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EXTENDING THE HOUSEHOLD FINANCIAL VULNERABILITY INDEX: INTEGRATING MORTGAGE LENDING AND CULTURAL DETERMINANTS IN CENTRAL ASIA

Azamat Auyezkhanuly¹, Aliya Bayakhmetova², Mohammad Falahat Nejadmahani³,
David Ng Kok Meng^{4*}

^{1,2}Almaty Management University, a.auyezkhanuly@almau.edu.kz, <https://orcid.org/0009-0007-0006-8530>,
a.bayakhmetova@almau.edu.kz, <https://orcid.org/0000-0001-5806-6430>

^{3,4}Asia Pacific University, mohammad.falahat@apu.edu.my:
<https://orcid.org/0000-0002-0423-984X>, david.ng@apu.edu.my,
<https://orcid.org/0000-0002-5173-4165>

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Corresponding Author: David Ng Kok Meng
(david.ng@apu.edu.my)

ABSTRACT

This research note extends the Household Financial Vulnerability Index (HFVI) by integrating a cultural block and mortgage risk. In international practice (IMF, ECB/ESRB, Bank of France, Bank of Italy), household vulnerability is usually assessed using debt-service-to-income (DSTI), loan-to-value (LTV), or solvency ratios. These approaches treat mortgage risk as an isolated variable, without incorporating it into a composite system. The proposed HFVI corrects this methodological limitation by integrating mortgage risk as a central transmission channel and adding a fourth dimension—culture—reflecting trust in financial institutions, financial literacy, reliance on informal borrowing, and debt attitudes. This reconfiguration conceptualizes vulnerability as both a financial and institutional phenomenon: even households with similar DSTI or LTV ratios may exhibit divergent resilience depending on cultural norms and regulatory mediation. The framework is particularly relevant for Central Asia, where shared cultural roots coexist with divergent institutional environments. For example, Uzbekistan restricts wedding expenditures to mitigate debt accumulation, while in Kazakhstan such practices remain unregulated, amplifying social borrowing pressure. Applied to Central Asia, the extended HFVI reveals that wedding-related borrowing contributes up to one-third of household debt among middle-income families, underscoring its diagnostic and policy relevance for macroprudential regulation.

KEYWORDS: Socio-Cultural Factors, Institutional Environment, Informal Borrowing, Financial Literacy, Trust in Financial Institutions, Debt Attitude, Resilience, Kazakhstan, Uzbekistan, Macroprudential Policy.

1. INTRODUCTION

Household financial vulnerability has become a central policy concern in both advanced and emerging economies. Rising debt burdens, volatile incomes, and unstable housing markets expose households to financial fragility, which in turn generates systemic risks. International organizations such as the IMF, the ECB/ESRB, and the World Bank have proposed frameworks for measuring household resilience. Existing HFVI frameworks, while robust in capturing liquidity and solvency dimensions, overlook culturally embedded determinants of financial behavior and the mortgage channel as an integrated risk transmission mechanism. This omission limits their explanatory and predictive capacity in emerging markets. These frameworks typically focus on debt-service-to-income (DSTI), loan-to-value (LTV), and liquidity buffers (Leika & Marchettini, 2017; ESRB, 2016; ECB, 2019; Bove et al., 2020; Attinà et al., 2019). While indispensable, such metrics cannot fully explain why households with comparable balance sheets respond differently to economic shocks.

Kazakhstan provides a compelling example. Over the past decade, rapid urbanization, the expansion of government mortgage programs, and the growth of consumer credit have heightened exposure to debt. At the same time, income inequality, limited financial literacy, and cultural expectations surrounding family events particularly weddings intensify household pressure to borrow. Importantly, such practices are embedded within broader Turkic cultural traditions common across Central Asia, suggesting that vulnerability is not only financial but also socio-cultural.

This note proposes an extension of the HFVI through the introduction of a cultural block, creating the HFVI index. Adding indicators of trust, financial literacy, informal borrowing, and debt attitudes allows the framework captures the embeddedness of financial behavior in a cultural and institutional context. Moreover, comparing Kazakhstan with Uzbekistan, where wedding expenses are officially regulated (Resolution of the Cabinet of Ministers of Uzbekistan, 2025), the article shows how institutional mediation in cultural practices affects vulnerability rates.

