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THESIS WORK

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Abstract

The better-prepared firms usually survive economic shocks higher than the rest. The goal of the research is to analyze the effect of the economic crisis on companies' performance in Kazakhstan. The goal of this research is to find ways for small and medium-sized enterprises to survive in the face of the Covid-19 coronavirus pandemic.

My research is focused on third largest industry by employment share in Kazakhstan, which is the distribution sector (Bijnens & Konings, 2018). I investigate the probability of surviving of more than 19,000 grocery stores from 2017 to 2021 and investigate the factors of stores' that influence their survival rate during economic crisis caused by the COVID-19. By implementing the Cox proportional hazards model and OLS, I explore the effects of different variables like location, region, sales size, and type of store, which are regarded as key determinants of a store's survival rate.

Results of analysis showed that due to the COVID-19 crisis, 1.8 times more retail outlets closed in 2020 compared to previous years and that rural outlets with high sales values had higher survival rates after the COVID-19 crisis than urban outlets. In addition, I found out that traditional grocery outlets have higher survival rates than wholesale stores. This statement is backed up by non-parametric and as well as parametric tests that were performed during the research.

These results of study could be useful in reducing the harmful consequences of crisis during recessions from a normative standpoint. Additionally, this research can act as a guide for grocery stores' crisis management. There is very little research in this field in Kazakhstan, and the proposed thesis can help companies choose their strategic directions in crisis management in Kazakhstan.

Keywords; *Effect of economic crises; Cox proportional hazards model; Kazakhstan; Survival Analysis; Survival Data; Covid-19 Crisis; Firm failure;*

Introduction

The last decade was very stressful for the economic performance of Kazakhstan, with falling oil prices, several steep devaluations of the tenge, and a high inflation rate for many consecutive years. The recent economic crisis due to the COVID-19 coronavirus has increased the degree of unpredictability and instability in the external environment for many businesses. According to studies by Bhamra, Dani, & Burnard (2011), small and medium-sized enterprises are the least prepared for external shocks. Small firms are particularly vulnerable to economic crises, which are characterised by recessions, industry animosity, diminished demand, and political instability. In addition, the research identifies the lack of financial resources, planning, and restricted investment prospects as the primary causes of the poor survival rate of small and medium-sized organisations (Storey, 1994). The issue of maintaining the survival of small and medium-sized enterprises is crucial due to their vulnerability during economic fluctuations.

McCann defines firm survival as "the ability to quickly recognise and seize opportunities, change direction, and avoid collisions." (McCann, 2004). For long-term survival, businesses must develop a strategy to adapt to any unexpected event, such as natural disasters, accidents, competition, and economic challenges (Herbane, 2019). The strategic management literature suggests that large, established organisations survive better than SMEs and new enterprises due to their established stakeholder connections and access to resources (Singh, House, & Tucker, 1986). Another study supports the notion that a company's lack of novelty and small size may contribute to the higher failure rate of SMEs (Lee, Kelley, D., & Lee, 2012). On the other hand, small and medium-sized businesses are seen to be more adaptable and flexible due to the lack of bureaucracy, the ability to learn quickly, and the quickness of decision-making processes (Stokes, 2002). These factors can be very important during a crisis.

In this paper, I looked from the microeconomic perspective at the effect of this crisis on grocery stores' survival rates and tried to understand which factors of stores

increase their chances for survival after a crisis. It is well known that firms that successfully adapt to market fluctuations are better off during a crisis.

I plan to contribute to the literature in the following respects: Firstly, research will be on Kazakhstan. There is not much survival analysis of firms yet in Kazakhstan. Secondly, survival analysis will be conducted on the COVID-19 crisis and will be actual and of current interest. In addition, the COVID-19 crisis has many differences compared to previous recessions.

Literature Review

Survival analysis is a statistical method for analysing the duration of a certain process until its failure or termination, where process means something happening in a certain period of a timeline. This type of analysis was originally widely used in the medical, biological, and insurance fields. Nowadays, it is also commonly used in social and economic sciences as well as in engineering. For example, survival analysis can be used to analyse the patient's life expectancy after surgery before death; to evaluate the duration of the advertising campaign's effect; to evaluate the service life of certain details of the car; and to assess the duration of cooperation with another party. In economics, survival analysis is commonly applied in industrial organization theories. The failure (event) is the firm's bankruptcy, and time is the period when the firm operates. The most beneficial part of survival analysis is that results can reveal which characteristics of a company can increase their chances of survival from a crisis. Today, there is a lot of interesting research dedicated to analysing which factors have the biggest effect on a firm's survival rate.

Economists have long argued which characteristics of the company influence the company's survival. An anticipated shock and an economic downturn are seen as a good opportunity to test why businesses fail or succeed. Studies conducted by Mata & Portugal (1994) showed that differences in ownership and corporate hierarchy have a significant impact on firm performance (Mata & Portugal, 1994). Outside ownership by foreigners and having an independent board of directors are indicated as common

features of surviving businesses (Mata & Portugal, 1994). Another research on a similar topic conducted by Kang et al. (2010) provided evidence that firms that have a board of managers (or several people in charge) have a higher chance of failing than firms led by independent owners or managers (Kang, Lee, & Na, 2010). In addition, Kang et al. (2010) found that differences in cash flow rights and control rights of shareholders weakened the trust of investors, leading to a lower survival rate than others. However, unaffiliated financial institutions' equity ownership of such firms, on the other hand, can mitigate such risks. To support this statement, Francis et al.'s (2012) study also discovered that the corporate board had a significant impact on business performance. Specifically, they showed that foreign directors who are less connected with CEOs and the companies where board meetings are held do not frequently have a negative impact on firm performance. In addition, during unprecedented circumstances, leaders often have little choice but to act in ways that have never been done before: they must be brave, move quickly, and take risks that, under more typical circumstances, they would consider unacceptable.

According to Dunne & Hughes (1994), a firm's size and age are also important factors in determining whether a company will survive. Large businesses are less likely to fail, although the effect of company age is complex. (Dunne & Hughes, 1994). Research by Commander & Svjenar (2011) showed that the strategy and vector of firms affect their survival. Firms that focus on innovation, export, and diversification are more likely to survive than those that do not (Commander & Svjenar, 2011).

The financial strength of a company is used to assess its market position and the stability of a business is crucial to its survival. To succeed in the market and grow, a business must first have a steady stream of cash revenues that can be used to pay suppliers, employees, creditors, taxes, etc. After deduction of all costs, to generate a profit is a must and should not be less than forecasted. But financial stability is not only about ability to pay, since sometimes firms that are not able to pay all costs can maintain financial stability. One of the factors that can have a high effect on firms' survival is the amount of credit or affiliation with conglomerates. Firms with a greater

amount of debt have a higher probability of failing during the crisis (Baek, Kang, & Park, 2004). Bridges and Guariglia (2008) confirmed the earlier finding and found that companies with higher leverage had higher failure rates in UK enterprises from 1997 to 2002. This effect is stronger for domestic businesses than for businesses that do business around the world.

