CHAPTER 10

# Impact of Crisis Caused by COVID-19 Pandemic on Enterprise Strategies. Example of Woodworking Industry

*Marcin Suder*[1], *Zofia Gródek-Szostak*[2], *Kamil Wiktor*[3], *Justyna Tora*[4]

[1] AGH University of Krakow, Poland; ORCID 0000-0001-6279-7359
[2] Cracow University of Economics, Poland; ORCID 0000-0001-6283-6952
[3] AGH University of Krakow, Poland; ORCID 0000-0003-1939-054X
[4] AGH University of Krakow, Poland; ORCID 0000-0002-6653-9004

**Summary.** The choice of an appropriate strategy is crucial to the development of an enterprise. Our research has determined the crisis associated with the pandemic adversely affected the woodworking industry. This is corroborated by the fact that (on the macro scale) the percentage of enterprises whose condition was assessed as good or very good fell from 60% to 20%, while of those whose condition was regarded as bad or critical rose from 27% to 52% in the period under analysis. It also turns out the intensities of the strategies applied, in particular, the strategy of market penetration and diversification, were different prior to and during the crisis, which is in line with the results reported by other researchers. The intensity of the market penetration strategy declined considerably at the time of the pandemic, while the strategy of diversification was employed more intensively.

**Keywords:** crisis, strategy, COVID, woodworking industry

## 1. Introduction

Although economic crises are natural parts of the cycle of economic development, they are challenges to enterprises (Wysłocka, 2011) and may become the sources of internal crises and threats to ongoing business (Zelek, 2000). Crises require enterprises to take appropriate actions (Siuta-Tokarska, 2011; Wawrzyniak, 1989) or even to modify their strategies (Krzakiewicz, Cyfert, 2008; Pasieczny, 2009; Romanowska, 2015). They can afflict in particular small enterprises with their lower reserves of resources (both material and financial) (Cowling et al., 2020).

Prevention is the best way of managing a crisis and anticipating it is the best method of prevention (Mikušová, Horváthová, 2019). Crisis management is a process whereby an organisation fights a crisis which poses a risk to itself, its stakeholders or the public in order to limit actual harm (Bundy et al., 2017; Coombs, 2014). An organisation's responses may be

planned or ad hoc, as initially identified and described by Pearson and Clair (1998). According to Coombs (2014), the process of crisis management consists of four stages:

1) prevention (steps taken to avoid crisis situations);
2) preparation (including a plan of crisis management);
3) response (application of the preparation components to a crisis situation);
4) revision (an evaluation of the organisation's responses to potential and real crises).

The COVID-19 pandemic had a substantial effect on the global economy. To alleviate it, governments worldwide took extraordinary measures and spent unprecedented monies on healthcare, economic stabilisation and stimuli like direct outpayments and support for part-time work (Hartman et al., 2022). The challenges the enterprises faced of keeping their business afloat focussed on efforts to determine and prioritise the key organisational resources (Brinks, Ibert, 2020). The business continuity refers to a newly formalised concept defined as an organisation's ability to continue supplying products and services within acceptable time-frames and at a specific productivity during disturbances (Gródek-Szostak et al., 2022).

The crisis associated with the outbreak of the COVID-19 pandemic in 2020 was one of the more serious. To enterprises, it spelled such unheard-of challenges as the interrupted chains of supply, reduced demand or staff in quarantine. This is a study of enterprise responses to those challenges.

Before the pandemic, the Polish furniture-making sector had celebrated its record sales and progress up the ranking of the biggest global exporters: with the estimated sales of PLN 50.5 bn and exports of EUR 11.2 bn, Poland came first in Europe (ahead of Germany) and second globally (after China) (Kaczorowska et al., 2019). The crisis in the furniture sector has been caused by the demand falling due to the ban on trade, advice to stay home, and a sudden decline in consumer confidence. Payment backlogs are the second gravest problem (Kaczmarek, Jasiński, 2021).

