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WEALTH EFFECTS IN THE CEE EMERGING ECONOMIES: A LONG-RUN PANEL APPROACH

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Abstract: This paper explores the relationship between actual individual consumption, housing wealth, and stock wealth in a panel of emerging European Union economies. Using the pooled mean group estimator (PMG) and a crisis dummy variable, the analysis captures the effects of the 2008–2010 financial crisis. Results indicate that both housing and stock wealth positively influence consumption, with housing wealth having a slightly stronger impact. Consumption is also sensitive to long-term changes in the income from wages and salaries. Particularly during the crisis, when real estate market downturns significantly affected households in Central and Eastern Europe (CEE), the effect of changes in asset prices raised in magnitude. The findings offer important policy implications for managing asset price effects on household consumption, particularly in emerging markets.

JEL classification: D12, E21, E52

Keywords: actual individual consumption, housing wealth, stock wealth, panel cointegration analysis

1. Introduction

The link between consumption and wealth has been a key area of study for decades. This relationship gained prominence through J. M. Keynes's General Theory of Employment, Interest and Money in 1936. Subsequent theories, such as Friedman's Permanent Income Theory (1957) and the Life Cycle Theory proposed by Modigliani and Brumberg in 1954, and later by Ando and Modigliani in 1963, further developed this area. In summary, these theories suggest that changes in wealth, if they permanently alter household resources, should lead to similar changes in consumption, although of a lesser magnitude, compared to changes in income.

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The wealth effect is one of the several ways in which a financial crisis may influence the real economy. It refers to changes in consumption that arise when households perceive their wealth to have increased or decreased due to fluctuations in asset prices. When households feel wealthier, they tend to spend more, thus affecting aggregate demand and GDP.

This wealth effect is often viewed as a psychological response: rising asset prices encourage higher spending. Studies by Poterba (2000) and Cheng and Fung (2008) indicate that capital market fluctuations can directly influence consumption by affecting individuals' confidence and expectations about future economic conditions. Furthermore, uncertainty in capital markets can significantly impact consumption trends. However, this study focuses solely on the effects of changes in wealth without considering expectations about future wealth.

It is important to recognise that not all types of wealth impact consumption similarly. Economic theory suggests that more liquid assets lead to stronger consumption responses when their value increases, as households feel more confident in raising their spending levels (Poterba, 2000; Jappelli & Pistaferri, 2014).

This paper provides new empirical evidence on the relationship between household consumption, employee compensation, and wealth while also considering the impact of the global financial crisis. The analysis focuses on emerging countries in Central and Eastern Europe (CEE), examining wealth effects in a disaggregated manner (financial and non-financial wealth). The results challenge much of the existing literature. This study is particularly relevant for policy, as asset price booms and busts in CEE countries have been more pronounced over the past two decades than in developed economies (Ahec-Sonje, 2012; Posedel and Vizek, 2009).

The contributions of this paper lie in (i) studying the specific sample of CEE emerging economies over a more extensive time span and (ii) incorporating a crisis dummy variable for the period 2008-2010 to assess the effects of the 2008 Lehman Brothers collapse. This collapse significantly impacted households' consumption, income, and wealth, raising inquiries about households' financial resilience and implications for monetary policy. The crisis dummy period also encompasses the year 2020 to consider the effects of the COVID-19 pandemic, which ultimately resulted in a stock market crash (Baker et al., 2020).

The paper is organized as follows: Section 2 provides a review of the literature on the consumption-wealth relationship in emerging economies. Sections 3 and 4 outline the data and methodology used. Section 5 presents the main findings, and Section 6 concludes with policy implications and suggestions for further research.

2. Literature review

Several empirical studies have explored the relationship between wealth and consumption using various approaches and datasets. A significant portion of these studies focus on macroeconomic data and measure wealth effects using time series methods, especially co-integration techniques (Lettau and Ludvigson, 2001, 2004; Catte et al., 2004). For example, Lettau and Ludvigson (2001, 2004) showed that co-integration can yield consistent estimates of parameters linking consumption, labour income, and wealth in a linear framework.

