

Between Crisis and Recovery: Economic Narratives and Systemic Risk in the Philippines

Lizelle Cruz

Bangko Sentral ng Pilipinas*

**The views expressed in this paper are those of the author and should not be interpreted as reflecting the views of the BSP.*

Systemic Risk Sentiment Index



Market Sentiment: **Negative**

Systemic Stress: **High**

01

Background of the Study



Concept Definition

Systemic Risk

A disruption in the provision of financial services caused by an **impairment of the financial system**, with serious **negative effects for the real economy**.



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Systemic Risk

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*"Being able to **identify systemic events at an early stage** enhances policymakers' ability to take necessary exceptional steps to contain or even prevent the crisis."*

— International Monetary Fund (2009)



Established: Contagion-based Measures

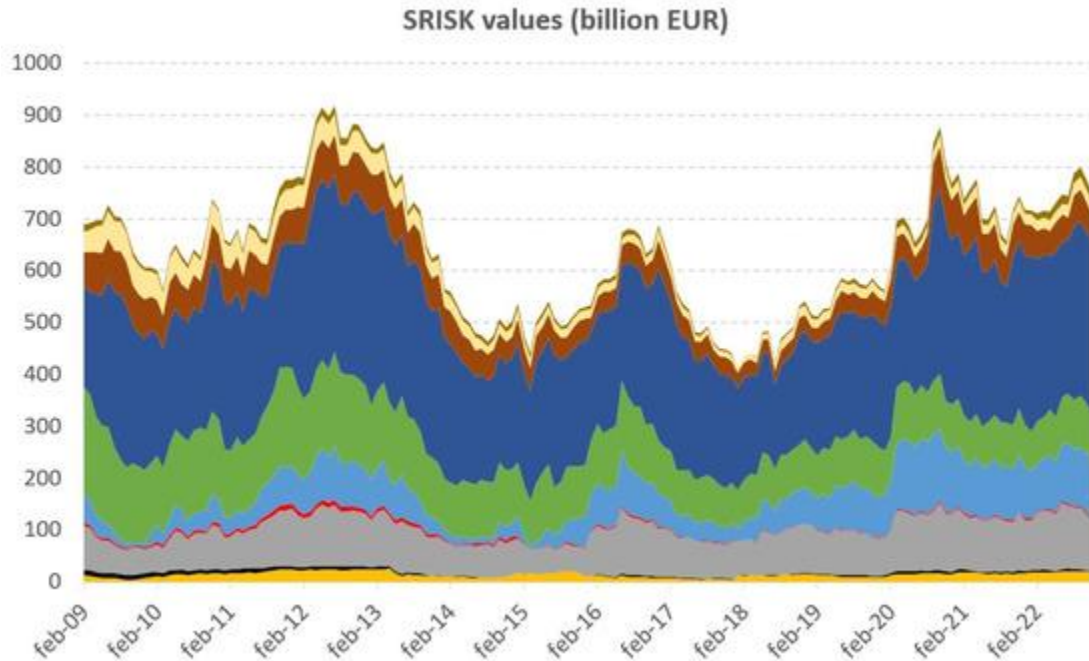
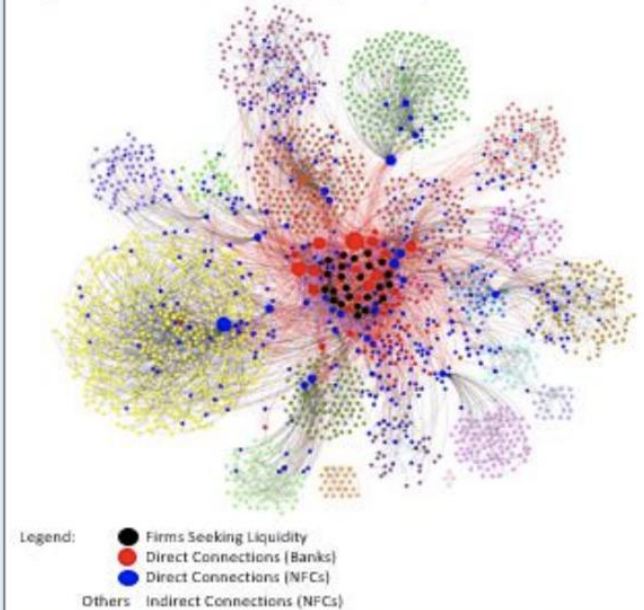
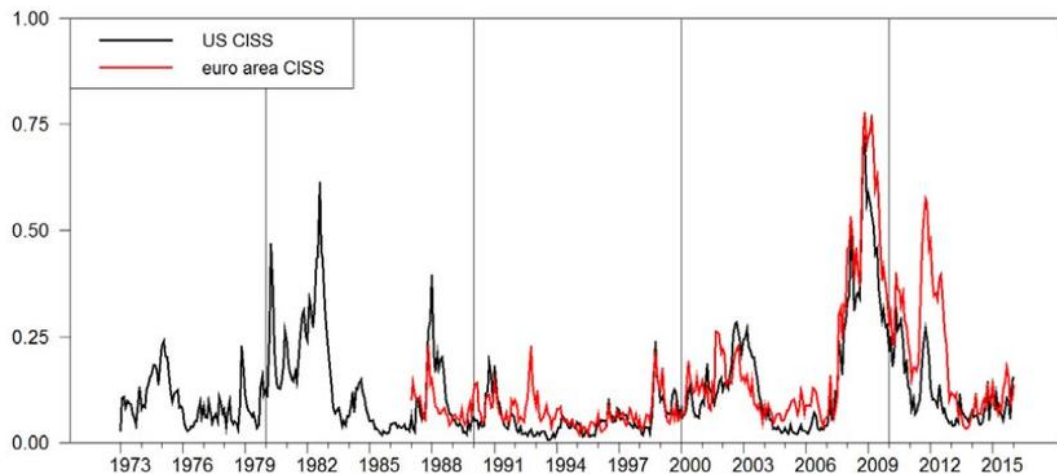


