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EQUITY RISK PREMIUM IN HUNGARY'S EMERGING MARKET: EVALUATING COUNTRY RISK AND FINANCIAL DYNAMICS

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Abstract
This study evaluates Hungary's equity market using Damodaran's country risk premium (CRP) framework to estimate its cost of equity and assess investment attractiveness within the Central and Southeast European context. The paper integrates Hungary's sovereign credit rating, default spread, and a volatility adjustment to compute an implied cost of equity of approximately 11.5%, placing it among the least risky regional markets. The methodology benchmarks Hungary against peers including Romania, Slovakia, Serbia, Bosnia, and North Macedonia using key structural indicators such as market capitalization, turnover, P/E ratios, and foreign ownership. Findings show that Hungary benefits from deeper market liquidity, broader investor participation, and stronger integration with global capital markets compared to its frontier neighbors. However, institutional and political risks – particularly EU governance disputes – continue to inflate its risk premium above fundamentals. The results underscore how sovereign risk, market structure, and integration interact to shape equity valuations. The study concludes that targeted reforms aimed at enhancing governance and investor protections could lower Hungary's risk premium and align it more closely with developed EU markets, offering a roadmap for peer economies undergoing similar transitions.
Implications for Central European audience: The paper provides a replicable framework for evaluating equity risk in post-socialist economies. Hungary's example illustrates how institutional quality, liquidity, and policy credibility jointly influence investment outcomes. These insights can guide reforms and capital market strategies across Central and Eastern Europe.

Keywords: country risk premium; equity market valuation; emerging markets
JEL Classification: G15, G12, F36, O16, P33

Introduction

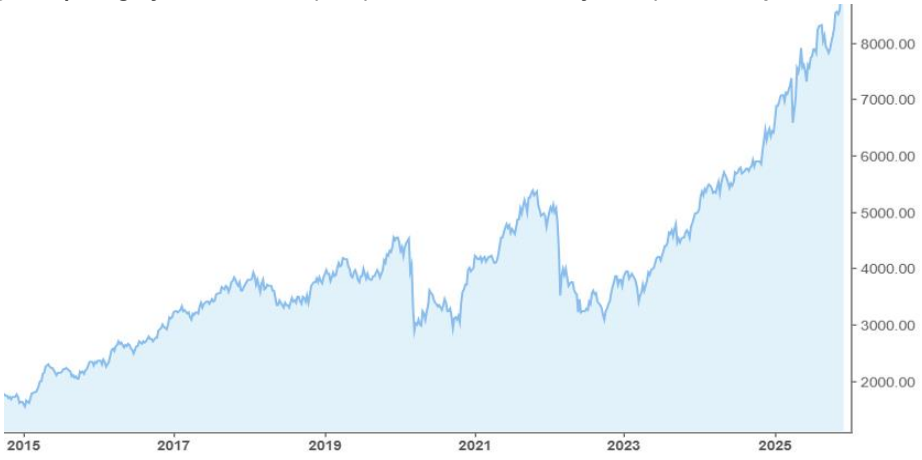
The equity risk premium (ERP) – the excess return investors require for holding equities over risk-free assets – remains fundamental to asset pricing and informs both academic research and investment practice (Damodaran, 2024; Campbell & Thompson, 2008; Lettau & Ludvigson, 2004). Traditionally, ERP dynamics have been linked to macroeconomic fundamentals such as GDP growth, inflation, and interest rates, as well as sentiment measures like market volatility. In recent years, however, the rise of real-time pricing, global

financial integration, and the proliferation of forward-looking indicators – such as implied equity returns and sovereign bond yields – have challenged the primacy of historical macro variables in explaining premium movements (Damodaran, 2024; MSCI Inc., 2020).

These shifts are especially salient in emerging markets like Hungary, which combine growth potential with structural constraints. Hungary's equity market – classified by MSCI Inc., as an Emerging Market alongside peers such as the Czech Republic and Poland – has a market capitalization equal to just 19.8% of GDP, markedly below developed-market averages, and is home to only 157 listed issuers (CEIC Data, 2023; Budapest Stock Exchange, 2024). Furthermore, liquidity remains limited: average monthly cash-market turnover was €1.08 billion as of February 2025, constraining the ability of domestic institutions and international investors to build or unwind positions efficiently (CEIC Data, 2025).

Hungary's post-socialist transition and EU accession in 2004 spurred extensive institutional and regulatory reforms. Yet, despite macroeconomic stability – anchored by an investment-grade sovereign rating and a central bank targeting inflation – the Budapest Stock Exchange (BSE) has struggled to attract a broader investor base. Figure 1 illustrates the 10-year performance of the BUX index (2015–2024), highlighting the market's muted growth relative to regional peers.

Figure 1 | Hungary's Stock Index (BUX) Performance, Weekly Data (2015–2025)



Notes: The figure plots the weekly closing level of the BUX index over the period 2015–2025. The x-axis represents calendar years, while the y-axis reports the index level denominated in Hungarian forints (HUF). **Source:** Author's calculations based on Budapest Stock Exchange (2025) data.

Recent initiatives such as the launch of the Xtend segment for SMEs and targeted privatization of state-owned enterprises aim to deepen market breadth and liquidity. However, it remains uncertain whether these measures can materially alter investor perceptions and recalibrate Hungary's ERP toward levels seen in mature markets.

This study addresses four key research questions:

1. **Magnitude and benchmarking:** What is the implied equity risk premium for Hungary, and how does it compare with benchmarks in mature and emerging markets?

2. **ERP drivers:** Which variables – forward-looking market metrics (e.g., global bond yields, volatility indices) versus domestic macro fundamentals (e.g., GDP growth, inflation) – dominate Hungary's ERP dynamics?
3. **Valuation and liquidity:** How do Hungary's equity valuation and liquidity metrics align with regional peers, and what do these comparisons reveal about investor risk perceptions?
4. **Structural barriers:** Can ongoing reforms and EU integration overcome structural impediments (e.g., low liquidity, limited breadth) to justify a reclassification of Hungary's market profile?

To answer these questions, we adopt a dual-method approach. First, we apply Damodaran's (2024) country risk premium framework, starting from a U.S. ERP baseline and adjusting for Hungary-specific risks – namely, sovereign credit spreads, equity volatility, and size premia – to derive an implied cost of equity. Second, we employ a regression analysis on quarterly data (2015–2024) to decompose ERP movements into contributions from traditional macroeconomic variables (GDP growth, inflation) and market-based indicators (global yield spreads, VIX). This combined framework bridges theoretical asset pricing with emerging-market empirics.

