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Introducing a composite indicator of cyclical systemic risk in Croatia: possibilities and limitations

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Abstract

This research deals with several approaches to constructing a composite indicator of cyclical systemic risk accumulation with a specific focus on Croatia. Such indicators are important in macroprudential policymaking, in order to track the position of the economy in the financial cycle. Moreover, the countercyclical capital buffer (CCyB) depends on the timely and accurate estimation of cyclical risk accumulation. The credit gap as defined in the BCBS (Basel Committee on Banking Supervision) and the ESRB (European Systemic Risk Board) guidance and recommendation has shown many flaws in practice. Thus, there is a need for improvement of the methodology. That is why this paper deals with the advantages and shortfalls of existing composite indicators of cyclical systemic risks and the possibilities of introducing them in Croatia. This research contributes to a critical overview of the methodological approaches, with suggestions for their improvement, focusing particularly on the specifics of Croatian data.

Keywords: cyclical risk, macroprudential policy, composite indicator, systemic risk

1 INTRODUCTION

One of the tasks of macroprudential policy is to track the cyclical systemic risks and estimate the economy's position within the financial cycle (Constâncio et al., 2019). The reasoning is that such information is used to assess the macroprudential policy stance based on the information on existing risks, the resilience of the financial system, and the policy itself. If the policy could dampen the peaks and troughs of the financial cycle itself, it would result in positive societal benefits. As one of the main tasks of macroprudential policy is to reduce the cyclical nature of the financial cycle and reduce systemic risks when they accumulate, there is a need for continuous monitoring of indicators that help to discover the phase of the cycle in which a specific financial system is located. The Basel credit gap is considered a stepping stone in financial cycle evaluation. It is estimated as the difference between the credit-to-GDP ratio and its long-term trend calculated via the HP filter (Hodrick and Prescott, 1997). Also, macroprudential authorities use the Basel credit gap as a basis for the calibration of the CCyB (Countercyclical capital buffer)[1] to increase the resilience of the financial system.

The HP filter is the most commonly used way to estimate the Basel gap, in practice and in the literature (see BIS, 2011; ESRB, 2014; Drehmann and Tsatsaronis, 2014;

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[1] CCyB is a macroprudential instrument used to mitigate the pro-cyclical nature of bank lending and reduce risks to the financial system's stability. This buffer is used for absorbing possible losses when the crisis hits. It could help limit excessive credit growth when the optimism rises during the upward phase of the cycle, the risk appetite is higher, and risks are undervalued. In that way, the CCyB is used for mitigating the fluctuations of the financial cycle. Some evidence in favour of this is found in both theoretical (the DSGE model in Brzoza-Brzezina, Kolasa and Makarski, 2015 shows that CCyB mitigates credit imbalances in the upward phase of the cycle; and something similar is shown in Gersbach and Rochet, 2017; and Tayler and Zilberman, 2016) and empirical research (Chen and Friedrich, 2021, show that tightening the cycle of CCyB in other countries has reduced lending in Canada; Basten, 2020, shows that the CCyB activation has resulted in raising mortgage pricing in bank's pricing offers; and Couallier et al., 2022, found that capital relief measures (including CCyB) were successful in supporting credit supply).

Dell'Ariccia et al., 2012; Rünstler and Vlekke, 2016; Wezel, 2019, Škrinjarić and Bukovšak, 2022). However, there are many problems with using this indicator for measuring the accumulation of cyclical systemic risk. Some of the well-known problems include the following. The gap calculated via the HP filter (Hodrick and Prescott, 1997) is biased because of the prolonged period of excessive credit growth before the GFC (Lang et al., 2019; Galán, 2019). This means that it will take longer to close the credit gap and positive rates of CCyB will be activated only when it is too late. The HP filter is characterized by the end-point problem (Canova, 1998; Pedersen, 2001; Edge and Meisenzahl, 2011) due to greater weights given to the latest observations in the optimization function. This can affect the decision-making process concerning the values of the CCyB rate, making it unreliable in real time. Next, the credit gap is often non-stable and/or non-stationary (Kauko, 2012a; Geršl and Seidler, 2012; Rychtarik, 2014; Castro, Estrada and Martínez, 2016). Consequently, unreliable unwanted CCyB rate variations could be problematic. Furthermore, the HP filter also has problems regarding the smoothing parameter that determines the length of the financial cycle itself, as ESRB (2014) proposes the value of 400,000. This implicitly assumes that all economies have an equal length of the financial cycle (30 years), a fact that is not true in practice (see Rünstler and Vlekke, 2016; Valinskytė and Rupeika, 2015; Wezel, 2019)[2].

Also, much recent research has found other variables to be good signalling indicators of the financial cycle and future turn of the cycle. The meta-analyses of Castro, Estrada and Martínez (2016), BIS (2017), and Tölö, Laakkonen and Kalatie (2018) offer a good overview of empirical work done so far. As can be seen there, more than 90 variables were found to be helpful in modelling and predicting the financial cycle. The authors have found that observing information not only about credit developments but asset prices, housing dynamics, external imbalances, private sector debt burden, mispricing of risks, the strength of bank balance sheets, etc.

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[2] The HP filter has various other problems, which are listed as follows. First, the HP filter is a statistical method in the application of which the author must decide in advance on the value of the smoothing parameter. This affects the filtering result and the gap evaluation. Following the original article by Hodrick and Prescott (1997), when calculating the long-term business cycle trend the authors most often use lambda 1600 (100) for quarterly (annual) data. However, there are also examples of alternative proposals in the literature. In research dealing with the credit gap, lambda 400.000 is most often used because it is assumed that the financial cycle lasts longer than the business one. Another common problem is the short time series, such as those for Croatian data. The values of the obtained gaps vary significantly depending on the length of the filtered series, because they depend on the dynamics of the series the trend of which is being evaluated. Related to this are the problems of the last point and the first point, discussed in Jokipii et al. (2021) and Drehmann and Tsatsaronis (2014). The value of the gaps also depends on the period of the systemic risk accumulation phase that is included in the filtering itself; the result depends on whether we start to filter the series at the top or at the bottom of the credit cycle. For the series observed here, the evaluation of the long-term trend and the filtering process also includes the period of credit expansion before the global financial crisis. After that there is a prolonged period of reduction in the value of the gap (see Lang et al., 2019; Galán, 2019). Also, the HP filter creates apparent cycles (Cogley and Nason, 1995), has poor real-time properties (Kamber, Morley and Wong, 2018), and is imprecise at the ends of the time series (Hamilton, 2018). Finally, the credit to GDP ratio is based on a stock variable in the numerator and a flow variable in the denominator, which makes it sensitive to sudden shocks in GDP. It could therefore result in signals misleading for macroprudential policy, e.g., leading to further tightening after the onset of a recession (Gross, 2022). See Škrinjarić and Bukovšak (2022), which deals with all of these issues in the case of Croatia.

facilitate the modelling process of the financial cycle itself, and consequently, the decision-making process of important macroprudential issues. However, when dealing with many data at once, policymakers are synthesizing the information into one single measure, a composite indicator of cyclical systemic risk. For example, in a recent study, Arbatli-Saxegaard and Muneer (2020) overview current central bank practices in the CCyB rate decision-making process. It shows that European countries included in the research use 6 to 35 different individual variables as indicators within the analysis of the cyclical risk build-up. Other newer applications of composite indicators are found in Plašil et al. (2015) and Plašil, Seidler and Hlaváč (2016) for the Czech National Bank; Lang et al. (2019) for EU countries and Rychtárik (2014, 2018) in Slovakia. Based on developments in different risk categories, the common factor of all these approaches is that all the information is summarized in composite indicators that facilitate the risk monitoring process. Composite indicators are, thus, useful to determine the economy's position within the financial cycle on the one hand and to provide detailed information about the dynamics of individual indicators that enter the composite indicator itself, on the other hand. Moreover, research proves that using such composite indicators helps mitigate systemic financial crises and their adverse effects on output (see Laeven and Valencia, 2012; Lo Duca et al., 2017).

That is why this paper gives a critical overview of the existing composite indicators regarding their motivation, methodology, advantages, and shortfalls. Based on these findings, comments about possible improvements can be applied in general, as well as regarding Croatian data. The empirical part of the paper will evaluate the possibilities of constructing an indicator for Croatia. The macroprudential policymaker can observe changes in the total cyclical systemic risk accumulation by obtaining such results in a composite indicator. In more detail, the sources form different risk categories. Furthermore, such an indicator offers insights into the financial conditions of the economy, providing signals of cyclical risk build-up. As financial systems are complex, the cyclical risk build-up can be observed better through a composite indicator. When the composite indicator is defined in practice, it is instrumental in giving information about the aggregate cyclical risk behaviour. It also provides information about the dynamics within sub-categories of the indicator itself, which should be monitored according to Comelli and Ogawa (2021). This is some of the reasoning on why such an indicator is better in practice than the Basel credit gap. Taking everything into consideration, the whole process is, of course, challenging. That is why many central banks use heat maps to consider cyclical risks. Although the main conclusions are obtained via some aggregation, a sole indicator is harder to obtain. This is corroborated by Arbatli-Saxegaard and Melle Johansen (2017), where the authors argue that a heat map can capture the complex set of information and factors about the financial cycle. Aikman et al. (2015), in their review of the IMF, Offices of Financial Research, and Bank of England approach to financial cycle monitoring, conclude that all three institutions employ a significant number of indicators, with two of them using heat maps as visualization tools (alongside spider charts) to summarize all of the information better.

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Focusing on Croatian data could be interesting for international readers for the following reasons. Croatia has had one of the most proactive macroprudential policies ever since the early 2000s, actively attempting to manage credit growth alongside capital inflows (see Kraft and Galac, 2011). This is especially true for the pre-GFC period, as Croatia was at the forefront of the creation of a timely countercyclical macroprudential policy (Vujčić and Dumičić, 2016). Thus, some specific happenings in the economy and financial sector, alongside the macroprudential activity of the Croatian National Bank (CNB), could be beneficial for other countries or those whose authorities are becoming more active.

A composite indicator can be used in the next step to calibrate the CCyB values concerning the evaluation of the position of the financial cycle. Thus, managing an active CCyB rate can help mitigate systemic risk crises over time, which have resulted in significant losses in the past (see Laeven and Valencia, 2012; Lo Duca et al., 2017). Finally, the purpose of constructing a composite indicator of cyclical systemic risk in this research is threefold. It could be used to determine the phase of the financial cycle, some components could be used as early warning indicators, as they are based on such methodology, and it could be a good tool for communication with the public, as changes in its components can be interpreted more efficiently than by the individual tracking of dozens of indicators.

2 GENERAL INFORMATION ABOUT COMPOSITE INDICATORS AND VARIABLE SELECTION

2.1 ABOUT COMPOSITE INDICATORS IN GENERAL

Cyclical composite indicators are discussed in handbooks such as the one by the EU and UN (2017). They list the main characteristics of such indicators, such as objectivity, freedom from bias, methodological soundness, clarity, transparency, interpretability, consistency, comparability, and readability. This is hard to achieve in practice, as the selection process of variables of interest has some bias due to the analysis of specific issues as well as occasional interpretability issues, depending on the approach of constructing the composite indicator itself. Other necessary and desirable properties are described in OECD (2012), which states that variables included in the composite indicator should have economic relevancy, the highest data frequency possible, without many data revisions, series breaks or publication lags. This is almost impossible to achieve in practice due to the nature of the data being observed and monitored for the analysis of cyclical behaviour, dealing with quarterly data that is usually published with a lag of several months in some cases, etc.

Figure 1 depicts the basic steps that need to be followed to construct a reliable indicator. The procedure seems straightforward at first, but many issues arise at each step. Step one includes the variable selection process, which depends on theory and/or empirical research, to correctly determine relevant indicators that represent the phenomenon. Due to the individual variables being expressed in different measurement units, the second step includes proper data preparation

(normalization or standardization) to be comparable. Moreover, if the idea is to measure specific dynamics, e.g., seasonality in data is an excess, it should be properly removed. The third step compares all potential candidate variables from steps one and two based on the primary goal of the indicator. For example, if the main idea is to construct a leading indicator, then forecasting methods are utilized to compare the variables in their forecasting properties. Finally, when the individual variables are ranked concerning their performance in step three, the last step aggregates all information into one composite indicator. Here, the main question concerns the distribution of weights across the individual indicators. Of course, in practice, the process is not so straightforward, and some of the steps will repeat.

FIGURE 1
Composite indicator construction steps
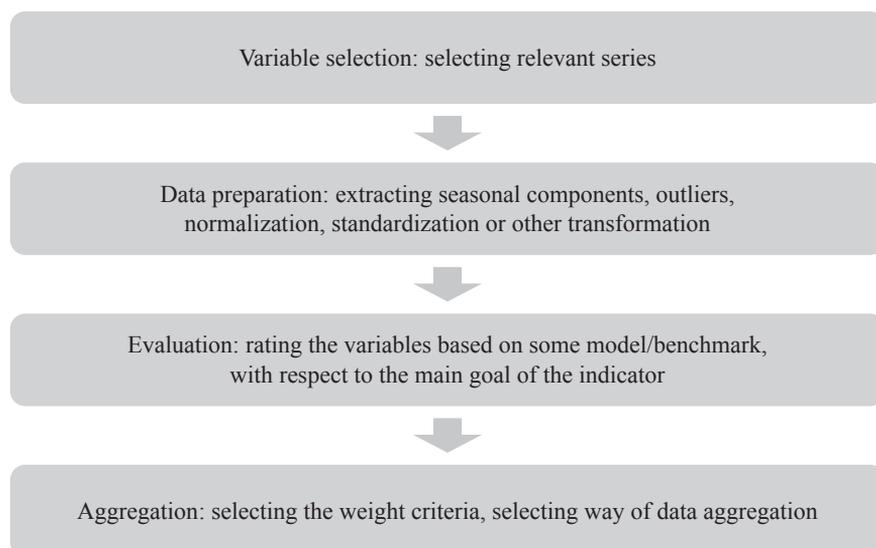
Source: Author's adjustment based on OECD (2012).

2.2 VARIABLE SELECTION FOR THE COMPOSITE INDICATORS
This section describes general ideas and explanations about several categories of risk measures that need to enter a composite cyclical risk indicator. The reasons for the importance of these variables for measuring cyclical risk movements are also explained. As the ESRB (2014) Recommendation has six categories of variables that indicate the build-up of system-wide risk associated with periods of excessive credit growth, a good composite indicator should include variables that follow within these categories. They include measures of potential overvaluation of property prices, credit developments, external imbalances, the strength of bank balance sheets, private sector debt burden, and potential mispricing of risk.

The category of potential overvaluation of property prices consists of variables that are most common in good early prediction of financial crises. Borio (2012), Jordá, Schularick and Taylor (2015), and Behn et al. (2013), among others, find

that overvaluation of property prices in combination with excessive credit growth is the best early warning signalling variable. The movements of loans in the economy and real estate prices are highly correlated. This is because real estate purchase is usually financed by lending. Moreover, such loans make up a large part of banks' balance sheets, making them vulnerable to large changes in real estate prices (Tölö, Laakkonen and Kalatie, 2018). The wealth effect is one of the incentives for higher real estate demand (Bakker, 2015), which creates price pressures in the upward phase of the financial cycle. This further stimulates credit expansion due to the increased value of the collateral (Bernanke and Gerlter, 1995; Kiyotaki and Moore, 1997). According to some research, property price movements have even preceded credit dynamics in some countries (see Grinderslev et al., 2017). Property price movements are sources of risk for households, corporations, and credit institutions. High property prices burden the private sector that finances house purchasing via bank loans. This can reduce the rest of private consumption. In addition, credit institutions hold real estate as collateral, which affects the value of balance sheets and price changes.

Credit dynamics is probably most commonly monitored in practice and investigated in empirical research. This is due to lending being the core business of credit institutions and thus affecting financial stability and cyclical risk accumulation. Alongside the property price dynamics, credit dynamics and developments have been proposed as the best predictors of crises in previous research (see Borio and Lowe, 2002; Borio and Drehmann, 2009; or Aldasoro, Borio and Drehmann, 2018). In periods of economic growth, optimism rises, and a reduced perception of risk characterizes economic agents. Expectations about future revenues are high, the private sector is more prone to taking loans, and credit institutions are more inclined to giving them to riskier clients (Plašil, Seidler and Hlaváč, 2016). Changing risk tolerance is assumed concerning the state of the economy, wealth, and balance sheets. These concepts are not new, as changeable risk aversion and tolerance were found in Minsky (1975, 1982, 1986). Here, the financial instability hypothesis states that after the turbulent period of the financial cycle is over, the economy is on a new path towards equilibrium and the recovery phase is in financial tranquillity. Policymakers and financial regulators are easing their regulatory standards, credit spreads are falling, and lenders are starting to approve loans they otherwise would not. At the same time, borrowers are showing speculative behaviour, and lending is increasing until a financial crisis materializes, with rising interest rates and declining lending. Then, the recovery phase follows, and the cycle continues. This relates to Borio and Zhu (2011), where the changing risk tolerance is related to monetary policy and its effects on credit institution behaviour. It explains the risk-taking channel as the effects of interest rate change on risk perceptions, which is reflected in the riskiness of the bank portfolio.

There is evidence that loans granted during a period of economic expansion have a greater default rate than those made in periods of slow credit growth (see Jimenéz, Salas and Saurina, 2006). Credit cycle studies are mostly focused on

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private sector credit growth and overheating, such as Babecký et al. (2014), Schularick and Taylor (2012), Borio and Drehmann (2009), Giese et al. (2014). Furthermore, as Jordà, Schularick and Taylor (2013, 2017) find, deeper recessions follow credit-intense booms and, empirically, financial factors and credit play an essential role in business cycle dynamics. The private sector debt burden has been considered both theoretically and empirically (see Rinaldi and Sanchiz-Arellano, 2006). If the debt burden is too high, this reduces financial stability. Accumulation of debt burden in the private sector in the short run affects consumption and GDP growth. In the long run, it spills over onto the whole financial system (Lombardi, Mohatny and Shim, 2107). This is the reason why a part of the literature is focused on monitoring variables within this group of measures, where it examines the debt burden or debt servicing ratios (see Giese et al., 2104; Detken et al., 2014; Drehmann and Juselius, 2012, 2014). As Plašil, Seidler and Hlaváč (2016) explain, accelerated debt-to-income ratio growth can indicate that the private sector overestimates its future possibility of debt repayment. This means that there is a decrease in solvency as a consequence of the worsening of the financial situation.

Measures of external imbalances are related to credit growth in an economy outstripping growth in GDP and domestic savings (Tölö, Laakkonen and Kalatie, 2018). The current account deficit is interpreted as investment in the economy greater than the sum of private and public savings (Plašil, Seidler and Hlaváč, 2016). This can lead to future problems with repayment of loans obtained from abroad (Giese et al., 2104). In Laeven and Valencia's (2008) study, in total 39 out of 41 economies had a current account deficit in the years that preceded financial crises in the past. Other relevant variables that were found to be informative of future crises were net exports, capital account dynamics, terms of trade, and gross external debt, as found in a meta-analysis by Tölö, Laakkonen and Kalatie (2018). Interested readers can refer to Kaminsky, Lizondo and Reinhart (1998), which gives a review of currency crises as they are related to external imbalances.

Banking sector vulnerability should also be visible in banks' balance sheets. However, there are some problems regarding variables within this group of measures. Tölö, Laakkonen and Kalatie (2018) found that these variables are rarely used as there is a publication lag of such measures, based on balance sheets and financial reports. Research finds significant and non-significant future crisis prediction results based on such variables. For example, Detken et al. (2014) found that the study's capital-to-asset ratio (the leverage ratio) had poor predictive power. On the other hand, Laina, Nyholm and Sarlin (2015) and Kamin and DeMarco (2012) found that a greater leverage ratio had future stabilizing effects on the financial system. In that way, the capital of a credit institution should be able to serve as a measure of the loss-absorbing capacities when the private sector stops repaying the loans. The greater the capital, the smaller the probability of future deleveraging during the financial downturn. Moreover, the economy-wide debt and leverage dynamics directly relate to such bank credit and leverage dynamics. With some economies, such as the US, it was important in non-bank credit as well.

This group also includes the ratio of (negative value) deposits and credit to the private sector, providing information about financing from stable sources, not depending on issuing securities or financing by borrowing.

Measures of potential mispricing of risk include distorted risk perceptions of the private sector and the bank sector. Distorted risk perception during some phases of the financial cycle can contribute to the accumulation of systemic risk. That is why this group of measures includes financing conditions variables, which measure the risk perception of credit institutions. Bordalo, Gennaioli and Shleifer (2018), López-Salido, Stein and Zakrajšek (2017), and Gross (2022) show that credit spreads fall during boom times. Furthermore, such falling spreads actually reflect rising risk, due to structurally falling volatility, disguising/dominating rising risk from growing indebtedness/leverage. Thus, this group of measures includes the interest premium regarding the private sector over a referent interest rate (such as the national interest rate or Euribor). Moreover, there are different economic accelerator types, defined and depicted in detail in Gross (2022). They include the collateral one (Bernanke, 1999, collateral value is procyclical and amplifies mispricing during upswings), mispricing (Jiménez, Salas and Saurina, 2006, regarding lending standards), herding behaviour (Kirman, 1992), and others. Other measures of risk mispricing are stock prices and their dynamics, as they can complete the total picture (Plašil et al., 2015). To summarize, Pfeifer and Hodula (2018) explain that credit institutions have greater estimation errors during the expansion phase of the financial cycle on the future non-repayments of given loans. If the share of nonperforming loans in total loans is very small at the peak of the financial cycle, credit institutions are realizing profits that are cyclically over-estimated. Thus, a bank prudence indicator is developed in the mentioned study by Pfeifer and Hodula (2018). It represents another measure of potential mispricing of risk, and it depends on such explanations.

Finally, as some approaches include some macroeconomic variables as additional information in the modelling process, here we examine the dynamics of business cycles. Rychtarik (2014) offers some reasoning on why macroeconomic variables should be tracked and explains that financial institutions could fuel macroeconomic imbalances, i.e., there could be spillovers of risk accumulation onto the real sector as well. Detken et al. (2014) add that macroeconomic imbalances and conditions affect the ability to repay loans (e.g., an increase in unemployment increases credit risk). Moreover, monetary indicators could also reflect problems: changes in money supply could affect asset prices (Adalid and Detken, 2017). Another example is foreign debt, which could reflect differences between information that the foreign lender and domestic creditors have (Kauko, 2012b).

3 REVIEW OF COMPOSITE INDICATORS FOR FINANCIAL CYCLES

3.1 FINANCIAL CYCLE INDICATOR

3.1.1 GENERAL DESCRIPTION OF FCI

The financial cycle indicator (FCI) developed by Plašil et al. (2015) estimates the economy's position within the financial cycle. The authors select the main variables that enter FCI with respect to the previous theoretical literature (such as Borio, 2012; or Borio and Zhu, 2011). In these works the financial cycle is observed via changing risk assessment by different economic agents. In the upswing of the cycle, the FCI indicator is interpreted as the risk accumulation within the financial system with respect to changed risk perceptions of different economic agents. Greater optimism in one sector should contribute to a greater FCI value. Moreover, if several sectors have similar risk perceptions, this should also be reflected in greater FCI values, i.e. correlation among the dynamics of risk perceptions matters within this approach. Formal construction of this indicator is based on Holló, Kremer and Lo Duca (2012). $w = (w_1, w_2, ..., w_M)$ is the vector of weights i, $i \in \{1, 2, ..., M\}$, values of transformed variables are given in vector $s_t = (s_{t,1}, s_{t,2}, ..., s_{t,M})$ for every period t, and FCI$_t$ indicator in period t is a nonlinear function constructed as:

$$FCI_t = (w \odot s_t)' \cdot C_t \cdot (w \odot s_t) \tag{1}$$

where $\odot$ is the Hadamard product of matrices, and C_t is the correlation matrix for values s_t. The correlation coefficients are estimated via the EWMA (exponentially weighted moving average) approach, with the smoothing parameter of value $\lambda = 0.94$ (RiskMetrics, 1996):

$$\sigma_{ij,t} = \lambda \sigma_{ij,t-1} + (1 - \lambda)\tilde{s}_{i,t}\tilde{s}_{j,t}$$
$$\sigma_{i,t}^2 = \lambda \sigma_{i,t-1}^2 + (1 - \lambda)\tilde{s}_{i,t}^2 \tag{2}$$
$$\rho_{ij,t} = \sigma_{ij,t} / (\sigma_{i,t}\sigma_{j,t})$$

where $\sigma_{i,t}^2$ are variances of each series i in period t, $\sigma_{i,t}$ are standard deviations, $\sigma_{ij,t}$ are the covariance between series s_i and s_j, $\rho_{ij,t}$ are correlation coefficients and $\tilde{s}_{i,t}$ are the values of each series reduced by the median value. Values $s_{i,t}$ are obtained from original data in $x = (x_1, x_2, ..., x_N)$, ordered from the smallest to the greatest value: $(x_{[1]}, x_{[2]}, ..., x_{[N]})$, $x_{[1]} \le x_{[2]} \le ... \le x_{[N]}$, where $[r]$ is the rank of value $x_{[r]}$. And finally, values s_t are obtained from the empirical cumulative function distribution as follows:

$$s_t = \begin{cases} \dfrac{r}{N}, & if \ x_{[r]} \le x_t < x_{[r+1]} \\ 1, & if \ x_t \ge x_{[r+1]} \end{cases}, \ 0 < s_t \le 1 \tag{3}$$

for $t = 1, 2, ..., N$. Due to this transformation, the FCI values will fall within the same interval, with greater values (closer to 1) indicating greater accumulation of

risk[3]. The authors utilize the transformation based on order statistics to preserve the original data properties. Moreover, normalization is not utilized, as the majority of used data does not follow a normal distribution[4]. Table 1 shows which variables are used for FCI construction. It would be ideal if the FCI indicator and variables that enter it are stationary. In that way, the modelling process is easier as stationary, or at least stabile indicators have known distribution parameters that can be modelled.

TABLE 1

Variables used in Plašil et al. (2015) for FCI indicator

Full name	Risk category covered	Unit measure
New bank loans to households	Credit developments	Q sum of monthly new loans
New bank loans to nonfinancial corporations		
Property prices	Potential overvaluation of property prices	Year-on-year change
Household debt and gross disposable income ratio	Private sector debt burden	Year-on-year growth rate
Nonfinancial corporations debt and gross operating surplus ratio		
Spread between rate on new loans to households and 3M PRIBOR (multiplied with -1)	Potential mispricing of risk	% annually
Spread between rate on new loans to nonfinancial corporations and 3M PRIBOR (multiplied with -1)		
PX 50 stock index		Three-month average
Adjusted current account deficit and GDP ratio (multiplied with -1)	External imbalances	% annually

Note: All variables in the table in the described form indicate that the greater the value, the greater the risk accumulation is.

Source: Plašil et al. (2015).

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[3] Before the transformation, it should be noted that the interpretation of the variable is such that greater values indicate whether risks are high or not. This applies to all composite indices. Those variables whose greater values indicate lower risks are multiplied with -1 value so that everything is comparable. In this research, credit spreads are multiplied by -1 to obtain the interpretation that higher value means more risk for the composite indicators. Due to those spreads falling before a bust occurs, lower spreads imply more risk. Thus, the multiplication by -1 results in the interpretation of "more risk" for the sake of the composite indicator value. As Croatian data are such that the credit spreads are falling in the entire period, not exhibiting cyclical dynamics, the one- or two-year changes were calculated in the first step, but to obtain the same interpretation of greater value of the variable means more risk, those changes are multiplied by -1.

[4] The order statistics approach does not change the shape of the original data distribution. It rather rescales the data to an interval such that different individual variables can be comparable if they have different measurement units. On the opposite side, data normalization assumes that original data follow a normal distribution, that the first two moments of the distribution are enough to explain the distribution itself, and the distribution is symmetric. Suppose this is not the case for the original data. In that case, the interpretations about how many standard deviations an observation is above or below the mean do not have any meaning if this mean is not representative of the sample.

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3.1.2 COMMENTS ABOUT THE FCI INDICATOR

The original paper does not fully describe the selection of variables for FCI. Although the selected variables make sense as they cover basic risk categories, there is no explanation of the chosen unit measures, the appropriateness of the selected variables, or their comparison to other relevant ones within each risk category.[5] There are some issues with the method of covariance estimations. EWMA assumes that the dynamics of covariances and variances are the same for all series (the same smoothing parameter). Unfortunately, there is no universal answer about how to choose this parameter. An ideal way to determine this value would be to minimize some of the forecasting measures (such as root mean squared error, see Bollen, 2014) in which the value of FCI is compared to a true realized volatility. Next, the data used in constructing the FCI indicator is on a quarterly frequency, and the variables are more sluggish than not. Therefore, it is advisable to use a greater value in such an analysis. Also, the greater the value of this parameter, the smaller the standard error of the variance estimator. In terms of costs and benefits for capturing the systemic risk, there are not many differences between larger or smaller lambda values besides smoothing out the final value of the composite indicator.

Moreover, the EWMA approach is more parsimonious than more complicated approaches, such as the DCC (dynamic conditional correlation). However, such an approach needs many more available data to obtain reliable estimations, something which is currently not available for Croatian data. Finally, another problem is how to determine the weights of each variable in the composite indicator. Practice often employs equal weights within a sub-category so that individual variables do not affect the outcome in a great manner. Another approach is found in Hájek, Frait and Plašil (2017). In this paper, the authors forecast future nonperforming loans (NPL) dynamics as a risk materialization variable using the FCI indicator. A final suggestion on how the weights can be determined is to estimate the EWM for every variable included in the indicator and give greater weights to those that had better predictive performances in crises.

3.2 CYCLOGRAM AND CYCLOGRAM+
3.2.1 GENERAL DESCRIPTION OF THE CYCLOGRAM

The cyclogram was developed in Slovakia in Rychtarik (2014, 2018). It is based on a linear aggregation of several risk measures categories. The basic approach here is to define core variables that determine the cycle. Afterward, the information is completed with supplementary variables (such as unemployment dynamics, consumer sentiment, etc.). There are two versions of this indicator: the cyclogram and the cyclogram+ (greater number of variables). The variable selection process is not detailed in the original research, as authors describe that the

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[5] To ensure better comparability among countries, the variable selection process should be as objective as possible. Although the rationale for the risk categories used in the original FCI paper is given, the specific variable selection is not based on a literature review in terms of theory and practice. Tölö, Laakkonen and Kalatie (2018) and Lang et al. (2019) provide good examples of how the whole variable process selection should be based.

selection was made by the usual monitoring process of cyclical risks, especially based on the dynamics of the variables before GFC. The value of the cyclogram in every quarter t is calculated as the simple average value of the transformed variables $z_{i,t}$ as follows:

$$Cyclogram_t = \frac{\sum_{i=1}^{N} z_{i,t}}{N}, \tag{4}$$

and cyclogram+ is a weighted average of the risk groups that are observed. Thus, formula (4) could be rewritten as:

$$Cyclogram+_t = \sum_{i=1}^{N} w_i z_{i,t}. \tag{5}$$

The transformation of the variables is done in such a way that the values are ordered from the smallest to the maximum value. Then, variables are divided into deciles as shown in formula (6):

$$z_{i,t} = \begin{cases} 1, & if \ ordered_{i,t} < x_{i,t}^{10\%} \\ 2, & if \ x_{i,t}^{10\%} \leq ordered_{i,t} < x_{i,t}^{20\%} \\ \dots \\ 9, & if \ order_{i,t} \geq x_{i,t}^{80\%} \end{cases} \tag{6}$$

There is a modification for cyclogram+, so that the max-min transformation is used:

$$z_{i,t} = \frac{x_{i,t} - x_{min}}{x_{max} - x_{min}} \tag{7}$$

where $x_{i,t}$ is the original value of a variable and x_{min} and x_{max} are the minimal and maximal values of x. The transformation can be made such that the values fall in the interval [-1,1], i.e., $z_{i,t} = \frac{2(x_{i,t} - x_{min})}{x_{max} - x_{min}} - 1$. Table 2 lists the variables included in the cyclogram. However, there is a problematic part in macroeconomic variables. Since they follow a business cycle, their dynamics lag. For example, when a downturn of the GFC happened, the changes in unemployment lagged compared to other variables, which captured the pre-crisis accumulation of risk. In addition, some variables are monitored in their levels and some in form of change (via change or statistical gaps). This makes the decision somewhat subjective and hard to communicate.

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TABLE 2

List of variables used in the cyclogram (and +)

Risk category	Variables		Transformation
	Cyclogram	**Cyclogram+**	
Lending market	Credit-to-GDP gap HH Credit growth HH Credit growth NFC	Credit-to-GDP gap HH Credit-to-GDP gap NFC Credit growth HH Credit growth NFC	HP gaps Differences
Risk appetite	NPL values Default rates of NFC	NPL values HH NPL values NFC Default rates of NFC Interest rate margin HH Interest rate margin NFC	Everything in levels
Indebtedness	Indebtedness of HH Indebtedness of NFC		Both in HP gaps and levels
Property market	Residential property price Price to income ratio	Residential property price Residential property price in main city Price to income ratio Price to rent ratio Flat to house price ratio	Growth rate and levels
Macroeconomy	ESI Unemployment rate Output gap	ESI Unemployment rate Output gap Revenue gap Current account deficit to GDP ratio	HP gaps and levels

Note: The gap denotes the HP gap, NPL denotes nonperforming loans, HH and NFC are house-holds and nonfinancial corporations, y-o-y is the year-on-year change or growth rate, ESI is the economic sentiment indicator. All variables in the table in the described form indicate that the greater the value, the greater the risk accumulation is.

Source: Rychtarik (2014, 2018).

3.2.2 COMMENTS ABOUT THE CYCLOGRAM

The basic idea of the cyclogram is not much different from that of the FCI indica-tor, but correlations are not included in the analysis. Variable weights are given based on equal weights to all variables in the first version of the indicator, which was redefined into equal weights across groups of variables. The monitoring of other relevant variables, macroeconomic, for instance, is important for obtaining a bigger picture. However, the idea of a composite cyclical systemic risk is to calibrate CCyB values on time. Thus, the use of unemployment rates and NPLs is inappropriate due to their lagging behaviour compared to the turning points of the business or financial cycles. This is prominent in Croatian data as well. Whereas NPLs are used in the FCI approach to forecasting them via the leading values of FCI, here the cyclogram consists of NPLs to determine the general value of the risk accumulation. This could be detrimental for CCyB calibration, especially when taking it into consideration that the CCyB value determined in a quarter of some year is put into practice one year later.

3.3 DOMESTIC SYSTEMIC RISK INDICATOR (D-SRI)

3.3.1 GENERAL DESCRIPTION OF D-SRI

Domestic systemic risk indicator (d-SRI henceforward) was developed in Lang et al. (2019) as an ECB publication. Since then, this indicator has regularly appeared in macroprudential reports, at least at the EU or EA level. This indicator is based on the results from early warning models (EWM) of signalling financial crises on a panel of countries across several financial crises over the decades. This makes the d-SRI primarily an empirical approach to constructing the composite indicator itself. Lang et al. (2019) observe many different variables and their transformations. The value of d-SRI for a country in every quarter is calculated as the average value of transformed variables that were the best in the EWM approach:

$$d\text{-}SRI_t = \sum_{i=1}^{N} w_i z_{i,t} \tag{8}$$

where w_i is the weight associated with variable i, and $z_{i,t}$ is the transformed variable $x_{i,t}$ in quarter t, with the transformation being the normalization process:

$$z_{i,t} = \frac{x_{i,t} - x_{med,i}}{\sigma_{xi}} \tag{9}$$

$x_{med,i}$ and σ_{xi} are the median value and the standard deviation for variable i across the whole panel. The median value is selected as being more robust to outliers. Furthermore, by obtaining normalized values with panel sample specifications, the output is more comparable across countries[6]. In the EWM approach, the warning predictor is called the indicator, whereas the variable that measures the crisis period or lack of is the vulnerability variable. The latter is related to formal dates of previous crises:

$$Vulnerability_t = \begin{cases} 1, & for\ 16\ to\ 5\ quarters\ before\ the\ crisis \\ omit\ data, & for\ 4\ to\ 1\ quarter\ before\ and\ during\ the\ crisis \\ 0, & else \end{cases} \tag{10}$$

Formal crisis dates for Croatia are obtained from ESRB (2018), ECB (2017), and Dimova, Kongsamut and Vandenbussche (2016), in which the beginning of the crisis was in October 2008, with the end in June 2012. Due to the data spanning from the early 2000s, it was not possible to include the period of formal crisis in the late 1990s in the analysis (see appendix for details). Based on the values of the indicator variable, a referent, i.e., threshold value τ is found in the optimization process, such that the errors type I and II (T1 and T2) are minimized. Potential indicators are compared based on the results from the optimization procedure[7]. In

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[6] Although some of these transformations lead to similar dynamics and conclusions, when dealing with data without normal distributions, such as the data in this study, one cannot use any transformation. This is important for, e.g., the mentioned CCyB calibration, as it often depends on the distribution of the indicator on which the calibration is based. Thus, wrong assumptions about a distribution could lead to potential misleading results regarding this buffer.

[7] Details about the ROC curve, AUROC values, and other relevant indicators and mathematical background can be found in Candelon, Dumitrescu and Hurlin (2012) and references within.

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the original paper, Lang et al. (2019) included six variables after all the rankings were done within each risk category. Those that entered the indicator were: the two-year change in the bank credit-to-GDP ratio, the two-year growth rate of real total credit, the two-year change in the DSR (debt to servicer ratio), the three-year change in the RRE price-to-income ratio, the three-year growth rate of real equity prices, and the current account-to-GDP ratio. The weights given to these variables follow the regression results in which each of the variables were explanatory, and the vulnerability was the dependent variable. The regression coefficients were rescaled so that their sum is equal to 1.

3.3.2 COMMENTS ABOUT D-SRI

The variable selection process here is objective and clear, due to EWM being a basis for variable comparison. Although future crises will not necessarily have the same causes, a starting point is needed. Thus, it is possible to use the EWM procedure to select a core group of variables that should be important when tracking risk accumulation. On the other hand, like others in this study, this approach relies on historical data and the observation of specific dynamics before and during crises that will not necessarily be repeated in the future. Therefore, such modelling should consider this issue and be flexible and adjustable. As the original paper utilizes panel data, the normalization process can be performed as noted in the previous sub-section. However, when dealing with non-normal data, other transformations are better. This could be the rank or the max-min. In addition, when dealing with one country or crisis in the sample, such as the Croatian case, it is possible to give equal weights over every risk category, to minimize the estimation bias. In that way, if the policymaker decides to change the structure of a risk category by including new variables or excluding existing ones, the weighting scheme allows the final indicator value not to be greatly affected (as it would be by, e.g., removing a variable from the sample).

3.4 OTHER POPULAR METHODS OF AGGREGATION OF DATA
3.4.1 PRINCIPAL COMPONENTS ANALYSIS

Principal components analysis (PCA) is used for correlated variables, where the original dataset is converted into a new set of uncorrelated principal components. PCA can be useful to reduce the analysis's dimensionality when the original dataset has many variables. One recent application to determine the financial cycle is found in Karamisheva et al. (2019). However, PCA analysis rests upon a number of assumptions, such as the linear relationship between the variables, the first two moments of the variable distributions being enough to describe them, etc., see Jackson (1991).

3.4.2 OVERHEATING INDEX

The overheating index (OI) is suggested in Chen and Svirydzenka (2021). The authors rely on the EWM model to obtain the signalling properties of every variable that was a potential candidate to enter the composite indicator. But, compared to the d-SRI, the basis on which the OI is constructed is the values of the variables

that exceed a certain threshold value. A binary variable I^i is defined as equal to 0 value if the original value does not exceed a threshold and 1 otherwise. Now, the OI indicator is calculated as:

$$OI_t = \sum_{i=1}^{N} w_i I_t^i \tag{11}$$

where weight w_i is also determined with the EWM results. Errors type I and II are calculated for every indicator and based on their values, weights are assigned in (11) such that indicators with smaller errors have greater weights, and vice versa. One problem with this approach is that the indicator can depend on one or only several variables exceeding their threshold values. In turn, it can be more volatile than other composite indicators. Thus, the stability of the indicator could be questionable.

3.4.3 AIKMANN ET AL. (2015) APPROACH

Aikmann et al. (2015) examine several approaches to aggregating data into one indicator. The following is the main formula for aggregating data:

$$V_t = \left[\sum_{i=1}^{N} w_i (v_{i,t})^r \right]^{\frac{1}{r}} \tag{12}$$

where V is the indicator of cyclical risks or vulnerabilities, calculated as a linear combination of sub-indices v_i, and w_i are their weights. The assumption of constant elasticity of substitution between each sub-indicator, the parameter r is introduced, with $1/(1-r)$ being the value of the mentioned elasticity of the substitution[8]. In general, introducing the assumptions about the sub-indicator or individual variable substitution results in indicators that are hard to interpret and communicate to the public.

3.5 COMPARISON OF THE SELECTED APPROACHES

Based on the previous overview of the selected approaches, we can compare their advantages, shortfalls, and some possibilities for Croatian data application. In general, all composite indicators are good at summarizing the information within each risk category into one number. It would be more difficult to track the dynamics of individual indicators in parallel, especially when the CCyB values need to be calibrated. However, the differences are as follows.

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[8] The authors do not explain why they choose this approach. One parallel that can be made from microeconomic theory is the interpretation of the constant elasticity of production factor substitution. The ratio of marginal contributions of each sub-indicator between two sub-indicators is always the same when the ratio increases by 1%. This is a fairly restrictive assumption.

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TABLE 3
Summary of the three main approaches for composite indicator construction

Indicator	Transformation	Method of data aggregation	Data selection criteria	Advantages	Shortfalls
FCI	Order statistics	Nonlinear function (like portfolio variance)	Financial cycle theory, previous literature, without empirical evaluation of the variable characteristics before the crisis	Takes correlation into consideration, graphical representation, no problems with statistical filters regarding data transformation, robustness due to scaling variables	Lack of objective data selection criteria, variable selection affects the dynamics of the indicator, harder to communicate, hard to evaluate the results
Cyclogram	Max min or based on percentiles of distribution	Average, weighted average	Previous experience with variable dynamics tracking	Graphical representation, no problems with statistical filters regarding data transformation, easy aggregation and interpretation	
d-SRI	Normalization, standardization or max min		Early warning models of signaling crisis	Data selection criteria, simple aggregation and interpretation, robust[9]	Correlations not observed, biased results for one country analysis
PCA	Normalization, standardization	Weighted average based on loadings on the first principal component	Any of the previous three main approaches	Simple aggregation	Assumptions of PCA analysis, changing correlations, bad predictive power of the first principal component
Geometric average	Normalization, standardization	Geometric average formula			Hard to interpret results in economic way, correlations not observed, depends on the main method of aggregation, negative values in data

[9] Lang et al. (2019) analyzed the robustness of the results via estimating the indicator in real time.

