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THE BEHAVIOR PATTERN OF COMMERCIAL ENTERPRISES IN POLAND DURING PERIODS OF NORMAL VOLATILITY AND EXTRAORDINARY INSTABILITY OF THE BUSINESS ENVIRONMENT¹

Summary

Purpose | The purpose of the study was to identify and compare the behavior pattern of commercial enterprises, reflected through qualitative indicators, during the period of normal volatility and the period of extraordinary instability of the business environment. It was assumed the behavior pattern is created by the inertia effect based on routines and the prediction effect based on expectations.

Research method | The study used qualitative indicators (diagnoses and forecasts) from GUS business tendency surveys in the Polish trade sector. The econometric study (ARDL models and multiplier analysis) was conducted for two subperiods: the period of normal volatility (01.2000–02.2020) and the period of extraordinary instability (03.2020–05.2025).

Results | The inertia effect played a key role in shaping the diagnoses. Combined with the prediction effect, it created a stable behavior pattern of commercial enterprises only in the period of normal volatility. This regularity was noted for qualitative indicators of financial situation and sales. No behavior pattern was identified in the period of extraordinary instability.

Originality/value/implications/recommendations | The study proved that the behavior pattern and the response of enterprises to extraordinary instability differ depending on their location in the producer–consumer supply chain.

Keywords: behavior pattern of enterprises, inertia effect, prediction effect, commercial enterprises, qualitative indicators

JEL classification: D21, D22, L81

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1. Introduction

The study continues research on the behavior pattern of economic entities reflected through qualitative indicators [Szczepkowska-Flis, Kozłowska, 2023, 2024]. The qualitative indicators come from business tendency surveys in which entrepreneurs express their moods, beliefs, and opinions about the direction of changes in various economic categories describing their past and present economic situation (diagnosis) as well as expectations regarding its changes in the near future, i.e., within the next three months (forecast) [GUS, 2023].

The idea of business tendency surveys is related to two seemingly contradictory views. On the one hand, it is assumed that entrepreneurs do not easily succumb to emotions, they make rather well-considered decisions and change their behavior only under the influence of sufficiently strong stimuli. On the other hand, it is argued that subjective factors (waves of optimism and pessimism) may prove much stronger than objective factors, causing expectations to become key determinants influencing the decisions, attitudes, and opinions of entrepreneurs. Qualitative indicators can therefore be treated as a specific (indirect) carrier of information about the behavior of enterprises, which is the result not only of the temptation to follow established patterns and rules, but also of expectations, although not always rational [Szczepkowska-Flis, Kozłowska, 2023].

Referring to the behavioral and evolutionary theory of the firm and studies belonging to the Keynesian school of economics, the concept of the behavior pattern was based on the assumption that the behavior (decisions, opinions) of entrepreneurs results from two distinct mechanisms by nature: actions based on routines and actions based on expectations [Szczepkowska-Flis, Kozłowska, 2023, 2024]. Depending on which of these mechanisms is dominant in the behavior pattern of entities, the processes reflected in qualitative indicators and observed at the aggregate level are subject, to a greater or lesser extent, to the inertia effect or the prediction effect. The essence of the inertia effect is a certain constancy of the process despite changes in the environment in which it takes place, while the prediction effect is the process's "response" to those changes.

The results of research by A. Szczepkowska-Flis and A. Kozłowska [2023], based on qualitative indicators for the manufacturing industry in Poland, showed that both the inertia effect and the prediction effect were significant components of the behavior pattern of enterprises, with their roles varying depending on the conditions (stability) of the environment in which these entities operated. It was found that a change in environmental conditions not only caused a change in the behavior pattern but also affected its long-term stability. For instance, regarding the financial situation and production sphere, it was noted that instability in the economic system (the COVID-19 pandemic, the war in Ukraine) favored the formation of a stable behavior pattern in which both effects (inertia and prediction) played active roles. This, perhaps seemingly paradoxical, conclusion – that instability generates stability – naturally prompts the question of whether the observed regularity is universal, i.e., whether it also applies to other sectors of the economy (trade, services, construction).