2. BACKGROUND: HOUSEHOLD VULNERABILITY IN INTERNATIONAL PRACTICE

International institutions have developed a range of approaches to measure household financial

vulnerability. The IMF (Leika & Marchettini, 2017), the ECB/ESRB (ESRB, 2016; ECB, 2019), the Bank of France (Bove et al., 2020) and the Bank of Italy (Attinà et al., 2019) rely primarily on indicators such as the debt-service-to-income (DSTI) ratio, the loan-to-value ratio (LTV), or solvency metrics. These tools are widely applied in stress testing and risk assessment, but they tend to conceptualize mortgage-related risks as either isolated indicators or elements of scenario-based analyses rather than as an integral component of a composite index.

This methodological limitation is particularly relevant for emerging markets, where mortgage constitute a dominant share of household liabilities and act as a key channel of risk transmission. Fragmented dashboards of indicators often fail to capture how mortgage dynamics interact with liquidity and solvency constraints, leading to an underestimation of systemic vulnerability.

Addressing this gap, our framework expands the Household Financial Vulnerability Index (HFVI) by integrating mortgage and housing risks as a central block and introducing a fourth dimension—culture—that reflects sociocultural determinants such as financial literacy, informal borrowing practices, trust in institutions, and attitudes toward debt. This approach recognizes that vulnerability is not only a balancing phenomenon, but also a cultural and institutional construct, especially in regions such as Central Asia, where common traditions coexist with different institutional structures.

3. THE CULTURAL BLOCK IN THE HOUSEHOLD FINANCIAL VULNERABILITY INDEX (HFVI)

3.1. Conceptual Rationale and Design

Conventional approaches to financial vulnerability focus on liquidity, solvency, and mortgage risk. While essential, these dimensions do not fully explain why households with comparable balance sheets may exhibit diverging resilience in the face of shocks. Financial sociology emphasizes that trust, literacy, social obligations, and cultural codes play a key role in shaping household behavior (Su et al., 2022, Fernández-López et al., 2023). To reflect this dynamic, we are expanding the HFVI index with the cultural block (CF), integrating socio-cultural determinants into it.

The cultural block expands the HFVI to cover non-financial determinants of household resilience. It is operationalized through four measurable indicators; each normalized on a [0,1] scale in line with the vulnerability direction “higher = worse”.

Table 1: Indicators Oh The Cultural Block.

Indicator	Definition / Proxy	Worse direction
Trust in financial institutions (TFI)	% of households expressing confidence in banks / regulators	Lower = worse
Financial literacy score (FLS)	% of correct answers to 3-5 OECD-style questions (interest, inflation, diversification)	Lower = worse
Informal borrowing reliance (IBR)	% of households borrowing from family / friends	Higher = worse
Cultural debt attitude (CDA)	Index of acceptance of debt as a "normal" lifestyle	Higher = worse

Normalization follows the HFVI scheme:

$$X = \frac{X - \min}{\max - \min}, \quad \text{for IBR, CDA (higher = worse)} \quad (1)$$

$$X = \frac{\max - X}{\max - \min}, \quad \text{for TFI, FLS (lower = worse)} \quad (2)$$

Block index:

$$CF = \frac{TFI + FLS + IBR + CDA}{4} \quad (3)$$

Integration into HFVI:

$$HFVI = \frac{LQ + SV + MR + CF}{4} \quad (4)$$

Where LQ = liquidity, SV = solvency, MR = mortgage risk, CF = cultural block.

INTERPRETIVE VALUE

The inclusion of a cultural block helps explain why similar financial indicators may lead to divergent vulnerability outcomes across regions and groups. For instance, households with substantial liquidity buffers but low financial literacy may underestimate refinancing risks, thereby eroding their resilience in the face of shocks (OECD, 2021). Communities with strong traditions of informal lending may appear stable, yet systemic fragility can remain hidden until shocks exceed the capacity of family networks to absorb them (Wiedemann, 2023). Likewise, low levels of institutional trust can discourage household from participating in formal stabilization programs, amplifying financial fragility (Guiso et al., 2008).

By incorporating these dimensions, the cultural block reconceptualized the Household Financial Vulnerability Index (HFVI) from a purely financial diagnostic tool into a socio-cultural indicator of resilience. This extension aligns with interdisciplinary debates in the fields of financial sociology and cultural economics, where trust, literacy, and social norms are increasingly recognized as structural determinants of economic behavior and systemic stability.

