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# What Exacerbates the Probability of Business Closure in the Private Sector During the COVID-19 Pandemic? Evidence from World Bank Enterprise Survey Data

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## Abstract

The purpose of the study is to look into the likelihood of private sector enterprises going bankrupt due to COVID-19 pandemic-related issues. The data for this study was taken from the World Bank's Enterprise Survey, which was intended to assess the impact of the COVID-19 pandemic on the business sector. This study uses the Ordinal Logit Method to analyze the model with dependent variables having ordinal values. The determinants reflect business performance, innovation, business relationships, and government support. According to the estimation results, a lower probability of business closures, illiquidity, and payment delays are found in businesses that maintain sales growth, operating hours, temporary workers, product portfolio, consumer demand, and input supply. Meanwhile, the increase in online business activities and receiving support from financial institutions and the government do not help businesses reduce the risk. Moreover, higher survival is found in manufacturing and developing countries. This implies the fragility of businesses in the retail and service sectors, especially for mega-enterprises in developed countries. In addition, the negative impact of the COVID-19 pandemic on businesses in Europe and West Asia is less severe than in other regions. The results imply policies to support the private sector during the pandemic, such as increasing labor market flexibility or rapidly implementing supportive policies.

**Keywords:** Bankruptcy Risk, COVID-19 Crisis, Enterprise Survey, Ordinal Logit Model, Private Sector

**JEL Classification Code:** G01, G33, H12, H32, L22

## 1. Introduction

The COVID-19 pandemic has been causing the strongest recession in 80 years. While the global economy is expected to bounce back to around 5.6% in 2021. This rebound is uneven and largely reflects strong recoveries in some major economies – most notably the United States, due to substantial financial support – amid highly unequal vaccine

access. By 2022, global output is expected to remain about 2% below pre-pandemic projections, and per capita income losses incurred last year will be continued in about two-thirds of emerging and developing economies. The global outlook remains significantly bearish. The consequences of the pandemic will increase the challenges that policymakers face when balancing the need to support recovery with the need for price stability and fiscal sustainability (World Bank, 2021).

Amid the COVID-19 pandemic, many sectors have seen demand slump and economic uncertainty persist for months or even years. Given the complexity of the pandemic, governments must prioritize public health before thinking about policies to revive economies when the immediate danger of the pandemic has passed. Meanwhile, businesses are rapidly running out of liquidity. In the United States, half of the small businesses - with fewer than 500 employees - have less than a month of cash reserves, and another quarter of businesses can run out of cash in two months (Bosio et al., 2020). For service industries, liquidity is maintained

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even shorter; for example, restaurants hold cash on hand for less than a month (Didier et al., 2020). Governments have provided unemployment assistance, deferred interest payments, and extended bank credits. However, other payments - such as land rent and raw material costs - are weighing heavily on businesses. Exporters are unable to ship goods due to transport system disruptions and trade-restrictive policies (Bosio et al., 2020; Camba & Camba, 2020; Olczyk & Kuc-Czarnecka, 2021).

The consequences of the COVID-19 pandemic are already present in almost all economic sectors, including the private sector. The closure and movement restriction policies adopted by governments in many countries have had a significant impact on the private sector (Olczyk & Kuc-Czarnecka, 2021). Paralyzed business activities and weakened manufacturing capabilities have left the sector facing financial turmoil. Private businesses face shortages of workers and production inputs due to supply chain disruptions, which negatively affect sales, and the ability to perform financial obligations and pay employees (Adam & Alarifi, 2021). This problem is exacerbated when consumer spending declines due to falling incomes and widespread feelings of insecurity. Owing to the pandemic, private sector businesses suffer mainly in sales and liquidity declines (Olczyk & Kuc-Czarnecka, 2021). Declining confidence, falling exports, and rising commodity prices will shrink private sector activity. In addition, the lack of digital infrastructure makes it slow for the private sector to deploy technology solutions to meet the growing needs of the population during the lockdown (World Bank, 2021). As a result, many businesses found themselves unable to cope with the situation, forced to suspend some operations due to temporary closure orders and supply chain disruptions (Webster et al., 2021). Some businesses have suspended operations or closed since the first months of the outbreak (Fairlie, 2020).

