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Determinants of Economic Fragility in Central and Eastern European Countries FsQCA Approach

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Abstract:

Purpose: *This study aims to identify the main drivers of economic fragility in Central and Eastern European countries (CEECs).*
Design/Methodology/Approach: *This study focuses on the FsQCA (Fuzzy set Qualitative Comparative Analysis) approach in economic fragility and crisis research. The study concentrates on implementing the FsQCA method to identify and evaluate the main drivers of financial fragility in CEECs based on Fragile States Index data. The research covers 2020.*
Findings: *The research indicates and examines the main reasons for economic fragility in CEECs, e.g., economic decline, uneven economic development, unemployment rate, demographic pressure, government debt, bankruptcy declarations. As a result of the financial crisis and anti-fragility measures, the national budget deficit is growing. Its reduction will be one of the main tasks of the post-crisis period. It points out that anti-crisis actions can create conditions for promoting the zombie-ing of the economy by their nature.*
Practical Implications: *The economic crisis manifested itself in the fact that many countries, including the USA, China, and most CEECs, suspended their economies. The lockdown of economic activity directly affected the real sector of the economy. Identifying factors that determine the main drivers of financial fragility may constitute practical recommendations for public managers in creating recovery measures during the Covid-19 pandemic. The Fragile States Index, analyzed in the article, can be helpful tools for practice, warning against failures at the level of economies.*
Originality/Value: *This article shows how a FsQCA approach can overcome the knowledge gap of current conceptual and methodological attempts to expose economic fragility's architecture of causalities. FsQCA is a valuable tool for economic fragility evaluation. Finally, the results may also serve as a basis for further research into economic and financial fragility.*

Keywords: *Fragility, FsQCA approach.*

JEL Classification: *E32, G01, H81, O57.*
Paper Type: *Research paper.*

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1. Introduction

The OECD describes fragility as the combination of exposure to risk and insufficient coping capacity of the state, systems, and communities to manage, absorb or mitigate those risks. Fragility can lead to adverse outcomes, including violence, poverty, inequality, displacement, and environmental and political degradation. The fragility of countries is assessed by a combination of measurable indicators (OECD, 2020). Failed states, characterized by not meeting citizens' basic needs, are characterized by a low level of economic development, poverty, epidemics, and conflicts of various backgrounds.

To emphasize the impact of the spread of the coronavirus on the economy, De Alwis (2020) uses a new termn „economics," which is a merger of the two words „corona" and „economics," and it studies the negative repercussions of the corona-virus for the economy. This is most apparent in health and education, the building blocks of sustainable development in fragile contexts. Focusing on fragility is imperative to mitigate the impact of COVID-19 and build back better by resourcing resilience, restoring livelihoods, and supporting people's potential and well-being.

Over the last 20 years, fragile contexts have gradually increased their connections to international systems, trade, migration, and financial networks. Fragile contexts may be among the most brutal hit from reductions in external finance, foreign direct investment (FDI), and remittances, impacting tax revenues and significant debt risks. Efforts to support the access of fragile contexts to domestic and international financing should include mechanisms to reduce the volatility of financial flows and prepare for so-called black swan events. A black swan is an "unknown" where its very existence is not recognized or predicted (Manning *et al.*, 2020).

Most of the research on fragility focuses on financial fragility. Most discussions of financial fragility have focused on what is often termed the "excessive" buildup of debt (Kaufman, 1987). Bernanke and Gertler (1990) characterize a "financially fragile" situation as one in which balance sheets are so weak that the economy experiences substantial underinvestment, misallocation of investment resources, and possibly even a complete investment collapse. Determinants of financial instability and the interaction between financial constraints generate cyclical fluctuations characterized by dynamic instability. A prestigious and diversified tradition of thought has been pointed out, including, among others, Fisher (1933) and Minsky (1982). What have not been thoroughly analyzed are the determinants of economic fragility. In this paper, the author intends to contribute to this analysis by identifying and interpreting the main drivers of financial fragility in CEECs by using FsQCA[2] (Fuzzy

[2] *FsQCA - Fuzzy set Qualitative Comparative Analysis, Ragin & Davey (2014). Fuzzy-set/qualitative comparative analysis 2.5 [software program]. Irvine, CA: Department of Sociology, University of California*.

set Qualitative Comparative Analysis) in this research. This method focuses on fuzzy sets theory. The FsQCA process is a globally recognized alternative to quantitative analysis (in which the causal complexity is ignored) and qualitative methods for examining individual cases (which do not have the tools to generalize on their basis). According to Ragin (2008), both limitations can be overcome by explicitly setting the logic of case-based research and extending this logic to quantitative data via Boolean algebra. Ragin developed a method of comparing cases as a configuration of factors leading to a result (Ragin, 1987).