3.2. Institutional Mediation of Cultural Norms: Evidence from Central Asia

Cultural practices are not static; they are mediated by institutional frameworks that shape their scope and social consequences. In Central Asia, weddings function as a key social ritual with deep symbolic meaning. They reinforce communal solidarity but simultaneously impose significant financial burden. When left unregulated, such practices may foster unsustainable borrowing and heighten household indebtedness.

Uzbekistan provides a striking case of institutional mediation. Since 2019, formal regulations have limited the number of guests, performers, and vehicles at weddings, as well as the permissible duration of ceremonies. Decree No. 2736-III (2019) sets a limit on the number of guests of 200 people for family events and 250 people for solemn gatherings, as well as strict restrictions on excess and extravagance (Lex.uz, 2019). International media also reported that weddings had restrictions on the number of guests of 250 people, two musical numbers and three vehicles. Officially, this was justified by a campaign against waste, but in fact it served as an institutional adjustment of cultural practices, curbing excessive consumption and reducing financial risks (Reuters, 2019).

Kazakhstan, by contrast, maintains similar cultural traditions without comparable constraints. This leaves households under greater pressure to finance large-scale celebrations, often by resorting to credit. Thus, despite share Turkic cultural roots and similar value systems, divergent different institutional approaches generate different vulnerability outcomes.

For HFVI, this highlights the critical role of embedding institutional context: identical cultural traditions can produce distinct resilience trajectories depending on the regulatory framework. From a theoretical perspective, the notion of institutional mediation is consistent with socio-legal research that conceptualize marriage as a domain where cultural norms are formalized and regulated by institutions (Scott, 2000). Likewise, empirical studies from Central Asia demonstrate how the costs of ceremonial events, especially weddings, act as factors contributing to increased household debt and financial instability (Barsukova, 2024).

3.3. Trust As Cultural Module

Although the cultural block is implemented using measurable indicators, these indicators are embedded in broader trust regimes that significantly influence household responses to crisis situations.

Institutions not only regulate economic behavior, but also actively contribute to the formation, strengthening or weakening of trust (Sønderskov & Dinesen, 2016; Lounsbury, 2023). Thus, trust is institutionalized, socially constructed, and context sensitive.

We propose a typology of three trust modes:

Formalized trust – grounded in bureaucratic rationality and procedural norms. Institutional confidence (TFI) dominates as the principal resilience mechanism, consistent with research on institutional trust in crisis contexts (Lounsbury, 2023; Estadieu et al., 2025).

Ritualized trust – rooted in symbolic loyalty, hierarchical norms, and social obligations. Here, reliance on informal borrowing (IBR) is central, as communal expectations override purely financial calculation (Karlan et al., 2009; Guérin, 2014).

Network-emergent trust – based on horizontal ties, peer networks, and digital interaction. In this regime, financial literacy (FLS) and debt attitudes (CDA) acquire greater weight, enabling adaptive responses. Empirical research shows that Internet use and digital engagement reshape levels of social trust, mediated by perceptions of fairness and institutional legitimacy (Miao et al., 2025).

This typology demonstrates that identical CF scores may produce divergent vulnerability outcomes depending on the prevailing trust regime. Culture, therefore, is not a passive background variable but an active analytical module shaping institutional resilience trajectories. By embedding this interpretive layer into HFVI, the index evolves from a purely financial diagnostic tool into a cultural-institutional measure of vulnerability, consistent with contemporary debates in financial sociology and cultural economics.

4. METHODOLOGY: CONSTRUCTING THE EXTENDED HFVI

4.1. RESEARCH OBJECTIVE AND OPERATIONALIZATION

The Household Financial Vulnerability Index (HFVI) is designed as a multidimensional composite measure that captures the extent to which households are exposed to financial stress in the face of macroeconomic shocks. Building on international practice (IMF, ECB/ESRB, Bank of France, Bank of Italy), which typically relies on liquidity and solvency metrics or fragmented indicator dashboards, the proposed framework introduces two methodological innovations. First, mortgage and housing risks (MR) are incorporated as one of the

central transmission channels, reflecting their dominant role in household balance sheets in emerging markets. Second, a cultural block (CF) is added, operationalizing socio-cultural determinants of financial behavior. Together, the four blocks – liquidity (LQ), solvency (SV), mortgage risk (MR), and culture (CF) – form the expanded HFVI index.

4.2. Index Architecture

Each block of HFVI is constructed as a sub-index composed of normalized indicators. Indicators are harmonized on a [0,1] scale, with consistent “higher = worse” orientation to ensure interpretability and comparability across dimensions. The headline HFVI is calculated as the equally weighted average of the four block indices:

$$\text{HFVI} = (\text{LQ} + \text{SV} + \text{MR} + \text{CF}) / 4 \quad (5)$$

This additive aggregation scheme ensures transparency and usability of the policy, while robustness checks are performed using alternative weighting and scaling methods.

