver.com/latestnews/St_Vincent_PM_declares_holidays;_rejects_lockdown_measures_again?profile=1228

- Lee, C.-C., Chen, M.-P., & Ning, S.-L. (2017). *Why Do Some Firms Perform Better in the Global Financial Crisis?* *Economic Research*, 30(1), 1339-1366.
- Lemieux, T., Milligan, K., Schirle, T., & Skuterud, M. (2020). *Initial Impacts of the COVID-19 Pandemic on the Canadian Labour Market*. *Canadian Public Policy*, 46(S1), S55-S65.
- Magaro, M. (2021, January 28). *Turning Crisis into Opportunity: COVID-19 as Accelerant in Finance Digital Transformation*. Retrieved June 2021, from www.financialexecutives.org/FEI-Daily/January-2021/Turning-Crisis-into-Opportunity-COVID-19-as-Accel.aspx
- Moore, W., Broome, T., & Robinson, J. (2009). *How Important are Cash Flows for Firm Growth*. *Journal of Eastern Caribbean Studies*, 34(4), 1-18.
- Naranchimeg, M., & Bernasek, A. (2013). *Gender and the Credit Rationing of Small Businesses*. *The Social Science Journal*, 50(1), 55-65.
- Oliver, R. (2019, January 21). *GOV.UK*. Retrieved June 2021, from www.gov.uk/government/publications/the-economic-and-social-costs-of-domestic-abuse
- Oni-Ojo, E. (2014). *Impact of Domestic Abuse on Female Employees' Productivity in the Nigerian Workforce*. *European Scientific Journal*, 10(26), 185-198.
- Pfeifer, S. (2014, October 16). *Ebola Outbreak Spurs Production of Protective Suits*. Retrieved June 2021, from www.latimes.com/business/la-fi-ebola-suit-demand-20141017-story.html
- Runyan, R. (2006). *Small Business in the Face of Crisis: Identifying Barriers to Recovery from a Natural Disaster*. *Journal of Contingencies and Crisis Management*, 14(1), 12-26.
- Ruprah, I., Melgarejo, K., & Sierra, R. (2014). *Is There a Caribbean Sclerosis? Stagnating Economic Growth in the Caribbean*. Washington: Inter-American Development Bank.
- Sabanoglu, T. (2020, November 26). *Coronavirus Impact on Hand Sanitiser Sales U.S. 2020*. Retrieved June 2021, from www.statista.com/statistics/1104484/impact-of-coronavirus-on-sales-values-of-hand-sanitizer-in-the-us/
- Sharpe, S. A. (1994). *Financial Market Imperfections, Firm Leverage, and the Cyclicity of Employment*. *American Economic Review*, 84(4), 1060-1074.
- Taub, A. (2020, April 6). *A New Covid-19 Crisis: Domestic Abuse Rises Worldwide*. Retrieved June 2021, from www.nytimes.com/2020/04/06/world/coronavirus-domestic-violence.html
- The Voice. (2020, September 1). *Saint Lucia Records 100 Percent Recovery of Covid-19*. Retrieved June 2021, from thevoiceslu.com/2020/09/saint-lucia-records-100-percent-recovery-of-covid-19/

Thorton, C. (2020, April 25). *100% of St. Lucia's Covid-19 Positive Patients have Recovered*. Retrieved June 2021, from www.blackenterprise.com/100-of-saint-lucias-covid-19-positive-patients-have-recovered/?test=prebid

United Nations Sustainable Development Group. (2020). *Policy Brief: The World of Work and COVID-19*. Washington: United Nations.

Wathen, N., MacGregor, J., & MacQuarrie, B. (2015). *The Impact of Domestic Violence in the Workplace: Results from a Pan-Canadian Survey*. *Journal of Occupational and Environmental Medicine*, 57(7), e65.

World Bank. (2014, November 19). *Nearly Half of Liberia's Workforce No Longer Working Since Start of Ebola Crisis*. Retrieved June 2021, from www.worldbank.org/en/news/press-release/2014/11/19/half-liberia-workforce-no-longer-working-ebola-crisis

World Bank. (2019). *World Development Report 2019: The Changing Nature of Work*. Washington: The World Bank .

World Bank. (2021, November 16). *Jobs and Development*. Retrieved December 30, 2021, from <https://blogs.worldbank.org/jobs/working-most-vulnerable-people-jobs-and-economic-transformation-face-covid-19>

World Health Organisation. (2021). *WHO Coronavirus (COVID-19) Dashboard*. Retrieved June 2021, from covid19.who.int

Worrell, D. (2017). *The Barbados Economy - The Road to Prosperity*. Bridgetown: DeLisle Worrell and Associates.