Ensuring survival becomes the primary goal of the company in cases where there are too many manufacturers in the market and in highly competitive sectors of the economy. To continue a firm's operation in a highly competitive sector, firms are forced to set low prices in the hope of a favourable response from consumers, since profit is not as crucial as survival for them. As long as the reduced prices cover their costs, these firms can continue to do business for a while. Survival analysis conducted in highly competitive markets can help and guide businesses to increase their survival rate without losing their profit. Mitton (2002) conducted research on the East Asian financial crisis of 1997–1998 in countries such as Korea, the Philippines, Malaysia, and Thailand and discovered that firms that were more focused on fewer products or services performed better during the recession than firms with diversified portfolios or services (Mitton, 2002).

Another great survival analysis was conducted on Croatian firms by Kovac, Vukovic, Kleut, & Podobnik in 2016. Authors used data from of 144 000 firms in Croatia during 2003-2015 and showed that small and micro firms with long-term investments prior to the crisis had 60-70% less failure rates than similar firms that decided not to invest. But for medium and large firms, they didn't find significant differences between groups, since it is likely that investment in large firms makes up a small portion of their assets (Kovac, Vukovic, Kleut, & Podobnik, 2016).

Other characteristics mentioned by Kovac et al. that ensure companies have a higher survival rate in the long run are being innovative. Both in terms of the amount of money invested in research and development and their ability to adapt to technological advances. Innovative companies not only have a better chance of successfully adjusting to the changing environment of the market, but they also have a

better chance of keeping the competitiveness of the market. Yet, the connection between innovation and survival is not a linear one. It depends on a variety of factors, like a company's starting technological level, type of industry, and type of innovation (Kovac, Vukovic, Kleut, & Podobnik, 2016).

Survival analysis conducted on 110 000 firms in Russia by Iwasaki & Kim (2018) in the period of 2007–2015 discovered that the effects of some major characteristics of firm survival are not necessarily robust throughout business cycles. Iwasaki and Kim mention in their research that concentration of ownership, the number of board directors and auditors, company age, and business network are among the elements that continuously impact firm survival across economic cycles and industries." (Kovac, Vukovic, Kleut, & Podobnik, 2016). Furthermore, they discovered that hiring an international audit firm increases the chances of surviving a crisis; however, the quality gap between international and Russian audit firms is closing over time.(Iwasaki & Kim, 2018).

There are many other factors which affect the survival rate of a company. In their study, Kovac, Vukovic, Kleut, & Podobnik (2016) listed the following factors: Corporate framework, business experience before entering to market, market growth, the size of workers growth rate, the amount of money spent on business sector, nature of business; learning-by-doing competencies, starting endowments and previous knowledge, diversity of firms, efficiency of employees, financial leverage and the capital-labor ratio in the business sector (Kovac, Vukovic, Kleut, & Podobnik, 2016).

From all the above-mentioned survival analysis, one can question whether the lessons learned from corporate failures during a crisis can be applied in normal times. Firm failure or bankruptcy happens rarely during normal times compared to crisis times. Yet, in both normal and crisis times, some characteristics seem to have a major impact on a firm's failure.

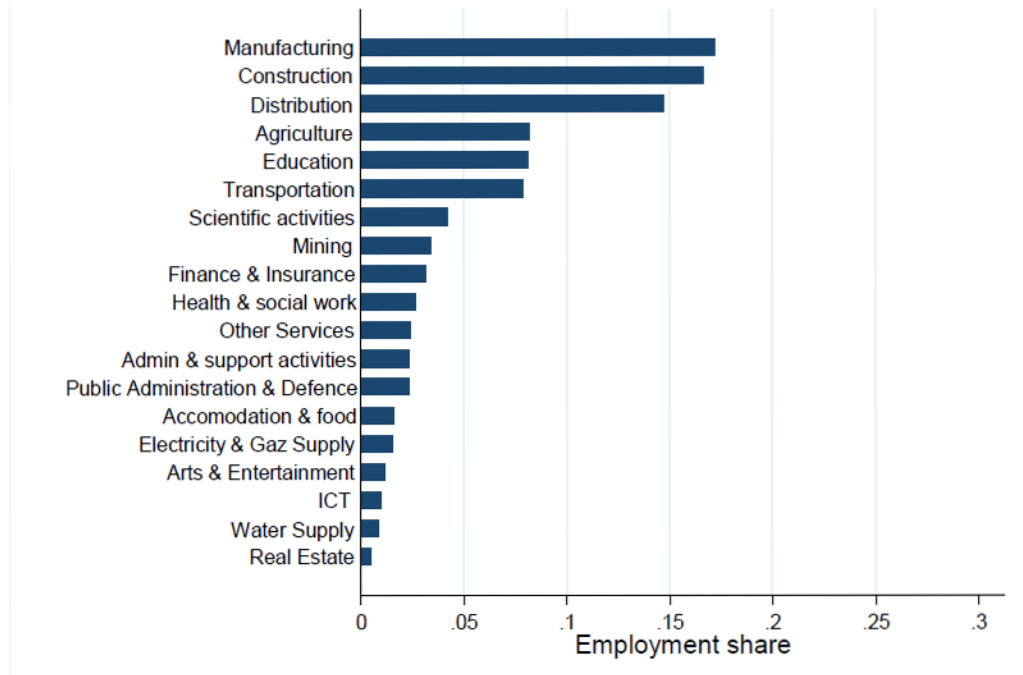
Data collection and research methodology

In this research, I decided to mainly focus on small and medium-sized enterprises and their failure rate after the COVID-19 coronavirus epidemic. The reason for focusing on SMEs is the fact that SMEs are the foundation of a market economy and SMEs play a crucial part in the country's economic development. For instance, small businesses make up 44% of US GDP according to Small Business Administration's report from 2019.

I used the dataset from the tobacco company "Japan Tobacco International" (JTI) distributor "Megapolis" company's sales to outlets. "Megapolis" provides distribution services for "Japan Tobacco International" and "Philipp Morris International" and has more than 30,000 different outlets in Kazakhstan. These two companies account for more than 70% of tobacco sales in Kazakhstan, making their distributor "Megapolis" one of the distributors with the most grocery store coverage in the world. In addition, their database has detailed sales data for each outlet on a daily basis. Data periods used in research are from 2017 and the survival analysis period starts from March 2020, the period when the COVID-19 quarantine started in Kazakhstan. While the data that I used is limited, it does provide several useful insights about the size, type, location, and age of stores. Although this type of data will not enable us to do a long-term comprehensive study of grocery store behaviour and development, it will enable us to record a few critical microeconomic structural elements of the Kazakhstan distribution sector. This is an important advantage. Because of this, the results of this study should be seen as a good first estimate while we wait for more detailed data on Kazakhstani companies, which may become available in the future for research purposes.

Figure 1 shows that the distribution sector in Kazakhstan is in third place by employment share in the private employment sector. Around 15% of private employment in Kazakshtan comes from the distribution sector, meaning retail and wholesale. In the first 2 places are the manufacturing and construction sectors, making up a 35% share of employment (Duparcq & Konings, 2016).

Figure 1: *Employment share NACE sectors in Kazakhstan 2012*



Source: Duparcq & Konings, 2016, *An Enterprise Map of Kazakhstan: A Guide for Industrial Policy*

Methodology

The main component in the standard survival analysis is the failure event. In my research, failure is when grocery stores close their stores or quit the business. Another important parameter is the total time passed until the failure. In my case, this is the number of months in which the grocery stores were continuing their operations. Using our panel data, I analyze the survival rate and hazard rates for chosen characteristics of firm (nonparametric methods). Then I apply the Cox proportional hazard model (parametric method) to estimate the survival rates for different factors in grocery stores. Such an approach also helps better understand the importance of certain characteristics of stores for survival chances during anticipated shocks.