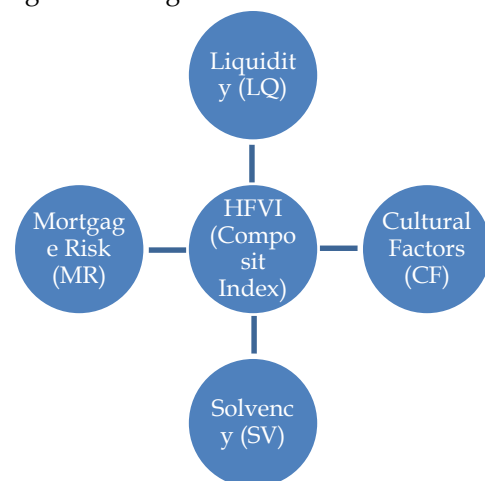


Figure 1: Conceptual Configuration of The Extended Household Financial Vulnerability Index (HFVI).

The diagram presents the HFVI as a composite framework integrating four equally weighted dimensions: Liquidity (LQ), Solvency (SV), Mortgage Risk (MR), and Cultural Factors (CF). Each block contributes to the overall index, which reflects the multidimensional nature of household financial vulnerability.

4.3. Indicators And Measurements

- Liquidity (LQ): buffer months (BM), liquidity-to-assets ratio (LAS).
- Solvency (SV): debt-to-income service ratio (DSTI), debt-to-assets ratio (DTA).
- Mortgage Risk (MR): mortgage share in debt (MSD), mortgage share in payments (MSP),

loan-to-value ratio (LTV, if available).

- Cultural factors (CF): trust in financial institutions (TFI), financial literacy score (FLS), informal borrowing reliance (IBR), cultural debt attitude (CDA).

4.3.1. Normalization

All indicators are normalized on a [0,1] scale according to the min-max procedure, with orientation aligned to the “higher = worse” direction of vulnerability:

- For negative indicators (IBR, CDA, DSTI, DTA, MSD, MSP, LTV):

$$x_{norm} = \frac{x - \min}{\max - \min} \quad (6)$$

- For positive indicators (BM, LAS, TFI, FLS):

$$x_{norm} = \frac{\max - x}{\max - \min} \quad (7)$$

Block aggregation

Each block sub-index is calculated as the arithmetic mean of its normalized indicators:

$Block = \frac{1}{n} \sum_{i=1}^n x_{i,norm} \quad (8)$

4.4. Sensitivity Analysis and Validation

To ensure robustness, we apply a set of validation tools:

- Leave-one-out tests within and across blocks to assess indicator influence.
- Principal Component Analysis (PCA) to evaluate variance concentration and prevent dominance by a single variable.
- Scenario analysis of macroeconomic shocks (interest rate hikes, income shocks, inflation, housing price corrections), which maps expected changes in HFVI components.

4.5. Contextual Adaptation for Central Asia

The flexibility of HFVI allows adaptation to national credit market structures. In Kazakhstan, where government programs such as “7-20-25” provide fixed-rate mortgages and floating-rate loans remain marginal, the floating-rate loan share (FRL) is excluded (Otbasy Bank, 2025). In contrast, in economies with significant floating-rate mortgage penetration, FRL serves as a meso-level modifier in scenario stress tests.

Institutional mediation of cultural practices provides further contextual differentiation. Official restrictions on weddings in Uzbekistan (for example, Decree No. 2736-III of 2019) act as an institutional correction of cultural obligations, indirectly reducing

household debt. Kazakhstan, lacking such restrictions, experiences greater household exposure to culturally driven financial obligations. Thus, the inclusion of the CF block ensures that HFVI captures not only balance-sheet fragility but also culturally embedded vulnerabilities, enhancing both its diagnostic accuracy and policy relevance.