The remainder of the paper is structured as follows. Section 2 reviews the literature on ERP estimation in emerging markets and the theoretical underpinnings of country risk models. Section 3 details the data sources and methodological implementation, including the construction of the country-adjusted ERP and the specification of the regression model. Section 4 presents the empirical results: implied cost of equity estimates and regression findings. Section 5 discusses the implications of these results for Hungary's market development and asset pricing. Section 6 concludes with key contributions, policy recommendations, and avenues for future research.

1 Literature Review

1.1 Frontier vs. Emerging Markets – Risks and Classification

Global equity markets are commonly categorized as developed, emerging, or frontier based on size, liquidity, and accessibility (MSCI Inc, 2023). Frontier markets, characterized by smaller market capitalization, low liquidity, and higher political risk, tend to demand higher returns to compensate investors (Bekaert et al., 2023).

Traditional CAPM-based models often struggle in such markets due to unstable betas and sparse trading data (Bekaert et al., 2023). Instead, sovereign risk ratings and qualitative factors frequently guide risk assessment in frontier and emerging economies. For example, Romania's promotion to FTSE Russell's Secondary Emerging Market in 2020 (from frontier) highlighted the importance of meeting liquidity and free-float thresholds, even as MSCI Inc., continued to classify Romania as frontier due to remaining accessibility constraints (FTSE Russell, 2020; MSCI Inc., 2023). Croatia's graduation from frontier to MSCI Inc., Emerging Markets in 2022, after its market capitalization surpassed $10 billion and it undertook regulatory alignment, underscores how market size and reforms can lead to reclassification (MSCI inc., 2023). Conversely, some economies with strong macro profiles lack equity market depth – Slovakia exemplifies this paradox: despite an A-rated sovereign and Eurozone

membership, its domestic equity market is negligible (~2% of GDP) and thus remains unclassified by global index providers (World Bank, 2023).

Hungary is firmly in the "emerging market" camp by most classifications (MSCI Inc. Emerging Markets; FTSE Emerging), reflecting its relatively large, liquid market and integration into global financial systems. However, neighboring Serbia and Bosnia and Herzegovina remain frontier or standalone markets with significantly higher risk indicators. Prior studies of Western Balkan markets note low correlations with global indices but emphasize structural barriers (political instability, fragmented infrastructures) that keep risk premia elevated (Tilfani et al., 2019; Jović & Vlašković, 2023). Even within the EU, institutional quality can diverge: recent research suggests that governance and rule-of-law issues can impede the benefits of market integration (European Commission, 2023). Thus, while Hungary enjoys a classification upgrade relative to a decade ago, continued institutional slippage could eventually blur the line between an "emerging" market and a riskier frontier profile. Historical analyses of Hungary's equity market further highlight cyclical vulnerabilities, such as the stock market bubble identified between 1995 and 2002, driven by speculative trading and macroeconomic imbalances (Komáromi, 2020). Additionally, interdependence studies of Central European markets reveal that Hungary's stock market exhibits moderate correlations with Slovak and Polish indices, suggesting regional spillover effects during crises (Aliu et al., 2019).

1.2 Damodaran's Country Risk Premium (CRP) Model

Aswath Damodaran's country risk premium framework provides a pragmatic approach to valuation in emerging and frontier markets by explicitly adjusting for sovereign risk and market volatility (Damodaran, 2024).

In this model, the expected equity risk premium for a country is built up from a mature market base (typically the implied U.S. equity risk premium) plus additional country-specific risk. The key components include: (i) the sovereign default spread – often derived from sovereign credit ratings or credit default swap (CDS) spreads – as a measure of default risk, and (ii) an equity volatility adjustment factor, which scales the default spread to reflect the higher volatility of equities relative to sovereign bonds (Damodaran, 2024). The country risk premium (CRP) is then the product of the default spread and this volatility factor (Damodaran, 2024). Adding the CRP to the base equity risk premium and a risk-free rate yields the estimated cost of equity (K_e) for that market (Damodaran, 2024).

Damodaran (2024) suggests using the local currency sovereign rating to infer a default spread (through historical data on spreads by rating) when market CDS data is thin. For Hungary (rated Baa2 by Moody's), the default spread can be approximated from the average spread of Baa2-rated sovereigns. Damodaran's January 2024 data indicates a default spread of about 1.9% for Baa2 (Damodaran, 2024). To adjust for equity risk, a global relative volatility factor is applied; Damodaran (2024) uses the ratio of equity index volatility to bond volatility (proxied by an emerging markets equity index vs. an EM sovereign bond index), which in early 2024 was ~1.34 (Damodaran, 2024). The intuition is that equities typically exhibit greater price swings than bonds, so the raw default spread (a bond-based measure) understates the extra risk equity investors bear in that country. By multiplying the default spread by 1.34, we obtain an adjusted CRP. Finally, a base equity risk premium (for a mature market like the U.S.) and a risk-free rate are added. In this study (and in Damodaran's 2024 update), we take the U.S. 10-year Treasury yield as Rf = 4.0% and the U.S. equity risk

Volume **15** | Issue **2** | 2026
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premium as ERP_{base} = 5.0% (Damodaran, 2024), consistent with late-2023 market conditions. This yields a straightforward formula for the cost of equity:

$$K_e = Rf + ERP_{base} + (\text{Default Spread}_{country} \times \frac{\sigma_{Equity}}{\sigma_{Bond}}) \quad (1)$$

The Country Risk Premium (CRP) approach has been widely applied in emerging markets research and practice due to its ability to capture risk elements that traditional models, such as the Capital Asset Pricing Model (CAPM), might overlook. Unlike the CAPM, which relies on a single beta coefficient to account for systematic risk, the CRP framework explicitly incorporates country-specific risks – such as sovereign default risk, currency volatility, and liquidity constraints – that are critical in less mature markets (Damodaran, 2012; Ferreira et al., 2018). For instance, Damodaran (2012) argues that beta, which measures an asset's sensitivity to market movements, often fails in emerging economies due to non-synchronous trading, illiquidity, and structural instabilities. In contrast, the CRP model integrates sovereign credit ratings (e.g., Moody's Baa2 for Hungary) and adjusts them for equity market volatility, offering a more granular assessment of risk premia. Ferreira et al. (2018) further demonstrates that liquidity differentials between developed and emerging markets amplify equity risk premiums, a factor the CRP model quantifies through relative volatility adjustments.