In my research, I use the methodology Kovac, Vukovic, Kleut, & Podobnik described in Croatia firms survival analysis. First of all, in survival analysis starts by defining T as a nonnegative continuous random variable denoting the time till an event occurs (i.e. grocery store stopping it's operation). $f(t)$ stands for function called probability density function. And it has also cumulative distribution function where $F(t) = Pr(T \leq t)$, which together define the likelihood that the event has taken place by a

certain amount of time t (Kovac, Vukovic, Kleut, & Podobnik, 2016). Based on that Kaplan-Meier survival function is defined:

$$S(t) = \Pr(T \geq t) = 1 - F(t) = \int_t^{\infty} f(x)dx$$

Where $S(t)$ is the propability that the event (failure of store) has not taken place before the period t . (Kovac, Vukovic, Kleut, & Podobnik, 2016)

In addition to the survival function, hazard function, which is a representation of the rate with which the event takes place is used:

$$\lambda(t) = \lim_{dt \rightarrow 0} \frac{\Pr(t \leq T < t + dt | T \geq t)}{dt}$$

The conditional probability that the event will occur in the period $[t; t + dt)$ provided that it has not happened before is represented by the numerator, while the breadth of the interval is represented by the denominator (Kovac, Vukovic, Kleut, & Podobnik, 2016). By dividing one number by the other, we may calculate the frequency with which an event occurs over a certain period of time. We are able to calculate an actual rate of occurrence by taking the limit as the size of the interval approaches 0 and working backwards. In essence, the survival function and the hazard function both provide characterizations of the distribution of T that are distinct from one another but functionally equal (Kovac, Vukovic, Kleut, & Podobnik, 2016). Both functions are examples of estimate methods that do not rely on parameters (Kovac, Vukovic, Kleut, & Podobnik, 2016).

On the other hand, the Cox proportional hazard model focuses specifically on hazard function, where the risk at time t for a single company together with a collection of factors is shown:

$$\lambda_i(t | x_i) = \lambda_0(t) \exp\{x_i' \beta\}$$

Cox hazard model is parametric model of estimation. $\lambda_i(t)$ is baseline hazard function which reflects the risk as $x_i=0$, whereas $\exp\{x_i' \beta\}$ indicates the relative risk, proportional to change in risk, connected with factor x_i . (Kovac, Vukovic, Kleut, & Podobnik, 2016)

After integrating both sides of equation with 0 to t , cumulative hazard is defined:

$$\Delta_i(t | x_i) = \Delta_0(t) \exp\{x_i' \beta\}$$

By changing signs and exponentiation, survivor function is obtained:

$$S_i(t | x_i) = S_0(t) \exp\{x_i' \beta\}$$

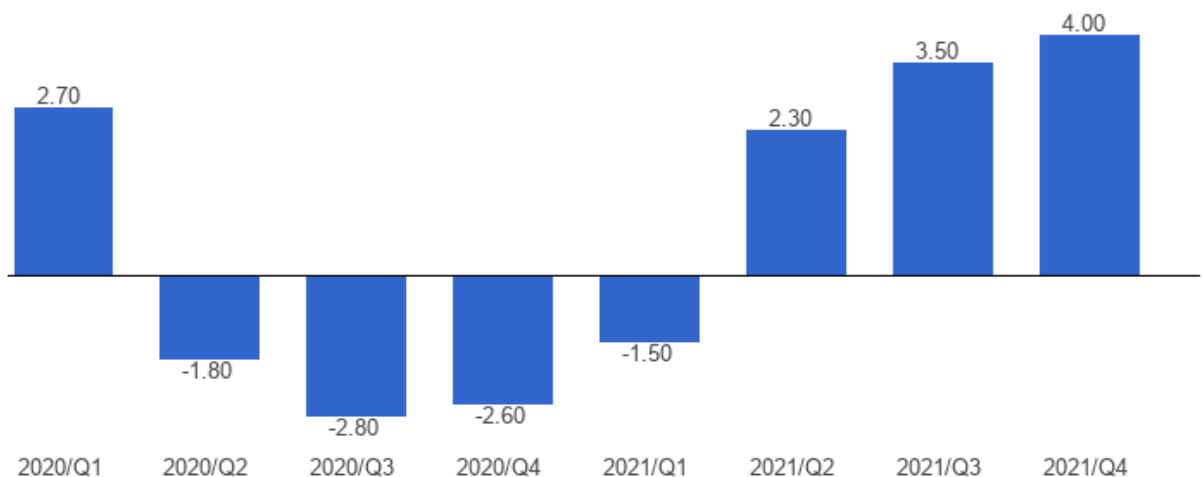
Where $S_0(t) \exp\{x_i' \beta\}$ is baseline survival function (Kovac, Vukovic, Kleut, & Podobnik, 2016).

Analysis and Findings

Kazakhstan market overview after Covid-19 coronavirus pandemic.

Figure 2 shows the impact of the COVID-19 coronavirus pandemic on Kazakhstan's real GDP starting from the second quarter of 2020. The first cases of coronavirus were found in March 2020 in Kazakhstan, and the government introduced a state of emergency in Kazakhstan on March 16th. Starting from 2020 Q2, we can see from the below figure that Kazakhstan had a negative change in real GDP for 1 year.

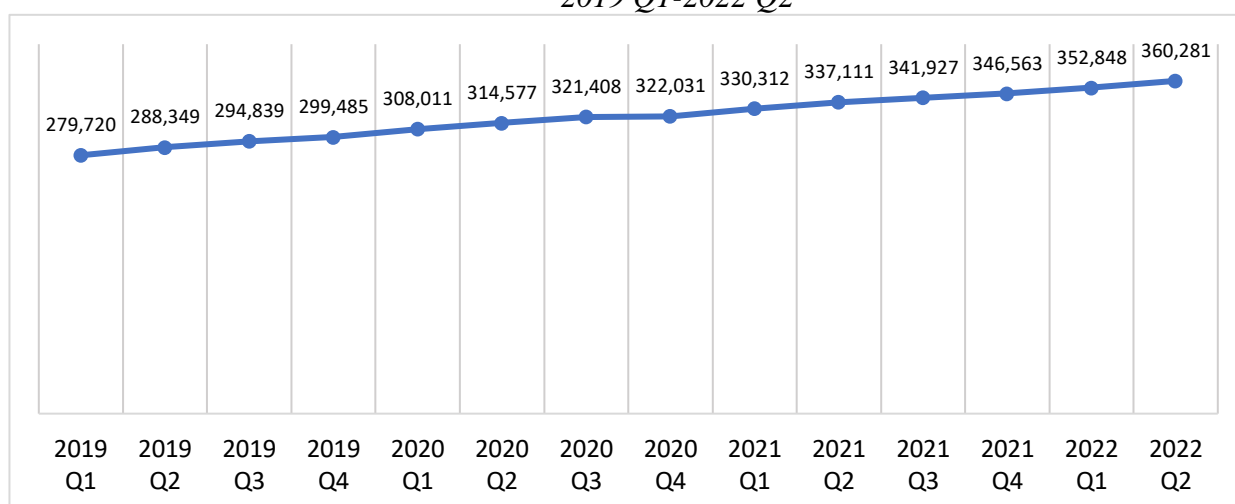
Figure 2: *Economic growth, percent change in quarterly real GDP in Kazakhstan, Q1 2009 - Q4 2021*