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Indicator	Transformation	Method of data aggregation	Data selection criteria	Advantages	Shortfalls
RMS	Normalization, standardization	Root mean square formula			Hard to interpret results in economic way, correlations not observed, depends on the main method of aggregation, negative values in data, lack of risk accumulation in one category is substituted with high risk in other
OI	Binary variable depending on EWM results	Average or weighted average		If based on d-SRI approach, advantages as there	Hard to interpret results in economic way, correlations not observed, depends on the main method of aggregation, negative values in data

Source: Author's preparation based on previous discussion.

Variable selection in some approaches is arbitrary. For example, the FCI study does not define how to transform variables. Other approaches, such as the d-SRI and OI, are based on the EWM approach of determining which variables and transformations were the best in signalling previous crises, which reduces subjectivity[10]. Such data selection approaches are better for country comparisons, as the variables are set. Moreover, the results can be comparable across the financial cycle and across a set of countries. By focusing more on individual indicators, it is possible to state that the FCI indicator has the advantage of including the correlation structure in its construction. If more variables tell the same story, we are more convinced that the risks are accumulating. However, this complicates the interpretation of the results. If the value of the indicator increases, we cannot be sure if this is due to an increase in the value of an individual variable, or due to the correlation[11] dynamics. The cyclogram in the original paper had the advantage of not using statistical filters and their problems (as described in the introduction).

Next, if we look at the data aggregation possibilities afterward, the approach of Aikmann et al. (2015) could have problems with negative data values. This makes the interpretability of the results harder. Policymakers have to consider communication with the public. A simple average is more worth considering. The OI index is a good starting point from which to extend the d-SRI indicator to obtain reliable results when one has more data and crises in the sample. As the OI approach is based on referent thresholds from the EWM model, it is problematic in the case of Croatia, due to the specific movements of the variables before the only crisis in the sample. This means that some referent values will not be exceeded in the future. The indicator would not show us the need to impose a positive value of CCyB, but it will be needed in reality. The PCA is a simple approach to analysis due to the focus on the first principal component results. However, there is one more problem in this approach, alongside those mentioned. When we use short time series, such as Croatian data, it is hard to test the validity of the assumptions. A summary of the three main approaches is given in table 3, alongside the comments on the rest of the approaches to aggregating the data.

4 EMPIRICAL ANALYSIS

4.1 BRIEF DATA DESCRIPTION

Quarterly series of the following data were collected for the empirical part of the study. All six risk accumulation categories are covered, as described in the second section. The starting point of a time series is 4Q 1999, with some variation due to lack of data. One such is the property price dynamics, which starts in 1Q 2002. The end of the sample is 3Q 2021. Nominal and real values of specific variables were obtained, broad and narrow definitions (credit), one and two-year

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[10] However, working with methods that do not rely on EWM has the advantage of being informative and feasible when looking at a country that did not experience notable crises in its own past, i.e., for which a LHS crisis indicator would not be quite informative/moving.

[11] Total number of correlation coefficients used in the estimation and FCI construction is a binomial coefficient, where n is over k, n being the number of variables entering the indicator, and $k = 2$.

differences, growth rates, one-sided HP gaps for 1.600, 25.600, 85.000, 125.000, and 400.000 values of smoothing parameters in the filtering process, dividing the data into that regarding households versus nonfinancial corporations, etc. For example, in the credit dynamics category, we look at both broad and narrow credits, their ratio to GDP, and all mentioned transformations. In the external imbalances category, we look at gross and net external debt, their ratios to GDP, terms of trade, current account to GDP ratio, net exports to GDP ratio, all their transformations, etc. Accordingly, the study compares more than 260 different variables in total[12].

4.2 FCI ESTIMATION RESULTS

All data were transformed into two-year differences or growth rates to obtain better smoothness of individual variables and the composite indicator itself. The original FCI paper uses the current account to GDP ratio in levels due to different dynamics compared to Croatian data. In the original form, the current account is non-stationary. Thus, we use differences instead of level values. Table 4 gives a summary of the two approaches. The first FCI variant includes yearly changes and growth rates (as in the original paper). The second variant uses annualized two-year changes and growth rates. All variables are given equal weights.

Figure 2 depicts the two variants of the FCI indicator in panels A. and B. Firstly, the FCI indicator increases significantly before the GFC due to the credit dynamics, house price increases, and changes in bank balance sheet strengths. After the indicator reached its maximum value at the beginning of 2007, there was a great fall in FCI value. As of 2017, a mild recovery is found until the end of the sample. The average correlation contribution is plotted alongside the dynamics of individual variables, as it is usually difficult to track all pairs of correlations in the model. Some variables do not have a significant positive correlation over time, meaning that the average correlation will contribute to the reduction of the total FCI indicator. Thus, the correlation contribution is plotted as negative values. For example, after 2018, the FCI indicator's value is much lower than in the period before the GFC due to variables having a lower correlation overall.

Figure 2 shows that it is relatively easy to follow the dynamics of individual variables that enter the composite indicator alongside the FCI value. However, due to the data transformation, it is harder to interpret the low-risk phase of the financial cycle. Therefore, it would be more straightforward to look at data with both positive and negative values, as this would be easier to comprehend. Moreover, as mentioned previously, the final value of the composite indicator depends not only on the dynamics of the individual variables but the correlation structure, not shown in figure 2. Finally, some variables had a later starting point. This, in turn, resulted in a relatively short period of the FCI indicator (beginning in 2004), as the correlation matrix estimation requires equal length of all series.

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[12] The full graphical representation is available in Škrinjarić (2022), on request.

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TABLE 4

Summary of two FCI variants

Abbreviation	Transformation	Variable	Risk category	FCI variant
ΔICSN	Yearly growth rate	House price index	Potential overvaluation of property prices	(1)
A. 2ΔICSN	Annualized two-year growth rate			(2)
ΔKK	Yearly growth rate	Bank loans to households	Credit dynamics	(1)
A. 2ΔKK	Annualized two-year growth rate			(2)
ΔKNFP	Yearly growth rate	Bank loans to nonfinancial corporations		(1)
A. 2ΔKNFP	Annualized two-year growth rate			(2)
Δ(LR)	Yearly change	Leverage ratio (multiplied with -1)	Strength of bank balance sheets	(1)
A. 2Δ(LR)	Annualized two-year change			(2)
Δ(LTD)	Yearly change	Credit to deposit ratio		(1)
A. 2Δ(LTD)	Annualized two-year change			(2)
Δ(K/Y)	Yearly growth rate	Debt (households) to disposable income ratio	Private sector debt burden	(1)
A. 2Δ(K/Y)	Annualized two-year growth rate			(2)
Δ(NFP/BOV)	Yearly growth rate	Debt (nonfinancial corporations) to gross operating surplus ratio		(1)
A. 2 Δ (NFP/BOV)	Annualized two-year growth rate			(2)
ΔCROBEX	Yearly growth rate	CROBEX, stock market index		(1)
A. 2 ΔCROBEX	Annualized two-year growth rate			(2)
Δ margin K	Yearly change	Household credits interest rate margin (difference between average new credits interest rate to households and 3 month EURIBOR interest rate) (multiplied with -1)	Mispricing of risk	(1)
A. 2 Δ margin K	Annualized two-year change			(2)
Δ margin NFP	Yearly change	Nonfinancial corporations credits interest rate margin (difference between average new credits interest rate to nonfinancial corporations and 3 month EURIBOR interest rate) (multiplied with -1)		(1)
A. 2 Δ margin NFP	Annualized two-year change			(2)
ΔRN	Yearly change	Current account to GDP ratio (multiplied with -1)	External imbalances	(1)
A. 2 ΔRN	Annualized two-year change			(2)

Source: CNB, author's calculation.

FIGURE 2

Selected FCI indicators and their dynamics
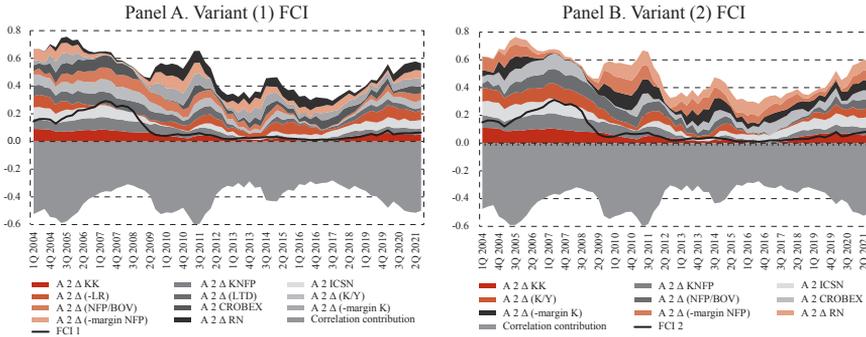
Source: CNB, author's calculation.

4.3 CYCLOGRAM ESTIMATION RESULTS

The cyclogram is the second indicator in focus. There are some problems here with including non-performing loans[13], as this variable has a lagging value compared to others that capture changes in the cycle with the preceding dynamics. Something similar holds for the macroeconomic: GDP and unemployment. The problem is that these variables also have lagging dynamics compared to changes in other variables that capture risk accumulation over time. That is why we observe two variants of the cyclogram in table 5. All risk categories will have equal weights.

TABLE 5

Cyclogram variants for Croatian case

Variant (1)	Variant (2)
Combination of variables that are transformed to annualized two-year changes or growth rates, and HP gaps, 125.000 value of the smoothing parameter[14]	Variant with GDP and unemployment dynamics

Source: CNB, author's preparation based on previous discussion.

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[13] Berti, Engelen and Vašiček (2017) find that its dynamics for the euro area are more related to the business cycle.

[14] Since it is not known how long the financial cycle lasts in Croatia, the value of 125.000 is chosen based on the assumption that the financial cycle lasts three times as long as the business cycle. This means that the financial cycle lasts approximately 22.5 years. Issues with HP gaps closing too late based on the value of 400.000 is well documented in the literature, please see Valinskytė and Rupeika (2015) or Galán (2019).

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Cyclogram variants from table 5
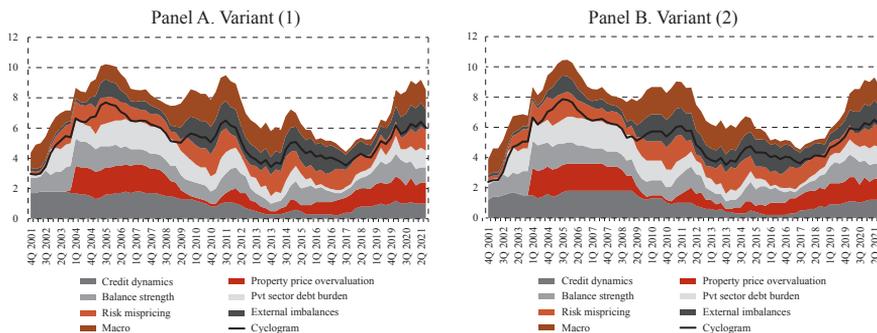
Source: CNB, author's calculation.

The results are shown in figure 3. Data transformation is done as in formula (6), meaning that all of the values are positive again, as were for the FCI case. The average value of risks is captured in the cyclogram value. However, it now shows dynamics that are harder to explain compared to the FCI values. Here, it seems that the economy is almost on the same level of risk as it was before the GFC. This is due to obtaining an average value of all positive values, without the negative correlation reduction. We know that the dynamics in the last couple of years is not as dramatic as it was at the beginning of the sample[15].

4.4 d-SRI ESTIMATION RESULTS
Based on the AUROC values from the EWM approach[16], we chose those indicators that are best in their respective risk category. Table 6 summarizes the properties of variables selected for every risk category.

Although the estimation process results are somewhat biased due to there being only one crisis in the sample, the variables chosen in table 6 overlap with related literature in the vast majority. However, it is advisable to track other relevant variables in parallel. Figure 4 depicts two variants of the d-SRI indicator based on data from table 6: panel A is the version with the median and standard deviation transformation procedure, whereas panel B is based on the max-min transformation of data. We include the latter transformation as normality tests rejected the null hypothesis for most variables in the study. Lang et al. (2019) do not recommend normalization and standardization if the data is not normally distributed. We

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[15] In the pre-GFC period, we had credit growth of 20-40% year on year for several years. The property price growth also had the highest growth rates. In the last couple of years, we do not experience this at all. Credit activity was somewhat subdued in the Covid period due to uncertainty when this crisis hit. The housing activity is not nearly as vigorous as it was in the pre-GFC period, as the index of house construction is not increasing that much, the number of building permits is smaller, and almost half of the transactions are in cash. Moreover, the banking system is more capitalized now. All of this leads to the conclusion that the economy at present is not at the same level of risk as it was in the pre-GFC period.

[16] To save space, we do not report all of the values, but the results are available upon request. Details on which dates were chosen for the formal analysis are given in appendix.

see a specific increase in all risk categories in the early 2000s and before the GFC. The Croatian domestic developments perhaps happened to correlate with broader worldwide trends pre-GFC, in the US and Europe, even for structural reasons (trade and financial connectedness). However, it is worth mentioning that Croatia did not cause the pre-GFC vulnerabilities in the US or the GFC outbreak. The risks have been accumulating again in the last couple of quarters, specifically in the categories of property price overvaluation, increasing credit dynamics and private sector debt burden. On panel B, we opt to use max-min transformation, due to data non-normality.

TABLE 6

Best indicators chosen for d-SRI calculation

Risk categories	Indicator description
Credit dynamics measures	HP gap for the broad definition of credit to households, smoothing parameter of 125,000
	HP gap for the broad definition of credit to non-financial corporations, smoothing parameter of 125,000
	HP gap for the ratio of narrow definition of credit and the sum of GDP of the current quarter and the preceding three quarters, smoothing parameter of 125,000
Measures of credit institution financing risk	Annualized two-year change in the negative ratio between credit institutions' equity and assets
	Annualized two-year change in the negative ratio between private sector deposits and credit
Measures of potential real estate price overvaluation	Annualized two-year growth rate in the residential real-estate price index
	Annualized two-year growth rate in the residential real-estate price-to-disposable income ratio
	Annualized two-year growth rate in the volume index of construction works
Measures of private sector debt burden	HP gap for the ratio between corporate debt and gross operating surplus, smoothing parameter of 125,000
	HP gap for the ratio between household debt and disposable income, smoothing parameter of 125,000
	HP gap of debt service measures – households, smoothing parameter of 125,000
	HP gap of debt service measures – corporations, smoothing parameter of 125,000
Measures of external imbalances	Annualized two-year change in the negative share of net exports of goods and services in GDP
	Annualized two-year change in the negative share of current account balance in GDP
Measures of potential mispricing of risk	Annualized two-year growth rate in CROBEX
	Annualized two-year change in the negative interest margin on new loans to households relative to the 3-month EURIBOR
	Annualized two-year change in the negative interest margin on new corporate loans relative to the 3-month EURIBOR

Source: CNB, author's calculation.

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FIGURE 4

d-SRI indicator variants
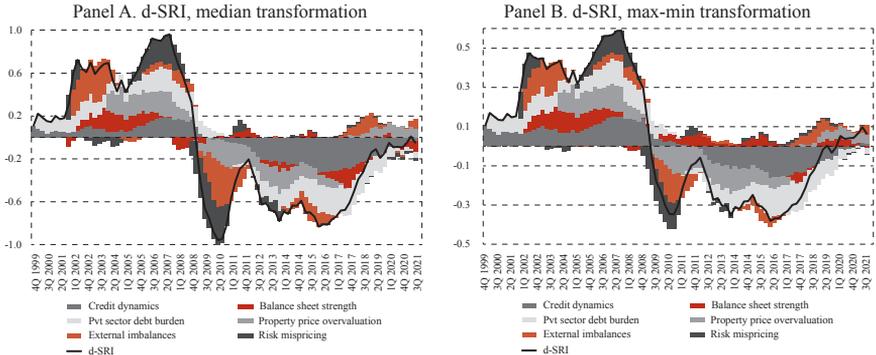
Source: CNB, author's calculation.

4.5 OTHER SELECTED APPROACHES ESTIMATION RESULTS

4.5.1 PCA APPROACH OF WEIGHTS SELECTION

Since this approach requires standardization, we observe two variants of PCA aggregation, shown in table 7 and figure 5. The resulting dynamics is a similar to another and the dynamics in figure 4. The reasoning is that PCA results have almost equal variable weights. A problem here, which is found besides the theoretical problems and assumptions, is that the two resulting PCA indicators describe 50.16% and 48.68% of the total variance. So, it seems more reasonable to use equal weights without additional analysis.

TABLE 7

Variants of PCA aggregation

Variant	Description
Variant (1)	Variables from table 6, normalization via median and standard deviation of each variable
Variant (2)	Variables from table 6, normalization via max-min approach of each variable

Source: Author.

FIGURE 5

Composite indicators based on PCA aggregation

Source: CNB, author's calculation.

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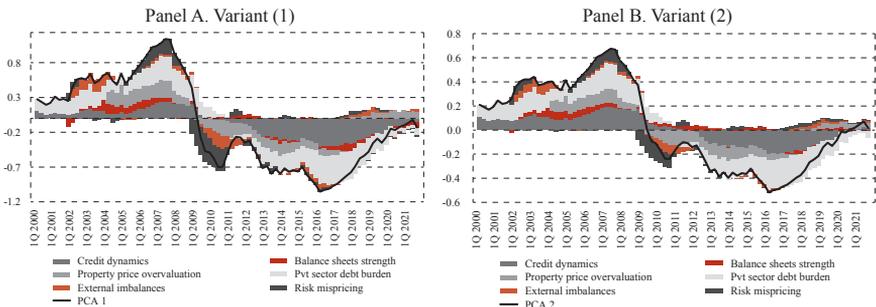
4.5.2 OVERHEATING INDEX WEIGHTS SELECTION AND AGGREGATION

When dealing with short time series, the thresholds are estimated within EWM result in values that cannot be realistically assumed for the future. This is due to specific values before the GFC in the case of Croatian data. However, for the sake of completeness, we obtain those threshold values for the best indicators from table 6 and follow the original paper to calculate the weights shown in table 8. The greatest values are given to the house price to income ratio, deposits to credit ratio, house price index, and household credits. As an alternative, we calculate the OI indicator based on equal weights for all variables as well. Figure 6 depicts both indicators, with some additional dynamics in figure 7 regarding the structure of the indicator, due to greater volatility in some individual variables, the overall OI indicator in both variants in figure 6 in some specific quarters. All risk categories contributed to the total OI value in the pre-GFC period. This corresponds to the previous indicators. In the last couple of years, the main contributors to risk accumulation were balance sheet strength, property price overvaluation and external imbalances. Two additional OI indicators in figure 8 are shown as well. The median value of each indicator is used as a threshold value, to obtain stable results.

TABLE 8

Weights assignment based on errors type 1 and 2

Indicator	Error T1	Error T2	Sum	Weight (%)
HP gap, household credit	0.08	0.08	0.16	8.84
HP gap, nonfinancial corporations credit	0.08	0.21	0.29	4.47
HP gap, narrow definition of credit	0.00	0.41	0.41	2.84
2y change, equity to assets ratio	0.50	0.00	0.50	2.15
2y change, deposit to credit ratio	0.00	0.09	0.09	15.82
2y growth rate, house price index	0.00	0.13	0.13	11.09
2y growth rate, house price to income ratio	0.00	0.09	0.09	17.14
2y growth rate, volume index of construction works	0.00	0.00	0.00	8.00
HP gap, ratio debt to gross operating surplus	0.00	0.22	0.22	6.10
HP gap, ratio debt to disposable income	0.00	0.49	0.49	2.24
HP gap, debt service ratio, households	0.00	0.49	0.49	2.24
HP gap, debt service ratio, nonfinancial corporations	0.00	0.33	0.33	3.73
2y growth rate, net exports to GDP ratio	0.00	0.61	0.61	1.57
2y growth rate, current account to GDP ratio	0.08	0.45	0.53	1.95
2y growth rate, CROBEX	0.00	0.00	0.00	8.00
2y change, interest margin, households	0.33	0.16	0.49	2.22
2y change, interest margin, nonfinancial corporations	0.25	0.19	0.44	2.60

Note: Abbreviations refer to variables from table 6, the following the sequence from first to last one as in the mentioned table.

Source: CNB, author's calculation.

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FIGURE 6

OI indicator, based on weights in table 8, and equal weights
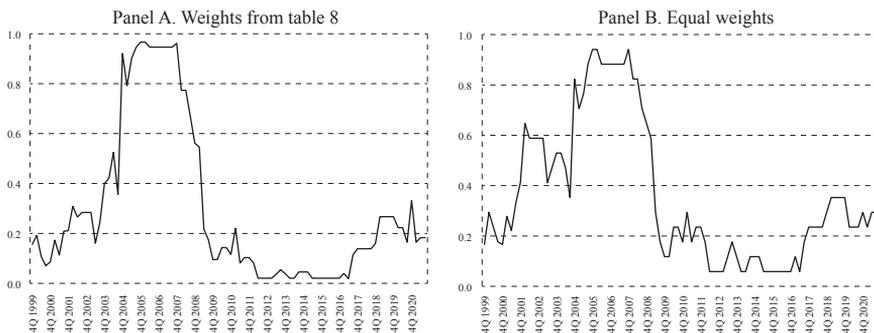
Source: CNB, author's calculation.

FIGURE 7

Structure of OI indicator, number of variables exceeding referent value, equal weights
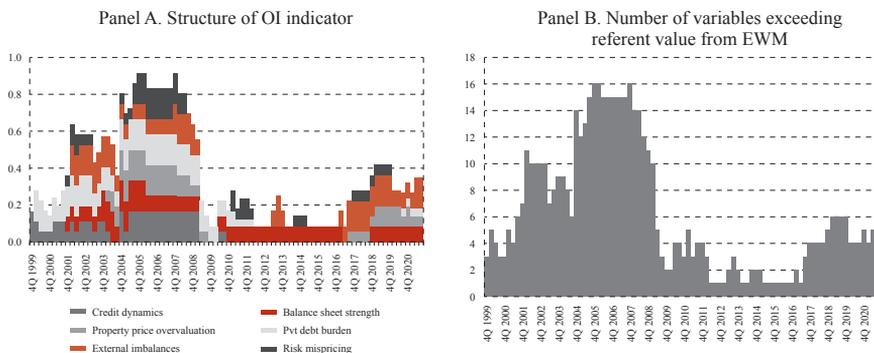
Source: CNB, author's calculation.

FIGURE 8

OI indicator, weights from table 8 and equal weights, median value for thresholds

Source: CNB, author's calculation.

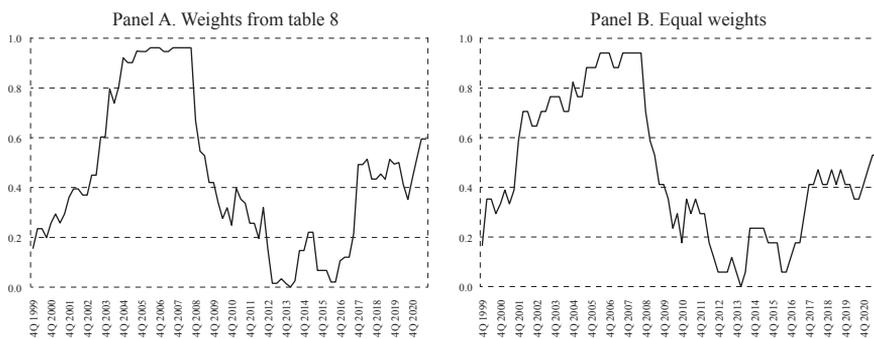### 4.5.3 THE AIKMANN ET AL. (2015) APPROACH

As a final approach to data aggregation, we look at the variants in Aikmann et al. (2015): the geometric mean calculation and the RMS (root mean square) approach. Variables are used from the d-SRI case, and the transformation is based on FCI approach. Figure 9 shows the geometric mean (panel A) and the RMS approach (panel B). The nature of calculating these indicators, especially multiplying the variables in the geometric mean setting, makes it is difficult to interpret the structure of panel A in figure 9. More intuition is given in panel B, in the RMS approach. But, squaring all variables and the final calculation of the root mean of the final value introduces nonlinearity in the procedure. Nevertheless, both indicators capture the dynamics in a way similar to that of the previous approaches, which is good. Thus, these approaches could be used as auxiliary indicators.

FIGURE 9

Geometric mean and RMS approaches of aggregating data
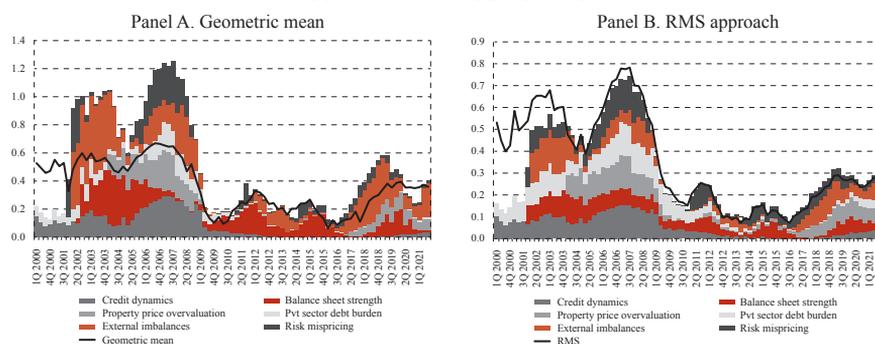
Source: CNB, author's calculation.

4.6 DISCUSSION BASED ON THE RESULTS

In this section we focus more on what we noticed in dealing with real data. To use any of these indicators or approaches in practice, we need to keep in mind that the variable selection needs to be as objective as possible, as this will ensure the validity of results to use in future tracking of cyclical risks. We need to include some subjectivity since some variable transformations have similar dynamics but one transformation is more stable than the other. For example, two-year growth rates in some cases had similar dynamics to the HP gaps for the smoothing parameter of 1,600. If we assume that a variable follows a business cycle dynamic and length in Croatia, the two-year growth rate tells almost the same story as the HP gap. The way in which to transform data in order to calculate the final indicator value, in terms of normalization, standardization, order statistics, max-min approach, was also a complex task. The more complicated the data transformation procedure is, the harder it is to communicate the results and decisions based on the indicator to the public. When dealing with real data, it is frequently found that the assumption of normality is often not satisfied. This was, of course, the case with Croatian data as well. Hence, the max-min approach to data transformation could be the best solution at the present time.

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Data aggregation proves to be important in relation to the communication issue as well. Nevertheless, due to the combination of data transformations, and the way of aggregating it, some indicators resulted in dynamics that are hard to interpret in economic terms. For example, the cyclogram results were such that the risk values of the composite indicator were almost on the level that obtained before the GFC, which is not a realistic result (see footnote 18). In addition, the dynamics of most of the variables in the last couple of years are still somewhat subdued. Some have a rising tendency, but the increase is not as near as recorded at the beginning of the sample. Data transformations need to be somewhat refined.

In general, the most promising results are obtained using the best features of several approaches: the d-SRI approach relying on the EWM to determine the best crisis predictors, the max-min transformation of data from the cyclogram, and general visualization of the results, such as the FCI or the OI index. Here, the variables are chosen based on the EWM approach to signalling the previous crisis. There is some bias in such results, but that is why the threshold values are not used in determining the final value of the composite indicator. Instead, just those variables that were the best predictors should be considered and monitored more closely. Other additional approaches of data aggregation observed in the last empirical part showed that they could provide some additional robustness checking of the results. On the other hand, nonlinear approaches to data aggregation could potentially be hard to carry out in practice[17]. Finally, the d-SRI approach is most likely to be used the most in practice, as the ECB reports utilize this indicator in country comparisons, alongside this variant being used in macroprudential stance estimation (see Krygier and Vasi, 2021; Duarte, Feliciano and De Lorenzo Buratta, 2022; or Galán and Rodríguez-Moreno, 2020).

Finally, this study focused on some approaches to cyclical risk tracking, namely the statistical filtering approach of calculating credit gaps, the composite indicator approach as the main focus, and the early warning model approach within the composite indicator. Other possible approaches that are found in practice are the semi-structural models (e.g., unobserved components model with economic and finance fundaments); multivariate models (e.g., vector error correction, where the equilibrium level of credit dynamics is estimated); other early warning approaches, such as the logit models; or other statistical filters (such as the Hamilton filter or the Christiano-Fitzgerald filter). Of course, every approach has its advantages and shortfalls when compared to others, and it is left for future work to analyse other possibilities for measurement of cyclical risk in the Croatian case.

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[17] It is hard to communicate the correlation due to calculating N over 2 (binomial coefficient) different values of correlation coefficients. If we look at 15 indicators that enter the composite one, it means that 105 different coefficients of correlation need to be tracked, alongside variances and the total value of the indicator. If a value of the total indicator increases from one period to another, we would need to look at all of these values to see the most significant contributors to this rise in risk. Due to total risk being based on individual risks and their interaction, it is hard to communicate, e.g., several dozen correlation coefficients contributing to risk increase or decrease. The correlation contribution of the FCI indicator in the figures is a simple average that remains after we account for individual variances. It is not representative of all 105 individual correlation coefficients.

5 CONCLUSION

Macroprudential policy asks for timely and accurate estimation of an economy's position within the financial cycle. This research dealt with the properties, advantages, and shortfalls of several popular approaches to composite indicator calculation that should capture the accumulation of cyclical risks over time. The composite indicator approach is recommended in the literature, as it enables the policymaker to track more items of information concurrently, not just the credit dynamics. Based on the analysis provided in this research, Croatian policymakers could be advised to use an EWM based approach for initial variable selection, a max-min data transformation, and simple averaging. However, to obtain a complete picture, the analysis could be extended with best indicators, such as those indicating how many variables pass their threshold values in a particular quarter. In future analysis, in the selection of the threshold values, consideration should be given to how objective and usable they are. In any future analysis, objective and usable threshold values should be selected.

Moreover, some possible improvements for composite indicator estimation are as follows. When we deal with longer time series, it will be possible to do transformations in real time. So, the parameters used in the procedure can be time-dependent and not fixed. This will enable robustness checking. If the chosen way of data transformation and aggregation is a good approach, it should not change much when we add new information over time. The dynamics of the indicator should tell a similar story, which is important for CCyB calibration. The problems mentioned above regarding the publication lags of many economic variables are an essential issue for CCyB calibration. Thus, some adjustments need to be made in the entire modelling process. For example, some composite indicators use the EWM, which is used to predict future crises early enough. In that way, some of the problems regarding the leading properties were addressed.

Next, changing the weights of risk categories or individual variables should be considered. When we deal with a small sample or do not have a theoretical model that tells us which variable is more important than others, giving equal weights to all risk categories at least excludes the subjectivity of the researcher. By obtaining more data in the future, some form of a VAR (vector autoregression) model can be estimated in which the interdependence of variables of interest can be established. Then, based on the variance decompositions, it will be possible to determine the weights of each variable. The way of synthesizing data into one number should also be considered. More realistic models such as DCC (dynamic conditional correlation) could be used in the future when enough data becomes available.

Next, future research could consider the FSRI (financial stability risk indicator), developed in ECB's (2018) publication. It represents an extension of d-SRI, with variables that measure spillovers and contagions in the financial sector. Besides the cyclicality of risks, the other part includes models that focus on either of these or a combination of sector-wide measures, amplification, the contagion of shocks,

and systemic illiquidity. In other words, the co-movement within the financial system is estimated, especially when cyclical risks materialize. Averaging out all individual variables into FSRI results with this measure was proven to forecast the lower percentiles of the GDP growth distribution in the next quarter. Thus, monitoring such indicators would be useful in terms of real activity monitoring and the effects of financial instability on future growth.

As seen, much work is still left to be done. As there was no such overview in literature in general, this paper aimed to critically analyse the existing approaches and the possibility of using them in practice, focusing on Croatian data. A starting point is thus given, with linear indicators, to detect in which phase of the financial cycle the economy stands. Such results are useful for policymakers within the macroprudential area, as the idea of synthesizing a lot of information from different sources of risk tracking is obtained alongside good communication characteristics. Such communication characteristics are important to provide a transparent and timely decision. Future work should focus on calibrating the CCyB to have a quantitative base for the macroprudential decision-making process.

Disclosure statement
The author declares that there is no conflict of interest.

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REFERENCES

1. Adalid, R., and Detken, C., 2007. Liquidity shocks and asset price boom/bust cycles. *ECB Working Paper*, No. 732. https://doi.org/10.2139/ssrn.963147

2. Aikman, D. [et al.], 2015. Mapping Heat in the U.S. Financial System. *Finance and Economics Discussion Series*, No. 2015-059.

3. Aldasoro, I., Borio, C. and Drehmann, M., 2018. Early warning indicators of banking crises: expanding the family. *BIS Quarterly Review*, March 2018.

4. Arbatli-Saxegaard, E. C. and Melle Johansen, R., 2017. A Heatmap for Monitoring Systemic Risk in Norway. *Staff Memo*, No. 10.

5. Arbatli-Saxegaard, E. C. and Muneer, M. A., 2020. The countercyclical capital buffer: A cross-country overview of policy frameworks. *Staff memo*, No. 6.

6. Babecký, J. [et al.], 2014. Banking, Debt, and Currency Crises in Developed Countries: Stylized Facts and Early Warning Indicators. *Journal of Financial Stability*, 15, pp. 1-17. https://doi.org/10.1016/j.jfs.2014.07.001

7. Bakker, B., 2015. The role of wealth in the financial crisis. *World Economic Forum*, February 9, 2015.

8. Basten, C., 2020. Higher Bank Capital Requirements and Mortgage Pricing: Evidence from the Counter-Cyclical Capital Buffer. *The Review of Finance*, 242, pp. 453-495. https://doi.org/10.1093/rof/rfz009

9. Behn, M. [et al.], 2013. Setting Countercyclical Capital Buffers Based on Early Warning Models: Would It Work? *ECB Working Paper*, No. 1604.

10. Bernanke, B. S. and Gerlter, M., 1995. Inside the black box: the credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 94, pp. 27-48. https://doi.org/10.1257/jep.9.4.27

11. Bernanke, B. S., 1999. The Financial Accelerator in a Quantitative Business Cycle Framework. In: *Handbook of Macroeconomics*, 1(1), pp. 1341-1393. https://doi.org/10.1016/S1574-0048(99)10034-X

12. Berti, K., Engelen, C. and Vašiček, B., 2017. A macroeconomic perspective on non-performing loans NPLs. *Quarterly Report on the Euro Area*, 161, pp. 7-21.

13. BIS, 2011. *Basel III: A global regulatory framework for more resilient banks and banking systems*. Basel: Bank for International Settlements.

14. BIS, 2017. *Range of Practices in Implementing the Countercyclical Capital Buffer Policy*. Basel: Bank for International Settlements.

15. Bollen, B., 2014. What should the value of lambda be in the exponentially weighted moving average volatility model? *UNE Business School Occasional Papers*, No. 2014-01.

16. Bordalo, P., Gennaioli, N., and Shleifer, S., 2018. Diagnostic Expectations and Credit Cycles. *The Journal of Finance*, 73(1), pp. 199-227. https://doi.org/10.1111/jofi.12586

17. Borio, C. and Drehmann, M., 2009. Assessing the risk of banking crises – revisited. *BIS Quarterly Review*, March 2009.

18. Borio, C. and Lowe, P., 2002. Asset prices, financial and monetary stability: exploring the nexus. *BIS Working Papers*, No 114. https://doi.org/10.2139/ssrn.846305

19. Borio, C. and Zhu, H., 2011. Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism? *Journal of Financial Stability*, 84, pp. 236-251. https://doi.org/10.1016/j.jfs.2011.12.003

20. Borio, C., 2012. The Financial Cycle and the Marco-economy: What have we learnt. *BIS Working Paper Series*, No. 395.

21. Brzoza-Brzezina, M., Kolasa, M. and Makarski, K., 2015. Macroprudential policy and imbalances in the euro area. *Journal of International Money and Finance*, 51, pp. 137-154. https://doi.org/10.1016/j.jimonfin.2014.10.004

22. Candelon, B., Dumitrescu, E-I. and Hurlin, C., 2012. How to Evaluate an Early-Warning System: Toward a Unified Statistical Framework for Assessing Financial Crises Forecasting Methods. *IMF Economic Review*, 60, pp. 75-113. https://doi.org/10.1057/imfer.2012.4

23. Canova, F. 1998. Detrending and business cycle facts. *Journal of Monetary Economics,* 41(3), pp. 475-512. https://doi.org/10.1016/S0304-3932(98)00006-3

24. Castro, C., Estrada, Á. and Martínez, J., 2016. The countercyclical capital buffer in Spain: An analysis of key guiding indicators. *Working Paper Documentos de Trabajo,* No. 1601. https://doi.org/10.2139/ssrn.2722632

25. Chen, D. and Friedrich, C., 2021. The Countercyclical Capital Buffer and International Bank Lending: Evidence from Canada. *Staff Working Paper/ Document de travail du personnel*, No. 2021-61.

26. Chen, S. and Svirydzenka, K., 2021. Financial Cycles – Early Warning Indicators of Banking Crises? *IMF Working paper*, WP/21/116. https://doi.org/10.5089/9781513582306.001

27. Cogley, T. and Nason, J. M., 1995. Output Dynamics in Real-Business-Cycle Models. *The American Economic Review*, 85(3), pp. 392-511.

28. Comelli, F. and Ogawa, S., 2021. *What Can We Learn from Financial Stability Reports? IMF working paper*, No. 200. https://doi.org/10.5089/9781513584294.001

29. Constâncio, V. [et al.], 2019. Macroprudential policy at the ECB: Institutional framework, strategy, analytical tools and policies. *ECB working paper*, No. 227. https://doi.org/10.2139/ssrn.3424161

30. Dell'Ariccia, G. [et al.], 2012. Policies for Macrofinancial Stability: How to Deal with Credit Booms. *IMF Staff Discussion Note,* SDN/12/06.

31. Detken, C. [et al.], 2014. Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options. *ESRB Occasional Paper*, No. 2014/5. https://doi.org/10.2139/ssrn.3723336

32. Dimova, D., Kongsamut, P. and Vandenbussche, J., 2016. Macroprudential Policies in Southeastern Europe. *Working Paper*, No. 16/29. https://doi.org/10.5089/9781498342872.001

33. Drehmann, M. and Juselius, M., 2012. Do debt service costs affect macroeconomic and financial stability? *BIS Quarterly Review,* September 2012.

34. Drehmann, M. and Juselius, M., 2014. Evaluating early warning indicators of banking crises: Satisfying policy requirements. *International Journal of Forecasting*, 30(3), pp. 759-780. https://doi.org/10.1016/j.ijforecast.2013.10.002

35. Drehmann, M. and Tsatsaronis, K., 2014. The credit-to-GDP gap and countercy-clical capital buffers: questions and answers. *BIS Quarterly Review*, March 2014.

36. Duarte, M., Feliciano, M. and De Lorenzo Buratta, I., 2022. How bad can financial crises be? A GDP tail risk assessment for Portugal. *Working paper*, No. 2022-04.

37. Duprey, T. and Klaus, B., 2017. How to predict financial stress? An assessment of Markov switching models. *ECB Working Paper*, No. 2057. https://doi.org/10.2139/ssrn.2968981

38. ECB, 2017. A new database for financial crises in European countries. ECB/ESRB EU crises database. *ECB Occassional Paper Series*, No. 194.

39. ECB, 2018. *A new Financial Stability Risk Index FSRI to predict near term risks of recessions and Predicting the likelihood and severity of financial crises over the medium term with a Cyclical Systemic Risk Indicator CSRI.* European Central Bank.

40. Edge, R. and Meisenzahl, R., 2011. The Unreliability of Credit-to-GDP Ratio Gaps in Real Time: Implications for Countercyclical Capital Buffers. *International Journal of Central Banking*, 7(4)4, pp. 261-298. https://doi.org/10.2139/ssrn.1956719

41. ESRB, 2018b. *The ESRB handbook on operationalising macroprudential policy in the banking sector*. European Systemic Risk Board.

42. ESRB, 2014. Recommendation of the European Systemic Risk Board of 18 June 2014 on guidance for setting countercyclical buffer rats (ESRB/2014/1). *Official Journal of the European Union* C 293/1.

43. EU and UN, 2017. *Handbook on Cyclical Composite Indicators For Business Cycle Analysis*. Luxembourg: European Union and United Nations. https://doi.org/10.2785/962890

44. Galán, J. and Rodríguez-Moreno, M., 2020. At-risk measures and financial stability. *Financial stability review*, 39, pp. 65-92.

45. Galán, J. E., 2019. Measuring Credit-to-GDP Gaps. The Hodrick-Prescott Filter Revisited. *Documentos de Trabajo*, No. 1906. https://doi.org/10.2139/ssrn.3384613

46. Gersbach, H. and Rochet, J., 2017. Capital regulation and credit fluctuations. *Journal of Monetary Economics*, 90(C), pp. 113-124. https://doi.org/10.1016/j.jmoneco.2017.05.008

47. Geršl, A. and Seidler, J., 2012. Credit Growth and Capital Buffers: Empirical Evidence from Central and Eastern European Countries. *Research Policy Notes*, No. 2/2011.

48. Giese, J. [et al.], 2014. The credit-to GDP gap and complementary indicator for macroprudential policy: evidence from the UK. *International Journal of Finance and Economics*, 19(1), pp. 25-47. https://doi.org/10.1002/ijfe.1489

49. Grinderslev, O. J. [et al.], 2017. Financial Cycles: Implementing SRISK in a Danish context. *Working Paper,* No. 105.

50. Gross, M., 2022. Beautiful Cycles: A Theory and a Model Implying a Curious Role for Interest. *Economic Modelling*, 106, pp. 1-21. https://doi.org/10.1016/j.econmod.2021.105678

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51. Hájek, J., Frait, J. and Plašil, M., 2017. The Countercyclical Capital Buffer in the Czech Republic. *CNB Financial Stability Report*, 2016/2017, pp. 106-114.

52. Hamilton, J. D., 2018. Why You Should Never Use the HP Filter. *Review of Economic Statistics*, 100(5), pp. 831-843. https://doi.org/10.1162/rest_a_00706

53. Hodrick, R. and Prescott, E., 1997. Postwar U.S. Business Cycles. An Empirical Investigation. *Journal of Money, Credit, and Banking*, 29, pp. 1-16. https://doi.org/10.2307/2953682

54. Holló, D., Kremer, M. and Lo Duca, M., 2012. CISS – A composite indicator of systemic stress in the financial system. *ECB Working Paper Series*, No. 1426.

