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BREAKING THE RULE OF ELASTICITY: INELASTIC GOLD DEMAND IN LOW-INCOME AND EMERGING ECONOMIES. EVIDENCE FROM THE WESTERN BALKANS

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Abstract. The present study investigates the persistent inelasticity of gold demand in financially constrained economies, focusing on the Western Balkans as an empirical case. The classical demand theory posits the premise that luxury goods should demonstrate relatively high elasticities with respect to both income and price. Contrary to the predictions made by theoretical models, the findings of this study indicate that demand for gold in the region remains significantly inelastic, a phenomenon that extends to lower-income countries as well, where gold constitutes a substantial component of household balance sheets. Utilising a panel dataset for Western Balkan economies over the period 2015–2024, a log-linear dynamic panel model of physical gold consumption was estimated. This model incorporates international gold prices, real income per capita, and proxies capturing cultural and behavioural determinants. The econometric strategy is predicated on the utilisation of fixed-effects estimation, complemented by the execution of robustness checks employing random-effects models, instrumental-variable techniques, and generalised method of moments (GMM) estimators. The results demonstrate that the price elasticity of gold demand is approximately –0.21 and the income elasticity is around 0.06. This confirms that gold consumption is only minimally sensitive to changes in price or income levels. Furthermore, both cultural perception indices and a behavioural factor index, constructed from survey responses and synthetic behavioural data, exert a statistically and economically significant positive effect on gold demand. These findings suggest that gold operates as a safe-haven asset, a store of value and a culturally significant symbolic good within the Western Balkans. The study makes a valuable contribution to literature on commodity demand, behavioural economics and household portfolio choice, as it shows that conventional elasticity predictions are inaccurate in situations where cultural norms, financial exclusion and heightened risk perceptions take precedence over purely price-based decision-making.

Keywords: gold demand, price elasticity, income elasticity, Western Balkans, behavioural economics, cultural factors, precious metals, panel data.

JEL Classification: D12, E31, G11, O12, C23, Z13

1. Introduction

Gold has long been seen as a symbol of wealth, security and financial stability. People from a variety of cultural backgrounds and income levels allocate a substantial portion of their savings to physical gold, even when other financial options are available. In many emerging markets and low-income economies, gold is not only an investment, but also a widely accepted store of value and a safeguard against economic uncertainty. Gold also plays an important role in rituals associated with marriage, inheritance and social status. These characteristics make gold a fitting subject for examining the limits of standard demand theory.

The traditional microeconomic framework clearly distinguishes between the price and income elasticities of demand. For most normal goods, demand decreases when prices rise and increases when income rises. Luxury goods in particular are expected to have a higher

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income elasticity. As households become wealthier, they tend to spend a larger proportion of their additional income on such goods. According to classical demand theory, gold, being considered a luxury or discretionary item, should be sensitive to changes in price and income. However, recent studies of developing and emerging economies show that demand for gold often responds weakly to price changes and only slightly to changes in income, particularly when gold serves as both a financial and a cultural asset.

This paper examines why demand for gold remains inelastic in poorer, financially limited regions, with a specific focus on the Western Balkans. This region experiences periods of economic instability and has low financial inclusion and strong cultural beliefs that regard gold as a key means of safeguarding wealth across generations. In this context, the traditional relationship between price and quantity may be more influenced by behavioural and cultural factors, such as risk and loss aversion, mental accounting, and the symbolic value of gold in relation to social status and family security.

The main goal is to measure the extent to which gold demand in the Western Balkans is unaffected by changes in price and income. The study also examines how cultural and behavioural factors influence these connections. Through the use of panel-data econometric modelling and behaviour-driven variables, the study seeks to explain why households continue to purchase gold even when prices rise or real incomes remain unchanged, and why gold is a vital asset for preserving wealth in this region. Based on this objective, the study advances the following hypotheses:

– **H1:** The price elasticity of gold demand in lower-income, financially constrained economies – illustrated by the Western Balkans – is significantly less than one in absolute value, indicating inelastic demand relative to price changes.

– **H2:** Cultural factors, such as the symbolic value of gold in social rituals and status signaling, exert a statistically significant and positive influence on gold demand beyond traditional economic determinants like income and price.

– **H3:** Behavioural factors, including risk aversion, loss aversion, safe-haven motives, and mental accounting, exert a statistically significant and positive influence on gold demand beyond traditional economic determinants.

– **H4:** Income levels have a comparatively weak effect on gold demand in the Western Balkans, due to limited access to formal financial alternatives and strong socio-cultural preferences for holding gold.

To explore these hypotheses, the study addresses the following:

1. The present study seeks to ascertain the extent of price elasticity of gold demand in financially constrained economies, with a particular focus on the Western Balkans.

2. The extent to which behavioural and cultural factors, including perceptions of gold as a symbol of wealth, security, and social prestige, influence gold demand in this regional context is a subject that merits further investigation.

3. The present study seeks to explore the intricate interplay between income levels, cultural perceptions, and price fluctuations in determining gold demand. In doing so, it aims to provide a comparative analysis of these relationships in the context of classical demand theory.

This research offers a comprehensive analysis of gold demand in the Western Balkans. It integrates econometric modelling with insights from behavioural and cultural economics. The objective of the present findings is twofold: firstly, to inform academic debates on demand elasticity and, secondly, policy discussions on household financial resilience, financial inclusion, and the design of alternative savings and investment instruments in emerging economies.

2. Literature Review

Classical demand theory primarily explains consumer behaviour through the effects of price and income. Within this framework, price elasticity of demand measures how the quantity demanded responds to changes in price, while income elasticity captures how consumption adjusts to changes in income. For most normal goods, demand falls when prices rise and increases with higher income. Luxury goods typically exhibit relatively high income elasticity, as consumers allocate a larger proportion of additional income to these goods. When applied to gold, this framework would predict that higher prices and constrained incomes would significantly reduce demand for gold, particularly in lower-income or financially fragile economies.

However, empirical evidence paints a more nuanced picture. Mandelbrot and Hudson (2004) contend that the dynamics of the gold price often mirror broader market sentiment and intricate, nonlinear risk processes rather than straightforward supply and demand fundamentals. Their work shows that, during periods of heightened uncertainty, such as financial crises or inflationary episodes, demand for gold tends to become relatively inelastic; households continue to purchase gold even when prices are rising. Chand (2012) conducted an analysis of emerging markets in Asia and Africa, the results of which indicate that price sensitivity of gold demand weakens during periods of macroeconomic instability and currency devaluation. In such circumstances, gold functions as a safe-haven asset, and consumers are willing to pay a premium for the security it provides. Tully and Lucey's (2007) research indicates that during periods of global financial turbulence, the demand for gold exhibits

diminished responsiveness to price fluctuations. This phenomenon occurs as investors undergo a strategic shift in their portfolios, allocating a greater proportion towards physical assets as opposed to speculative financial instruments.