This study aims to analyse the impact of the crisis associated with the coronavirus pandemic on the operation of woodworking businesses. The claim: 'The crisis associated with the coronavirus pandemic had an adverse effect on the woodworking industry' is the key research hypothesis.

The following detailed hypotheses are formulated as well:

H1: The times prior to and during the crisis were characterised by different intensities of strategies applied.
H2: The occurrence of the crisis significantly changed the results of the enterprises studied in the dimensions analysed.
H3: The different types of results translate into the various impacts of the particular strategies.
H4: The market situation determines the impacts of the particular strategies on enterprise results.

This study is part of research into the effectiveness of strategies in a variety of conditions determined by enterprise environment and into the potential of applying strategic planning during some turbulent changes of the environment (Romanowska, 2010). The period reviewed exhibited a high variability of external conditions. It allowed for registering enterprise responses to varying conditions over a relatively short time – given the scale of changes during the crisis triggered by the COVID-19 pandemic, those responses involved some strategy changes as well (Suder, Kusa, 2022).

## 2. Methodology

Several interviews with woodworking shop owners or managers preceded the process of data collection. A survey was prepared following the interviews and completed electronically. The surveys were sent to the enterprises that had agreed to fill them before, which makes the choice of the study group intentional. The data were gathered from July to September 2022.

The impact of four strategies is analysed: market penetration (MPS), market development (MDS), product development (PDS) and diversification (DS) on the performance variables defined as: market performance (MP), financial performance (FP), and firm growing (FG). The intensity of strategy application is examined by means of the five-degree Likert scale. The survey's questions relate to how intensively a given strategy is applied (1 – the strategy is not implemented, …, 5 – the strategy is realised with a great intensity). The respective performance variables (products) are structured to reflect answers to the relevant questions. The respondents indicated to what degree they agree with a statement concerning these variables (1 – I absolutely disagree, …, 5 – I absolutely agree).

The respondents said to what degree they apply the particular strategies in the two periods suggested in the survey, namely: Period I – before the crisis (till March 2020), Period II – during the crisis.

The completed questionnaires were verified for the correctness and completeness. In effect, the data derived from 30 surveys served further analysis. Since the performance variables, i.e., market result, financial result, and enterprise development, are constructs based on several indicators (to be precise, they are arithmetic means), it's necessary to verify their reliability. Table 1 lists the number of questions in each particular and the Cronbach's alpha values calculated for the two periods of analysis.

**Table 1.** The characteristics of independent variable indicators

| Indicator | Symbol | Number of items | Cronbach's alpha | |
|---|---|---|---|---|
| | | | before the crisis | during the crisis |
| Market performance | MP | 5 | 0.758 | 0.88 |
| Financial performance | FP | 3 | 0.738 | 0.911 |
| Firm growing | FG | 5 | 0.807 | 0.879 |

Since all the values of Cronbach's alpha coefficient are above 0.7, the result constructs can be treated as internally coherent.

## 3. Results and discussion

The study was divided in two stages. A comparative analysis of the intensities of the particular strategies and the variable results in the two periods was undertaken as part of the

first stage. At the second stage, some linear models were built of the dependences of results on the strategies applied in both the periods.

For the purposes of a more detailed description of the variables and assessing how the level of the particular strategy application and of enterprise productivity changed across the periods of analysis, basic statistics were defined for the variables analysed. They are illustrated in the tables below.

Table 2 suggests two conclusions concerning the strategies under analysis. First, the average degrees of the diversification and penetration are lower than of the other strategies. In Period I (before the pandemic), the mean diversification was 2.26, whereas the ones for the remaining strategies (market and product development) were greater than 3. Likewise, the mean for the strategy of penetration was below 3 both prior to and during the crisis. On the other hand, the comparison proves the intensities of three strategies, i.e., MPS, MDS, PDS, were lower in Period II than in Period I. Thus, the intensities declined in effect of the crisis. As far as the diversification strategy is concerned, the intensity of its application is greater in Period II than in Period I. At the time of the pandemic, the mean intensity of the strategy rose by 0.62. To verify the differences noted for the applications of the particular strategies in the periods examined, some tests for dependent variables were used, namely, Wilcoxon signed-rank test and rank sum test. These tests are selected as the variables are rank and dependent data (the same group is studied, though in different periods). Tables 3 and 4 contain the results of these tests for the strategies produced by means of Statistica package.