The study aims to indicate and interpret the main drivers leading to the economic fragility in Central and Eastern European countries. Following this introduction, the next section presents the literature review. This concentrates on economic theories and the most recent research devoted to the problem of fragility evaluation. In the next methodology section, the study discusses the FsQCA as a method, which has a great potential for analyzing causal conditions that lead to economic fragility. Then, this article presents results and research contributions. Finally, the study ends with a discussion, and finally, the conclusions, which stress the specific value-added of the approach.

2. Literature Review

To better understand the financial crisis, Hausman and Johnston (2014) present its anatomy and the timeline of significant events, drawing attention to the critical conditions and factors leading to the financial collapse. As with low-income countries generally, some countries affected by fragility have experienced rapid economic growth, particularly at the end of a conflict, but this growth is typically low quality and not sustained (McMillan *et al.*, 2017). Economic transformation has not been given much attention in fragile settings, even though it may reduce the risk of future conflict and increase resilience to shocks.

According to Albuquerque and Rajhi (2019), four factors are known to cause financial instability in developing countries: (1) unexpected increases in interest rates, (2) a deterioration in bank balance sheets, (3) adverse shocks to nonbank balance sheets, such as a stock market decline, and (4) increases in uncertainty. State fragility shocks tend to create economically and financially detrimental feedback loops. Albuquerque and Rajhi (2019) examine the relationships between natural disasters, state fragility, banking and financial risk, and output. Using up to 66 developing countries and 17 years (1995-2011) of data, eight-panel VAR models were built to examine the links among life years lost, state fragility, GDP per capita, banking and financial system deposits, banks' Z-scores, and non-performing loans.

The Covid-19 pandemic as a shock has caused various effects in different dimensions of fragility, including economic, financial, political, and social problems on a large scale (Banerjee and Rai, 2020). In such pandemics, which threaten our lives and public health, social isolation, lockdowns, and periods of quarantine create even more

uncertainty (Al-Omush *et al.*, 2021). Besides, jobs that did not use virtual plat-forms were severely damaged (Badrkhani, 2021).

Recent studies on Covid-19 effects on economies allow indicating which sectors are affected mainly by a coronavirus and which countries, e.g., recreational and philanthropic sectors in the US (Roy *at al.*, 2021), US electricity sector (Ruan *et al.*, 2020), the food and beverage sector (Bucak and Yiğit, 2021), UK food retailers and the restaurant sector (Panzone e*t al.*, 2021), the water sector in Europe (Antwi *et al.*, 2020). A few studies concentrate on the economic effects of COVID-19 and policy response mitigating its impact on the EU countries, (Zinecker *et al.*, 2021; Workie *et al.*, 2020). Zinecker *et al.* (2021) assume that heuristics can explain behavioral patterns and use the qualitative trend analysis to develop and explore how Covid-19 contagious disease and the EU's policy response may affect macroeconomic output.

Besides, this study underlines that many authors agree that due to the pandemic, we might face the most severe economic and social crisis since the outbreak of the Great Depression in 1929 (Zinecker *et al.*, 2021). It is worth emphasizing that the Covid-19 pandemic has also triggered negative consequences mainly in the following dimensions of fragility, economic, social, human, political, security. Liu, Xu, and Skare, (2021) analyze the existing studies on COVID-19 and the economy from bibliometrics. The discussion starts from the statistical analysis, in which the elemental distributions of the studies on different countries/regions, different publication sources, different publication years, etc., are presented. Then, Liu, Xu, and Skare, (2021) show the cooperation situations of the researchers by analyzing the related citation networks, co-citation networks, and cooperation networks. Further, the theme analysis of the associated studies is presented, and then the detailed analyses of the studies and the future research trends are introduced.