Most empirical research focuses on the effects of total or financial wealth on US consumer spending, largely because of the available detailed databases and the predominant stock wealth in American households. Funke (2004) was the first study to examine emerging economies (including 16 countries in Asia, Latin America, and Africa). The study found a small but statistically significant wealth effect, though it focused only on stock market wealth and excluded European countries. Compared with this study, more recent works (i.e. Apergis et al., 2018; Singh, 2022) make use of at least two distinctive types of wealth, namely stock wealth and housing wealth, distinction that will be clearly followed in the empirical exercise of this paper.

A recurring finding in the literature is the positive long-term relationship between wealth and consumption, though the strength and nature of this relationship vary depending on asset type, measures utilised as proxies for wealth and methods of estimation (Catte et al., 2004, Jawadi and Sousa, 2014; Apergis et al., 2018;). Ciarlone (2011), for instance, showed that both financial and housing wealth positively affect household consumption in emerging economies in Asia and Central and Eastern Europe (CEE), with housing wealth having a larger elasticity, employing a cointegration-based method, however, over a period that ended in 2009. Similarly, Peltonen et al. (2012) found significant wealth effects, with financial wealth playing a more dominant role in countries with higher market capitalization. In the latter case, it is imperative to mention that the sample was comprised of 14 non-European emerging economies, which faced a different financial market development compared to their European counterparts, which benefited more through integration with Western Europe (Nardo et al, 2022; Bakaert et al., 2023).

Vizek (2011) observed similar long-term consumption responses to stock price changes in Bulgaria, Croatia, and the Czech Republic, though housing price shocks led to divergent consumption reactions across these countries. Rosenberg (2015), focusing on Estonia, which saw dramatic housing market changes during the global financial crisis, concluded that real estate price shocks had a positive and lasting impact on private consumption.

More recent work by Ceh-Casni (2018) on European countries found that housing wealth has a stronger effect on consumption than financial wealth, especially before the global financial crisis. Nicolau (2020) reported similar findings for a panel of CEE countries, noting that the housing wealth effect is more pronounced.

However, despite the general trend of housing wealth having a stronger effect in bank-based economies, the subject has yet to be explored, accounting for other economic factors, besides their economic status (Ahec-Sonje and Ceh-Casni, 2014; Singh, 2022). This may stem from difficulties in finding accurate proxies for different types of wealth, making comparisons between emerging and developed economies challenging. For instance, Rodil and Menezes (2016) found that financial wealth had a more significant effect than housing wealth in 10 Eurozone countries, with financial wealth having a positive and significant effect during the global financial crisis, while housing wealth had a negative effect during the same period. This motivates the inclusion of a crisis dummy in our model as a robustness check.

It is important to note that changes in residential property prices and consumption seem to have become more closely linked in the last decade, particularly following the 2008 financial crisis (Ciarlone, 2011). More recent evidence suggests that this linkage has strengthened further, especially in the post-crisis period, with housing wealth playing a more substantial role in shaping household

spending decisions (Angrisani et al., 2018; Cloyne et al., 2018). For many emerging countries, residential property represents households' largest asset (Rosenberg, 2015), making the wealth effect of house price changes more substantial than other asset price changes.

Recent studies indicate that the elasticity of consumption to house price fluctuations has increased, with consumers now spending more out of housing wealth than in previous decades (Berger et al., 2017). Although Buiter (2008) argues that house price changes may influence consumption through the credit channel by easing collateral constraints, Muellbauer (2008) cautions that these effects may simply reflect wealth redistribution and may not significantly alter aggregate wealth. For instance, Christelis et al. (2021) suggest that the consumption response to house price changes is more pronounced in economies with higher mortgage market penetration and greater financial inclusion, reinforcing the role of credit conditions in shaping the wealth effect.