Source: Ministry of National Economy of the Republic of Kazakhstan
https://www.theglobaleconomy.com/Kazakhstan/gdp_growth/

Firstly, based on data from the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National Statistics, I decided to check whether the number of legal entities in Kazakhstan decreased after the COVID-19 pandemic. By analysing all the monthly reports from the Bureau of National Statistics, I was able to collect the trend of the quantity of legal entities from 2019. At first glance, it seemed that the number of legal entities rose instead of declined after COVID-19. Figure 3.1 shows the number of registered legal entities in Kazakhstan from 2019 to the second quarter of 2022. Despite the economic crisis due to a coronavirus pandemic in 2020, the quantity of registered legal entities keeps increasing in each quarter. From Q2 2020 when Covid-19 hit Kazakhstan, till recent data from Q2 2022, more than 45,000 new legal entities were registered in Kazakhstan.

Figure 3.1: *Quantity of registered legal entities in Kazakhstan on quarterly basis, 2019 Q1-2022 Q2*

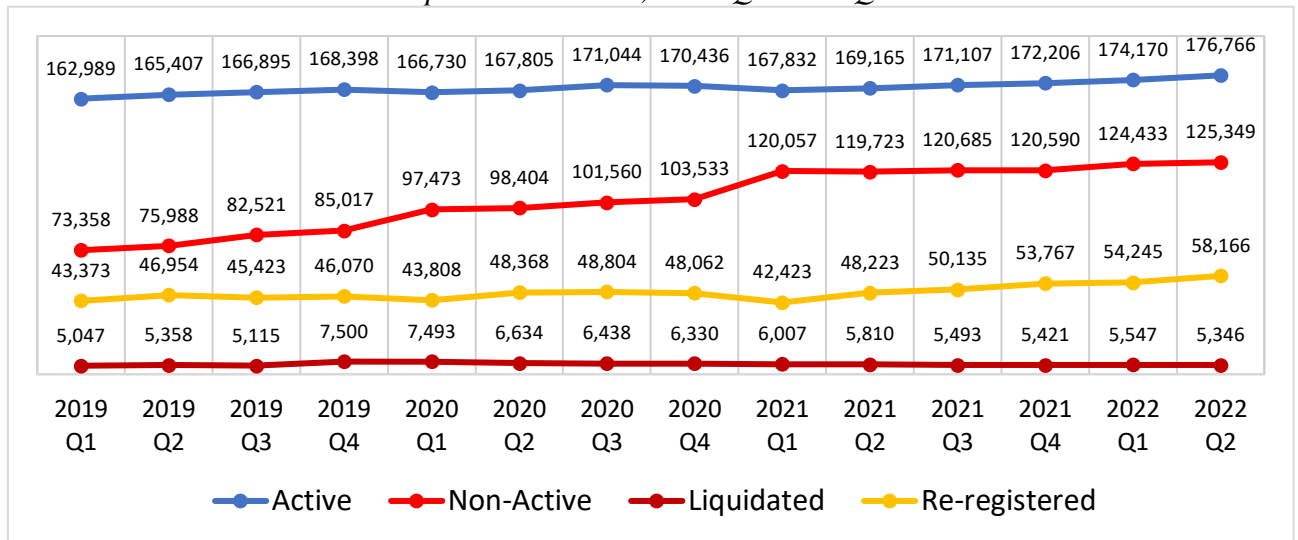


Source: computed by author based on data from Kazakhstan Bureau of National statistics <https://stat.gov.kz/>

Next, we if tune in more details in the number of legal entities by operational statuses in Figure 3.2: Active (operating), Non-active (freeze or stop operation), Liquidated – (withdraw legal entity license) and Re-registered (re-registered license). The number of operating active legal entities did not change during the first year following the pandemic's impact. It started to rise only after 2021 Q2 by around 9,000 entities, the latest available data shows. whereas the number of non-active legal entities that ceased operations increased from 97,473 to 120,057, implying that more than 22,000 legal entities ceased operations as a result of the COVID-19 pandemic.

net number of operating legal entities decreased by around 13% during the first year of the COVID-19 pandemic.

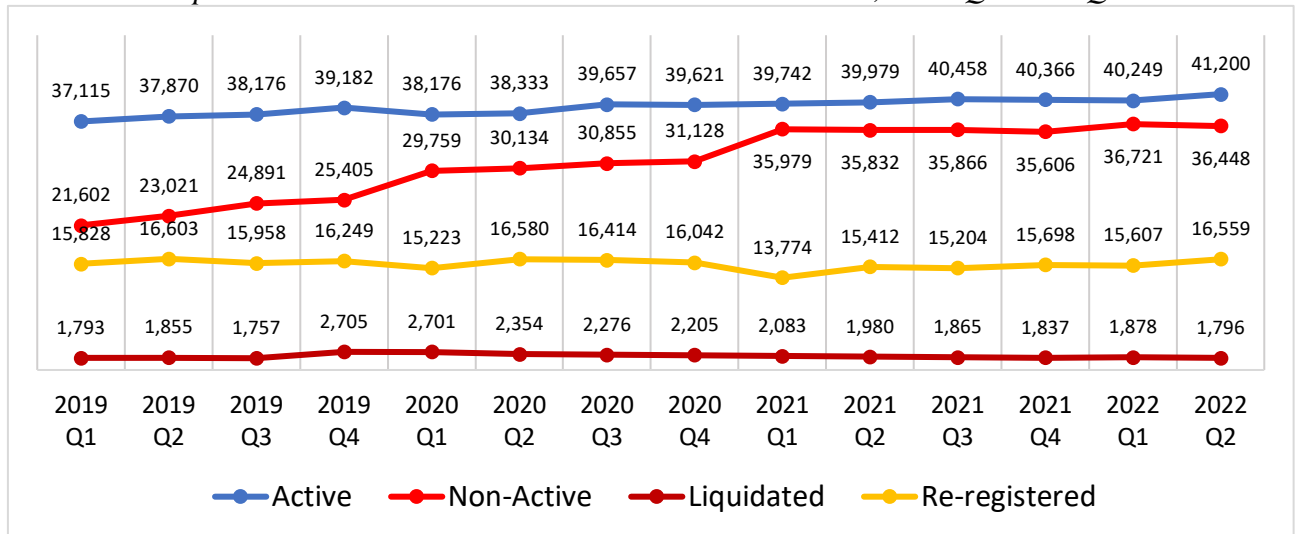
Figure 3.2: *Quantity of operating legal entities in Kazakhstan on quarterly basis by operational status, 2019 Q1-2022 Q2*



Source: computed by author based on data from Kazakhstan Bureau of National statistics <https://stat.gov.kz/>

Figure 3.3 shows further details of the legal entities' quantity trend in my main research economic sector of retail and wholesale trade. More than 10,000 legal entities in the retail and wholesale trade sectors stopped or frozen operations during the first year of the pandemic in 2020. This means that approximately 25% of the 40,000 regular operating legal entities in the retail and wholesale trade sectors have ceased operations. Based on the data in Figure 3.3, I assume that usually when a shop owner or renter decides to stop operation, another renter or person opens a store in the same building or boutique since the demand for grocery products does not change due to external factors. Due to that, in Figure 3.3, the total number of operating legal entities did not fall after the pandemic hit Kazakhstan in 2020. In addition, in the chart below, the number of re-registered legal entities did not rise during the COVID-19 pandemic, meaning that legal entities opened instead of closed entities didn't have licences before.