When analyzing the impact of the COVID-19 pandemic on the economic activities of companies, most studies focus on three aspects. First, the studies attempt to identify what channels are being adjusted by companies to adapt to the economic disruptions caused by COVID 19. Several analyzes show that businesses try to weather the crisis mainly by accelerating the adoption of digital, automation, and other technologies (Papadopoulos et al., 2020; Nguyen, 2021) or shifting business operations to remote work (Phillips, 2020; Ahmed & Khalil MD, 2021). The second group of studies concentrates on firms' expectations about the duration of the crisis and its effects on their decisions (Bartik et al., 2020; Buchheim et al., 2020). The last group of papers concerns the supply and demand shocks caused by COVID-19 to the financial and operational performance of enterprises (Fairlie, 2020; Carletti et al., 2020; Nguyen, 2022). However, few studies have analyzed the determinants of the impact of

the COVID-19 pandemic on the economic performance of private sector firms.

Recent papers suggest that private sector data sources can be used to forecast government statistics (Ehrlich et al., 2019; Gindelsky et al., 2019). Previous studies on the private sector in the context of the COVID-19 pandemic have varied approaches. They analyze the influence of the COVID-19 pandemic on consumer spending (Sheth, 2020), management and marketing activities (Carracedo et al., 2020), the business performance (Olczyk & Kuc-Czarnecka, 2021), labor market trends (Carnevale & Hatak, 2020). However, only a handful of studies have analyzed the probability of business closure during the COVID-19 pandemic. For example, Omar et al. (2020) show that businesses in Saudi Arabia have used financial and marketing strategies to survive in the face of crises. Adam and Alarifi (2021) argued that innovation applied in response to COVID-19 has a positive impact on the performance and viability of Malaysian SMEs. The weakness of these papers is that they are based only on data from one country and a limited number of determinants (scale, finance, marketing, and innovation). Our study uses datasets from the global survey of more than 11,696 businesses conducted by the World Bank in 35 countries to provide a broader view of the economic impact of COVID-19 on the private sector.

Recently, Bosio et al. (2020) used a dataset of nearly 7,000 companies in 12 high-and middle-income countries from the World Bank's enterprise survey. However, this dataset was surveyed before the COVID-19 outbreak and focused solely on explaining the viability of businesses based on size, duration of operation, and productivity. The study also failed to explain the risk of business closure by the business sector and did not compare development levels across countries. The study also failed to explain the risk of closure by the business industry and did not compare the levels of development across countries. Therefore, our paper is conducted to examine the factors affecting the risk of closure of private businesses during the COVID-19 pandemic. More specifically, the risk of business closure is represented by illiquidity, payment deferrals, and the degree of a business closure. This research contributes to expanding the literature on the private sector and its resilience in times of crisis. Empirical results provide some implications for private sector managers and policymakers in maintaining liquidity and survivability of the business.

## **2. Literature Review**

Many economists have used the theory of "creative destruction" to explain why businesses close during recessions. Firms are forced to withdraw from the market if they are inefficient and slow to innovate in the face of a downturn (Melitz & Gianmarco, 2008). However, some

subsequent papers find that the “creative destruction” effect is weaker than expected. Efficient businesses are also at risk of closing commensurate with their higher financial needs. In times of crisis, businesses in any country face difficulties because of the unusual business situation. Ouyang (2009) provides evidence that the economic distress has even “destroyed” businesses that were once very efficient. Supportive regulations and policies implemented by the government can skew the effects of negative shocks as they allow relatively inefficient firms to survive (Foster et al., 2008).