3. Data

To model the relationship between consumption, income, housing wealth, and stock wealth, we examine a panel of 11 emerging economies from Central and Eastern Europe (CEE), members of the European Union: Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The sample was selected based on similarities among these countries, such as the high proportion of fully owned homes, a key factor in our analysis (Kaas et al., 2019). We use quarterly data covering the period from 1998Q1 to 2020Q4, yielding up to 84 observations per country. Details on the available data, variables, and descriptive statistics in logarithmic form are presented in Table 1 below, as well as in Tables A.1. and A.2. in the Appendix.

Table 1: Descriptive statistics for variables in logarithmic form

Variable	Observations	Mean	Std. Dev.	Min.	Max.
Actual Consumption	924	4.516	0.235	3.712	5.024
Wages and salaries	924	4.499	0.302	3.567	5.228
House price index	605	4.699	0.163	4.188	5.231
Stock price index	863	4.615	0.461	3.079	6.149

Source: Author's estimations in STATA 17.
Note: The values displayed are descriptive statistics for the series in initial form.

As a dependent variable, we used actual individual consumption without distinguishing between durable and non-durable consumption. To measure the immediate income effect more accurately, we use income from wages and salaries, which reflect more accurately labour market conditions and individual earning capacity (Blundell et al, 2008) since disposable income also encompasses non-labour income (see, for instance, Vizek, 2011; De Bondt et al., 2019). Moreover, the data on disposable income were unavailable for several countries in the sample and at the needed frequency. The literature is still relatively limited in terms of using income at a more disaggregated level, one of the causes being the data availability.

For housing and stock wealth, consistent measures are lacking for emerging economies, as it is the case for data series on net value of housing and other types of assets owner by households, which are not commonly collected. This inconvenience makes houses prices and stock prices indices the most suitable proxies for housing and stock wealth, respectively. We define stock wealth more intuitively since financial wealth comprises a larger variety of financial assets apart from stocks. While asset price indices do not capture wealth-level changes, potentially leading to inconsistent results over time (Rodil and Menezes, 2016), they are commonly used due to data availability and frequency. Asset prices remain a key element in assessing wealth evolution. To ensure comparability with previous studies (Ciarlone, 2011; Ceh-Casni, 2017, 2018; Nicolau, 2020), we use house price indices instead of house values, which helps avoid measurement errors across countries.

Although some studies include the interest rate as an exogenous variable and find a negative and significant effect on consumption (Rodil and Menezes, 2016; Nicolau, 2020), we were not able to include it due to inconsistent data across the countries in our panel. However, we acknowledge that interest rates could affect consumption by making credit more expensive or by increasing financial returns for households (Rodil and Menezes, 2016).

We include a dummy variable for the global financial crisis, with a value of 1 for the period 2008Q1–2010Q4 and 0 for the pre and post-crisis periods (namely, 2000Q1–2007Q4 and 2011Q1–2019Q4). Additionally, we extend the dummy to include the COVID-19 stock market crash (2020Q1–2020Q4) and test the impact of the COVID-19 crisis on consumption. This variable captures the impact of the crisis on household consumption, reflecting the changes in economic, social, and political contexts, increased uncertainty, and credit restrictions. Additionally, this dummy acts as a time-fixed effect.

All series, except house price indices (deflated at the source), are deflated using the Harmonized Index of Consumer Prices (HICP, base year 2015=100) to express them in real terms. The X-12-ARIMA method is used for seasonally adjusting the data, except for the series already adjusted at the source, and are further transformed into logarithmic form. All series are expressed per capita. Data on household consumption, employee compensation, house prices, and HICP were sourced from Eurostat, while stock market indices were obtained from Thomson Reuters Eikon and investing.com.

4. Methodology

Recent studies on consumption and wealth effects (Rodil and Menezes, 2016; Singh, 2022) have shown growing interest in dynamic panel estimation models, particularly when both the time dimension (T) and the cross-sectional dimension (N) are relatively large. This type of panel data is well-suited for cross-sectional analyses, especially when seeking to estimate long-term effects and the speed of adjustment of consumption to long-term equilibrium.