**Table 2.** Basic statistics for strategies indicators in the selected periods

| Strategy type | Type of statistics | Period | |
|---|---|---|---|
| | | I | II |
| MPS | average | 2.94 | 2.15 |
| | median | 3 | 2 |
| | standard deviation | 1.37 | 1.18 |
| MDS | average | 3.03 | 2.79 |
| | median | 3 | 3 |
| | standard deviation | 1.03 | 0.91 |
| PDS | average | 3.82 | 3.35 |
| | median | 4 | 4 |
| | standard deviation | 0.87 | 1.10 |
| DS | average | 2.26 | 2.88 |
| | median | 2 | 3 |
| | standard deviation | 1.19 | 1.01 |

**Table 3.** The results of Wilcoxon signed-rank test for the strategies

| Strategy type | Non-ties number | $v < V$ [%] | $Z$ | $p$ |
|---|---|---|---|---|
| MPS | 22 | 18.18 | 2.77 | 0.0056 |
| MDS | 29 | 44.83 | 0.37 | 0.7103 |
| PDS | 24 | 37.50 | 1.02 | 0.3074 |
| DS | 30 | 73.33 | 2.37 | 0.0176 |

**Table 4.** The results of Wilcoxon rank sum test for the strategies

| Strategy type | $N$ valid | $T$ | $Z$ | $p$ |
|---|---|---|---|---|
| MPS | 22 | 28.00 | 3.20 | 0.0014 |
| MDS | 29 | 174.00 | 0.94 | 0.3469 |
| PDS | 24 | 82.50 | 1.93 | 0.0538 |
| DS | 30 | 127.50 | 2.16 | 0.0308 |

The tests show some substantial differences in the periods under discussion concern two strategies, i.e., market penetration and diversification. The intensity of the market penetration strategy reduced significantly during the pandemic (compared to the time before). As far as the diversification is concerned, on the other hand, its application exhibited a marked intensification. Thus, the hypothesis H1 is upheld in part, or for some strategies.

A parallel analysis was then conducted for the results. Although this is not a case of ordinal variables, non-parametric testing is employed here as well, since the sample was relatively small and the assumptions for normal distribution are not fulfilled. Table 5 lists the basic measures of position and dispersion for the results in the two periods.

The figures in Table 5 suggest the businesses examined suffered declining results in all their dimensions. This is true of the results category, WR, where the mean fell from 3.67 to 3.57, RF, where it reduced from 3.51 to 3.28, and WF, from 3.5 to 3.3. Thus, the results did not return to their pre-pandemic levels in all the three cases. What's noteworthy, the median for the market results is higher in Period II than I.

**Table 5.** The basic statistics for performance in the selected periods

| Performance type | Type of statistic | Period | |
|---|---|---|---|
| | | I | II |
| FG | mean | 3.51 | 3.29 |
| | median | 3.7 | 3.5 |
| | standard deviation | 0.65 | 0.93 |

**Table 5** cont.

| Performance type | Type of statistic | Period | |
|---|---|---|---|
| | | I | II |
| MP | mean | 3.68 | 3.57 |
| | median | 3.7 | 3.9 |
| | standard deviation | 0.57 | 0.84 |
| WF | mean | 3.50 | 3.33 |
| | median | 3.7 | 3.7 |
| | standard deviation | 0.63 | 0.97 |

The test results that serve to verify the significance of the result differences in both the periods are presented in Tables 6 and 7.