Figure C: Multi-Level Contagion Map



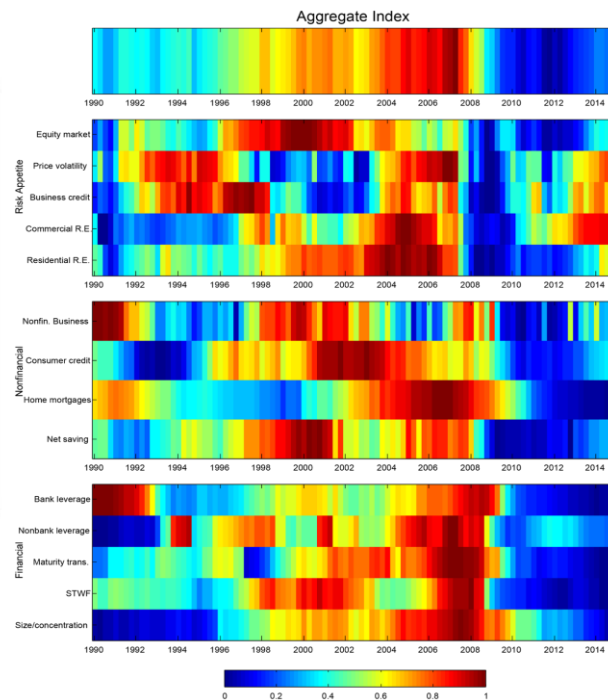
Established: Heatmaps and Indices

Figure: Composite Indicator of Systemic Stress (CISS) for two large economies

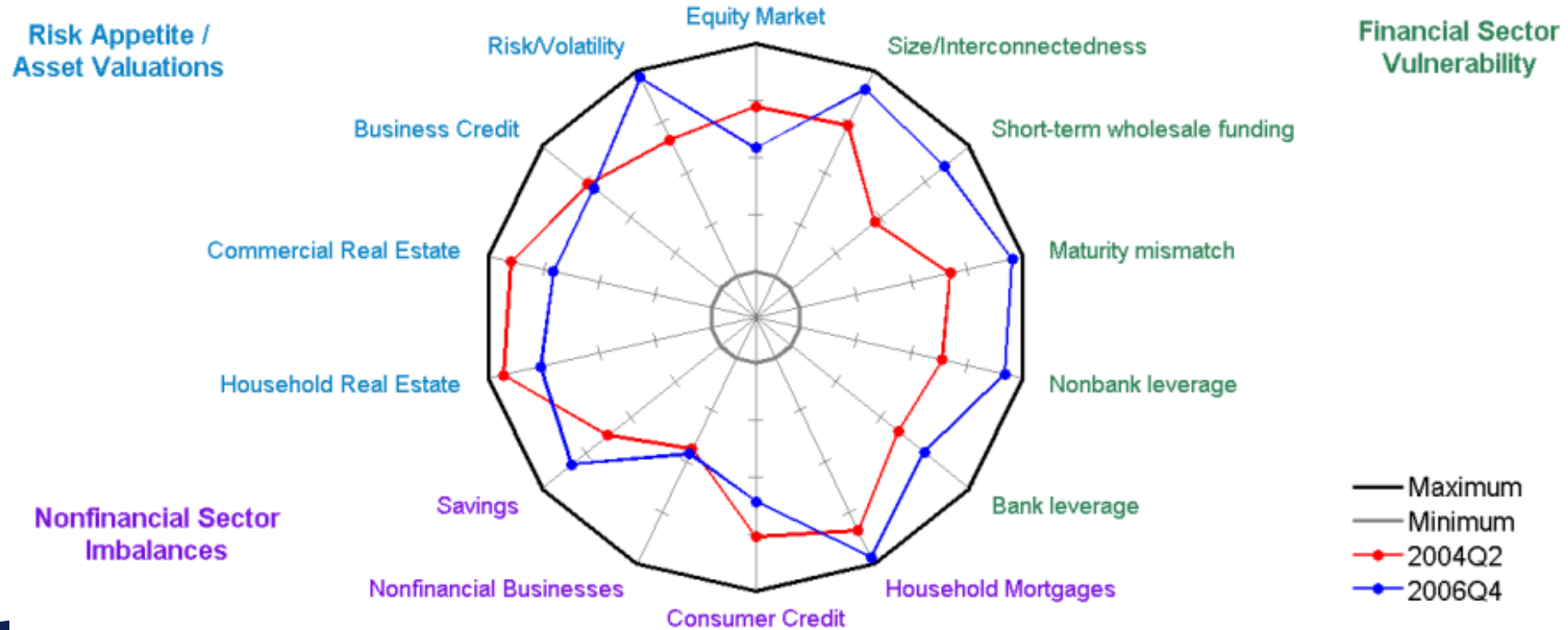


Notes: Monthly averages of weekly data; January 1973 to January 2016.