Olczyk and Kuc-Czarnecka (2021) argue that increasing online business activities cannot boost sales of businesses due to a decrease in consumption demand in direct sales channels. Recently, many empirical studies have returned to support the theory of “creative destruction”. It is recommended that businesses quickly find alternatives and transform their business models to adapt to the new scenario and ensure their survival. Proposed solutions include managing uncertainty in the business (Sharma, 2020), developing new marketing policies (He & Harris, 2020), strengthening financial management (Eggers, 2020), applying digital technology and automation (Winarsih et al., 2020), transforming the remote working model (Phillips, 2020), implementing interventions by means of legislation and public policy (Woodside, 2020). As such, there is no clear expectation for the impact of innovation on the survivability of businesses in times of crisis. Innovation generally refers to the effective implementation of new solutions related to products, services, or organizational processes; marketing mechanisms; administrative tasks by firms in the face of challenges to improving performance (Johannessen et al., 2001; O’Regan & Ghobadian, 2006). This study uses the introduction of new or improved products, the promotion of online sales, and the acceleration of delivery as measures of innovation.

In addition to creativity, factors that reflect business relationships also significantly determine the viability of businesses. The economic distress will create a business environment that lacks the willingness to cooperate (Adam & Alarifi, 2021). A drop in consumption often brings uncertainty during a recession, which makes economic transactions more difficult to conduct (Bloom, 2014). The relationship between businesses, consumers, and suppliers can become less reliable (Accetturo & Giunta, 2019). There is not enough information for financial institutions to accurately assess creditworthiness, thereby increasing credit constraints (Ivashina & Scharfstein, 2010). Even though they have received credit support from financial institutions, many businesses are also on the verge of bankruptcy because they have no sales (Lu et al., 2020). Barlevy (2003) finds that during times of economic distress, this effect may not exist in the presence of credit constraints.

Another important factor that needs to be considered is government support. If the government does not act promptly during a time of severe crisis, the economy may suffer for a long time, leading to large losses in output and employment and causing frustration in society (Bosio et al., 2020). In a systemic crisis, it is often preferred by governments to define the principles that lead to effective private sector restructuring efforts. The economy will find its solutions to financial distress. If the private sector is not proactive enough to deal with the problem satisfactorily, the government will provide direct support to keep businesses afloat (Claessens et al., 2001).

In summary, the literature review has proposed two hypotheses that need to be tested: (i) The COVID-19 pandemic causes mass closure of inefficient and slow-innovation enterprises; (ii) The COVID-19 pandemic causes random closure of private sector businesses due to the narrowing of business relations or lack of government support.

### 3. Data and Methodology

#### 3.1. Data

The study uses short-term survey data “Follow-up COVID-19”, extracted from the World Bank Enterprise Survey. This is a representative dataset of the private sector of several economies around the world. Survey subjects are businesses with five or more employees, and respondents are business owners and senior managers. The survey was conducted in 42 countries, the number of interviews depends on the size of the economy, from 150 in small countries to 1200–1800 in large economies. Each country will be surveyed in 2–3 consecutive rounds. This study covers survey data obtained from September to November 2021. Items covered include business results, liquidity, sales, demand, supply, working time, temporary workers, innovation, credit accessibility, and government support. Based on careful sifting and selection of data, the study uses survey results from 11,696 businesses in 35 countries, detailed as shown in Table 1.

**Table 1:** Description of Surveyed Enterprises

Area		Level	
• Europe	60.96%	• Developed	29.75%
European Union	39.12%	• Developing	70.25%
• Asia	18.13%	<b>Industry</b>	
West Asia	11.65%	• Manufacturing	51.17%
• Africa	12.46%	• Retail	19.91%
• Central America	8.45%	• Other services	28.92%

### 3.2. Research Methodology

Logit models are commonly used to evaluate choice decision-making behavior. The decision to choose will depend on the utility that those options bring. The option with the highest utility ( $U_{ij}$ ) will be chosen. Since  $U_{ij}$  is not observable, the probability of selection will be observed instead. Each alternative  $j$  will have a corresponding probability.

