

RESILIENCE OF POLISH NON-FINANCIAL CORPORATIONS UNDER ECONOMIC SHOCKS

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Purpose: The aim of the article is to assess how Polish companies cope in crisis situations. The period of analysis covers the years 2004 - 2020. Two economic shocks took place during this period, i.e. the global financial crisis and the COVID-19 pandemic. The research problem was formulated in the form of a question: how do Polish enterprises cope under conditions of economic shocks in comparison with enterprises in the European Union and the Euro Area?

Design/methodology/approach: In order to address the research problem, the key indicators of economic activity of the non-financial corporate sector in Poland, the European Union and the Euro Area proposed by Eurostat were analysed. Aggregate data were adopted for the European Union and the Euro Area. The gross investment rate ratio, gross profit share ratio, gross return on capital employed, net debt to income ratio and net return on equity ratio were analysed.

Findings: The analysis shows that Polish companies performed well both throughout the period analysed and during the global financial crisis. After the financial crisis, Polish companies were able to rebuild their economic potential. In the case of the COVID-19 pandemic period, on the other hand, it is still too early to draw conclusions. However, worrying signals cannot be overlooked. First and foremost, attention should be drawn to the systematic decline in the level of investments made by the Polish business sector. This may reduce its competitiveness in the future and weaken its business resilience.

Originality/value: No consensus has emerged in the literature on indicators measuring organisational resilience. Nor is there a clearly dominant position on which indicators allow for the assessment of how businesses are coping in crisis situations. This paper proposes the use of five metrics to assess and monitor business resilience in the corporate sector. These are the gross investment rate ratio, the gross profit share ratio, the gross return on capital employed ratio, the net debt-to-income ratio and the net return on equity ratio.

Keywords: business resilience, measuring business resilience, non-financial corporations.

Category of the paper: research paper.

1. Introduction

In today's highly volatile and uncertain economy, incidents that disrupt the normal operation of businesses can occur at any time (Duchek, 2020; Goosman, 2022). These occurrences can be referred to as critical incidents affecting the operational risk of business entities (Goosman, 2022). Critical incidents often take the form of economic shocks such as the global financial crisis or the COVID-19 pandemic (Amadeo, 2022a, 2022b, 2022c, 2022d; Jones et al., 2021; Padhan, Prabheesh, 2021). Predicting the nature of these events, the exact timing of their occurrence and their scale is extremely difficult, and often impossible at the level of an individual company (Sahebjamnia et al., 2015). However, this does not mean that companies should remain passive. On the contrary, companies must adopt a proactive attitude by developing organisational resilience (Duchek, 2020; Gimenez et al., 2017; Sahebjamnia et al., 2015). Organisational resilience can be defined as the ability of a company to recover quickly from critical incidents (e.g. an economic shock) (Hornby, Crowther, 1995). The resilience of a company should be considered here on five levels. These are: the company's response to the external threat, organisational reliability, human resources, business models, and business networks (Linnenluecke, 2017).

In response to external threats, companies can adopt defensive and/or progressive attitudes (Denyer, 2017). The prerequisite for achieving organisational reliability is the consistency of the actions taken and their flexibility (Denyer, 2017). The company's dynamic capabilities and organisational ambidextrousness are important here (Mamouni Linnios et al., 2014). Competence in the area of organisational learning and the creation of a knowledge enterprise is also important (Rokita, 2009; Sawalha, 2015). When it comes to human resources, the strengths of the people employed by the economic entity are significant (Linnenluecke, 2017). Crucial here is the commitment of both managers and employees and their professionalism and qualifications (Gimenez et al., 2017). Business models of companies should take the form of sustainable models and companies must build on sustainable business practices (Cardillo et al., 2022; Samborski, 2022). Often, the technological sophistication of a company's business processes is a prerequisite for, and a source of, the development of sustainable business practices (Seifi, 2022). For business networks, it is crucial to design supply chains in a way that reduces its vulnerability to disruption (Linnenluecke, 2017). It is also important to develop business partnerships involving extensive cooperation with industry players (Gimenez et al., 2017). The right ethical attitudes of management and the building of good relationships with stakeholders are significant too (Cheema-Fox et al., 2021; Sajko et al., 2021).