Sources: ECB and own calculations.



Established: Components of Systemic Risk



Research Gap

01

Lack of Granularity

Traditional systemic risk tools often rely on aggregate-level indicators with low frequency.

02

Backward-Looking

Many existing indicators are constructed from balance sheet data that are published with a lag.

03

Behavioral Risks

Rarely incorporate behavioral or sentiment-driven dynamics, such as excessive optimism or market herding.

Theoretical Framework



Behavioral Finance

Financial decisions are influenced not only by economic fundamentals but also by narratives, expectations, and investor psychology (Akerlof & Shiller, 2010; Shiller, 2000)



Narrative Economics

Shifts in prevailing narratives, from confidence and optimism toward fear and uncertainty, may provide useful information on how perceptions of vulnerabilities evolve before and during periods of financial stress. (Shiller, 2017; 2019)

Research Objectives



Main Objective

To construct a Systemic Risk Sentiment Index from Philippine news headlines and evaluate whether it provides timely signals of emerging vulnerabilities

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Research Question 1

Can sentiment in Philippine news provide timely signals of rising systemic risk, particularly around episodes of financial stress?



Research Question 2

Which sectors and news topics contribute most to increases in negative sentiment, and how are these narratives related to emerging system-wide vulnerabilities?

02

Methodology & Results



Outline of Methodology and Results Discussion



News headlines were gathered from the Index to Philippine Newspapers

periodicals.upd.edu.ph/ipn/search.php

IPNOnline

Index to Philippine Newspapers Online: Version 2.0

Home Search Publications Sign in

ur search for **economy** returned **1,074** records.

[Check All](#) | [Uncheck All](#) | [Add to Cart](#) | [Remove from Cart](#)

Sort by: Issue Date Descending

Barro, Dexter II. Business sector affirms commitment to economy amid political turmoil.
[Manila Bulletin](#) 635(19) November 19, 2025 : 1+.
Subject: [Business sector](#)
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Rosal, Dercio. Recto: ghost projects cost economy P119 B.
[Manila Bulletin](#) 633(3) September 3, 2025 : 1+.
Subject: [Philippines -- Economic conditions](#); [Flood control projects](#); [Corruption](#)
[View Article Details](#) | [View All Articles in this Issue](#)

Included News Publications



Malaya
Business Insight



News headlines were gathered from the Index to Philippine Newspapers

01**Coverage**

News headlines from **Jan 1, 1997 to August 25, 2026**

02**Key Crises**

Covers the 1997 Asian Financial Crisis and 2007-2009 Global Financial Crisis

03**Architecture**

Utilizes clean and accessible website architecture (scrapable via Selenium)

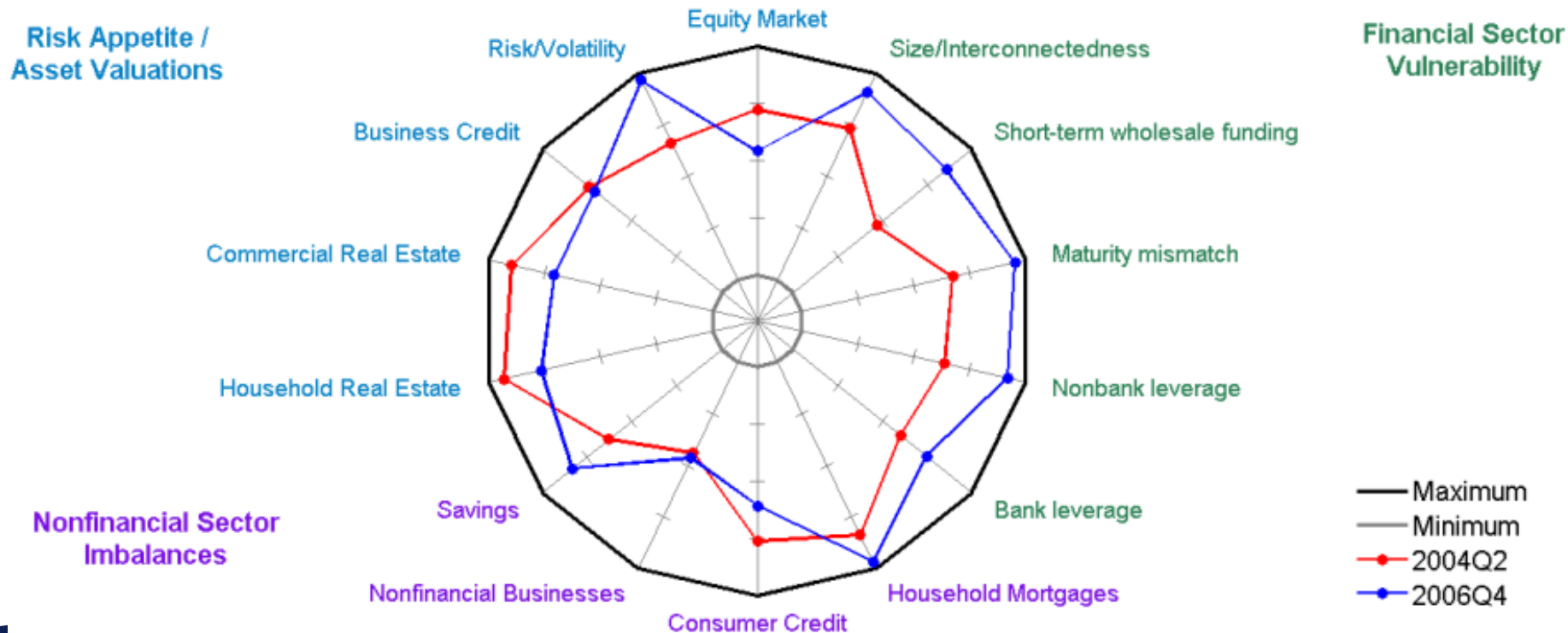
04**Scraping**

The title, source, and publication date were scraped. Only English headlines were retained.