Figure 3.3: *Quantity of operating legal entities in Kazakhstan on quarterly basis by operational status in retail and wholesale trade sector, 2019 Q1-2022 Q2*



Source: computed by author based on data from Kazakhstan Bureau of National statistics <https://stat.gov.kz/>

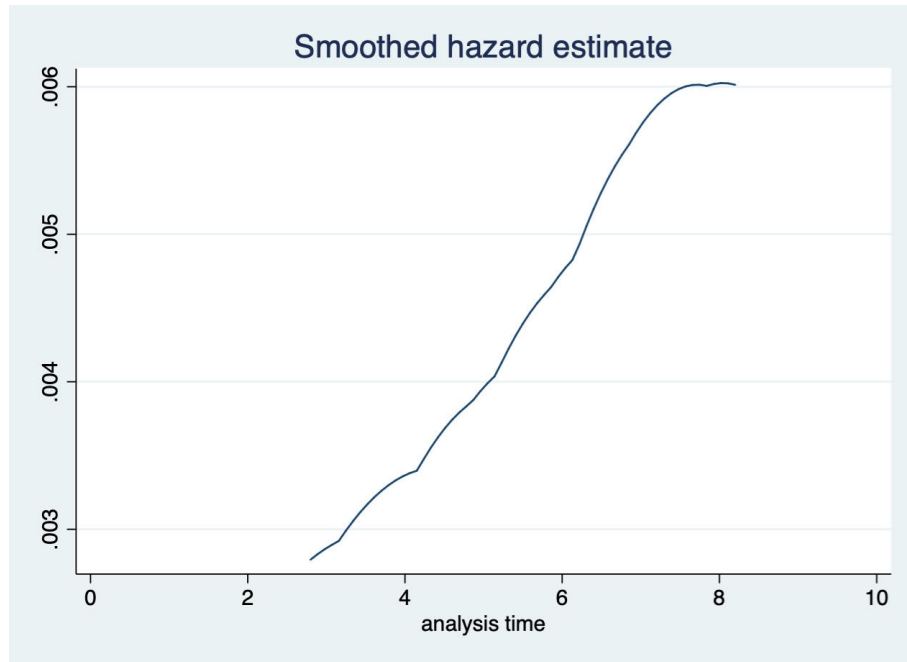
Primary data survival analysis

From the JTI database, I extracted and compiled a sizable dataset of sales for each outlet on a monthly basis. From this data, I chose outlets that met two criteria: first, they were operational in the first quarter of 2020 (before COVID-19 in Kazakhstan); and second, their survival status was trackable for at least one year. As a result, I chose a total of 19,466 traditional outlets (convenience shops) that met the above conditions, excluding types of outlets in modern trade and key account channels. In addition to that, I collected information regarding the outlet’s location city, whether the outlet is retail or wholesale, whether it is in urban or rural areas, and their sales value.

The distributor of JTI covers more than 70% of the volume of cigarettes in Kazakhstan. Also, cigarettes are one of the best-selling products in traditional outlets, making up the highest share of a grocery store’s turnover. It means that if an outlet does not buy cigarettes from JTI at all for several consecutive months, I assume that it is closed. So, using JTI direct sales data to outlets, I can anticipate the number of closed outlets and conduct a survival analysis.

Initially, we analyse our panel of 19,466 outlets as a whole over a 1-year period after March 2020, when COVID-19 started in Kazakhstan.

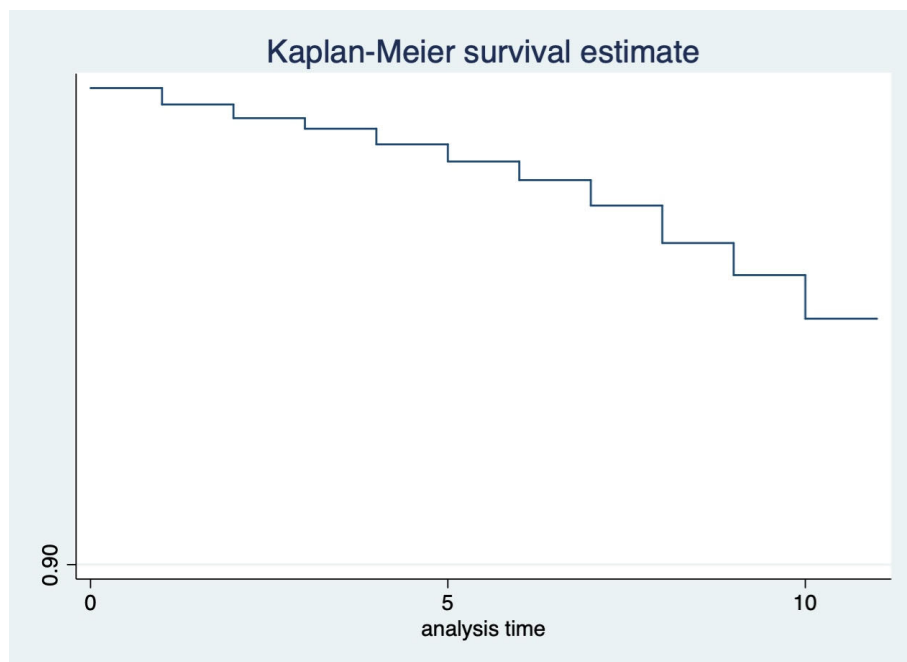
Figure 4. Hazard rate for all outlets February to December 2020



Source: graph is prepared by author

In Figure 4, the smoothed hazard estimate for 19,466 outlets shows that outlets began to close after the third–fourth months and increased in the same phase until the eighth month, implying that outlets began to close in June–July 2020 and peaked in October–November 2020.

Figure 5. Kaplan-Meier survivor function of all outlets survival probability



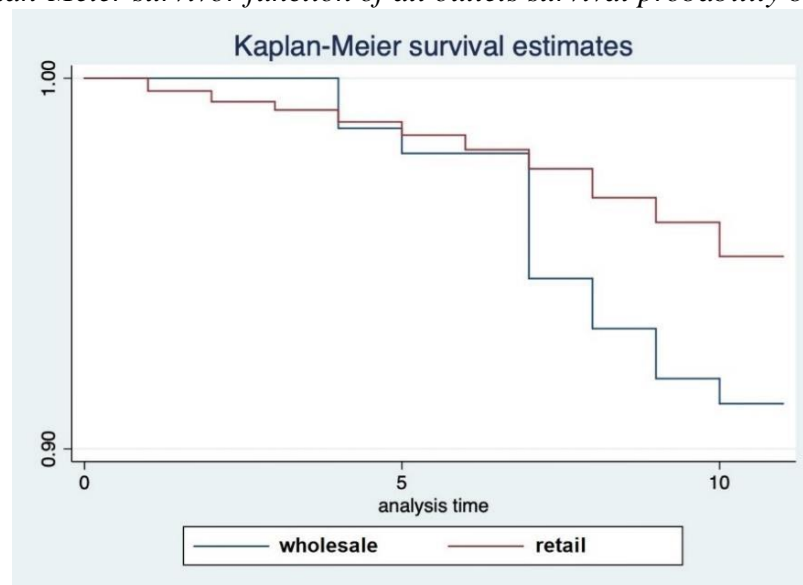
Source: graph is prepared by author

In Figure 5, we can see that 4.8% of the 19,466 outlets analysed in the research closed after COVID-19 in 2020. If we compare the failure rate with previous years, the failure rate in 2020 is on average 77% higher than in 2019 and 2018. It means that the higher failure rate of grocery stores in Kazakhstan could be the result of the COVID-19 crisis.