These layers intertwine and complement each other.

Organisational resilience is thus a meta-capability within which three stages can be distinguished. These are anticipation, coping and adaptation (Duchek, 2020).

The first stage mentioned is the anticipation of critical incidents. As already mentioned at the level of an individual enterprise, this is extremely difficult, often impossible. It is therefore important to have adequate threat information support from public institutions (national and international) and cooperation within business networks aimed at processing information on future critical events. Also important is the quality of the human resources employed in companies and their knowledge of potential threats, as well as their ability to process the available data.

The next stage in the process of building business resilience is how companies cope with crisis situations. Both managerial and institutional factors are important at this stage (Adekola, Clelland, 2020). The problem of coping must therefore be considered at two levels. The first level is the level of the individual enterprise. In times of crisis, the company's response to threats, the organisational reliability developed, the quality of human resources, the business model adopted and the inter-organisational cooperation networks developed are all important. At company level, it is important to respond appropriately to threats and to take measures aimed at rebuilding economic potential (Aldunce et al., 2014). Attention must also be paid to issues of social trust among business partners (Levine et al., 2018). However, the effectiveness of a company's handling of critical situations does not depend only on the company. The institutional environment, fiscal and monetary policy, economic policy at the macroeconomic and even global level are all important. The legal environment in which businesses operate is crucial (Samborski, 2021). State aid of a financial nature directed at the business sector often proves important in times of crisis. It is important to note here that it should respond to specific risks and must aim to increase the resilience of individual companies and the sector as a whole (Sudmeier-Rieux, 2014).

The final stage in building organisational resilience is adaptation. In response to external threats, companies need to change and adapt to new business conditions (Carmeli, Markman, 2011). The scope of change is often very deep and concerns not only the tactics of the company but also the strategy adopted (Carmeli, Markman, 2011). All layers of organisational resilience, i.e. the right response of the enterprise to threats, organisational reliability, high quality human resources, a sustainable business model, well-developed inter-organisational cooperation networks, are important in effectively managed adaptation processes. These are crucial not only for surviving a difficult period, but also for achieving a state of normalcy for the enterprise more quickly (Duchek, 2020).

Organisational resilience is important for a company's future competitive position. It can become a source of future market success (Duchek, 2020). It is therefore extremely important to measure and monitor it on an ongoing basis (Hémond, Robert, 2012). Measures of business resilience need to be developed both at the level of the companies themselves and at the level of the economy. No consensus has emerged in the literature on indicators measuring organisational resilience. Nor is there a clearly dominant position on which indicators allow for the assessment of how enterprises are coping in crisis situations.

This article proposes the use of five metrics to assess and monitor the business resilience of enterprises. The aim of this article is to assess the coping of Polish enterprises in crisis situations. The period of analysis covers 2004-2020. Two economic shocks took place during this period. The first, i.e. the global financial crisis, fell between 2007 and 2009. The second, i.e. the COVID-19 pandemic, started at the end of 2019. The main austerity in the European Union fell during the period under review in 2020 (Amadeo, 2022a, 2022b, 2022c, 2022d; Jones et al., 2021; Padhan, Prabheesh, 2021; Rada Europejska, Rada Unii Europejskiej, n.d.).

The research problem was formulated in the form of the question: how do Polish companies cope under economic shocks compared to companies in the European Union and the Euro Area?

2. Methods

In order to address the research problem, the key indicators of economic activity of the non-financial corporations sector in Poland (PL), the European Union (EU) and the Euro Area (EA) proposed by Eurostat were analysed. Aggregate data were adopted for the EU and EA. The non-financial corporations sector comprises economic entities that offer non-financial goods and services on the market. This refers to enterprises that have legal identity (Rozporządzenie..., 2015) – further Rozp. nr 549/2013 (2.45). The data used to calculate the economic activity indicators of the non-financial corporations sector are taken from national accounts compiled in the ESA 2010 standard (Rozp. nr 549/2013). Five indicators were analysed. The first two indicators were calculated on the basis of non-financial transactions (Eurostat, n.d.-b). Non-financial, or non-monetary, transactions are those "that do not involve the exchange of cash or assets or liabilities expressed in monetary units [...]." (Rozp. nr 549/2013) (1.70).