Headlines are filtered based on keywords

Component	Keywords (Total of 730)
Bank Resilience	bank, BDO, BPI, capital adequacy, credit standard, lending standard, leverage ratio, NPL
Commercial Property	complex, developer, industrial park, mall, office, retail property, co-working space
Consumer Credit	auto loan, car loan, consumer credit, consumer loan, personal loan, vehicle loan
External Sector	developing nations, emerging market, foreign currency, foreign exchange
Fiscal Sector	budget, fiscal balance, fiscal debt, government debt, gov't debt, NG debt, PH borrowing
NFC Credit	business, corporation, private loan, corporate loan, ayala, san miguel, aboitiz
Nonbank Leverage	5-6, GCash, insurance, lending firm, mutual fund, pawnshop, pension, remittance center
Residential Loans	housing loan, mortgage, PAG-IBIG, property loan, real estate loan, residential
Volatility	plunge, sink, slump, soar, spike, stability, surge, swing, tumble, turbulent, volatile

Headlines are filtered based on risk components



Data Processing**Model****Index****Narrative****Analysis**

Each headline is mapped to a risk component

Component	Keyword	Title	Source	Date
Short-term Funding	28-day	BSP resumes sale of P 28-day term deposit	Philippine Star	5/14/2019
Short-term Funding	28-day	BSP set to issue 28-day securities starting with P20 billion	Manila Bulletin	9/10/2020
External Sector	trade	Canada taps PH support in ASEAN free trade talks	Manila Bulletin	5/20/2023
External Sector	tariff	Zero tariff on diesel products	Manila Times	12/3/2007

Component Mapping of Headlines

Component	1997-2000	2001-2005	2006-2010	2011-2015	2016-2020	2021-2026	Total	Coverage
Bank Resilience	747	847	474	2,314	3,526	4,537	12,445	6.7%
Commercial Property	21	11	30	432	785	785	2,064	1.1%
Consumer Credit	563	1,260	890	1,139	2,714	4,654	11,220	6.0%
Equity	437	505	348	3,898	5,197	5,812	16,197	8.7%
External Sector	3,721	5,873	3,948	7,472	15,098	22,737	58,849	31.5%
Fiscal Sector	1,269	2,373	2,538	2,843	7,008	10,198	26,229	14.1%
Housing Market Conditions	198	246	168	323	551	544	2,030	1.1%
Interconnectedness	76	79	45	126	188	332	846	0.5%
Maturity Mismatch	3	3	1	39	28	37	111	0.1%
NFC Credit	2,552	4,316	2,993	5,493	11,075	11,480	37,909	20.3%
Nonbank Leverage	285	596	354	417	1,203	1,163	4,018	2.2%
Residential Loans	57	67	63	82	200	235	704	0.4%
Savings	65	88	65	380	677	794	2,069	1.1%
Short-term Funding	16	25	5	165	407	476	1,094	0.6%
Volatility	451	600	439	2,757	2,689	3,854	10,790	5.8%
Total	10,461	16,889	12,361	27,880	51,346	67,638	186,575	100.0%

**Until August 25, 2026*

A test set was labeled for validation

Full Dataset (186,575 Headlines)

Unlabeled Corpus

184,575 headlines

For SRSI Construction

Remaining unlabeled headlines
used to construct the Systemic
Risk Sentiment Index

Labeled Test Set

2,000 headlines

Model Comparison

A dedicated, manually verified
evaluation set held out to
benchmark and compare the
baseline models.

Sentiment Labelling for Test

Negative 🙄

Heightened vulnerabilities, weakening balance sheets, reduced liquidity, economic stress and uncertainty.

Non-performing loans ratio rises to 5%

Peso weakens sharply on Fed hikes

Positive / Non-Negative 😊

Improvement in economic indicators, strengthening of financial conditions, or declining systemic risks.

Multiple Q1 indicators signal strong start for economy

Alliance Global posts record P30.6B income

Neutral 😐

Descriptive headlines, events with unclear risk implications, or those with no directional sentiment.

BSP releases new survey results

Ayala Corp holds annual meeting

Sentiment Labelling for Test

Ternary Classification Task

The ternary classification model categorizes headlines into three distinct directional classes to capture nuanced market sentiment:

Positive Headlines: 48.4%

Negative Headlines: 39.3%

Neutral Headlines: 12.3%

Binary Classification Task

Positive and neutral headlines were labeled as positive, otherwise negative, based on the idea that negative news can amplify risks, while non-negative news can lessen panic in the market (Fernandez et al., 2021).