In this study, we use the pooled mean group (PMG) estimator, introduced by Pesaran et al. (1999), which offers a flexible approach to panel data analysis. The PMG estimator is suited for pooling long-term parameters across countries while allowing short-term dynamics (such as adjustment speed) to vary at the country level. This flexibility makes it ideal for studying the heterogeneity in short-term

consumption responses across economies. The PMG estimator is built on the Auto-Regressive Distributed Lag (ARDL) model, which accounts for both serial-correlated residuals and endogeneity in the regressors by selecting appropriate lags for both dependent and independent variables. Another advantage of this method is that it allows to work with a combination of variables that can be I(1) and I(0), respectively.

To define the link between consumption, income and wealth, we specify a long-term consumption function that is identical for all countries and which, for $\boldsymbol{i} = \overline{\boldsymbol{1,N}}$ and $\boldsymbol{t} = \overline{\boldsymbol{1,T}}$, can be written as follows:

$$\boldsymbol{AIC_{i,t}} = \boldsymbol{\alpha_i} + \boldsymbol{\beta_{i,1}I_{i,t}} + \boldsymbol{\beta_{i,2}HW_{i,t}} + \boldsymbol{\beta_{i,3}SW_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \quad (1)$$

where *AIC* is the actual individual consumption, *I* represents the real per capita income from wages and salaries, *HW* refers to the real per capita house prices, *FW* represents the real per capita stock prices, and $\boldsymbol{\varepsilon_{i,t}}$ represents the term error, which incorporates the effects of unexpected shocks on consumption. The notations i and t represent the country and the unit of time, respectively.

The next step is to give the previously introduced representation a dynamic structure. This approach is advised for various reasons, such as persistent habits, adjustment costs, or liquidity constraints, which support the immediate adjustment of consumption to a change in its main determinants.

The literature usually proposes estimating ARDL-type models to capture changes in consumption caused by income and wealth by introducing lags in the model. Equation (1) can be generated accordingly by indicating the deterministic variables, an auto-regressive term for the outcome variable and distributed lags for the explanatory variables. The optimal number of lags for each country in the sample is selected based on the Schwarz Information Criterion (BIC). We identify the ARDL (1, 1, 0, 0) specification for the entire country sample, and we will proceed to estimate the PMG estimator based on it, considering the first lags for consumption and income, while housing and financial wealth will be considered at their current values:

$$\boldsymbol{AIC_{i,t}} = \boldsymbol{\alpha_i} + \boldsymbol{\gamma_i AIC_{i,t-1}} + \boldsymbol{\beta_{i,10}I_{i,t}} + \boldsymbol{\beta_{i,11}I_{i,t-1}} + \boldsymbol{\beta_{i,20}HW_{i,t}} + \boldsymbol{\beta_{i,30}SW_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \quad (2)$$

By re-parameterising equation (2), the model becomes:

$$\Delta\boldsymbol{AIC_{i,t}} = \boldsymbol{\alpha_i} + \boldsymbol{\varphi}\left(\boldsymbol{AIC_{i,t-1}} - \boldsymbol{\alpha_{i,1}I_{i,t}} - \boldsymbol{\alpha_{i,2}HW_{i,t}} - \boldsymbol{\alpha_{i,3}SW_{i,t}}\right) + \boldsymbol{\beta_{i,10}}\Delta\boldsymbol{I_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \quad (3)$$

For the PMG estimator, the null hypothesis, tested using the Hausman test, states that the long-run relationship between the dependent and independent variables is identical across all cross-sectional units. In case the hypothesis is rejected after computing the Hausman test, it is suggested that the mean group (MG) estimator is more appropriate than the PMG estimator. The MG estimator, introduced by Pesaran and Shin (1997), provides consistent estimates of long-term coefficients; however, it may prove inefficient should the homogeneity assumption hold. In contrast, the PMG estimator assumes homogeneity in the long-term coefficients while allowing for heterogeneity in short-term adjustments. The Hausman test evaluates the difference between the PMG and MG estimators to determine whether the homogeneity assumption is valid. If the test fails to reject homogeneity, the PMG estimator is preferred due to its efficiency.