These indicators are:

- “Gross investment rate of non-financial corporations” (Eurostat, n.d.-b)

$$GIR = \frac{\text{Gross fixed capital formation}}{\text{Gross value added}} * 100$$

- “Gross profit share of non-financial corporations” (Eurostat, n.d.-b)

$$GPS = \frac{\text{Gross operating surplus (mixed income)}}{\text{Gross value added}} * 100$$

The next three indicators link non-financial transactions to financial transactions (Eurostat, n.d.-b). According to ESA 2010, "transactions are monetary transactions if the units involved make or receive payments or incur liabilities or receive assets expressed in monetary units". (Rozp. nr 549/2013) (1.70). The remaining transactions are non-monetary in nature.

These indicators are:

- “Gross return on capital employed, before taxes, of non-financial corporations” (Eurostat, n.d.-b)

$$GROCE = \frac{\text{Gross operating surplus (mixed income)}}{\text{Currency and deposits} + \text{Debt securities} + \text{Loans} + \text{Equity and investment fund shares (liab)}} * 100$$

- “Net debt-to-income ratio, after taxes, of non-financial corporations” (Eurostat, n.d.-b)

$$NDTI = \frac{\text{Currency and deposits} + \text{Debt securities} + \text{Loans (liab)}}{\text{Net entrepreneurial income} - \text{Current taxes on income and wealth}} * 100$$

- “Net return on equity, after taxes, of non-financial corporations” (Eurostat, n.d.-b)

$$NROE = \frac{\text{Net entrepreneurial income} - \text{Current taxes on income and wealth}}{\text{Equity and investment fund shares (liab)}} * 100$$

where: "liab" refers to the stock of liabilities incurred by a given sector and recorded in the financial balance sheets” (Eurostat, n.d.-b).

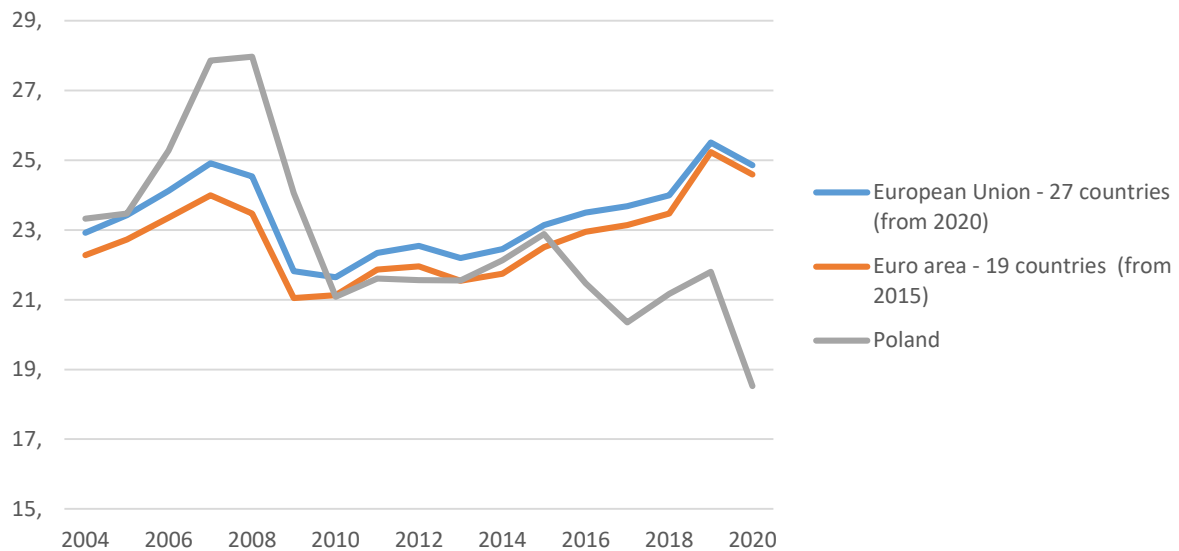
Descriptive characteristics of data distributions (indicator values) and correlations were analysed. Measures of location included the arithmetic mean and median, measures of variability (diversity) included the range and standard deviation, measures of asymmetry included the skewness and measures of concentration included the kurtosis (Agarwal, 2006; Holmes et al., 2017; Kassyk-Rokicka, 1997; Microsoft, n.d.-a, n.d.-c, n.d.-b; Peck et al., 2008; Sobczyk, 1997; Starzyńska, 2012).

