



From Vulnerability to Resilience: Has the Philippine Economy Become More Resistant to Financial Crises? Evidence from 1970–2025

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Abstract

This study examines whether Philippine resilience has improved across major crisis episodes while distinguishing financial stability, output recovery, and return to a pre-crisis growth path. Independently assembled World Bank annual data for 1970–2025 support a comparison of the 1983 debt crisis, the 1997 Asian Financial Crisis, the 2008 Global Financial Crisis, and the 2020 pandemic. A common event framework measures annual contraction, peak-to-trough real GDP decline, recovery of previous output levels, and deviations from extrapolated pre-event paths. Supporting annual regressions examine associations between global growth deceleration, lagged external buffers, and Philippine growth. The 1980s episode recorded a 13.41% peak-to-trough GDP decline, compared with 0.51% during the Asian Financial Crisis and no annual output decline during the Global Financial Crisis. COVID-19 recorded the largest single-year contraction, 9.52%, despite substantially stronger pre-event external buffers. GDP exceeded its 2019 level in 2022 but remained 18.77% below the five-year pre-pandemic reference path in 2025. Large reference-path shortfalls persist across alternative specifications for the debt crisis and pandemic, whereas smaller shortfalls for the other episodes are sensitive to baseline selection. Stationarity tests challenge buffer-level regressions; buffer-change interactions are imprecise, and an era comparison does not establish weaker sensitivity to global slowdowns after 1993. The findings qualify a general resilience narrative: improved absorption of some financial disturbances coexists with vulnerability to severe real shocks and prolonged output shortfalls. The design identifies historical patterns and conditional associations rather than causal reform effects.

Keywords: *Philippine economy; financial resilience; crisis recovery; output shortfalls; external buffers; global spillovers.*

1. Introduction

The Philippine financial system has experienced debt distress, banking instability, regional contagion, global financial disruption, and a pandemic over several decades of institutional development. These episodes provide a demanding setting for evaluating resilience. A system can continue to intermediate funds while aggregate output contracts sharply. An economy can resume positive growth while remaining below its previous level, and it can regain that level without returning to its earlier growth path. Assessments that conflate these outcomes may overstate either the severity of a financial disturbance or the completeness of recovery. Philippine work benchmarking economic resilience against ASEAN peers has likewise identified volatility-sensitive external exposure as a constraint (Atento, 2025a).

Moreno and Bayangos (2026) document substantial changes in the Philippine macro-financial environment and develop the proposition that resilience improved after the 1980s. The episode chapters identify debt overhang, exchange-rate exposure, financial-sector reform, external buffers, and policy responses as relevant mechanisms. Fernandez and Remolona (2026) explain the persistence of the debt crisis; Guinigundo and Cacnio (2026) discuss the Asian Financial Crisis; Canlas et al. (2026) examine the Global Financial Crisis; and Abenoja et al. (2026) analyze the pandemic. Their accounts motivate an independent empirical question: do consistently measured outcomes show greater resistance to disruption and more complete recovery across these episodes?

The question is narrower than whether all aspects of Philippine resilience improved. Four episodes cannot identify the contribution of particular reforms, and their shocks differ materially. The 1983 debt crisis involved domestic and external financial vulnerabilities. The 1997 episode involved regional financial disruption. The 2008 episode originated in advanced-economy financial markets. COVID-19 involved health restrictions and interruptions to real economic activity. A comparison can establish how outcomes differed; it cannot assume that the country faced an equivalent shock in each case.

The contribution is a harmonized reconstruction of crisis severity and recovery using independently retrieved annual observations through 2025. The analysis separates growth, output levels, and reference-path deviations; tests the sensitivity of conclusions to event dating and extrapolation; and evaluates whether the available annual data can support an explanatory buffer model. This last step is consequential. Improved buffer indicators and milder historical recessions may coexist without a statistically identified relationship between the two.

The principal evidence is descriptive longitudinal analysis. Parsimonious annual regressions provide a complementary assessment of exposure to global growth deceleration. Their role is deliberately limited because world growth is an imperfect proxy for financial stress, buffer measures trend, and the estimation samples contain relatively few extreme observations. The resulting paper extends the BSP interpretation by making resilience conditional on the outcome measured and the nature of the disturbance.