55. Jackson, J. E., 1991. *A User's Guide to Principal Components*. Wiley and Sons. https://doi.org/10.1002/0471725331

56. Jiménez, G., Salas, V. and Saurina, J., 2006. Determinants of Collateral. *Journal of Financial Economics*, 81(2), pp. 255-281. https://doi.org/10.1016/j.jfineco.2005.06.003

57. Jokipii, T., Nyffeler, R. and Riederer, S., 2021. Exploring BIS credit-to-GDP gap critiques: the Swiss case. *Swiss Journal of Economics and Statistics*, 157(7), pp. 1-19. https://doi.org/10.1186/s41937-021-00073-1

58. Jordà, O., Schularick, M. and Taylor, A. M., 2013. When Credit Bites Back. *Journal of Money, Credit, and Banking*, 45(s2), pp. 3-28. https://doi.org/10.1111/jmcb.12069

59. Jordà, O., Schularick, M. and Taylor, A. M., 2017. Macrofinancial History and the New Business Cycle Facts. *NBER Macroeconomics Annual*, 31, pp. 213-263. https://doi.org/10.1086/690241

60. Jordá, O., Schularick, O. and Taylor, A. M., 2015. Leveraged Bubbles. *Journal of Monetary Economics*, 76(Supplement), pp. S1-S20. https://doi.org/10.1016/j.jmoneco.2015.08.005

61. Kamber, G., Morley, J. and Wong, B., 2018. Intuitive and Reliable Estimates of the Output Gap from a Beveridge-Nelson Filter. *The Review of Economics and Statistics*, 100(3), pp. 550-566. https://doi.org/10.1162/rest_a_00691

62. Kamin, S. B. and DeMarco, L. P., 2012. How did a domestic housing slump turn into a global financial crisis? *Journal of International Money and Finance*, 31(1), pp. 10-41. https://doi.org/10.1016/j.jimonfin.2011.11.003

63. Kaminsky G., Lizondo, S. and Reinhart, C., 1998. Leading Indicators of Currency Crises. *IMF Staff Papers*, No. 451. https://doi.org/10.2139/ssrn.882365

64. Karamisheva, T. [et al.], 2019. Financial Cycle in the Bulgarian Economy and Its Interaction with the Business Cycle. *Discussion papers*, No. DP/113/2019.

65. Kauko, K., 2012a. Triggers for countercyclical capital buffers. *MPRA Paper*, No. 85692.

66. Kauko, K., 2012b. External deficits and non-performing loans in the recent financial crisis. *Economics Letters*, 115, pp. 196-199. https://doi.org/10.1016/j.econlet.2011.12.018

67. Kirman, A., 1992. Whom or What Does the Representative Individual Represent? *Journal of Economic Perspectives*, 6(2), pp. 117-136. https://doi.org/10.1257/jep.6.2.117

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68. Kiyotaki, N. and Moore, J., 1997. Credit Cycles. *Journal of Political Economy*, 105(2), pp. 211-248. https://doi.org/10.1086/262072

69. Kraft, E. and Galac, T., 2011. Macroprudential Regulation of Credit Booms and Busts: The Case of Croatia. *Policy Research Working Paper*, No. 5772. https://doi.org/10.1596/1813-9450-5772

70. Krygie, D. and Vasi, T., 2021. *Macrofinancial conditions, financial stability and economic growth in Sweden – evaluating the Growth-at-Risk framework*. Staff memo, Sveriges Riskbank.

71. Laeven, L. and Valencia, F., 2008. Systemic Banking Crises: A New Database. *IMF Working Paper*, No. WP/08/224. https://doi.org/10.5089/9781451870824.001

72. Laeven, L. and Valencia, F., 2012. Systemic banking crises database: an update. *IMF working paper*, No. WP/12/163.

73. Laina, P., Nyholm, J. and Sarlin, P., 2015. Leading Indicators of Systemic Banking Crises: Finland in a Panel of EU Countries. *Review of Financial Economics*, 24, pp. 18-35. https://doi.org/10.1016/j.rfe.2014.12.002

74. Lang, J-H. [et al.], 2019. Anticipating the bust: a new cyclical systemic risk indicator to assess the likelihood and severity of financial crises. *Occasional Paper Series*, No. 219. https://doi.org/10.2139/ssrn.3334835

75. Lo Duca, M. [et al.], 2017. A new database for financial crises in European countries. *Occasional paper series*, No. 194. https://doi.org/10.2139/ssrn.4033025

76. Lombardi, M. J., Mohatny, M. and Shim, I., 2017. The real effects of household debt in the short and long run. *BIS working paper*, No 607.

77. López-Salido, D., Stein, J. C. and Zakrajšek, E., 2017. Credit-Market Sentiment and the Business Cycle. *Quarterly Journal of Economics*, 132(3), pp. 1373-1426. https://doi.org/10.1093/qje/qjx014

78. Minsky, H. P., 1975. *John Maynard Keynes*. New York: Columbia University Press. https://doi.org/10.1007/978-1-349-02679-1

79. Minsky, H. P., 1982. *Can "it" happen again? Essays on instability and finance*. New York: M. E. Sharpe. https://doi.org/10.1080/05775132.1982.11470774

80. Minsky, H. P., 1986. *Stabilizing an Unstable Economy*. New Haven: Yale University Press.

81. OECD, 2012. *OECD system of composite leading indicators*. Paris: OECD.

82. Pedersen, T. M., 2001. The Hodrick-Prescott filter, the Slutzky effect, and the distortionary effect of filters. *Journal of Economic Dynamics and Control*, 25, pp. 1081-1101. https://doi.org/10.1016/S0165-1889(99)00059-7

83. Pfeifer, L. and Hodula, M., 2018. A profit-to-provisioning approach to setting the countercyclical capital buffer: the Czech example. *CNB working paper*, No. 5. https://doi.org/10.2139/ssrn.3723430

84. Plašil, M. [et al.], 2015. In the Quest of Measuring the Financial Cycle. *CNB working paper series*, No. 5. Czech National Bank.

85. Plašil, M., Seidler, J. and Hlaváč, P., 2016. A New Measure of the Financial Cycle: Application to the Czech Republic. *Eastern European Economics*, 544, pp. 296-318. https://doi.org/10.1080/00128775.2016.1192950

86. Rinaldi, L. and Sanchis-Arellano, A., 2006. Household debt sustainability: what explains household non-performing loans? An empirical analysis. *ECB Working Paper Series*, No. 570. https://doi.org/10.2139/ssrn.872528

87. Rünstler, G. and Vlekke, M., 2016. Business, Housing, and Credit Cycles. *ECB Working Paper Series*, No. 1915. https://doi.org/10.2139/ssrn.2797274

88. Rychtarik, Š., 2014. Analytical background for the counter-cyclical capital buffer decisions in Slovakia. *Ročník*, 22(4), pp. 10-15.

89. Rychtárik, Š., 2018. Follow-up on CCyB in Slovakia: build-up, calibration and release. Ročnik, 263, pp. 20-24.

90. Schularick, M. and Taylor, A. M., 2012. Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870-2008. *The American Economic Review*, 1022, pp. 1029-1061. https://doi.org/10.1257/aer.102.2.1029

91. Škrinjarić, T. and Bukovšak, M., 2022. Novi indikatori kreditnog jaza u Hrvatskoj: unapređenje kalibracije protucikličkog zaštitnog sloja kapitala. *Working paper,* No. 69.

92. Škrinjarić, T., 2022. Uvođenje kompozitnog indikatora cikličkog sistemskog rizika u Hrvatskoj: mogućnosti i ograničenja. *Working paper,* No. 71.

93. Tayler, W. J. and Zilberman, R., 2016. Macroprudential regulation, credit spreads and the role of monetary policy. *Journal of Financial Stability*, 26, pp. 144-158. https://doi.org/10.1016/j.jfs.2016.08.001

94. Tölö, E., Laakkonen, H. and Kalatie, S., 2018. Evaluating Indicators for Use in Setting the Countercyclical Capital Buffer. *International Journal of Central Banking*, 142, pp. 51-111.

95. Valinskytė, N. and Rupeika, G., 2015. Leading Indicators for the Countercyclical Capital Buffer in Lithuania. *Occasional Paper Series*, No. 4.

96. Vujčić, B. and Dumičić, M., 2016. Managing Systemic Risks in the Croatian Economy. *BIS Paper,* No. 861.

97. Wezel, T., 2019. Conceptual Issues in Calibrating the Basel III Countercyclical Capital Buffer. *IMF working papers*, No. 19/86. https://doi.org/10.5089/9781498312097.001

For this work, we determine the crisis periods in Croatia, following the recommendations of the ESRB and the literature that deals with movements in the Croatian banking market, and describe crisis periods lasting: April 1998 – January 2000 and October 2008 – June 2012. Due to the shortness of the time series, only the second crisis is effectively used in the analysis. In applying the signalling method, the ESRB (2018) recommends defining the dependent variable of the banking crisis to include periods of system-wide crises related to excessive credit growth.

The criteria for determining crises according to ECB (2017) and ESRB (2014) are as follows:
a) withdrawal of deposits or losses of the banking system (a proportion of bad loans greater than 20% or bankruptcy of banks that make up at least 20% of the system's assets) or public intervention in response to the losses of the banking system to prevent the realization of such losses,
b) assessment of members of the expert group who have:
    – excluded crises that are not systemic banking crises,
    – excluded periods of a systemic banking crisis not related to the domestic credit or financial cycle,
    – included periods in which regulators responded to certain domestic developments related to the credit or financial cycle that would otherwise have led to a systemic banking crisis or an external event that moderated the financial cycle.

Several potential dates for the duration of the crisis in Croatia are listed in international research. According to the ECB (2017), the banking crisis in Croatia lasted from April 1998 to January 2000 and from September 2007 to June 2012 because both periods were characterized (among other things) by excessive credit growth before its outbreak and had macroprudential significance according to the criteria specified in the ECB (2017:11). Duprey and Klaus (2017) assess episodes of systemic financial stress for EU countries and state that for Croatia these are the periods: March 1999 to January 2000, October 2008 to December 2010, and September 2011 to October 2012. Finally, Dimova, Kongsamut and Vandenbussche (2016) consider the macroeconomic characteristics of selected CEE countries, including Croatia, from 2003-2012 and state that Croatia was characterized by a strong inflow of foreign capital and by credit growth until the last quarter of 2008. In addition to the first crisis taken from the ECB (2017), the second crisis is defined as the one that began in the fourth quarter of 2008 and lasted until the second quarter of 2012, when the last macroprudential measures were taken (see the list in Dimova, Kongsamut and Vandenbussche, 2016: 74-75).

Political economics
and citizens' engagement
in Croatia: a differential
analysis

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Abstract

Based on the Euro Social Survey, we show that Croatians' values do not predict perfectly their political partisanship. This feature may be a consequence of the lack of interest of Croatian people on politics, which explains the significantly lower electoral turnout in Croatia. Besides, surprisingly, Croatians' judgment of government's performance is more unfavourable when their party holds power. Political polarization is increasing, which jeopardizes the median voter assumption. Besides, trust of Croatians in parliament and politicians is extremely low. Most probably, it is due to high corruption and to the post-communism effect (the belief that the state worked against the individual rather than for it). Croatia missed the opportunity to implement ambitious reforms when opting to join the EU and NATO. However, the Croatian budgetary process performs very well, which is a very positive feature that should increase the engagement of Croatians in their government, economy and political system.

Keywords: SDG16, Croatia, political economics, citizens' engagement, trust, partisanship

1 INTRODUCTION

After the fall of communism and state-planned economic systems, a new market system and democracy were introduced into Croatia, with controversial results. Some institutional issues emerged during the transition processes, as will be shown in this research paper. The Western Balkan states have been politically stabilized as a result of their efforts to access international organisations such as the EU and NATO. Croatia introduced several legal amendments during the process of joining the EU (July 1st, 2013). These amendments contributed to the harmonisation of the Croatian legal framework with European anti-corruption legislation (Budak, 2007). According to the Commission of the European Communities (2004), Croatian reforms aimed at enabling accession to the EU had to be in accord with the principles of liberty, democracy, respect for human rights and fundamental freedoms and the rule of law on which the Union is founded. Thus, the integration process speeded up reforms (Ateljevic and Budak, 2010), but Croatia still differs in some ways from other European countries. This empirical research will evaluate these unique features of Croatia.

Budak (2007) shows that in Croatia there exists civil and political awareness of the problem of corruption. However, it remains to be assessed to what extent perseverance in the implementation of and political will for combating corruption will yield results in the forthcoming period. The author also states that political corruption usually starts with non-transparent financing of political parties or their campaigns. Therefore, insights about corruption must consider its connection with the political arena.

Democracies assume accurate knowledge by citizens, but misinformation poses a serious problem for healthy democratic functioning. Identification with a political party – known as partisanship – can alter perceptual judgments and shapes

political judgments such as voting preferences or support for a specific politics (Van Bavel and Pereira, 2018). In the case of Croatia, political will is a prerequisite for building confidence in the ruling structures and public administration (Budak, 2007). We evaluate the extent to which Croatian governments arising from elections have succeeded in building citizens' trust in institutions. In other words, to what extent do Croatians engage in politics and how much do they know about the national economy?

Research about Croatians' engagement with politics is necessary because after the collapse of Yugoslavia, Croatia was able to establish its own currency and cut levels of inflation comparable to those in Western Europe. For some, this was a source of great national pride. For others, however, the new state meant unemployment and a fall in living standards. It meant that to survive they had to retain the habits learned during the communist period. Such habits, based on the belief that the state worked against the individual rather than for it, included trading on the black market and not declaring employment (Bellamy, 2003). Therefore, two research questions arise. On the one hand, does citizens' distrust of government stemming from communism still obtain 30 years after the disintegration of Yugoslavia? On the other hand, does the behavior described above, aimed at evading the restrictions of from the communist state, mean a higher level of corruption in Croatia?

Trust is considered a cornerstone for democracy, since it enhances the legitimacy, validity and sustainability of governments by connecting citizens with public institutions (Godefroidt, Langer and Meuleman, 2017). Although trust is considered a critical component of good governance (Wu, Ma and Yu, 2017), public trust in governments has decreased significantly in recent decades (Park et al., 2015). According to Bouckaert and van de Walle (2003), the most frequently expressed concern by politicians, journalists and the general public is the decrease in confidence in the government and the harmful effects that this generates. This paper will provide a thorough analysis of trust in Croatian political institutions.

We will evaluate empirically the features of Croatian civil society, how Croatians participate in politics and how they engage in public economics: in sum, whether Croatian people are willing to hold their politicians accountable. Accordingly, we would like to answer three questions: is Croatia different from the rest of Europe in terms of political partisanship? How do Croatians engage in politics and the national economy? Is Croatia, in terms of trust in institutions, budget transparency and corruption, comparable to other European countries?

The paper is organised as follows. Section 2 discusses the literature on political economics (partisanship). Section 3 summarises literature on citizens' engagement in politics and economic affairs. Section 4 reviews the literature on trust, budget transparency and corruption. Section 5 addresses the empirical methodology. Section 6 comments on the results concerning political partisanship, citizens' engagement and trust/corruption. Finally, section 7 summarises the conclusions and proposes further research.

2 LITERATURE ON POLITICAL ECONOMICS: PARTISANSHIP

There is extensive literature on the alignment of citizens' values with political partisanship. It is broadly held that left-wing parties value equality and economic security, while right-wing counterparts place a premium on moral traditionalism and social order (Ciuk et al., 2017). These authors list core political values that influence political attitudes. For example, equality and economic security shape attitudes toward social welfare programs. Racial questions shape citizens' attitudes towards immigration. Conservative citizens in many countries complain that government policies have favoured immigrants while their own communities have been neglected (Abramowitz and McCoy, 2019).

Moral traditionalism shapes attitudes toward several cultural issues. Wealthier citizens are consistently and significantly more likely to oppose social welfare spending relative to other citizens, thus connecting higher income with conservative parties. Older respondents tend toward left-wing parties. Finally, more religious respondents are more ideologically conservative than the more secular (Ciuk, Lupton and Thornton, 2017).

Hemingway (2022) finds that legislators from business backgrounds are more likely to support income inequality and small government, as well as less likely to consult with labour groups, than those from working-class and other backgrounds. Similarly, core values concerning equality and government intervention versus individualism and free enterprise are fundamental orientations that can themselves shape partisanship (Evans and Neundorf, 2020).

One of conservative citizens' concerns is the size of the government, and particularly the amount of government spending. Nearly 90% of respondents of a sample of conservative US citizens rated "deficits and spending" a very important issue to address. Most of them thought economic should take precedence over social issues. Right wing partisanship considers that government spending is creating benefits for people who do not contribute, who take handouts at the expense of hard-working citizens. Moreover, there is criticism of unauthorised immigration, it being alleged that immigrants receive undue government support (Williamson, Skocpol and Coggin, 2011).

The literature shows that, generally speaking, leftist parties are in favour of a broader public sector, focused on the distribution of wealth, which increases public spending and debt levels, while rightist parties tend to emphasise budgetary discipline to reduce spending (García-Sánchez, Mordán and Cuadrado-Ballesteros, 2014). Additionally, leftist supporters tend to oppose restrictive fiscal policies, due to their negative impact on income and employment. On the opposite side, right-wing parties attempt to control inflation and promote price stability (Bojar, 2015). Jost, Christopher and Napier (2009) show that in an empirical research, both social and economic forms of conservatism were positively associated with right-wing orientation in 60 countries investigated. Therefore, some patterns hold across countries when it comes to determining political partisanship. The research question is, therefore, if Croatia follows the same partisanship pattern as other European countries.

A current topical issue has to do with environment and, specifically, with climate change. In this respect, Fielding et al. (2012) empirically show that politicians from more left-leaning groups have beliefs that more closely endorse scientists' beliefs about the causes and impacts of climate change and give greater priority to climate change in their political work. In contrast, conservative politicians are more uncertain and sceptical about climate change and prioritise climate change less. According to Switzer (2017), politics influence environmental policy implementation, since the local role in environmental policy is tied to political incentives. This author suggests that cities with more liberal constituents should be incentivized to comply with environmental regulation at higher rates than those serving more conservative citizens.

Based on this literature review, we would like to gauge whether Croatians place themselves in the left-right political scale following the same values and beliefs as other Europeans. Accordingly, we test the following hypothesis:

H$_1$: Political partisanship in Croatia is driven by the same values and principles as in the rest of Europe.

3 CITIZENS' ENGAGEMENT: PERCEPTION ABOUT ECONOMY AND POLITICS
In a scenario of aging western countries, public pensions have become a sensitive issue. In this regard, the overall level of misinformation is huge, and it rejects the common assumption in political economics that voters are able rationally to compare alternative policies according to their economic self-interest. Thus, informing the public about the costs is an important aspect of any politically successful reform (Boeri, Börsch-Supan and Tabellini, 2001). Achieving better-informed citizens requires the provision of more information or the same information but provided in a different, more transparent way.

Thus, citizens need to be informed in an objective way, so that information is not biased by the media. In this respect, Dubois and Blank (2018) explain that in a high-choice media environment, there are fears that individuals will select media that reinforce their existing beliefs and lead to segregation based on interest and/or partisanship. This can lead to partisan *echo chambers*. Today, individuals may access news and political information from social media, Internet searches, online, and offline versions of newspapers, television broadcasts, radio, etc. These authors provide evidence of polarization in some media, such as partisan news websites, blogs, and some social media. In Croatia, this polarization would be mirroring the polarization already taking place in political parties' programs. Finally, these *echo chambers* will exacerbate the gap between those who are informed about politics and those who are not, will increase political polarization, which will reinforce political divides, and will threaten democracies by limiting political information and discussions.

According to Diercks and Landreville (2016), the knowledge gap predicts that individuals of higher socioeconomic status will be better informed on political issues. Bisgaard (2015) shows that citizens' identification with a political party directs their thinking about reality in striking ways. In perhaps one of the clearest

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examples, studies find that party identifiers tend to perceive economic conditions as being markedly more favourable when their party holds office. Belonging to a political party leads to a partisanship bias to some extent. This bias affects how citizens perceive economic conditions. However, this bias decreases when real economic conditions are clear. Recent experimental work further indicates that when the evidence is unambiguous, partisans appear not to reject it. In the same vein, Citrin and Stoker (2018) posit that citizens' judgments of governments' performance are more favourable when their party holds power and more unfavourable when their party does not. According to Hetherington and Rudolph (2015), this bias in performance evaluation has become more pronounced in recent years.

According to Bullock et al. (2015) citizens know little about politics, and they often recognise their own lack of knowledge. Partisanship seems to affect factual beliefs about politics. For example, Croatian supporters of the HDZ party will play down the economic failures of the HDZ government. Thus, political partisanship shapes citizens' perception about economy and politics.

If we now shift our focus to the supply of information, the media play a custodian role of holding the three sides of modern states – government, judiciary and parliament – accountable. The media check the balance of power and keep the public informed, consequently enabling citizens to make informed decisions on social, economic and political matters. Because of their decentralized nature, social media and the internet are considered user-centric and therefore "democratic" platforms, enabling a better and unbiased information society (Chitanana and Mutsvairo, 2019). The Arab Spring in 2011 as well as the 2008 and 2012 Obama campaigns fuelled interest in how social media might affect the way in which citizens receive political information (Boulianne, 2015).

Some research shows that mass media have been giving increasing attention to polarization, with coverage that is overwhelmingly negative (Citrin and Stoker, 2018). Citizens learn about elite partisan polarization, and politics more generally, through media reports. Yet, party divisions may be communicated to the public in varying ways with important consequences for opinion and behaviour (Robison and Mullinix, 2016). Therefore, citizens are informed by media and the way they report on polarization itself feeds back polarization.

Boeri, Börsch-Supan and Tabellini (2001) indicate through a survey that a retrenchment of the welfare state would not carry a majority among the voters in any of the countries in their panel. The electorate would oppose any shrinkage of the welfare state if asked to participate in governmental decision-making. Misinformation matters when it is used to engage citizens to participate in political decision-making. Better informed voters are more likely to favour reforms. Politicians, union leaders, or opinion makers who do not disclose full information are making reforms less likely. Moreover, an important ingredient of successful reforms is their simplicity and transparency (ibid., 2001).

Political parties have adapted to voters' preferences: electoral competition has forced them to offer the policies preferred by the majority (Boeri, Börsch-Supan and Tabellini, 2001). This political strategy is called the *median voter theorem*, and it shapes the way voters can participate in their governments' decision-making. In Croatia, though, as has happened worldwide in recent years, political polarization makes it more complicated for governments to implement the *median voter* strategy.

Ančić, Baketa and Kovačić (2019), on an empirical analysis of political behaviour in Croatia, show that interest in politics is the most robust predictor of voter turnout. Therefore, if the interest in politics of Croatians is similar to the remaining Europeans, we should expect a similar electoral turnout. Lalić (2011) analysed the February-April 2011 protests in Croatia, demanding the calling of early elections. These demonstrations, mostly led by radical right-wing and left-wing activists, showed that polarization started more than a decade ago in Croatia. The ruling politicians were faced with a strong combined pressure from the "street" and the opposition, which strengthened the public's awareness; accordingly, the referendum concerning EU accession held before the elections was able to express a prevailingly anti-government sentiment. In spite of this, the government still agreed to hold the elections before the referendum. In conclusion, the 2011 protests certainly intervened in the political arena. Criticism of institutions was expressed at the protests, showing that the public had become more interested in political issues, increasing participation in politics. In addition, the protests had the effect of increasing the awareness of many citizens about the wear and tear of the old and the need for a new political paradigm. An assessment of the electoral turnout in Croatia will confirm whether Croatians' engagement on politics is currently as high as the 2011 unrest showed. As Lalić (2011) concludes, this topic deserves special attention.

Croatia has advanced both in the area of free elections and association, yet it still needs to develop incentive policies for elections and civic activism to keep the government accountable and transparent (Florentina and Dritero, 2020). In Croatia, the election turnout is low, and there is no trust in elected political representatives' ability or willingness to act in the public interest. Dissatisfaction with governance remains the most mentioned cause for this low electoral turnout (Florentina and Dritero, 2020).

In agreement with this literature review, and regarding citizens' engagement, we posit these hypotheses:

H_2: Interest in politics/current affairs is similar in Croatia to that in the rest of Europe.

H_3: The partisanship alignment bias predicted by the literature holds in Croatia.

H_4: The trend of increasing political polarization observed across the world holds in Croatia.

H_5: Political participation through electoral turnout in Croatia is similar to that in the rest of Europe.

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4 TRUST, BUDGET TRANSPARENCY AND CORRUPTION

Political trust refers to citizens' feelings about their government. The absence of trust can take two forms, mistrust and distrust. Mistrust reflects doubt or scepticism about the trustworthiness of the other, while distrust reflects a settled belief that the other is untrustworthy. The literature gives examples of research into trust in different institutions such as the police, civil service, judiciary, and parliament (Citrin and Stoker, 2018).

The literature on the consequences of trust for participation has long recognised competing expectations. On the one hand, trust could be a sentiment of civil affirmation that inspires political engagement and participation in politics. On the other hand, the trusting may be satisfied with government and view it as needing little monitoring, so trust could weaken the impulse to participate in politics (Citrin and Stoker, 2018). In the case of Croatia, we will research the levels of trust and political participation.

Drawing on the Euro Social Survey (ESS), Torcal (2017) finds out that the 2008 crisis functioned as a "stress test" for representative democracies in western Europe in general, but much more so for countries suffering the most severe effects, resulting in a deterioration of political trust, particularly in southern Europe. The frustration of citizens with the perceived lack of responsiveness of the political system resulted in increasing levels of political distrust. Political parties and politicians, the two main actors of representation, are consistently distrusted the most in all the countries. Following these two institutions are parliaments, which are the institutions most essential to political representation. Finally, the most trusted are consistently the legal system and the police (Torcal, 2017). Abramowitz and McCoy (2019) points out that rising mistrust and, at times, hatred of the opposing party and its leaders, may be one of the most dangerous consequences of growing partisan polarization.

Civil society is still relatively weak in Croatia, while the parallel structures, networks of organised crime, corruption and para-state institutions are still relatively strong (Ateljevic and Budak, 2010). Lack of security and trust in their own state forced many individuals from the Western Balkans to find their own ways to move on by creating mechanisms detached from the formal state structure; some have had more opportunities than others. Success depends on a number of factors; individual background (e.g. belonging to a particular ethnic/religious group, political party, fake patriotism during the conflict in the former Yugoslavia, etc.). It is also worth noting that democratization "hit" the Western Balkans too quickly, and for the first time in its history. Indeed, this kind of complex social environment in the region provides fertile ground for almost all the main types of corruption.

Croatia is a worrying phenomenon, but the logic of political survival of Croatian politicians is comparable to that of other countries. The difference is only in institutions that either prevent or encourage corrupt behaviour. Countries with clear and enforceable rules manage to prevent power-hungry individuals from usurping social and market outcomes, while countries that lack such rules or lack

enforceability of existing rules are condemned to increased corruption. A change of such a social order must come from an institutional push, encouraging both greater transparency and accountability to the voters, and credibly punishing politicians when they break the rules (Vuković, 2017).

In the last 25 years Croatia has set up a legal framework and other instruments that provided the citizens with the necessary rights for participation in governance, thus enabling their participation in the budgetary process as well. In addition, there were several projects financed by international donors, aimed at fostering fiscal transparency and enabling citizens to involve themselves in budgetary decision-making. Citizen participation in the budget process is crucial for ensuring democratic, transparent and politically accountable decision-making in public finance (Švaljek, Rašić Bakarić and Sumpor, 2019). These authors find that public policy needs to focus on raising awareness among citizens of the ways they could influence the budget process.

One of the most frequently used corruption perceptions indicator is the Corruption Perceptions Index of Transparency International. Although corruption perceptions indicators are subjective measures based on surveyed survey of the prevalence of corruption as it is perceived, for the time being they are the only methodologically consistent databases for an analysis of corruption. For Croatia and other countries included in international integration processes, international ranking according to corruption perceptions indicators reflects an external image towards the international community (Budak, 2007).

H_6: Croatia is similar to the rest of Europe in terms of corruption, budget transparency and trust in parliament and politicians.

5 RESEARCH DESIGN AND METHODOLOGY

5.1 SAMPLE AND VARIABLES

The sample takes all the rounds of the ESS, from 2002 (ESS round 1) to 2020 (ESS round 9). There are limited data on Croatia, as this country appears only in the years 2008 (ESS round 4), 2010 (ESS round 5) and 2020 (ESS round 9). The universe of ESS is all persons aged over 14 resident within private households, regardless of their nationality, citizenship, language or legal status, in the participating countries. Table 1 summarises the set of variables included in the main political partisanship regression described below. Table 2 reports correlations among these variables. For the sake of simplicity, tables 1 and 2 show only the variables included on the main regression on political economics (partisanship). We will use additional variables for the remaining sections of this article, which will be briefly described and referred to their corresponding public datasets.

TABLE 1
Descriptive statistics

	Variable	Description	Mean	Std. dev.	Min	Max
Dependent	*lrscale*	Placement on left right scale. 0 Left – 10 Right	5.13	2.19	0	10
Income	*gincdif*	Government should reduce differences in income levels. 1 Agree strongly – 5 Disagree strongly	2.17	1.02	1	5
	hinctnta	Household's total net income, all sources. 1 1st decile – 10 10th decile	5.52	2.73	1	10
	lknemny	How likely not enough money for household necessities next 12 months. 1 Not at all likely – 4 Very likely	2.00	0.89	1	4
	imprich	Important to be rich, have money and expensive things. 1 Very much like me – 6 Not like me at all	4.13	1.33	1	6
Redistribution	*sbstrec*	Social benefits/services place too great strain on economy. 1 Agree strongly – 5 Disagree strongly	3.02	1.05	1	5
	sbprvpv	Social benefits/services prevent widespread poverty. 1 Agree strongly – 5 Disagree strongly	2.55	0.98	1	5
	sbeqsoc	Social benefits/services lead to a more equal society. 1 Agree strongly – 5 Disagree strongly	2.70	0.99	1	5
	sbbsntx	Social benefits/services cost businesses too much in taxes/charges. 1 Agree strongly – 5 Disagree strongly	2.97	1.05	1	5
	sblazy	Social benefits/services cost make people lazy. 1 Agree strongly – 5 Disagree strongly	2.92	1.12	1	5
Immigration	*imsclbn*	When should immigrants obtain rights to social benefits/services? 1 Immediately on arrival – 5 They should never get the same rights	3.17	1.01	1	5
	imbgeco	Immigration bad or good for country's economy. 0 Bad for the economy – 10 Good for the economy	5.10	2.40	0	10

	Variable	Description	Mean	Std. dev.	Min	Max
Social welfare system	*uentrjb*	Most unemployed people do not really try to find a job. 1 Agree strongly – 5 Disagree strongly	3.01	1.09	1	5
	lbenent	Many with very low incomes get less benefit than legally entitled to. 1 Agree strongly – 5 Disagree strongly	2.68	0.96	1	5
	bennent	Many manage to obtain benefits/services not entitled to. 1 Agree strongly – 5 Disagree strongly	2.47	0.98	1	5
Environment	*impenv*	Important to care for nature and environment. 1 Very much like me – 6 Not like me at all	2.15	1.03	1	6
	rlgblg_r	Belonging to particular religion or denomination. 1 Yes – 0 No (recoded)	0.58	0.49	0	1
Personal features	*gndr_r*	Gender 0 Female – 1 Male (recoded)	0.50	0.50	0	1
	agea	Age of respondent, calculated. age in years	48.21	17.59	15	98
	blgetmg_r	Belong to minority ethnic group in country 1 Yes – 0 No (recoded)	0.06	0.23	0	1

Note: All variables obtained from the ESS, rounds 1 (2002) to 9 (2020). Croatia is available in rounds 4 (2008), 5 (2010) and 9 (2020). Total observations: N= 50,718.

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TABLE 2
Pearson correlation matrix

	lrscale	gincdif	hinctnta	lknemny	imprich	sbstrec	sbprvpv	sbeqsoc	sbbsntx	sblazy	imsclbn	imbgeco	uentrjb	lbenent	bennent	impenv	rlgblg_r	gndr_r	agea
gincdif	0.17																		
hinctnta	0.06	0.18																	
lknemny	-0.04	-0.17	-0.31																
imprich	-0.09	-0.05	-0.09	-0.07															
sbstrec	-0.11	-0.08	-0.01	0.03	0.03														
sbprvpv	0.04	0.00	-0.03	0.12	-0.05	0.06													
sbeqsoc	0.04	0.04	-0.03	0.12	-0.03	-0.01	0.54												
sbbsntx	-0.14	-0.07	0.00	0.00	0.04	0.46	0.05	0.02											
sblazy	-0.12	-0.09	0.01	0.06	0.00	0.38	0.01	-0.05	0.34										
imsclbn	0.11	-0.01	-0.06	0.09	-0.08	-0.06	0.07	0.09	-0.08	-0.08									
imbgeco	-0.06	0.08	0.16	-0.17	0.05	0.07	-0.09	-0.11	0.11	0.09	-0.31								
uentrjb	-0.11	-0.02	0.06	-0.02	0.05	0.23	-0.06	-0.07	0.22	0.42	-0.12	0.15							
lbenent	0.04	0.21	0.15	-0.19	0.03	-0.04	-0.03	-0.01	0.01	-0.03	-0.04	0.09	0.09						
bennent	-0.07	0.06	0.08	-0.06	0.04	0.17	-0.05	-0.07	0.19	0.28	-0.15	0.17	0.32	0.23					
impenv	0.05	0.09	0.01	0.03	-0.05	-0.02	0.04	0.05	-0.01	-0.03	0.02	-0.04	-0.02	0.06	0.05				
rlgblg_r	0.11	-0.07	-0.09	0.05	-0.01	-0.02	0.00	-0.03	-0.04	-0.02	0.00	-0.02	-0.04	-0.09	-0.07	-0.05			
gndr_r	0.03	0.07	0.10	-0.07	-0.11	-0.03	-0.01	-0.03	-0.01	-0.02	0.01	0.05	0.01	0.03	0.00	0.05	-0.09		
agea	0.02	-0.08	-0.22	-0.04	0.25	-0.02	-0.02	0.00	-0.02	-0.02	0.05	-0.06	-0.02	-0.02	-0.04	-0.12	0.15	-0.04	
blgetmg_r	-0.06	-0.03	-0.07	0.08	-0.07	0.04	0.01	0.00	0.01	0.03	-0.04	0.03	0.02	-0.03	0.01	0.01	0.06	0.01	-0.06

5.2 EMPIRICAL MODEL

The main model to test the first hypothesis (partisanship determinants), is an ordinary least square regression (OLS) with standard error consistent with heteroscedasticity:

$$y_{it} = \gamma + \sum \beta_j \, x_{jit} + cntry\_XX\_r_k + essround_t + \varepsilon_{it} \qquad (1)$$

Where y_{it} represents the indicators of our dependent variable *lrscale*: *where would you place yourself on this scale, where 0 means the left and 10 means the right?* γ is the intercept, x_{jit} is the vector of explanatory variables and β_j is a vector of parameters to be estimated. To control for fixed country effects, we introduce *cntry_XX_r$_k$* (33-1 dummy variables accounting for the 33 European countries surveyed in the ESS). Table 3 provides the full list of the 33 countries covered by the ESS and the regressions results. To control for annual shocks that affect all surveyed countries simultaneously, all regressions include *essround$_t$* (9-1 dummy variables to control for the 9 ESS waves). The error term is ε_{it}. Subscripts *i* and *t* represent interviewee and ESS wave (2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2020), respectively. Panel data methodology is not suitable because interviewees are not repeated in each wave.

Table 3 also shows two robustness checks. One the one hand, there is an ordered probit model, considering that the dependent variable is ordinal 0 to 10. This specification works as a confirmation of the OLS coefficients. On the other hand, a multilevel analysis for Croatia. We did not run a multilevel regression on the European sample due to the large amount of regions (different per country), which would make the regression too complex. For this reason, on the European sample, the OLS and ordered probit regressions control the country effect through the variable *cntry_XX$_{-rk}$*.

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TABLE 3
Regression, base model

Dept. variable: lrscale 0 Left – 10 Right		Definition	Expect. sign	European countries		Croatia		Multilevel
				OLS	Ordered probit	OLS	Ordered probit	
	gincdif	Government should reduce differences in income levels.	(+)	0.32***	0.15***	0.24**	0.11**	0.25***
				32.4	32.0	2.1	2.2	3.1
Income	*hincmta*	Household's total net income, all sources.	(+)	0.02***	0.01***	-0.02	-0.01	-0.03
				7.0	8.1	-0.7	-0.9	-0.9
	llanemy	How likely for there not to be enough money for household necessities next 12 months.	(-)	-0.05***	-0.02***	-0.06	-0.03	-0.06
				-4.8	-4.5	-0.5	-0.6	-0.3
	imprich	Important to be rich, have money and expensive things.	(-)	-0.09***	-0.06***	0.05	0.02	0.04
				-12.1	-17.2	0.8	0.7	0.5
Redistribution	*sbstrec*	Social benefits/services place too great strain on economy.	(-)	-0.14***	-0.04***	0.06	0.03	0.06
				-12.9	-8.8	0.5	0.5	1.1
	sbprvpv	Social benefits/services prevent widespread poverty.	(+)	0.02**	0.02***	-0.31**	-0.14***	-0.25**
				2.4	5.1	-2.5	-2.7	-2.2
	sbeqsoc	Social benefits/services lead to a more equal society.	(+)	0.02*	0.00	0.20	0.09	0.15
				1.8	0.8	1.5	1.5	1.1
	sbbsntx	Social benefits/services cost businesses too much in taxes/charges.	(-)	-0.14***	-0.07***	-0.32***	-0.14***	-0.32***
				-13.2	-15.0	-2.6	-2.6	-6.7
	sblazy	Social benefits/services cost make people lazy.	(-)	-0.10***	-0.03***	-0.12	-0.05	-0.14**
				-9.4	-7.0	-1.0	-0.9	-2.0
Immigration	*imsclbn*	When should immigrants obtain rights to social benefits/services?	(+)	0.13***	0.07***	0.18*	0.08*	0.13**
				13.2	15.9	1.7	1.7	2.1
	imbgeco	Immigration bad or good for country's economy.	(-)	-0.02***	-0.01***	-0.11**	-0.05**	-0.10**
				-4.2	-5.0	-2.4	-2.4	-2.4

Dept. variable:
lrscale
0 Left – 10 Right

		Definition	Expect. sign	European countries		Croatia		
Social welfare system	uentrjb	Most unemployed people do not really try to find a job.	(−)	−0.089*** (−8.6)	−0.04*** (−9.5)	−0.00 (0.0)	0.00 (0.1)	0.00 (0.0)
	lbenent	Many with very low incomes get less benefit than their legal entitlement.	(+)	0.071*** (6.6)	0.02*** (4.4)	0.03 (0.3)	0.02 (0.3)	0.02 (0.7)
	benent	Many manage to obtain benefits/services they are not entitled to.	(−)	−0.05*** (−4.5)	−0.01** (−2.0)	0.03 (0.2)	0.00 (0.1)	0.07 (0.5)
Environment	impenv	Important to care for nature and environment.	(+)	0.08*** (8.7)	0.03*** (8.4)	−0.04 (−0.5)	−0.01 (−0.3)	−0.06 (−1.1)
	rlgblg_r	Belonging to particular religion or denomination.	(+)	0.50*** (25.2)	0.26*** (28.2)	1.08*** (4.3)	0.50*** (4.4)	1.06* (1.8)
Personal features	gndr_r	Gender	¿?	0.10*** (5.6)	0.04*** (4.4)	0.11 (0.5)	0.05 (0.6)	0.10 (0.4)
	agea	Age of respondent, calculated.	(−)	0.00*** (8.5)	0.00*** (8.8)	0.00 (0.2)	0.00 (0.1)	0.00 (0.0)
	blgetmg_r	Belong to minority ethnic group in country	(−)	−0.75*** (−17.0)	−0.31*** (−14.7)	−0.96* (−1.7)	−0.47* (−1.8)	−1.05 (−1.5)
	N			50,713		552		
	R-squared			0.13		0.12		
	Maximum VIF			1.55				
	Log pseudolikelihood							−1,228.72

OLS= Ordinary Least Squares (robust variance estimations).

Below each coefficient, t value is reported. Sig.: *10%, **5%, ***1%.

All models include these not reported variables:

– The intercept

– Variable essround (ESS round), to control for possible year-shocks.

32 (33-1) dummy variables entry_XX_r, which account for each European country in the ESS dataset (Austria, Belgium, Bulgaria, Switzerland, Croatia, Cyprus, Czechia, Germany, Denmark, Estonia, Spain, Finland, France, United Kingdom, Greece, Hungary, Ireland, Israel, Iceland, Italy, Lithuania, Luxembourg, Latvia, Netherlands, Norway, Poland, Portugal, Russia, Sweden, Slovenia, Slovakia, Turkey, Ukraine). These dummy variables do not enter in the Croatia regression.

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6 RESULTS AND DISCUSSION

6.1 POLITICAL ECONOMICS IN CROATIA: PARTISANSHIP

Table 3 shows the impact of citizens' values on their partisanship (hypothesis 1). We split the regression in two columns as a way to compare the Croatian sample with the remaining European countries. It is important to point out that the coefficients agree with the expected signs of all variables except for the social benefits variable in Croatia (*sbprvpv*), as will be explained below. Therefore, citizens align their values with the level of partisanship expected by the literature on political economics. There are two main features of the Croatian case. On the one hand, there is the low impact of Croatian values on partisanship. In other words, it seems that Croatian citizens' values do not predict perfectly their political alignment, which, as we will see later, may be a consequence of the lack of interest of Croatian people in politics. Secondly, the impact of social benefits/services to prevent widespread poverty (*sbprvpv*) has an opposite impact to literature predictions and other European experience, i.e., conservative Croatians are more in favour of this policy.

If we focus on the variables grouped under the "income" label (*gincdif*, *hinctnta*, *lknemny*, *imprich*), they show that respondents with higher income (*hinctnta*, *lknemny*, *imprich*) tend to vote more conservatively in the rest of Europe, but not in Croatia. Regarding the government role of helping lower income groups (*gincdif*), conservatives in both Croatia and elsewhere in Europe are less in favour than their leftist counterparts. This result was expected according to Abramowitz and McCoy (2019), Ciuk, Lupton and Thornton (2017), Hemingway (2022) and Evans and Neundorf (2020).

Regarding the redistributive government role and social welfare variables (*sbstrec*, *sbprvpv*, *sbeqsoc*, *sbbsntx*, *sblazy*, *uentrjb*, *lbenent*, *bennent*) they are connected with more left-wing respondents in the European sample. These regression coefficients agree with Abramowitz and McCoy (2019) and Ciuk, Lupton and Thornton (2017). However, the Croatian sample shows much less significance in all these variables, meaning that these issues do not have much on the political alignment of Croatians. Regarding the variable *sbprvpv* (Social benefits/services prevent widespread poverty), Croatians show a result opposite to that predicted by the literature, since leftist Croatians oppose this policy. Further research is needed to disentangle the determinants of this feature.

As far as immigration is concerned, conservatives in both Croatian and the rest of Europe think it is not good for the economy (*imbgeco*). The empirical literature reports the same relationship, for example Williamson, Skocpol and Coggin (2011) and Abramowitz and McCoy (2019).

Croatians' concern for environment issues (*impenv*) does not influence their partisanship preferences. However, as predicted by the literature, the rest of Europeans' values are in line with the literature, being leftist implies increased concern about environmental issues (Dubois and Blank, 2018).