3. Results

3.1. Gross investment rate of non-financial corporations (GIR)

The average GIR in the corporate sector in PL was lower than in the EU and EA corporate sector. GIR values in the PL corporate sector were more volatile than in the EU and EA corporate sector. The asymmetry of the distribution of GIR values in the corporate sector in PL was greater than in the EU and EA corporate sector (positive asymmetry). The strength of the asymmetry of the distribution of GIR values in the corporate sector in PL was also greater than in the corporate sector in the EU and EA. GIR values in the PL corporate sector, unlike in the EU and EA corporate sector, clustered around the mean. The kurtosis took on a positive value. Moreover, the values of the GIR of the corporate sector in PL in relation to the values of this indicator in the EU and EA corporate sector were characterised by a weak correlation relationship. On the other hand, a strong positive correlation relationship occurred between the values of the analysed indicator in EU and EA enterprises.

The GIR values of the PL corporate sector during the global financial crisis were above the median. For the EU and EA corporate sector, the values of this indicator were above the median in 2007, 2008 and fell below the median in 2009. During the COVID-19 pandemic, the values of the corporate sector GIR in PL were below the median. In the EU and EA corporate sector, the values of this indicator were above the median.



The chart was made in the programme “Microsoft® Excel® dla Microsoft 365 MSO”.

Figure 1. Gross investment rate of non-financial corporations.

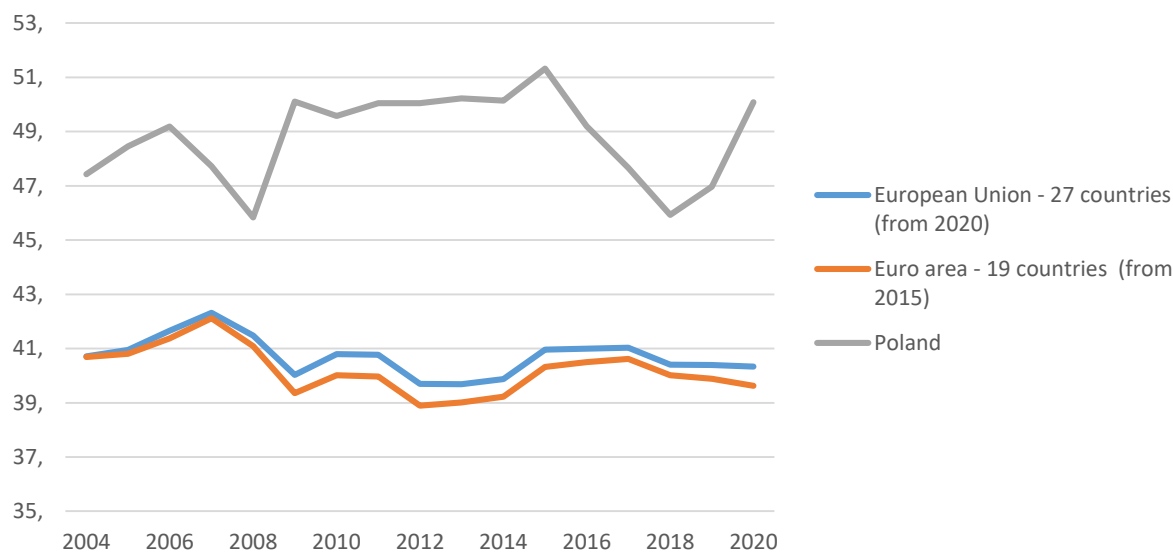
Source: Data obtained from: (Eurostat, n.d.-a).