This paper is conducted to analyze the factors affecting the closure of private sector businesses during the COVID-19 pandemic. The dependent variable – closing status, illiquidity, and payment deferrals – are variables with hierarchical characteristics. Therefore, the Ordinal Logit model (OLM) is the most suitable estimator. Min (2013) suggested that using OLM would be statistically more suitable than OLS when estimating a model with a hierarchically dependent variable. In particular, the use of an OLM model helps to avoid inconsistent and biased conclusions.

OLM can be used to analyze decision-making probabilities for a set of prioritized alternatives. OLM assumes that businesses are completely unbiased when it comes to ratings. Thus, it is possible to give complete hierarchies according to the base utility function. The ranking given by the company  $i$  is denoted by  $Y_i = (Y_{i1}, Y_{i2}, \dots, Y_{iJ})'$ , where  $Y_{ij}$  is the preferred order of the company  $i$  for the alternative  $j$ . For instance,  $Y_{ij} = 3$  means the alternative  $j$  is the third preferred choice by the company  $i$ . Also, the rank of choice is expressed in terms of the selected alternatives  $r_i = (r_{i1}, r_{i2}, \dots, r_{iJ})$ , where  $r_{ij}$  is the alternative (encoded as a number) ranked  $j$  by the company  $i$ . For instance,  $r_{ij} = 2$  means the second alternative is ranked  $j$ . The probability of ranking observations given by the individual  $i$  is as follows:

$$P(r_i | \beta) = P(U_{ir_1} > U_{ir_2} > \dots > U_{ir_j}) = \prod_{j=1}^{J-1} \frac{\exp(\beta_{r_j} X'_i)}{\sum_{k=j}^J \exp(\beta_{r_k} X'_i)} \quad (1)$$

Logit models are estimated by the log-likelihood method. The log-likelihood function of OLM is:

$$LL = \sum_{i=1}^N \log \left\{ \sum_{k=0}^{J-1} \rho_k \exp \left[ -\log((J-k)!) + \sum_{l=1}^k \left( \beta_{r_{il}} X'_i - \log \sum_{m=1}^J \exp(\beta_{r_{im}} X'_i) \right) \right] \right\} \quad (2)$$

Where,  $U_{ir_1} \dots U_{ir_j}$  are the utilities for a company  $i$  in the preferred order of the alternatives. Odds ratios are used to determine the degree and direction of the effect of the explanatory variables, obtained by exponential

functions of the coefficients of the respective estimates ( $e^{\text{coef}}$ ). The set of variables used in the analysis is defined in Table 2.

Table 3 presents the proportions of enterprises in the manufacturing, retail and other service industries by operating status and liquidity. Objectively, the proportion of businesses that have to terminate or suspend operations due to COVID-19 is quite similar in the retail and other service sectors, while this proportion for enterprises in the manufacturing industry is only equal to half. On the other hand, manufacturing enterprises are more liquid than other industries.

### 4. Results

Tables 4, 5, and 6 present models for assessing the impact of factors on the bankruptcy risk of private sector businesses. Bankruptcy risk is measured through closure, illiquidity, and deferral of payments, respectively. The coefficients Pseudo  $R^2$  and Log-likelihood both show the appropriateness of the selected variables. LR test according to the Chi-squared distribution ( $\chi^2$ ) with  $p$ -value = 0 rejects the hypothesis  $H_0$  about the independence of the dependent variables. Thus, the models presented in Tables 4, 5, and 6 are consistent with empirical data and predict the bankruptcy probability of enterprises.

The models with the dependent variable Close presented in Table 4 show that the effects of 14/18 explanatory variables are statistically significant. Eight of them have a negative effect, and the others have a positive effect. Specifically, the more weekly working hours (Work\_Time), temporary workers (Temp\_Labor), and input supply (Supply), the lower the risk of closing businesses. On the contrary, if the businesses interrupt the production of some goods and offer any services (Dis\_Production) or start/intensifies online business activities (Busi\_Online) and delivery operations (Delivery) will increase their risk of closure. These results do not support the theory of “Creativity Destruction” but agree with Ouyang (2009) when stating that creativity in business is not enough to help businesses overcome the crisis. Similarly, liabilities due within the next 6 months (Out\_Liabilities) will increase the probability of business closure. Financial obligations seem to have contributed to the difficulties of businesses (Barlevy 2003). The positive impact of the variable Gov\_Support also shows that businesses, despite being supported by the government, still cannot avoid closing because the severe damage caused by the pandemic has exceeded expectations. This result is similar to the study of Olczyk and Kuc-Czarnecka (2021). On the other hand, the estimation parameter of the geographical control variables (Developed, Africa, Cent\_America, EU, Rest\_Europe, West\_Asia) provides some interesting findings. Firms based in the study areas are more likely to survive than elsewhere.