Regarding personal features treated as control variables (*rlgblg_r*, *gndr_r*, *agea*, *blgetmg_r*), Croatians agree with their European counterparts and with the literature (Ciuk, Lupton and Thornton, 2017; Diercks and Landreville, 2016; Abramowitz and McCoy, 2019). Belonging to a minority tends to meaning voting for the left. Religious people lean toward conservative parties.
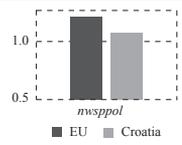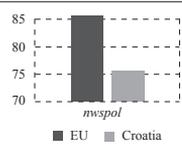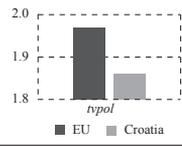
6.2 CITIZENS' ENGAGEMENT: PERCEPTION ABOUT ECONOMY AND POLITICS

This section evaluates how Croatian citizens engage in governmental and economics issues. Figure 1 reports the different attitude of Croatians and remaining Europeans as far as getting informed about politics and economy (Hypothesis 2). Variables considered are *nwsppol* (Newspaper reading, politics/current affairs on average weekday), *nwspol* (News about politics and current affairs, watching, reading or listening, in minutes) and *tvpol* (TV watching, news/politics/current affairs on average weekday). As figure 1 shows, Croatians show a highly statistically significant lower interest in political or economic news. It is worth mentioning that considering different news media (TV, newspapers, radio) does not change the result. Croatians are quite a lot less interested in politics/economic than other Europeans. This feature is relevant, because voters cannot hold politicians accountable if they ignore what is going on in politics and economy (Dubois and Blank, 2018). As Bullock et al. (2015) points out, Americans know little about politics, and they often recognise their own lack of knowledge. However, Europeans want to be informed, but the same cannot be concluded about Croatians, which means that Hypothesis 2 must be rejected.

There is an interesting feature pointed out by the literature. Bisgaard (2015), Hetherington and Rudolph (2015) and Citrin and Stoker (2018) posit that citizens' judgments of governments' performance are more favourable when their party holds power and more unfavourable when their party does not. We tested this point in Croatia (Hypothesis 3), and figure 2 shows the results.

ESS has a variable (*uemplwk*) with this question: "*Of every 100 people of working age in [country] how many would you say are unemployed and looking for work? Choose your answer from this card. If you are not sure please give your best guess*". We subtracted this number provided by interviewees from the real unemployment of the interviewee's country, and we got a measurement of the favourable perception of citizens. The more negative, the more pessimistic are respondents compared to the real economic situation (unemployment). Surprisingly, citizens are less favourable in their perception of unemployment when their party holds power. We think this feature relates to the lack of trust of Croatians in their politicians and parliament, which as we will see later, is increasing. Therefore, we reject Hypothesis 3, as the political alignment bias does not apply to Croatia.

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FIGURE 1

Searching for news about politics in Croatia

Variable	Groups				Student's t-test for the comparison of two means
	cntry_HR_r= 0 Remaining European countries		*cntry_HR_r= 1* Croatia		
	Mean	**Observations**	**Mean**	**Observations**	
nwsppol Newspaper reading, politics/ current affairs on average weekday	1.21	166,912	1.07	2,097	7.07***
	cntry_HR_r= 0 Remaining European countries		*cntry_HR_r= 1* Croatia		Student's t-test for the comparison of two means
	Mean	**Observations**	**Mean**	**Observations**	
nwspol On a typical day, about how much time (in minutes) do you spend watching, reading or listening to news about politics and current affairs?	85.67	87,795	75.53	1,793	3.07***
	cntry_HR_r= 0 Remaining European countries		*cntry_HR_r= 1* Croatia		Student's t-test for the comparison of two means
	Mean	**Observations**	**Mean**	**Observations**	
tvpol On an average weekday, how much of your time watching television is spent watching news or programmes about politics and current affairs?	1.97	315,072	1.86	2,976	4.36***

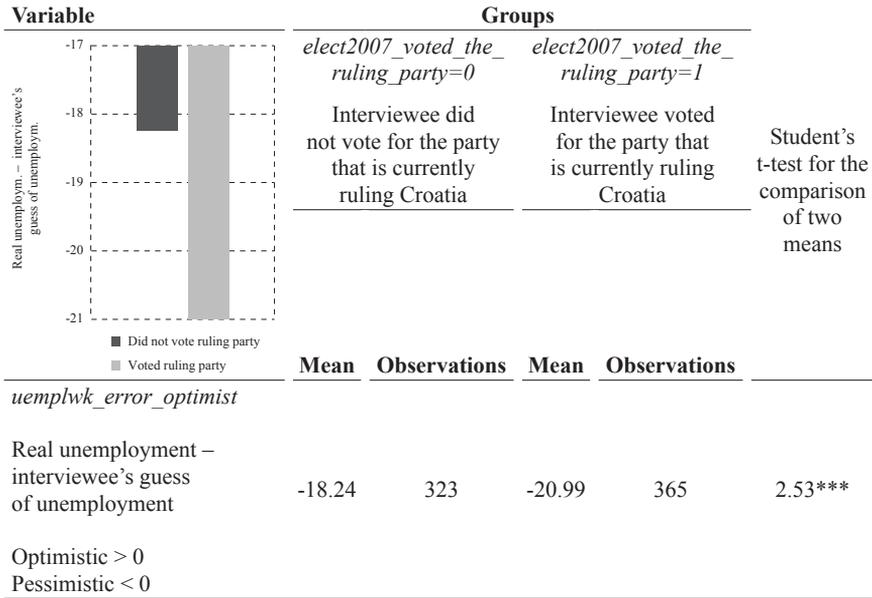*Sig.:*10%,**5%,***1%. Total number of observations 318,048.*

Sample is ESS round 4 (2008), 5 (2010) and 9 (2020). All countries vs. Croatia.

Variables description:

- *cntry_HR_r: Country is Croatia 1, otherwise 0.*
- *nwsppol: Newspaper reading, politics/current affairs on average weekday: (0) No time at all, (1) Less than 0,5 hour, (2) 0,5 hour to 1 hour, (3) More than 1 hour, up to 1,5 hours, (4) More than 1,5 hours, up to 2 hours, (5) More than 2 hours, up to 2,5 hours, (6) More than 2,5 hours, up to 3 hours, (7) More than 3 hours.*
- *nwspol: On a typical day, about how much time (in minutes) do you spend watching, reading or listening to news about politics and current affairs?*
- *tvpol: On an average weekday, how much of your time watching television is spent watching news or programmes about politics and current affairs? (0) No time at all, (1) Less than 0,5 hour, (2) 0,5 hour to 1 hour, (3) More than 1 hour, up to 1,5 hours, (4) More than 1,5 hours, up to 2 hours, (5) More than 2 hours, up to 2,5 hours, (6) More than 2,5 hours, up to 3 hours, (7) More than 3 hours.*

Figure 2

Optimism in citizens who voted for the ruling party in Croatia

Variable	Groups			
	elect2007_voted_the_ruling_party=0	*elect2007_voted_the_ruling_party=1*	Student's t-test for the comparison of two means
	Interviewee did not vote for the party that is currently ruling Croatia	Interviewee voted for the party that is currently ruling Croatia	
	Mean	**Observations**	**Mean**	**Observations**	
uemplwk_error_optimist					
Real unemployment – interviewee's guess of unemployment	-18.24	323	-20.99	365	2.53***
Optimistic > 0 Pessimistic < 0					

*Sig.:*10%,**5%,***1%. Total number of observations 688.*

Sample is ESS round 4 (2008), Croatia subsample.

Variables description:

- *uemplwk_error_optimist: Real unemployment of the country – interviewee's guess of their country's unemployment. This latter variable coded as uemplwk on ESS round 4 and ESS round 8: "Of every 100 people of working age in [country] how many would you say are unemployed and looking for work? If you are not sure please give your best guess."*
- *elect2007_voted_the_ruling_party: Interviewee voted for party currently ruling Croatia 1, otherwise 0.*

Many scholars are claiming that polarization is increasing and they warn about the negative effects this trend may have for democracies around the globe (Dubois and Blank, 2018; Citrin and Stoker, 2018; Robison and Mullinix, 2016; Boeri, Börsch-Supan and Tabellini, 2001). Figure 3 shows the assessment of polarization in Croatia, as a way to check Hypothesis 4.

Party polarization is also a prime suspect for the overall downward trend in trust (Citrin and Stoker, 2018). As shown in figure 3, polarization has increased in Croatia over the last years. Figure 3 presents two indicators of this trend, which reinforces the robustness of the results. First, at the top of figure 3, the Manifesto project variable of partisanship is presented (variable *rile* – right-left). The difference between the most conservative (right wing) party's numerical indicator minus the most progressive (left-wing) indicator has increased from 22.328 in 1990 to 62.489 in 2020. Similarly, the standard deviation of the variable *rile* has increased from 7.903 in 1990 up to 19.609 in 2020. Second, the bottom part of figure 3 shows the variable *lrscale* from the ESS, with a standard deviation rising from 2.48 in 2008 to 2.60 in 2020. All these data confirm Hypothesis 4.

FIGURE 3

Political polarization trend in Croatia
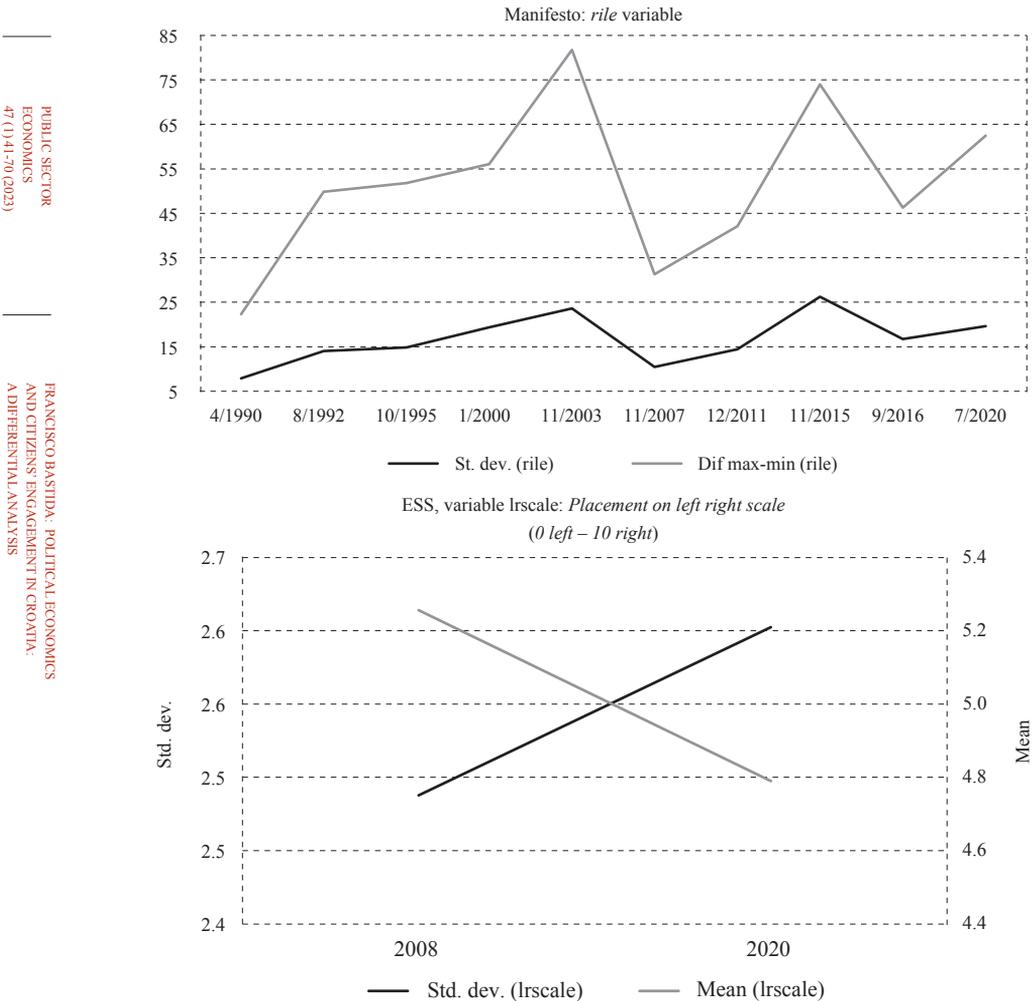
Top figure reports variable rile: Volkens et al. (2021) publish the Manifesto dataset (https://man-ifesto-project.wzb.eu/), with a variable called rile, which measures the left (minimum value) vs. right (maximum value).
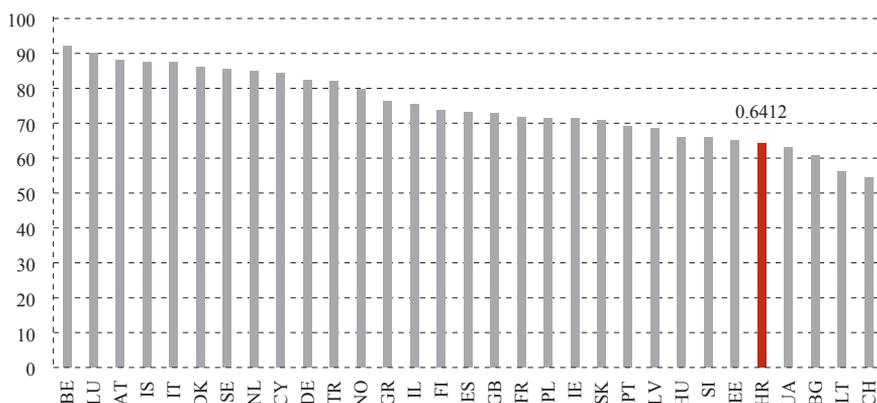
Bottom figure reports variable lrscale: European Social Survey.

This increasing polarization makes political consensus more difficult and, to some extent, biases citizens' judgment in the direction of a fixed rejection of political opponents' proposals. Polarization reinforces political divides, and will threaten democracies by limiting political information and discussions (Dubois and Blank, 2018). This high political polarization of Croatia makes it more complicated for the government to implement the *median voter* strategy.

How do all these features (low interest in politics, polarization) affect Croatians participation in political issues? Figure 4 seeks to answer this question (Hypothesis 5).

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FIGURE 4

*Voter turnout (%), average of previous parliamentary election (voter_turnout_
parliam)*

Variable	Groups				Student's t-test for the comparison of two means
	Remaining European countries		*Croatia*		
	Mean	**Observations**	**Mean**	**Observations**	
voter_turnout_parliam					
Voter turnout in last parliamentary election	0.7518	30	0.6412	1	5.89***

*Sig.:*10%,**5%,***1%. Total number of observations 31.*

Variable voter_turnout_parliam: Voter turnout in last parliamentary election.

Source: Voter Turnout Database (https://www.idea.int/data-tools/data/voter-turnout).

As figure 4 shows, voter turnout of Croatian citizens is significantly below the European context. The voter turnout of the last parliamentary elections was 64.12%, which is significantly lower than the benchmark sample composed of the remaining European countries. Therefore, Croatians vote less in the parliamentary elections, indicating low participation and engagement, which agrees with all the features pointed out in this section. Accordingly, our data reject Hypothesis 5.

6.3 TRUST, BUDGET TRANSPARENCY AND CORRUPTION

Figure 5 shows the corruption perception index of European countries (Transparency International). The index for Croatia is 47, which is significantly lower than the remaining European countries (average of these 30 European countries is 65.7). This finding shows that the high levels of corruption claimed by Ateljevic and Budak (2010) hold more than a decade later. Budak (2007) states that at the beginning of the twentieth century, in Croatia there existed a problem of corruption. Integration of Croatia in international institutions, such as EU (in 2013) and NATO (in 2009), seemed to speed up reforms towards lower corruption (Ateljevic and Budak, 2010). However, as data show, there is still room for improvement.

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FIGURE 5

Corruption perception index 2021, Transparency International

Variable	Groups				Student's t-test for the comparison of two means
	Remaining European countries		*Croatia*		
	Mean	Observations	Mean	Observations	
cpi_2021					
Corruption perception index (higher value means lower corruption).	65.7	30	47.0	1	6.45***

Sig.:*10%,**5%,***1%. Total number of observations 31.

Variable cpi_2021: 2021 Corruption perception index, Transparency International. Higher values mean cleaner (less corrupt) countries. (https://www.transparency.org/en/cpi/2021).

Regarding budget transparency, figure 6 shows the open budget index (OBI), as computed by the Open Budget Partnership. The Open Budget Survey ranks countries according to their level of accountability in national budget processes. The last available index corresponds to 2019. Due to missing values of some European countries, we compared the Croatian budgetary transparency index with the rest of the world. In this case, Croatia clearly outperforms the international sample of countries. This means that the Croatian government is preparing and disclosing the budget in a correct way, according to international standards. Thus, we confirm that the budget is well implemented and disclosed, but it does not reach Croatian citizens, due to the lack of their interest in politics in general. Švaljek, Rašić Bakarić and Sumpor (2019) find that public policy needs to raise awareness among citizens of the ways they could influence the budget process, once the Croatian budget transparency is greater than the international average.

FIGURE 6

Budget transparency, Open Budget Partnership

Variable	Groups				Student's t-test for the comparison of two means
	Remaining European countries		*Croatia*		
	Mean	**Observations**	**Mean**	**Observations**	
cobi_2019					
Open budget index (higher value means timely and comprehensive budget)	44.4	116	68.0	1	-11.14***

Sig.:*10%,**5%,***1%. Total number of observations 117.

Variable cobi_2019: 2019 Open budget index, as computed by the Open Budget Partnership. Higher value means more budget transparency.

Note: t-test performed with the rest of the world, as EU had some missing values. Data available at: https://internationalbudget.org/open-budget-survey/.

To what extent do Croatians trust their political system? This is the question we aim to address now (see figures 7 and 8).

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FIGURE 7

Trust in country's parliament
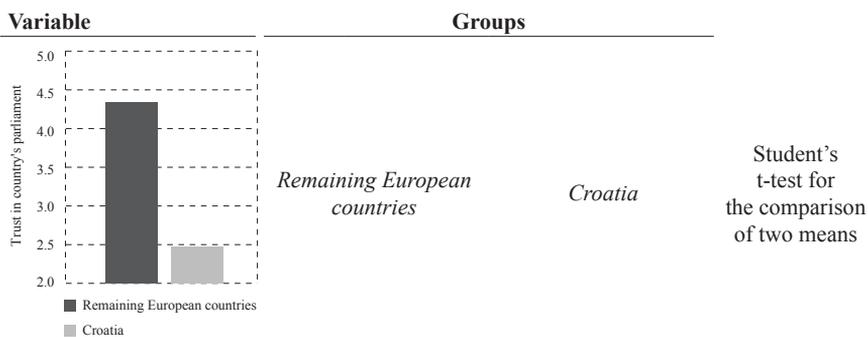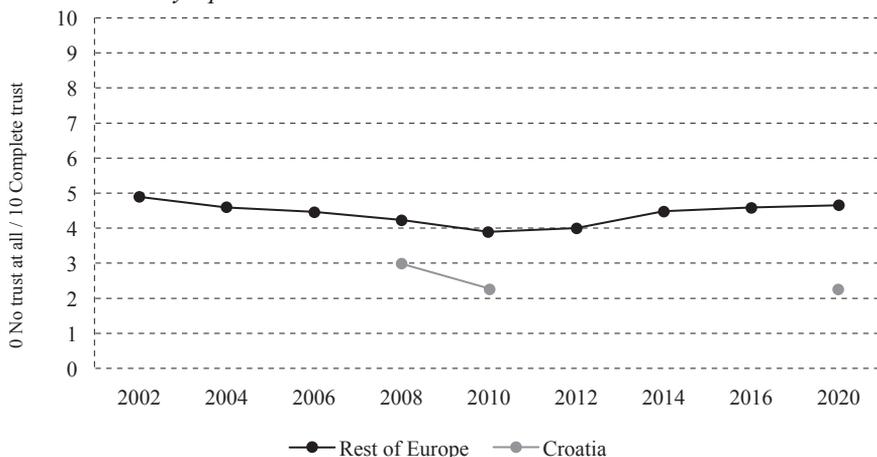
Variable	Groups		Student's t-test for the comparison of two means
	Remaining European countries	*Croatia*	
	Mean	**Observations**	**Mean**	**Observations**	
trstprl					
Trust in country's parliament (higher value means more trust)	4.40	406,259	2.48	4,852	51.12

Sig.:*10%,**5%,***1%. Total number of observations 411,111.

ESS variable trstprl: Trust in country's parliament. "Please tell me on a score of 0-10 how much you personally trust each of the institutions I read out. 0 means you do not trust an institution at all, and 10 means you have complete trust. [Country]'s parliament?"

FIGURE 8

Trust in politicians
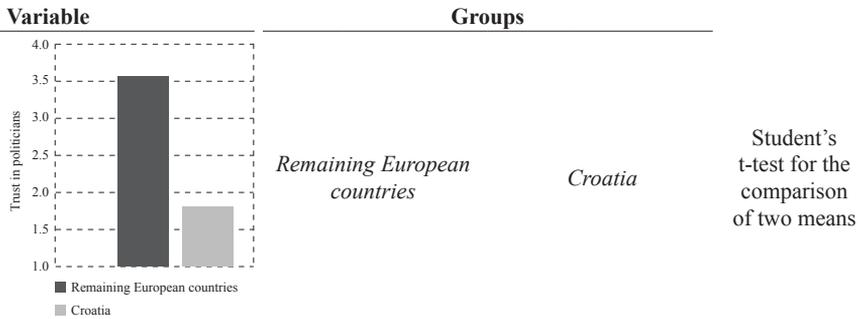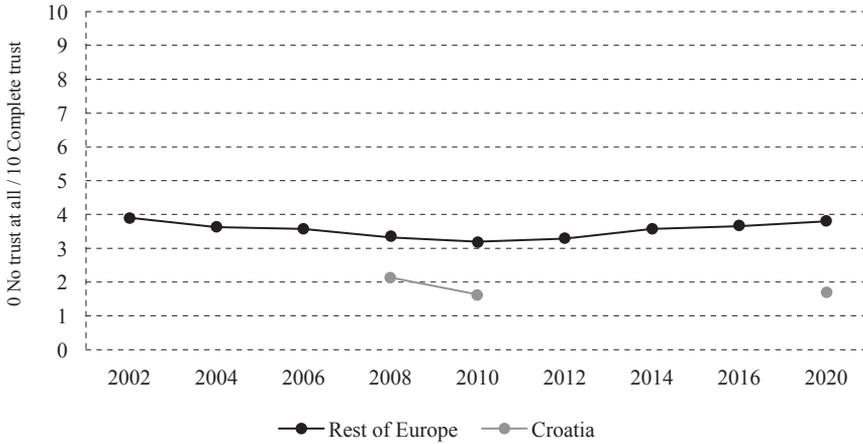
Variable	Groups		
	Remaining European countries	*Croatia*	Student's t-test for the comparison of two means
	Mean	Observations	Mean	Observations	
trstplt					
Trust in politicians (higher value means more trust)	3.53	409,088	1.80	4,851	49.82***

*Sig.:*10%,**5%,***1%. Total number of observations 413,939.*

ESS variable trstplt: Trust in politicians. "Please tell me on a score of 0-10 how much you personally trust each of the institutions I read out. 0 means you do not trust an institution at all, and 10 means you have complete trust. Politicians?"

Both figures 7 and 8 show that Croatians trust their parliament and politicians to a significantly lower extent than other Europeans. The average level of trust in parliament for Croatians is 2.48 compared to 4.40 of Europeans. For politicians, the Croatian average is even lower, 1.80 vs. 3.53. Besides, both graphs show a declining trend, meaning that trust on parliament and politicians is decreasing over the years in Croatia. This reduced trust in government in Croatia was claimed by Ateljevic and Budak (2010) more than a decade ago. These two levels of Croatians' trust agree with Torcal (2017), who shows that politicians are consistently the most distrusted in all European countries, but parliaments are trusted a bit more.

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Torcal (2017), when evaluating trust in a European context with the ESS dataset, concludes that there is a "Mediterranean" or "southern European" political culture, deeply rooted in particular and stable ways of life. This culture is characterised by traditionalism and fatalism, elitism and charismatic leadership, distance from politics and low participation. Although Croatia was not evaluated by this author, we wonder if some of these features may apply to Croatia, since Croatia shows significantly lower trust in parliament, politicians, etc., as compared to the remaining European countries surveyed in the ESS.

As an overall conclusion, with a significance of 1%, our data reject Hypothesis 6. Regarding corruption, trust in parliament and politicians, Croatia ranks worse than the remaining European countries. As far as budget transparency is concerned, Croatia performs well above the remaining countries (the rest of Europe and additional countries included in the OBI 2019 dataset).

7 CONCLUSIONS AND FURTHER RESEARCH

The two findings on Croatian partisanship are, on the one hand, a lower impact of Croatian values on partisanship. In other words, it seems that Croatian citizens' values do not perfectly predict their political alignment, which may be a consequence of the lack of interest of Croatian people in politics. The role of government in reducing income inequality (*gincdif*), the impact of social benefits in terms of taxes (*sbbsntx*), immigration (*imbgeco*) and religion (*rlgblg_r*) significantly impact political partisanship in the way predicted by the literature, and all these features mimic other European countries. On the other hand, the impact of social benefits/services on the prevention of widespread poverty (*sbprvpv*) works in the opposite way to that predicted by the literature and shown in other European countries, i.e., conservative Croatians are more in favour of this policy. Further research is needed to disentangle the determinants of this feature.

Furthermore, Croatian political parties will face problems to implement the *median voter* strategy, because polarization is an issue that is increasing over the years. This polarization clearly decreases the quality of Croatian democracy and jeopardizes the *median voter* assumption.

Trust of Croatians in their political system (parliament, politicians) is extremely low. Most probably, it is due to the high level of corruption and to the post-communism effect. The habits learned during the communist period, based on the belief that the state worked against the individual rather than for it, prevent Croatians from trusting their political system.

The country missed the opportunity to implement ambitious reforms in this regard when opting to join the EU and NATO. Therefore, it is strongly recommended that the Croatian government effectively curbs corruption. We believe that the joint effect of corruption and distrust explains the low engagement in elections, which in turn means low electoral turnout. This low level of trust most probably explains

why Croatians do not keep up with political or economic news. We confirm that citizens' distrust of government stemming from communism still holds, 30 years after the disintegration of Yugoslavia. It seems that citizens' behavior aimed at evading the rules of the communist state means a higher corruption level in Croatia

It is worth mentioning the positive evaluation of the budgetary process in Croatia, since this country ranks well above the international standards in terms of quality of budget and scope of disclosure. This very positive feature should be reinforced in the future, as a way to increase the engagement of Croatians in their government, economy and political system.

As policy implications from this research, we can highlight the positive finding of the Croatian budgetary process, which outperforms the international standard, and that should be capitalized on by the Croatian government, and used as a landmark to campaign about increasing citizens' involvement in public affairs. Thus, we agree with Švaljek et al. (2019), in the claim that public policy needs to raise awareness among citizens of the ways they could influence the budget process. It is essential that the government achieves higher trust from citizens, so that the democracy that was prompted in post-communist Croatia matures and allows Croatia to implement the reforms requested by the European Union in terms of corruption and democratic quality. The target should be to achieve an electoral turnout similar to the remaining European countries, i.e., 75%. In a nutshell, our findings align with Vuković (2017), in a claim for an institutional push that encourages both greater transparency and accountability to voters, and that punishes corrupt politicians.

Further research should address the trend on the factors that are affecting the quality of Croatian democracy, i.e., corruption, low citizen engagement and declining trust. Furthermore, researching the determinants of the budgetary implementation success could shed light on the policies that are working well in Croatia. This philosophy could be extended to other fields of the political system, as a way to curb the main problems identified in this piece of research.

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The author declares that there is no conflict of interest.

REFERENCES

1. Abramowitz, A. and McCoy, J., 2019. United States: Racial resentment, negative partisanship, and polarization in Trump's America. *The ANNALS of the American Academy of Political and Social Science*, 681(1), pp. 137-156. https://doi.org/10.1177/0002716218811309

2. Ančić, B., Baketa, N. and Kovačić, M., 2019. Exploration of class and political behavior in Croatia. *International Journal of Sociology*, 49(4), pp. 264-281. https://doi.org/10.1080/00207659.2019.1634826

3. Ateljevic, J. and Budak, J., 2010. Corruption and public procurement: example from Croatia. *Journal of Balkan and Near Eastern Studies*, 12(4), pp. 375-397. https://doi.org/10.1080/19448953.2010.531202

4. Bellamy, A. J., 2003. *The formation of Croatian national identity: A centuries-old dream?*. https://doi.org/10.7228/manchester/9780719065026.001.0001

5. Bisgaard, M., 2015. Bias will find a way: Economic perceptions, attributions of blame, and partisan-motivated reasoning during crisis. *The Journal of Politics*, 77(3), pp. 849-860. https://doi.org/10.1086/681591

6. Boeri, T., Börsch-Supan, A. and Tabellini, G., 2001. Would you like to shrink the welfare state? A survey of European citizens. *Economic Policy*, 16(32), pp. 8-50. https://doi.org/10.1111/1468-0327.00069

7. Bojar, A., 2015. Intra-Governmental Bargaining and Political Budget Cycles in the European Union. *European Union Politics*, 16(1), pp. 90-115. https://doi.org/10.1177/1465116514547954

8. Bouckaert, G. and van de Walle, S., 2003. Comparing Measures of Citizen Trust and User Satisfaction as Indicators of `Good Governance': Difficulties in Linking Trust and Satisfaction Indicators. *International Review of Administrative Sciences*, 69(3), pp. 329-343. https://doi.org/10.1177/00208523030693003

9. Boulianne, S., 2015. Social media use and participation: A meta-analysis of current research. *Information, Communication and Society*, 18(5), pp. 524-538. https://doi.org/10.1080/1369118X.2015.1008542

10. Budak, J., 2007. Corruption in Croatia: Perceptions rise, problems remain. *Croatian Economic Survey*, (9), pp. 35-68.

11. Bullock, J. G. [et al.], 2015. Partisan Bias in Factual Beliefs about Politics. *Quarterly Journal of Political Science*, 10(4), pp. 519-578. http://dx.doi.org/10.1561/100.00014074

12. Chitanana, T. and Mutsvairo, B., 2019. The deferred 'democracy dividend' of citizen journalism and social media: Perils, promises and prospects from the Zimbabwean experience. *Westminster Papers in Communication and Culture*, 14(1), pp. 66-80. https://doi.org/10.16997/wpcc.305

13. Citrin, J. and Stoker, L., 2018. Political trust in a cynical age. *Annual Review of Political Science*, 21, pp. 49-70. https://doi.org/10.1146/annurev-polisci-050316-092550

14. Ciuk, D. J., Lupton, R. N. and Thornton, J. R., 2018. Values voters: The conditional effect of income on the relationship between core values and political

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attitudes and behavior. *Political Psychology*, 39(4), pp. 869-888. https://doi.org/10.1111/pops.12442

15. Commission of the European Communities, 2004. *Communication from the Commission to the Council and to the European Parliament. Strategy Paper of the European Commission on Progress in the Enlargement Process. {SEC(2004) 1199, 1200}.*

16. Diercks, D. and Landreville, K. D., 2016. The Indirect Effects of Partisanship and Partisan Media on Knowledge About Same-Sex Marriage Policy: Exploring the Knowledge and Belief Gap Hypotheses. *Mass Communication and Society,* 20(2), pp. 192-212. https://doi.org/10.1080/15205436.2016.1230221

17. Dubois, E. and Blank, G., 2018. The echo chamber is overstated: the moderating effect of political interest and diverse media. *Information, Communication and Society*, 21(5), pp. 729-745. https://doi.org/10.1080/1369118X.2018.1428656

18. Evans, G. and Neundorf, A., 2020. Core political values and the long-term shaping of partisanship. *British Journal of Political Science*, 50(4), pp. 1263-1281. https://doi.org/10.1017/S0007123418000339

19. Fielding, K. S. [et al.], 2012. Australian politicians' beliefs about climate change: political partisanship and political ideology. *Environmental Politics*, 21(5), pp. 712-733. https://doi.org/10.1080/09644016.2012.698887

20. Florentina, H. H. and Dritero, A., 2020. The importance of public participation in building up democracies in former Yugoslav states. Case study: Kosovo and Croatia. *UBT Knowledge Center*, No. 28.

21. García-Sánchez, I. M., Mordán, N. and Cuadrado-Ballesteros, B., 2014. Do Electoral Cycles Affect Local Financial Health? *Policy Studies*, 35(6), pp. 533-556. https://doi.org/10.1080/01442872.2014.971727

22. Godefroidt, A., Langer, A. and Meuleman, B., 2017. Developing political trust in a developing country: The impact of institutional and cultural factors on political trust in Ghana. *Democratization*, 24(6), pp. 906-928. https://doi.org/10.1080/13510347.2016.1248416

23. Hemingway, A., 2022. Does Class Shape Legislators' Approach to Inequality and Economic Policy? A Comparative View. *Government and Opposition*, 57(1), pp. 84-107. https://doi.org/10.1017/gov.2020.27

24. Hetherington, M. J. and Rudolph, T. J., 2015. Why Washington won't work. In: *Why Washington Won't Work*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226299358.001.0001

25. Jost, J. T., Christopher, M. F. and Napier, J. L., 2009. Political Ideology: Its Structure, Functions, and Elective Affinities. *Annual Review of Psychology,* 60, pp. 7-37. https://doi.org/10.1146/annurev.psych.60.110707.163600

26. Lalić, D., 2011. Politički prosvjedi u Hrvatskoj: Klasične demonstracije, političko gibanje ili novi društveni pokret. *Političke analize,* 2(6), pp. 23-28.

27. Park, M. J. [et al.], 2015. Trust in government's social media service and citizen's patronage behavior. *Telematics and Informatics*, 32*(*4), pp. 629-641. https://doi.org/10.1016/j.tele.2015.02.006

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ECONOMICS
47 (1) 41-70 (2023)

FRANCISCO BASTIDA: POLITICAL ECONOMICS
AND CITIZENS' ENGAGEMENT IN CROATIA:
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28. Robison, J. and Mullinix, K. J., 2016. Elite polarization and public opinion: How polarization is communicated and its effects. *Political Communication*, 33(2), pp. 261-282. https://doi.org/10.1080/10584609.2015.1055526

29. Švaljek, S., Rašić Bakarić, I. and Sumpor, M., 2019. Citizens and the city: the case for participatory budgeting in the City of Zagreb. *Public Sector Economics*, 43(1), pp. 21-48. https://doi.org/10.3326/pse.43.1.4

30. Switzer, D., 2017. Citizen partisanship, local government, and environmental policy implementation. *Urban Affairs Review*, 55(3), pp. 675-702. https://doi.org/10.1177/1078087417722863

31. Torcal, M., 2017. Political trust in western and southern Europe. In: *Handbook on political trust*. Edward Elgar Publishing.

32. Van Bavel, J. J. and Pereira, A., 2018. The partisan brain: An identity-based model of political belief. *Trends in Cognitive Sciences*, 22(3), pp. 213-224. https://doi.org/10.1016/j.tics.2018.01.004

33. Volkens, A. [et al.], 2021. *The Manifesto Data Collection. Manifesto Project (MRG/CMP/MARPOR)*. Version 2021a. Berlin: Wissenschaftszentrum Berlin für Sozialforschung (WZB). https://doi.org/10.25522/manifesto.mpds.2021a

34. Vuković, V., 2017. The political economy of local government in Croatia: winning coalitions, corruption, and taxes. *Public Sector Economics*, 41(4), pp. 387-420. https://doi.org/10.3326/pse.41.4.1

35. Williamson, V., Skocpol, T. and Coggin, J., 2011. The Tea Party and the remaking of Republican conservatism. *Perspectives on Politics*, 9(1), pp. 25-43. https://doi.org/10.1017/S153759271000407X

36. Wu, W., Ma, L. and Yu, W., 2017. Government Transparency and Perceived Social Equity: Assessing the Moderating Effect of Citizen Trust in China. *Administration & Society*, 49*(*6), pp. 882-906. https://doi.org/10.1177/0095399716685799

The characteristics and effects of public participation in Croatian e-consultations in fiscal matters

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PETRA DURMAN, ANAMARIJA MUSA, TEREZA ROGIĆ LUGARIĆ:
THE CHARACTERISTICS AND EFFECTS OF PUBLIC PARTICIPATION
IN CROATIAN E-CONSULTATIONS IN FISCAL MATTERS

Abstract

Public participation in the formulation of fiscal policy is particularly salient, since public finances is a topic relevant for the public in general, although it requires certain level of knowledge about fiscal matters. The purpose of this paper is to investigate the level and the type of public interest in the area of fiscal policy, and to assess the influence of the interested public on the regulation of fiscal policy. In order to do so, authors analyze the implementation of electronic public consultations (e-consultations) in Croatia conducted by the Ministry of Finance in a three-year period. Research findings suggest that even though the level of participation in fiscal policy area does not significantly derogate from the average of e-consultations at the state level, public interest appears to be quite well organized and informed, which positively affects the level of administrative responsiveness in this policy area.

Keywords: public participation, electronic public consultations (e-consultations), fiscal policy, regulation process, interested public, Ministry of Finance, Croatia

1 INTRODUCTION

During the past two decades, the principles of government transparency and openness have become an inherent part of public governance (see Musa, 2017). Both principles pertain to the category of political values and refer to the relation between the government and the public, changing the traditional "top-down" constellation of power to something more collaborative (Koprić, 2017: 6). Contemporary public governance has become increasingly complex because of different socio-economic and technical developments and tendencies. Although there is an increasing number public problems combined with their growing entanglement, the capabilities of societies to resolve collective problems have also widely progressed. In contemporary decision-making processes, the public has become one of the inherent actors that can provide a useful input for the formulation of solutions to complex public problems. Due to a high level of information, knowledge and interconnectedness, the interested public is able to provide an additional, "fresh" perspective, thereby widening the decision-making basis.

In this paper, the focus is on public participation in the area of public finance. The main research question is related to the level, characteristics and the effects of involving the public in the process of formulating fiscal policy. In order to address the research question, the electronic public consultations (e-consultations) conducted by the Croatian Ministry of Finance (MF) in the period 2016-2018/2020[1] are analyzed. Due to the specificities of the fiscal policy area as traditional government department, a lower level of public interest in relation to public services sectors (such as education, health policy, etc.) is expected, as well as a lower level of government responsiveness to public input. However, it is also expected that members of the public interested in fiscal matters possess a certain level of knowledge of public finances and are able to provide informed comments on the regulation.

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[1] The main part of the research covers the period from 2016 to 2018, while some research data have been supplemented with the year 2019 and 2020. On methodology design see section 4.

After the introductory part, a discussion of the principles of transparency and openness in public governance in general and in the area of public finances in particular is presented (2). In the next section, the main research questions and hypotheses on public participation in fiscal policy area are presented (3), followed by an explanation of the research design (4). Within the research part of the paper, we first explore the state of fiscal transparency and openness in Croatia in general, and then we analyse the instrument of e-consultations in the fiscal policy area, by presenting and discussing the research results (6). In the concluding section we summarize the main research findings and give recommendations for further research as well as for the practice of conducting e-consultations (7).

2 THE PRINCIPLES OF TRANSPARENCY AND OPENNESS IN PUBLIC GOVERNANCE AND FISCAL POLICY

The principles of government transparency and openness, although interrelated, imply different conceptualizations of the relationship between government and public and are not to be treated as synonyms. While transparency implies the visibility and availability of different types of information and data from government to the public, the principle of openness includes the inverse as well – the ability of the public to provide feedback (opinions, suggestions, etc.) to the government. There is a spectrum of instruments contemporary governments use for providing information to the public and for involving the public in the regulatory process. Government transparency is mostly achieved via official websites providing catalogues, brochures, databases and other types of information owned by government organizations (the proactive provision of information), or alternatively, via requests of a natural or legal person for information (passive provision of information) (Musa, 2017: 35). When referring to formal participatory instruments[2], a distinction has to be made between the instruments for the participation of the narrower interested public[3], such as working groups for drafting regulation, and the instruments for involving the wider, general public, such as public consultations, citizens' panels, questionnaires, etc. Different countries rely on different instruments, which differ in the mode in which they involved the public, the level of inclusiveness and influence provided to the public, etc. Nevertheless, information-communication technology (ICT)-based participatory instruments (such as e-consultations, e-petitions, e-referenda, etc.) predominate today as innovative participatory instruments in contrast to conventional, mostly offline, instruments.

The relevance of the two government principles is particularly emphasized in the area of public finances, which actually intersects with the concept of transparency. It represents the reflection of a relatively recent change of paradigm towards higher levels of protection of human rights, citizen participation and taxpayer protection on the one hand and the increase of public authorities' accountability on

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[2] Public can also exert influence via informal channels, as in the case of lobbying or clientelistic networks (narrower public) or via different media platforms (wider public).
[3] Such as experts and professionals, representatives of civil society organizations (CSO) and other organizations and institutions involved in policy implementation.

the other hand. Therefore, transparency occurs in two predominant forms – budget (fiscal) transparency and tax transparency. The former relates mostly to the expenditure side, while the latter relates predominately to the revenue side of the public finance system. For the purpose of the paper, the concept of budget (fiscal) transparency is used.

The principle of budget transparency is one of the youngest budget principles. In modern times, it is tightly connected to the evolution of the idea of responsible budgeting. Within that framework, a public budgeting system is recognized as one means of holding a government accountable for its actions. As the budgetary law is often "a sword without a blade", one of the methods for achieving results is through reinforcing (social) values, i.e. to strengthen public disapproval of and pressure on non-compliant behaviour. Nevertheless, although the budget is the most important instrument for financing public needs, it is just one of them. Therefore, it could be said that the aim of budgetary and fiscal transparency is the same. The notion of fiscal transparency, however, is wider in its scope taking into account the complexity of the public finance sector (and its different instruments and aspects) and trying to comprise "complete" financial dimension of public sector. Consequently, it is used more often, especially in public policy and soft law documents on national as well as on international levels.

Therefore, separate concepts of fiscal transparency and fiscal openness have been established in academic, professional and public discourse. Fiscal transparency has been vigorously advocated by international organizations, such as the International Monetary Fund (IMF), World Bank, United Nations, and others, particularly within the initiatives such as Open Government Partnership (OGP) and other anti-corruption programmes. Fiscal transparency refers to the comprehensiveness, clarity, reliability, timeliness, and relevance of public reporting on the past, present, and future state of public finances (Bronić, 2013: 29; IMF, 2019a). According to the IMF's Fiscal Transparency Code (IMF, 2019b), it comprises four areas: (i) fiscal reporting; (ii) fiscal forecasting and budgeting; (iii) fiscal risk analysis and management; and (iv) resource revenue management. Fiscal transparency is extremely important because the public is informed on the means of collecting and spending government budget, which enables the public to have oversight of the public finances. As stressed by Ott and Bronić (2017: 478), public oversight promotes government accountability and reduces opportunities for corruption.