This question is even more relevant because, as research results show, the adaptive behavior of enterprises in response to external shocks and the resulting instability of the economic system may differ not only due to the initial conditions of the company (size, age, resources, innovation and R&D activity, the degree of internationalization) [Osiyevskyy et al., 2023; Özşuca, 2023; Krammer et al., 2024; Rocchetta, Upadhayay, 2024], but also due to the specificity of the industry/sector in which they operate [Rocchetta, Upadhayay, 2024; Sokołowska et al., 2024]. The mechanisms and transmission channels of external shocks specific to particular sectors are the reason why the same shocks generate different disruptions both in terms of their strength and the period of their occurrence and duration. The “sensitivity” of entities, the speed of reaction and the scale of reorganization of processes (business models) are also different. For example, it is pointed out that due to the strong dependence of the trade sector on consumer demand, Polish commercial enterprises experienced strong economic downturns caused by lockdowns and reduced consumer spending [Kuryłek, Shachmurove, 2025]. According to the results of GUS business tendency surveys, the effects of the COVID-19 pandemic and the war in Ukraine have affected commercial enterprises to a greater extent than manufacturing enterprises [GUS, 2020, 2022], threatening the stability of companies and forcing immediate

adjustment measures [Sokołowska et al., 2024; Gąsowska, 2025; Skawińska, Zalewski, 2021].

The paper presents the results of the study based on qualitative indicators derived from the GUS business tendency surveys among commercial enterprises in Poland. Following the approach of A. Szczepkowska-Flis and A. Kozłowska [2023], two research questions were formulated:

- Q1:** Has the behavior pattern of commercial enterprises, reflected through qualitative indicators, changed under conditions of unprecedented instability and uncertainty in the business environment?
- Q2:** If so, what features distinguish patterns typical of periods of normal volatility and extraordinary instability of the business environment?

The main purpose of the research was to identify and compare the behavior pattern of commercial enterprises, reflected through qualitative indicators, in periods of normal volatility and extraordinary instability of the business environment.

In line with this purpose, the study was conducted for two subperiods: 01.2000–02.2020 (the period of normal volatility), and 03.2020–05.2025 (the period of extraordinary instability). It should be emphasized that the term “period of normal volatility” does not imply that during this time there were no disturbances or instability associated with fluctuations in economic activity (e.g., financial or debt crises). However, these were not as intense and they were not caused by exogenous “black swan” events as those observed in the second of the distinguished subperiods. The choice of March 2020 as the boundary date between sub-periods was based on three facts: in March 2020, the WHO declared the COVID-19 pandemic, the first case of COVID-19 was reported in Poland and a lockdown was introduced. This choice was subject to statistical verification.

The conclusions were based on a multiplier analysis using ARDL (3,3) models, in which the autoregressive part (AR) reflected the influence of the inertia effect, the distributed lag part (DL) represented the influence of the prediction effect, and the long-run multiplier illustrated the behavior pattern of entities.

2. Behavior pattern – inertia effect and prediction effect

The concept of the behavior pattern is based on the assumption that the behavior (decisions, opinions) of entrepreneurs is shaped by two mechanisms that differ in nature: actions based on routines and actions based on expectations [Szczepkowska-Flis, Kozłowska, 2024]. Within the framework of the behavioral and evolutionary theory of the firm, routines are defined as regular, repetitive behaviors [Teece, 2023], resulting from experience and knowledge accumulated in the past (the firm's memory repository) [Gavetti et al., 2012; Hölzl, 2005]. Under conditions of bounded rationality and environmental uncertainty, routines reduce this uncertainty [Stańczyk-Hugiet, 2014], ensuring organizational stability, predictability, and continuity [Bromiley, Rau, 2022]. When uncertainty is significant and the information required to make fully rational decisions is unavailable or difficult to obtain, enterprises use copying mechanisms that do not require anticipating the distant future [Gavetti et al., 2012; Hagen et al., 2024] – calculations and long-term forecasts play no role, and planning and forecasting are replaced by standard procedures and automatic operation [Hagen et al., 2024; Mandysová, 2018]. Entities rely on solutions that rarely violate the status quo [Gavetti et al., 2012; Greve, 2007] and, despite environmental variability, apply routine approaches even to non-routine situations (problems) [Stańczyk-Hugiet, 2014]. It should be emphasized that although routines are characterized by stability and predictability, they are not constant over time – they undergo fundamental changes in response to sufficiently strong stimuli [Bromiley, Rau, 2022; Feldman, 2000]. Minor environmental changes, within the so-called indifference range, do not change routines but only modify them (incremental adjustments) [Kamalipoor et al., 2025]. Although the same or modified routines under different environments may generate different outcomes at the firm level, the aggregated processes observed at the macro level still exhibit inertia.