**Table 6.** The results of Wilcoxon signed-rank test for firm performance

| Performance type | Non-ties number | $v < V$ [%] | $Z$ | $p$ |
|---|---|---|---|---|
| MP | 32 | 56.25 | 0.53 | 0.5959 |
| FP | 21 | 42.86 | 0.44 | 0.6625 |
| FG | 32 | 43.75 | 0.53 | 0.5959 |

**Table 7.** The results of Wilcoxon rank sum test for firm performance

| Performance type | $N$ valid | $T$ | $Z$ | $p$ |
|---|---|---|---|---|
| MP | 32 | 248.50 | 0.29 | 0.7719 |
| FP | 21 | 86.50 | 1.01 | 0.3135 |
| FG | 32 | 205.50 | 1.09 | 0.2740 |

Based on the test results, it can be concluded the emergence of the crisis did not affect the results of the enterprises studied significantly in any of the result dimensions analysed. Therefore, hypothesis H2 is not affirmed.

The models of multivariate regression are used to test the relationship of the enterprise performance and the intensities of their strategies. Since the independent variables, or strategies, are measured with the Likert scale, the classic multiple regression cannot be applied. Therefore, the module Regression, available with the application SmartPLS 4.0, is utilised in this study. As a bootstrap is used in this module, the significance of the particular regression coefficients can be evaluated. The following model types are taken into account, therefore:

$$W = \beta_0 + \beta_1 \cdot MPS + \beta_2 \cdot MDS + \beta_3 \cdot PDS + \beta_4 \cdot DS + \beta_t$$

where $W$ is one of the result variables ($MP$, $FP$ or $FG$).

All the dependent variables are considered in all the tested models for each result and in each period. Only those variables whose coefficients prove statistically significant are taken into account in the results, though. One-tailed distribution is adopted for the test. The analysis results are shown in Table 8.

**Table 8.** The models representing the impact of the strategies tested on the performance

| Period I | Period II |
|---|---|
| $MP_1 = 2.009 + 0.396 \cdot PDS_1$<br>$R^2 = 35.7\%$ | $MP_2 = 1.276 + 0.349 \cdot MDS_2$<br>$R^2 = 30.1\%$ |
| $FP_1 = 3.144$<br>$R^2 = 12.54\%$ | $FP_2 = 0.339 \cdot MDS_2 + 0.269 \cdot PDS_2$<br>$R^2 = 28.8\%$ |
| $FG_1 = 1.622 + 0.341 \cdot MPS_1 + 0.441 \cdot PDS_1$<br>$R^2 = 34.3\%$ | $FG_2 = 0.427 \cdot MDS_2$<br>$R^2 = 31.2\%$ |

An estimation of the models' parameters suggests none of the strategies had a significant impact on the financial performance in the period before the crisis. Product development (PDS) proved significant to the market and development results. In addition, the strategy of penetration turned out to be a significant factor for the development of the dependent variable FG. The forces of these strategies' effects, expressed as the coefficients of regression, are similar. The significance of the particular variables changed in Period II. The strategy of market development (MDS), absent from all the models in Period I, proved significant in all the models. The strategy of product development had an additionally significant impact on the financial result. The coefficients of determination $R^2$ for all the models (except the Period I model for FP) are 30%, a satisfactory value in social research. Since the models were slightly different for the particular results, although the differences were insignificant, it can be said H3 is upheld in part. In turn, the differences of modelling for Periods I and II are quite considerable, therefore, hypothesis H4 is corroborated.

The businesses examined exhibited some changes in their strategies, with some applied more intensively and some far more weakly during the crisis. The strategy of market penetration can serve as an example. Its intensity declined considerably in the period of the pandemic, when diversification was applied more intensively. Economic ratios determine the utilisation of a given strategy. The role of the market development strategy, where a business enters new sales markets with its existing products, can also be observed to grow at a time of economic difficulties. Such an approach is complicated and requires substantial preparation, yet it may become a way of maintaining the earlier performance in a crisis situation. The crisis associated with the coronavirus pandemic adversely affected the woodworking industry and forced it to change its existing strategies. A return to the solutions tried and tested at the time of economic stability may be posited once the pre-pandemic conditions are restored. Besides, the businesses studied managed to attract nearly as many completely new customers in the period of the pandemic as before the crisis. This may have been a result of the strategy of market development and thus of entering new sales markets with existing products. The levels of customer retention and of new orders declined a little during the pandemic, though.