In economies with limited financial resources, demand for gold is frequently associated with inflation and currency risk. McMahon (2017) and Deaton (2003) demonstrate that in contexts of hyperinflation and repeated devaluation, households increase their gold holdings with a view to protecting their purchasing power. In such environments, characterised by underdeveloped financial markets and restricted access to formal savings instruments, gold assumes a pivotal role as an informal store of value. Despite elevated prices, gold continues to be accumulated as a hedge against macroeconomic instability rather than as a purely speculative asset. This evidence suggests that standard assumptions about elastic demand for non-essential or luxury goods are not fully applicable to gold in such settings.

Behavioural economics provides further insight into why conventional models frequently underperform in terms of capturing the observed persistence of gold demand. Prospect theory, developed by Kahneman and Tversky (1979), posits that individuals evaluate outcomes in terms of gains and losses relative to a reference point and exhibit loss aversion, placing greater weight on losses than on equivalent gains. In volatile or inflationary environments, households may regard gold as a means of protection against perceived losses in local currency, which may result in sustained gold purchasing, even in the face of rising prices. Thaler's (1985) concept of mental accounting posits that individuals may regard gold as a discrete, "untouchable" asset category, reserved for long-term security rather than day-to-day consumption. This phenomenon contributes to the stability of gold demand, even in the face of adverse price fluctuations. As Ariely (2008) emphasises, emotionally charged and culturally significant purchases are particularly prone to deviations from rational price sensitivity. This reinforces the idea that gold's symbolic meaning can weaken its responsiveness to price.

The cultural dimension of gold demand has also been extensively documented. As Kiyosaki (2007) and Hawkins and Gendall (2011) have demonstrated, in countries such as India, Vietnam and several African economies, gold is employed as a symbol of wealth, social status and mobility. Subramanian and Suresh (2009a, 2009b) demonstrate that in India, gold is profoundly interwoven with family life through practices such as dowries, wedding gifts, and intergenerational transfers, thereby ensuring sustained demand even during periods of high prices. In such contexts, gold is considered an integral component of the social fabric, and fluctuations in its price do not necessarily correspond to proportional changes in demand.

The Western Balkans exhibit similar characteristics. Haxhiu and Shala (2018a, 2018b) describe the role of gold in maintaining family legacies, facilitating the transfer of wealth across generations, and supporting social obligations. Even when household finances are limited, families regard gold as a secure, tangible asset that can be utilised in times of need. Ahmed and Ahmed (2015) report similar trends in Egypt, Tunisia and Pakistan, where the importance of gold in rituals and traditions remains unchanged by its market price. Yglesias (2019) highlights the significance of gold as a cultural asset in African economies with limited financial infrastructure, where households rely on gold during periods of economic hardship and institutional instability.

Gold's reputation as a safe haven is therefore both financial and cultural. Tully and Lucey (2007) and Baur and Lucey (2010a, 2010b) have provided evidence that gold tends to appreciate or remain stable when stock markets and other financial assets are performing poorly. This confirms its role as a hedge against portfolio risk. In low-income and emerging economies, the safe-haven function of gold is further amplified by inflation, exchange-rate volatility and weak institutional trust. Sharma (2015a, 2015b) and Krugman (2009) observe that when traditional financial systems are perceived as fragile or inaccessible, the attractiveness of gold as a liquid, tangible, and universally recognised asset increases, contributing to demand that is relatively insensitive to short-term price movements.

The extant literature suggests that the demand for gold in lower-income and financially constrained economies is shaped by a complex interaction of economic, psychological and cultural forces. While price and income remain significant factors, they are influenced by psychological phenomena such as loss aversion, mental accounting, status signalling, and entrenched cultural norms surrounding wealth and security. In such contexts, gold functions not only as an investment asset but also as a "social currency" and a trusted store of value. This phenomenon helps to explain why demand can remain inelastic even when prices rise or incomes stagnate.

Notwithstanding these advances, there are several gaps that still need to be addressed. Firstly, a significant proportion of extant empirical work focuses on large emerging markets, such as India, or on broad cross-country comparisons, with comparatively limited attention being paid to smaller regions, such as the Western Balkans. Secondly, while the behavioural and cultural determinants of gold demand are widely discussed in theoretical terms, they are seldom incorporated into formal econometric models using explicit behavioural constructs or proxies. Thirdly, the majority of elasticity estimates are derived from

price and income variables alone, thereby leaving the quantitative contribution of cultural and behavioural factors underexplored.

3. Methodology

This section presents the empirical strategy employed in the investigation of the determinants of gold demand in the Western Balkans. The investigation further aims to ascertain whether demand is inelastic with respect to price and income, once cultural and behavioural factors are taken into account. The methodology combines panel-data econometrics with behaviourally motivated constructs, including synthetic indices for risk aversion, loss aversion and mental accounting.

3.1. Research Design

The study employs a quantitative panel-data research design, combining annual macroeconomic indicators, country-level measures of physical gold demand, and indices capturing cultural and behavioural factors related to gold ownership for a set of Western Balkan economies over the period 2015–2024.

The Western Balkans are treated as a representative example of a financially constrained, partially euroised/dollarised economy in which gold plays a significant role as a store of value and a culturally embedded asset. A cross-sectional time-series (panel) analysis is conducted over a ten-year period using historical data on gold prices and demand, supplemented by socio-economic and behaviourally informed variables.

The empirical strategy has two main components:

1. Estimation of a log-linear (static and dynamic) demand function for gold, where the dependent variable is physical gold demand and the key explanatory variables are gold price, income per capita, cultural perception, and behavioural factors.
2. The integration of behaviourally motivated variables, constructed from survey evidence and synthetic data calibrated to the behavioural economics literature, into the econometric framework is proposed in order to capture risk attitudes, loss aversion, mental accounting, and status-driven motives related to gold.

The design of the study enables the quantification of standard price and income elasticities, whilst also explicitly testing the role of cultural and behavioural determinants of gold demand.

3.2. Data Collection

Data are drawn from multiple reputable sources to ensure robustness and comparability across countries and years.