The second mechanism underlying the behavior pattern is action based on expectations. According to the behavioral theory of the firm, the company as a whole is a rational, adaptable system [Baleanu, 2007], in which expectations – apart from several simple, verifiable recognition patterns (e.g., linear extrapolation) – influence the decision-making process [Gavetti et al., 2012]. Expectations, like routines, result from experience and the individual

knowledge of economic entities. They also derive from both observation and interpretation of the environment (perception of uncertainty) by organizations [Isabiry, 2021], and their influence on business decisions manifests in reactions to external disturbances [Kowalski, 1998]. Entities operate under conditions of imperfect information, which implies that their expectations cannot be considered fully rational [Bludnik, Wallusch, 2012; Tomczyk, 2001]. However, such anticipations – even if incorrect – lead to specific actions and economic activities, causing forecasts to become self-fulfilling prophecies [Bludnik, Wallusch, 2012]. Under the influence of external stimuli and achieved results, enterprises continuously revise their expectations [Kowalski, 1998], making them an active, environment-sensitive component of the behavior pattern. In this context, expectations influence firms' goals (aspiration levels), which aim for satisfactory rather than maximum outcomes [Baleanu, 2007], and determine subsequent decisions [Hagen et al., 2024].

To adapt the presented concept to the analysis of the behavior pattern reflected in qualitative indicators, it was assumed that the pattern is created by two effects [Szczepkowska-Flis, Kozłowska, 2024]:

- the inertia effect, indirectly expressing actions based on routines;
- the prediction effect, indirectly expressing actions based on expectations.

The essence of the inertia effect is a certain immutability of the observed process despite changes in the environment in which it occurs. The condition for flexible macro-level adjustment of the process to changes in external factors is the ideal behavior of entities at the micro level (full rationality, precise forecasting, perfect information). The lack of such ideal behavior causes the process to follow established patterns, and the effects of external factors become visible with some delay [Łyko, 1992]. The essence of the prediction effect is the process's response to changes in entrepreneurs' expectations generated by disturbances in the environment in which the process takes place. The prediction effect is responsible for the transmission and persistence of disturbances and constitutes an additional source of variability and uncertainty [Carlstrom, Fuerst, 2001; Nicolò, 2020], especially in the case of self-fulfilling expectations [Bludnik, Wallusch, 2012].

3. Data and method

Data for the study was taken from business tendency surveys in the Polish trade sector, published by GUS. The study used monthly, seasonally adjusted series (01.2000–05.2025) of two pairs of qualitative indicators expressing entrepreneurs' opinions on their current (diagnosis, D) and expected (forecast, P):

- sales – variables S_D and S_P ;
- financial situation – variables F_D and F_P .

The conclusions were based on the results of the ARDL model parameters and the multiplier analysis derived from them [Hill et al., 2011; Verbeek, 2004]. The choice of lag order in the ARDL model was based on the specific nature of the data. The forecast indicators are based on entrepreneurs' responses to the question: *How will your company's sales (financial situation) change in the next three months?* The diagnostic questions (*How is current sales (financial situation) changing in your company?*) do not specify a reference period for the formulated assessment. However, by analogy with forecasting indicators, it was assumed that lags of the order of three months are sufficient to capture the studied phenomena, especially since the reaction of financial results to shocks (collapse in demand and sales) materializes in the short term, particularly in consumer-driven sectors [Sokołowska et al., 2024].