**Table 2:** Description of Variables Used in the Study

Variables	Definition	Expected*
<b>The Risk of Business Closure</b>		
Close	2 if permanently closed due to COVID-19; 1 if ever temporarily closed due to COVID-19; 0 otherwise	
Illiquidity	2 if being illiquidity due to COVID-19; 1 if liquidity balances; 0 otherwise	
Pay_Deferrals	4 if deferred all four payment obligations (to suppliers, landowners, tax authorities, and financial institutions) since the outbreak of COVID-19; 3 if deferred three payment obligations; 2 if deferred two payment obligations; 1 if deferred only one payment obligation; 0 otherwise	
<b>Business Efficiency</b>		
Sale	2 if sales increase; 1 if sales are constant; 0 otherwise	–
Work_Time	2 if the total working time per week increases; 1 if the total hours worked per week remain the same; 0 otherwise	–
Temp_Labor	2 if the number of temporary workers increases; 1 if the number of temporary workers is constant; 0 otherwise	–
Dis_Production	1 if discontinued the production of some goods or the offering of any services; 0 otherwise	+
<b>Creativity and Innovation</b>		
Intro_Products	1 if introduced new or improved products; 0 otherwise	+/-
Busi_Online	1 if started or increased business activity online; 0 otherwise	+/-
Delivery	1 if started or increased delivery or carry-out of goods or services	+/-
<b>Business Relations</b>		
Demand	2 if the demand for products and services increases; 1 if the demand for products and services is constant; 0 otherwise	–
Supply	2 if the supply increases; 1 if the supply is constant; 0 otherwise	–
App_Credit	1 if applied for at least one credit since COVID-19; 0 otherwise	+
Out_Liabilities	1 if fallen in arrears in any of its outstanding liabilities in the next 6 months; 0 otherwise	+
<b>Government Support</b>		
Gov_Support	2 if ever received government support to respond to COVID-19; 1 if expected government support in the next 3 months; 0 otherwise	–
<b>Countries</b>		
Developed	1 if a developed country, 0 otherwise	+/-
Africa	1 if in African, 0 otherwise	+/-
Cent_America	1 if in Central American, 0 otherwise	+/-
EU	1 if in the European Union, 0 otherwise	+/-
Rest_Europe	1 if in European (outside the EU), 0 otherwise	+/-
West_Asia	1 if in West Asia, 0 otherwise	+/-

\*Expectations of positive impact (+), negative impact (–), uncertain impact (+/–) on dependent variables.

**Table 3:** Proportion of Enterprises by Operating Status and Liquidity

Status	Manufacturing	Retail	Other Services
Permanently closed	1.3%	2.8%	2.7%
Temporarily closed	14.8%	23.7%	24.5%
Normal operation	83.9%	73.5%	72.8%
Low liquidity	37.5%	44.7%	48.0%
Balanced liquidity	50.0%	39.1%	36.2%
High liquidity	17.5%	16.1%	15.8%