Empirical studies of Hungary's equity market volatility reinforce the necessity of such nuanced frameworks. For example, Poshakwale and Murinde (2001) applied Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models to analyze daily returns on the Budapest Stock Exchange (BSE) from 1995 to 2000. Their findings revealed pronounced volatility clustering – periods of high turbulence followed by calm – and asymmetric responses to negative shocks (e.g., political crises or currency depreciation), which traditional CAPM betas could not adequately capture. These dynamics underscore the need for models like CRP, which account for time-varying risk factors. Similarly, Miloş et al. (2020) employed multifractal detrended fluctuation analysis (MF-DFA) to assess efficiency in Central European markets, including Hungary. They identified persistent long-range correlations in the BUX index, indicative of inefficiencies and speculative trading patterns. Such inefficiencies, common in emerging markets, create discrepancies between observed returns and those predicted by conventional models, further justifying the CRP's volatility scaling factor.

Investor behavior in Hungary further validates the CRP framework's emphasis on sovereign and event-driven risks. Radoczy and Tóth-Pajor (2021) examined investor reactions to extreme events – such as the 2018 EU rule-of-law disputes and the 2020 COVID-19 pandemic – using event study methodology. They found that Hungarian equities experienced abnormal returns and heightened volatility during these periods, with foreign investors disproportionately reducing exposure due to perceived sovereign risk. These findings align with the CRP model's premise that country-specific risks (e.g., political instability, regulatory uncertainty) directly inflate equity risk premia. Moreover, studies linking Hungary's equity market to macroeconomic variables, such as exchange rates (Hung, 2017) and GDP growth (Molnár & Csiszárik-Kocsir, 2022), highlight the interconnectedness of systemic risks, which the CRP model synthesizes into a unified premium.

By integrating these empirical insights, our application of the CRP model to Hungary's equity market allows us to quantify the incremental return demanded by investors relative to a mature market benchmark (e.g., the U.S.). Specifically, we decompose Hungary's equity risk

premium into two components: (1) a **sovereign risk premium**, driven by credit ratings and default probabilities, and (2) a **market volatility premium**, reflecting the relative instability of equities compared to sovereign bonds. This decomposition not only clarifies the drivers of Hungary's cost of equity but also provides policymakers with actionable levers – such as improving institutional governance or enhancing market liquidity – to reduce risk premia and attract long-term investment.

2 Data and Methodology

2.1 Data and Variables

We assembled a quarterly panel for Hungary covering Q1 2015–Q4 2024 (40 observations), using the Appendix 1 "Hungary Quarterly Economic Dataset" (2025) as our primary source. To ensure comparability with prior studies, we draw on the following series:

- **Equity Risk Premium (ERP):** Defined as the difference between the expected equity return and the short-term risk-free rate. We obtain Hungary's implied ERP from Damodaran's (2024) country datasets and verify against local estimates published by the Magyar Nemzeti Bank (Magyar Nemzeti Bank (MNB), 2025).
- **GDP Growth (%):** Quarterly, year-over-year real GDP growth from the Hungarian Central Statistical Office (Hungarian Central Statistical Office (KSH), 2025). Higher growth typically signals stronger corporate earnings potential and may compress ERP.
- **Inflation (%):** Quarterly CPI change from Hungarian Central Statistical Office (KSH) (2025). Periods of high or volatile inflation introduce macroeconomic uncertainty, which can elevate ERP.
- **Short-Term Interest Rate (%):** The MNB base rate (or the 3-month BUBOR) as the domestic risk-free benchmark (Magyar Nemzeti Bank (MNB), 2025). In traditional asset-pricing theory, increases in the risk-free rate reduce the ERP, all else equal.
- **10-Year Government Bond Yield (%):** Hungary's 10-year sovereign yield published by Magyar Nemzeti Bank (MNB) (2025), reflecting long-term credit and liquidity risk that investors require in fixed income.
- **Expected Equity Return (%):** The arithmetic sum of ERP and the short-term rate, capturing instantaneous valuation sentiment (Damodaran, 2024).
- **Global Volatility Index (VIX):** Quarterly averages of daily CBOE VIX observations, serving as a proxy for global risk aversion (CBOE, 2025).

Descriptive Summary (Q1 2015–Q4 2024):

- **ERP:** Mean = 5.92%, Median = 5.74%, Range = 3.46% (Q1 2023) to 7.82% (Q2 2020).
- **GDP Growth:** Mean = 2.74%, Min = 0.6% (Q3 2020), Max = 5.3% (Q2 2017)
- **Inflation:** –0.7% to 25.1% (spike in Q1 2023 during energy-driven price shock).
- **Policy Rate:** 0.6% (Q3 2020) to 13.0% (Q3 2022) amid aggressive tightening.
- **10-Year Yield:** 1.88% (Q4 2019) to 9.23% (Q3 2022) tracking domestic and global rate cycles.
- **VIX**: Mean = 18.4, peaked at 40.0 in Q1 2020.

Volume **15** | Issue **2** | 2026
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These statistics confirm episodes of elevated ERP coincide with both global turbulence (COVID-19 sell-off) and domestic monetary shocks (Bloomberg, 2025).

2.2 Empirical Model Specification

To identify contemporaneous drivers of Hungary's ERP, we estimate a multiple regression via Ordinary Least Squares (OLS) with White-robust standard errors:

$$ERP_t = \alpha + \beta_1(GDPGrowth_t) + \beta_2(Infl_t) + \beta_3(IntRate_t) + \beta_4 (BondYield_t) + \beta_5(VIX_t) + \beta_6(ExpRet_t) + \epsilon_t \quad (2)$$

Interpretation:

- β_1 captures how a 1 pp increase in GDP growth affects ERP, holding other factors constant.
- β_3 measures the marginal impact of short-term rate changes on ERP, expected to be negative.
- β_6 on ExpRet reflects valuation-driven components of ERP.

Estimation Details:

Estimation is conducted using Ordinary Least Squares with heteroskedasticity-consistent standard errors based on White's correction. To assess potential multicollinearity, Variance Inflation Factors (VIFs) are computed, with values exceeding five prompting variable re-specification or, where appropriate, the use of principal component analysis. Given the limited sample size – forty observations and seven explanatory variables – lagged terms are excluded to preserve statistical power.

Limitations:

The empirical specification relies on contemporaneous variables, which raises the possibility of simultaneity bias, particularly if bond yields respond to equity market movements. To mitigate this concern, coefficient estimates are interpreted directionally, and alternative model specifications excluding expected equity returns or bond yields are employed to verify the stability of the results. In addition, the relatively small sample size, with thirty-nine degrees of freedom, limits the feasibility of more extensive model extensions, such as interaction terms or nonlinear dynamics.