Positive Headlines: 61.0%

Negative Headlines: 39.0%

Model Comparison

LM Dictionary

Designed for finance as opposed to general dictionaries

FS Dictionary

Designed to pick up systemic risk language by flagging terms associated with stress, and instability



FinBERT

Trained on financial news

CentralBankRoBERTA

Trained on monetary-policy and financial-stability communications

Model Comparison - Binary

Method	Accuracy	Precision (- / +)	Recall (- / +)	F1-score (- / +)
Loughran & McDonald (2011) Dictionary	0.73	0.75 / 0.72	0.44 / 0.91	0.55 / 0.80
Financial Stability Dictionary (Correa et al., 2017)	0.68	0.82 / 0.66	0.21 / 0.97	0.33 / 0.79
ProsusAI FinBERT (Araci, 2019)	0.82	0.84 / 0.82	0.67 / 0.92	0.75 / 0.87
FinBERT (Yang et al., 2022)	0.78	0.84 / 0.76	0.53 / 0.94	0.65 / 0.84
CentralBankRoBERTa (Pfeifer & Marohl, 2023)	0.85	0.75 / 0.95	0.93 / 0.81	0.83 / 0.87
Ensemble (Araci, 2019; Pfeifer & Marohl, 2023)	0.89	0.85 / 0.92	0.87 / 0.90	0.86 / 0.91

Model Misclassifications

1. Inflation Dynamics

"Inflation slows sharply..."

"Inflation decelerates..."

"Inflation to fall within target..."

The model associates inflation, bad loans, and NPL with negative sentiment regardless of whether the indicator is improving or deteriorating.

2. Policy Rate

"BSP seen to cut rates..."

"BSP hikes rate anew..."

Easing generally reflects improving conditions, whereas tightening (higher rates) raises borrowing costs and may amplify vulnerabilities.

3. Banking

"Banks' NPL ratio drops..."

"NPL ratio improves ..."

"Bad loan ratio improves..."

Rapid loan growth may signal leverage accumulation and future systemic risks despite appearing favorable in other contexts.

4. External Sector

"BoP deficit narrows..."

"PH peso recovers..."

"Oil prices sink on hopes Hormuz..."

Narrowing deficit represents an improvement, lower oil prices in context of Hormuz is positive.

Data Processing

Model

Index

Narrative

Analysis

Index Construction

Full Dataset (186,575 Headlines)

Unlabeled Corpus

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Labeled Test Set

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Model Comparison

A dedicated, manually verified
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benchmark and compare the
baseline models.

Sentiment Index Construction

$$SRSI_t = \frac{\sum_{i=1}^{N_t} Prob(Positive_i) - \sum_{i=1}^{N_t} Prob(Negative_i)}{\sum_{i=1}^{N_t} Prob(Positive_i) + \sum_{i=1}^{N_t} Prob(Negative_i)}$$

Variable Definitions

N_t : Total number of headlines on day t .

$Prob(Positive_i)$: Probability that headline i is positive (non-negative).

$Prob(Negative_i)$: Model's predicted probability that headline i is negative.

Generates a continuous raw index from -1 (most positive) to +1 (most negative).

Smoothing

The resulting raw daily index is smoothed to filter out transient daily market noise but still highlight main sentiment trends

Index Rescaling (0 to 1)

-  **0.0** : Most positive sentiment
-  **0.5** : Neutral threshold
-  **1.0** : Most negative sentiment



Baseline Index Construction

Date	Headline	Class	Probability
January 1	Headline 1	+	0.75
January 1	Headline 2	-	0.82
January 2	Headline 1	+	0.93
January 2	Headline 2	-	0.74
January 3	Headline 1	+	0.82
January 3	Headline 2	-	0.98