**Table 4:** Estimation of Models with Dependent Variable Close

Variables	Full Sample	Manufacturing	Retail	Other Services
Sale	-0.0800	-0.2875***	0.0666	0.0183
Work_Time	-0.3931***	-0.4027***	-0.3661***	-0.3815***
Temp_Labor	-0.4219***	-0.3838***	-0.5003***	-0.3533***
Dis_Production	0.6466***	0.6913***	0.6097***	0.6400***
Intro_Products	-0.0167	-0.1291	0.0862	0.0051
Busi_Online	0.2796***	0.1197	0.4330***	0.2031*
Delivery	0.1267*	0.0397	0.0287	0.2107*
Demand	-0.0875	0.1112	-0.3612***	-0.0543
Supply	-0.1460***	-0.2315***	0.0190	-0.2354***
App_Credit	0.0803	0.1022	0.1464	0.0907
Out_Liabilities	0.7324***	0.7124***	0.7197***	0.7471***
Gov_Support	0.3905***	0.3210***	0.4074***	0.4566***
Developed	0.4134***	-0.0089	0.6111***	0.5589***
Africa	-0.9882***	-1.5135***	-0.4005***	-0.8437***
Cent_America	-0.6714***	-0.9360***	-0.2193	-0.5759***
EU	-2.0151***	-2.2947***	-1.2997***	-1.8876***
Rest_Europe	-1.7090***	-2.0474***	-1.1910***	-1.5519***
West_Asia	-1.3799***	-1.7404***	-1.3964***	-0.9680***
/cut1	-0.1387	-0.3876	0.1791	-0.0047
/cut2	2.8073	2.7174	3.0147	2.9463
Obs.	11,696	5,985	2,329	3,382
Pseudo R <sup>2</sup>	0.1632	0.1974	0.1356	0.1505
LR chi2(18)	2236.45***	1150.98***	422.39***	685.6***
Log-likelihood	-5734.91	-2339.13	-1346.29	-1934.56

\*\*\*, \*\* and \* are at 1%, 5% and 10% significance level, respectively.

Businesses in developed countries have a higher probability of closing than in developing countries. This result contrasts with the findings of Olczyk and Kuc-Czarnecka (2021). In fact, on average, social benefits account for more than 50%

of major government spending in developed countries and about 40% in emerging markets (Galeano et al., 2021).

To test for differences in the impact of factors on the probability of business closure, the model is evaluated for

**Table 5:** Estimation of Models with Dependent Variable Illiquidity

Variables	Full Sample	Manufacturing	Retail	Other Services
Sale	-1.2341***	-1.2237***	-1.2806***	-1.1951***
Work_Time	-0.2371***	-0.2981***	-0.0234	-0.2515***
Temp_Labor	-0.6758***	-0.5858***	-0.8177***	-0.7150***
Dis_Production	0.4490***	0.5050***	0.2875**	0.4794***
Intro_Products	-0.1557***	-0.0767	-0.1089	-0.3471***
Busi_Online	0.0561	0.0992	0.0351	0.0255
Delivery	-0.2121***	-0.2524***	-0.3722***	-0.0401
Demand	-0.6499***	-0.7740***	-0.5781***	-0.5147***
Supply	-0.30728***	-0.3339***	-0.2636***	-0.3254***
App_Credit	0.1880***	0.1459*	0.3735***	0.1812*
Out_Liabilities	0.7537***	0.7064***	0.8936***	0.6660***
Gov_Support	0.1755***	0.1365***	0.22418***	0.2031***
Developed	0.0386	-0.0861	-0.0976	0.4067***
Africa	-0.4948***	-0.4494***	-1.1226***	-0.3750*
Cent_America	0.2196*	0.4612***	-0.5121***	0.2578
EU	-0.5134***	-0.3401**	-0.9870***	-0.5800***
Rest_Europe	-0.3718***	-0.1939	-1.05408***	-0.3264
West_Asia	0.1911*	0.2603*	-0.3590	0.3135
/cut1	-5.2781	-5.4124	-5.7219	-4.8972
/cut2	-1.9675	-1.8027	-2.5851	-1.9325
Obs.	11,696	5,985	2,329	3,382
Pseudo R <sup>2</sup>	0.3211	0.3339	0.3117	0.3105
LR chi2(18)	7728.49***	4126.53***	1483.08***	2123.58***
Log-likelihood	-8168.97	-4115.49	-1637.33	-2358.1

\*\*\*, \*\* and \* are at 1%, 5% and 10% significance level, respectively.

each different industry (manufacturing, retail, and other services). Fortunately, most of the results for estimating the samples for each industry show similarity with the model using the pooled sample. Only the variable Sales is found to have a significant negative impact on the likelihood of closure for the manufacturing industry, while the variable Demand has a negative effect on the retail industry. These findings add to the evidence for an inverse relationship between performance, business expansion, and risk of business closure (Table 4).