3.2. Gross profit share of non-financial corporations (GPS)

The average value of the GPS indicator in the corporate sector in PL was higher than in the corporate sector in the EU and EA. The values of the GPS indicator in the corporate sector in PL were more variable than in the corporate sector in the EU and EA. In the PL enterprise sector, unlike in the EU and EA corporate sector, there was a negative asymmetry in the distribution of GPS indicator values. In the corporate sector in PL, the values of the GPS indicator were slightly concentrated around the mean. The kurtosis was negative. In the EU and EA corporate sector, the distribution of GPS values resembled a normal distribution. Moreover, there was a weak/moderate correlation relationship (negative) between the GPS indicator values of the corporate sector in PL and those of the corporate sector in EU and EA. However, a strong positive correlation relationship occurred between the values of the analysed indicator in enterprises in the EU and EA.

The values of the GPS indicator of the corporate sector in PL during the global financial crisis and the COVID-19 pandemic, relative to the median, developed inversely to the corporate sector in the EU and EA. For the corporate sector in PL, the GPS values in 2007, 2008 were below the median, and in 2009, 2020 the values of this indicator were above the median. For the EU and EA corporate sector, the values of this indicator were above the median in 2007,

2008. In 2009, 2020, the values of the GPS indicator in the EU and EA corporate sector were below the median.



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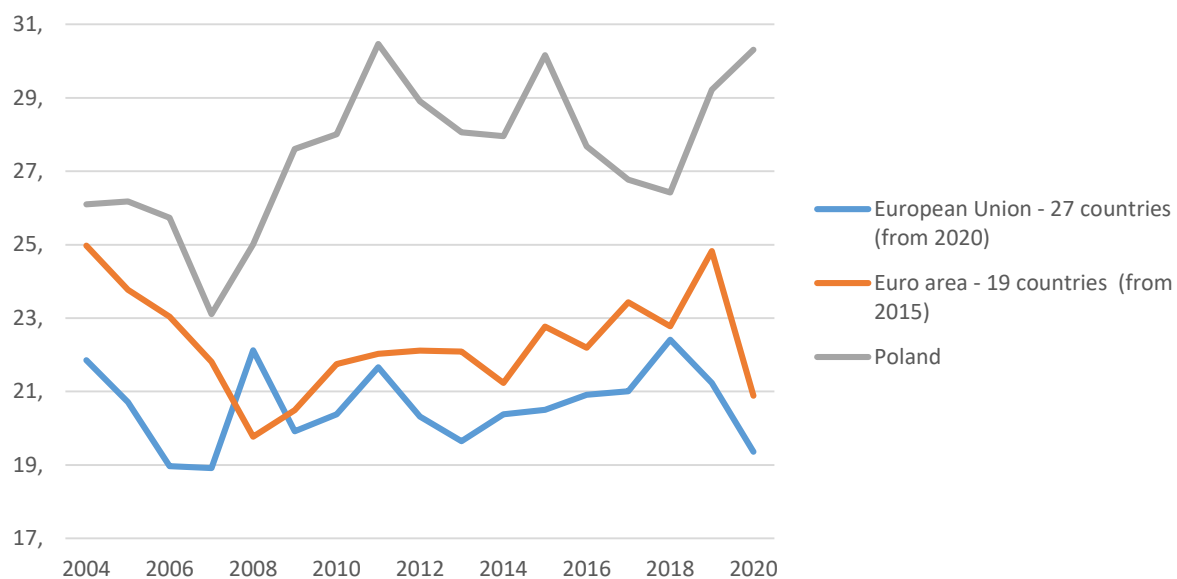
Figure 2. Gross profit share of non-financial corporations.

Source: Data obtained from: (Eurostat, n.d.-a).

3.3. Gross return on capital employed, before taxes, of non-financial corporations (GROCE)

The average GROCE value in the corporate sector in PL was higher than in the corporate sector in the EU and EA. GROCE values in the PL corporate sector were characterised by higher volatility than in the EU and EA corporate sector. The distributions of GROCE values in the corporate sector in PL and in the EU and EA corporate sector were characterised by low levels of asymmetry and even symmetry. The concentration of the distribution of GROCE values around the mean in the corporate sector in PL and in the corporate sector in EA assumed a form close to a normal distribution. However, in the case of the GROCE indicator values of the business sector in the EU, the kurtosis assumed a negative value, which means that a large number of indicator values occurred with low frequency. Moreover, the GROCE indicator values of the corporate sector in PL, EU and EA were characterised by weak or no correlation relationship.