4.6. Applications and Policy Implications

4.6.1. Practical Applications

The extended HFVI offers regulators and policymakers a multidimensional framework for assessing household fragility that extends beyond balance-sheet indicators. Its integration of mortgage risk and cultural determinants provides several distinct applications:

- Early warning capacity. By embedding socio-cultural variables such as informal borrowing, trust in financial institutions, and debt attitudes, the index can detect latent vulnerabilities that conventional liquidity or solvency metrics overlook.
- Scenario testing relevance. HFVI enhances stress-test design by capturing how cultural practices (e.g., wedding-related borrowing or reliance on family loans) amplify macroeconomic shocks such as interest rates hikes or income volatility.
- Cross-country comparability. Withing Central Asia, the index reveals how shared cultural codes (for example, ceremonial obligations) produce different resilience outcomes under divergent institutional frameworks. Uzbekistan’s formal restrictions on wedding expenditures mitigate household debt accumulation, while Kazakhstan’s absence of comparable regulation leaves families more exposed to credit-driven obligations.

4.6.2. Practical Applications

HFVI can serve as:

- A diagnostic tool for identifying at-risk households and monitoring systemic fragility.
- An input for macroprudential policy, aligning capital buffers, lending standards, and stress testing with culturally embedding borrowing cycles.
- A foundation for targeted interventions such as literacy campaigns and institutional trust-building programs that directly address cultural drives of indebtedness.

4.7. Scientific And Interdisciplinary Debate

In addition to its applied significance, HFVI provokes important scholarly questions that extend beyond technical measurements:

- Cultural regulation against adaptation. Should financial regulators actively constrain cultural practices that generate debt (for example, large-scale ceremonies), or should policies adapt to them while mitigating systemic risks?
- Quantification of social norms. To what extent can trust, literacy, and obligations be meaningfully quantified without reducing their symbolic or relational character?
- Technocratic limits. Does embedding cultural practices into a composite index risk oversimplifying complex social dynamics, thereby depoliticizing practices that are socially contested?
- Institutional mediation. How can institutional intervention balance respect for cultural traditions with the necessity of preventing systemic financial fragility?

By combining technical reliability with cultural sensitivity, HFVI* facilitates both application policy development and interdisciplinary discussions. It allows regulators to integrate cultural determinants into early warning systems, providing scientists with a framework to explore the interrelationships of finance, culture, and institutions.

4.8. Limitations And Future Research

While the HFVI offers a multidimensional and relevant framework, several limitations should be acknowledged. First, the operationalization of cultural indicators relies on surveys (e.g., trust, literacy, and attitudes), which may vary in coverage, comparability, and methodological quality across countries. Cross-country comparability of cultural indicators poses a well-known methodological challenge. Survey-based measures of trust and debt attitudes may reflect linguistic nuances, translation asymmetries, and differing social desirability biases (Davidov et al., 2014; OECD, 2017). For instance, the notion of “trust in institutions” may carry administrative connotations in Kazakhstan, while implying moral reliability in Uzbekistan (Inglehart & Welzel, 2005), complicating direct cross-cultural comparison. Complementing these conceptual

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insights, Smid (2023), in *Understanding Cultural Differences and Extreme Attitudes in the 2021 OECD Trust Survey*, demonstrates that respondents across 16 OECD countries associate institutional trust with socio-economic vulnerabilities and cultural narratives not captured by closed-ended questions – confirming that standardized indicators often omit deeply contextual dimensions of trust.

Second, equal weighting across blocks, though transparent, may obscure the disproportionate role of certain dimensions such as mortgage risk in highly indebted markets. Third, cross-country generalization remains limited: Central Asia provides a unique institutional and cultural context that may not directly translate to other regions. Therefore, further research should focus on three areas: empirical testing of the HFVI on real episodes of financial stress, refinement of weighting schemes through principal component or Bayesian methods, and conceptual expansion of the cultural block to include intergenerational transfers, gender-based financial practices, and digital finance norms.

5. CONCLUSION

This research note has proposed an extension of the Household Financial Vulnerability Index (HFVI) by integrating mortgage risk and cultural block into the composite measure. This demonstrates that household vulnerability is not only a financial phenomenon, but also a cultural and institutional construct. Evidence from Central Asia illustrates how similar cultural traditions generate different vulnerability outcomes depending on institutional mediation, while regulatory restrictions on ceremonial expenses in Uzbekistan have a stabilizing effect, which is not observed in Kazakhstan.

Thus, HFVI contributes both to policy practice (by increasing the diagnostic accuracy of stress testing, macroprudential monitoring, and targeted measures) and to academic discussions, highlighting the role of trust, literacy, and cultural commitment in generating financial instability. Further research should focus on clarifying the quantification of socio-cultural factors, testing this model in various contexts, and engaging in an interdisciplinary dialogue about the balance between cultural heritage preservation and financial stability.

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