Diagnostic indicators (S_D , F_D) were modelled assuming that they are functions of their own values lagged to three periods and of the simultaneous and three lagged values of the corresponding forecast indicators (S_P , F_P). This implies the use of the ARDL(3,3) model (1):

$$y_t = C + \alpha_1 y_{t-1} + \alpha_2 y_{t-2} + \alpha_3 y_{t-3} + \beta_0 x_t + \beta_1 x_{t-1} + \beta_2 x_{t-2} + \beta_3 x_{t-3} + \varepsilon_t$$

Referring to the works of A. Szczepkowska-Flis and A. Kozłowska [2023, 2024], it was assumed that the autoregressive part of the model (AR) reflects the impact of the inertia effect on the dependent variable. Its strength is determined by the sum of lag coefficients: $\sum \alpha$. The distributed lags part of the model (DL) describes the impact of the prediction effect on the dependent variable. Its strength is expressed by the cumulative multiplier calculated as $\sum \beta$.

Furthermore, assuming that a change in x persists in subsequent periods, the ARDL model allows the estimation of a long-run multiplier (m_d) describing the impact of a permanent change in x on the dependent variable y (2):

$$m_d = \frac{\sum \beta}{1 - \sum \alpha}.$$

In this study, the long-run multiplier is interpreted as a synthetic measure of the strength of the combined impact of the inertia and prediction effects on the assessments (diagnoses) formulated by entrepreneurs and as an illustration of the behavior pattern of entities in the long run.

If the parameters of the model described by equation (1) meet the conditions: the absolute value of the sum of lag coefficient $\alpha_1 + \dots + \alpha_2$ is less than unity ($|\sum \alpha| < 1$) and the long-run multiplier is statistically significant, then the model has long-run equilibrium, described by the formula (3):

$$y^* = C + m_d x^*,$$

where:

- y^* – long-run level of the endogenous variable;
- x^* – long-run level of the exogenous variable;
- $C = \frac{c}{1 - \sum \alpha}$ – long-run constant term.

It was assumed that the existence of long-run equilibrium in the model implies the stability of the behavior pattern in the examined period.

In accordance with the research purpose, two subperiods were distinguished:

- 01.2000–02.2020 – the period of normal volatility;
- 03.2020–05.2025 – the period of extraordinary instability.

The model (equation 1) was estimated for each diagnostic indicator (S_D, F_D) for the entire research period (01.2000–05.2025). Then the Chow test was used to see if there was structural change in these models in March 2020. Models (equation 1) for the subperiods were estimated only for those diagnostic

indicators for which the Chow test allowed to reject the null hypothesis of parameters stability (i.e., no structural change).

Before estimating the models, the ADF unit root test was conducted. The ADF test showed that all the time series were stationary (Appendix, Table 2). Models were estimated using the OLS with heteroskedasticity and autocorrelation consistent standard errors (HAC). The normality assumption was tested using the Jarque–Bera test. The statistical significance of the sums of regression coefficients ($\sum \alpha$, $\sum \beta$) and the long-run multiplier (m_d) was tested using the Wald test. A level of statistical significance $\alpha = 0.05$ was assumed.

4. Results

The results of the Chow test (Appendix, Table 3) showed that for the models describing diagnoses of the financial situation of commercial enterprises (F_D) and their sales (S_D), there were grounds to reject the null hypothesis of no structural change in March 2020. In accordance with the research procedure, for these variables, regression models (1) were estimated for the distinguished subperiods (Appendix, Tables 4 and 5). The results of the multiplier analysis based on these models are presented in Table 1.

Based on the multiplier analysis, it was found that:

- in both subperiods, the sums of the coefficients in the autoregressive part of model (AR) were statistically significant. This implies that, in both the period of normal volatility and the period of extraordinary instability, the inertia effect played a significant role in formulating the diagnoses of financial situation and sales by commercial enterprises;
- in none of subperiods were the diagnoses of commercial enterprises concerning their financial situation and sales influenced by the prediction effect – the sums of the coefficients in the distributed lag part DL of the regression equations were not statistically significant;
- only in the first subperiod the conditions of long-run equilibrium of the models were fulfilled, i.e., statistical significance of the long-run multipliers and the absolute value of the inertia effect's influence being less than unity

($|\sum \alpha| < 1$). This means that only under conditions of normal volatility of the business environment did a stable behavior pattern of commercial enterprises exist. At the same time, the positive values of the multiplier indicate that, in this group of entities, a sustained increase or decrease in expectations (a wave of optimism or pessimism) led to a multiplied increase or decrease in the values of diagnostic indicators (S_D , F_D), stronger in the case of assessments related to sales.