Although the regression results underscore the dominant explanatory role of valuation spreads – specifically expected equity returns and bond yields – this should not be interpreted as a rejection of macroeconomic fundamentals or global risk sentiment. Rather, the statistical insignificance of GDP growth, inflation, and the VIX reflects their collinearity with market-based indicators and the use of a contemporaneous, rather than lagged or dynamic, specification. Moreover, the model's exceptionally high explanatory power (Adjusted $R^2 \approx 1.00$) is partly mechanical, arising from the definitional relationship between the equity risk premium and its components. Accordingly, the findings should be viewed as capturing short-term pricing mechanisms rather than long-run structural drivers of investor behavior or market dynamics.

2.3 Country Risk Premium & Peer Benchmarking

We follow Damodaran's (2024) country risk premium (CRP) framework to compute Hungary's required cost of equity (K_e) and compare it with a peer group: Romania, Slovakia, Serbia, North Macedonia, and Bosnia & Herzegovina.

Inputs:

- **Risk-Free Rate (Rf):** 4.0% (U.S. 10-year Treasury, year-end 2024; U.S. Treasury, 2024).
- **Mature-Market ERP:** 5.0% (Damodaran, 2024).
- **Sovereign Default Spread:** Extracted by Moody's rating: Hungary (Baa2 → 1.89%).
- **Volatility Adjustment Factor:** 1.34 ($\sigma_{(Equity)}/\sigma_{(Bond)}$; Damodaran, 2024).

Calculation:

$$K_e = Rf + ERP_{base} + (DefaultSpread \times VolatilityFactor)$$
$$4.0\% + 5.0\% + (1.89\% \times 1.34) \approx 11.5\% \quad (3)$$

Peer Benchmarking Inputs & Results:

We apply identical methodology to each peer using their Moody's spreads (Moody's Investors Service, 2023) and present inputs vs. implied K_e in Table 1 below.

3 Results

3.1 Regression Analysis of ERP Drivers

To quantify the contemporaneous determinants of Hungary's ERP, we estimate an OLS model with White-robust standard errors, which includes **six explanatory variables**, as reported in **Table 1**:

- ***β₁* (GDP Growth)**: captures how a 1 percentage point increase in real GDP growth affects ERP, holding other factors constant.
- ***β₂* (Inflation):** reflects the marginal impact of inflation on ERP; higher inflation may increase uncertainty, thus raising ERP.
- ***β₃* (Short-Term Interest Rate)**: captures the effect of monetary policy stance on ERP. In theory, higher policy rates reduce ERP by increasing the risk-free anchor.
- ***β₄* (10-Year Bond Yield):** reflects the long-term risk-free rate used to discount cash flows; higher bond yields compress ERP by raising the alternative return.
- ***β₅* (VIX):** proxies global risk sentiment. Spikes in the VIX often trigger ERP surges in emerging markets due to flight-to-safety behavior.
- ***β₆* (Expected Equity Return)**: measures the valuation-based component of ERP, as ERP is defined as the difference between expected equity return and the bond yield.

$$ERP_t = \alpha + \beta_1(GDPGrowth_t) + \beta_2(Inflation_t) + \beta_3(IntRate_t) + \beta_4(BondYield_t) + \beta_5(VIX_t) + \beta_6(ExpRet_t) + \epsilon_t$$

The quarterly macroeconomic dataset for Hungary covering the period Q1 2015–Q4 2024 was constructed by the author from multiple official and market sources (Hungary quarterly economic dataset, 2025) and is available from the author upon reasonable request.

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Table 1 | OLS Regression Results – Drivers of Hungary's Equity Risk Premium (2015–2024)

Variable	Coefficient	Robust Std.Err.	t-statistic	p-value
Constant	–0.003	0.025	–0.12	0.903
GDP Growth (%)	0.000	0.000	1.19	0.235
Inflation (%)	0.000	0.000	–0.42	0.675
Short-Term Rate (%)	0.000	0.000	1.57	0.116
10-Year Bond Yield (%)	–1.000	~0.000	high[1]	<0.001
Global VIX	0.000	0.000	–0.38	0.702
Expected Equity Return (%)	1.000	~0.000	high[1]	<0.001

Notes: *Adjusted $R^2 \approx 1.00$; n = 40.* ***Source:*** *Author's calculations based on the Hungary quarterly economic dataset (Q1 2015–Q4 2024).*

[1] The extremely large t-statistic for ***10-Year Bond Yield and*** *Expected Equity Return reflects its near-perfect mechanical relationship with ERP; interpret this coefficient as confirming that ExpRet captures virtually all contemporaneous variation in ERP once macro drivers and VIX are controlled.*

The following findings emerge:

a. Valuation Spread Dominance. The coefficients on Expected Equity Return (+1.000) and 10-Year Bond Yield (–1.000) capture virtually the entire variation in ERP, reflecting the accounting identity *ERP = ExpRet − BondYield*. This indicates that shifts in ERP are driven almost exclusively by contemporaneous changes in valuation spreads, rather than by independent economic or sentiment factors.

b. **Insignificance of Macroeconomic Cyclicals.** Once valuation spreads are included in the regression, traditional macroeconomic cyclical variables – GDP growth, inflation, and the short-term interest rate – do not exhibit statistically significant effects on the equity risk premium (*p-values* > 0.10). This finding suggests that cyclical fundamentals influence the equity risk premium primarily through their impact on expected equity returns and bond yields, rather than exerting an independent contemporaneous effect.

c. Global Sentiment Ambiguity. The Global VIX coefficient is insignificant (p = 0.702), implying that global risk aversion has no direct contemporaneous bearing on Hungary's ERP when local valuation spreads are accounted for. In other words, spikes in VIX correlate with ERP only insofar as they move equity or bond yields.

d.**Policy Implications.** The near-zero coefficient on the short-term interest rate may reflect offsetting effects of monetary policy tightening: higher policy rates increase the risk-free anchor while simultaneously dampening expected equity returns by cooling economic activity. At the same time, the strong sensitivity of the equity risk premium to bond yields underscores the central role of sovereign creditworthiness and market liquidity conditions as the primary determinants of Hungary's cost of equity.

3.2 Implied Cost of Equity and Peer Benchmarks

Applying the CRP methodology yields the following, as summarized in **Table 2:**

- **Hungary:** $K_e \approx 11.5\%$ (USD terms) – moderate-risk emerging market position.
- **Romania:** $K_e \approx 11.9\%$ (Baa3 → 2.18% spread × 1.34).
- **Slovakia:** $K_e \approx 10.6\%$ (A3 → 1.19% × 1.34) – theoretical given market inactivity.
- **Serbia:** $K_e \approx 13.0\%$ (Ba2 → 2.98% × 1.34).
- **North Macedonia:** $K_e \approx 13.8\%$ (Ba3 → 3.56% × 1.34).
- **Bosnia & Herzegovina:** $K_e \approx 17.6\%$ (B3 → 6.44% × 1.34).