Using Sum of Probabilities

Sentiment (January 1) : $(0.82 - 0.75) / (0.82 + 0.75) = 0.05$

Sentiment (January 2) : $(0.74 - 0.93) / (0.74 + 0.93) = -0.11$

Sentiment (January 3) : $(0.98 - 0.82) / (0.98 + 0.82) = 0.09$

Using Counts

Sentiment (January 1) : $(1 - 1) / (1 + 1) = 0$

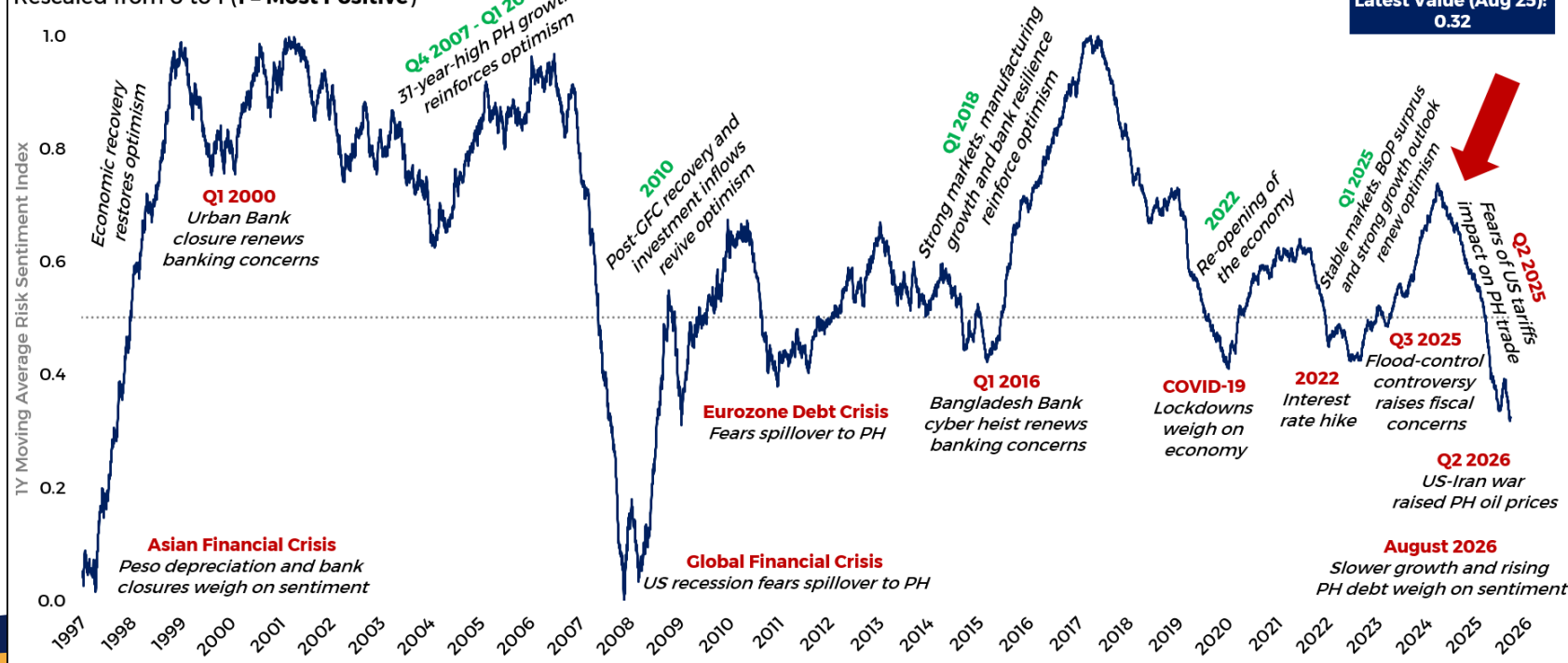
Sentiment (January 2) : $(1 - 1) / (1 + 1) = 0$

Sentiment (January 3) : $(1 - 1) / (1 + 1) = 0$

Systemic Risk Sentiment Index

Systemic Risk Sentiment Index

Rescaled from 0 to 1 (1 = Most Positive)



Systemic Risk Sentiment Index

Systemic Risk Sentiment Index

Rescaled from 0 to 1 (1 = Most Positive)



Systemic Risk Sentiment Index



Systemic Risk Sentiment Index

Systemic Risk Sentiment Index

Rescaled from 0 to 1 (1 = Most Positive)



Systemic Risk Sentiment Index

Systemic Risk Sentiment Index

Rescaled from 0 to 1 (1 = Most Positive)



Event Study Analysis

Crisis	Crisis Start Date	Date SRSI Fell Below 0.5	Timing Relative to Event Start	SRSI Trough Date	No. of Days from Crisis Start to Trough
Global Financial Crisis	Sep 15, 2008 (0.22)	May 8, 2008 (0.49)	130 days (~ 19 Weeks) before start of crisis	Nov 15, 2008 (0.00)	61 days (~ 9 Weeks)
Eurozone Debt Crisis	Jul 1, 2011 (0.58)	Aug 21, 2011 (0.49)	51 days (~ 7 Weeks) after start of crisis	Dec 14, 2011 (0.38)	166 days (~ 24 Weeks)
COVID-19 Pandemic	Mar 15, 2020 (0.62)	Jul 14, 2020 (0.49)	121 days (~ 17 Weeks) after start of crisis	Dec 26, 2020 (0.41)	286 days (~ 41 Weeks)
Rate Hikes	May 19, 2022 (0.62)	Dec 8, 2022 (0.49)	203 days (~ 29 Weeks) after start of crisis	Jun 10, 2023 (0.42)	387 days (~ 55 Weeks)
PH Oil Crisis	Mar 24, 2026 (0.64)	Feb 23, 2026 (0.49)	29 days (~4 Weeks) before start of crisis	Jun 10, 2026 (0.34)	78 days (11 Weeks)

Granger Causality

EVALUATION FRAMEWORK

Granger Causality:

Granger causality tests were conducted to examine the lead-lag relationships between the Overall SRSI and representative macro-financial indicators.

Early-Warning Usefulness:

Unlike event study analysis, this framework evaluates if sentiment changes systematically precede financial vulnerability.

VAR METHODOLOGY

Optimal Lag Selection:

Determined separately via the Akaike Information Criterion (AIC) to capture joint past observations (e.g., lag order of seven).

Statistical Significance:

Evaluated at the conventional 5% level ($p < 0.05$), with 10% providing only marginal evidence.