Liquidity is another popular metric used to measure the risk of bankruptcy. When the liquidity of an enterprise is in serious deficit, it means that the enterprise is facing the risk of bankruptcy (Bartik et al., 2020). Regarding the dependent variable, which is the liquidity position of enterprises (Illiquidity), the model has up to 16/18 statistically significant explanatory variables. Twelve of them have the same impact

direction as the model with the dependent variable Close, including Sale, Work\_Time, Temp\_Labor, Dis\_Production, Demand, Supply, Out\_Liabilitie, Gov\_Support, Developed, Africa, EU, and Rest\_Europe. The other variables have a negative impact on the illiquidity of businesses. However, the variables measuring the creativity and innovation of enterprises do not have a consensus on the direction of impact. The models in Table 5 find a negative relationship between the policy of introducing new products, boosting delivery, and illiquidity, while the effects of the online business policy are not significant. In contrast to the models in Table 4, these results show support for the “creative destruction” theory. On the other hand, the significant positive effect of the variable App\_Credit explained the increased risk of firms accessing credit during the crisis period (Lu et al., 2020). In addition, the control variables Cent\_America and West\_Asia are different for the full sample and the manufacturing

sample. This explains why manufacturing firms in Central America and West Asia are less liquid than in other regions (Table 5).

The final estimators use the dependent variable measured by the deferrals of the firms' debt (Table 6). The lower the ability of businesses to pay their liabilities, the higher the risk of bankruptcy. Most of the estimated parameters of the explanatory variables in this model are the same as in the previous models. In which the variables measuring innovation have a higher similarity with the models in Table 4. Specifically, the impact of innovation policies proved ineffective in reducing the overdue liabilities of enterprises. The theory of "creative destruction" once again receives objections from this research result. On the other

hand, the positive effect of variables Africa and Cent\_America shows that businesses in the two respective regions are more likely to deferral debts than in others, especially in the manufacturing industry. However, the debts of businesses in the retail industry in developed countries are less deferred than in developing countries.

## 5. Conclusion

This study aims to analyze the bankruptcy risk of private sector enterprises measured by the opening/closing status, illiquidity, and payment deferrals during the COVID-19 pandemic. The explanatory factors selected for analysis reflect business performance, innovation,

**Table 6:** Estimation of Models with Dependent Variable Pay\_Deferrals

Variables	Full Sample	Manufacturing	Retail	Other Services
Sale	-0.2292***	-0.2621***	-0.2612***	-0.1559*
Work_Time	-0.1517***	-0.2038***	-0.1530	-0.0809
Temp_Labor	-0.2315***	-0.1185*	-0.2188**	-0.3684***
Dis_Production	0.4986***	0.6350***	0.2666**	0.4592***
Intro_Products	0.1379**	0.0353	0.1445	0.2906***
Busi_Online	0.2446***	0.2722***	0.2994**	0.1624
Delivery	0.2817***	0.2422***	0.3123***	0.3404***
Demand	-0.0330	-0.0268	-0.0010	-0.0583
Supply	-0.1121***	-0.1082*	-0.1101	-0.1283*
App_Credit	0.8148***	0.7468***	0.9278***	0.8431***
Out_Liabilities	1.9217***	2.0137***	1.9479***	1.7447***
Gov_Support	0.1543***	0.1598***	0.1988***	0.1211***
Developed	0.0035	0.0551	-0.3626**	0.1751
Africa	0.2519***	0.3839***	0.2785	-0.0500
Cent_America	0.3567***	0.5111***	0.1804	0.1422
EU	-1.0464***	-0.9552***	-0.8413***	-1.3715***
Rest_Europe	-0.6284***	-0.4884***	-0.6955***	-0.8744***
West_Asia	-0.2045**	-0.0797	-0.4437*	-0.3092*
/cut1	0.7196	0.8994	0.6418	0.4510
/cut2	1.8574	2.1330	1.7677	1.4757
/cut3	2.9824	3.2227	2.9397	2.6302
/cut4	4.3480	4.6741	4.2988	3.9186
Obs.	11,696	5,985	2,329	3,382
Pseudo R <sup>2</sup>	0.1834	0.1873	0.1868	0.1732
LR chi2(18)	4350.32***	2087.14***	932.83***	1296.27***
Log-likelihood	-9683.20	-4529.13	-2030.15	-3093.74