Macroeconomic data. Annual data on real GDP per capita, consumer price inflation and exchange rate indicators are obtained from the World Bank and the International Monetary Fund (IMF). These series provide a consistent basis for measuring income, inflation and macroeconomic conditions in the Western Balkans, alongside selected comparative indicators from other emerging and lower-income economies where relevant.

Gold consumption data. Data on physical gold demand (in kilograms), including consumption, imports and exports, is compiled from national statistics offices in the Western Balkans and international trade databases. These data are then harmonised to create a country-year panel of gold demand. Where necessary, minor gaps are addressed through standard interpolation and cross-checking against alternative trade statistics.

Cultural and behavioural data. Information on cultural attitudes towards gold, and on households' perceptions of gold as a store of value, is taken from regional survey studies, reports by local research institutes, and international surveys on financial inclusion and savings behaviour. These sources are used to construct a cultural perception index that captures gold's symbolic and social role (e.g., its importance in weddings, dowries, inheritance, and signalling status).

Systematic micro-data are not available for all countries and years for several behavioural dimensions (risk aversion, loss aversion and mental accounting of gold). In such cases, the study uses synthetic data generation, calibrated to the parameter ranges and distributions reported in behavioural economics literature and the limited existing regional surveys. Section 3.4 describes the construction and use of these synthetic indices.

3.3. Econometric Model

3.3.1. General Demand Specification

In order to analyse inelastic gold demand, the study begins with a standard microeconomic demand function that has been adapted to account for the specific characteristics of gold in financially constrained economies. The demand for gold can be expressed as:

$$\boldsymbol{D = f\left(P, Y, CP, BF\right)} \quad (1)$$

Where: D = demand for gold, P = price of gold, Y = income or GDP per capita, CP = cultural perception index and BF = behavioural factor index.

3.3.2. Price Elasticity of Demand (PED)

The price elasticity of demand (PED) measures the percentage change in quantity demanded resulting from a one-percent change in price. For the demand function (D(P)), PED is defined as:

$$\boldsymbol{PED = \frac{\partial P}{\partial D} x \frac{P}{D}} \quad (2)$$

Where: $\frac{\partial P}{\partial D}$ is the first derivative of the demand function with respect to price, representing the sensitivity of demand to changes in price. If ($|PED| < 1$), demand is considered inelastic, meaning that a change in price does not lead to a proportionally large change in quantity demanded.

3.3.3. Log-Linear Model for Estimation

Given the likely non-linearity of gold demand and the interest in elasticity estimates, a log-linear specification is adopted. The baseline static model is:

$$lnD = ² 0 + ² 1lnP + ² 2lnY + ² 3CP + ² 4BF + \mu \quad (3)$$

Where: (lnD), (lnP) and (lnY) are the natural logarithms of demand, price and income, respectively.

In this specification: ($\beta 1$) is the price elasticity of gold demand, ($\beta 2$) is the income elasticity of gold demand, ($\beta 3$) and ($\beta 4$) capture the marginal effects of cultural perception and behavioural factors, holding income and price constant.

The log-linear form enables the coefficients relating to price and income to be interpreted directly as elasticities, while reducing the influence of outliers in the distribution of macroeconomic variables. This static model is first estimated using Ordinary Least Squares (OLS) as a baseline.

3.3.4. Panel and Dynamic Specification

In order to exploit the time-series and cross-sectional dimensions of the data, the model is extended to a panel framework. The log-linear panel specification is:

$$lnDit = ± + ² 1lnPit + ² 2lnYit + \\ + ² 3CPit + ² 4BFit + ui + \mu it \quad (4)$$

Where: ($lnDit$) is the logarithm of gold demand in country (i) at time (t), ($lnPit$), (Yit), ($CPit$), ($BFit$) are price, income, cultural perception and behavioural factors in country (i) at time (t), (ui) is the unobserved, time-invariant country-specific effect, (εit) is the idiosyncratic error term.

To capture persistence and habit formation in gold demand, a dynamic panel specification is also estimated:

$$lnDit = ± + ÁlnDi,t - 1 + ² 1lnPit + \\ + ² 2lnYit + ² 3CPit + ² 4BFit + ui + \mu it \quad (5)$$

Where: ($lnDi,t-1$) is the lagged dependent variable. The coefficient (ρ) measures the degree of persistence in gold demand over time.

In this dynamic specification: ($\beta 1$) represents the price elasticity of gold demand ($\beta 2$) represents the income elasticity, ($\beta 3$) and ($\beta 4$) capture the marginal impacts of cultural and behavioural factors, respectively.

3.4. Behavioural Factors Integration

Given the central role of behavioural and cultural determinants in the theoretical framework, this section explains how these dimensions are incorporated into the empirical model.

3.4.1. Rationale for Synthetic Data

Direct micro-level data on risk preferences, loss aversion and mental accounting related to gold are limited for the Western Balkans. Synthetic data are therefore used for three main reasons:

– Data scarcity. Comprehensive surveys or interviews on gold-related attitudes and behavioural biases are not consistently available across all countries and years in the sample.

– Modelling behavioural mechanisms. Synthetic data enable the simulation of behavioural patterns, such as heightened risk aversion and strong loss aversion in the face of inflation, which are well documented in the behavioural economics literature but not always observed directly in this regional context.

– Integration with macro-level data. By calibrating synthetic behavioural parameters to plausible ranges derived from experimental and survey studies, country-level behavioural indices can be constructed and merged with a panel of macroeconomic and gold demand data.

Synthetic behavioural indices are used to complement, rather than substitute for, observed data. Where survey-based measures are available, they are used to calibrate the synthetic distributions.

3.4.2. Behavioural Constructs

Three core behavioural mechanisms are incorporated.

(a) Risk aversion. Risk aversion is modelled using a standard concave utility function of wealth (W):

$$U(W) = \frac{W^{1-y}}{1-y}, y > 0, y \neq 1 \quad (6)$$

Where: (W) is wealth and (y) is the risk-aversion parameter. Higher values of (y) indicate stronger risk aversion and a greater preference for safe, tangible assets such as gold relative to more volatile financial instruments. In the synthetic data, (y) is varied across consumer profiles, with lower income levels associated, on average, with higher risk aversion.