FINDINGS

Financial Conditions → SRSI

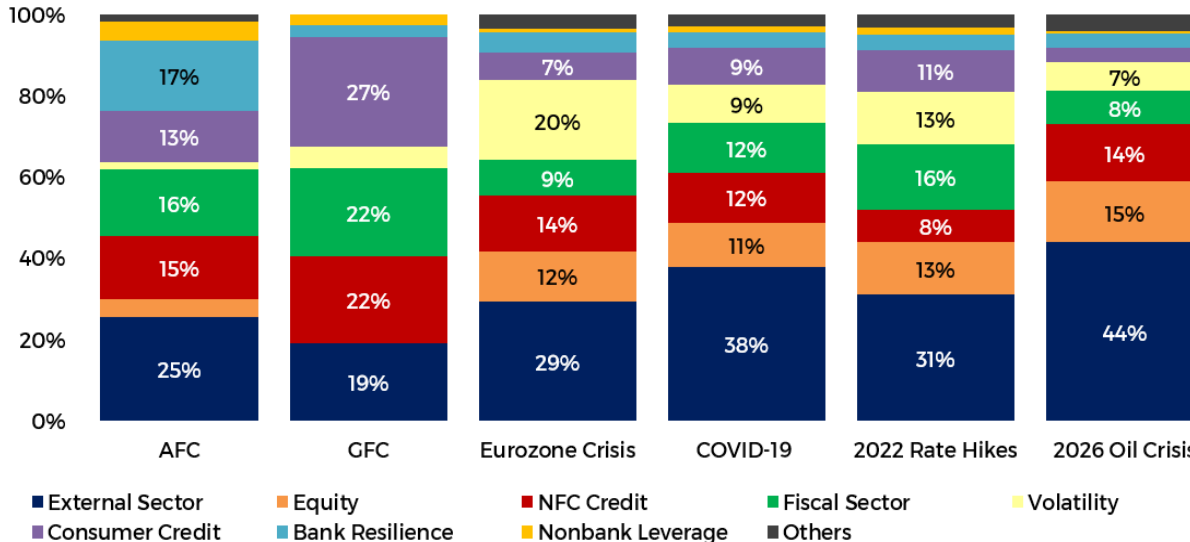
Both the PSEi and VIX Granger-cause the SRSI, with p-values well below the 5% significance level.

Weaker in the Reverse Direction

VIX strongly Granger-causes SRSI, whereas evidence in the reverse direction is considerably weaker. The SRSI Granger-causes the VIX at the 10% significance level.

Component and Keyword Analysis

Drivers of Negative Sentiment Across Crisis Episodes
Percent Share of Negative Headlines by Risk Component