The GROCE values of the corporate sector in PL during the global financial crisis were below the median - with the exception of 2009. During the COVID-19 pandemic, the GROCE value of the corporate sector in PL was above the median. For the business sector in EA during both the financial crisis and the COVID-19 pandemic, GROCE values were below the median. Similarly, the values were in relation to the median in the EU corporate sector with the difference, however, that the GROCE value was higher than the median in 2008.



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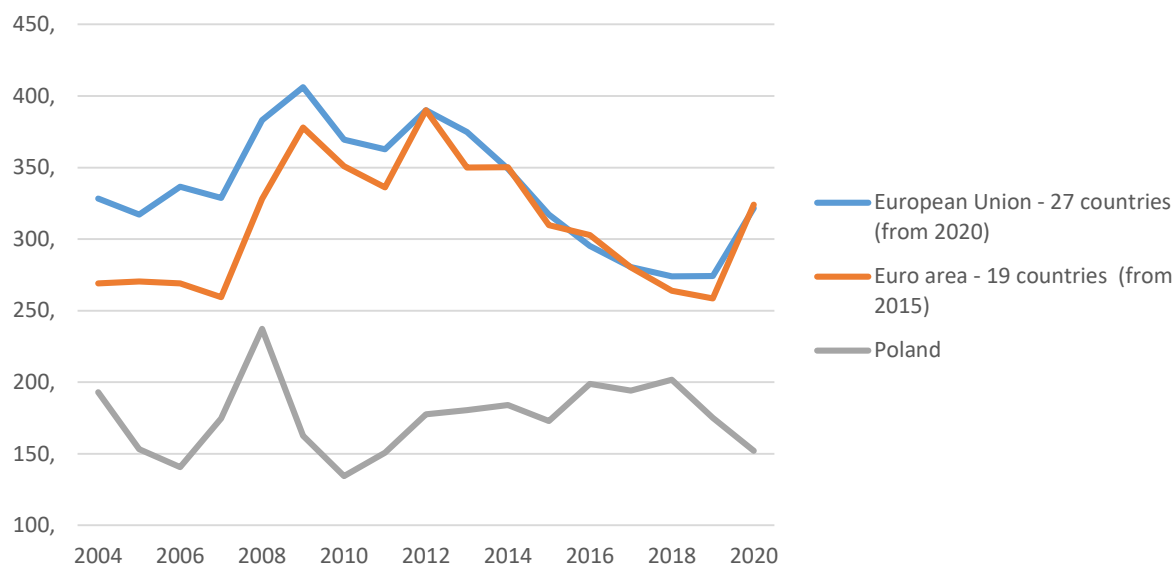
Figure 3. Gross return on capital employed, before taxes, of non-financial corporations.

Source: Data obtained from: (Eurostat, n.d.-a).

3.4. Net debt-to-income ratio, after taxes, of non-financial corporations (NDTI)

The average value of NDTI in the corporate sector in PL was lower than in the corporate sector in the EU and EA. NDTI values in the corporate sector in PL were less volatile than in the corporate sector in the EU and EA. The asymmetry of the distribution of NDTI values in the PL corporate sector was greater than in the EU and EA corporate sector (positive asymmetry). The values of the NDTI indicator in the PL corporate sector, unlike in the EU and EA corporate sector, clustered around the mean. The kurtosis took on a positive value. Moreover, the values of the NDTI indicator of the corporate sector in PL in relation to the values of this indicator in the corporate sector in the EU and EA were characterised by a weak correlation relationship. On the other hand, a strong positive correlation relationship occurred between the values of the indicator analysed in EU and EA enterprises.

The values of the NDTI indicator of the enterprises sector in PL during the global financial crisis and during the COVID-2019 pandemic were below the median - except for 2008. For the enterprises sector in the EU, the values of this indicator during the global financial crisis were greater than or equal to the median. For the EU corporate sector, the value of the NDTI indicator during the COVID-19 pandemic was below the median. For the EA corporate sector, NDTI values during the global financial crisis and the COVID-19 pandemic were above the median, except for 2007.