While including fiscal transparency, the concept of fiscal openness goes further by encompassing the possibility for the public to be able to influence the formulation of fiscal policy, that is, to provide the government with the suggestions on public expenditures. Instruments through which the public can be involved in the process of formulating fiscal policy are more commonly applied at the local level of government. They include "usual" participatory instruments, such as public consultations, citizens' panels or forums, questionnaires and similar, when conducted on issues of fiscal policy. Participatory budgeting is one specific instrument, which

gained global popularity from 2000s onwards, after its successful introduction in Brazil (Porto Alegre) in 1989.[4]

In sum, fiscal transparency and openness can enhance public trust in politico-administrative institutions, contribute to better regulations, that is, the regulations meeting the needs and preferences of citizens and the private sector, which can consequently facilitate the implementation of such regulations, but also produce positive economic effects, such as promoting market confidence and investments.

3 PUBLIC PARTICIPATION IN FISCAL MATTERS – RESEARCH QUESTIONS AND HYPOTHESES

While transparency and openness have become well-established principles in public governance in general, their importance in the domain of fiscal policy derives from several specificities of the respective policy domain. Fiscal matters can be perceived as a topic relevant for the public in general, not only for specific target groups such as patients, students, teachers and similar. The context of fast and deeply changing socio-economic conditions provides additional reasons why public policies should acquire legitimacy, support and input from the public. The purpose of this paper is, therefore, to investigate the level and the type of public interest in the area of fiscal policy as well as to assess the influence of the interested public in the fiscal policy formulation process. In addressing these research questions – the level of public interest, the characteristics of public interest and the level of public influence – we compare the area of fiscal policy to other policy areas.

When dealing with the phenomenon of public participation in the regulatory process, at least three specificities of fiscal policy area can be identified. First, public finances fall within the purview of traditional government departments, together with justice, internal affairs, foreign affairs and defence. The traditional departments differ from departments of public services (social, such as health and education; technical, such as transport and telecommunications; communal, etc.) in their basic purposes. Namely, while public services are preoccupied with providing a spectrum of necessary and required functions which satisfy public needs, traditional departments are primary focused on ensuring order, security and stability (Koprić et al., 2014: 32-34). Consequently, in relation to the public, within traditional departments, the government appears as a legitimate law enforcer, which significantly differs from its role of a provider of socially useful services. This distinction in "*government role*" could reflect itself in the level of openness and responsiveness towards the public in particular government departments. Second, public finances can always be described as a "hot" topic, since the public are usually interested in knowing "where their money goes" and how it is spent. Therefore, a *wider interest and greater motivation of public* to be involved in formulation of more general policy decisions and regulations in the area of fiscal

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[4] Participatory budgeting has become quite popular worldwide in a number of implementation variations. In countries such as Germany, France, Italy and Spain it has become well established (more in: Wampler, 2012; Wampler, McNulty and Touchton, 2021).

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matters could be expected. However, in contrast to some other policy areas, the area of fiscal affairs requires certain *level of familiarization and knowledge* about public finances, instead of pure "user" experience that could be sufficient on some issues within health or education policy. This especially refers to more technical, specific regulations (by-laws).

In order to address the research questions, three hypotheses are formulated based on explained specificities of public participation in the area of fiscal policy. First, we expect public interest in fiscal matters to be higher than in other traditional departments' policies (justice, internal and external affairs), since we suppose the public is interested in being informed and involved in matters of acquiring and spending public finances. However, in relation to social (education, health, employment, culture, and pensions), technical (environment protection, spatial planning, transport, and communications) and economy (business and entrepreneurship, agriculture, tourism) policy areas, the public interest is expected to be lower. Namely, those policy areas largely address citizens as users in their everyday life (e.g. as workers, patients, and similar) or are continuously gaining more salience as public issues (environment pollution, urbanization and traffic, etc.). Nevertheless, the public participates more often in the regulation of more general and value-laden issues (strategic and planning documents, laws) than in drafting more specific and technical acts, such as by-laws. Second, we expect public input in the e-consultations on fiscal matters to be more informed compared to other policy areas. Finally, the level of responsiveness is generally expected to be lower within traditional government departments compared to social, technical and economy public services, due to explained distinction in governmental role towards the public. However, for expert input from the public we assume greater acceptance than in the case of non-expert comments.

4 RESEARCH DESIGN

In the first research part of the paper we explore the level of fiscal transparency and openness in Croatia in general, relying on desk research method. We present brief overview of legal framework for fiscal transparency and openness and the existing secondary data, both national and comparative. The second part of the research addresses our main research questions in order to test formulated hypotheses. Here we focus on the instrument of e-consultations with interested public conducted by Croatian Ministry of Finance. E-consultations are one of the common instruments (often legally binding) for involving general public in the process of issuing regulation worldwide, and one of rare participatory instruments widely applied in Croatia[5]. Therefore, they appear as a solid ground for investigating the subject of public participation in fiscal matters.

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[5] At the central state level, e-consultations are the main policy-making instrument which involves the wider public in the policy formulation. Local participatory instruments, such as referenda, initiatives and forms of submunicipal government are very rarely used (see Koprić and Klarić, 2017; Milošević, 2017; Manojlović Toman and Vukojičić Tomić, 2018).

Table 1

State-level administrative organizations included in the research

Traditional government departments	Administrative organizations by function		
	Social	Technical	Economic
Ministries of			
Finance Defence Internal Affairs Justice State Property Public Administration	Science and Education Health Culture Work and Pension System Demography, Family, Youth and Social Policy Croatian War Veterans	Environment and Energy Construction and Spatial Planning, Maritime Affairs, Transport and Infrastructure	Economy, Entrepreneurship and Crafts Agriculture Tourism Regional Development and EU funds
State administration organizations			
State Administration Organization for Civil Protection State Administration Organization for Radiological and Nuclear Safety	State Institute for Intellectual Property	State Geodetic Administration	State Metrology Institute
Agencies			
Croatian Agency for the Oversight of Financial Services Croatian National Bank	Croatian Agency for Health Insurance	Croatian Energy Regulatory Agency Croatian Regulatory Authority for Network Industries Croatian Civil Aviation Agency	

The research is based on the data collected within previous research of e-consultations conducted by Đurman (2019), and supplemented with the data for two additional years – 2019 and 2020.[6] Applied research methods include quantitative content analysis of the reports on e-consultations that were conducted in a three-year period (2016-2018) by Croatian administrative organizations.[7] For the purpose of research subject in this paper, we have extracted the data for the MF and compared them with data from other traditional government departments (TGD), as well as to those of other state-level administrative organizations (SAO). Alongside the MF, the category of TGD includes five ministries, two state administration organizations and two independent agencies. The category of TGD is compared to SAO performing social, technical and economic functions, which also include ministries, state

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[6] The data collected for 2019 and 2020 include only basic information on the number of conducted e-consultations, number of participants and comments, and the acceptance rate of comments, without the analysis of the type of participants and comments, and the correlations between them, which was made only for the period 2016-2018.

[7] Administrative organizations in this paper include government organisations at the central-state level (19 ministries, 5 central state organizations and 6 regulatory agencies), for which 1.643 e-consultations procedures were analyzed.

administration organizations and agencies. All types of analysed SAO are listed in table 1.[8]

Analyzed aspects of e-consultations include their procedural attributes (number of conducted e-consultations, duration and clarity of e-consultations), features of the interested public involved in the process (number of participants, type of participants and type of comments) and the results of e-consultations (acceptance rate of the comments). More precisely, the following data are included in the research. On behalf of procedural attributes: (i) the number of conducted e-consultations; (ii) the duration (in days) of conducted e-consultations; and (iii) the clarity of conducted e-consultations (the comprehensiveness of the explanations of why an act is issued). Features related to the interested public involved in the e-consultations encompass: (i) the number and the type of participants (individuals, private sector organizations, civil society organizations, chambers, other state and public sector authorities); and (ii) the number and the type of the comments (technical, opinions, well-supported and very well-supported comments)[9]. Finally, the acceptance rate of the comments was analysed, which actually represents the level of responsiveness to public suggestions (the status of comments in the e-consultation process can be marked as accepted, partially accepted, denied or noted). In addition, correlations among the type of participants, type of comments and the level of the acceptance of comments are made.

5 FISCAL TRANSPARENCY AND OPENNESS IN CROATIA

In Croatia, the legal framework for fiscal transparency is in place. The legal obligation for public authorities to publish financial documents derives from two basic acts – *Law on the right to access information* (LRAI)[10], a systemic regulation for ensuring government transparency, and the *Budget Law*, a specific regulation. According to these legal acts, financial acts and documents that have to be published openly include: budget and budgetary projections, revisions and amendments of the budget, decisions on temporary financing, reports on budget implementation, annual financial reports, strategic documents, financial plans, and public procurement procedures.[11] In addition to prescribing the principle of proactive

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[8] After conducting the research, certain reorganizations took place within the system of state administration in Croatia in accordance with the new Law on the State Administration System of 2019 (see Koprić, 2019; Lopižić and Manojlović Toman, 2019). Therefore, the names and scope of some of the mentioned administrative organizations here has changed.

[9] The category of technical comments refers to nomotechnic and grammarly remarks as well as minor technical observations without reasoned support. The category of opinions refers to comments reflecting a pure attitude, opinion or preference, also unsupported. The other two categories refer to supported comments, with the difference between them in the level of expertise in the reasoning. The criteria for differentiating very well reasoned comments were expert terminology, referring to scientific and professional sources, providing and explaining data, and similar.

[10] Law on the right to access information, Official Gazette (25/13, 85/15).

[11] Budget Law, Official Gazette (144/21) article 12; LRAI, article 10.

transparency[12] for public authorities, in accordance with the most recent trends, LRAI also mandates an open format for the publication of information held by public authorities. This implies that financial documents and information (as well as the other types of information LRAI refers to) should be published in easy searchable and machine-readable format, that is, published as open data that can be re-used for various other purposes.[13] Within the OGP, a number of measures referring to financial transparency have been embraced within the action plans. For instance, in 2015 the MF published Recommendations for drafting local budgets[14], containing all the relevant information for timely and accurate publication of key budgetary documents on the official websites of local units, including the instructions for preparing a Citizens' Guide, with all the basic information and explanation of crucial financial terms and the content of the budget.

A continuous and significant improvement in the level of government fiscal transparency has been achieved at the national, local and regional level. This is the result of a more consistent government transparency and openness policy during the last decade.[15] Namely, in addition to legal framework on government transparency and openness, an institutional mechanism for its oversight was established in 2013 – the Information Commissioner (IC). With its rights and duties of oversight and promotion of different aspects of government transparency and openness at all levels of government, noticeable shifts in practice have been achieved from 2013 onwards. For instance, as shown by the Information Commissioner (2021: 71-72), the level of proactive transparency is the highest for the category of financial documents – 85% of all public authorities published financial reports in 2020 (83% in 2019), 83.4% of public authorities published financial plans/budgets in 2020 (82% in 2019) and 76.3% published reports on budget implementation (75% in 2019).

While financial transparency in the broadest sense for all public sector bodies is monitored by the IC, local financial transparency has in particular been assessed by the Croatian Institute of Public Finance since 2013. The level of financial transparency is systematically measured by the number of budgetary documents published on the official websites of local and regional units, including annual and semi-annual execution of budget, budget and budgetary projections, and citizens' budget. The results clearly show that the level of local and regional transparency has been increasing every year, with counties (Croatian regional units) being the

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[12] The obligation of proactive transparency consists of four main elements: decision-making transparency (availability of decisions and acts, as well as the opportunities for the public to get involved in decision-making processes); financial transparency (includes financial acts and documents, allowing the control of government spending and its financing of various activities); operational transparency (information on organizational structure and functioning, i.e. planned activities and projects, regulations that apply to citizens' individual rights, public calls, etc.); communication transparency (transparency in providing public services to citizens and in citizens' communication with the government and officials) (Musa, Bebić and Đurman, 2015).

[13] On open data in general see van Loenen, Vancauwenberghe and Crompvoets (2018); for open data in Croatia see Musa, Đurman and Hadaš (2021).

[14] In 2021, new recommendations for the period 2022-2024 were published as well (MoF, 2021).

[15] Government transparency and openness were inherent elements of anticorruption policy, which became a very salient issue during the process of Croatian accession to the European Union, one of the crucial prerequisites for the EU membership (see Đurman, 2016).

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most transparent, followed by cities (urban type of local units), while municipalities (rural type of local units) proved to be the least transparent (however, with the largest discrepancies within the category).[16]

The level of openness in the processes of formulating fiscal policy can vary from consultative to partnership relations with local governments. In terms of normative framework, there is a general obligation for public authorities to consult the public via e-consultations when drafting acts that affect the interests of the public. Since 2013 when the new LRAI was adopted, e-consultations have been legally mandatory for all public authorities in all policy areas during the process of drafting laws, bylaws, strategic and planning documents and other acts that affect the interests of general public. E-consultations represent an instrument for collecting suggestions and opinions from public during regulation process, before a legal act or policy document is adopted. After closing an e-consultation, the public authority decides which comments received from the interested public are to be accepted and which not.[17] In the procedural aspect, e-consultations are mandated to be open for public comments for 30 days in general. At the central state level, public authorities such as ministries, agencies and other state administrative organizations conduct e-consultations via the portal eConsultations[18], which appears to be transparent and user-friendly for participants as well as easily operated on behalf of public authorities conducting e-consultations (Đurman, Musa and Koprić, 2022). Local and regional units, as well as other legal entities with public authority conduct e-consultations via their own websites. After closing an e-consultation and analyzing comments, a public authority is supposed to publish a report with explanations for non-accepted comments. Since 2013, significant progress, both in the number and the quality of conducted e-consultations, has been achieved in general (Đurman, 2020: 408-409).

The provision of LRAI on consulting the public allows for additional participatory instruments, but does not mandate them. The application of instruments such as participatory budgeting is, therefore, facultative and a result of sharing and applying good practices. Although participatory budgeting is becoming more popular within Croatian local units, only four cities (Pazin, Trogir, Rijeka, Dubrovnik) implement this participatory instrument in its "genuine" variant, while others can be described as "attempts" at participatory budgeting (Džinić, 2021). Some other successful examples of the involvement of the public in creating fiscal policy can be find at the local level, but unfortunately, more as an exception. The city of Rijeka provides its citizens with opportunities to get engaged in the formulation process of budgetary cycle via an educational budgetary game (*Proračun(ajme)*). Local citizens can also take part in planning the distribution of part of the budget via programmes called *Small communal actions* and *Local partnership programme*.

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[16] See: https://www.ijf.hr/en/transparency-2022/.
[17] More on e-consultations in general and in Croatia in: Đurman (2020); Đurman, Musa and Koprić (2022).
[18] See: https://esavjetovanja.gov.hr/ECon/Dashboard.

From a comparative perspective, according to the International Budget Partnership (IBP, 2019) ranking of budget transparency, in 2019 Croatia was placed within the category "sufficient" transparency with score 68 out of 100 (57/100 in 2017 and 53/100 in 2015). This dimension is measured by using 109 indicators in relation to 8 key financial documents. In the second dimension – budget oversight (legislative and audit) – the Croatian score is 61 out of 100. With respect to the third dimension of the survey – public participation – the Croatian score is far more modest (22 out of 100 in 2019). This dimension includes "formal opportunities offered to the public for meaningful participation in the different stages of the budget process. It examines the practices of the central government's executive, the legislature, and the supreme audit institution". In comparison to other countries in the region, Croatia scored best in the public participation dimension, while in the budget transparency aspect it shares the highest rank with Slovenia.[19]

6 ANALYSIS OF E-CONSULTATIONS IN FISCAL AREA: RESEARCH FINDINGS AND DISCUSSION

In this chapter, we compare the data on different aspects of e-consultations conducted by the MF, other TGD and SAO. Analyzed aspects of e-consultations include their procedural attributes (number, duration and clarity of e-consultations), features of interested public involved in the process (number and type of participants and comments) and the results of e-consultations (acceptance rate of the comments).

The MF is one of the most regulatory "active" ministries – in general and especially within the category of TGD – which is reflected in the number of implemented e-consultations. In three-year period (2016-2018) this ministry conducted 105 e-consultations, while, for instance, the Ministry of State Property conducted 13, and the Ministry of Defence only 10 e-consultations. Although there is a problem of inconsistent implementation of e-consultations in all legally mandatory situations (in accordance with the LRAI), the frequency of their implementation mainly reflects regulatory activity, which depends on the policy area and the type of administrative organization. With respect to procedural aspects of e-consultations, the MF suffers from the same deficiencies as most other SAO. E-consultations were mostly open less than 30 days, as legally required, and for the majority of the acts issued, a full explanation of the goals of the act / its changes was lacking, especially for the bylaws. Besides the duration, clarity is a weak point of the e-consultations conducted by the majority of SAO, except some agencies.

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[19] In both dimensions, Albania, Bosnia and Herzegovina, Hungary, Macedonia and Serbia are lagging behind Croatia and Slovenia.

TABLE 2

Characteristics of e-consultations conducted by the Ministry of Finance compared to other administrative organizations (2016-2018)

| | Duration (average, days) | Clarity (median value 1-4) | Number of | | | Acceptance rate of comments (%) |
			E-consultations	Participants	Comments	
Ministry of Finance	19.8	1	105	736	1,543	34.8
Traditional governmental departments	23.2	1	606	2129	6,016	34.3
State-level administrative organizations	24.8	1	1,643	13,615	32,906	23.8

Source: Authors based on data collected by Đurman (2019).

TABLE 3

Characteristics of e-consultations conducted by the Ministry of Finance (2016-2020)

| Duration (average) | Number of | | | Acceptance rate of comments (%) |
	E-consultations	Participants	Comments	
19.1	230	1,285	2,638	29.4

Source: Authors.

In the period from 2016-2018, 736 participants were involved in the e-consultations conducted by the MF, submitting 1,543 comments.[20] In a five-year period (2016-2020) the number of participants increased, to 1,285, as did the number of comments, to 2,638. An average number of participants per e-consultation conducted by the MF is 7, which is slightly higher than the average for TGD (4.6 participants). However, compared to other administrative organizations' functions, the interest of the public within TGD is the lowest, while e-consultations conducted by administrative organizations performing social functions are characterized the highest number of participants (13.6 participants per e-consultation) (Đurman, 2019: 368), which is in line with our first hypothesis.

With respect to our second hypothesis on the type of public input, the results suggest that comments submitted to the MF are more informed and in significant share submitted by organized and expert stakeholders. As shown in table 4, although individuals are the most represented category of participants in the e-consultations in general (MF included), in the case of MF, chambers and private sector organizations constitute 1/3 of the participants. Chambers and professional associations as expert organizations, and private sector organizations as actors involved in implementation, are able to provide elaborate and useful comments

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[20] The number of participants differs from the number of the comments, because a participant can submit more than just one comment.

for the respective Ministry. Although 28.6% of comments in the e-consultations of the MF are classified as attitudes, which is slightly higher than the average for SAO (21.9%), the share of very well-reasoned comments is almost as twice as great as in the case of SAO (40.8% in relation to 22.9%).

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TABLE 4

Characteristics of participants in the e-consultations conducted by the Ministry of Finance and state-level administrative organizations (%)

	Ministry of Finance	**State-level administrative organizations**
Interested public (participants)		
Individuals	42.7	50.0
Chambers	16.8	5.9
Private sector organizations	15.6	10.0
CSO	15.2	17.2
Public companies	3.0	6.2
Other	6.7	10.7
Type of comments		
Technical	13.6	28.8
Attitudes	28.6	21.9
Reasoning	15	22.1
Very well reasoned	40.8	22.9
Other	2	4.3
Status of comments		
Accepted	34.8	23.8
completely	26.6	15.7
partially	8.2	8.1
Not accepted	32.6	43.5
Noted	32.1	28.1
No response	0.6	4.7

Source: Authors based on data collected by Đurman (2019).

In addition, there is a correlation between the type of comments and the type of participants, as well as between these two variables and the level of administrative responsiveness to public input. In general, individuals (physical persons) submit most comments categorized as "opinions", while at the same time they submit the least very well-reasoned comments. On the other hand, more organized type of participants (state and public sector authorities, CSO, private sector organizations, etc.) submit a higher share of well-reasoned comments and fewer opinions. For instance, at the level of SAO, 37.4% of comments submitted by the chambers are very well-reasoned, 35.8% are technical comments, while only 7.4% are opinions. In the case of the MF, chambers are more often involved in the e-consultations than in the SAO average (see table 4), providing 67.6% very well-reasoned comments and only 7.7% opinions.

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The type of comments and participants further reflects the responsiveness towards public input. In general, administrative organizations more often accept well-reasoned, well-informed comments – which they find useful in issuing a regulation – than non-supported opinions. Also, comments submitted by organized interests and institutions are accepted more often than the comments of individuals (Đurman, 2020: 81-82). In the case of the MF, the widest share of the submitted comments is accepted (34.8%, with 26.6% completely and 8.2% partially accepted), while average rate of responsiveness for the SAO is 23.8% (15.7% fully accepted comments and 8.1% partially accepted). In relation to the average rate of responsiveness for the SAO, the level of responsiveness is higher within traditional policy areas – 34.3%, and the same applies for the MF (34.8%). For comparison, the average rate of responsiveness for social-function administrative organizations is 20%. This is not in line with our initial hypothesis on lower responsiveness within TGD compared to public services departments, but it can be explained by two factors. The first one refers to the significantly well-informed type of public input in the case of the MF, which has proven to be crucial factor for explaining the level of administrative responsiveness. The second reason is related to the level of public interest (i.e. the number of participants) which is lower in TGD (slightly higher in the case of the MF in relation to other TGD) compared to public services departments. Namely, as shown by Đurman (2019), higher numbers of participants and comments negatively affect the level of administrative responsiveness, due to reaching a limit with respect to the usefulness of information and resources of the participants (comments tend to overlap or duplicate).[21]

7 CONCLUSION

The aim of this paper was to explore the level, characteristics and effects of involving the public in the process of formulating fiscal policy, by analyzing e-consultations conducted by the Croatian MF. Our research results revealed three interesting findings. First, public interest in participation has been slightly higher in the fiscal policy area than in the areas of other TGD, but at the same time lower than in social, technical and economy public policy areas which are more directly related to citizens' everyday life and needs.

Second, public input in the area of fiscal policy is well informed when compared to other policy areas. However, the explanation behind this finding is slightly different from our initial theoretical assumption. The higher level of informed public input in the fiscal policy area is largely a result of the participation of experts and/or professional associations and organizations involved in the implementation of policy, rather than that of he informed general public, i.e. individuals interested in public finances. The MF receives significant share of well-reasoned, expert comments submitted by participants with knowledge and/or practical experience in the area of fiscal policy. One third of the participants consists of chambers and

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[21] Although it may appear illogical at first, this finding is actually similar to some other empirical findings (Schalk, 2015) and is also in accordance with theoretical premises of communication theory on information overload of organizations.

private sector organizations which possess the capacities to provide useful inputs in the regulation process.

Third, the level of responsiveness is higher within traditional departments' policies, and even higher in the fiscal policy area than the average for TGD, than that related to public service departments. As already explained, this is primarily related to the characteristics of the interested public involved in the e-consultations (the type of participants and comments).

In sum, the research has indicated that the variables such as the type of public and the quality of input make a difference when it comes to public participation. It has primarily revealed the importance of supported and well-informed inputs as a valuable resource for administrative organizations in general, and in the fiscal policy area in particular. Additionally, our research has pointed at some deficiencies in the e-consultations procedure in general, based on which some practical recommendations can be made. On the one hand, procedural aspects of conducting e-consultations should be improved, especially when it comes to the consistency of the implementation of e-consultations, their duration and clarity, as legally mandated by the LRAI, but not always implemented in practice. In addition, administrative organizations could rely more on other, optional participatory instruments, such as participatory budgeting, educational budgetary games, and similar. This could be positively reflected in public interest in participation as well as in their knowledge and familiarization with fiscal policy matters.

Finally, it is necessary to point at some methodological limitations of our research. The most important research findings are derived from empirical research conducted in a three-year period (2016-2018), and should be upgraded with additional data from recent years. More longitudinal research would enable more comprehensive data to be obtained about e-consultations conducted by the MF, now limited in scope. Therefore, our research findings should be taken as tendencies which require further research. A study including some other participatory instruments in the fiscal policy area would also be useful in order to formulate more well-founded conclusions on public participation in fiscal policy regulation.

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REFERENCES

1. Bronić, M., 2013. Koliko su otvoreni proračuni hrvatskih lokalnih jedinica. In: A. Musa, ed. *Transparentnost - kako i zašto*. Zagreb: Institut za javnu upravu ; Friedrich Ebert Stiftung, pp. 27-42.

2. Budget Law, Official Gazette 144/21.

3. Đurman, P., 2016. Europeizacija javne uprave i načelo otvorenosti. *Godišnjak Akademije pravnih znanosti Hrvatske*, 7(1), pp. 342-373.

4. Đurman, P., 2019. *Utjecaj organizacijskih varijabli na process i rezultate participacije u javnoj upravi*. Doctoral dissertation. Zagreb: Faculty of Law.

5. Đurman, P., 2020. Savjetovanje s javnošću u pripremi propisa u Hrvatskoj. *Zbornik Pravnog fakulteta u Zagrebu*, 70(2-3), pp. 407-444. https://doi.org/10.3935/zpfz.70.23.08

6. Đurman, P., Musa, A. and Koprić, I., 2022. Participatory lawmaking in the digital age: the case of the e-public consultations platform in Croatia. In: T. Randma-Liiv and V. Lember, eds. *Engaging Citizens in Policy Making: e-Participation Practices in Europe*. Cheltenham, UK; Northampton, MA, USA: Edward Elgar Publishing, pp. 91-103.

7. Džinić, J., 2021. Participativno budžetiranje u službi razvoja dobrog lokalnog upravljanja. In: I. Koprić and F. Staničić, eds. *Referendum i deposredna demokracija u Hrvatskoj*. Zagreb: Institut za javnu upravu, pp. 215-246.

8. IBP, 2019. *Country results: Croatia*. Washington: International Budget Partnership.

9. IMF, 2019a. *Why Fiscal Transparency Matters*. Washington: International Monetary Fund.

10. IMF, 2019b. *The Fiscal Transparency Code*. Washington: International Monetary Fund.

11. Information Commissioner, 2021. *The Report on the Implementation of the Law on the Right to Access Information*. Zagreb: Information Commissioner.

12. Koprić, I. [et al.], 2014. *Upravna znanost - Javna uprava u suvremenom europskom kontekstu*. Zagreb: Pravni fakultet Sveučilišta u Zagrebu.

13. Koprić, I. and Klarić, M., 2015. New developments in local democracy in Croatia and its neighbouring countries. *Hrvatska i komparativna javna uprava/Croatian and Comparative Public Administration*, 15(2), pp. 389-414.

14. Koprić, I., 2017. Demokracija, decentralizacija, povjerenje građana i ponos javnih službenika: stari i novi koncepti u razvoju odnosa građana i javne uprave. In: I. Koprić, A. Musa, and T. Giljević, eds. *Građani, javna uprava i lokalna samouprava: povjerenje, suradnja, potpora*. Zagreb: Institut za javnu upravu, pp. 3-27.

15. Koprić, I., 2019. Novi zakoni o državnim službenicima i o sustavu državne uprave – osnovne primjedbe. *Hrvatska i komparativna javna uprava/Croatian and Comparative Public Administration*, contribution to the No. 2/2019, pp. 7-14.

16. Law on the right to access information, Official Gazette 25/13 and 85/15.

17. Law on the State Administration System, Official Gazette 66/19.

18. Lopižić, I. and Manojlović Toman, R., 2019. Prethodna evaluacija ukidanja ureda državne uprave u županijama. *Zbornik Pravnog fakulteta u Zagrebu*, 69(5-6), pp. 835-870. https://doi.org/10.3935/zpfz.69.56.09

19. Manojlović Toman, R. and Vukojičić Tomić, T., 2018. Načelo demokracije Europske povelje o lokalnoj samoupravi i sudjelovanje građana u hrvatskoj lokalnoj samoupravi. In: I. Koprić, A. Musa, and T. Giljević, eds. *Građani, javna uprava i lokalna samouprava: povjerenje, suradnja, potpora.* Zagreb: Institut za javnu upravu, pp. 343-371.

20. Milošević, B., 2017. Decentralizacija i poverenje građana: aktualna pitanja i problemi. In: I. Koprić, A. Musa, and T. Giljević, eds. *Građani, javna uprava i lokalna samouprava: povjerenje, suradnja, potpora.* Zagreb: Institut za javnu upravu, pp. 153-194.

21. MoF, 2021. *Upute za izradu proračuna jedinica lokalne i područne (regionalne) samouprave za razdoblje 2022. - 2024.* Zagreb: Ministry of Finance.

22. Musa, A., 2017. Informacije za građane: transparentnom i otvorenom javnom upravom prema boljem upravljanju i povjerenju građana In: I. Koprić, A. Musa, and T. Giljević, eds. *Građani, javna uprava i lokalna samouprava: povjerenje, suradnja, potpora.* Zagreb: Institut za javnu upravu, pp. 29-72.

23. Musa, A., Bebić, D. and Đurman, P., 2015. Transparency and openness in local governance in new democracies: A case of Croatian cities. *Hrvatska i komparativna javna uprava/Croatian and Comparative Public Administration,* 15(2), pp. 415-450.

24. Musa, A., Đurman, P. and Hadaš, P., 2021. Otvoreni podaci javne uprave i lokalne samouprave. In: I. Koprić and F. Staničić, eds. *Referendum i neposredna demokracija u Hrvatskoj*. Zagreb: Institut za javnu upravu, pp. 273-313.

25. Ott, K. and Bronić, M., 2017. Lokalna samouprava i građani: Proračunska transparentnost lokalnih jedinica - Stavovi zaposlenika. In: I. Koprić, A. Musa, and T. Giljević, eds. *Građani, javna uprava i lokalna samouprava: povjerenje, suradnja, potpora.* Zagreb: Institut za javnu upravu, 477-502.

26. Schalk, J., 2015. Linking Stakeholder Involvement to Policy Performance: Nonlinear Effects in Dutch Local Government Policy Making. *American Review of Public Administration*, 47(4), pp. 1-23. https://doi.org/10.1177/0275074015615435

27. Van Loenen, B., Vancauwenberghe, G. and Crompvoets, J. (eds.), 2018. *Open Data Exposed. T.M.C.* Asser Press. https://doi.org/10.1007/978-94-6265-261-3

28. Wampler, B., 2012. Entering the state: civil society activism and participatory governance in Brazil. *Political Studies*, 60(2), pp. 341-362. https://doi.org/10.1111/j.1467-9248.2011.00912.x

29. Wampler, B., McNulty, S and Touchton, M., 2021. *Participatory Budgeting in Global Perspective.* Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780192897756.001.0001

Understanding territorial inequalities in decentralised welfare systems: early childhood education and care system expansion in Croatia

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Abstract

The decentralised provision of social services raises concerns about availability of services in different geographical areas, particularly in low- and middle-income countries with weak governance and fiscal redistributive capacities. Yet the interconnection of different decentralisation regimes and territorial inequalities in the provision of social services remains underexplored. This article engages with one aspect of this puzzle, the implications of the fiscal conditions on exacerbating (or overcoming) territorial inequalities in services provision. Using the Croatian system of early childhood education and care (data for the 2005-2018 period) as an empirical lens, the article shows that in the absence of a well-established policy and fiscal framework sensitive to regional inequalities in administrative and fiscal capacities, decentralised systems can only institutionalise territorial inequalities in services provision. Next to the legal entitlement to a certain service, inter-territorial fiscal equalisation policies are crucial in overcoming fragmentation in social rights along territorial lines.

Keywords: early childhood education and care, decentralisation, devolution, local welfare systems, territorial inequalities, fiscal decentralisation, Croatia

1 INTRODUCTION

Following a mainstream subsidiarity discourse that "going local […] is the best solution for all problems" (Kazepov and Barberis, 2017: 307), European welfare systems have undergone reforms aimed at strengthening local autonomy in the provision of social services (see, e.g., Ruano and Profiroiu, 2017). Reforms were typically guided by the idea that decentralisation, that is, the transfer of responsibility for defining, financing and providing services to lower levels of government, will bring more efficient services that better respond to diverse regional preferences and needs (Darby, Muscatelli and Roy, 2003; Neuman, 2005; Bartlett, Maleković and Monastiriotis, 2013; Hlepas, 2016), as well as greater accountability and transparency of governance at the local level (Czike, Krémer and Tausz, 2002). Nevertheless, there are certain challenges inherent to decentralisation, such as the risk of "institutionalising" territorial disparities in service provision and increasing inequalities in access to social services (Kazepov, 2008; Andreotti, Mingione and Polizzi, 2012). Concerns about equality have been particularly raised in relation to low- and middle-income countries and countries with poor governance and weak mechanisms devoted to equalization of local government fiscal capacities (Rodríguez-Pose and Ezcurra, 2010; Kyriacou, Muinelo-Gallo and Roca-Sagalés, 2015; Kazepov and Barberis, 2017; Liu, Martinez-Vazquez and Wu, 2017).

Yet the intersection of different decentralisation regimes and territorial inequalities in the provision of social services remains underexplored (cf. Kazepov and Barberis, 2017; Costa-Font, 2010; Costa-Font and Turati, 2018) and asks for further elaboration. This article aims to contribute to this debate, in particular with respect to the implications of the different fiscal mechanisms and conditions involved in decentralisation on the exacerbation (or alleviation) of territorial inequalities in the provision of social

services (see Kazepov and Barberis, 2017). Using the Croatian case as an empirical lens, the article explores the patterns and dynamics of early childhood education and care (ECEC) services expansion within a strongly devolved system marked by high territorial fragmentation and the absence of inter-territorial fiscal equalisation mechanisms. It shows that in the absence of a well-established fiscal framework sensitive to regional inequalities in administrative and fiscal capacities, decentralised services can only institutionalise territorial inequalities in the provision of social services.

The contribution to the existing literature is twofold. First, the article contributes to the literature on fiscal decentralisation (e.g., Liu, Martinez-Vazquez and Wu, 2017; Martinez-Vazquez, Lago-Penas and Sacchi, 2017) by pointing out the importance of fiscal equalisation mechanisms for equalising the provision of social services within decentralised systems (cf. Kazepov and Barberis, 2017). By building an original database covering 556 Croatian local government units (LGUs)[1] over the 2005-2018 period and exploring the patterns of ECEC provision, the article adds to the evidence on trends and dynamics of territorial inequalities in service provision in systems that did not establish fiscal equalisation mechanisms and whose financing largely depends on the local tax base determined by fiscal policy set at the national level. While the ECEC institutional framework in Croatia was stable in the last two decades (Baran, Dobrotić and Matković, 2011; Dobrotić, Matković and Menger, 2018), fiscal policy was subject to frequent reforms which affected the disposable revenue of LGUs. That allowed exploring whether the change in LGUs' revenues itself translated into (dis)investments in service delivery and the reduction of regional inequalities in ECEC provision, or whether there is a need to reform the fiscal policy mechanisms involved in decentralisation in the light of the literature that points to the importance of inter-territorial fiscal equalization (e.g., Liu, Martinez-Vazquez and Wu, 2017). Focusing on a single country is beneficial here as it allows for the control of the variations in an institutional context and limits the variations in structural and cultural factors to a minimum, overcoming one of the main challenges in cross-country studies on decentralisation (Faguet and Sánchez, 2014). At the same time, it retains ample variation in observations from several fiscal policy reforms in the 2005-2018 period, the 2009-2014 economic crisis and a large number of heterogeneous LGUs. Besides, in this way, the article also adds a new evidence base to earlier studies published in Croatia, which problematised inequalities in social rights provision produced by the ill-advised policy and fiscal framework involved in decentralisation (for recent findings see, e.g. Dobrotić, 2016; Dobrotić, Matković and Menger, 2018; Babić, 2018; Berc, Blažeka Kokorić and Opačić, 2019; Babić and Šućur, 2022).[2] Yet this is the first study built on panel data

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[1] Croatia is administratively divided in 20 counties and the City of Zagreb (regional level), and 127 towns and 428 municipalities (local government units).

[2] Discussing the development of eldercare services in Croatia, Dobrotić (2016: 30) stressed that "'limited decentralisation', that is, the fact that decentralisation of the eldercare function was not accompanied by adequate fiscal decentralisation, contributes to the maintenance of regional inequalities in service coverage". Similar findings in later studies also showed that social benefits and service provision tend to be lower in less developed areas (Dobrotić, Matković and Menger, 2018; Babić, 2018; Berc, Blažeka Kokorić and Opačić, 2019; Babić and Šućur, 2022).

and explicitly connecting funding mechanisms, that is, the fiscal conditions involved in the decentralisation, and territorial inequalities in service provision. Second, the article contributes to the literature on ECEC systems and developments. It provides necessary empirical evidence and insight into the governance-related challenges European countries are facing in setting up ECEC entitlements for all children, the main goal of an ongoing "global agenda of childcare" (Rostgaard, 2018: 101). It points out how reaching the European Union's ECEC targets[3] may be particularly challenging in countries with highly decentralised systems operating within the context of large territorial economic disparities, particularly if coupled with vague ECEC framework law and a lack of budget transfer mechanisms dedicated to securing funds for the ECEC function (cf. OECD, 2001; Neuman, 2005; Moss, 2007; Kazepov, 2008).

The article starts with a discussion of the effects of decentralisation on territorial disparities in the provision of social services, including an overview of the main characteristics of the Croatian ECEC system and the policy context within which it operates. Based on these insights, an analytical framework is set out, which is then applied in the analytical section utilising the empirical evidence on territorial patterns of ECEC services development in Croatia to examine the dynamic and limits of ECEC expansion within a strongly devolved system characterised by high local discretion in ECEC provision and the absence of earmarked mechanisms of inter-territorial fiscal equalisation, coupled with large regional inequalities in the local units' fiscal and administrative capacity. It concludes by emphasizing the importance of a well-established policy framework and fiscal system (including fiscal equalisation mechanisms) behind decentralised services to ensure equal rights for all citizens and overcome the fragmentation of social rights along territorial lines.

2 DECENTRALISATION, TERRITORIAL INEQUALITIES IN THE PROVISION OF SOCIAL SERVICES AND THE ECEC SYSTEM IN CROATIA

Kazepov and Barberis (2017) point to the interconnection of different "territorial regimes" and the extent of institutionalised territorial disparities in public service provision, with underlying regulative mechanisms playing an important role in palliating or exacerbating these inequalities. The literature indicates that the absence of legal entitlements to certain public services and of inter-territorial fiscal equalisation policies, as well as weak governance (particularly inadequate coordination between central and local bodies), tend to yield a fragmentation in citizenship and social rights along territorial lines (Andreotti, Mingione and Polizzi, 2012; Kazepov and Barberies, 2017; Liu, Martinez-Vazquez and Wu, 2017). The inequalities in social rights may be additionally exacerbated in the context of high territorial fragmentation, that is, "a structure of many independent

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[3] Barcelona goals target an ECEC enrolment rate of 33% of nursery-age children (0-2) and 90% of kindergarten-age children (from 3 to primary school; European Council, 2002), and the educational target of the Europe 2020 strategy required an ECEC enrolment rate of 95% of children aged four or older (until they enter primary school; European Commission, 2011).

units of government with very small populations, and limited public resources and management capacity" (Hortas-Rico and Rios, 2020: 963). This raises the risk of having many LGUs with limited administrative and fiscal capacities, which struggle to establish and provide services due to both the small economy of scale and administrative inefficiencies (e.g., staff costs and overheads multiply across many local administrations; Faguet and Sánchez, 2014).

All these features are to be found in the Croatian system of ECEC governance and may pose a significant implementation barrier in service provision to local communities with fewer financial resources (see, e.g. Brennan et al., 2016) and weak administrative capacities (Bartlett, Maleković and Monastiriotis, 2013). Namely, the ECEC system in Croatia has been devolved since its establishment in the early socialist period. Functional decentralisation was followed by financial decentralisation in 1959 when the ECEC funding was fully transferred to the municipal level (Iris, 1984), while a legal entitlement to ECEC or fiscal equalisation mechanisms were never established (Baran, Dobrotić and Matković, 2011). Weak central state involvement paved the way for the institutionalisation of territorial disparities in ECEC accessibility and affordability (Dobrotić, Matković and Menger, 2018), which only intensified with the transition from a socialist to a capitalist regime. The policy context has changed profoundly since 1990 as local finances were reduced, and the territorial organisation became even more fragmented. The number of LGUs (towns and municipalities) quintupled from 109 to 556. The majority (80%) of LGUs have fewer than 5,000 inhabitants (Koprić, Musa and Đulabić, 2016),[4] and therefore poor fiscal and administrative capacities are a commonplace. As the financing of operational costs and the development of new ECEC infrastructure remained exclusively dependent on LGUs and their fiscal capacities, large territorial disparities in ECEC provision persisted (Dobrotić, Matković and Menger, 2018).

Although the decentralisation literature argues for fiscal autonomy "to ensure that financing and expenditure responsibilities are linked at the margin, so that local politicians can bear the costs of their decisions" (Darby, Muscatelli and Roy, 2003: 8), it also argues for some limits to be imposed on fiscal autonomy when it comes to equality of access to public services. Fiscal equalisation mechanisms are seen as one of the instruments that may equalise service provision within the decentralised systems (Kazepov and Barberis, 2017). That is particularly important as not all local communities have the same revenue base at their disposal. Wealthier communities tend to have better access to resources (including more skilled workers), thus, challenging the basic assumptions on which decentralization is based (Rodríguez-Pose and Gill, 2004; Lessmann, 2012). Hence, although fiscal autonomy can contribute to the accountability of local policymakers, a guarantee of equal access to quality public services also requires

[4] There is a great variety in population size of LGUs, from 137 to 803,900 residents as of the end of 2017, the median standing at 2,826.

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some degree of inter-territorial redistribution to provide adequate resources to less developed communities (Darby, Muscatelli and Roy, 2003; Rodríguez-Pose and Gill, 2004; Liu, Martinez-Vazquez and Wu, 2017). The same is stressed in the ECEC literature, which emphasizes that the entitlement to ECEC must be coupled with a funding system that enables all children equal access to quality ECEC (Moss, 2007). Governance is seen as a critical component of the ECEC system, which may importantly affect the availability, affordability and quality of ECEC services as well as their efficiency in achieving equity goals (Kagan and Cohen, 1997, cited in Neuman, 2005). At the EU level, such a framing of both governance and funding issues was integrated into the 2019 Council Recommendation on High-Quality ECEC systems (Council of the European Union, 2019).

Fiscal equalisation mechanisms have never been introduced into the Croatian ECEC system. The 2001 decentralisation reform in Croatia established local responsibilities for four public services: primary and secondary education, healthcare, social assistance and fire protection. It was coupled with a fiscal package aimed at increasing local revenues by: 1) an increase in the share of personal income tax assigned to LGUs; 2) an increase in the fiscal autonomy of LGUs by allowing them to collect additional local taxes and surtax;[5] 3) an earmarked part of the personal income tax revenue for the newly decentralised functions;[6] and 4) an equalization grant for decentralised functions. Moreover, the wage costs for most of the newly decentralised functions continued to be further paid from the central budget. As the reform covered only the newly decentralised functions and the already decentralised ECEC system was not part of the reform package, neither a funding mechanism nor an obligation for LGUs to provide ECEC was introduced. Still, the ECEC system could have benefited from a higher share of the personal income tax being transferred to LGUs or from the autonomy given to LGUs to introduce new local taxes (Act on the financing of regional and local government units, No. 33/2000; 59/2001). However, the LGUs' own-tax revenues continued to form a small proportion of their total revenues (Jurlina Alibegović, 2013). Most of the local revenue came from taxes from the resident population and businesses (defined at the state level), with more developed areas therefore performing better. As a result, LGUs retained low fiscal autonomy and revenue-raising authority, and the share of local budgets in the consolidated budget of the central government and GDP continued to be small (table 1).