Next, I analyse our panel based on specific characteristics of outlets. To maintain the methodology, we were constrained to examining only characteristics that usually don't change over time: location, city, type of store, or size.

Firstly, I analyse the survival rate based on outlet type: wholesale or urban. As it is shown in Figure 6 below, the percent share of outlets closed in 2020 in wholesale types of outlets is about twice as high as in traditional outlets. The failure rate in wholesale is 8.7% and in regular outlet groups it is 4.8%. But we also should consider that the number of wholesale outlets is only 148, making up less than 1% of total panel data. As a result, wholesale outlets contribute more to weighted coverage than to numeric coverage. I assume that wholesale outlets are affected by COVID-19 more than retail outlets, since most wholesale outlets are in crowded bazaars. Since the government-imposed quarantine and lockdown in overcrowded locations like bazaars and open markets, most of the wholesale outlets were forced to freeze or stop operating.

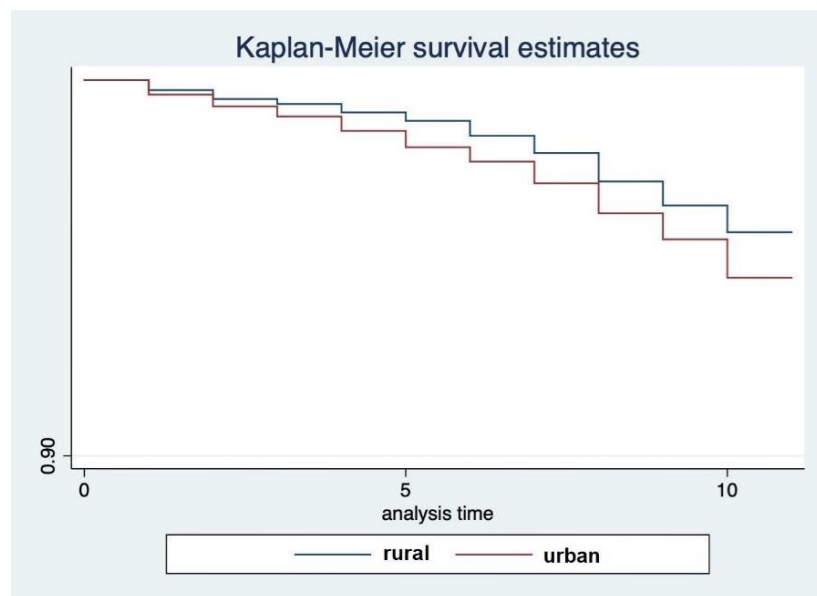
Figure 6. *Kaplan-Meier survivor function of all outlets survival probability by type of outlets*



Source: graph is prepared by author

Secondly, I analyse the survival rate based on the location of the outlet: in an urban area or rural. Figure 7 shows that urban outlets' failure rate of 5.2% is slightly higher than in rural areas' of 4.1%. By the way, the numeric distribution of urban/rural is: 34.67% of coverage is located in rural areas and 65.33% in urban areas. I assume that a slightly higher failure rate in urban areas compared to rural areas is logical, taking into account that COVID-19 hit mostly in urban areas and government protection measures in urban areas were harsher.

Figure 7. *Kaplan-Meier survivor function of all outlets survival probability by type of location (urban or rural)*

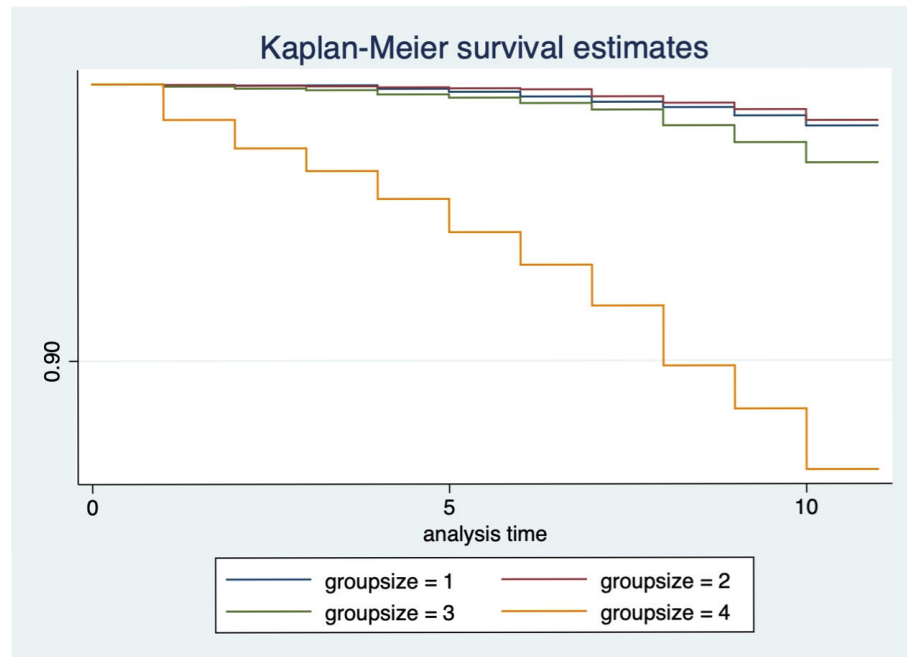


Source: graph is prepared by author

Thirdly, I analyse the survival rate based on the sales size of the outlet. The sales range was chosen to evenly distribute all panel outlets into 4 groups. Stores that buy less than 50 cartons per month are considered lowest category stores, and we can see that 13.90% of outlets that have less than 50 cartons of sales per month on average have closed after COVID-19. From Figure 8 and Table 1, we can see that the highest failure probability rate from a crisis is in outlets with smaller sales. I assume that the smallest sales size stores had a higher rate of failure after COVID-19 than other bigger stores, because they couldn't cover all the costs in their outlet with decreasing profit after the crisis. Figure 8 shows that stores which sell fewer than 50

cartons per month had almost 10 times higher rates of failure (a 13,9% failure rate) compared to stores with sales of more than 80 cartons per month.