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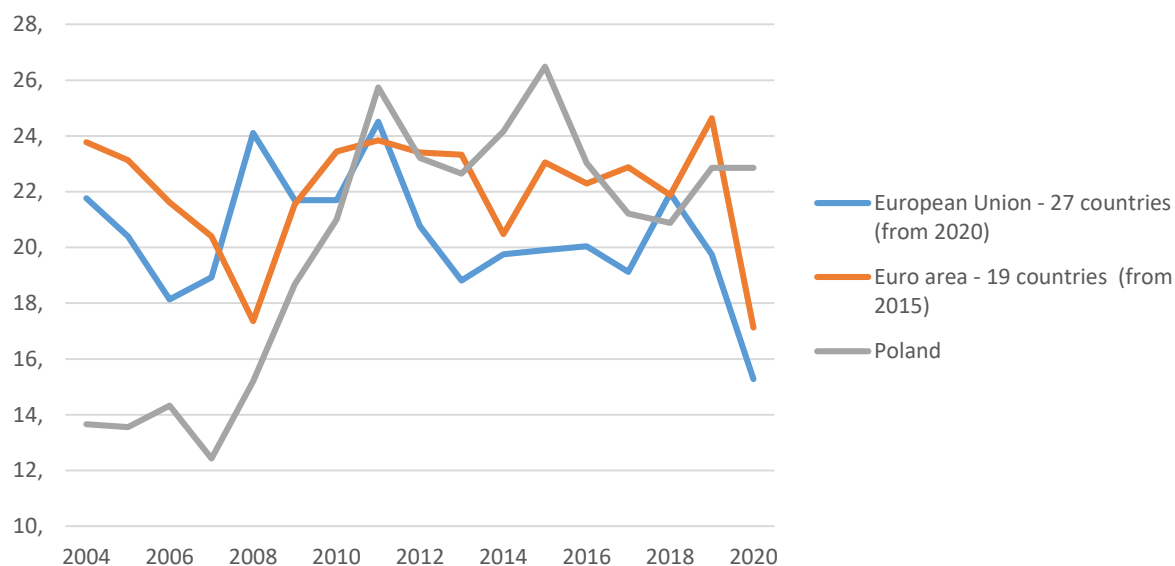
Figure 4. Net debt-to-income ratio, after taxes, of non-financial corporations.

Source: Data obtained from: (Eurostat, n.d.-a).

3.5. Net return on equity, after taxes, of non-financial corporations (NROE)

The average NROE in the corporate sector in PL was at a similar level as in the corporate sector in the EU and EA. The values of the NROE indicator in the corporate sector in PL were more variable than in the corporate sector in the EU and EA. There was a negative asymmetry in the distribution of NROE indicator values in the PL, EU and EA corporate sector. The values of the NROE indicator in the PL corporate sector, unlike in the EU and EA corporate sector, did not cluster around the mean. Indeed, the kurtosis assumed a negative value. Moreover, the NROE indicator values of the corporate sector in PL, EU and EA were characterised by a weak or no correlation relationship.

The NROE indicator values of the corporate sector in PL and EA were below the median during the global financial crisis. The NROE of the corporate sector in the EU was above the median during the global financial crisis, except in 2007. During the COVID-19 pandemic, the NROE of the corporate sector in PL was above the median. In the EU and EA corporate sector, the values of this indicator were below the median.



The chart was made in the programme “Microsoft® Excel® dla Microsoft 365 MSO”.

Figure 5. Net return on equity, after taxes, of non-financial corporations.

Source: Data obtained from: (Eurostat, n.d.-a).

4. Discussion

In order to solve the research problem formulated in the form of the question of how enterprises in PL are coping under economic shocks, in comparison with enterprises in the EU and EA, the development of five indicators was analysed. The coefficients of GIR, GPS, GROCE, NDTI and NROE were analysed for the years 2004 - 2020. Particular attention was paid to the period of the global financial crisis (years 2007 - 2009) and the COVID-19 pandemic (year 2020).