(b) Mental accounting and status-driven consumption. The concept of mental accounting suggests that households treat gold as a distinct "account" designated for long-term security and significant life events, rather than as part of their everyday spending. In the synthetic data, a fixed percentage of income is

allocated to gold purchases, regardless of short-term price fluctuations. This reflects the cultural norm of considering gold an essential asset. A synthetic indicator has also been constructed to capture the perception of gold as a symbol of wealth and social status. Higher values have been assigned to profiles and country–year combinations where cultural ties to gold and status-related motives are stronger.

(c) Prospect theory and loss aversion. Prospect theory posits that individuals are more sensitive to losses than to gains. This is represented by a value function of the form:

$$v(x) = \begin{cases} x^{a}, & x \geq 0 \\ -\lambda(-x)^{\beta}, & x < 0 \end{cases} \quad (7)$$

Where: (x) denotes changes in wealth, (α) and (β) are curvature parameters, and ($\lambda > 1$) is the loss-aversion coefficient. In the context of gold demand, higher (λ) values are associated with stronger reactions to perceived or actual losses in real wealth, leading households to increase gold purchases even when gold prices are high.

3.4.3. Data Generation Process

The synthetic data generation process proceeds in three steps:

1. Income profiles. Synthetic income levels are assigned to representative household profiles, based on the empirical income distribution in each Western Balkan country. This ensures that behavioural parameters are calibrated to realistic economic conditions.

2. Behavioural characteristics. For each synthetic profile, the parameters for risk aversion, loss aversion, mental accounting, and cultural perception are drawn from distributions informed by behavioural economics studies and limited regional survey evidence. These distributions are constrained so that, on average, higher income and financial literacy are associated with somewhat lower extreme risk aversion, while still allowing for substantial heterogeneity.

3. Simulation of gold demand. The demand function is applied to each synthetic profile, combining income, price, and behavioural parameters. The resulting gold demand at profile level is then aggregated into country-year behavioural indices (the **behavioural factor** index), which reflect the average behavioural disposition towards gold in each context. These indices are normalised to facilitate interpretation and integration into the econometric model as BFit in equations (4) and (5).

3.5. Estimation Techniques

Several econometric techniques are employed to estimate the model and assess the robustness of the results:

– Ordinary Least Squares (OLS). The OLS is utilised as a baseline for the static log-linear specification, excluding the lagged dependent variable (equation 3). This approach provides preliminary estimates of price and income elasticities; however, it does not account for unobserved heterogeneity or dynamics.

– Fixed-effects (FE) panel estimation. The primary outcomes are derived from a fixed-effects estimator applied to the panel specifications (equations (4) and (5)), which accounts for time-variant country-specific factors such as institutional quality, long-standing cultural norms, and structural characteristics of the financial system. The present approach is focused on within-country variation over time.

– Random-effects (RE) panel estimation. A random-effects model is estimated as a robustness check. Hausman tests are utilised to evaluate the relative appropriateness of the FE or RE specification. In light of the presence of correlated unobservable variables, the utilisation of fixed-effects results is deemed optimal. However, the RE estimates are reported to illustrate the stability of coefficients across alternative specifications.

– Instrumental Variables (IV) estimation. To address the potential endogeneity between gold prices and demand, an instrumental variables (IV) estimator is applied. Lagged values of the gold price and selected external macroeconomic indicators are used as instruments under the assumption that they primarily affect domestic gold demand through their impact on domestic gold prices. Standard diagnostics, including first-stage F-statistics and over-identification tests, are employed to evaluate the relevance and validity of the instruments.

– Generalised Method of Moments (GMM). A panel GMM estimator is used to correct for dynamic panel bias and remaining endogeneity in the dynamic panel specification including the lagged dependent variable (equation (5)). Lagged levels and differences of the regressors serve as internal instruments. The overall validity of the instrument set is evaluated using Hansen or Sargan tests, and tests for serial correlation are conducted to verify the appropriateness of the moment conditions.

The analysis combines these complementary estimators to ensure that the key findings, particularly the inelastic price and income responses and the significant influence of cultural and behavioural factors, are not affected by a specific modelling choice or uncorrected endogeneity.

4. Results

This section presents empirical evidence on gold demand in the Western Balkans. It begins with descriptive statistics and model diagnostics, before presenting the baseline panel estimates of the log-linear demand model. This includes price and

income elasticities, as well as the effects of cultural and behavioural factors. It then examines dynamic persistence in gold demand, followed by robustness checks using alternative estimators. Finally, the section concludes with a synthesis of how the findings relate to the four hypotheses formulated in the introduction.

4.1 Descriptive Statistics and Model Diagnostics

Table 1 summarises the key variables employed in the empirical analysis for the period from 2015 to 2024. The data show significant variation across countries and over time, providing a solid basis for panel estimation.

The mean gold price (USD per gram) is 95, with a standard deviation of 12 and a range between 70 and 120. This dispersion reflects global gold price movements and how they are transmitted into domestic markets. Income per capita averages at 7,752.60 USD, with a standard deviation of 3,041.74 USD, and values ranging from 3,000 USD to 12,000 USD. This indicates significant heterogeneity in economic development within the Western Balkans.

The average gold demand is 29.55 kilograms, with a standard deviation of 14.18 and a range of 5 to 50 kilograms. This shows that there is meaningful variation in gold demand across countries and over time. The Cultural Perception Index has a mean of 0.54 and a standard deviation of 0.29. Values are bounded between 0 and 1, indicating that, while cultural attachment to gold is generally strong, it is not uniform. With a mean of 0.53 and a standard deviation of 0.27 (also on a 0–1 scale), the Behavioural Factor Index captures cross-sectional and temporal differences in risk aversion, loss aversion, safe-haven motives, and mental accounting related to gold.

Figure 1 presents a pair plot of the key variables – namely Gold Price, Income per Capita, Cultural Perception Index, Behavioural Factor Index and Gold Demand – for the period 2015–2024. Visual models indicate: a **negative correlation** between the price of gold and demand for gold; a **weak positive correlation** between per capita income and demand for gold; and a **clear positive correlation** between demand for gold and cultural and behavioural indices.

These preliminary findings suggest that cultural and behavioural factors may have a stronger association with gold demand than income, in accordance with the study's conceptual framework.

In order to verify the suitability of the data for panel regression, panel unit root tests were conducted. The Levin–Lin–Chu (LLC) and Im–Pesaran–Shin (IPS) tests both reject the null hypothesis of a unit root at the 5% significance level for all variables in levels. These results indicate that the series are stationary in the panel, thereby supporting the use of log-linear panel regression models without the necessity for differencing or cointegration techniques (Wooldridge, 2015; Uriel, 2019).