Enterprise profitability before and during the crisis differed, as better results had been reported in the earlier period. What is more, such indicators as market results, financial results, and enterprise development declined in the period analysed.

## 4. Conclusion

Every crisis is complex, not only in its causes, but also its nature. A crisis usually leads to far-reaching, adverse economic consequences and a range of problems with the functioning of societies and organisations. An economic crisis is a situation where economic indicators substantially decline, though it may be a result of not only financial but also health issues. The coronavirus pandemic may be an example that engendered negative effects in professional, social, and economic contexts. In Poland, that period of the pandemic commenced in March 2020. An industry is analysed in this study with reference to the declining economic indicators. The woodworking sector and the impact of the crisis associated with the coronavirus pandemic on its functioning in recent years are examined. This research suggests the crisis failed to have a considerable effect on the performance of the businesses studied in the result dimensions reviewed. Therefore, such negative indicators as were reported by the industry on average did not materialise in the study group. This may be due to the small size of the sample, a limitation of the study. It's additionally been established the different types of results translate into the varying impacts of the particular strategies, as demonstrated by the differences across the models generated. Besides, the market situation has been found to determine the intensity of impact of the particular strategies on enterprise performance. This is corroborated by the differences in modelling results for the first and second period, which were sufficiently significant to prove these research assumptions true as well. In effect, the businesses in the study group suffered poorer performance, which means the crisis associated with the coronavirus pandemic had a varied, though normally the same adverse effect on the woodworking industry.

The results also indicate the intensities of impact of the particular strategies on enterprise results change dependent on the market situation (in this study, this refers to the conditions before and after the outbreak of the crisis), while the particular strategies introduced in response to the crisis determine the enterprise position to different extents, which is in line with the results reported by other investigators (Klyver, Nielsen, 2021; Suder, Kusa, 2022). Such dependences could be observed on the occasion of previous crises as well (Brzozowski, Cucculelli, 2016; Stefaniak-Kopoboru, Kuczewska, 2014).

## References

Brinks V., Ibert O., 2020. *From corona virus to corona crisis: The value of an analytical and geographical understanding of crisis*. "Tijdschrift voor Economische en Sociale Geografie. Journal of Economic and Human Geography", vol. 111(3), pp. 275–287, https://doi.org/10.1111/tesg.12428.

Brzozowski J., Cucculelli M., 2016. *Proactive and reactive attitude to crisis: Evidence from European firms*. "Entrepreneurial Business and Economics Review", vol. 4(1), pp. 181–191, https://doi.org/10.15678/EBER.2016.040111.

Bundy J., Pfarrer M.D., Short C.E., Coombs W.T., 2017. *Crises and crisis management: Integration, interpretation, and research development.* "Journal of Management", vol. 43(6), pp. 1661–1692, https://doi.org/10.1177/0149206316680030.

Coombs W.T., 2014. *Ongoing Crisis Communication: Planning, Managing, and Responding.* Sage Publications, London.

Cowling M., Brown R., Rocha A., 2020. *Did you save some cash for a rainy COVID-19 day? The crisis and SMEs*. "International Small Business Journal: Researching Entrepreneurship", vol. 38(7), pp. 593–604, https://doi.org/10.1177/0266242620945102.

Gródek-Szostak Z., Adamczyk J., Luc M., Suder M., Tora J., Kotulewicz-Wisińska K., Zysk W., Szeląg-Sikora A., 2022. *Hard cash in hard times – The effect of institutional support for businesses shaken by COVID-19*. "Sustainability", vol. 14(8), 4399, https://doi.org/10.3390/su14084399.