TABLE 1

Values of the inertia and prediction effects and the long-run multiplier

Category	Period of	Qualitative indicator category	
		Sales	Financial situation
Inertia effect	normal volatility	1.00 [167482.50]	1.00 [163184.40]
	extraordinary instability	0.99 [18352.21]	1.00 [23838.59]
Prediction effect	normal volatility	0.01 [1.99]	0.01 [2.38]
	extraordinary instability	0.01 [0.72]	0.01 [1.87]
Long-run multiplier	normal volatility	1.30 [5.67]	1.07 [10.48]
	extraordinary instability	1.13 [1.15]	2.52 [0.37]

Note: values in square brackets represent χ^2 Wald test statistics. Statistically significant values are in blue bold.

Source: own elaboration.

5. Discussion

The study showed that both in the period of normal volatility and in the period of extraordinary instability, the inertia effect played a significant role in shaping the diagnoses made by commercial enterprises regarding their financial situation and sales. During the period of normal volatility, processes proceeded

in a normal mode, following historically conditioned schemes and established behavioral rules. This statement does not exclude a dynamic approach to the environment in the sense that routines, on the one hand, reflect the direct reaction of entities to environmental changes, and on the other, are modified by these changes within the existing behavior pattern. During the period of extraordinary instability, inertia became a kind of safeguard against making mistakes in an unpredictable environment, and adaptive actions based on routines ensured the firm's stability and survival.

In both subperiods, all regression coefficients in the DL part of the models met the criteria of statistical significance, while the cumulative multipliers ($\sum \beta$) were not statistically significant. Therefore, it can be concluded that regardless of the conditions existing in the environment of commercial enterprises, the prediction effect played a passive role in shaping their diagnoses of financial situation and sales.

Statistically significant values of the long-run multiplier and fulfilled conditions of long-run equilibrium were recorded only in the period of normal volatility. This result implies that, although the prediction effect "alone" was not significant for formulating diagnoses, in combination with the inertia effect, it formed a stable long-run behavior pattern of commercial enterprises. This means that during the period of normal volatility – when processes proceed "normally" and changes in business conditions fall within the so-called indifference range – unexpected, persisted changes in expectations and the resulting modification of routines occur within the framework of an established behavior pattern. During demand/supply shocks, when changes in business conditions exceed the indifference range, expectations alter the transmission of shocks and perpetuate disturbances [Nicolò, 2020], causing routines to require fundamental revision and the previously existing behavior pattern to be destroyed – a finding confirmed by the results of this study.

If, according to J.A. Schumpeter's theory of economic development, destruction is part of the transformation of the previously existing behavior pattern, the answer to the first research question would be affirmative. However, the obtained results do not allow an answer to the second research question. The lack of statistical significance of the long-run multiplier in the period

03.2020–05.2025 suggests that, in the case of commercial enterprises, the scale of disruptions caused by the COVID-19 pandemic and the war in Ukraine, with the resulting spectacular increase in risk and uncertainty, translated into outcomes in the trade sector that prevented the formation of a new behavior pattern.

6. Conclusions

According to the presented concept, the prediction effect is an active element of the behavior pattern, serving as a carrier of disturbances originating from the entities' environment. The inertia effect, in turn, plays a passive role in this pattern, in the sense that minor changes in environmental conditions cause only small changes in routines (routines are modified, they evolve), while their fundamental change occurs only under the influence of sufficiently strong external stimuli. These statements find partial confirmation in the results of this study. In both the period of normal volatility and the period of extraordinary instability, the key role in shaping assessments of the financial situation and sales of commercial enterprises was played by the inertia effect. Although the prediction effect did not directly influence the diagnoses formulated by commercial enterprises, under conditions of normal volatility, in combination with the inertia effect, it created a stable behavior pattern reflected by qualitative indicators.