As noted by Pesaran et al. (1999), while pooled estimators are often used without testing for constraints, cross-country analyses frequently reject equality of error variances and long- and short-term coefficients at conventional significance levels. Hence, applying the Hausman test ensures the most appropriate model specification for our analysis.

5. Results and Discussion

To ensure a consistent estimation of the long-term relationship between consumption, the income from wages and salaries, and wealth, the variables must either be stationary or co-integrated in the long run.

We begin by applying several first-generation unit root tests: Levin, Lin and Chu (LLC) test by Levin et al. (2002), Im-Pesaran-Shin (IPS) test by Im et al. (2003), Hadri (2000), Breitung (2000), and the Cross-sectionally augmented Im-Pesaran-Shin (CIPS) test by Pesaran (2007), which accounts for heterogeneity in the panel.

Table 2: First- and second-generation panel unit-root test results

Test	Actual individual consumption	Wages and salaries	House price index	Stock price index
LLC	0.559	4.108	5.012	-2.658
	(0.712)	(1.000)	(1.000)	(0.004)
IPS	0.335	0.921	3.705	-0.967
	(0.631)	(0.821)	(0.999)	(0.166)
ADF-Fisher	23.081	12.918	17.491	35.621**
	(0.397)	(0.935)	(0.735)	(0.033)
ADF-Choi Z-stat	-0.817	2.017	1.158	-1.262
	(0.207)	(0.978)	(0.876)	(0.103)
Hadri Z-stat	82.407***	87.779***	62.016***	59.521***
	(0.000)	(0.000)	(0.000)	(0.000)
Breitung	0.118	3.709	0.659	0.148
	(0.547)	(0.999)	(0.745)	(0.558)
CIPS	-1.512	-1.646	-2.599	-2.205

Source: Author's estimations in STATA 17.
Note: The values displayed are the results of t-tests, and the values in parentheses represent the corresponding p-values. The tests were applied to the series in logarithmic form. H_0 is rejected for a p-value < 0.05.

The results, shown in Table 2, generally support the presence of unit roots in most variables. The stock price results may initially seem unclear but are aligned with the efficient market hypothesis, which treats stock prices as a random walk. The Hadri test further confirms non-stationarity in stock prices.

For cointegration testing, we utilize the Westerlund (2007) tests, which are suitable for shorter time periods. Table 3 indicates that the tests reject the null hypothesis of no cointegration, providing evidence of a long-term relationship between the variables.

Table 3: Westerlund (2007) panel cointegration test results

Statistic	t-stat
G_τ	-2.93***
	(0.000)
G_α	-11.692**
	(0.020)
P_τ	-8.721***
	(0.000)
G_α	-9.622***
	(0.003)

Source: Authors' estimations in STATA 17.
Note: The values displayed are the results of t-tests. Standard errors are reported in brackets. ***, **, * denote statistical significance at the 1%, 5%, and 10% respectively. The tests were applied to the series in logarithmic form. H0 is rejected for a p-value < 0.05.

Table 4 summarizes the regression results. The negative adjustment coefficients indicate a proper adjustment mechanism, ensuring a long-run balance between the variables. Both housing and stock wealth positively and significantly impact consumption, with the effect of housing wealth being marginally larger than stock wealth. As expected, the income from wages and salaries has the strongest effect on consumption due to its liquidity.

Table 4: The results of the ARDL (1, 1, 0, 0) specification

Variables	**PMG**	**MG**
Adjustment coefficient φ	-0.470***	- 0.626***
	(0.000)	(0.000)
Long-run coefficients		
Wages and salaries (lnI)	0.556***	0.617***
	(0.000)	(0.000)
House price index (lnHW)	0.066***	0.034
	(0.001)	(0.641)
Stock price index (lnSW)	0.062***	0.043
	(0.000)	(0.122)
Hausman test	3.80	
	(0.284)	
Number of countries	11	11
Number of observations	594	594
Log Likelihood	1406.495	
Short-run coefficients		
ΔlnI	0.656***	0.716***
	(0.000)	(0.000)
ΔlnHW	0.005	0.027
	(0.927)	(0.816)
ΔlnFW	-0.019	-0.021
	(0.130)	(0.175)
Constant	0.681***	0.847***
	(0.000)	(0.000)

Source: Author's estimations in STATA 17.
Note: Standard errors presented in parentheses.