A business cycle depends on financial activity (Fisher, 1933). Well-functioning banks support technological innovation by identifying entrepreneurs who have the most excellent chances of implementing innovative products or processes. This approach was endorsed by Schumpeter (1942) and later developed by Minsky (1982). Financial fragility arises from the widespread practice of companies using debt contracts to finance production. An economy is financially fragile; in Minsky's terms, if the bankruptcy of one firm can set off a chain reaction of bankruptcies of other firms. Minsky analyzes financial fragility in a firm's cash flow accounting categories (1982; 1988).

3. Research Methodology

The research sample consists of Central and Eastern European Countries (CEECs). CEECs is an OECD term for the group of countries comprising Albania, Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, Slovenia, and the three Baltic States, Estonia, Latvia, and Lithuania (OECD Glossary of Statistical Terms…, https://stats.oecd.org/glossary/detail.asp?ID=303). The article

also uses the Fragile States Index (2020), OECD (2020), Eurostat (2021), and International Monetary Fund data (2021).

The study concentrates on implementing the FsQCA method to identify and evaluate the main drivers of economic fragility in CEECs based on Fragile States Index data. The research presents the following hypothesis: The level of fragility of CEECs has been increased during the Covid-19 pandemic. The application of FsQCA to cross-case evidence comprises three distinct phases:

1. selecting cases and constructing a truth table that defines their causally relevant characteristics,
2. testing the sufficiency of causal conditions,
3. deriving and interpreting the results.

Research methodology describes data matrix and truth table construction. FsQCA comprises several steps. The first step is to construct a truth table. Stage two reduces the number of rows in the truth table. Ragin (2006) recommends a minimum consistency of 0.75. Conversely, cases, where the outcome is not present are irrelevant and are thus absent when testing propositions. During the third stage of analysis, following a review of the truth table, an algorithm simplifies combinations and minimizes solutions.

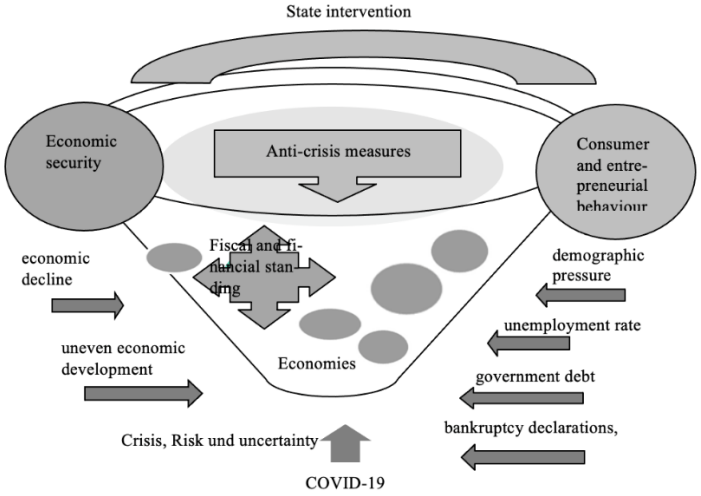
Data matrix: Qualitative Comparative Analysis (QCA) is an analytic technique for studying different cases or configurations of aspects that can lead to the same outcome. Both theory and the mechanics of the FsQCA 2.5 software program (Ragin, 2008; Ragin and Davey, 2014) are helpful to obtain information on relevant recipes and have importance in economic fragility evaluation because "such analyses provide a useful match among the tenets of complexity theory and the inherent complexity of relationships in data" (Woodside, 2014). FsQCA is a program that uses combinatorial logic, fuzzy set theory, and Boolean minimization to point out what combinations of case characteristics are necessary or sufficient to produce an outcome.

The program begins with a data matrix. Although this lists the cases as rows, as with a conventional data matrix, in the columns, case characteristics are not variables in the usual sense, but degrees of membership of a defined category, namely a fragile country case or non-fragile country case. Membership may be binary, cases are either members or non-members of a category, namely delicate and non-fragile cases. A fuzzy set allows the calibration of the degree of set membership, using scores in the interval 0.0 to 1.0. Membership scores above 0.5 indicate that a case is more in than out, while scores close to 1.0 indicate that a case is mostly in, and scores close to 0.0 indicate that a case is mostly out. Full membership (1.0) and full non-membership (0.0) are qualitative states, not arbitrary values (highest and lowest scores). Fuzzy sets are binary and metric at the same time. The set-theoretic techniques that this study uses (Ragin, 1987; 2000) are methods of exploring cross-case evidence configurational.