Figure 8. Kaplan-Meier survivor function of all outlets survival probability by size of sales groups



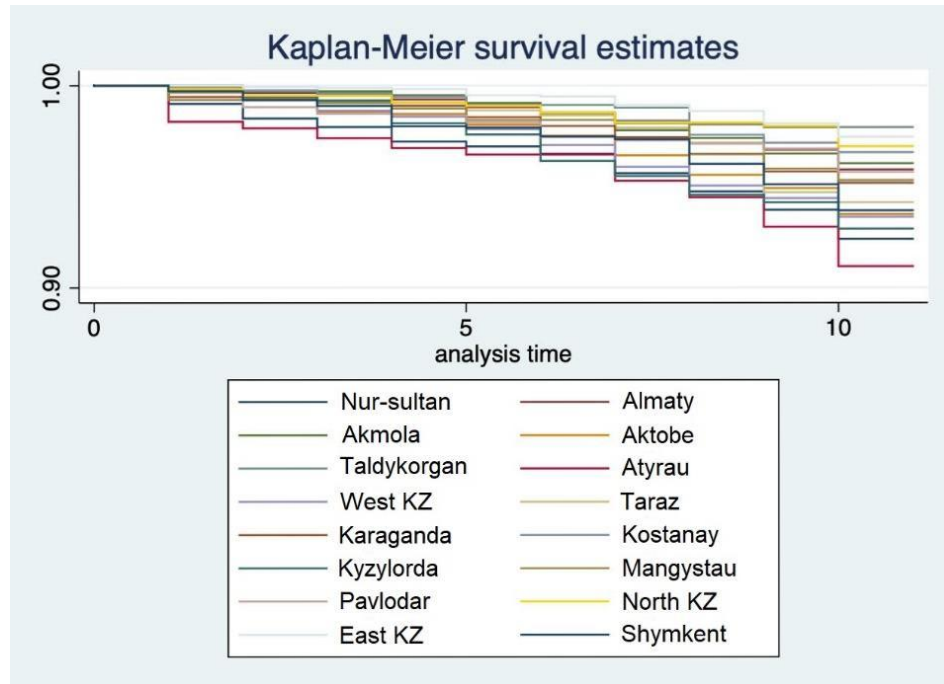
Source: graph is prepared by author

Table 1. Distribution of outlets and failure% by size of sales groups

Group by sales size	Sales range	Share%	Failure%
Group Size 1	above 125 cartons	23.63%	1.52%
Group Size 2	80 to 124 cartons	26.06%	1.32%
Group Size 3	50 to 79 cartons	25.95%	2.86%
Group Size 4	below 50 cartons	24.37%	13.90%

The final criteria for outlets to analyse survival rates is the city or region of outlet. From Figure 9 and Table 2, we can see that the failure rate in Nur-Sultan-7.6%, the South region-6.7%, and the West region-6.5% is higher than the national average of 4.8%. The reason behind these numbers could be that in Nur-Sultan, the rules and control of the government's quarantine regime are higher and possibly it affected the failure of 7.6% of outlets. The South region has the highest number of outlets per capita, and after COVID-19, most of them closed. The West region's high survival failure rate can be explained by the closing of oil production plants for lockdown and by the decreasing number of potential buyers.

Figure 9. Kaplan-Meier survivor function of all outlets survival probability by region



Source: graph is prepared by author

Table 2. Distribution of outlets and failure% by regions

Region	Region ID	Failure %	Number of outlets	Share %
Nur-Sultan	1	7.60%	1 659	8.52%
Almaty	2	4.16%	4 084	20.98%
Akmola	3	3.85%	1 038	5.33%
Aktobe	4	6.37%	926	4.76%
Taldykorgan	5	2.07%	725	3.72%
Atyrau	6	8.94%	615	3.16%
West Kazakhstan	7	6.50%	646	3.32%
Taraz	8	5.78%	813	4.18%
Karaganda	9	4.82%	1 597	8.20%
Kostanay	10	3.30%	1 269	6.52%
Kyzylorda	11	7.08%	536	2.75%
Mangystau	12	4.68%	704	3.62%
Pavlodar	14	4.28%	1 214	6.24%
North Kazakhstan	15	3.02%	597	3.07%
East Kazakhstan	16	2.54%	1 652	8.49%
Shymkent	17	6.18%	1 391	7.15%

Table 3 and Table 4 show the Cox regression model and OLS regression model results of a panel of 19,466 outlets. Based on the analysis, the region is less affected by the survival rate (p-value 0.254). Other factors like urban/rural, wholesale/regular outlet, and target group have a very high effect on the sales volume of an outlet, as the P value for all of them is about 0.0001.

Table 3. *Cox proportional hazard model for sales group, region, type of outlet (wholesale/outlet), location (urban/rural) and target group*

Cox regression -- Breslow method for ties						
No. of subjects =	19,466			Number of obs =	19,466	
No. of failures =	942					
Time at risk =	210045					
				LR chi2(5) =	957.64	
Log likelihood =	-8804.4412			Prob > chi2 =	0.0000	

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
groupsize	3.34773	.1702934	23.75	0.000	3.03006	3.698705
regionid	.9748957	.0059645	-4.16	0.000	.9632753	.9866563
outlet1ws0	.0421905	.013068	-10.22	0.000	.0229913	.0774221
urban1rural0	1.225729	.0884583	2.82	0.005	1.064058	1.411965
targetgroup	.7418619	.0530863	-4.17	0.000	.6447815	.853559

Source: prepared by author

Table 4. *OLS Regression model of sales volumes to region, type of outlet (wholesale/outlet), location (urban/rural) and target group*

Source	SS	df	MS	Number of obs =	19,333
Model	53255923.4	4	13313980.9	F(4, 19328) =	3744.54
Residual	68722134.3	19,328	3555.574	Prob > F =	0.0000
				R-squared =	0.4366
				Adj R-squared =	0.4365
Total	121978058	19,332	6309.64503	Root MSE =	59.629

size	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
regionid	.0889225	.0779957	1.14	0.254	-.063956	.2418009
outlet1ws0	-530.2176	9.823066	-53.98	0.000	-549.4717	-510.9636
urban1rural0	-13.39163	.9037886	-14.82	0.000	-15.16313	-11.62013
targetgroup	-70.68044	.6350828	-111.29	0.000	-71.92525	-69.43562
_cons	799.3381	10.03244	79.68	0.000	779.6737	819.0026

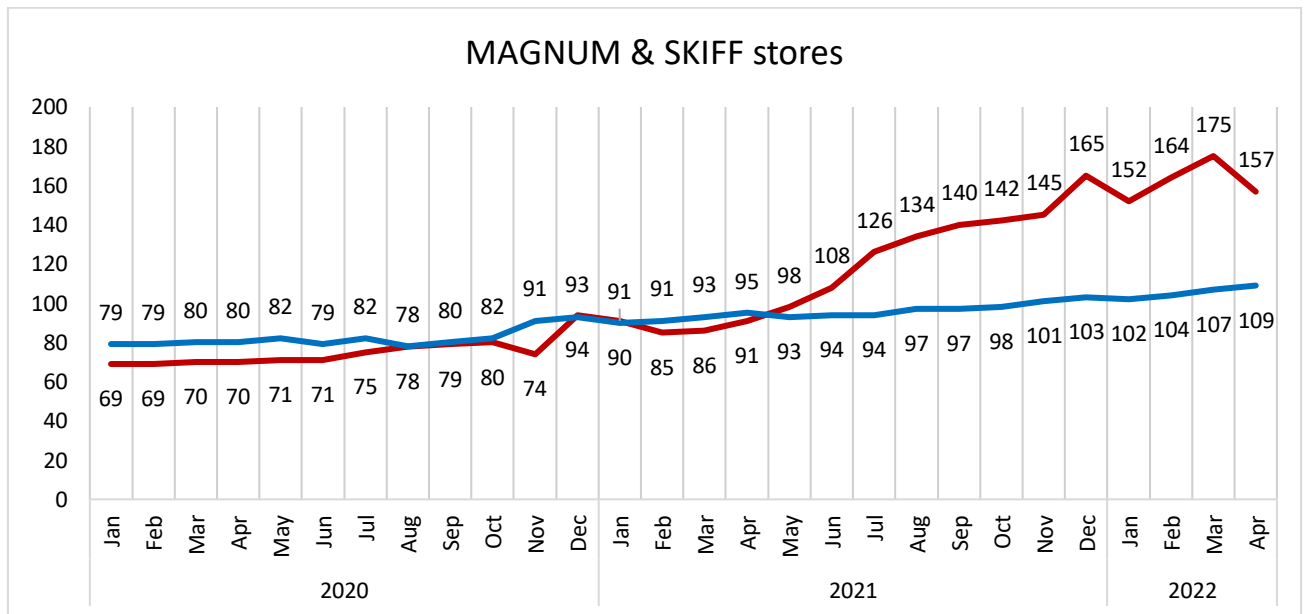
Source: The OLS Regression model is prepared by author in STATA