4.2 Baseline Econometric Results

The core empirical results were obtained using fixed-effects (FE) panel estimation of the log-linear demand model, which included a lagged dependent variable in order to capture dynamic persistence. Table 2 reports the main coefficients of the preferred FE dynamic specification alongside their respective standard errors, t-statistics, and p-values.

Table 1
Descriptive statistics of key variables (2015–2024)

Variable	Mean	Std. Dev.	Min	Max
Gold Price (USD/gram)	95.00	12.00	70.00	120.00
Income per Capita (USD)	7,752.60	3,041.74	3,000.00	12,000.00
Gold Demand (kg)	29.55	14.18	5.00	50.00
Cultural Perception Index	0.54	0.29	0.00	1.00
Behavioural Factor Index	0.53	0.27	0.00	1.00

Table 2
Baseline fixed-effects dynamic panel estimates for gold demand
(Dependent variable: Log(Gold Demand))

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Log(Gold Price)	-0.21	0.08	-2.63	0.010
Log(Income per Capita)	0.06	0.02	3.00	0.003
Cultural Perception Index	9.78	3.12	3.13	0.003
Behavioural Factor Index	7.64	2.89	2.65	0.011
Lagged Gold Demand	0.65	0.09	7.22	0.000
Constant	3.70	0.33	11.21	0.000

*Note: Country fixed effects included. Standard errors clustered at the country level. Significance levels: * $p < 0.05$, ** $p < 0.01$.*

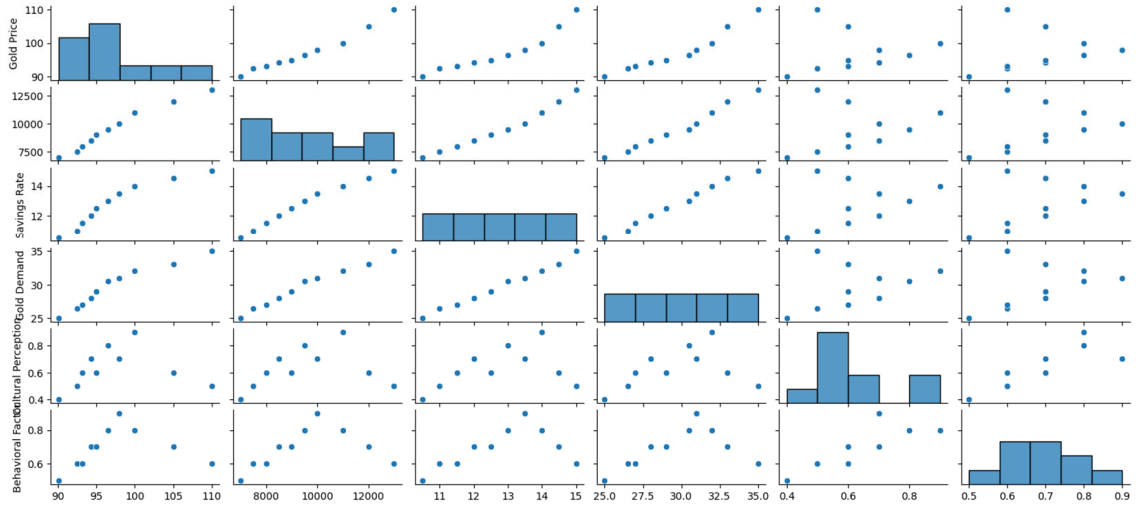

Figure 1. Pairwise relationships among gold demand, price, income, cultural perception and behavioural factors (2015–2024)

The model successfully explains a significant proportion of the variation in gold demand within countries, and the signs and magnitudes of the coefficients align with the theoretical expectations outlined in Section 3.

4.2.1. Price Elasticity of Gold Demand (H1)

The coefficient on Log(Gold Price) is found to be −0.21, which is statistically significant at the 1% level ($p = 0.010$). Within the log-log specification, this coefficient is indicative of the price elasticity of gold demand. This indicates that a 1% increase in the domestic price of gold is associated with a 0.21% decrease in the quantity of gold demanded, ceteris paribus.

The absolute value of this elasticity is well below one, implying that gold demand in the Western Balkans is strongly inelastic with respect to price. As demonstrated in Figure 2, the estimated price elasticity over the sample period is shown to be inelastic (in absolute value) across a range of price levels and years. This robustness suggests that households do not significantly reduce gold purchases in response to higher prices.

These results are consistent with the notion of gold as a store of value and safe-haven asset, the demand for which responds weakly to price shifts, especially in financially constrained contexts. Behavioural mechanisms such as loss aversion and mental accounting, as well as the symbolic status of gold, have been demonstrated to insulate demand to a certain extent from market price signals. Consequently, the evidence strongly supports Hypothesis 1, which posits that the price elasticity of gold demand in the Western Balkans is significantly less than one in absolute value.

4.2.2. Income Elasticity of Gold Demand (H4)

The coefficient on Log(Income per Capita) is found to be 0.06, which is statistically significant at the 1% level ($p = 0.003$). This estimate can be interpreted as the income elasticity of gold demand: a 1% increase in per capita income leads to a 0.06% increase in gold demand, holding other factors constant.

Despite the positive correlation, the elasticity is negligible, suggesting that gold demand exhibits minimal responsiveness to fluctuations in income. This pattern stands in contrast to the classical economic perspective of gold as a purely luxury good, for which demand is expected to rise more than proportionally with income. However, the extant evidence suggests that in the Western Balkans, gold functions more as a quasi-necessity or informal savings vehicle, the accumulation of which is only modestly influenced by income growth. This finding is consistent with the region's limited financial inclusion and persistent reliance on tangible assets for wealth preservation.

These findings are consistent with Hypothesis 4, which predicts that income levels exert a relatively negligible effect on gold demand once cultural and behavioural factors are taken into consideration. The results also imply that analyses focusing solely on income dynamics would substantially understate the role of non-economic determinants of gold demand.