4. Results and Discussions

The study implements the conceptual model of main reasons interpreting CEECs economic fragility during the Covid-19 pandemic (Figure 1). This part of the article presents CEECs' Fragile States Index countries evaluation using the FsQCA method. QCA comprises several steps. The first step is to construct a truth table. Stage two reduces the number of rows in the truth table. Establishing necessary conditions should highlight cases that lead to the outcome. During the third stage of analysis, following a review of the truth table, an algorithm simplifies combinations and minimizes solutions.

Figure 1. *Main reasons for economic fragility in Central and Eastern European countries*



Source: *Own study.*

FsQCA method analyses and interprets the CEECs empirical data collected from the Fragile States Index (2020). The study analyses and uses the data of the Fragile States Index that consists of 4 main groups and 12 indicators totally (3 more indicators data relay on Eurostat and International Monetary Fund). The study analyzes 15 indicators. These groups indicate economic, social, and cross-cutting, cohesion, and political indicators. All these groups are interconnected and intervene with each other. Economic indicators include the economic decline indicator, the uneven economic development indicator, and the human flight and brain drain indicator.

The economic decline indicator considers factors related to economic decline within a country. For example, the hand looks at patterns of the progressive economic decline of the society as measured by per capita income, Gross National Product, unemployment rates, inflation, productivity, debt, poverty levels, or business failures. The uneven economic development indicator considers inequality within the

economy, irrespective of the actual performance of an economy. For example, the hand looks at structural inequality based on group or education, economic status, or region (such as urban-rural divide). The human flight and brain drain indicator consider the economic impact of human displacement (for economic or political reasons) and the consequences on development. The unemployment rate is the number of unemployed persons as a percentage of the labor force (the total number of employed and unemployed) based on the International Labour Office (ILO) definition. The unemployment data are seasonally adjusted. The data source is the quarterly EU Labour Force Survey (EU LFS), Eurostat (2021), and International Monetary Fund (2021).

The study indicates the following 15 reasons for the fragility in CEECs: economic inequality, economy, human flight, and brain drain, government debt, unemployment rate, bankruptcy rate, public services, state legitimacy, human rights, demographic pressures, refugees and IDPs, external intervention, security apparatus, factionalized elites, group grievance. All 15 conditions comprise the five main groups, namely: (1) economic decline and poverty (DECLINE), (2) uneven economic development (UNEDEV), (3) government debt (GDEBT), (4) unemployment rate (UNEMPLOY), (5) demographic pressure (DEPRESS). The model is as follows:

$$Fragility = f(EDECLINE, UNEDEV, GDEBT, UNEMPLOY, DEPRESS) \quad (1)$$

Outcome and 15 conditions correspond to the codification in Table 1. The product (fragile case) is a dichotomous variable distinguishing fragile countries from those that are not fragile (coding a weak point as 1). The analysis explains which conditions lead countries to the outcome (fragility). The FsQCA method allows verifying and evaluating if economic indicators are the main drivers of fragility in CEECs. Table 2 presents the results of selected necessary conditions that lead to fragility.

Table 1. *Codifications of outcome and selected conditions*

Outcome and conditions	Codifications
Outcome:	
Fragile country case	Fragility
Conditions:	
Economic inequality	Economic_inequality_cal
Economy	Economy _cal
Human flight and brain drain	Human_flight_brain_drain_cal
Government debt	Government_debt_cal
Unemployment rate	Unemployment_rate_cal
Demographic pressure	Demographic_pressure_cal
Bankruptcy declarations	Bankruptcy_declarations_cal

Source: *Own study.*

Coverage presents empirical relevance or importance. Consistency scores should be as close to 1.0 (perfect consistency) as possible. With consistency scores below 0.75,

maintaining that a subset relation exists is increasingly difficult. Conversely, cases, where the outcome is not present are irrelevant and are thus absent when testing propositions.