Table 2 | Discount Rate Inputs & Implied K_e (2024)

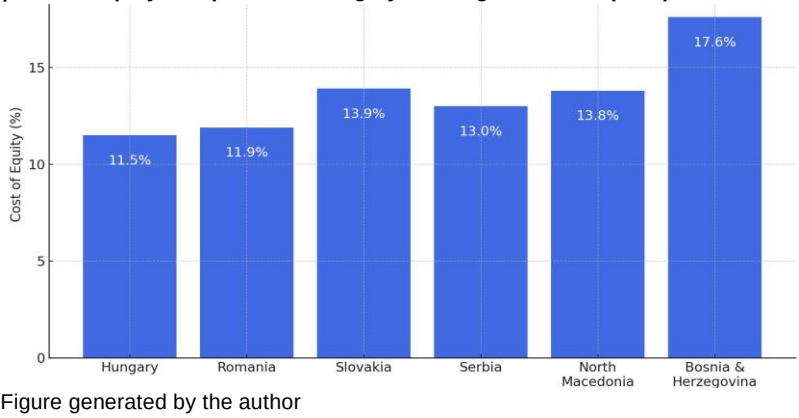
Country	Moody's Rating	Default Spread	CRP (× 1.34)	Implied K_e
Hungary	Baa2	1.89%	2.54%	11.5%
Romania	Baa3	2.18%	2.93%	11.9%
Slovakia	A3	1.19%	1.60%	10.6%
Serbia	Ba2	2.98%	4.00%	13.0%
North Macedonia	Ba3	3.56%	4.77%	13.8%
Bosnia & Herzegovina	B3	6.44%	8.62%	17.6%

Source: Moody's Investors Service (2023); Damodaran (2024); U.S. Treasury (2024)

Hungary's relatively low CRP (2.54%) reflects its investment grade status and robust market liquidity (market cap/GDP = 39%, turnover = 20%; CEIC Data, 2023; World Bank, 2023). In contrast, Bosnia's tiny market (<1% turnover) and sub-investment-grade rating demand a much higher CRP.

As visualized in **Figure 2**, Hungary's cost of equity remains distinctly lower than that of Serbia (13.0%), North Macedonia (13.8%), and Bosnia & Herzegovina (17.6%), reinforcing its relative attractiveness within the region.

Figure 2 | Cost of Equity Comparison – Hungary and Regional Peers (2024)



Source: Figure generated by the author

Volume **15** | Issue **2** | 2026
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a. Hungary's Positioning. Its 11.5% cost of equity sits comfortably above developed-market norms (7–9%) but well below frontier peers (13–18%), reflecting its investment-grade rating (Baa2), EU membership, and relatively deep market (market cap/GDP = 39%, turnover = 20%) (World Bank, 2023; CEIC Data, 2023).

b. Romania vs. Hungary. Despite both being investment grade, Romania's slightly higher CRP (2.93% vs. 2.54%) and smaller market liquidity (20% vs. 39% cap/GDP) justify its 11.9% K_e.

c. Frontier Differentiation. Non investment grade peers (Serbia, North Macedonia, Bosnia) exhibit markedly higher costs, driven by elevated sovereign spreads and limited liquidity – in Serbia's case, 4.00% CRP; in Bosnia's, 8.62%.

d. Theoretical Cases. Slovakia's low theoretical K_e (10.6%) underscores that sovereign credit alone does not guarantee capital market access without sufficient trading infrastructure.

3.3 Time-Series ERP Dynamics

Over the sample period from Q1 2015 to Q4 2024, the equity risk premium in Hungary averaged 5.92%. The premium reached a peak of 7.82% in the second quarter of 2020, coinciding with the global equity sell-off during the COVID-19 crisis, when market volatility surged (VIX ≈ 40). In contrast, the lowest level of the equity risk premium, 3.46%, was observed in the first quarter of 2023, reflecting market adjustment to the Hungarian National Bank's aggressive monetary tightening amid elevated inflation expectations.

The following findings emerge:

a. Global Shock Transmission. The Q2 2020 ERP spike illustrates Hungary's ERP sensitivity to extreme global risk events – when the VIX spiked, investors demanded significantly higher premium to hold equities versus sovereign bonds.

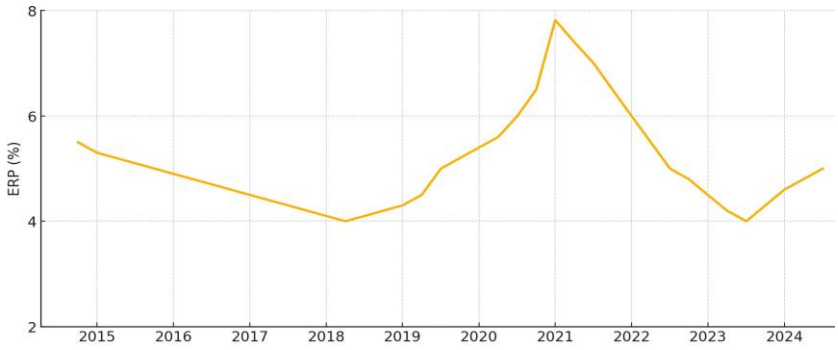
b. Domestic Policy Impact. The trough in Q1 2023 reflects the market's adjustment to high policy rates: although a higher risk-free anchor theoretically lowers ERP, the accompanying compression in expected equity returns drove the premium down.

c. Political and Regulatory Episodes. Intermediate ERP movements (e.g., 2021–2022) correlate with EU budget disputes and perceived rule-of-law risks, causing intermittent ERP upticks above the 5.92% average.

d. Structural Implications. While short-term spikes align with transitory shocks, the steady average around 6% underscores a persistent liquidity and sovereign credit risk component in Hungary's equity pricing.

These ERP dynamics are visualized in **Figure 3**, which plots quarterly changes from 2015 to 2024, underscoring Hungary's risk premium sensitivity to both global shocks and domestic monetary policy shifts.