4.2.3. Cultural Perception and Behavioural Factors (H2 and H3)

The Cultural Perception Index enters the model with a coefficient of 9.78 (standard error 3.12, $p = 0.003$). Given the index's 0–1 scale, this coefficient suggests that shifting from minimal to very high levels of cultural affinity with gold is linked to a significant

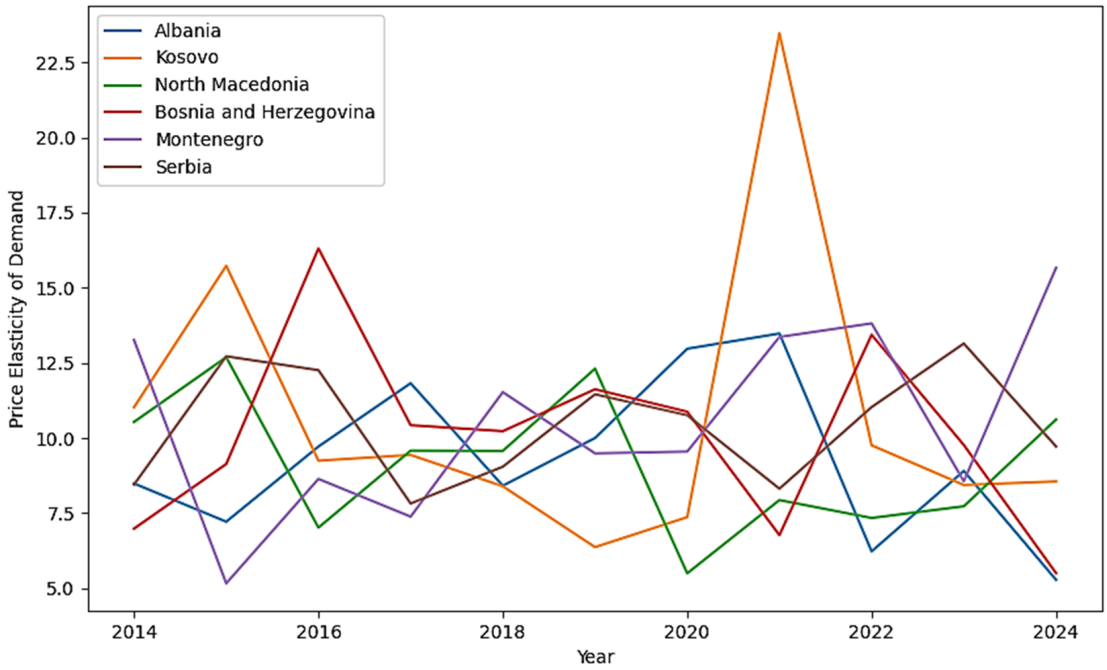

Figure 2. Estimated price elasticity of demand for gold in the Western Balkans

rise in demand for gold, even when accounting for price, income, and previous demand. This highlights the important influence of cultural norms and social practices, such as the use of gold for weddings, dowries and intergenerational transfers, on gold consumption in the Western Balkans.

The size of the coefficient indicates that, under certain conditions, cultural factors can dominate purely economic incentives, sustaining high levels of gold demand even during periods of high prices or stagnant incomes. This provides strong empirical support for Hypothesis 2, which states that cultural factors have a positive and statistically significant influence on gold demand beyond that of traditional economic determinants.

The Behavioural Factor Index has a coefficient of 7.64 (standard error 2.89, $p = 0.011$) and is significant at the 5% level. This index summarises behavioural traits such as risk aversion, loss aversion, safe-haven motives, and mental accounting with regard to gold. A higher index value is associated with a marked increase in gold demand, indicating that households with stronger behavioural dispositions favouring security and loss protection allocate more resources to gold.

This result confirms Hypothesis 3, which states that behavioural factors have a statistically significant positive effect on gold demand. It also shows that psychological biases and heuristics, rather than purely rational cost–benefit calculations, play an important role in decisions about holding assets. Notably, the positive impact of the behavioural index indicates that households may retain or even expand their gold holdings during periods of economic uncertainty, thereby contributing to the observed inelasticity of demand with respect to price.

Figure 3 illustrates the combined impact of income, cultural perception, and behavioural factors. It plots gold demand against income per capita at various cultural and behavioural index levels. The figure shows that higher cultural and behavioural scores are consistently associated with higher levels of gold demand at any given income level. This visual evidence reinforces the regression results, highlighting how socio-cultural and behavioural dimensions shift the entire demand profile upwards rather than merely adding noise to an income-based trend.

4.2.4. Dynamic Persistence in Gold Demand

The coefficient on the lagged dependent variable (Lagged Gold Demand) is 0.65 (standard error 0.09, $p < 0.001$), which indicates a high level of dynamic persistence. This suggests that current gold demand is significantly affected by previous demand, even when accounting for price, income, cultural and behavioural factors.

This persistence can be interpreted as evidence of the formation of habits, social learning, and the intergenerational transmission of norms relating to gold ownership. Households appear to maintain stable patterns of gold acquisition over time, which are reinforced by cultural expectations and family practices. Consequently, shocks to gold demand,

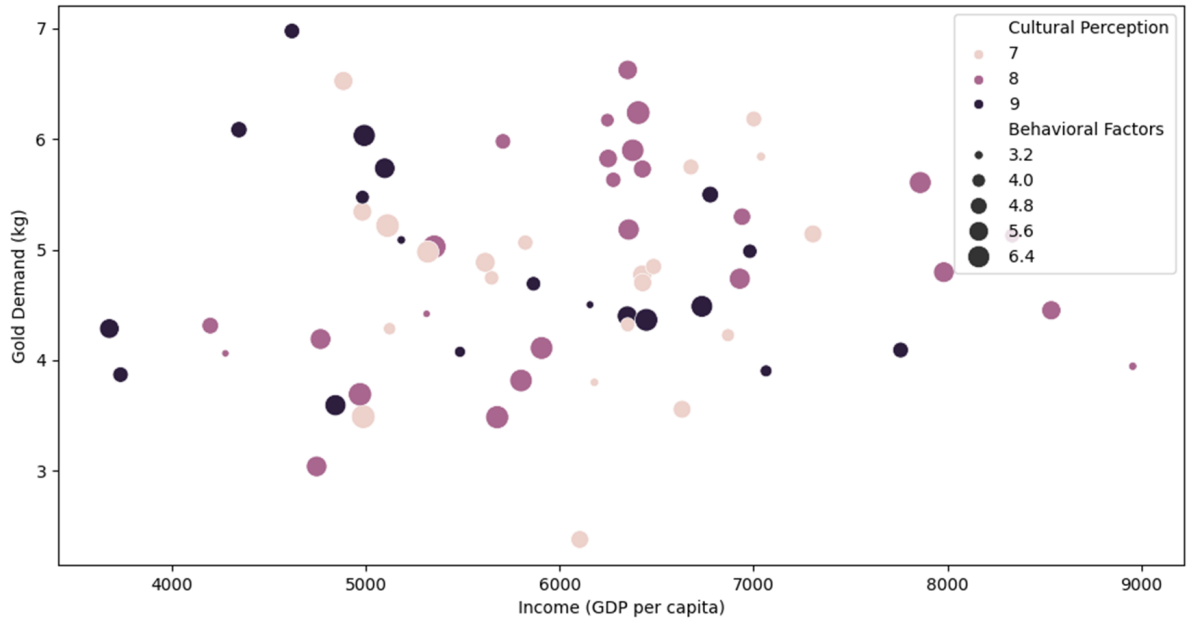

Figure 3. Gold demand versus income per capita at varying levels of cultural perception and behavioural factors in the Western Balkans

whether driven by macroeconomic events or sudden price changes, tend to have a gradual rather than an abrupt effect, which further contributes to the inelastic nature of demand.