Limitations

One of the biggest limitations of survival analysis is that between the period of an event happening (the COVID-19 pandemic started in Kazakhstan) and the end period being analyzed, a lot of other things happen in between. Due to that, I cannot be 100% sure that the higher failure rate of grocery stores is related only to the fact of the COVID-19 pandemic.

For instance, Figure 10 below shows the dynamic of the quantity of outlets of the 2 biggest key account (modern trade) chains in Kazakhstan: "Magnum" and "Skiff" (SMALL). The quantity of stores of "Magnum" has doubled and "Skiff" has increased the number of stores by 57% from January 2020 to April 2022. Mainly, most of the stores that top modern trade chains are opening are in the format of convenience shops (express shops near houses) instead of big cash & carry stores. A huge rise in the number of modern trade stores in the neighborhood of traditional grocery stores can force traditional grocery stores to stop operating due to a decrease in their profits.

Figure 10. *The quantity of stores in Magnum and Skiff chains in 2020-2022.*



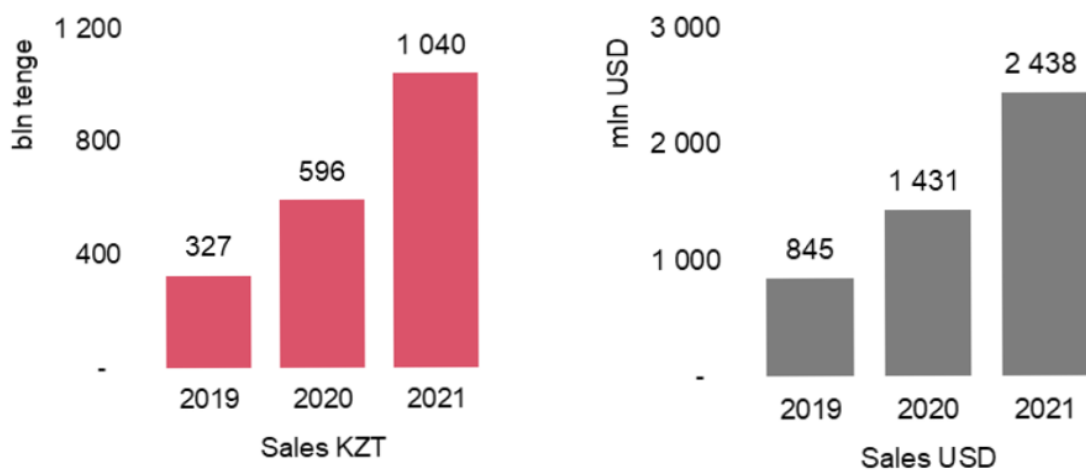
Source: prepared by author

Another factor which might also affect the high failure rate of grocery stores after COVID-19 is the rapid development of e-commerce trade. According to

research on e-commerce in Kazakhstan by PwC, Figure 11 shows that the size of retail e-commerce increased by +82% in 2020 vs 2019 and increased by +75% in 2021 vs 2020. According to PwC, such a trend can be partly due to COVID-19 quarantine regulations since people were forced to shop online after COVID-19 lockdowns. Many people continued to do online shopping even after the ease of government pandemic restrictions. So, even in 2021, the effect of a pandemic remained an important factor influencing the development of retail e-commerce (PricewaterhouseCoopers, 2022).

Figure 11. *Total sales of retail e-commerce in Kazakhstan*

Total sales for 2019, 2020 and 2021



Source: Analysis of the retail e-commerce, 2022, PwC,

<https://www.pwc.com/kz/en/publications/e-commerce-analysis/e-commerce-12m-2021.html>

Conclusions

In conclusion, analysis shows that the COVID-19 crisis has definitely affected the survival rate of outlets in Kazakhstan. Also, research has shown that wholesale outlets, urban outlets, and outlets with small sales have been most affected by the crisis. After COVID-19, the number of closed grocery stores was 70% higher compared to previous years. Stores with high sales value weren't significantly impacted by the COVID-19 pandemic, since less than 2% of bigger grocery stores stopped their operations. Entrepreneurship is always risky since there is no guarantee of sufficient

volume of sales or service sales. However, governments usually encourage the growth of small businesses by offering a variety of advantages: tax benefits, subsidised loans, preferential access to government contracts, and other privileges. But the COVID-19 coronavirus interrupted everything and increased their chances of failure. I assume that the main issues that grocery stores faced after COVID-19 and which led to their failure were: decrease in demand, incapability to do business due to imposed restrictions by the government and the necessity to meet salary and rent payments.

To support businesses, the government of Kazakhstan has established many rules and measures. The primary business assistance measures are preferential loans for employee wages, temporary deferral of taxes and instalment tax payments, credit holidays, temporary cancellation of rent for municipal property, etc. But postponement and instalment plans are not cancellations. It implies that corporations will still need to find the money to pay at the end of a difficult economic phase. When we consider that businesses had to demonstrate social responsibility and pay wages to all employees, it is clear that a greater percentage of business owners struggled as a result of the crisis. According to KPMG's survey published on the effectiveness of Kazakhstan's support for business during the COVID-19 pandemic: "About 300 thousand entities have suspended operations; 1 million business entities have suffered directly from the pandemic, mainly in the services and trade sectors; More than 1.6 million people were sent on leave without pay; About 14–15 thousand SME with bank loans have requested a deferral" (KPMG, 2020). Most companies were in a position where it was impossible to plan anything. In such a circumstance, only the state could help the business. Overall, Kazakhstani companies ranked the level of governmental business assistance during the COVID-19 pandemic as "below average" in the KMPG survey. If we specifically refer to small and medium enterprises, only 30% of SMEs that are affected by the COVID-19 pandemic could obtain support from the government. For the rest of the SMEs, support was not available. (KPMG, 2020).

Finally, note that determinants of business survival in the literature should be revised if research is done during normal periods, instead of economic crisis as done

in this research. This is due to the fact that findings from economic recessions cannot be generalised to other recessions or crises. Since the economic crisis that happened due to the pandemic can have a completely different effect on companies compared to other financial crises.

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