Hartmann A.J., Gangl K., Kasper M., Kirchler E., Kocher M.G., Mueller M., Sonntag A., 2022. *The economic crisis during the COVID-19 pandemic has a negative effect on tax compliance: Results from a scenario study in Austria*. "Journal of Economic Psychology", vol. 93, 102572, https://doi.org/10.1016/j.joep.2022.102572.

Kaczmarek A., Jasiński A., 2021. *Branża meblarska w Polsce. Przegląd.* Polska Agencja Inwestycji i Handlu, Warszawa, https://www.paih.gov.pl/files/?id_plik=42176.

Kaczorowska Z., Staniec I., Szczygieł N., 2019. *Analiza rynku meblarskiego.* Zeszyty Naukowe Politechniki Łódzkiej. Organizacja i Zarządzanie, Tom 72, Nr 1225, pp. 95–111, https://doi.org/10.34658/oiz.2019.72.95-112.

Klyver K., Nielsen S.L., 2021. *Which crisis strategies are (expectedly) effective among SMEs during COVID-19?* "Journal of Business Venturing Insights", vol. 16, e00273, https://doi.org/10.1016/j.jbvi.2021.e00273.

Krzakiewicz K., Cyfert S., 2008. *Strategie w systemie zarządzania antykryzysowego*. Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Nr 20, pp. 163–170.

Mikušová M., Horváthová P., 2019. *Prepared for a crisis? Basic elements of crisis management in an organization*. "Economic Research – Ekonomska Istraživanja", vol. 32(1), pp. 1844–1868, https://doi.org/10.1080/1331677X.2019.1640625.

Pasieczny J., 2009. *Strategie zmian w kryzysie*. Prace i Materiały Wydziału Zarządzania Uniwersytetu Gdańskiego, vol. 3(2), pp. 83–92.

Pearson C.M., Clair J.A., 1998. *Reframing crisis management.* "Academy of Management Review", vol. 23(1), pp. 59–76, https://doi.org/10.2307/259099.

Romanowska M., 2010. *Ewolucja metod planowania strategicznego*. [In:] R. Krupski (red.), *Zarządzanie strategiczne. Strategie organizacji*. Wałbrzyska Wyższa Szkoła Zarządzania i Przedsiębiorczości, Wałbrzych, pp. 57–66.

Romanowska M., 2015. *Myślenie strategiczne – myślenie przedsiębiorcze: obserwacje postaw i zachowań strategicznych menedżerów w kryzysie*. "Marketing i Rynek", nr 9, pp. 541–552.

Siuta-Tokarska B., 2011. *Zarządzanie organizacją w czasie kryzysu – badania empiryczne przedsiębiorstw w Polsce w dobie globalnego kryzysu ekonomicznego z początku XXI wieku*. "Problemy Zarządzania", vol. 9(1), pp. 8–33.

Stefaniak-Kopoboru J., Kuczewska J., 2014. *European enterprises in crisis time*. "Managerial Economics", no. 14, pp. 151–164, https://doi.org/10.7494/manage.2013.14.151.

Suder M., Kusa R., 2022. *Rola wybranych strategii w kształtowaniu wyników małych firm w różnych warunkach rynkowych*. "Organizacja i Kierowanie", vol. 1(190), pp. 83–96.
Wawrzyniak B., 1989. *Polityka strategiczna przedsiębiorstwa*. Państwowe Wydawnictwo Ekonomiczne, Warszawa.
Wysłocka E., 2011. *Kryzys – nieodłączny element funkcjonowania współczesnych organizacji*. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Poznaniu, nr 199, pp. 138–147, https://bazekon.uek.krakow.pl/zeszyty/171208515.
Zelek A., 2000. *Upadłość przedsiębiorstwa jako skutek kryzysu finansowego. Casus: TUR Polisa SA*. "Przegląd Organizacji", nr 7–8, pp. 46–50.