Although not linked to a separate formal hypothesis, the finding of dynamic persistence is consistent with the study's broader argument: that gold demand in the Western Balkans is structurally anchored in long-lived cultural and behavioural mechanisms.

4.3. Robustness Checks and Sensitivity Analyses

To examine the robustness of the results, alternative estimators were employed, including random effects (RE), instrumental variables (IV) and the generalised method of moments (GMM). Table 3 reports the key coefficients for these different specifications.

The key findings are highly robust:

Although the RE estimates closely match the FE results, Hausman tests confirm that FE is the preferred estimator due to the correlation between the unobserved country effects and the regressors. The similarity between the FE and RE specifications indicates that the estimated relationships are stable.

The IV estimates address the potential for endogeneity between gold prices and demand for gold by using lagged gold prices and external macroeconomic variables as instruments. First-stage F-statistics suggest that the instruments are highly relevant, and over-identification tests (Hansen/Sargan) indicate that the instruments are valid ($p > 0.10$). The IV results confirm that price elasticity remains negative and inelastic, income elasticity remains small and positive, and cultural and behavioural indices remain large and statistically significant.

GMM estimates were obtained for the dynamic specification in order to correct for dynamic panel bias and residual endogeneity (Arellano & Bond, 1991). The lagged dependent variable remains highly significant, with a persistence parameter close to 0.65. Tests of over-identifying restrictions and serial correlation in the error terms support the validity of the GMM specification. The magnitudes and signs of the

Table 3
Robustness checks: coefficient estimates across alternative models
(Dependent variable: Log(Gold Demand))

Variable	FE Estimate (SE)	IV Estimate (SE)	RE Estimate (SE)	GMM Estimate (SE)
Log(Gold Price)	-0.21 (0.08)**	-0.19 (0.09)*	-0.20 (0.07)**	-0.22 (0.06)**
Log(Income per Capita)	0.06 (0.02)**	0.05 (0.02)*	0.05 (0.02)**	0.06 (0.01)**
Cultural Perception Index	9.78 (3.12)**	10.12 (3.45)**	9.65 (2.98)**	9.88 (2.85)**
Behavioural Factor Index	7.64 (2.89)**	7.25 (3.01)**	7.30 (2.77)**	7.80 (2.66)**

**Note: Standard errors in parentheses; **p < .01, p < .05*

key coefficients are very similar to those obtained using the FE and IV models.

5. Conclusions

The present study was initiated with a divergence between theoretical frameworks and empirical observations, particularly in the context of the Western Balkans, where the behaviour of gold deviates from the standard textbook descriptions. It was hypothesised that, in contrast to the prevailing perspective of gold as an elastic luxury good, the demand for gold in this region would be inelastic with respect to price. The estimated price elasticity of approximately −0.21, which proved to be robust across a range of estimators including fixed-effects, random-effects, IV and GMM, is consistent with this hypothesis. In econometric terms, a 1% increase in the price of gold reduces demand by just 0.21%. In practice, this means that even when the price of gold rises in euros or dollars, households in Skopje, Tirana or Pristina do not significantly reduce their purchases. They cut back on other expenditures and postpone other projects, but they still "make the gold" for a wedding, a dowry or a daughter's future. The inelastic coefficient is more than just a number; it is a statistical reflection of how deeply gold is interwoven into the material and symbolic fabric of everyday life.

Hypothesis 4 suggested that income would only have a weak impact once cultural and behavioural factors were considered. The results validate this, with an income elasticity of around 0.06 indicating that a 10% increase in average income in the Western Balkans would lead to a rise in gold demand of less than 1%. This is not typical of a status luxury. Instead, it reflects the fact that, for many households in the region, gold is not something they only start buying once they are considered "rich" by Western standards. They purchase it at low-income levels, often using remittances, earnings from seasonal work or informal employment, because they perceive gold to be the safest place to store surplus value. When incomes grow, some gold purchases increase marginally, but the core motive – to provide a tangible hedge against inflation, devaluation and institutional fragility – was already in place. The small positive elasticity coefficient reflects the socio-economic reality of a region where formal savings accounts, pension funds, and capital markets are not as trusted as a bracelet kept in a family drawer.

Hypotheses 2 and 3 deliberately moved beyond price and income, positing that cultural and behavioural factors have an independent and positive influence on gold demand. The estimates are unambiguous. The Cultural Perception Index, scaled between 0 and 1, has a coefficient of approximately 9.78, while the Behavioural Factor Index, scaled in the same way, has a coefficient of around 7.64. In model space, these are significant coefficients; in lived space, they capture phenomena that regional ethnographers have long described. Where the cultural index is high – where gold is given as a gift at weddings, where a woman's jewellery is seen as a form of personal security, and where families talk about "gold for bad days" – demand for gold is consistently higher, even at the same income level and price. Where the behavioural index is high – where memories of inflation are fresh, banks are mistrusted and people still remember frozen deposits and currency changes – risk and loss aversion push households towards holding something they can touch, weigh and pass on. Therefore, hypotheses 2 and 3 are not merely abstract statements about "culture" and "behaviour"; they are supported by coefficients that closely align with the everyday logic of precaution, honour, and obligation that structure economic life in the Western Balkans.