Table 2. *Results of analysis of selected necessary conditions*

Conditions tested:	Consistency (minimum consistency of 0.75)	Coverage
economic_inequality_cal	0.300000	1.000000
~ economic_inequality_cal	0.700000	1.000000
economy _cal	0.400000	1.000000
~ economy _cal	0.600000	1.000000
human_flight_brain_drain_cal	0.500000	1.000000
~ human-_flight_brain_drain_cal	0.500000	1.000000
government_debt_cal	0.360000	1.000000
~ government_debt_cal	0.640000	1.000000
unemployment_rate_cal	0.520000	1.000000
~ unemployment_rate_cal	0.480000	1.000000
demographic_pressure_cal	0.220000	1.000000
~ demographic_pressure_cal	0.780000	1.000000
bankruptcy_declarations_cal	-0.460000	1.000000
~ bankruptcy_declarations_cal	0.940000	0.643836

Note: *Outcome variable Fragility, (~) means negation of condition.*
Source: *Own study.*

According to the results, consistency does not exceed 0.75 for any conditions. Thus, any situation on its own assures state fragility. These results do not confirm the hypothesis that the level of fragility of CEECs has been increased during the Covid-19 pandemic. This is in line with French research results that indicate a relatively low level of corporate bankruptcy and good economic standing of the French economy because of public financial support.

The research shows that Poland has ranked in the stability zone with countries like Croatia, the Czech Republic, the Slovak Republic, Slovenia, Estonia, Latvia, and Lithuania. Sordi and Vercelli (2006) use qualitative dynamic analysis and numerical simulations to investigate the interaction between financial fragility, modeled in structural instability and dynamically unstable economic fluctuations. Goodhart *et al.* (2006) claim that the model they present is rich enough to include heterogeneous agents, endogenous default, and multiple commodities, and credit and deposit markets. Financial fragility in this model emerges naturally as an equilibrium phenomenon. The model also indicates how monetary policy may affect financial fragility, thus highlighting the trade-off between financial stability and economic efficiency.

According to Bernanke and Gertler (1987), the policy analysis suggests that, under some circumstances, government "bailouts" of insolvent debtors may be a reasonable

alternative in periods of extreme financial fragility. In March 2020, central banks in 42 developing countries cut interest rates, according to the World Bank, far more than in any month in 2008. Several major banks have also bought sovereign bonds, helping governments provide as much stimulus as they dare (Emerging markets..., 2020). In a small, open, developing economy, the state will likely come under pressure to absorb firms' debts in periods of financial fragility in one way or another. Thus, the financial fragility of the private sector is converted into the economic vulnerability of the public sector, and the financial crisis that occurs can appear in the form of a problem of public finance and foreign exchange reserves (Duncan, 2001).

Considering that the number of bankruptcies in 2020 has not increased in most European countries as one could expect, this phenomenon can be explained by substantial governmental financial support and anti-crisis response to mitigate the negative economic impact of the Covid-19 pandemic. It is worth mentioning that the number of bankruptcies in France decreased significantly by 36% in 2020 compared to 2019 (Cros *et al.*, 2021). A question arises if these policies may create "zombies" by reducing the exit of non-productive firms (The Economist, 2020).

Jiang *et al.* (2017) highlight the necessity and urgency of cleaning up zombie companies. Zombie enterprises are characterized by low operational efficiency and production, resulting from long-term losses or insolvency. They consume social funds and resources, and although the market should have eliminated them, they continue to exist. Research shows that overcapacity is more prominent in industries that have more zombie enterprises (Caballero *et al.*, 2008). They squeeze resources, hinder the emergence of new innovative enterprises and seriously affect improvements to social productivity. In addition, zombie enterprises can bear higher losses than public enterprises.

5. Conclusion

This article shows how a FsQCA approach can overcome the knowledge gap of current conceptual and methodological attempts to expose economic fragility's architecture of causalities. In this study, the author contributes to a theory by identifying and interpreting the main drivers of economic fragility in Central and Eastern European countries by using FsQCA in the research. Because of governments' financial support, the economic fragility factors, namely: economic decline and uneven economic development, have too low a consistency level (minimum is 0.75) and are outside the final model. This is in line with French research results that indicate a relatively low level of corporate bankruptcy and good economic standing of the French economy because of public financial intervention.

According to the results, the Fragile States Index, analyzed in the article using FsQCA, can be one of the valuable tools for practice, warning against failures at the level of economies. As a result of the economic crisis and anti-fragility measures, the national budget deficit is growing. Its reduction will be one of the main tasks of the post-crisis

period. It points out that anti-crisis actions can create conditions for promoting the zombing of the economy by their nature.

Considering future research, long-run effects evaluation of the influence of the Covid-19 pandemic on countries' fragility requires the longer perspective of assessing its negative economic and financial consequences for CEECs and comparison to non-Covid-19 times.

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