2. Review of Related Literature

2.1. Balance-sheet mechanisms and shock absorption

External liquidity can reduce the need for abrupt adjustment when foreign financing becomes scarce. Import cover represents one dimension of reserve availability, while short-term external debt relative to reserves approximates near-term financing exposure. External debt relative to GDP describes a broader stock of liabilities. These measures capture different vulnerabilities and should not be treated as interchangeable. The IMF (2016) reserve-adequacy framework likewise emphasizes multiple potential drains rather than a universal threshold based on a single ratio. Cross-country WDI evidence on foreign reserves and other macroeconomic indicators in ASEAN economies likewise shows substantial heterogeneity across countries (Quinto & Atento, 2025).

The mechanism also depends on the location and composition of liabilities. Foreign-currency borrowing can amplify depreciation through balance-sheet losses; short maturities can increase rollover pressure; and impaired intermediation can restrict investment and working capital. Jordà et al. (2015) show in long-run international evidence that leverage associated with asset-price booms can deepen subsequent recessions and slow recovery. Their evidence motivates attention to financing conditions, but it does not supply a Philippine coefficient or imply that every credit expansion is destabilizing. Philippine evidence on cross-border financing also documents high portfolio-investment volatility and net-flow reversals relative to ASEAN comparators (Chen et al., 2026).

Buffers have an opportunity cost, and observed reserves are endogenous to policy, capital flows, valuation, and the denominator used. A higher import-cover ratio may reflect stronger reserves, weaker imports, or both. Lagging a ratio avoids a same-year mechanical comparison with growth, but it does not remove the influence of past shocks or expected future conditions. The empirical framework therefore treats reserve variables as indicators of conditions rather than exogenous insurance assignments.

2.2. Recovery, reference paths, and economic scarring

Cerra and Saxena (2017) challenge the assumption that output routinely returns to its former path after recession. Positive growth after a downturn may coexist with a persistent output loss. Suphaphiphat and Shi (2022) document medium- and long-term losses following large crises and emphasize that their magnitude varies with shock type, pre-crisis conditions, and supply-side channels. This literature supports measuring more than the first year of renewed growth.

A historical reference path is nevertheless not an observed counterfactual. Extrapolating a short pre-crisis trend assumes that its pace would have continued in the absence of the event and any subsequent disturbance. Trend-deviation comparisons of projected and observed performance have also been applied to shock periods in other settings, including a commodity-price shock affecting sector equities (Atento, Atento, & Espelita, 2026). Demographic change, productivity developments, political transitions, and later shocks can also alter output. Accordingly, this study uses the term “reference-path shortfall” for the measured deviation. “Scarring” denotes a possible interpretation supported by wider literature, rather than a causal quantity estimated by this design.

2.3. Crisis classification and international comparability

Banking distress and macroeconomic recession are distinct classifications. Laeven and Valencia (2020, 2026) identify systemic banking crises using financial distress and policy-intervention criteria. Their updated database includes Philippine episodes beginning in 1983 and 1997, but does not list a Philippine systemic banking crisis beginning in 2008 or 2020. The 1997 classification matters even though the associated annual GDP decline was comparatively small. A mild aggregate recession does not demonstrate the absence of systemic financial distress.

The database's output-loss estimates use a different trend procedure and aggregation convention from this paper. They are therefore used for classification, not merged with the event metrics. International work informs the mechanisms and the

distinction between distress and output recovery. No cross-country performance ranking is estimated here, and the Philippine experience is not interpreted as evidence of exceptionalism relative to ASEAN economies.

2.4. Philippine historical and contemporary evidence

The BSP chapters provide differentiated explanations. Fernandez and Remolona (2026) associate the protracted 1980s adjustment with debt overhang and delayed resolution. Guinigundo and Cacnio (2026) emphasize vulnerabilities exposed by regional turmoil and the importance of earlier reforms. Canlas et al. (2026) describe why global financial disruption did not coincide with a Philippine annual recession in 2008–2009. Abenoja et al. (2026) discuss how financial buffers and policy responses operated during a severe pandemic contraction. These are historical propositions to assess against independently reconstructed outcomes, not findings generated by the present regressions.