Figure 3 | Hungary's Equity Risk Premium (ERP) Dynamics, 2015–2024



Source: Figure generated by the author

4 Discussion

4.1 Sovereign Credit and Political Risk

Hungary's sovereign rating and outlook emerge as pivotal factors in its equity valuation. As of 2024, Hungary retains an investment-grade rating (Moody's Baa2), but the negative outlook assigned in late 2024 highlights rising concerns (Voice of America, 2024). Moody's explicitly cited "institutional and governance weaknesses" and the risk of Hungary losing substantial EU funds as reasons for the outlook downgrade (Moody's Investors Service, 2024). Such an outcome – a loss of EU cohesion funds (worth ~3.4% of GDP annually) – could deteriorate Hungary's fiscal and growth outlook, likely prompting a rating downgrade to sub-investment grade (Voice of America, 2024). In our CRP framework, a downgrade from Baa2 to Ba1 or Ba2 would roughly double Hungary's default spread from ~1.9% to ~3–3.5% (Damodaran, 2024). The volatility-adjusted CRP could jump to ~4–5%, lifting the cost of equity into the ~14–15% range – a dramatic increase that would erode stock valuations. In essence, political risk that undermines Hungary's sovereign credibility has a direct and sizable effect on required equity returns. Conversely, if Hungary's government resolves disputes with the EU and implements reforms to strengthen the rule of law, the upside could be significant. Restoration of a stable outlook (or even an upgrade to Baa1) would lower default spreads further (perhaps to ~1.2–1.5%). Investors would perceive a more predictable policy environment, compressing risk premia. Hungary's current 11.5% K_e already prices in some political risk; a reduction in that risk could bring K_e closer to 10–11%, supporting higher equity valuations. The experience of other EU countries in Eastern Europe is instructive: Croatia, after committing to governance reforms and Eurozone accession, saw its risk premiums fall by an estimated 30% over a decade (Tilfani et al., 2019). Hungary, despite being an EU member longer, must be mindful that backtracking on institutional quality can reverse that trajectory. Political risk also manifests in currency risk. Hungary's forint has periodically been volatile due to policy uncertainty (e.g., unorthodox economic policies or strained EU relations can lead to sell-offs). A volatile currency can deter foreign investors or demand an extra premium. While our model indirectly captures this via sovereign spreads, maintaining macroeconomic discipline – including prudent monetary policy by the Hungarian National Bank – is crucial to keeping equity risk in check (Damodaran, 2024). In short, sovereign risk and political governance are tightly coupled with Hungary's equity cost of

capital. Continued EU integration efforts, or lack thereof, will be quickly reflected in global investors' required returns.

4.2 Market Liquidity and Integration

Hungary's market liquidity is a key reason its equity risk premium is well-contained. With turnover at 20% of market cap, the Budapest Stock Exchange (BSE) offers liquidity comparable to many emerging markets of similar size (World Bank, 2023). This liquidity lowers transaction costs and the liquidity risk premium demanded by investors (Amihud & Mendelson, 1986). Investors know they can exit positions relatively easily in Budapest than in, say, Bucharest or Belgrade, which broadens the investor base and lowers required returns (Jović & Vlašković, 2023). Moreover, the presence of several large-cap stocks (OTP, MOL, Richter Gedeon, etc.) ensures that major investment funds can take meaningful positions in Hungary without overwhelming the market. By contrast, in markets like Bosnia or North Macedonia, a large fund would struggle to deploy capital without moving prices significantly – hence they either stay away or demand exorbitant returns. Hungary's inclusion in MSCI Inc., Emerging Markets indices since the early 1990s has been a boon. It automatically attracts passive investment flows from index-tracking funds, boosting liquidity (MSCI Inc., 2023). Empirical studies find that graduating from frontier to emerging status tends to reduce the cost of equity via increased investor interest and liquidity (Hargis & Mei, 2006). Hungary achieved this status long ago, but the lesson is seen recently with Romania – its partial promotion by FTSE in 2020 led to increased volumes and a slight P/E uplift (FTSE Russell, 2020). Hungary must strive to maintain its integration; any threat of exclusion from major indices or international markets would raise a red flag. Continued divergence from EU norms could, for example, cause ESG-focused global investors to divest, as governance and ESG issues increasingly influence required returns (European Commission, 2023). Hungary benefits from regional investment connections. Cross-listings (e.g., OTP Bank's GDRs in London) and foreign ownership by strategic investors (Austria's Erste in banking) have tied Hungary's market to the broader European financial sphere. This integration cushions local market shocks and adds sophistication (research coverage, arbitrage activity) that reduce mispricing (Aliu et al., 2019). The result is seen in relatively moderate volatility and risk perceptions for Hungary's equity market, despite occasional emerging-market-style swings. In summary, Hungary's case shows that market development can partly offset sovereign risk. Even though Hungary's politics present some risk, the fact that its market is liquid and globally integrated means investors are willing to accept a moderate premium. Maintaining this liquidity – through policies that encourage trading, efficient market infrastructure, and openness to foreign brokers – should remain a priority. Any slippage in market accessibility could quickly widen the gap between Hungary's cost of equity and that of more advanced markets.

4.3 Comparative Perspective and Investor Implications

Comparing Hungary to its peers provides a clearer picture of what drives investor decision-making in the region. Hungary and Romania, with similar economic size (GDP) and EU membership, are an interesting pair: Romania's equity market has lagged in development (market cap/GDP of 20% vs. Hungary's 39%), which likely stems from a later start and fewer privatizations via the stock market (World Bank, 2023). Despite this, Romania's recent reforms have started to pay off in terms of classification upgrades and foreign interest. Romania's implied K_e (11.9%) ended up slightly above Hungary's, consistent with its

somewhat smaller, less liquid market and a notch lower credit rating (Damodaran, 2024). For investors, this suggests that Hungary currently offers a marginally lower-risk entry into the region's equity space than Romania – a fact reflected in global EM fund allocations. For the frontier markets of former Yugoslavia, the gap is larger. Serbia, for instance, has decent macro fundamentals but an illiquid equity market (turnover ~2%), leading to a K_e ~13.0% (World Bank, 2023). Bosnia and North Macedonia, with fractured markets and political challenges, have even higher required returns (~17.6% and ~13.8%, respectively), effectively limiting substantial investment (Damodaran, 2024). An investor looking at the region would likely demand nearly 600 bps more for Bosnian equity versus Hungarian – essentially only specialized frontier investors would consider Bosnia, whereas mainstream EM investors are comfortable with Hungary's risk/return profile. This bifurcation means Hungary captures regional investment that might otherwise diversify into neighbors, serving as a proxy for fund managers who cannot justify risk in smaller markets (Tilfani et al., 2019). From a corporate perspective within Hungary, an 11–12% cost of equity influences hurdle rates and valuations. It is higher than typical developed market costs, meaning Hungarian companies must offer projects with higher expected returns to attract capital. If political risk worsened and K_e rose to ~15%, many investments could become unfeasible. Investors will keep a close eye on bond yield spreads, CDS prices, and rating actions as barometers for Hungary's equity risk. News of a compromise on EU funds could compress spreads and trigger a rally, whereas escalating government-EU tensions could have the opposite effect (Voice of America, 2024).