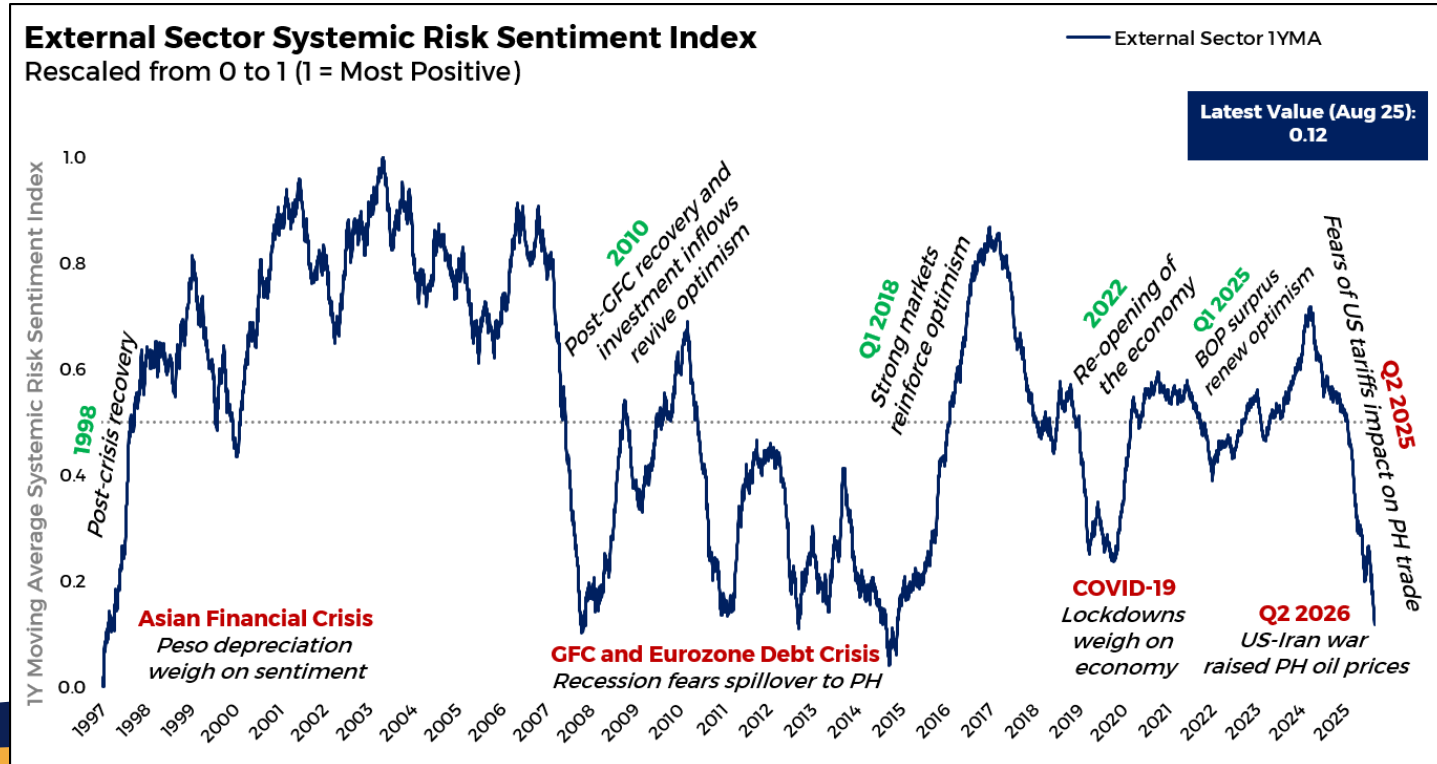


KEY TAKEAWAYS

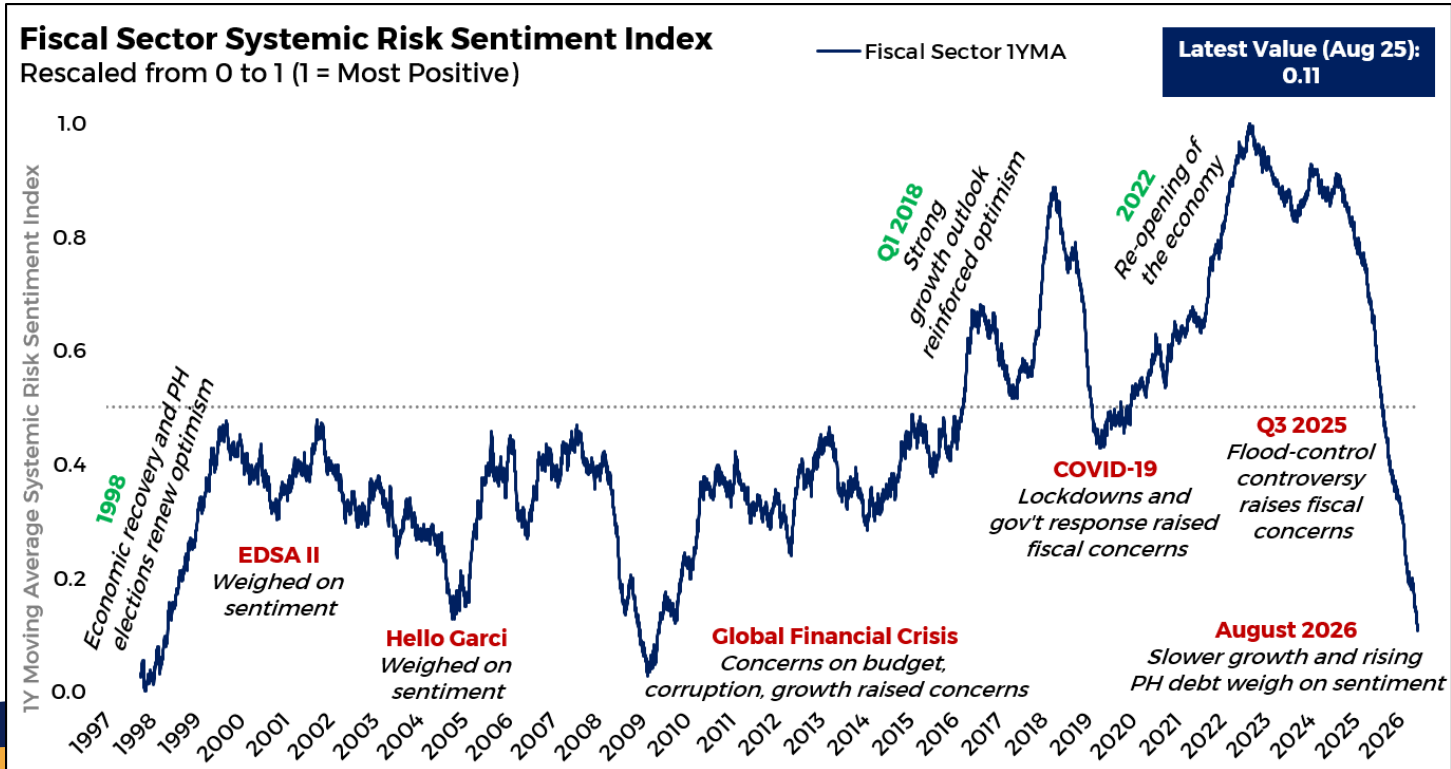
Dominant Risk Drivers

- External Sector** is the primary driver of negative sentiment, peaking significantly during the **2026 Oil Crisis (44%)** and **COVID-19 (38%)**.
- During the **Asian Financial Crisis**, negative sentiment was concentrated in **NFC Credit (29%)** and **Bank Resilience (17%)**.
- During the **Global Financial Crisis**, negative sentiment became highly diversified across multiple sectors, suggesting transmission through interconnected domestic and international channels.

Component and Keyword Analysis



Component and Keyword Analysis



03

Conclusion



Conclusion



Policy Implication

Translates text data into interpretable risk measures that integrate into dashboards to support expert judgment and supervisory action.



Real-Time Tracking

Updated daily using NLP and publicly available news headlines, allowing policymakers to monitor macro-financial sentiment changes in near real-time.



Complementary Tool

Designed to complement traditional indicators like credit gaps and leverage ratios, which are typically only available at lower monthly or quarterly frequencies.

Areas for Future Research

Fine-Tuning Sentiment Models

Fine-tuning using Philippine financial reports, monetary policy statements, local news corpora, and bank disclosures would allow the model to better understand local linguistic nuance, improving accuracy and reducing noise in the sentiment estimates.

Exploring Other Data Sources

Comparing sentiment from market rumors (e.g., social media posts, forums, retail-investor channels) with official news could provide insights into how information diffuses through different layers of the financial system.

Thank you

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