Based on the analyses carried out, the following findings were made:

- The average values of the GIR and NDTI indicators were lower in the corporate sector in PL than in the corporate sector in the EU and EA. On the other hand, the average values of GPS and GROCE indicators were higher in the PL corporate sector than in the EU and EA corporate sectors. As for the NROE indicator, it was at a similar level in the corporate sector in PL, EU and EA.
- From 2004 to 2020, the level of realised investment (GIR) in the corporate sector in PL was on a downward trend. The collapse of the level of realised investment in the corporate sector in PL occurred in 2009. The GIR reached its lowest level for the corporate sector in PL in 2020. The situation was different for the corporate sector in the EU and EA, where the GIR remained on an upward trend during the period under review. During the global financial crisis, the level of the GIR declined markedly in the

corporate sector in the EU and EA. However, enterprises in the EU and EA, unlike enterprises in PL, rebuilt investment opportunities relatively quickly. The pandemic period brought declines in the level of realised investment in the corporate sector in the EU and EA. By 2020, however, the GIR was at a significantly higher level in EU and EA enterprises than in PL enterprises.

- Between 2004 and 2020, the level of indebtedness (NDTI) in the corporate sector in PL followed a slight upward trend. The NDTI ratio in the corporate sector in PL reached its peak in 2008. In 2009 and 2010, by contrast, the ratio was significantly lower. The NDTI in the corporate sector in PL was also at a low level in 2020. From 2004 to 2020, the NDTI in the corporate sector in the EU and EA followed a downward or neutral trend. It should be noted, however, that during the global financial crisis and the COVID-19 pandemic, the year-on-year dynamics of the NDTI indicator took on positive values in the EU and EA corporate sector.
- Between 2004 and 2020, the level of profitability (GPS) in the corporate sector in PL remained in a slight upward trend. Under the conditions of the global financial crisis, the value of this indicator in the corporate sector in PL declined only in the initial period of the crisis. In 2009, the GPS indicator reached a value significantly higher than in 2007. The year 2020 also saw an increase in the value of the GPS indicator in the PL corporate sector compared to the previous year. By contrast, for the corporate sector in the EU and EA, the GPS indicator followed a downward trend from 2004 to 2020. During the global financial crisis and the COVID-19 pandemic, the year-on-year dynamics of the GPS indicator in the corporate sector in the EU and EA became negative.
- From 2004 to 2020, the level of return on capital employed (GROCE) in the corporate sector in PL followed an upward trend. In the period of the global financial crisis and during the COVID-19 pandemic, the year-on-year dynamics of the GROCE indicator took on positive values. For the corporate sector in the EU and EA, the level of return on capital employed remained in an upward or neutral trend. During the global financial crisis, the GROCE indicator was characterised by high volatility. For the corporate sector in the EU and EA, the level of GROCE in 2020 was below 2019.
- From 2004 to 2020 in the corporate sector in PL, the level of return on equity (NROE) followed an upward trend. The NROE in the corporate sector in PL increased markedly during the global financial crisis. For the EU and EA corporate sector, the level of return on equity (NROE) trended downwards from 2004 to 2020. During the global financial crisis, the NROE ratio in the corporate sector in the EU and EA was characterised by high volatility. During the COVID-19 pandemic, the level of the NROE ratio in the corporate sector in PL, EU and EA formed below 2019. However, in the corporate sector in PL the decrease was generally smaller.

5. Conclusions

The development of the GIR and NDTI shows that in the corporate sector in PL a decrease in investment was accompanied by an increase in debt. The situation was the opposite in the corporate sector in the EU and EA, where an increase in investment was accompanied by a decrease in debt or its stabilisation. The analysis of the GPS, GROCE and NROE indicators shows that in the corporate sector in PL an increase in profitability was accompanied by an increase in the level of return on capital employed and return on equity. For the corporate sector in the EU and EA, the decrease in profitability was accompanied by a slight or neutral increase in the level of profitability of capital employed and a decrease in the return on equity.

The analysis shows that Polish companies performed well both throughout the period analysed and during the global financial crisis. After the financial crisis, Polish companies were able to rebuild their economic potential. In the case of the COVID-19 pandemic period, on the other hand, it is still too early to draw conclusions. However, there are also some worrying signs. First and foremost, attention should be drawn to the systematic decline in the level of investments made by the Polish corporate sector. If this trend continues, it may jeopardise the future competitive position of Polish enterprises by weakening their business resilience.

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