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[5] New local taxes (e.g., taxes on the use of land or properties) were permitted and the introduction of different levels of surtax on income taxes (max 10 to 30%, depending on the size of the municipality/city). LGUs have the autonomy to determine their level, however, with maximum tax ceiling rate for each purpose set at the national level (Act on the financing of regional and local government units, No. 33/2000; 59/2001). They can also charge various fees (e.g., fees for ECEC services).
[6] An additional share of personal income tax was transferred for decentralised functions: 2.9% for primary education, 2% for higher education, 2% for social assistance, 2.5% for healthcare and 1% for fire protection (Decision on decentralised functions, No. 75/2001). The share increased in 2007 at 3.1%, 2.2%, 2.2%, 3.2% and 1.3% respectively (Decision on decentralised functions, No. 143/2006), however, it decreased again in 2014 at 1.9%, 1.3%, 0.8%, 1% and 1% respectively (Decision on decentralised functions, No. 33/2016).

In the two decades following the 2001 decentralization, the government has implemented several reforms affecting the disposable revenues of LGUs (table 1). Repeated personal income tax reforms at the national level (2003, 2005, 2008, 2010, 2013, 2015, 2017) that aimed to decrease the tax burden on labour and increase the disposable income for citizens had a secondary effect of unevenly reducing this revenue stream for LGUs. Therefore, personal income tax reforms have usually been followed by reforms pertaining to the financing of LGUs (in 2007, 2012, 2015, 2017 and 2018), which resulted in a short-term increase in the LGUs' revenues. Finally, the 2009-2014 crisis severely affected LGU budgets, as employment levels (and personal income tax revenues) nosedived (Vukšić, 2014). Consequently, the contraction of local revenues was much stronger than the GDP change in 2010 and 2011 (table 1).

Therefore, while the legal framework of and governance setting for a strongly devolved ECEC system in Croatia remained stable in the last twenty years, the LGUs' capabilities to improve ECEC provision remained highly dependent on the national fiscal policy, where a steady procession of minor reforms affected the level of revenues at the disposal of each LGU in an unpredictable manner. Such exogenous interventions, together with the 2009-2014 crisis, provide enough variation in local revenues to explore the patterns and limits of ECEC expansion within a devolved system underlined by the weak autonomy of LGUs, their heterogeneous fiscal and administrative capacities and the absence of a fiscal equalisation mechanism.

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TABLE 1

LGUs revenues and fiscal reform effects on disposable LGU revenue, the share of local government revenues in the consolidated governmental revenues and GDP

Year	LGU revenue (bn HRK)	LGU revenue (bn HRK, 2018 prices)	Tax reform area: (effective since) Type of the reform (affecting LGUs disposable income in positive (increase) or negative (decrease) way)	Real GDP growth, %	Year on year local revenue growth (fixed prices), %	% of public revenues	% of GDP
2004	12.52	16.41	–	3.9	6.8	11.5	5.0
2005	13.94	17.69	Personal income tax: (Jan 2005) Growth in personal deduction rate (–)	4.1	7.8	12.0	5.2
2006	15.86	19.51	–	4.9	10.3	12.5	5.4
2007	18.43	22.04	Financing of LGUs: (Jan 2007) Growth in share of income tax assigned to LGUs (+) Growth in share of income tax assigned to decentralisation function (+)	5.3	13.0	13.3	5.7
2008	19.97	22.52	Personal income tax: (Jul 2008) Growth in personal deduction rate (–)	2.0	2.2	13.5	5.7
2009	18.86	20.77	–	-7.3	-7.8	13.5	5.7
2010	17.72	19.32	Personal income tax: (Jul 2010) Change in personal income tax categories (–)	-1.5	-7.0	12.9	5.4
2011	16.88	17.99	–	-0.3	-6.9	12.5	5.1
2012	17.30	17.82	Financing of LGUs: (Mar 2012) Growth in share of income tax assigned to LGUs (+)	-2.3	-1.0	12.3	5.2
2013	18.52	18.67	Personal income tax: (Jan 2013) Growth in personal deduction rate (–)	-0.5	4.8	13.2	5.6
2014	18.32	18.51	–	-0.1	-0.9	12.9	5.5

Year	LGU revenue (bn HRK)	LGU revenue (bn HRK, 2018 prices)	Tax reform area: (effective since) Type of the reform (affecting LGUs disposable income in positive (increase) or negative (decrease) way)	Real GDP growth, %	Year on year local revenue growth (fixed prices), %	% of public revenues	% of GDP
2015	17.78	18.05	Financing of LGUs: (Jan 2015) Growth in share of income tax assigned to LGUs (+) Growth in share of income tax assigned to decentralisation function (-) Growth in the share of real estate transfer tax assigned to LGUs (+) Personal income tax: (Jan 2015) Growth in personal deduction rate (-)	2.4	-2.5	11.6	5.2
2016	18.51	18.99	–	3.5	5.2	11.4	5.3
2017	18.90	19.19	Financing of LGUs: (Jan 2017) Change in local taxes (-) Growth in the share of real estate transfer tax assigned to LGUs (+) Personal income tax: (Jan 2015) Change in personal income tax categories (-)	2.9	1.0	11.2	5.2
2018	21.64	21.64	Financing of LGUs: (Jan 2018) Growth in share of income tax assigned to LGUs (+) Fiscal equalization formula (+)	2.6	12.8	12.2	5.7

Sources: Ministry of Finance (financial reports of LGUs), Croatian National Bank (consolidated public expenditures and GDP), Acts on personal income tax, Acts on the financing of regional and local government units, Acts on local taxes, Acts on real estate transfer tax.

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3 THE ANALYTICAL FRAMEWORK

This article aims to point out that there are the limits of ECEC development within strongly devolved ECEC systems characterised by the absence of a legal entitlement to a regular ECEC program, which operates within: 1) the context of pronounced territorial fragmentation creating unequal fiscal and administrative capacities of LGUs; and 2) a fiscal policy framework that does not provide budget transfers from the central to the local level dedicated to the ECEC function (i.e. lacks a fiscal equalisation mechanism). In particular, it analyses whether and to what extent changes in LGUs' disposable revenue caused by the central state-led fiscal reforms affected LGUs' investments in ECEC. Other ECEC policy elements being stable, frequent changes in taxation and financing rules during the observed period have affected LGUs' abilities to tax and spend differently, depending on their economic activity, wage structure and sources of income and therefore exogenously introducing revenue variation both among and within LGUs. In other words, the article examines whether changes (constraints or expansions) in LGUs' fiscal capacity may be associated with changes in ECEC enrolment rates within a system that does not oblige LGUs to provide this service and the context of pronounced inequalities in LGU's fiscal and administrative capacities, which particularly affects underdeveloped areas. The investigated period also allows assessment of the effects of external shocks (i.e. the economic crisis) on resilience/retrenchment of the local ECEC provision in such a system.

Towns and municipalities (LGUs) are used as a basic unit of analysis. The dataset was compiled for the purposes of this article from the institution-level Croatian Bureau of Statistics' education and population reporting and the Ministry of Finance's local budget series. It is organised as a panel covering the 2005-2018 period for the entire population of 556 LGUs. For each LGU, it contains detailed annual information on revenues, budget and consolidated public expenditure for ECEC function[7], number of children and educators in ECEC, and an estimate of the population. As for time-invariant attributes, the official categorisation of mountain (85) and island (47) LGUs is applied, as well as the Eurostat degree of urbanisation (DEGURBA) category for all the LGUs. Based on our exposition, the following variables are considered in the analysis:

The overall ECEC enrolment rate (0-6) is a key service provision outcome of interest. Although enrolment rate indicators are usually monitored separately for the nursery (0-2) and kindergarten (3-6) level, the pooled indicator is used in this analysis as Croatia has a unified ECEC system, and budgetary expenditures on those two programmes are not formally separated and can spill over.

Total local revenues collected (in fixed 2018 value) is used as an indicator of the LGUs' fiscal capacity at any given year.[8] The effect of both the level and change in revenues is explored.

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[7] As the functional budget breakdown of local government is published in consolidated fashion (including publicly owned ECEC facilities) only up to 2015, such consolidated LGU data for the ECEC function for the 2016-2018 period was provided by the Ministry of Finance.
[8] Only the EU transfers to LGUs are not included as they are mostly awarded for highly specific projects at the time of their implementation, and none were invested into the ECEC sector until 2018.

Share of locally-sourced revenues is applied as a fiscal autonomy indicator of LGUs (see Akai and Sakata, 2002), and it excludes state-level equalisation transfers. In addition, the *level of surtax on personal income* that LGUs are free to adjust indicates the commitment of local governments to increasing their revenues that may be spent on the ECEC function.

Share of ECEC expenditure in the LGUs' budget is used as an indicator of LGUs' commitment to investing in ECEC, alongside which is an indicator showing *whether a town has fiscal responsibility for primary education* (34 such towns in Croatia) as those might have a greater capacity to govern educational systems, including the ECEC system (see, e.g., Rodríguez-Pose and Gill, 2004).

The model controls for the *degree of urbanisation*, *remote island and mountain location* as ECEC services are more challenging to establish in areas with a more dispersed population, and for the *LGUs population size,* as efficiency loss might emerge due to smaller economies of scale or administrative inefficiencies (see Faguet and Sánchez, 2014). Also, the impact of *change in the size of the preschool population* is assessed as capacities might increase due to demographic pressures.

The analytical strategy is as follows: First, territorial inequalities in the overall ECEC enrolment rates, including their changes over the 2006-2018 period, are described. Then, the existing relationship between ECEC enrolment rates and budgetary commitment to ECEC is plotted against the fiscal capacity of the LGUs (per capita). This being established, a pooled OLS regression model is estimated using the most recent 2016-2018 data and a full set of fiscal and spatial indicators to identify those contributing to the established ECEC enrolment rates. Penultimately, to fully utilise the panel form, a first difference regression is applied with 2006-2018 data, with an eye towards the contribution that the changes in revenue (in the prior year) and demographic pressure may have had on the change in ECEC enrolment rates. In order to check for the resilience of once-established ECEC services to austerity, the effects of revenue growth and cuts are estimated separately. Finally, several first difference regressions are deployed to explore the dynamics of ECEC investments; that is, how general budget change translates into the ECEC commitment, ECEC budget (per capita and child), and a pupil-educator ratio.

Some of the data collected were not used in the analysis. Two municipalities with fewer than ten children of preschool age are excluded. For the first difference analysis of the panel data, LGUs without ECEC capacities in a given year (zero children attending) are not included – a total of 2,395 observations (155-204 LGUs per year), neither are LGUs that established a provision in a given year (total of 127 observations). As for the revenue indicator, there were 275 occasions on which reported revenues peaked or collapsed in one year by more than 50%, only to reverse to the baseline a year after. Observations involving such outlier occurrences were omitted from the regression analysis.

4 ANALYSIS

4.1 REGIONAL DIFFERENCES IN ECEC ENROLMENT RATES AND THE LGUs' FISCAL CAPACITY

The expansion of the ECEC system in Croatia was slower than in other former socialist countries of Central Eastern Europe (cf. figure 1; Stropnik, 1989; Zrinščak, 2002; TransMonee, 2019). In the 1990s, there was only modest growth in ECEC enrolment rates, which mostly emerged due to negative demographic developments (Matković and Dobrotić, 2013). A more noticeable increase in ECEC capacities reappeared in the 2000s (figure 1), and the overall ECEC enrolment rate increased from 31.0% to 46.1% between 2005 and 2018.[9] During this period, the ECEC population size remained rather stable, but public investment in ECEC increased from 0.46% to 0.60% of GDP between 2005 and 2009 and levelled off afterwards.

There is a large variation in ECEC enrolment rates both within the NUTS3 regions and particularly between them (cf. Dobrotić, Matković and Menger, 2018). As indicated in figure 2, several large areas in northeast and central Croatia have no or very sporadic ECEC provision. At the same time, higher ECEC enrolment rates are a characteristic of coastal areas and large urban centres (cf. Dobrotić, Matković and Menger, 2018 for 0-2 and 3-6 breakdown). ECEC enrolment rates plot (figure 2) closely resembles the wealth disparities between LGUs (cf. figure 2).

However, territorial disparities in ECEC enrolment rates, while still high, seem to be narrowing, as the population-weighted coefficient of variation steadily declined from 0,616 in 2005 to 0,414 in 2018 (figure 1).[10] Over the 2005-2018 period, new capacities were established in 52 LGUs, and ECEC enrolment rates in several hitherto underprovided areas were improved, while the provision declined or remained stagnant in several coastal areas (figure 2).

Figure 3 (left pane) demonstrates a moderate correlation (r = -0,34) between the total local revenues collected per capita and ECEC enrolment rates in 2016-2018. This association is not evident in high-revenue LGUs, collecting above HRK 5,000 per capita (r = 0,02, n.s.). Also, almost all LGUs without the ECEC services belong to the group of low-revenue LGUs. Yet, there seems to be no association between revenues collected and LGUs' commitment to ECEC (r = -0,05, n.s.), and there is considerable variation in LGUs' ECEC expenditure at all revenue levels, particularly among the LGUs with low fiscal capacity (figure 3, right pane). On the one hand, 40 towns and municipalities (containing 9.2% of the preschool population) invest more than 15% of their budget in the construction and operation of ECEC facilities. On the other hand, 215 small towns and municipalities (accounting for 12.4% of the preschool population) invest less than 5% of their budget in ECEC. However, most LGUs with moderate-to-high fiscal capacity invest between 6 and 14 per cent of their budget in ECEC.

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[9] In 2018, nursery-age children (0-2) enrolment rate reached 23.7% and kindergarten-age children (3-6) enrolment rate (regular programs) stood at 61.3%. That still places Croatia among the EU countries with the lowest ECEC enrolment rates, particularly for kindergarten-aged children (cf. OECD, 2019).
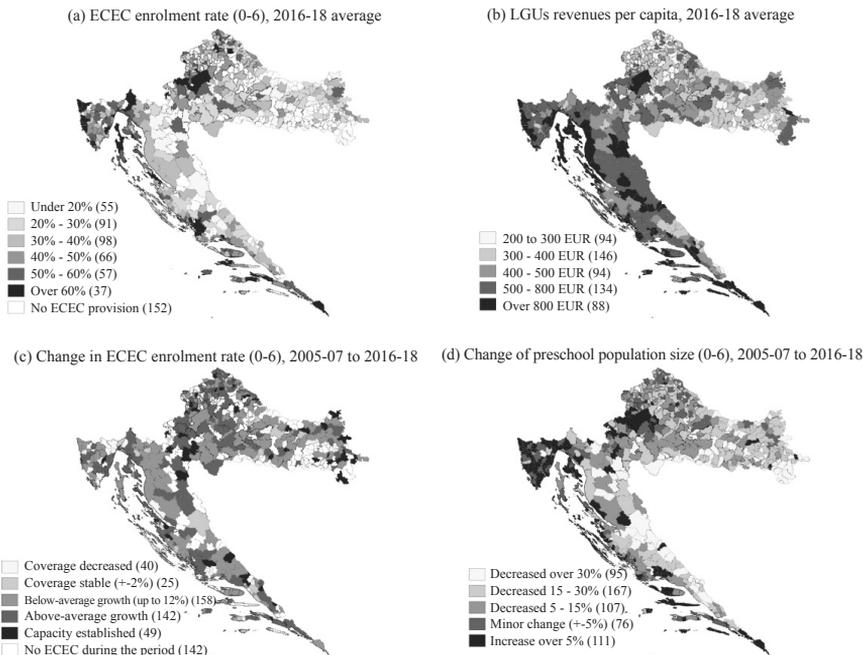[10] With the exception of the 2009-2012 crisis period when the variation coefficient stagnated at about 0.54-0.55.

FIGURE 1

ECEC enrolment and financing indicators, 2005-2018
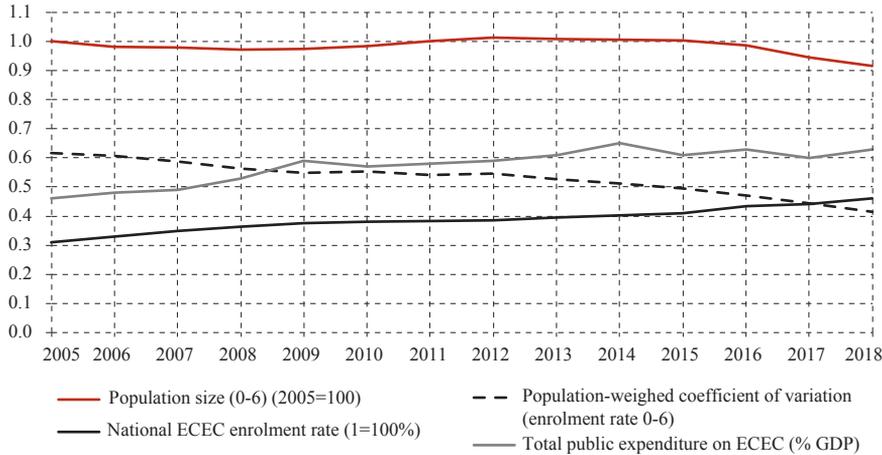
Source: Calculated from Croatian Bureau of Statistics and Ministry of Finances data. Regular programs only.

FIGURE 2

Regional differences in ECEC enrolment rates (0-6), LGUs' total revenues per capita (2018 prices), change in ECEC enrolment rates (0-6) between the 2005-2007 and 2016-2018, and change in preschool population size (0-6)

Source: Calculated from Croatian Bureau of Statistics and Ministry of Finance data. Regular programs only.

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FIGURE 3

ECEC enrolment rate and fiscal capacity, and commitment to ECEC and fiscal capacity (average, 2016-2018)
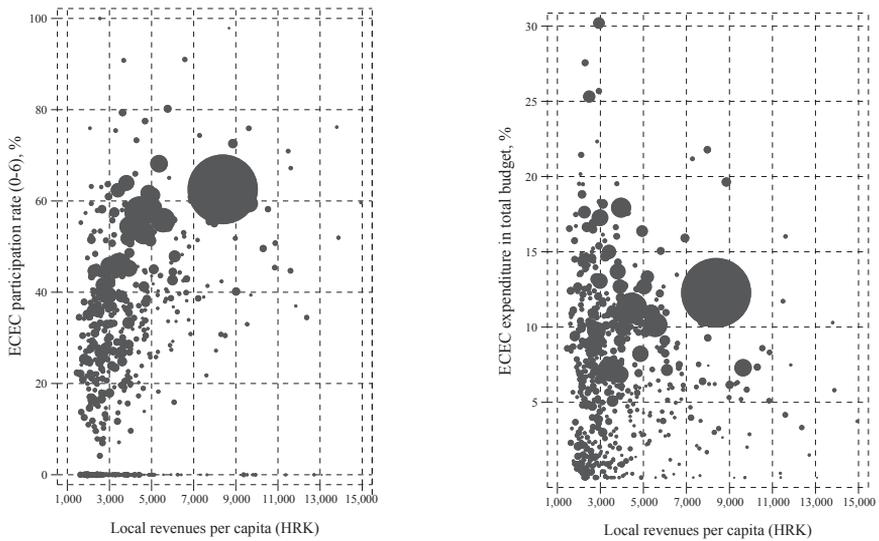
Note: Bubble size denotes size of preschool population (0-6) in the LGU.
Source: Calculated from Croatian Bureau of Statistics and Ministry of Finance data. Regular programs only.

4.2 CROSS-SECTIONAL EVIDENCE ON FISCAL AND SPATIAL INDICATORS CONTRIBUTING TO THE ECEC ENROLMENT RATES

The pooled linear regression model based on the 2016-2018 data shows that after controlling for the size and density of the population as well as fiscal commitment indicators, the ECEC enrolment rates are still strongly associated with the *LGUs' fiscal capacity* – each HRK 1,000 per capita in local revenues is associated with a 3 percentage point higher ECEC enrolment rate. Therefore, the difference from the 2nd to 9th revenue decile (1.91 to 7.25) could account for a 16.1 percentage point difference in ECEC enrolment rates. Moreover, greater *LGU fiscal autonomy* contributes to higher enrolment rates: the difference from the 2nd to 9th revenue decile (29% to 77%) could account for a 6.7 percentage point difference in ECEC enrolment rates.

Apart from the revenues, *LGU commitment to investing* in ECEC is firmly associated with ECEC enrolment rates, as a ten percentage point difference in the share of ECEC expenditure in an LGU budget (e.g., from 5% to 15%) accounts for a 13.7 percentage points difference in ECEC enrolment rates. Finally, *having authority for running the primary education* (currently, most of LGUs with a population size over 30,000, and about a third of those with a population size 10-30,000) spill over to 7.3 percentage points higher ECEC enrolment rates.

Population size and density do matter for provision. Fiscal indicators being controlled for, LGUs with too few children to organise an efficient-sized ECEC

facility are still likely to have a lower enrolment rate. Following the model, LGUs with fewer than 2,000 residents are likely to have an 8.7 percentage point lower enrolment rate than those with over 5,000.[11] Also, rural areas have lower ECEC enrolment rates than more densely populated LGUs. However, municipalities officially categorised as mountainous do not have lower ECEC capacities, and on islands, ECEC enrolment rates are currently higher than in similar LGUs on the mainland (cf. figure 2).

TABLE 2

Pooled regression model: ECEC enrolment rate (0-6), 2016-2018

	Coef.	Std. err. (cluster)
Fiscal capacity: revenues per capita (HRK 1,000)	3.02***	(0.39)
Fiscal autonomy: share of local revenues (%)	0.14***	(0.03)
Surtax (%)	0.13	(0.17)
Commitment to ECEC – share in budgetary expenditure (%)	1.37***	(0.20)
LGU authority over primary education (yes)	7.34***	(2.13)
Population size (ref: 2,000-5,000)		
Up to 2,000	-4.14*	(1.69)
Over 5,000	4.54*	(1.94)
Degree of urbanisation (DEGURBA) (ref: Cities)		
Towns and suburbs (intermediate)	-2.56	(2.66)
Rural areas (thinly populated)	-7.11*	(3.14)
Island	8.24**	(2.94)
Mountain LGU	-0.74	(2.14)
Constant	2.71	(3.97)

*N=1,662, groups: 554, R2 =0.440 *p<0.05, **p<0.01, ***p<0.001.*

4.3 ESTIMATING THE EFFECT OF CHANGES IN LGU REVENUES ON ECEC ENROLMENT RATES

Having a panel of fourteen years of data, externally introduced variation in the level of LGU revenues caused by frequent changes in local government income and taxation rules and the 2009-2014 economic crisis allows for a closer look at changes in ECEC enrolment rates. More precisely, it enables us to explore when and under which circumstances ECEC enrolment rates change. For that purpose, the analysis starts with descriptives of the first differences in ECEC enrolment rates. On average, ECEC enrolment rates in LGUs increased by 1.19 percentage points per year. Some growth was present in times of both declining and rising revenues. However, the increase in ECEC enrolment rates was considerably slower after years of considerable reductions in LGUs' revenue per capita, and strongest after years of moderate revenue growth or stability (table 3).

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[11] The size of the preschool population at average stands at about 7% of total population, and the optimal ECEC facility size, stipulated by the national pedagogical standard, is 340-400.

TABLE 3

Average change in ECEC enrolment rates, by annual change in LGU revenues per capita (fixed prices), 2006-2018

Annual change in revenue per capita (fixed prices), HRK	Average annual change in enrolment rate in the subsequent year (p.p.)
Decrease >1,000	0.64
Decrease 300-1,000	0.90
Minor change	1.26
Increase 300-1,000	1.45
Increase >1,000	1.00
Total	1.19

Note: Only LGUs with existing ECEC capacity. Outliers excluded.

The net effect of the budgetary change was isolated using a first-difference OLS regression (observations clustered by LGUs), allowing the assessment of the effect of the budgetary change on change in ECEC enrolment while also controlling for pressures related to demographic change (table 4). The first-difference regression indicates that an increase in an LGU's revenues of HRK 1.12 million (about 150,000 EUR) led to one child newly enrolled in ECEC. In addition, the reductions in LGU revenues, many of which occurred in the 2009-2014 crisis period, were not associated with a subsequent reduction in ECEC provision. A similar pattern was also identified concerning the indicators related to demographic trends. An increase in the number of children was followed by an increase in ECEC capacities (6.9 places per 10 children increase). However, the decline in population size did not lead to a reduction in ECEC enrolment.

TABLE 4

First-difference regression on change in ECEC enrolment, 2006-2018

	Coef.	Std. err.
Change in LGU revenues in the previous year (per million HRK, fixed prices)		
Growth	0.89***	(0.12)
Decrease	-0.08	(0.08)
Change of preschool population size (per child)		
Growth	0.69***	(0.03)
Decline	-0.25	(0.22)
Constant	3.01	(2.16)

*N=4,530, clusters: 417, R2=0.36, *p<0.05, **p<0.01, ***p<0.001.*

4.4 ESTIMATING THE EFFECTS OF CHANGE IN LGU BUDGETS ON ECEC INVESTMENTS

Apart from the ECEC enrolment rate, an increase in an LGU disposable budget might have led to an increase in other kinds of ECEC investments such as expenditure per child or staffing. The mechanism of such developments was explored via four auxiliary first difference specifications, deploying different dependent variables (table 5). *The change in the ECEC budget per capita* (1) is responsive to changes in

the general LGU budget to a similar extent when the LGU budget is both expanding and contracting, with an additional HRK 33 being allocated for a HRK 1,000 budgetary increase, and HRK 36 being divested for HRK 1,000 of budgetary contraction. However, if the share of ECEC expenditure in the local budget is already high, the change in the ECEC budget per capita is suppressed downwards. The effect of demographic change on the change of the ECEC budget per capita is below the threshold of statistical significance, in cases of both demographic contraction and expansion. *The change in the share of the budget dedicated to ECEC* (2) indicates the stickiness of ECEC spending. When the LGU budget is contracting, the share of an LGU's ECEC budget grows. However, the share of the budget devoted to ECEC usually declines in years of budgetary expansion. These findings (1 and 2) indicate that in good fiscal years the ECEC budget grows slower than the LGUs' budget in general, yet, in bad fiscal years the cuts to ECEC services funding are limited. Also, population pressure slightly contributes to the change in the proportion of the budget dedicated to ECEC.

TABLE 5

First-difference regression on change in ECEC investment, 2006-2018

	(1) Change in ECEC budget per capita (real prices) (HRK)	(2) Change in share of budget dedicated to ECEC	(3) Change in ECEC public expenditure per enrolled child (HRK)	(4) Change in a pupil-educator ratio
Change in LGU budget per capita (fixed prices) (000 HRK)				
Growth	32.63**	-0.45***	1,472**	
Decrease	-36.18***	0.48***	-1,821***	
Change of preschool population size (%)				
Growth	1.27	0.04		0.03
Decline	-2.03	-0.04*		
Change in ECEC enrolment rate (p.p.)			-433***	0.16***
Change in public expenditure per enrolled child				-0.00
Commitment to ECEC – share in budgetary expenditure during the previous year (%)	-9.80***		-520***	-0.00
Constant	96.81***	0.27***	5,076***	-0.35***
R^2	0.093	0.027	0.134	0.041
N	4,488	4,488	4,488	4,475

*$p<0.05$, **$p<0.01$, ***$p<0.001$.*

Both in times of budget expansion and, in particular, budget contraction, a considerable adjustment happens with respect to *public expenditure per enrolled child* (3). According to the model, one HRK change in the LGU budget per capita is associated with about HRK 1.47 increase (if budget is growing) or a HRK 1.82

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decline (if budget is decreasing) in the ECEC public expenditure per enrolled child. Moreover, expansion in ECEC enrolment rates contributes to lower investment per child, about HRK 436 per one percentage point increase in ECEC enrolment rate, if the change in ECEC capacity is not followed by a proportional increase in investment. However, the change in investment per child is not related to the hiring (or dismissal) of ECEC staff, and neither is the LGUs' commitment to ECEC, as neither contributes to the *change in a pupil-educator ratio* (4). Here the change occurs only due to a change in the ECEC enrolment rates (increased capacity). This finding points to trade-offs between ECEC quality and accessibility.

5 CONCLUDING DISCUSSION

This article explored the patterns and dynamics of the development of devolved social services provided under the conditions of strong local disparities in the fiscal and administrative capacity, coupled with a lack of inter-territorial fiscal equalisation mechanisms. Using territorial inequalities in the provision of ECEC services in Croatia as an empirical lens – a case within which the local governments have a high level of discretion in service provision, no service mandate and no earmarked transfers from the central budget – the article shows that the inadequately established policy framework and above all the lack of a fiscal system including fiscal equalization mechanisms that underpin decentralised services may be an important obstacle to providing equal rights to all citizens in the country. In other words, reaching the EU's ECEC targets that ask for high ECEC coverage (especially for older age groups) may be particularly challenging in countries with highly decentralised systems coupled with vague policy frameworks, prone to the institutionalisation of territorial inequalities in the provision of social services. Fourteen years of observational data have provided ample evidence of higher ECEC enrolment rates in localities with higher total revenues and greater fiscal autonomy (i.e. wealthier communities less dependent on central state transfers), as well as in those that are more committed to the ECEC function or have the administrative capacity to govern primary education. The analysis revealed a slow but steady increase in ECEC enrolment rates, followed by a reduction in disparities in ECEC provision among LGUs over the 2005-2018 period (in part due to saturation in prosperous regions). However, the ECEC expansion is very gradual, territorial disparities are still large, and the EU's ECEC targets are far from being achieved at the national level.

Concerning the role of fiscal policy developments, a robust pattern of ECEC enrolment rates growth was identified in the years following the increase in LGU disposable revenue. At the same time, already existent ECEC capacities seem to be resilient to the budget cuts. However, this growth mechanism does not seem very efficient, as in general, only a minor part of the budget growth was invested in ECEC. Consequently, overall revenue growth reduced the share of ECEC expenditures in the local budgets. Moreover, in the periods of budget expansion, the ECEC expenditure per child was prone to fast growth while the teacher-pupil ratio (seen as a proxy for ECEC quality) was not being improved. Conversely, the ECEC system has proved to be rather resilient to revenue decline, avoiding a reduction in ECEC enrolment rates via two mechanisms: (a) increasing the share of ECEC expenditures in the local budget, and (b) taking a cost-cutting route, that is, decreasing the ECEC expenditure per child

and potentially affecting the quality of services being provided. The latter might have been instrumental in containing the growth of local ECEC expenditures, although those increased from 0.45% to 0.63% GDP in the 2005-2018 period.

While demonstrating a certain resistance of the already established system to external shocks, these findings point at the limits of ECEC expansion within a policy and institutional setting such as that found in Croatia. First, a sizeable post-1990 territorial fragmentation gravely limited the administrative and fiscal capacities of many LGUs, particularly in less developed areas of Croatia (see, e.g. Koprić and Đulabić, 2018). This is an essential obstacle to higher investments in new ECEC capacities with provision being weaker in the smallest municipalities and towns, which do not have enough population to organise an efficiently sized ECEC facility on their own, indicating the importance of economies of scale (cf. Faguet and Sánchez, 2014). At the same time, inter-municipal collaboration in joint ECEC services provision in Croatia is rare and, in most cases, inherited from the pre-fragmentation period (see Dobrotić, Matković and Menger, 2018). Second, the fiscally decentralised ECEC system in Croatia never introduced mechanisms to address the weak fiscal capacity of many LGUs, especially after the 1990s when the number of LGUs quintupled, resulting in many of them not being able to serve basic local needs (see Koprić, Musa and Đulabić, 2016). Equalisation funds were primarily established to serve newly decentralised functions (primary and secondary education, healthcare, social assistance and fire protection), while ECEC has never become part of this package. Such a setup severely limited the development of the ECEC system, particularly in the absence of an obligation to dedicate a part of the budget to the ECEC function. Third, the vague ECEC framework law inherited from the socialist period has never been the subject of comprehensive reform, providing a lot of local discretion in services provision. Among other things, a child's entitlement to the regular ECEC program has never been established, leaving this function low among the priorities of many LGUs.

These findings indicate that it is not decentralisation per se, but the inadequate underlying mechanisms and conditions that are likely to contribute to the persistence of regional inequalities in ECEC provision. They particularly indicate the importance of the regulatory capacity of the state to provide equal rights to all citizens. As shown, in highly devolved systems, it is crucial to have a well-established fiscal system to achieve territorial equality and efficiency in service provision. As pointed out by Rodriguez-Pose and Ezcurra (2010: 639), "positive effects of political decentralisation on cohesion will be easily counterbalanced by the unequal capacity of regions in the core and in the periphery of these countries to make the most of decentralised resources, especially in the absence of well-established territorially progressive fiscal systems". Thus, "the regulatory capacity of the nation-state plays a crucial role in […] guaranteeing citizens' rights independently of the local conditions in which a person is embedded" (Andreotti, Mingione and Polizzi, 2012: 1928).

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REFERENCES

1. Akai, N. and Sakata, M., 2002. Fiscal decentralization contributes to economic growth: evidence from state-level cross-section data for the United States. *Journal of Urban Economics*, 52, pp. 93-108. https://doi.org/10.1016/S0094-1190(02)00018-9

2. Andreotti, A., Mingione, E. and Polizzi, E., 2012. Local Welfare Systems: A Challenge for Social Cohesion. *Urban Studies*, 49(9), pp. 925-1940. https://doi.org/10.1177/0042098012444884

3. Babić, Z. and Šućur, Z., 2022. The Matthew Effect in Local Welfare Policy in Croatia. *Croatian and Comparative Public Administration*, 22(1), pp. 159-186. https://doi.org/10.31297/hkju.22.1.1

4. Babić, Z., 2018. Decentralizacija socijalne skrbi i socijalne nejednakosti: slučaj Hrvatske. *Revija za socijalnu politiku,* 25(1), pp. 25-48. https://doi.org/10.3935/rsp.v25i1.1458

5. Baran, J., Dobrotić, I. and Matković, T., 2011. Razvoj institucionaliziranog predškolskog odgoja u Hrvatskoj: promjene paradigme ili ovisnost o prijeđenom putu? *Napredak: časopis za pedagogijsku teoriju i praksu,* 152(3 -4), pp. 521-539.

6. Bartlett, W., Maleković, S. and Monastiriotis, V., 2013. Decentralization Paradigms in South East Europe: An Introduction. In: W. Bartlett, S. Maleković and V. Monastiriotis, eds. *Decentralization and Local Development in South East Europe.* Cham: Palgrave McMillian, pp. 3-28. https://doi.org/10.1057/9781137295651_1

7. Berc, G., Blažeka Kokorić, S. and Opačić, A., 2020. Dostupnost socijalnih prava i usluga za obitelji u općinama u ruralnim područjima Hrvatske. *Revija za socijalnu politiku*, 27(2), pp. 113-136. https://doi.org/10.3935/rsp.v27i2.1659

8. Brennan, C. [et al.], 2016. How can states ensure access to personal assistance when service delivery is decentralised? A multilevel analysis of Iceland, Norway and Sweden. *Scandinavian Journal of Disability Research*, 19(4), pp. 334-346. http://doi.org/10.1080/15017419.2016.1261737

9. Costa-Font, J. and Turati, G., 2018. Regional healthcare decentralization in unitary states: equal spending, equal satisfaction? *Regional Studies*, 52(7), pp. 974-985. https://doi.org/10.1080/00343404.2017.1361527

10. Costa-Font, J., 2010. Does devolution lead to regional inequalities in welfare activity? *Environment and Planning: Government and Policy.* 28, pp. 435-449. https://doi.org/10.1068/c09156

11. Council of the European Union, 2019. *Council Recommendation on High-Quality Early Childhood Education and Care Systems (2019/C 189/02)*.

12. Czike, K., Krémer, B. and Tausz, K., 2002. The Impact of Decentralization on Social Policy in Hungary, Latvia and Ukraine. In: K. Tausz, ed. *The Impact of Decentralization on Social Policy*. Budapest: Open Society Initiative, pp.1-88.

13. Darby, J., Muscatelli, A. V. and Roy, G., 2003. Fiscal decentralisation in Europe: a review of recent experience. *European Research in Regional Science,* 13, pp. 1-32.

14. Dobrotić, I., 2016. Razvoj i poteškoće sustava skrbi za starije osobe u Republici Hrvatskoj. *Društvena istraživanja*, 25(1), pp. 21-42. https://doi.org/10.5559/di.25.1.02

15. Dobrotić, I., Matković, T. and Menger, V., 2018. *Analiza pristupačnosti, kvalitete, kapaciteta i financiranja sustava ranoga i predškolskog odgoja i obrazovanja u Republici Hrvatskoj*. Zagreb: Ministarstvo za demografiju, obitelj, mlade i socijalnu politiku.

16. European Commission, 2011. *Communication from the commission. Early childhood education and care: providing all our children with the best start for the world tomorrow*.

17. European Council, 2002. *Presidency Conclusions: Barcelona European Council, 15-16 March 2002*.

18. Faguet, J. P. and Sánchez, F., 2014. Decentralization and access to social services in Colombia. *Public Choice*, 160, pp. 227-249. https://doi.org/10.1007/s11127-013-0077-7

19. Hlepas, N. K., 2016. Is it the twilight of decentralization? Testing the limits of functional reforms in the era of austerity. *International Review of Administrative Sciences*, 82(2), pp. 1-18. https://doi.org/10.1177/0020852315581994

20. Hortas-Rico, M. and Rios, V., 2020. Is there an optimal size for local governments? A spatial panel data morel approach. *Regional Studies*, 54(7), pp. 958-973. https://doi.org/10.1080/00343404.2019.1648786

21. Iris, G., 1984. Društvena briga o djeci predškolskog uzrasta. In: M. Škrbić [et al.], eds. *Socijalna zaštita*. Zagreb: JUMENA, pp. 318-325.

22. Jurlina Alibegović, D., 2013. Less is More: Decentralization in Croatia and its Impact on Regional Development. In: W. Bartlett, S. Maleković and V. Monastiriotis, eds. *Decentralization and Local Development in South East Europe*. Cham: Palgrave McMillian, pp. 51-66. https://doi.org/10.1057/9781137295651_3

23. Kazepov, Y. and Barberis, E., 2017. The territorial dimension of social policies and the new role of cities. In: P. Kennett and N. Lendvai-Bainton, eds. *Handbook of Europan Social Policy*. Cheltenham: Edward Elgar, pp. 302-319. https://doi.org/10.4337/9781783476466.00028

24. Kazepov, Y., 2008. The subsidiarization of social policies: actors, processes and impacts: Some reflections on the Italian case from a European perspective. *European Societies*, 10(2), pp. 247-273. https://doi.org/10.1080/14616690701835337

25. Koprić, I. and Đulabić, V., 2018. Evaluation of the Decentralization Programme in Croatia: Expectations, Problems and Results. In: I. Koprić, H. Wollmann and G. Marcou, eds. *Evaluating reforms of local public and social services in Europe*. Cham: Palgrave Macmillan, pp. 243-260. https://doi.org/10.1007/978-3-319-61091-7_15

26. Koprić, I., Musa, A. and Đulabić, V., 2016. Local Government and Local Public Services in Croatia. In: W. Hellmut, I. Koprić and G. Marcou, eds. *Public and Social Services in Europe*. Cham: Palgrave Macmillan, pp. 201-216. https://doi.org/10.1057/978-1-137-57499-2_14

27. Kyriacou, A. P., Muinelo-Gallo, L. and Roca-Sagalés, O., 2015. Fiscal decentralization and regional disparities: The importance of good governance. *Papers in Regional Science*, 94(1), pp. 89-107. https://doi.org/10.1111/pirs.12061

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28. Lessmann, C., 2012. Regional inequality and decentralization: an empirical analysis. *Environment and Planning*, 44(6), pp. 1363-1388. https://doi.org/10.1068/a44267

29. Liu, Y., Martinez-Vazquez, J. and Wu, A. M., 2017. Fiscal decentralization, equalization, and intra-provincial inequality in China. *International Tax and Public Finance*, 24(2), pp. 248-281. https://doi.org/10.1007/s10797-016-9416-1

30. Martinez-Vazquez, J., Lago-Penas, S. and Sacchi, A., 2017. The impact of fiscal decentralization: a survey. *Journal of Economic Surveys*, 31(4), pp. 1095 -1129. https://doi.org/10.1111/joes.12182

31. Matković, T and Dobrotić, I., 2013. Promjene u obuhvatu programima predškolskog odgoja i obrazovanja u Hrvatskoj na nacionalnoj i županijskoj razini između 1990. i 2012. godine. *Revija za socijalnu politiku*, 20(1), pp. 65-73. https://doi.org/10.3935/rsp.v20i1.1133

32. Moss, P., 2007. Bringing politics into the nursery: early childhood education as a democratic practice. *European Early Childhood Education Research Journal*, 15(1), pp. 5-20. https://doi.org/10.1080/13502930601046620

33. Neuman, M. J., 2005. Governance of early childhood education and care: recent developments in OECD countries. *Early Years*, 25(2), pp. 129-141. https://doi.org/10.1080/09575140500130992

34. OECD, 2001. *Starting strong: early childhood education and care.* Paris: OECD.

35. OECD, 2019. *OECD Family Database*. Paris: OECD

36. Rodríguez-Pose, A. and Ezcurra, R., 2010. Does decentralisation matter for regional disparities? A cross-country analysis. *Journal of Economic Geography*, 10(5), pp. 619-44. https://doi.org/10.1093/jeg/lbp049

37. Rodríguez-Pose, A. and Gill, N., 2004. Is there a global link between regional disparities and devolution? *Environment and Planning,* 36, pp. 2097-2117. https://doi.org/10.1068/a362

38. Rostgaard, T., 2018. Childcare as a global policy agenda. In: G. B. Eydal and T. Rostgaard, eds. *Handbook of Family Policy*. Cheltenham: Edward Elgar Publishing, pp. 96-110. https://doi.org/10.4337/9781784719340.00016

39. Ruano, J. M. and Profiroiu, M. (eds.), 2017. *The Palgrave Handbook of Decentralisation in Europe*. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-319-32437-1

40. Stropnik, N., 1989. *Družina – Vir Kvalitete Življenja*. Ljubljana: Institut za sociologijo.

41. TransMonee, 2019. *Monitoring the situation of children and women in Europe and Central Asia Database*.

42. Vukšić, G., 2014. Employment and employment conditions in the current economic crisis in Croatia. *Financial Theory and Practice*, 38(2), pp. 103-138. https://doi.org/10.3326/fintp.38.2.1

43. Zrinščak, S., 2002. Socijalna i obiteljska politika u tranziciji. *Revija za socijalnu politiku,* 9(1), pp. 107-115. https://doi.org/10.3935/rsp.v9i1.196

Economic growth or social expenditure: what is more effective in decreasing poverty and income inequality in the European Union – a panel VAR approach

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Abstract

Are economic growth and social expenditure effective in decreasing poverty and income inequality in the European Union? We try to provide an answer to this question by using a Panel VAR model for the period from 2010 to 2019, using a sample of 28 European member states plus Norway and Iceland. We find that although both economic growth and social expenditure decrease poverty, economic growth is more effective at decreasing poverty than social expenditure. However, when it comes to income inequality, economic growth seems to increase it, while social expenditure seems to lower it.