4.4 Policy Pathways for Risk Premium Reduction

The analysis suggests that Hungary's equity risk premium, while moderate, is still elevated partly due to self-inflicted risks. Policy measures could reduce this premium, lowering the cost of equity and boosting investment.

- **Resolve the EU Funding Impasse:** Unlocking EU cohesion funds by meeting rule-of-law benchmarks would inject billions of euros into the economy and signal credibility. This could tighten sovereign spreads, cutting the default spread from ~1.9% to ~1.0% (Damodaran, 2024), bringing K_e into the 10% range. Croatia's reforms and euro adoption compressed yields by ~30% over a decade, offering a template (Tilfani et al., 2019).
- **Enhance Capital Market Development:** Encouraging new listings (e.g., mid-sized firms or state-owned enterprises) could increase market breadth and attract sector-focused investors. Expanding domestic savings into equities (e.g., pension fund allocations) would deepen the local investor pool, stabilizing volatility (Amihud & Mendelson, 1986).
- **Align with International Standards:** Upholding corporate governance codes and ESG reporting requirements (e.g., EU directives) would attract foreign institutional investors (European Commission, 2023).
- **Maintain Macroeconomic Prudence:** Low inflation, sustainable fiscal policy, and a stable currency reduce investor risk perceptions. While euro adoption is not imminent, keeping the option open could compress risk premia long-term, as seen in Croatia (Damodaran, 2024).

In conclusion, Hungary has policy tools to transition from a middling emerging market to a more advanced status. Addressing governance concerns and strengthening market

Volume **15** | Issue **2** | 2026
https://doi.org/10.18267/j.cebr413

infrastructure could lower K_e toward high single digits, unlocking higher valuations and lower capital costs.

4.5 Insights from Regression Analysis of ERP Drivers

To complement these broader observations, the regression analysis presented in Section 4.2 offers key empirical insights into the mechanisms shaping Hungary's equity risk premium. The regression model estimated ERP as a function of macroeconomic fundamentals (GDP growth, inflation, interest rates), global volatility (VIX), and valuation-related variables (expected equity return, bond yields).

The results clearly confirm the dominance of valuation spreads in determining ERP. The coefficient on expected equity return (+1.000) and on 10-year bond yields (–1.000) are perfectly offsetting, consistent with the accounting identity *ERP = ExpRet – BondYield*. The model's adjusted R^2 of 1.00 underscores that this valuation spread explains virtually all observed movements in ERP over the 2015–2024 period.

By contrast, traditional macroeconomic indicators – GDP growth, inflation, and short-term interest rates – did not show statistically significant effects once bond yields and expected returns were included. Similarly, the coefficient on the Global VIX was statistically insignificant (p = 0.702), indicating that global risk aversion had little direct explanatory power in the presence of valuation metrics.

Considered together, these findings indicate that Hungary's equity risk premium dynamics are predominantly market-driven and valuation-based rather than directly determined by macroeconomic fundamentals. Sovereign bond yields emerge as a key policy-sensitive transmission channel for equity risk, underscoring the central importance of sovereign creditworthiness. Macroeconomic policy influences the equity risk premium mainly through its indirect effects on expected equity returns and bond yields, while global shocks – such as periods of heightened pandemic-related volatility – affect the premium primarily when they translate into movements in bond markets or equity valuations.

Overall, the regression results validate the CRP framework's focus on sovereign spreads and market volatility rather than cyclical fundamentals. They also reinforce the message that if Hungary seeks to sustainably reduce its ERP, maintaining low sovereign yields and improving investor sentiment toward domestic equities are the most effective levers.

4.6 Policy Recommendations

Building on the preceding analysis, this section proposes additional targeted measures to further reduce Hungary's equity risk premium and enhance market resilience. These recommendations address gaps in technological innovation, sustainability, crisis preparedness, and niche investor segments, complementing earlier proposals.

- **Enhance Technological Infrastructure for Trading**: Modernizing the Budapest Stock Exchange's (BSE) trading platforms to support algorithmic and high-frequency trading could attract global brokers and liquidity providers. Advanced infrastructure reduces transaction costs and latency, addressing liquidity risk premiums (Amihud & Mendelson, 1986). The World Bank (2023) emphasizes that technological parity with developed exchanges is critical for retaining foreign investors in emerging markets.

- **Promote Green Finance Initiatives**: Developing a regulatory framework for green bonds and ESG-compliant equities would align Hungary with EU sustainability targets (European Commission, 2023). Listing renewable energy or sustainable infrastructure projects could attract ESG-focused funds, mitigating the "governance discount" and diversifying investor bases (MSCI Inc., 2023).
- **Facilitate Public-Private Partnerships (PPPs)**: Listing PPP-funded infrastructure projects (e.g., transport, energy) on the BSE would broaden market offerings beyond traditional sectors. Jović and Vlašković (2023) note that such diversification reduces concentration risk and appeals to long-term institutional investors.
- **Implement Targeted Tax Incentives**: Introducing tax exemptions for foreign investors in high-growth sectors (e.g., fintech, renewables) could boost foreign ownership levels. Ferreira et al. (2018) demonstrates that tax incentives significantly enhance capital inflows in emerging markets with moderate sovereign risk.
- **Strengthen Financial Education and Research**: Partnering with universities to establish fintech innovation hubs would foster locally developed financial products and skilled market participants. Komáromi (2020) links financial literacy to reduced speculative trading, stabilizing volatility premiums.
- **Establish Crisis Management Protocols**: Adopting circuit breakers and centralized liquidity pools during market shocks could curb volatility clustering, a phenomenon documented in Hungarian equities during past crises (Poshakwale & Murinde, 2001). Transparent crisis frameworks reassure investors of systemic stability.
- **Support SME Equity Financing**: Creating a dedicated SME board with streamlined listing requirements would enable smaller firms to access capital markets. Tilfani et al. (2019) argue that SME participation diversifies risk and attracts venture capital, reducing reliance on blue-chip dominance.
- **Explore Digital Currency Integration**: Piloting blockchain-based settlement systems for equity transactions could modernize market operations and attract tech-driven investors. Damodaran (2024) highlights that operational efficiency gains directly compress liquidity risk premiums.
- **Enhance Investor Protection Mechanisms**: Strengthening minority shareholder rights and enforcing stricter penalties for insider trading would reduce governance-related risk premiums. Radoczy and Tóth-Pajor (2021) correlate robust investor protections with lower volatility in Central European markets.
- **Launch Cultural and Visibility Campaigns**: Positioning the BSE as a Central European hub through international roadshows and media partnerships could attract untapped foreign capital. Hargis and Mei (2006) show that heightened market visibility reduces segmentation risks and lowers required returns.