The PMG results show an elasticity of consumption to housing wealth of 0.066 and to stock wealth of 0.062. While the difference is small, these results confirm most findings for emerging economies, which typically show a larger effect of housing wealth. The result may be explained by the borrowing capacity derived from housing assets. Although housing wealth is less liquid than stocks, it is typically used as collateral when accessing credit, which is then used by households to finance their consumption. This practice is widespread, especially in the CEE emerging economies, where housing is the main asset in households' portfolios.

The result of the Hausman test suggests that the homogeneity of long-term parameters holds, supporting the preference for the PMG estimator over the MG estimator. The main takeaway is that both housing and stock wealth positively affect long-term consumption, with stock wealth having a slightly lower impact. These results are robust and consistent with prior literature, where housing wealth elasticities are typically above financial wealth elasticities (Casni, 2018; Singh, 2022).

Table 5: Robustness checks - the results of the ARDL (1, 1, 0, 0) specification with crisis dummy

Variables	**Model 1**	**Model 2**
Adjustment coefficient φ	-0.470***	- 0.493***
	(0.000)	(0.000)
Long-run coefficients		
Wages and salaries (lnI)	0.556***	0.575***
	(0.000)	(0.000)
House price index (lnHW)	0.066***	0.0735***
	(0.001)	(0.000)
Stock price index (lnFW)	0.062***	0.0732***
	(0.000)	(0.000)
Crisis Dummy	-	-0.011**
		(0.028)
Hausman test	3.80	6.44
	(0.284)	(0.168)
Number of countries	11	11
Number of observations	594	594
Log Likelihood	1406.495	1714.46
Short-run coefficients		
ΔlnI	0.656***	0.390***
	(0.000)	(0.000)
ΔlnHW	0.005	-0.031
	(0.927)	(0.637)
ΔlnFW	-0.019	-0.020
	(0.130)	(0.119)
Crisis Dummy	-	-0.001
		(0.857)
Constant	0.681***	0.683***
	(0.000)	(0.000)

Source: Author's estimations in STATA 17.
Note: Standard errors are reported in brackets. ***, **, * denote statistical significance at the 1%, 5%, and 10% respectively.

Short-run coefficients for housing and stock wealth are not statistically significant, possibly due to delayed wealth effects stemming from sticky expectations or habit formation (Slacalek, 2009; Carroll, 2011).

Our results are in line with previous studies conducted by Ciarlone (2011), Ceh-Casni (2018), and Nicolau (2020), which also found a slightly stronger housing wealth effect. These findings confirm that actual individual consumption data could be a reliable alternative measure to private household consumption expenditures.

In addition, the model includes a crisis dummy variable (see Model 2 in Table 5) to account for the impact of the global financial crisis on consumption, income, and wealth. The crisis context creates negative expectations about the future evolution of asset prices, which may lead households to modify their consumption behaviour in anticipation of a potential decrease in their financial and housing wealth. The findings are presented in Table 5, alongside the results from the previous model, denoted as Model 1, to facilitate comparison.

After including the crisis dummy variable in Model 2, the coefficients for housing and financial wealth maintain their sign, with a slightly larger magnitude, of 0.0735 for housing wealth (compared to 0.066 in Model 1), and 0.0732 for stock wealth (compared to 0.062 in Model 1). The coefficient of the dummy variable is negative and statistically significant at a 5% level, which indicates that households adjust their consumption downwards during the period of economic distress. In the short run, the only significant coefficient in both models is the coefficient of the income from wages and salaries, while the coefficients for the two types of wealth become negative but not statistically significant.