Keywords: panel VAR model, poverty, income inequality, economic growth, social expenditure, European Union

1 INTRODUCTION

The Euro-crisis that started in 2010 increased the need for addressing the problems of poverty and income inequality even more than before and the efforts to tackle these problems were embedded in the Europe 2020 strategy. This strategy aimed at decreasing the number of people living in poverty in Europe by 20 million before the year 2020. However, before we reached the end of the decade, the European Commission stated that this goal had not been attained and that significant efforts were still needed in the fight against poverty and income inequality (European Commission, 2022). The Europe 2020 strategy has been supplemented and eventually replaced by Agenda 2030 (Becker et al., 2020) and the fight against poverty is still ongoing. In addition, according to the European Commission, the effects of the economic recovery after the Eurozone crisis were not evenly distributed among all groups of society (European Commission, 2019). In respect to the Covid-19 pandemic crisis that followed in 2020, a study (Fana et al., 2020) showed that the government-imposed restrictions intended to mitigate the spread of the virus had asymmetrical effects on different groups in society and the most affected were those who were the most vulnerable in the first place.

At the moment of writing this paper the world is facing yet another crisis due to the Russian military aggression against Ukraine. The war exacerbated the previously existing energy crisis, the already disrupted supply chains and triggered even higher inflation throughout the world. Because the poor suffer the most from these developments there is a growing need for new and innovative social packages. On the other hand, the fiscal space is shrinking as a result of the expansive fiscal policy that took place during the pandemic crisis and due to the inflationary pressure on fiscal policy because of the energy crisis. This is why we think it is important for policy makers to learn more about the dynamics of fiscal expenditure in reducing poverty and income inequality, particularly the social component of fiscal expenditure – social protection benefits. The values of the European Union (EU) rest on the foundation of the economic paradigm of the social market economy. While ensuring free-market capitalism with fair competition and a flourishing industrial economy, social market economies strive for social justice

and a strong welfare state. This is the European Union's shared vision; although the level of social expenditure is different among the member states, they all tend to spend a significant share of their budgets on social protection. That makes the EU an interesting region for this type of econometric analysis. But which decreases poverty and income inequality more – the market or the state?

The trends of the indicators that measure poverty and income inequality remind us that the problem of poverty and inequality persists despite the rising social expenditure and economic growth. In our paper we have tried to analyse and compare the effectiveness of social expenditure versus economic growth on reducing poverty and income inequality. Our main hypothesis is based on the economic theory of market socialism according to which it is the market that creates poverty and income inequality while the state corrects them. Our findings show that this is partly true: economic growth seems to increase income inequality and social expenditure seems to lower it. However, regarding poverty, we were intrigued by the results that showed that economic growth seems to be more effective in reducing poverty than social expenditure.

The problems of poverty and inequality are a big challenge in times of economic crisis, pandemics or other economic disruptions tackling them is crucial to the stability of the economy, the recovery process and economic growth in the long run. In the same time, the key question arises about the constant increases in social expenditures, which in the last decade have occupied a significant part of the budgets of European economies and whose effectiveness is important in terms of both reducing poverty and inequality, and of fiscal sustainability. We use panel data for 28 EU countries plus Norway and Iceland for the period from 2010 until 2019. In this way we cover the period between the Eurozone crisis and the Covid-19 pandemic crisis. Another contribution of this paper and the reason why we cover this period is because the existing literature usually covers the period up to the year 2015. It should be noted, that we used a balanced panel and the last publicly available social expenditure data were for the year 2019, and also the following year 2020 would have probably shown outlier values for the variables. The year 2020 and the following period seem to be unique from the aspect of social expenditure and as such should be analysed as a separate period. Nevertheless, conclusions drawn from the period following the start of the financial crisis in the previous decade will be important for policy makers in this decade and for tackling the crises it has unfortunately brought to us.

The used methodology is a panel VAR model analysis. According to the literature review, this methodology has not been previously used for this area of research for European countries. The methodology used the most for analysis of this problem area is the panel data model. We improve the analysis by employing panel VAR techniques because they allow us to take into account the interdependencies of the variables both with their past values and among themselves. In addition, panel data improve the simple VAR approach because despite analysing the time

component it now also includes the cross-sectional component in the findings. In this way, our contribution in filling the gap in the relevant literature is twofold. The paper is unique because for the first time in this area of research we employ a panel VAR model, previously unattempted for European countries and secondly, we include the latest available data and cover a period of time that has not been covered so far. Furthermore, we analyse a unique area of research that will become increasingly important in the coming period – especially for the countries in the euro area due to the economic, energy, social and security challenges they are increasingly facing. This allows us to draw unique conclusions for this period of time in the EU and to understand the dynamics between distribution and redistribution in a specific way. It is our expectation that despite stirring up the academic debate in the field, the conclusions could eventually help policy makers in tackling the challenging times ahead of us.

The structure of this paper goes as follows: in the first part we present a thorough literature review giving the reader a quick overview of what has been done so far in the field; the second part explains the methodology; the third part presents an overview of the trends of the variables used in the model and other variables crucial for explaining the roots of the problem that is subject to our analysis; the fourth part presents the econometric analysis and its results; the fifth part presents the robustness checks and we present the concluding remarks in the last and sixth part of this paper.

2 LITERATURE REVIEW

We have tried to thoroughly analyse the existing literature in order to systemize the used methodology in the field, to determine which period has not been covered in the literature and to familiarize ourselves with the empirical findings. Although some of the studies show that social expenditure is not efficient in decreasing poverty and income inequality (Nelson, 2013; Bayar and Sasmaz, 2018; Caminada and Goudswaard, 2009; Fonayet, Eraso and Sánchez, 2020), most of the studies seem to provide evidence of social expenditure effectiveness in respect to poverty and income inequality reduction (Dafermos and Papatheodorou, 2010; Mansi et al., 2020; Bosco and Poggi, 2019; Doina and Viorica, 2017; Sanchez and Perez-Corral, 2018). We have not found papers that employ the panel VAR model or compare the effects of social expenditure versus economic growth on poverty and income inequality reduction in the same model. The most used methodological approach in investigating the effects that social expenditure has on poverty and income inequality reduction, are panel models using OLS estimators. In addition, we found only one study that covers the period until 2018, while most studies cover the period until 2015. We provide the analysis of the relevant literature review below and have summarized the findings in the table at the end of this chapter.

Dafermos and Papatheodorou (2010) use panel data in order to examine the way economic growth and social expenditure affect poverty and income inequality for 14 EU member states for the period from 1994 to 2007. The results of this study

show that social expenditure has a significant effect in decreasing poverty and income inequality. On the other hand, Nelson (2013) using macro and micro poverty data for 28 EU member states for the period from 1990 to 2008, asks the question whether social expenditure helps people in the EU to reach the poverty threshold income level. This empirical analysis shows that social expenditure rarely manages to accomplish this, meaning that European redistributive mechanisms cannot be characterised as just and effective.

However, it should be noted that the amount of social expenditure is not always enough to ensure effectiveness in tackling poverty and income inequality while this ineffectiveness could also be caused by inadequate targeting of the poor (World Bank, 2003). Cyrek (2019) analyses the efficacy of social expenditure in decreasing poverty and income inequality for the EU member countries for the period from 2007 to 2016. The conclusion of this study is that within the crisis period the effectiveness of social expenditure declined and that different countries show different level of social expenditure effectiveness. The countries in the North use social expenditure to target poverty reduction, while the states in the South focus more on mitigating income inequality. Similar results have been previously shown in the 2007 study of Ferrera (2007), according to whom the southern member states are far from successfully handling poverty which to an extent is a result of complex cultural and institutional factors as well as of public policy that seems to have a high tolerance for long-term poverty and inequality.

In addition, Andrés-Sánchez, Belzunegui-Eraso and Valls-Fonayet (2020) analyse 28 EU member states for the period between 2011 and 2015 using deterministic and stochastic models. They also conclude that in southern EU member states the efficacy of social expenditure is low. Molina-Morales et al. (2014) used panel data for 11 years and 27 EU member states, coming to a conclusion that the variables economic development, economic freedom and being part of the euro zone best predict the extent of social expenditure, meaning that it is political will rather than inequality levels that is crucial for higher social expenditure levels. The social state model is also relevant when predicting the effectiveness of social expenditure – those states that have the highest levels of social expenditure also employ their social expenditure most effectively (De Bonis and Antonelli, 2018).

The literature review shows that the greatest number of studies conclude there is a negative correlation between social expenditure on one hand and poverty and income inequality on the other. Sanchez and Perez-Corral (2018) who use dynamic panel models aiming to analyse the effects from different categories of social expenditure concluded that for the period from 2005 to 2014, the highest social expenditure effectiveness in the developing European economies was related to both health expenditure and social protection, while in the developed European economies it was expenditure for social protection. Similar results are produced by the study of Cammeraat (2020) who uses OLS and 2SLS regression with data from 1990 to 2015 and analyses which types of social expenditure result in the largest reduction of poverty and income inequality. This study concludes that social

protection expenditure is most effective when targeted to the most vulnerable part of the population. However, economists and policy makers should not forget about the importance of equal opportunities, especially for the children growing up in poor families; Hidalgo-Hidalgo and Iturbe-Ormaetxe (2018) point out that in the long run it is public expenditure for education that is the most effective for the wellbeing of the children of poor and uneducated parents. According to Leventi, Sutherland and Tasseva (2018) who use microsimulation models the results could be dependent on the types of poverty indicators used in the model, but they also conclude that social protection expenditure and child related benefits are the most effective in tackling poverty. A study using regression analysis for 27 EU member countries in 2015 (Doina and Viorica, 2017) comes to the conclusion that of all the types of public expenditures, it is social expenditure that is the most effective in poverty reduction, followed by public expenditure for health and education.

Some research indicates that social expenditure has negative correlation with poverty and income inequality without having an effect on economic growth and that they are most effective when they are targeted, while non-targeted social expenditure, i.e. a universal social protection program, is more effective when tackling income inequality (Cammeraat, 2020). Antonelli and De Bonis (2017) conduct an analysis with cross section data for the year 2013 for 22 EU member countries, using social performance indexes as proxy combining the effects that social expenditure has on health, education, unemployment, etc. and conclude that countries with low social expenditure efficacy have also low results in respect to the abovementioned index. Bosco and Poggi (2019) used a dynamic three-level model for 26 EU countries for the period from 2008 to 2011 and found that the risk of poverty is negatively related to the size of the structural social expenditure.

Finally, a study using multiple regression analysis and the fixed effect model for European and Western Balkan (WB) countries (Albania, North Macedonia, Montenegro, Bosnia and Serbia) for the period from 2009 to 2018 shows that economic growth does have a significant impact on reducing poverty while it is shown to have a more significant impact on the EU than in the WB (Mansi et al., 2020). Different levels of social expenditure effectiveness are also shown in the paper of Da Silva and Andrade (2016) who used a nonparametric panel data model for the EU-27 countries and covered the period from 2003 to 2013. This study suggests that Finland, Hungary and Luxembourg were the most efficient countries in reducing poverty via social transfers, whereas Greece, Portugal and Spain were the least efficient in the EU-27. Another interesting finding of this study is that social transfers were found to be less efficient in the crisis period (2008-2013) and "a positive relationship between poverty gains and social transfers exists for values below 27% of GDP, while above that saturation point, expenditures on social transfers describe a situation of total inefficiency".

Although the literature mostly concludes there is a negative correlation between social expenditure and poverty and income inequality, a part of the research on the

topic indicates that there is a weak link between them or no relationship at all. Such is the study of Caminada and Goudswaard (2009) which includes the OECD and EU-15 countries and shows that there is no statistically significant relationship between social expenditure and poverty reduction. Although they do not find a strong relationship between social expenditure and poverty, they did find a statistically significant relationship between social programs targeted at poor children and their families and poverty reduction. Nevertheless, in their 2010 study, Caminada and Goudswaard show that if pensions are treated as transfers, there is a strong relationship between levels of social spending and antipoverty effects of social transfers and taxes and that in the EU-15 countries the increase of social transfers by one percentage point results in a 0.7 percentage point reduction in poverty.

In addition, Fonayet, Eraso and Sánchez (2020) using data from the EU-SILC and ESSPROS databases for the period from 2007 to 2015 showed that there is a weak correlation between social expenditure and poverty and income inequality reduction which is also dependent on the social state model. However, this study also showed that in the EU-15 group there is a statistically significant relationship between the social programs targeted at poor children and their families and poverty reduction. Another study that focuses on EU member states from Central and Eastern Europe for the period from 2005 to 2014 using a causality analysis did not manage to find evidence of causality between social expenditure and poverty reduction (Bayar and Sasmaz, 2018). On the other hand, Van Lancker and Van Mechelen (2015) show that the social expenditure targeted at the most vulnerable citizens has a negative effect on child poverty and they indicate that the universal approach to social protection is more successful in reaching its aim. Nevertheless, Atkinson (2000) points out that those countries in Europe that have the highest social expenditure are also those that show the best results in poverty and inequality reduction, inferring that "economic and social policies are inseparable".

The literature review suggests that most of the existing studies in this research field provide evidence of social expenditure effectiveness in respect to poverty and income inequality reduction. However, the trends of the indicators measuring poverty and income inequality remind us that the problem of poverty and inequality persists despite the rising social expenditure and economic growth, thus making the question of their effectiveness still relevant. Due to this fact, it is maybe more important for researchers to ask the question of the dynamics between the forces of market distribution and government redistribution and the extent of the effects in addition to the investigation of the existence of a significant relationship. The extent of the effectiveness of social expenditure is important because the primary aim of social policy is effective redistribution of income and correction of market imperfections such as poverty, income inequality and unemployment. Understanding the mechanism of redistribution is crucial in choosing the right approach to social policy and increasing its effectiveness in the reduction of poverty and income inequality. Table 1 summarises some contributions from the reviewed literature.

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TABLE 1

Literature review

Study	Period	States	Methodology	Results
Dafermos and Papatheodorou, 2010	1994-2007	14 EU members	Panel model	Social expenditure significantly decreases poverty and inequality
Nelson, 2013	1990-2008	28 EU members	Panel model	European social protection inadequate for redistribution
Cyrek, 2019	2007-2013	All EU members	Panel model	Effectiveness of social protection declined during euro zone crisis
Andrés-Sánchez, Belzunegui-Eraso and Valls-Fonayet, 2020	2011-2015	28 EU members	Panel model	The southern member states are less effective in tackling poverty and inequality
Molina-Morales, Amate-Fortes and Guarnido-Rueda, 2014	1996-2006	27 EU members	Panel model	The social protection expenditure is dependent on the political will of the country
Mansi et al, 2020	2009 -2018	EU and WB	Multiple regression analysis using the fixed effect model	Economic growth does have a significant impact on reducing poverty
Bosco and Poggi, 2019	2008-2011	26 EU countries	Dynamic three-level model	The risk of poverty is negatively related to the size of the *structural* social expenditure
Da Silva and Andrade, 2016	2003- 2013	EU-27	Nonparametric panel data model	Results show different effectiveness for different countries and for different levels of social transfers which above a saturation point result in inefficiency.
Sanchez and Perez-Corral, 2018	2005-2014	28 EU members	Dynamic panel models	The results show the existence of a negative correlation between public social expenditure as a whole and income inequality.
Hidalgo-Hidalgo and Iturbe-Ormaetxe, 2018	2005	17 EU members	Cross-section analysis	Public expenditure in primary education has a strong effect on raising individuals above the poverty line
Leventi, Sutherland and Tasseva, 2018	2013	7 EU members	Microsimulation models	Most cost-effectively in most countries are increasing child benefits and social assistance
Doina and Viorica, 2017	2015	27 EU members	Regression analysis	The expenditure made by the state have a significant influence on poverty reduction. The greatest influence is made by expenses for social protection and they are followed by the health care, business and education-related expenses
Cammeraat, 2020	1990-2015	22 EU and OECD members	2SLS regression models	Social expenditure reduces poverty and inequality without being harmful for GDP growth. Targeted schemes are most effective in reducing poverty, while social expenditure types with a universal character are more effective in reducing inequality

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Study	Period	States	Methodology	Results
Antonelli & De Bonis, 2017	2013	22 EU members	Cross section analysis	States that have the highest levels of social expenditure are also the ones with highest effectiveness of social expenditure
Caminada and Goudswaard, 2010	1990-2007	OECD and EU-15	Cross country analysis	If pensions are treated as transfers, we find a strong relationship between levels of social spending and antipoverty effects of social transfers and taxes. Social spending seems to be an important determinant of a country's poverty outcome. Each percentage point of social expenditure alleviates poverty in both EU15 and non-EU15 countries by 0.7 percentage point on average
Caminada and Goudswaard, 2009	2005, 2006	OECD and EU-15	Cross country analysis	They do not find a strong relationship between levels of social spending and antipoverty effects of social transfers and taxes. At the program level, family programs and child support alleviate poverty to a large extent
Fonayet, Eraso and Sánchez, 2020	2007-2015	EU	Panel model	Correlation between social expenditure and the levels of poverty is not strong
Bayar & Sasmaz, 2018	2005-2014	Selected CE and EU countries	Causality analysis	There is no causal interaction between social expenditures and poverty in this sample

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3 METHODOLOGY

Both economic growth and the welfare state are important factors in decreasing poverty and income inequality. Although economic growth is important in moving forward the economy and all of its constituents, some form of income redistribution is crucial for building an equal society (Atkinson, 2015; Piketty, 2014; Stiglitz, 2012). The central question of our analysis is to determine to what extent social expenditure is effective in poverty and inequality reduction compared to economic growth. The literature suggests that so far, for European countries, the panel VAR model has not been used to investigate the effectiveness of social expenditure on reducing poverty and income inequality, making this paper a unique and relevant contribution to the existing strand of literature. It should be noted that we have used an external software package for the panel VAR model developed by (Abrigo and Love, 2016) for the software package STATA. The VAR methodology is often used for analysing the interactions and the effects of the economic policies and enables us to detect the effects, the interaction and the transmissions of the shocks of important economic policies by using the impulse response function. All this is done without the need to include a lot of restrictions in the model and enables the data to manifest the mutual dynamics and transmissions among the variables in the model (Petrevski, Trenovski and Tashevska, 2019). In the VAR models all variables are treated as endogenous and dependent in both a static and a dynamic sense and the panel VAR models have the same structure as the basic VAR models, although the cross-section component adds a new dimension to the model (Canova and Ciccarelli, 2013).

Because the aim of the study is on the one hand to measure the effects that social expenditure as part of public expenditure and an instrument of fiscal policy has on macroeconomic phenomena such as poverty and income inequality, but on the other hand to compare it with the effects that economic growth has on poverty and inequality reduction, we needed a model that does not impose restrictions regarding the endogeneity of the variables. In other words, the change in poverty and income inequality levels could be caused by changes in social expenditure, but at the same time public and social expenditure could also change due to changes in economic growth, poverty, income inequality, etc. Due to this fact, we needed a complex model that could include all mutual effects and dependencies between the variables and their lagged values. According to Petrevski, Trenovski and Tashevska (2019), the biggest advantage of this model is that it allows for a complex analysis of the phenomena without the need to build a complex structure for the whole economy. Since the panel VAR model has the same structure as the basic VAR model with addition of the cross-section effects by countries, we will base our methodology on the common VAR model:

$$AX_t = \beta_0 + \beta_1 X_{t-j} + u_t \tag{1}$$

where X_t represents a vector dependent on its own lagged values and the structural shock of u_t which are mutually independent. However, the panel VAR model is

different from the basic VAR model because of the cross-section component – in this case we use data for 30 EU countries. Following Dees and Guntner (2014), the panel VAR equation could be written in the following way:

$$y_{i,t} = v_i + A_{1,i}\,Y_{t-1} + ... + A_{j,i}Y_{t-1} + e_{i,t} \qquad i = 1,.....,N \qquad (2)$$

where, $y_{i,t}$ represents a $(K\ x\ 1)$ vector of endogenous variables for $i = 1,....., N$; $Y_t = (y'_{1,t}, y'_{2,t} ... y'_{N,t})'$ represents a $(N*K x\ 1)$ vector of $y_{i,t}$; v_i is a vector of the coefficients of the intercept; $A_{j,i}\,j = 1,...., p$, $i = 1,....,N$ is a $(K\ x\ N*K)$ matrix of the slope coefficients; and $e_{i,t}$ is a $(K \otimes 1)$ standard errors vector. While the common VAR models could be estimated using the OLS estimator, this estimator is biased when it comes to using the panel VAR methodology which is why the literature recommends the usage of the GMM estimator (Hsiao, 2003). As previously mentioned, in this study we use the STATA 13 packet commands developed by Abrigo and Love (2016) who use the GMM estimator for calculating the panel VAR model.

The reviewed literature suggests that the most used variables in the models which measure the effectiveness of social expenditure on reducing poverty and income inequality are the variables: Social expenditure as percentage of GDP; Social expenditure per capita; Gini coefficient; the 80/20 ratio; At risk of poverty and social exclusion rate; Number of people living with incomes below the poverty line; and GDP per capita. In our model we employ the following variables: 1) Social protection benefits per capita; 2) At risk of poverty and social exclusion rate; 3) Gini coefficient; 4) GDP per capita. At the moment of writing this paper, the data were available online in the Eurostat database and cover the period after the start of the economic crisis in Europe, starting from the year 2010 until the latest available data at the moment of writing this paper, the year 2019. Most of the literature analyses the period before the crisis or until the year 2015, making this another important contribution to the existing strand of literature. We have not used data for the year 2020 due to two reasons. One reason is that the data for social benefits per capita are made available within a two-year lag and the other variables were also not available for all the countries in the sample, when our intention was to build a balanced panel. The other reason is that the year 2020 was marked by unusual characteristics and disruptions due to the Covid-19 pandemic crisis. The earliest available data that were balanced data are for the year 2010. The countries included in the sample are the 28 EU member countries plus Norway and Iceland which are not members but belong to the European economic zone and are a good example of a Nordic social model. It should be mentioned that the United Kingdom is still a member state for the analysed period and is included in the sample.

4 VARIABLES TRENDS ANALYSIS

The data source for the sample used in the econometric analysis of this study is the Eurostat database. Having in mind the research hypothesis we have used the following variables in the model: 1) **At risk of poverty and social exclusion** – this indicator is chosen as the poverty variable in the model because it involves all its

sub-categories such as people at risk of poverty, people who are severely deprived and people who live in households with very low work intensity, but it counts persons only once even if they are present in several sub-categories; it is also the main indicator in the Europe 2020 Strategy. The data source related to the income data, social inclusion and the standard of living within the Eurostat database is the *EU-Statistics on Income and Living Conditions (EU-SILC)[1]* database that includes the group of indicators. The main indicator of this database is the one we used in the model – *People at risk of poverty or social exclusion* (% of total population / 3-year change in pp). Other indicators within the group are: *People at risk of poverty after social transfers* (% total population / 3-year change in pp) – The indicator measures persons with an equalised disposable income below the risk-of-poverty threshold, which is set at 60% of the national median equalised disposable income (after social transfers); *Severely materially deprived people* (% total population / 3 year change in pp) – Severely materially deprived persons have living conditions severely constrained by a lack of resources. They experience at least 4 out of the 9 following deprivations, items relating to the "economic strain and durables" dimension of their household; they cannot afford to: i) pay rent or utility bills, ii) keep the home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) take a week's holiday away from home, vi) run a car, vii) have a washing machine, viii) have a color TV, or ix) own a telephone; and *People living in households with very low work intensity* (% of population aged 0-59 / 3 year change in pp) – People living in households with very low work intensity are people aged 0-59 living in households where the adults (aged 18-59) worked less than 20% of their total work potential during the past year. Students are excluded. 2) **Gini coefficient** – we chose this indicator for the income inequality variable due to its availability for the sample period and because it indicates the pre-redistribution inequality levels. It is a common indicator in the literature for measuring inequality and ensures comparable results among different papers. The Gini coefficient takes values from 0 to 100. A Gini coefficient at value zero would mean that all constituents in the economy have exactly the same level of income, while a coefficient at a value of one hundred would mean that only one constituent gets all the income in the economy. Another indicator that measures income inequality is the 80/20 ratio, which puts into a ratio the income of the poorest 20% of the income distribution and the income of the richest 20% of the income distribution. In the attempt to build a balanced panel, the ratio 80/20 has not been available for the analysed period, but if this is no longer the case in the future it could be used in further research in order to check the results of the study. 3) **Social protection benefits per capita** – We have used this indicator for the variable representing social expenditure because it entails all types of social benefits at once. The indicator entails the following benefits by the function of social protection: Sickness/Health care; Disability; Old age; Survivors; Family/children; Unemployment; Housing; and Social exclusion not elsewhere classified. It should be noted that the indicator we use does not

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[1] More on the following link: Poverty and social exclusion (tipspo) (europa.eu) (Accessed at 1 May 2022).

include pensions, but it does include old-age related benefits. We used the per capita indicator for social protection benefits so we could eliminate the differences in country size and population numbers. The data are available online at the group of indicators *ESSPROS – European System of integrated Social Protection Statistics.*[2] Besides the social protection benefits, the total social expenditure includes the administration costs and other expenditure. It should be noted that when we use the term social expenditure in this paper, we refer only to the social protection benefits as they are described by this indicator. The indicator is expressed in current prices. 4) **GDP per capita** – The variable economic growth is introduced in the model by using data for the per capita indicator in order to eliminate the effects from the size of the economy and the population numbers and in order for it to be somewhat comparable with the Social protection benefits per capita indicator. It should be noted that this indicator represents an index, i.e. it is calculated as the percentage of EU 27 (from 2020) total per capita (based on million euro, EU 27 from 2020), in current prices.

The trends of the variables can inform the researchers on what the crucial questions are, those that need to be addressed regarding the phenomena they describe. As can be seen from graph 1.1. below, the at risk of poverty and social exclusion rate has only slightly declined in the last decade by approximately 3 percentage points and the trend line appears to be almost flat. This trend is even more intriguing when the trends of the other variables are taken into consideration. Social protection benefits per capita have been on the rise in the last decade. Graph 1.2. shows the average value of the indicator for the countries included in the sample for each year. The data show an approximately 23% increase in the average value of this indicator. The GDP per capita has been constantly increasing for the analysed period as well, while at the same time the Gini coefficient has also increased, which can be an indication of an un-inclusive growth. It is interesting to notice that the income inequality trend seems to have a cyclic pattern on a first glance, which is in line with the Kuznets curve hypothesis. Graph 1.5. and 1.6. show two other interesting poverty-related indicators. The impact of social transfers shows the reduction in percentage of the risk of the poverty rate, due to social transfers (calculated comparing at-risk-of poverty rates before social transfers with those after transfers; pensions are not considered as social transfers in these calculations). This indicator is also based on the EU-SILC database (statistics on income, social inclusion and living conditions). From graph 1.5. below it is clear that the impact of the social transfers on poverty reduction has declined in the last decade on average in the analysed countries. Another indicator presented in graph 1.6. is the number of people with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income (after social transfers).
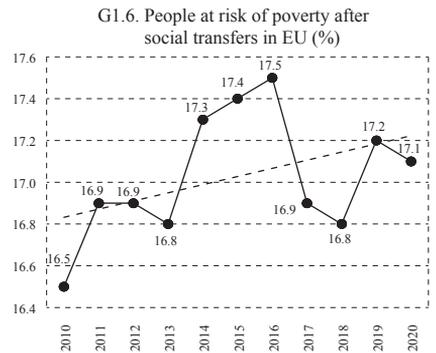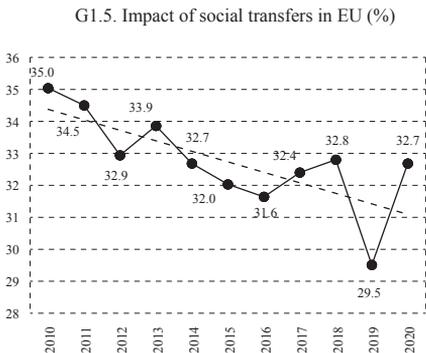
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[2] More on the following link: Social protection (spr) (europa.eu) (Accessed at 1 May 2022).

GRAPH 1

EU averages of the variables used in the model and other poverty related indicators

G1.1. At risk of poverty and social exclusion rate in EU (%)

G1.2. Social protection benefits per capita in EU (thousands of EUR)

G1.3. Gini coefficient in EU (index value)

G1.4. GDP per capita in EU (index value)

G1.5. Impact of social transfers in EU (%)

G1.6. People at risk of poverty after social transfers in EU (%)
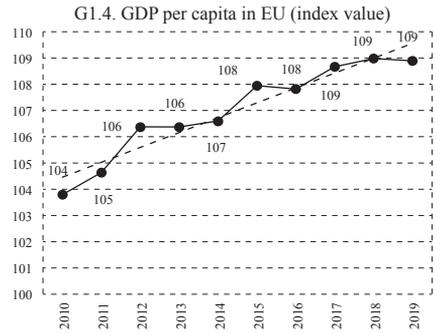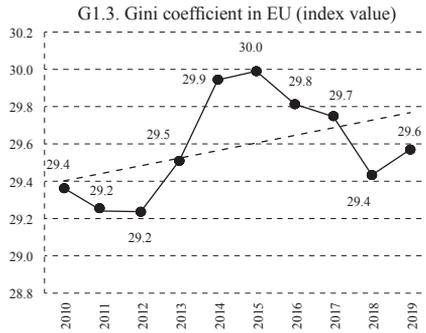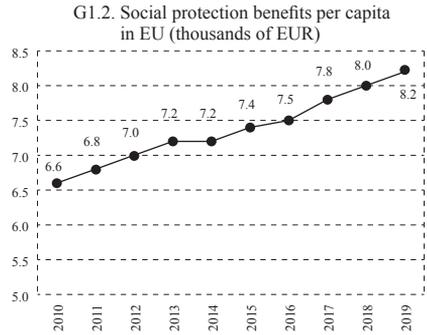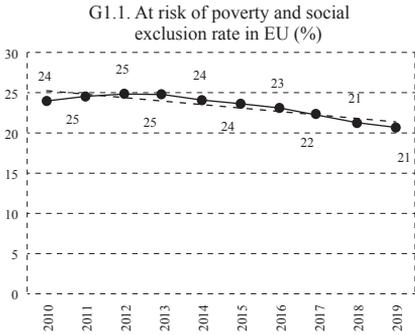
Source: Eurostat database (Accessed 1 May 2022).

GRAPH 2

Average impact of social transfers for the period 2010-2019 (%)
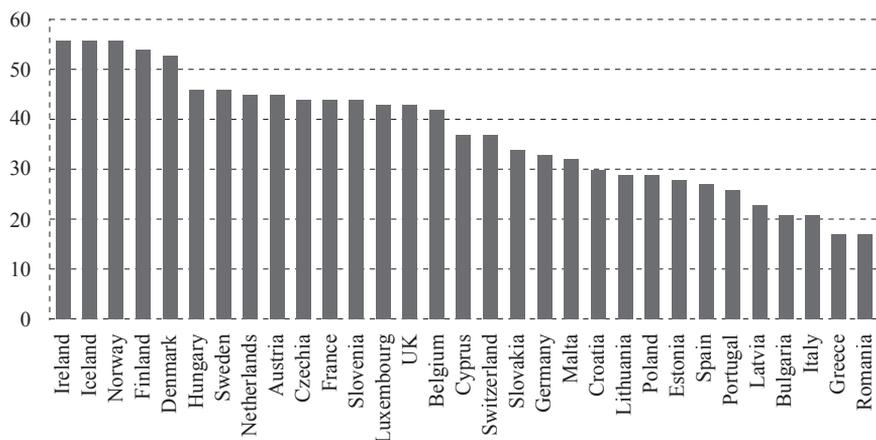
Source: Eurostat database (Accessed 1 May 2022) and authors' calculations.

Graph 2 presents the average impact of social transfers for the period 2010-2019 (calculated as the average from each year's impact). The countries where social transfers have the highest impact on reducing poverty are the following: Ireland, Norway, Iceland, Finland and Denmark. On the other hand, social transfers have the lowest impact in Greece, Romania, Italy, Bulgaria and Portugal. This graph suggests that older EU member states that are located in the North of the continent seem to have better performance of social transfers, while newer member states that are located in the South seem to have lower social expenditure effectiveness, with some exceptions. In the same time, it should be noted that the countries that have the highest impact are also the countries which have the highest social benefits per capita, while it seems that the countries with the lowest impact are the countries which have the lowest social benefits per capita.

Graph 3 shows the change in the Gini coefficient per country in the year 2019 compared to the year 2010. The highest rise in inequality can be noticed in Bulgaria, Luxembourg, Hungary, Netherlands and Sweden. It seems that the change in poverty has been even greater, with the highest increase in Estonia, Germany, Netherlands, Luxembourg and Sweden all of which are highly developed economies (graph 4).

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GRAPH 3

Change in Gini coefficient per country, 2019-2010 (p.p.)
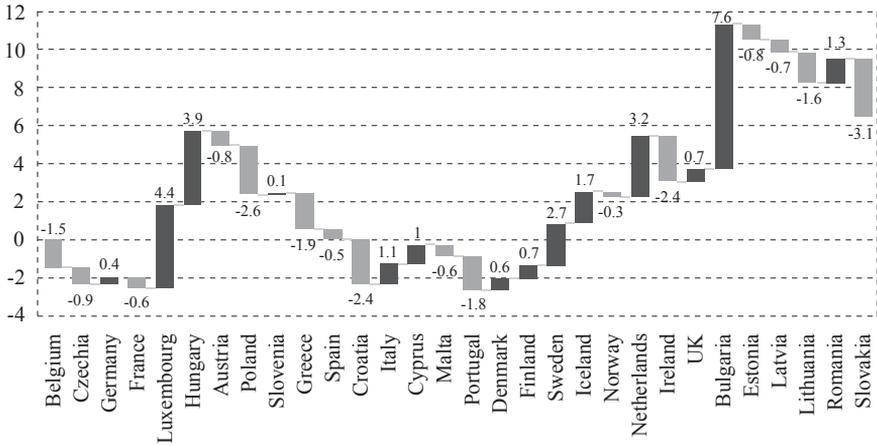
Source: Eurostat database (Accessed 1 May 2022) and authors' calculations.

GRAPH 4

Change in poverty after social transfers per country, 2019-2010 (p.p.)
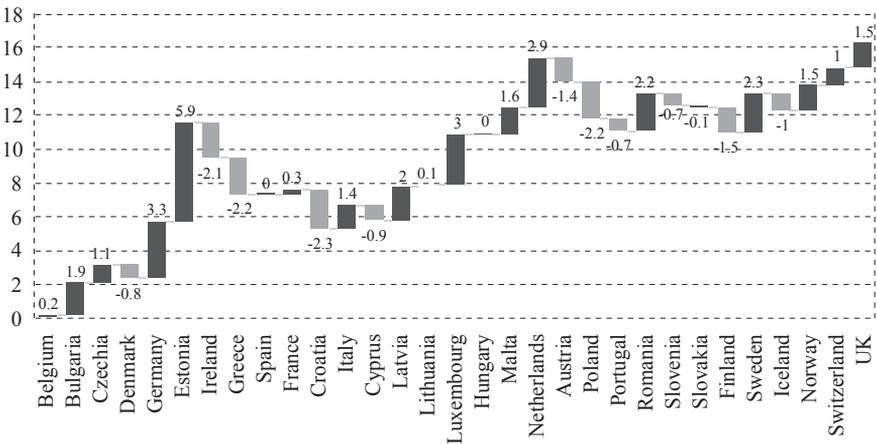
Source: Eurostat database (Accessed 1 May 2022) and authors' calculations.

Table 2 shows the descriptive statistics of the variables used in the econometric model and table 3 shows the correlation between the variables before their transformations. This is the first glance of the data and it is interesting to notice that there is a negative correlation between social protection benefits and poverty and income inequality. This may be the case because poor and unequal countries have lower social expenditure in general or it can be a consequence of social expenditure effectiveness. In addition, social protection benefits per capita and GDP per capita are positively correlated but we do not know if it is because richer countries have higher social expenditure in general or because social expenditure might have a positive impact on economic growth. As expected, poverty and income inequality are also positively correlated meaning that they move in the same direction. Lastly, GDP per

capita is negatively correlated to both poverty and income inequality, but the reason for this could be because poor and unequal societies have lower economic growth or because richer countries have lower poverty and inequality in general.

TABLE 2

Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
SPE	300	7,426	5,331.1	879.2	22,329.1
PVR	300	23	7.4	10.7	49.3
INQ	300	29	3.9	20.9	40.8
GDP	300	107	70	20.3	336

Source: Authors' calculation using STATA 13.

TABLE 3

Correlation between variables (before transformation)

	SPE	PVR	INQ	GDP
SPE	1	–	–	–
PVR	-0.59	1	–	–
INQ	-0.44	0.76	1	–
GDP	0.94	-0.56	-0.41	1

Source: Authors' calculation using STATA 13.

The group of graphs 5 represent the scatterplots of the variables used in the model in order to get a sense of the relationship between them. From the scatterplots of the data set it seems that both GDP and social expenditure are correlated with a decrease in poverty and income inequality. However, graph 5.3. shows a very strong correlation between GDP per capita and the level of social expenditure. Is this because richer countries tend to have a strong welfare state or is it because countries with strong welfare state have better economic prospects?

Before we continue with the econometric analysis, we close this chapter with the following indication: the decade after the start of the eurozone crisis is a period of economic growth and rising social protection benefits, but it has not resulted in significant reduction of poverty and income inequality.

GRAPH 5

Scatterplot of the variables used in the model

5.1. Social protection expenditure per capita (EUR) and inequality (Gini coefficient)

5.2. Social protection expenditure per capita (EUR) and poverty rate (%)

5.3. Social protection expenditure per capita (EUR) and GDP per capita (index value)

5.4. Income inequality (Gini coefficient) and poverty rate (%)

5.5. GDP per capita (index value) and poverty rate (%)

5.6. GDP per capita (index value) and inequality (Gini coefficient)
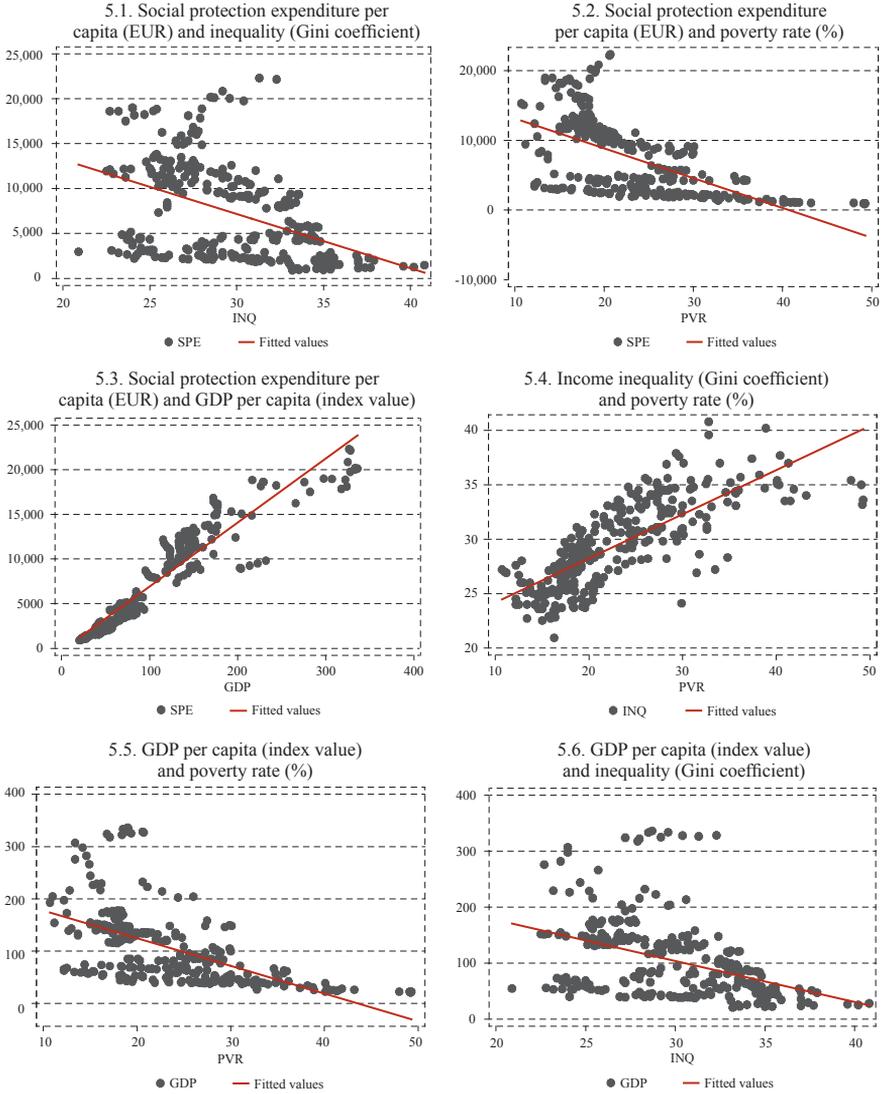
Source: Authors' calculation using STATA 13.

5 EMPIRICAL ANALYSIS

For the purpose of measuring the effects that social expenditure and economic growth have on poverty and income inequality and to test the main hypothesis of this study by employing the panel VAR model, we used the following equation (Vidangos, 2009):

$$Y_{it} = Y_{it-1}A_1 + Y_{it-2}A_2 + ... + Y_{it-p+1}A_{p-1} + Y_{it-p}A_p + X_{it}B + u_i + e_{it} \tag{3}$$

where $i \in (1, 2, ..., N)$, $t \in (1, 2, ..., T_i)$, and $Y_{it} = (SPE_{it}, PVR_{it}, INQ_{it}, GDP_{it})$ as a vector of endogenous variables for each country i and time period t, where $i = 1, ..., 30$ for each country used in the sample and $t = 2010, ..., 2019$ for the yearly data used in the sample covering the period after the start of the eurozone crisis and before the start of the Covid-19 pandemic crisis.

Furthermore, in the model we used the transformed variables, i.e. the first difference of the logarithm of the social protection benefits per capita (*dlogSPE*), the first difference of the indicator that measures the people who are at risk of poverty and social exclusion (*dPVR*), the first difference of the Gini coefficient (*dINQ*) and the first difference of the logarithm of the GDP per capita (*dlogGDP*). The transformation of the variables was performed because the data were not stationary at level and the variables social protection benefits per capita and the gross domestic product per capita were expressed in absolute values.