\*\*\*, \*\* and \* are at 1%, 5% and 10% significance level, respectively.

business relationships, and government support. The data is collected from the World Bank's Enterprise Survey amid the COVID-19 pandemic.

The analysis results show that the risk of bankruptcy is less likely for businesses that can maintain sales growth, working hours, temporary workers, and a full supply of goods and services. During the COVID-19 pandemic, the constant and rapid change in market conditions has made it difficult for businesses to adapt. The use of temporary labor to maintain operations has helped many businesses to effectively manage the production of goods, the provision of services as well as the growth of sales. As a result, the flexibility of the labor market in pandemic-affected countries is highlighted as an effective policy to support the economic recovery after the crisis.

In terms of innovation, the intensification of online business activity cannot prevent businesses from closing or deferring payments as expected by the theory of "creative destruction". Most likely, online commerce channels have not been able to help increase sales because of the narrowing of demand at direct selling points (Olczyk & Kuc-Czarnecka 2021). On the other hand, the policy of introducing new or improved products and promoting delivery has helped businesses maintain liquidity. However, these policies have made businesses increase operating costs and overdue payments and even increase the risk of bankruptcy. These results imply that businesses need to be careful and thorough when studying the effectiveness of innovation programs.

Research also shows that expanding business relationships to increase consumption demand and input supply can reduce the bankruptcy risk of businesses. However, supports from financial institutions and the government do not help businesses reduce the risk. These negative effects may be related to delays in the implementation of supportive policies. In other words, support packages need a lot of time (at least in the medium term) to take effect instead of expecting immediate effects. Only effective and capable businesses with more outside support will have more chances to survive. It implies that governments need to accelerate the implementation of supportive policies for businesses in the private sector.

On the other hand, the survivability of businesses in the manufacturing sector is higher than those in the retail and other service sectors due to a higher degree of automation in the manufacturing process. Furthermore, service-providing businesses that rely heavily on human contact and interaction should suffer significantly more during social distancing episodes (Olczyk & Kuc-Czarnecka, 2021). This result shows the fragility of businesses in the retail and other service sectors, especially as the pandemic tends to linger. Many service businesses keep so little cash that they must drastically reduce spending, take on more debt and even file for bankruptcy during the outbreak.

The study also found that the negative impact of the COVID-19 pandemic on businesses in the study area is less severe than in other regions. However, manufacturing firms are less liquid in Central America and Western Asia, while their past due payments are found more frequently in Central America and Africa. Furthermore, the closure probability of private sector business is higher in developed countries than in developing countries. This conclusion raises skepticism and needs further testing as the World Bank survey was only conducted in member countries, and therefore, most high-income countries (United States, China, Japan, Canada, and Western European countries) are not included in the survey.

The most significant limitation of the study is the inability to analyze the risk of businesses over time. The impact of COVID-19 on economies has been divided into several waves from the beginning of 2020 to the present. In the second quarter of 2020, many countries began to lift some restrictions when there were first signs of recovery. Then, they continued to practice distance when the second wave of COVID-19 appeared in the third quarter. In addition, some countries have been affected by the third pandemic wave, which occurred in the first quarter of 2021. Therefore, future studies may examine differences in the impact of COVID-19 on businesses in each outbreak. Furthermore, future studies may also expand the assessment of the impact of COVID-19 on businesses to more specific areas.

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