The lack of statistical significance of long-run multipliers observed in this study for the period of extraordinary instability does not confirm the regularity identified by A. Szczepkowska-Flis and A. Kozłowska [2023] for the manufacturing industry, according to which environmental instability generates a stable behavior pattern of entities. Explaining this specific asymmetry in research results undoubtedly requires further studies that would take into account the specificity of commercial enterprises, resulting, for instance, from the fact that they represent the final link in the producer–consumer supply chain. In this context, the presented study can be regarded as a preliminary stage of research on behavior patterns of entities operating in sectors or industries differing in the nature of their economic activity.

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Appendix

TABLE 2

Results of the ADF unit root test

Variable	Type of test	ADF statistic	p
S_D	with constant and trend	-4.71	0.00
S_P	with constant and trend	-3.74	0.02
F_D	with constant and trend	-3.92	0.01
F_P	with constant and trend	-3.72	0.02

Source: own elaboration.

TABLE 3

Results of the Chow test for structural change in March 2020

Model	Statistic	Value	p
Dependent variable S_D	F-statistic	2.18	0.03
	Log-likelihood ratio	17.84	0.02
Dependent variable F_D	F-statistic	1.74	0.09
	Log-likelihood ratio	14.38	0.07

Note: significance level: $\alpha = 0.1$.

Source: own elaboration.

TABLE 4

Results of ARDL(3,3) models – dependent variable F_D

Period	01.2000–02.2020	03.2020–05.2025
Variable	Coefficient [standard error]	Coefficient [standard error]
<i>C</i>	-0.01 [0.01]	0.05 [0.06]
<i>F_D</i> _{<i>t</i>-1}	2.70 [0.05]	2.61 [0.08]
<i>F_D</i> _{<i>t</i>-2}	-2.56 [0.09]	-2.35 [0.15]
<i>F_D</i> _{<i>t</i>-3}	0.86 [0.04]	0.74 [0.08]
<i>F_P</i> _{<i>t</i>}	0.67 [0.05]	0.78 [0.07]
<i>F_P</i> _{<i>t</i>-1}	-1.68 [0.16]	-1.90 [0.20]
<i>F_P</i> _{<i>t</i>-2}	1.49 [0.19]	1.58 [0.24]
<i>F_P</i> _{<i>t</i>-3}	-0.47 [0.08]	-0.45 [0.10]
	• R-squared 0.99; Adjusted R-squared 0.99; • F-statistic 206611.9; Prob (F-statistic) 0.00; normality J-B test 3.50; Prob(J-B-statistic) 0.17	• R-squared 0.999; Adjusted R-squared 0.999; • F-statistic 27265.14; Prob (F-statistic) 0.00; normality J-B test 1.76; Prob(J-B-statistic) 0.42

Note: statistically significant regression coefficients are in blue bold.

Source: own elaboration.

TABLE 5

Results of ARDL(3,3) models – dependent variable S_D

Period	01.2000–02.2020	03.2020–05.2025
Variable	Coefficient [standard error]	Coefficient [standard error]
C	-0.00 [0.02]	0.01 [0.06]
S_D_{t-1}	2.68 [0.04]	2.58 [0.06]
S_D_{t-2}	-2.55 [0.08]	-2.31 [0.12]
S_D_{t-3}	0.86 [0.04]	0.72 [0.07]
S_P_t	0.56 [0.09]	0.64 [0.10]
S_P_{t-1}	-1.34 [0.24]	-1.55 [0.24]
S_P_{t-2}	1.16 [0.24]	1.29 [0.24]
S_P_{t-3}	-0.38 [0.08]	-0.36 [0.10]
	• R-squared 0.99; Adjusted R-squared 0.99; • F-statistic 157020.3; Prob (F-statistic) 0.00; normality J-B test 0.03; Prob(J-B-statistic) 0.98	• R-squared 0.999; Adjusted R-squared 0.999; • F-statistic 11124.10; Prob (F-statistic) 0.00; normality J-B test 3.52; Prob(J-B-statistic) 0.17

Note: statistically significant regression coefficients are in blue bold.

Source: own elaboration.