Table 6: Alternative methods of estimation for the two specifications

Variables	**PMG**		**FMOLS**		**DOLS**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Wages and salaries	0.556***	0.575***	0.556***	0.551***	0.548***	0.546***
(lnI)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
House price index	0.066***	0.0735***	0.042**	0.053**	0.051**	0.054**
(lnHW)	(0.001)	(0.000)	(0.043)	(0.014)	(0.022)	(0.018)
Stock price index	0.062***	0.0732***	0.023**	0.023**	0.026**	0.036***
(lnFW)	(0.000)	(0.000)	(0.012)	(0.015)	(0.018)	(0.001)
Crisis Dummy	-	-0.011**	-	-0.009	-	-0.012*
		(0.028)		(0.171)		(0.092)
Number of countries	11	11	11	11	11	10
Number of observations	594	594	594	594	583	542

Source: Author's estimations in STATA 17.
Note: Standard errors are reported in brackets. ***, **, * denote statistical significance at the 1%, 5%, and 10% respectively.

We also specified the consumption-wealth relationship differently while assessing for the effect of interactions with the crisis dummy of the housing and stock prices series, respectively. However, the results proved to be not statistically significant and, as a

consequence, were not presented in the results section. The estimation results, including the interactions, are available upon request.

Both models used in our study are further subject to other two robustness checks regarding the estimation methods. We also estimated the wealth-consumption relationship through Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) methods to account for the long-run wealth effects. The results provided in Table 6 confirm the results from the PMG method: alternative estimation methods indicate a stronger positive housing wealth effect on consumption compared to the stock wealth effect.

It is important to notice that all estimated coefficients for each variable have the same sign, regardless of the estimation method: the income coefficients, house price coefficients and stock market coefficients are significant and positive.

6. Conclusions

This study explored the effect of changes in housing and stock wealth on consumption for a panel of 11 CEE countries that are members of the European Union. While alternative measures for wealth exist in developed countries, such as occupancy rates and market capitalisation, we relied on house price indices and stock indices as proxies, based on data availability.

Our analysis revealed that consumption, the income from wages and salaries, and both types of wealth are non-stationary and co-integrated. By employing modern econometric technique like the PMG procedure, we obtained a clear understanding of both the short-run and long-run relationships among these variables.

The results indicate a wealth effect from both the real estate and stock markets, with the impact of stock wealth being slightly smaller than that of housing wealth. These findings align with previous research on emerging economies. Notably, when incorporating time-fixed effects for the global financial crisis (2008–2010), the coefficients for housing and stock wealth keep their sign, with a slightly larger magnitude. However, direct comparisons between the results obtained in this study and the estimates found in previous literature might be challenging due to significant differences in timeframes, data frequency, country samples, variable definitions, and robustness checks.

Most existing studies suggest that changes in housing wealth, particularly house prices, constitute the primary channel through which economic cycles influence emerging economies, especially during periods of economic expansion. This raises important policy questions regarding the most effective tools to mitigate risks associated with housing market fluctuations in both boom-and-bust phases. During economic downturns, liquidity constraints become more binding, which may justify policies aimed at improving housing affordability for lower-income households, either through direct ownership support or mortgage assistance schemes. Conversely, in periods of economic expansion, rising house prices—particularly in economies with high homeownership rates, such as those in Central and Eastern Europe (CEE)—can lead to increased household consumption. While this wealth effect can stimulate economic growth, it may also contribute to inflationary pressures, which are undesirable from a macroeconomic stability perspective. Addressing these dynamics requires a combination of financial literacy initiatives and well-calibrated monetary, fiscal, and

macroprudential policies. However, no single policy framework applies universally, and identifying optimal policy responses remains a persistent challenge (Crowe et al., 2011).

For future research, alternative methodologies could be explored to examine the wealth-consumption relationship, which may exhibit instability, asymmetry, and nonlinearity depending on economic conditions. Factors such as temporal variations in wealth, household habit formation, differences in utility functions, and loss aversion may contribute to these nonlinear effects. Moreover, households often perceive changes in wealth as transitory rather than permanent, which may influence consumption behaviour. Another promising avenue for further investigation involves quantitative studies on the impact of homeownership rates on private consumption across different economic contexts.

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Statements and Declarations

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