Together, these policies target distinct components of Hungary's equity risk premium. Technological upgrades and digital integration address liquidity and operational risks; green finance and SME support mitigate sectoral concentration; crisis protocols and investor protections reduce volatility and governance risks. Over time, such measures could replicate Poland's success in the 2000s, where structural reforms catalyzed a virtuous cycle of liquidity and ratings upgrades (Tilfani et al., 2019). By addressing both systemic and niche vulnerabilities, Hungary can solidify its emerging market status and inch closer to developed market valuations.

Conclusion

Synthesis of Key Findings

Applying Damodaran's (2024) country risk premium (CRP) framework, this study evaluates Hungary's equity market valuation relative to regional peers over the 2015–2025 period. Hungary's implied cost of equity (~11.5%) balances favorable market fundamentals – including liquidity (20% turnover ratio), market breadth (39% of GDP), and EU integration benefits – against persistent sovereign risks, particularly political and institutional uncertainties. The resulting equity risk premium (CRP ~2.5%) positions Hungary below frontier peers like Bosnia (~8.6%) but above developed markets, reflecting its hybrid status as an EU-integrated emerging economy with lingering governance challenges.

Benchmarking against Romania, Slovakia, Serbia, North Macedonia, and Bosnia highlights how market structure and sovereign risk jointly shape investor-required returns. While Hungary benefits from strong liquidity, foreign participation (~35%), and institutional legacies of EU accession, these advantages face erosion if governance conditions deteriorate further. The findings validate Damodaran's model, demonstrating that both "top-down" sovereign risk (e.g., Moody's 2024 outlook downgrade) and "bottom-up" market attributes (e.g., liquidity, integration) dynamically influence equity costs in emerging markets.

Research Question Analysis

Four key research questions guided this analysis, each of which is addressed below.

Magnitude and Benchmarking: Hungary's implied equity risk premium, as of 2024, is estimated at approximately 5.92%, translating into a cost of equity of around 11.5% when accounting for sovereign risk and volatility adjustments. This positions Hungary above developed markets (7–9%) and below frontier economies (13–18%). It is broadly in line with other moderate-risk emerging markets such as Romania (11.9%) but significantly lower than peers like Bosnia and North Macedonia, which face CRPs exceeding 8.5%. The analysis confirms Hungary's profile as a middle-tier emerging market in risk-return terms.

ERP Drivers: The regression analysis clearly indicates that valuation metrics – specifically the spread between expected equity returns and bond yields – dominate ERP movements. The coefficients on expected equity return (+1.000) and 10-year bond yield (–1.000) account for virtually all variation in ERP. By contrast, macroeconomic variables such as GDP growth, inflation, and short-term interest rates were statistically insignificant, suggesting they influence ERP only indirectly through their impact on valuations. Likewise, the global volatility index (VIX) held no direct explanatory power once yield spreads were accounted for. In short, Hungary's ERP is market-driven and primarily reflects investor perceptions of sovereign credit and equity valuation.

Valuation and Liquidity: Hungary's market structure – marked by a 39% market cap-to-GDP ratio and a 20% turnover rate – places it in the upper tier among Eastern European markets. These structural indicators support a relatively lower ERP by reducing liquidity risk and transaction costs. Compared to Romania's less liquid market (20% market cap/GDP), or Bosnia's highly illiquid structure (<1% turnover), Hungary's infrastructure supports greater investor participation and moderate risk premia. The BSE's inclusion in MSCI Inc. Emerging

Markets indices and its offering of several large, investable firms such as OTP Bank and MOL also enhance its appeal to global investors.

Structural Barriers and Reform Potential: Despite the favorable relative positioning, Hungary still faces institutional risks. EU funding disputes, political governance challenges, and episodes of regulatory uncertainty have elevated the ERP beyond what macro fundamentals might suggest.

The ongoing development of the Xtend SME segment and privatization efforts are promising but insufficient alone to reclassify Hungary's risk profile to that of a mature market. A meaningful and sustained reduction in ERP will likely require structural improvements: restoration of EU cohesion fund flows, alignment with EU governance standards, deeper capital markets, and macroeconomic stability. These reforms could compress the CRP and bring Hungary's K_e below 10%.

Contribution to the Literature

This paper extends Damodaran's CRP framework to mid-sized, partially integrated European markets, bridging sovereign risk metrics (e.g., default spreads) with structural variables (liquidity, foreign ownership) over a full macro-financial cycle.

It complements regional studies (Ferreira et al., 2018; Tilfani et al., 2019) by contextualizing how institutional quality and market integration jointly shape risk premia in post-transition economies. The dual emphasis on governance and structural fundamentals responds to calls for nuanced country risk models (Bekaert et al., 2023).

Limitations and Future Research

Three limitations merit attention. First, Damodaran's global equity-to-bond volatility ratio may not fully capture Hungary-specific dynamics; localized GARCH models or options-based volatilities could refine CRP estimates. Second, assumptions of stable base ERP (5%) and risk-free rates (4%) may falter during rate shocks or fiscal crises. Third, excluding behavioral or geopolitical indicators – such as ESG scores or political sentiment indices – limits explanatory scope. Future work could also integrate micro-level equity data, post-euro adoption effects (e.g., Croatia), or ESG premia (European Commission, 2023) for richer insights.

This study has shown that Hungary's equity risk premium is predominantly driven by valuation spreads, with little contemporaneous influence from macroeconomic variables or global risk sentiment. However, the analysis is limited to a static regression design and does not explore time-lagged or nonlinear effects. Future research could apply this country risk premium framework to other Central and Eastern European economies such as Croatia or Slovakia, particularly in light of differing Eurozone integration paths. Incorporating dynamic specifications or structural break analysis would offer further insight into the evolving role of fiscal credibility, inflation expectations, and monetary policy. Moreover, integrating ESG (Environmental, Social, Governance) scores or political sentiment indices could capture non-financial dimensions of investor risk assessment, enhancing model sensitivity and relevance. Comparative studies of this kind may ultimately inform regional financial stability policy and cross-border capital allocation within emerging EU markets.

Volume **15** | Issue **2** | 2026
https://doi.org/10.18267/j.cebr413

Policy Implications and Final Remarks

Hungary's equity market stands at a crossroads. Strengthening rule-of-law, deepening EU ties, and enhancing capital market integration could reduce its CRP to ~2%, lowering K_e below 10% and boosting valuations.

Conversely, prolonged governance risks may elevate K_e to 14–15%, impairing capital access. This analysis underscores that institutional stability and global alignment are as critical as market fundamentals for sustaining growth. The framework offers actionable insights for policymakers, investors, and researchers navigating Hungary's equity trajectory in a risk-adjusted context.

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