The incorporation of a dynamic term within the model serves to enhance the degree of realism inherent in the theoretical framework. The lagged dependent variable enters with a coefficient of approximately 0.65, indicating strong persistence in gold demand over time. This persistence can be attributed to the cultural transmission of gold accumulation, which is perpetuated through rites of passage and reinforced by historical narratives of past crises. A household that purchased gold during the inflationary turmoil of one decade is more likely to continue purchasing gold in the subsequent decade. Furthermore, their children internalise this pattern, perceiving it as the behaviour of "responsible people". The statistical persistence parameter thus provides empirical evidence in support of the observation that gold demand does not undergo a complete annual re-optimisation; rather, it is a path-dependent habit that is transmitted across generations, anchored in memory and social comparison. The model's dynamics therefore mirror reality: behaviour in year t cannot be understood without the history of years t-1, t-2 and so on.

The combined picture that emerges from this analysis is both conceptually clear and empirically grounded. The first hypothesis is supported: gold demand is inelastic to price. This is not because economic agents do not understand prices, but because the role of gold in their lives is not that of a marginal consumption good. The fourth hypothesis is supported: income is a factor, but only to a marginal extent, because even households with low incomes feel compelled to hold some gold as a form of insurance and as a symbol of status. The second and third hypotheses are supported: culture and behaviour are not merely "soft" factors but rather central structural determinants that shape both the level and the responsiveness of demand. It is evident that all of the aforementioned elements are embedded within a dynamic process that the model captures through persistence. However, it is important

to note that this process is also visible in the continuity of practices, stories and expectations surrounding gold.

These findings have direct implications for the way in which economists conceptualise demand in such contexts. The elasticities estimated are not universal parameters; they are the outcomes of a specific configuration of financial underdevelopment, historical shocks, cultural scripts and behavioural heuristics. In markets where there is a high level of trust in banks and the state, and where alternative financial instruments are both widely accessible and credible, the same good could display very different elasticities. In the Western Balkans, however, gold functions as a store of value, a social obligation, a dowry, collateral, an heirloom and a psychological hedge. The findings, as evidenced by the data, indicate that households utilise gold as a means to address challenges that conventional models attribute to financial markets and social insurance systems. Any theory that abstracts from this reality will misinterpret the numbers it seeks to explain.

The link from coefficients and hypotheses to reality is equally stark for policy. If demand for gold is price-inelastic because it serves roles that no formal product has yet credibly replaced, raising taxes or import duties on gold will not dramatically reduce holdings. It will simply make an already costly form of security even more expensive. Similarly, if income growth does not automatically result in diversified portfolios, development strategies cannot assume that rising GDP per capita alone will draw households into formal savings and pension systems. If cultural and behavioural factors are central, financial inclusion cannot be reduced to opening accounts and offering products. It must also engage with the narratives of safety, honour, intergenerational responsibility and loss which currently underpin the dominance of gold.

In this respect, the case of the Western Balkans is more than just a regional curiosity. With explicit hypotheses and measurable coefficients, it demonstrates how the "reality" that economists seek to model is shaped by institutions, culture and psychology as much as by prices and incomes. Rather than declaring classical demand theory to be wrong, the paper's main contribution is to demonstrate, in a concrete, data-driven way, what happens when the same theoretical framework is applied to a world in which gold is not just a commodity, but also a symbol of security, status and memory. Any policy or model hoping to be effective in such a world must recognise this.

References:

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, *58*(2), 277–297.

Ariely, D. (2008). *Predictably irrational: The hidden forces that shape our decisions*. HarperCollins.

Baur, D. G., & Lucey, B. M. (2010a). Is gold a hedge or a safe haven? An analysis of stocks, bonds and gold. *Financial Review*, *45*(2), 217–229.

Baur, D. G., & Lucey, B. M. (2010b). Is gold a safe haven? International evidence. *Journal of Banking & Finance*, *34*(8), 1886–1898.

Chand, R. (2012). The demand for gold in developing countries. *Emerging Markets Review*, *13*(1), 84–102.

Deaton, A. (2003). Gold and inflation in developing countries. *Review of Development Economics*, *7*(4), 431–447.

Feldstein, M. (1997). The political economy of the global financial crisis. *Foreign Affairs*, *76*(1), 51–64.

Hawkins, J., & Gendall, P. (2011). Cultural perceptions of gold as a symbol of wealth. *International Journal of Economic Studies*, *19*(2), 145–156.

Haugom, E. (2021). Supply and demand elasticities in the gold market. *Journal of Commodity Markets*, *19*, 100123.

Haxhiu, B., & Shala, A. (2018a). Gold as a cultural asset in the Western Balkans: Social and economic implications. *Cultural Economics Review*, *12*(3), 45–62.

Haxhiu, B., & Shala, A. (2018b). The role of gold in the Western Balkans: A cultural and financial analysis. *Balkan Journal of Economics*, *6*(3), 120–133.

International Monetary Fund. (2019). *Private gold market model and demand elasticities* (IMF Working Paper). International Monetary Fund.

Jorion, P., & Goetzmann, W. N. (2000). Global stock markets and gold. *Journal of Portfolio Management*, *26*(4), 64–77.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291.

Kiyosaki, R. (2007). *Rich dad's guide to investing: What the rich invest in, that the poor and the middle class do not!* Warner Business Books.

Krugman, P. (2009). *The return of depression economics and the crisis of 2008*. W. W. Norton & Company.

Mandelbrot, B., & Hudson, R. L. (2004). *The (mis)behavior of markets: A fractal view of risk, ruin, and reward*. Basic Books.

McMahon, S. (2017). Gold as a safe haven in developing economies. *World Economics*, *18*(2), 113–130.

Sharma, R. (2015a). The economics of gold demand in emerging economies. *International Journal of Emerging Market Economics*, *8*(1), 56–74.

Sharma, R. (2015b). Gold as a store of value in developing economies. *Journal of Development Studies*, *51*(7), 895–910.

Subramanian, A., & Suresh, N. (2009a). The role of gold in the economy of India. *South Asian Journal of Economics*, *10*(2), 45–61.

Subramanian, A., & Suresh, N. (2009b). Gold: Demand determinants and price behaviour. *Economic and Political Weekly*, *44*(32), 53–61.

Thaler, R. H. (1985). Mental accounting and consumer choice. *Marketing Science*, *4*(3), 199–214.

Tully, E., & Lucey, B. M. (2007). A power GARCH examination of the role of gold in the investment portfolio. *Journal of International Financial Markets, Institutions and Money*, *17*(3), 265–281.

Uriel, E. (2019). *Introduction to econometrics* (12th ed.). University of Valencia.

Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach* (5th ed.). Cengage Learning.

Yglesias, M. (2019). The economics of gold in emerging markets. *Journal of Global Economics*, *27*(5), 145–159.

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