We calculate the results of this model and check the robustness of the results in the next chapter.

The ordering of variables within the model (SPE PVR INQ GDP) was chosen due to the economic logic it follows; the main hypothesis of our study is that social protection benefits should decrease the poverty level, which should decrease the income inequality and ultimately have a positive impact on economic growth. This is the case if the social protection benefits are effective. Also, when the income at the lower end of the income distribution increases it should result in income inequality decline. Ultimately, a decrease in poverty and income inequality should have a positive impact on economic growth through various economic, political and social channels (Piketty, 2014).

The VAR analysis enables us to see beyond the one-sided effect, i.e. we also analyse the effects that each variable has on all the other variables. In this way we can also identify the effects of economic growth on poverty and income inequality. That being said, we must indicate that a different order of the variables gave more or less the same results and did not affect the conclusion at all.

Before we utilised the panel VAR model, we made sure to test the stationarity of the variables used in the model. In order to do that we used the Harris-Tzavalis (1999) stationarity tests and the Levin, Lin and Chu test (2002). The variables are not stationary at level, but they become stationary at first difference which is why we used the first differences of the variables in the model.

Taking into consideration that all the variables have consistent arithmetic mean and variance throughout the analysed period, the next step was to test the data for both heteroscedasticity and autocorrelation because panel data entail both the cross section and the time component. We applied the Wooldridge (2002) test for autocorrelation and according to the result (Prob > F = 0.1488) we concluded that the sample has no autocorrelation.

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Furthermore, we applied the Frees (2004) test for cross sectional dependence which is adequate for data with small T and large N, as in our case (De Hoyos and Sarafidis, 2006). According to the result (0.562) we concluded that the sample has no heteroscedasticity.

Due to the fact that panel VAR models give results for the relationship between all endogenous variables and their lagged variables and the lagged variables of all other variables included in the model, we should proceed to determine the lag length of these variables. According to Andrews and Lu (2001), the panel VAR model is best fitted when it has the lowest values for MBIC, MAIC and MQIC. In our model, this is the case for the second time lag, which is why we used two time-lags in the model. We continue the analysis by calculating the panel VAR model, which has shown to be stable as per the results of the pVAR stability tests.

The results of the panel VAR model show three statistically significant slope coefficients in three different equations (table A1, appendix).

The first one is in the first equation where the endogenous variable is the first difference of the logarithm of the social protection benefits per capita (dlogSPE). In this equation the poverty indicator (dPVR) is statistically significant in explaining the change in social expenditure and shows a positive relationship. In the second equation where the endogenous variable is the first difference of the poverty indicator, the variable GDP per capita is statistically significant and shows a negative relationship with poverty. In the third equation where the endogenous variable is the first difference of the Gini coefficient (dINQ), the variable GDP per capita is again statistically significant and shows a negative relationship with income inequality. In the fourth and last equation, where the first difference of the logarithm of the GDP per capita (dlogGDP) is the endogenous variable, there are no statistically significant coefficients.

In addition, we calculated the Wald test for panel Granger causality and we notice that the trends of the variable GDP per capita predict the trends of both the variables PVR and INQ, i.e. the poverty indicator and the Gini coefficient measuring income inequality (table A2, appendix).

As it can be seen on graph 6, the shock in the GDP per capita results in a short-term increase in income inequality and a short-term decline in poverty. In addition, the shock in the social expenditure results in declines in both income inequality and poverty. To conclude, the results suggest that social expenditure has an impact on decreasing inequality contrary to the effect that economic growth has. In respect to poverty reduction, the opposite is true – it seems that economic growth has a stronger impact than social expenditure. It should be noted that the variance decomposition results (available upon request) showed that the impact of the independent variables in explaining the dependent variable in all equations does not seem to increase significantly over time.

Impulse response function using variables from model 1

impulse : response
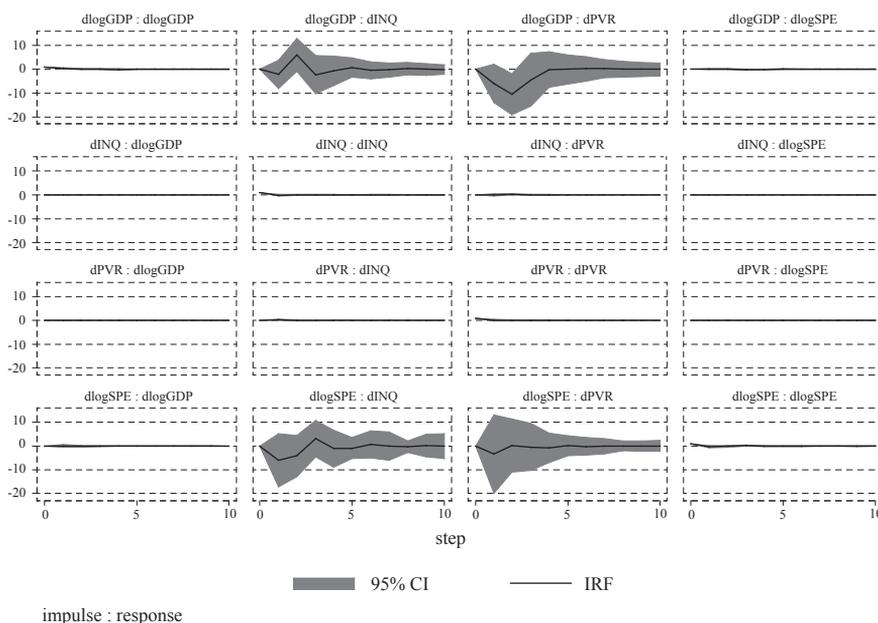
Source: Authors' calculation using STATA 13.

6 ROBUSTNESS CHECKS

Robustness checks are important in order to test the strength of the results obtained in the original panel VAR model presented in the previous chapter. Due to this, we also calculated two other models, which have the following ordering of the variables:

Model 2: SPE PVR GDP, and
Model 3: SPE INQ GDP,

i.e. we checked the originally obtained results by dropping the variables INQ and PVR respectively thus isolating the effects that social expenditure and economic growth have on poverty and inequality separately.

In order to test the results we got from calculating model 1 in this study, we proceed to the calculation of model 2 and model 3. Model 2 is different from the original model 1 in this paper because the variable INQ is dropped and model 3 is different from the original model 1 in this paper because the variable PVR is dropped. It should be noted that we have also performed tests for autocorrelation, heteroscedasticity and pVAR stability and these are available upon request. The results for model 2 show that GDP per capita is statistically significant in explaining the change in poverty and shows a negative relationship (table A3, appendix). These results are confirmed by the panel Granger causality test as presented in table A4 in the appendix. The impulse response function shows that the shock in GDP results in a short-term decline in poverty, which is larger than the impact that social

expenditure has on the reduction of poverty. This is in line with the finding of the original model in this paper. The results of variance decomposition (available upon request) confirm that there is only a short-term effect, because the independent variables do not get stronger in explaining the dependent variable over time.

GRAPH 7

Impulse response function using variables from model 2
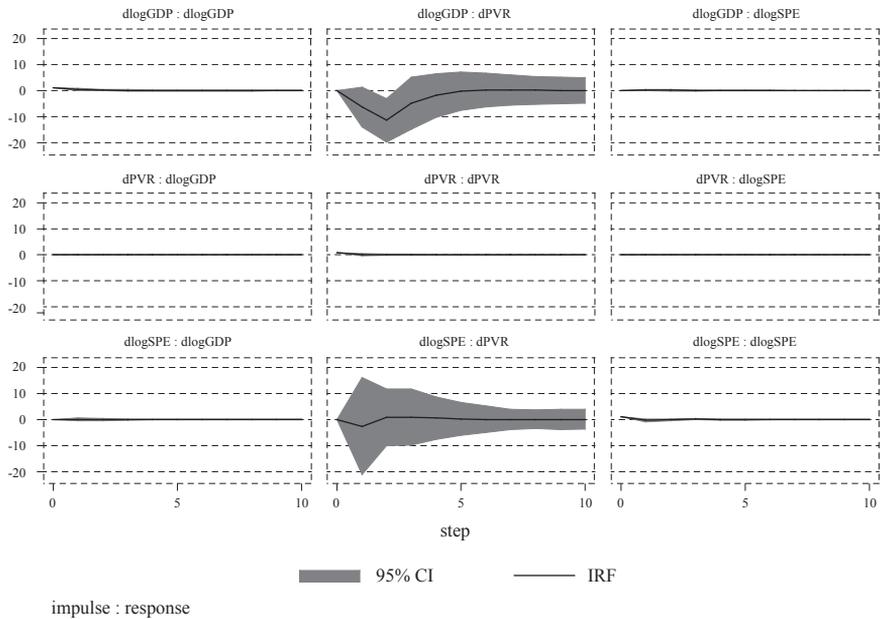
Source: Authors' calculation using STATA 13.

The results for model 3 show that GDP per capita is statistically significant in explaining the change in income inequality and shows a positive relationship (table A5, appendix). These results are confirmed by the panel Granger causality test as presented in table A6 in the appendix. The impulse response function shows that the shock in GDP results in a short-term increase in income inequality, while social expenditure shocks result in a short-term decline in income inequality (graph 7). The variance decomposition results (available upon request) confirmed that the impact of the independent variables in explaining the dependent variable in all equations remains short-term.

Summarizing the results from the original model and the models 2 and 3 that we used for the robustness checks, we could say that they are complementary in explaining the dilemma of this study. They lead us to conclude that economic growth is effective in decreasing poverty but is not effective in decreasing income inequality. On the other hand, social expenditure is less effective in decreasing poverty than economic growth, but is more effective in decreasing income inequality.

GRAPH 8
Impulse response function using variables from model 3

impulse : response
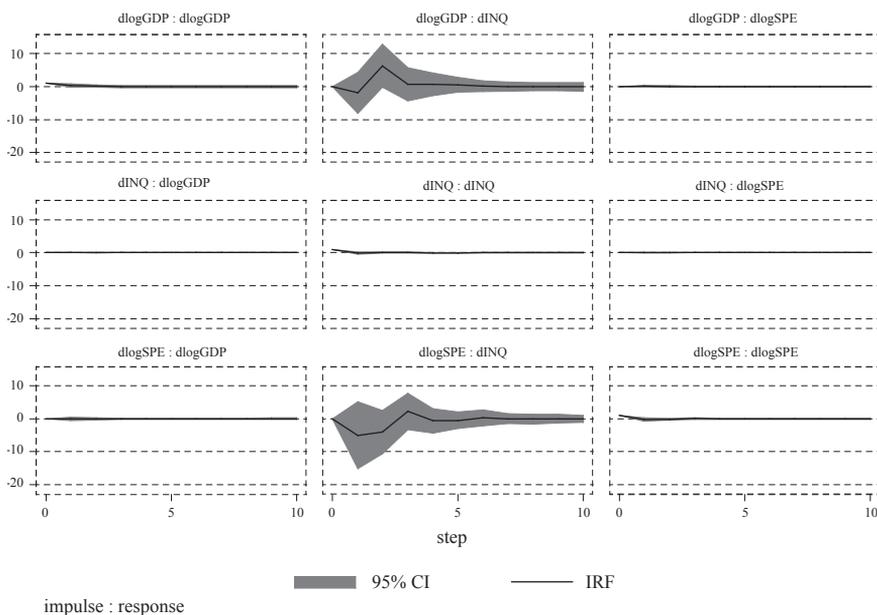
Source: Authors' calculation using STATA 13.

7 CONCLUSION

In this study, we have analysed the effectiveness of social protection benefits in decreasing poverty and income inequality versus the effectiveness of economic growth in decreasing poverty and income inequality in the EU. For this purpose, we have employed a panel VAR model, which has not been used in the relevant literature for investigating this topic so far. The countries included in the sample are the 28 EU member countries (the United Kingdom was still an EU member state at that time) plus Norway and Iceland. In addition, the period that was subject to our analysis (from 2010 until 2019) has not been covered by the existing literature.

Before we continue with summarising the conclusions of this study, it should be noted that this analysis faced two important limitations that could be potentially overcome in the future. Firstly, it would be beneficial to utilize a lengthier time series, either retrospective if older data are made available or beyond the point of 2019, when the data are available in the future. A longer time series would be also valuable when trying to section the data by different social models or different subsets of countries (e.g., new versus old member states) without losing degrees of freedom. Secondly, we would suggest using some different measures of inequality and poverty such as the 80/20 ratio or the share of the bottom 10% of the income distribution, as they were unavailable at the moment of writing this paper, but could be beneficial in strengthening the robustness checks.

The literature review helped us position our paper in the relevant strand of literature in respect to the topic of effectiveness of social expenditure in decreasing poverty and income inequality in the EU. The study utilizes a methodology for investigating this topic in European countries rarely used and covers a period in time that has not been discussed in many papers. The analysis of the variables' trends has given us a direct insight in the data and helped us formulate the research questions. Why was there no significant decrease in poverty and income inequality in the EU in the last decade while the economy grew and social expenditure was constantly rising? Does the market or the state contribute the most to a decline in poverty and income inequality?

Analysing the effects that social expenditure and economic growth have on reducing poverty and income inequality we found the following results. Economic growth does improve the wellbeing of the most vulnerable people in the society and decreases poverty, however in the same time it also increases income inequality. That being said, can we characterise European growth as inclusive? The answer is partly positive because it seems that economic growth in Europe does help those at the bottom of the income distribution. However, at the same time it increases the gap between the poorest and the richest. The tide raises all boats but more those at the top. Having in mind the high poverty rates, these findings pose the following question for further research: is it possible to solve poverty without significantly improving income inequality?

On the other hand, the results of our study show that social expenditure has a lesser impact on poverty than economic growth. However, when it comes to income inequality, social expenditure seems to play a significant role in decreasing it, while economic growth seems to play a role in increasing it. This brings us to the question: how can social expenditure be reformed in order to generate a stronger decline in poverty and how can economic growth be made more inclusive in Europe so it does not exacerbate inequality?

Our results indicate that the distributive market mechanisms in the European Union appear to be stronger than the redistributive government mechanisms. The small decline in poverty during the analysed period was triggered by economic growth much more than by social expenditure. Economic growth also triggers income inequality, while social expenditure seems to lower it. If the European growth had been more inclusive and if social protection benefits had been more effective in decreasing poverty, we would have probably not seen the stagnation in income inequality and the high poverty rates in the decade before the pandemic crisis and the consequent economic crisis and the economy would have been more resilient to the challenges of today. Economic growth has already had a significant effect on reducing poverty but not enough for the stubborn poverty rate to decline in the long term. Notwithstanding the high levels of social expenditure, the desiderated effects still seem to be wanting. This is an indication that it might be time for rethinking the welfare state in Europe.

Going further, the focus should be on making economic growth more inclusive meaning that besides increasing economic output, countries should pay more attention to structural economic reforms, investing in human capital and technological innovation and enhancing infrastructure in lagging and poor regions. In addition, the latest crises show us that effective social protection is extremely important for the mitigation of social and economic impact. Rethinking the welfare state in a fiscally sustainable and effective way that results in significant decreases in poverty is the way to go forward. A carefully and sustainably designed social safety net would not only provide safety for the direct beneficiaries but would act as a cushion for the European economy as a whole, helping Europe navigate easily through turbulent economic periods in the future.

Disclosure statement
Authors disclose that we do not have any conflict of interest.

REFERENCES

1. Abrigo, M. and Love, I., 2016. Estimation of panel vector autoregression in Stata. *Stata Journal,* 16(3), pp. 778-804. https://doi.org/10.1177/1536867X1601600314

2. Andrés-Sánchez, J., Belzunegui-Eraso, Á. and Valls-Fonayet, F., 2020. Pattern recognition in social expenditure and social expenditure performance in EU 28 countries. *Acta Oeconomica,* 70(1), pp. 37-61. https://doi.org/10.1556/032.2020.00003

3. Andrews, D. W. K. and Lu, B., 2001. Consistent model and moment selection procedures for GMM estimation with application to dynamic panel data models. *Journal of Econometrics,* 101(1), pp. 123-164. https://doi.org/10.1016/S0304-4076(00)00077-4

4. Antonelli, M. and De Bonis, V., 2017. Social Spending, Welfare and Redistribution: A Comparative Analysis of 22 European Countries. *Modern Economy,* 8(11), pp. 1291-1313. https://doi.org/10.4236/me.2017.811087

5. Atkinson, A. B., 2000. A European social agenda: poverty benchmarking and social transfers. *EUROMOD Working Paper*, No. EM3/00.

6. Atkinson, A. B., 2015. *Inequality: What Can Be Done*? Harvard University Press. https://doi.org/10.4159/9780674287013

7. Bayar, Y. and Sasmaz, M. U., 2018. Social Expenditures and Poverty in Central and Eastern European Union Countries: A Causality Analysis. In: D. Procházka, ed. *The Impact of Globalization on International Finance and Accounting, Springer Proceedings in Business and Economics.* Cham: Springer, pp. 257-263. https://doi.org/10.1007/978-3-319-68762-9_27

8. Becker, W. [et al.], 2020. Wrapping up the Europe 2020 strategy: A multidimensional indicator analysis. *Environmental and Sustainability Indicators,* 8. https://doi.org/10.1016/j.indic.2020.100075

9. Bosco, B. and Poggi, A., 2019. Middle Class, Government Effectiveness and Poverty in the EU: A Dynamic Multilevel Analysis. *The Review of Income and Wealth*, 66(1), pp. 94-125. https://doi.org/10.1111/roiw.12403

10. Caminada, K. and Goudswaard, K. P., 2009. Effectiveness of Poverty Reduction in the EU: A Descriptive Analysis. *Poverty & Public Policy,* 1(2), pp. 1-49. https://doi.org/10.2202/1944-2858.1023

11. Caminada, K. and Goudswaard, K. P., 2010. How well is social expenditure targeted to the poor? In: P. Saunders and R. Sainsbury, eds. *Social Security, Poverty and Social Exclusion in Rich and Poorer Countries.* Mortsel: Intersentia, pp. 97-112.

12. Cammeraat, E., 2020. The relationship between different social expenditure schemes and poverty, inequality and economic growth. *International Social Security Review*, 73(2). https://doi.org/10.1111/issr.12236

13. Canova, F. and Ciccarelli, M., 2013. Panel Vector Autoregressive Models: A Survey. *ECB Working Paper,* No. 1507. https://doi.org/10.2139/ssrn.2201610

14. Cyrek, M., 2009. Government social Spending in the EU countries: efficiency in poverty and income inequality reduction. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 14(3), pp. 405-424. https://doi.org/10.24136/eq.2019.019

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15. Da Silva, N. B. and Andrade, J. S., 2016. The relationship between social transfers and poverty reduction: A nonparametric approach for the EU-27. *GEMF Working Papers,* No. 2016-09.

16. Dafermos, Y. and Papatheodorou, C., 2010. The Impact of Economic Growth and Social Protection on Inequality and Poverty: Empirical Evidence from EU Countries. *1st International Conference in Political Economy*, September 10-12, 2010, Rethymno, Crete.

17. De Bonis, V. and Antonelli, M. A., 2018. Welfare State and Social Spending: Assessing the Effectiveness and the Efficiency of European Social Policies in 22 EU countries. *Public Finance Research Papers*, No. 32.

18. De Hoyos, R. and Sarafidis, V., 2006. Testing for Cross-sectional Dependence in Panel Data Models. *The Stata Journal,* 6(4), pp. 482-496. https://doi.org/10.1177/1536867X0600600403

19. Dees, S. and Guntner, J., 2014. Analysing and Forecasting Price Dynamics Across Euro Area Countries and Sectors: A Panel VAR Approach. *ECB Working Paper,* No. 1724. https://doi.org/10.2139/ssrn.2479303

20. Doina, J. and Viorica, C., 2017. The Statistical Analysis of the Relationship Between Poverty and Public Expenses in the European Union Countries. *"Ovidius" University Annals, Economic Sciences Series,* 17(2).

21. European Commission, 2019. *Joint Employment Report 2019.*

22. European Commission, 2022. *Employment, Social Affairs & Inclusion*.

23. Fana, M. [et al.], 2020. The COVID confinement measures and EU labour markets. *Publications Office of the European Union,* EUR 30190 EN 30190 IT.

24. Ferrera, M., 2007. *Democratization and Social Policy in Southern Europe. From expansion to "recalibration"* (updated version 2007). Geneva: United Nations Research Institute for Social Development (UNISRID).

25. Fonayet, F. V., Eraso, A. B. and Sánchez, J. D. A., 2020. Efficiency of Social Expenditure Levels in Reducing Poverty Risk in the EU-28. *Poverty and Public Policy*, 12(1), pp. 43-62. https://doi.org/10.1002/pop4.267

26. Frees, E. W., 2004. *Longitudinal and Panel Data: Analysis and Applications in the Social Sciences.* Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511790928

27. Harris, R. D. F. and Tzavalis, E., 1999. Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics*, 91, pp. 201-226. https://doi.org/10.1016/S0304-4076(98)00076-1

28. Hidalgo-Hidalgo, M. and Iturbe-Ormaetxe, I., 2018. Long-run effects of public expenditure on poverty. *The Journal of Economic Inequality,* 16, pp. 1-22. https://doi.org/10.1007/s10888-017-9360-z

29. Hsiao, C., 2003. *The Analysis of Panel Data.* Cambridge University Press. https://doi.org/10.1017/CBO9780511754203

30. Leventi, C., Sutherland, H. and Tasseva, I. V., 2019. Improving poverty reduction in Europe: What works best where? *Journal of European Social Policy,* 29(1), pp. 9-43. https://doi.org/10.1177/0958928718792130

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31. Levin, A., Lin, C.-F. and Chu, C.-S. J., 2002. Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), pp. 1-24. https://doi.org/10.1016/S0304-4076(01)00098-7

32. Mansi, E. [et al.], 2020. Poverty-A Challenge for Economic Development? Evidences from Western Balkan Countries and the European Union. *Sustainability*, 12 (18), 7554. https://doi.org/10.3390/su12187754

33. Molina-Morales, A., Amate-Fortes, I. and Guarnido-Rueda, A., 2013. Social Expenditure in the European Union: Does Inequality Matter? *Journal of Economic Issues*, 47(3), pp. 745-764. https://doi.org/10.2753/JEI0021-3624470308

34. Nelson, K., 2013. Social Assistance and EU Poverty Thresholds 1990-2008. Are European Welfare Systems Providing Just and Fair Protection Against Low Income? *European Sociological Review*, 29(2), pp. 386-401. https://doi.org/10.1093/esr/jcr080

35. Petrevski, G., Trenovski, B. and Tashevska, B., 2019. The effectiveness of fiscal and monetary policies in a small open economy – the case of Macedonia. *Post-Communist Economies*, 31(6), pp. 805-821. https://doi.org/10.1080/14631377.2019.1607437

36. Picketty, T., 2014. *Capital in the 21st Century.* The Belknap Press of Harvard University Press.

37. Sánchez, A. and Pérez-Corral, A. L., 2018. Government Social Expenditure and Income Inequalities in the European Union. *Hacienda Pública Española / Review of Public Economics,* 227(4), pp. 133-156. https://doi.org/10.7866/HPE-RPE.18.4.5

38. Stiglitz, J. E., 2012. *The Price of Inequality*. W. W. Norton and Company.

39. Van Lancker, W. and Van Mechelen, N., 2015. Universalism under siege? Exploring the association between targeting, child benefits and child poverty across 26 countries. *Social Science Research,* 50, pp. 50-65. https://doi.org/10.1016/j.ssresearch.2014.11.012

40. Vidangos, I., 2009. Fluctuations in individual labor income: a panel VAR analysis. *Finance and Economics Discussion Series,* No. 2009-09.

41. Wooldridge, J. M., 2002. *Econometric Analysis of Cross Section and Panel Data.* Cambridge: MIT Press.

42. World Bank, 2003. *World Development Report 2004: Making Services Work for Poor People.* Washington, D.C.: The International Bank for Reconstruction and Development: The World Bank.

Table **A1**

pVAR results for model 1

Panel vector autoregression
GMM Estimation
Initial weight matrix: Identity
GMM weight matrix: Robust
No. of obs. = 180
No. of panels = 30
Ave. no. of T = 6,000

Variables	Coef.	Std. err.	z	P>|z|	[95% Conf. interval]	
dlogSPE						
dlogSPE L1	-0.22	0.24	-0.93	0.35	-0.69	0.24
dlogSPE L2	-0.20	0.15	-1.29	0.19	-0.50	0.10
dPVR L1	0.00	0.00	1.97	**0.04**	0.00	0.01
dPVR L2	0.00	0.00	0.56	0.57	-0.00	0.00
dINQ L1	0.00	0.00	-1.21	0.22	-0.01	0.00
dINQ L2	0.00	0.00	-1.56	0.11	-0.01	0.00
dlogGDP L1	0.09	0.17	0.54	0.59	-0.24	0.42
dlogGDP L2	0.07	0.10	0.65	0.51	-0.14	0.28
dPVR						
dlogSPE L1	-3.49	8.51	-0.41	0.68	-20.19	13.20
dlogSPE L2	-0.18	4.66	-0.04	0.96	-9.33	8.96
dPVR L1	0.05	0.19	0.29	0.77	-0.32	0.44
dPVR L2	0.02	0.09	0.22	0.82	-0.16	0.20
dINQ L1	0.01	0.24	0.07	0.94	-0.46	0.50
dINQ L2	0.16	0.15	1.09	0.27	-0.13	0.47
dlogGDP L1	-5.88	4.02	-1.46	0.14	-13.77	2.01
dlogGDP L2	-7.87	3.01	-2.61	**0.00**	-13.78	-1.97
dINQ						
dlogSPE L1	-5.99	5.90	-1.01	0.31	-17.56	5.58
dlogSPE L2	-5.90	4.42	-1.33	0.18	-14.58	2.77
dPVR L1	0.19	0.14	1.38	0.16	-0.08	0.47
dPVR L2	0.12	0.07	1.70	0.08	-0.01	0.26
dINQ L1	-0.17	0.16	-1.07	0.28	-0.50	0.14
dINQ L2	-0.03	0.15	-0.24	0.81	-0.33	0.26
dlogGDP L1	-2.18	3.18	-0.68	0.49	-8.42	4.06
dlogGDP L2	8.04	2.57	3.12	**0.00**	2.99	13.09
dlogGDP						
dlogSPE L1	0.01	0.26	0.07	0.94	-0.50	0.54
dlogSPE L2	-0.06	0.14	-0.46	0.64	-0.35	0.21
dPVR L1	0.00	0.00	0.45	0.65	-0.00	0.00
dPVR L2	0.00	0.00	1.34	0.18	-0.00	0.00
dINQ L1	-0.00	0.00	-0.33	0.74	-0.01	0.00
dINQ L2	-0.00	0.00	-1.08	0.28	-0.01	0.00
dlogGDP L1	0.32	0.22	1.42	0.15	-0.12	0.76
dlogGDP L2	0.01	0.08	0.22	0.82	-0.14	0.18

Source: Authors' calculation using STATA 13.

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Table A2

pVAR Granger test results for model 1

Panel VAR-Granger causality Wald test

Ho: Excluded variable does not Granger-cause Equation variable

Ha: Excluded variable Granger-causes Equation variable

Equation \ Excluded	chi2	df	Prob > chi2
dlogSPE			
dPVR	4.03	2	0.13
dINQ	2.45	2	0.29
dlogGDP	0.60	2	0.73
All	6.98	6	0.32
dPVR			
dlogSPE	0.37	2	0.83
dINQ	1.66	2	0.43
dlogGDP	8.05	2	**0.01**
All	16.64	6	0.01
dINQ			
dlogSPE	1.77	2	0.41
dPVR	3.33	2	0.18
dlogGDP	10.60	2	**0.00**
All	13.73	6	0.03
dlogGDP			
dlogSPE	0.54	2	0.76
dPVR	1.79	2	0.40
dINQ	1.40	2	0.49
All	2.22	6	0.89

Source: Authors' calculation using STATA 13.

Table A3

pVAR results for model 2

GMM Estimation
Initial weight matrix: Identity
GMM weight matrix: Robust
No. of obs. = 180
No. of panels= 30
Ave. no. of T = 6,000

Variables	Coef.	Std. err.	z	P>|z|	[95% Conf. interval]	
dlogSPE						
dlogSPE L1	-0.29	0.28	-1.06	0.29	-0.85	0.25
dlogSPE L2	-0.23	0.18	-1.28	0.20	-0.58	0.12
dPVR L1	0.00	0.00	1.76	0.07	0.00	0.01
dPVR L2	0.00	0.00	0.21	0.83	0.00	0.00
dlogGDP L1	0.13	0.17	0.74	0.46	-0.21	0.47
dlogGDP L2	0.12	0.10	1.14	0.25	-0.08	0.34
dPVR						
dlogSPE L1	-2.59	9.71	-0.27	0.78	-21.62	6.43
dlogSPE L2	0.17	4.86	0.04	0.97	-9.35	9.69
dPVR L1	0.05	0.18	0.30	0.76	-.313	0.42

Variables	Coef.	Std. err.	z	P>|z|	[95% Conf. interval]	
dPVR						
dPVR L2	0.03	0.08	0.46	0.64	-0.12	0.19
dlogGDP L1	-6.37	3.76	-1.69	0.09	-13.75	0.99
dlogGDP L2	-8.54	2.84	-3.00	**0.00**	-14.13	-2.96
dlogGDP						
dlogSPE L1	0.00	0.28	-0.02	0.98	-0.57	0.55
dlogSPE L2	-0.07	0.15	-0.51	0.60	-0.37	0.21
dPVR L1	0.00	0.00	0.45	0.65	0.00	0.00
dPVR L2	0.00	0.00	1.22	0.22	0.00	0.00
dlogGDP L1	0.33	0.22	1.51	0.13	-0.09	0.77
dlogGDP L2	0.03	0.08	0.46	0.64	-0.12	0.20

Source: Authors' calculation using STATA 13.

TABLE A4

pVAR Granger test results for model 2

Panel VAR-Granger causality Wald test
Ho: Excluded variable does not Granger-cause Equation variable
Ha: Excluded variable Granger-causes Equation variable

Equation \ Excluded	chi2	df	Prob > chi2
dlogSPE			
dPVR	3.55	2	0.16
dlogGDP	1.69	2	0.42
All	5.83	6	0.21
dPVR			
dlogSPE	0.25	2	0.88
dlogGDP	12.35	2	**0.00**
All	13.99	6	0.00
dlogGDP			
dlogSPE	0.53	2	0.76
dPVR	1.49	2	0.47
All	1.79	6	0.77

Source: Authors' calculation using STATA 13.

TABLE A5

pVAR results for model 3

GMM Estimation
Initial weight matrix: Identity
GMM weight matrix: Robust
No. of obs. = 180
No. of panels= 30
Ave. no. of T = 6,000

Variables	Coef.	Std. err.	z	P>|z|	[95% Conf. interval]	
dlogSPE						
dlogSPE L1	-0.19	0.22	-0.88	0.38	-0.63	0.24
dlogSPE L2	-0.18	0.15	-1.19	0.23	-0.47	0.11
dINQ L1	-0.00	0.00	-0.75	0.45	-0.01	0.00

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Variables	Coef.	Std. err.	z	P>|z|	[95% Conf. interval]	
dlogSPE						
dINQ L2	-0.00	0.00	-1.37	0.17	-0.01	0.00
dlogGDP L1	0.10	0.16	0.61	0.53	-0.22	0.42
dlogGDP L2	0.04	0.10	0.44	0.66	-0.15	0.24
dINQ						
dlogSPE L1	-4.98	5.72	-0.87	0.38	-16.21	6.24
dlogSPE L2	-5.37	4.09	-1.31	0.18	-13.38	2.64
dINQ L1	-0.09	0.14	-0.67	0.50	-0.37	0.18
dINQ L2	0.02	0.12	0.20	0.84	-0.22	0.27
dlogGDP L1	-1.86	3.15	-0.59	0.55	-8.04	4.32
dlogGDP L2	7.25	2.68	2.70	**0.00**	1.99	12.51
dlogGDP						
dlogSPE L1	0.03	0.26	0.12	0.90	-0.49	0.55
dlogSPE L2	-0.06	0.14	-0.44	0.66	-0.35	0.22
dINQ L1	-0.00	0.00	-0.20	0.84	0.00	0.00
dINQ L2	-0.00	0.00	-0.99	0.32	0.00	0.00
dlogGDP L1	0.32	0.22	1.44	0.15	-0.11	0.77
dlogGDP L2	0.01	0.08	0.13	0.89	-0.15	0.17

Source: Authors' calculation using STATA 13.

Table A6

pVAR Granger test results for model 3

Panel VAR-Granger causality Wald test

Ho: Excluded variable does not Granger-cause Equation variable
Ha: Excluded variable Granger-causes Equation variable

Equation \ Excluded	chi2	df	Prob > chi2
dlogSPE			
dINQ	1.98	2	0.37
dlogGDP	0.48	2	0.78
All	2.51	6	0.64
dINQ			
dlogSPE	1.75	2	0.41
dlogGDP	8.18	2	**0.01**
All	9.31	6	0.05
dlogGDP			
dlogSPE	0.56	2	0.75
dINQ	1.21	2	0.54
All	1.62	6	0.80

Source: Authors' calculation using STATA 13.

Informality, Labour Mobility and Precariousness: Supplementing the State for the Invisible and the Vulnerable

ABEL POLESE (Ed.)
Cham: Springer, 2022, pp. 391

Book review by PREDRAG BEJAKOVIĆ[*]
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There is a relatively abundant number of scientific sources and studies regarding the informal economy and international labour mobility. Until now, there was almost no research simultaneously considering both phenomena, their development and characteristics. It is quite hard to explain this lack of research, but some of the reasons could be the complexity of the topics, insufficient and unreliable data, impossibility of examining something that has been mostly hidden and/or determined by many intertwined links and mutual influences. Therefore, one should really praise the new publication *Informality, Labour Mobility and Precariousness: Supplementing the State for the Invisible and the Vulnerable*, edited by Abel Polese, in which many authors shed light from various standpoints on the importance and consequences of the unofficial economy and migration in many countries around the world.

In the introductory note, the editor explains the main goals and intentions of the book and explains that the authors prepared case studies contributing to a better understanding of the ways informality manifests itself. These analyses of the relationship between informality and mobilities are intended to encompass the complexity of cultural practices in everyday life. The authors in the book clearly show that many people alongside the usual pull factors for emigration such as higher wages, better working conditions and broader possibilities for professional promotion, also emigrate due to push factors – inadequate governance, widespread corruption, low quality of public goods in their native countries.

The book consists of three parts and four contributions, in the first part assessing a phase of emigration in the new society and economy. All research presented show new ways in which people avoid the burden of state regulations and institutions. Fradejas-García, Molina and Lubbers analyse the life and work of Romanian migrants in Spain and their adjustment to the new cultural context. During such a process, emigrants develop a transnational social field, networks of personal relationships that extend across national borders and enable the successful exchange of ideas, practices, and resources as well efficient and adequate incorporation into the new societal and cultural context.

As Poland has emerged as an attractive immigration destination, Bielenin-Lenczowska and Patzer present in this interesting text, a result from their survey on the character of a suburban neighbourhood in the outskirts of Warsaw. Migrants mostly settle in the cheaper parts of the city, which they domesticate and reorganize in various ways, leaving hints of their presence and slowly becoming visible in the public space. The authors were connected with many migrants and collected their individual life stories. Very often, many immigrants are exposed to abuse, discrimination and exploitation by employers and have limited possibilities for integration into the official labour market. However, messages disseminated through migrant networks help those without employment and connections to earn some income and survive in unwelcoming circumstances.

Banović, Škokić and Alpeza examine the informal networks among immigrant entrepreneurs in Croatia. From previous literature, it is well known that Hispanic, Chinese, and Korean entrepreneurs who immigrate to North America very often use already existing ethnic communities. However, similar surveys concerning entrepreneurs from South-Eastern Europe countries have been rare. Therefore, the aim of their study is to examine networking activities among ethnic entrepreneurs in Croatia, an economy with low rates of immigrants and a increasing waves of emigration. The authors show that already developed in-group cooperation and support among immigrant entrepreneurs are very important measures for resolving problems of the Croatian entrepreneurial environment, primarily linked to the unfavourable business climate and widespread corruption. In Croatia, to have *veza* (informal connection) is a very important factor for access to entrepreneurship, to start a small firm with only limited resources and to mitigate the drawbacks of an underdeveloped and unsupportive institutional framework, weak enforcement of property rights, high level of corruption, and an inadequate and hostile business environment.

After presenting a short history of philosophical attitudes towards the role of the state in the regulation of the international migration and labour mobility, Daniel Kashnitsky reminds us that state boundaries delimit people into those who are expelled instantaneously and those who are included, but mostly as illegal migrants. His contribution analyses the position of migrants living with HIV in Russia, who are almost always exposed to social exclusion and very often are deported to their native state, in a process characterised by unequal treatment and arbitrariness. Using the data obtained from performed semi-structured interviews with undocumented labour migrants and recorded cases from one NGO that aids and accompanies migrants with HIV, the author concludes that illegal migrants in Russia are kept in legal uncertainty, so they never know exactly how many documents they need to collect to be eligible for medical care, to be able to work legally and freely move in the city.

The second part of the book titled *Staying*, begins with the contribution by Johanna Paquin on the tax morale of small businesses in Armenia and Georgia. Such analysis is particularly interesting because two neighbouring countries significantly differ in their economic policies: while Georgia is a positive example of a top reformer, very active and successful in eradicating corruption, reforming the business environment, improving government effectiveness and developing democratic institutions, the situation in Armenia is quite the opposite. Regarding the share of informal economy in GDP, the situation is paradoxical, as the mentioned share is higher in Georgia, which is probably *trapped in informality*. It is hard to provide a simple explanation of this unexpected empirical situation, but it is probably caused by bigger institutional incongruence and weaker enforcement power of formal institutions in the implementation of laws and regulations in Georgia than in Armenia.

Aimar Ventsel writes on the informal moral economy of the Russian Far East, concretely the Yakutsk region, which is characterised by ab obsolete economic structure, a high share of big companies in regional GDP, and the importance of the public sector as the main source of income. There is a complex link between the state and entrepreneurship, intertwined via various forms of corruption, networking and social links. In such circumstances, entrepreneurs lose any contact with the state and try to avoid social or economic ties with state structures. One consequence of such an attitude is the conscious decision to be active mostly in the shadows, evading tax obligations. Due to the harsh climate and unfavourable living conditions, they are very devoted to supporting their relatives, friends, neighbours and kin people through strong reciprocal ties, fully aware of the importance of peer networks.

Aneta Strzemzalska analyses cultural policy and local actors' agenda in Azerbaijan through a musical genre called *meykhana*. The author studies how the interplay between formal and informal approaches can be used in research on the nation-building process. In the previous time, there were actual efforts to subordinate *meykhana* performers to the state's interests, which were primarily meant to promote this music form as one of the main categories of folk art. In the hope of improving their social status, performers, named *meykhanachis,* using various methods successfully institutionalized and standardized their creative activities. This motivated the authorities to accept *meykhana* as a type of "invented ethnic tradition" and use it as the country's representative national symbol.

The last contribution in this part of the book prepared by Polese, Urinboyev, Svenson, Adams and Kerikmäe, is based extensive ethnographic field research, examining the illegal, immoral, and illegitimate forms of governance in Uzbekistan. According to the World Bank definition, governance is the mixture of traditions and institutions by which authority in a country is exercised. The Uzbek state is, without doubt, powerful in using coercion and preventing political instability, but it is quite weak in terms of enforcing the "rule of law" and efficient delivery of public services.

The third part of the book titled *Competing* begins with a contribution by Anil Duman dedicated to the link between various forms of informality and policy preferences in the Middle East and Northern Africa. Such activities are quite widespread and deeply rooted in the economies and societies of the observed areas and exhibit no signs of reduction. Formal workers show slightly higher trust in the government than informal, while almost 47% of the informal workers and 38% of the formal workers do not trust the government at all. The author deems that people in the upper layer of the informal sector, who get expelled from the formal sector, might regard formal and informal behaviours as complementary and tolerate their highly gratifying informal activities. Paradoxically, their trust in the government is expected to be positive despite their informal activities. On the other side, persons who are involuntarily in precarious and badly paid jobs in the

informal sector might have more negative opinions about the government, especially concerning its incapacity to generate more official jobs and achieve a greater redistribution of wealth in the society.

Lebanese political elites developed a system that protects and ensures the persistence of monopolies, disincentivizes the creation of an adequate authority responsible for the protection of competition while diminishing the capacity and accountability of responsible institutions. An empirical case study by Joseph Helou presents the history of the Lebanese state's public finance mismanagement that led to the sovereign debt crisis of 2020 and drove the country into an economic cliff. Such conditions forced many people to take part in economic activity in the informal sector and required citizens to accept a new tacit social contract with the state Druică and Ianole-Călin analyse the current situation in Romania, which has been characterised by a large number of healthcare staff leaving the country. Although the doctors' remunerations recently significantly improved, for nurses and other healthcare support professionals it remained the same. The authors consider factors that offer reasons to leave, like better opportunities for professional development and a more agreeable working environment. On the other hand, they analyse the reasons to stay, measured through several dimensions of satisfaction at the workplace like working conditions, improved professional opportunities, fair evaluation and possibilities for further education and training. They conclude that overall satisfaction is not associated with an inclination to seek for fairer and more responsible working environments, and that temptation for mobility proves not to be related to any of the dimensions accounting for professionals' satisfaction at their current workplace.

Ismailbekova and Baialieva direct their attention toward the relationship between smartphone applications and new forms of informality by Kyrgyz people in the country and abroad. The authors, through many interviews and focus groups, collected opinions of different generations of citizens and how their age and identity influence their access to information services and opportunities. New mobile technology possibilities have enabled migrants to stay in touch with their families and friends and permitted them political, social and economic inclusion. They can much easier help each other in case of need, and share information about reliable networks and needed services, for example, information about informal support for adequate healthcare provision and enrolment in kindergartens and schools. Such exchange of information on informal support is much more accepted by the younger generations.

Petru Negură examines the employment opportunities for homeless people in Moldova in the context of the post-Soviet transformation. The majority of homeless persons are excluded from the formal labour market and forced to engage in various forms of informal economic activities in precarious jobs which help them to survive, but also tend to perpetuate their social and economic vulnerability. Almost half of the interviewees intend to obtain the necessary identity documents

for employment, while fewer than one-fifth plan to get a job. They do not worry about labour activity in informal jobs as long as they receive an income. However, such jobs enable limited access to medical services, inability to receive unemployment benefits in the case of joblessness and pension rights once the person becomes old. Furthermore, these jobs are also characterised by actual remuneration that is significantly lower than the amounts agreed or even by the lack of any payment. The government has begun a programme for the formalization of unregistered work, which should positively affect workers' rights and establish better conditions for employment of informal workers, including homeless persons.

In conclusion, we can say that the publication *Informality, Labour Mobility and Precariousness* is an interesting and valuable book that covers the neglected intersection of different forms of informality and migration. The authors consider the analysed themes from various standpoints, while the editor very successfully selected topics that should be of interest to experts in the field as well as to the broader community of readers.