Philippine pandemic research also cautions against simple interpretations of policy support. Basilio et al. (2022) examine the macroeconomic effects of fiscal and monetary responses and find that pandemic conditions altered policy transmission, including fiscal multipliers under restrictions. Debuque-Gonzales et al. (2026) assess the fiscal consequences and public-debt sustainability of the pandemic. Their discussion of debt ratios of 60.4% in 2021 and 60.9% in 2022 underscores the fiscal dimension of crisis absorption. These studies motivate a distinction between preserving intermediation, restoring activity, and maintaining room for future interventions. Comparative policy analysis of Philippine crisis-response instruments under external cost-push shocks similarly distinguishes consumption-side relief through household cash transfers from production-side stabilization through MSME credit (Atento, Quinto, & Atento, 2026).

The latest institutional assessment is consistent with this distinction. The IMF's September 2026 mission describes Philippine systemic risks as contained while identifying corporate and property-related vulnerabilities (IMF, 2026). This assessment supplies contemporary context, not an additional annual observation or an estimate of historical resilience. Full-year 2026 outcomes are excluded. Related work examines the BSP's prudential requirements for digital-centric banks, an institutional development bearing on the regulatory context of financial resilience (Geca et al., 2026). Contemporary Philippine equity-market studies provide further context, including evidence of post-pandemic corporate balance-sheet conservatism (Atento, 2025b) and an empirical sample spanning the COVID-19 disruption, the post-pandemic recovery, and the 2022–2023 BSP tightening cycle (Atento, Atento, Espelita, et al., 2026).

2.5. Research gap, framework, and hypotheses

The unresolved question is whether the book's broad resilience interpretation survives a common measurement of output severity and recovery through 2025, and whether annual observations can substantiate its proposed buffer mechanism. Existing historical accounts, international crisis classifications, and scarring studies answer related questions with different outcomes and methods. This paper contributes an explicit reconciliation of those dimensions for the selected Philippine episodes. It does not claim that prior research neglected Philippine crises.

The analytical sequence is that an external or domestic disturbance encounters pre-existing balance-sheet conditions; those conditions may alter financing pressure and adjustment; and the economy subsequently records a growth response and an output trajectory. The data observe selected conditions and outcomes, but do not separately identify all intermediate channels. Financial resilience can consequently improve without guaranteeing recovery to an earlier real-output path.

Three propositions organize the evidence. First, stronger external liquidity is hypothesized to attenuate the negative growth association with global deceleration. Second, greater financing exposure is hypothesized to amplify it. Third, if improved resilience broadly weakened exposure to external slowdowns, the post-1993 conditional association should be less negative. The first two concern lagged buffer levels; changing them to first differences after diagnostic testing changes the estimand. Estimates using changes address whether recent buffer movements modify the association, not whether a permanently larger stock provides insurance. All tests are two-sided, and failure to reject zero is not interpreted as proof of no effect.

3. Methodology

3.1. Research design and episode selection

The study combines longitudinal description, a common episode comparison, and supporting time-series regressions. The four anchors are 1983, 1997, 2008, and 2020. They correspond to the debt moratorium, regional financial crisis, global financial crisis, and pandemic discussed in the respective BSP chapters. The debt moratorium was announced on 14 October 1983 (Fernandez & Remolona, 2026). Annual data necessarily aggregate conditions before and after intra-year events. The anchors are therefore historical reference dates rather than sharply identified treatment dates.

The main comparison uses five pre-event years and six follow-up observations, including the anchor year: 1978–1982 and 1983–1988; 1992–1996 and 1997–2002; 2003–2007 and 2008–2013; and 2015–2019 and 2020–2025. Later shocks

within these windows are part of the observed trajectory, not attributed exclusively to the initiating event. Recovery dates are tracked beyond the six-observation window through 2025 so that the debt-crisis peak recovery in 1989 remains observable. This extension is explicitly separated from the fixed-window shortfall comparison.

3.2. Data, coverage, and operational definitions

The dataset comprises World Bank (2026b) World Development Indicators observations retrieved on 4 October 2026. Archived API responses record a last-update date of 13 July 2026. Philippine real GDP, growth, inflation, exchange rates, reserves, and private bank credit cover 1970–2025. Import cover begins in 1977. External-debt indicators end in 2024, permitting their lagged 2024 values to enter a regression for 2025. Observations are not interpolated or backfilled. The retrieved series may be revised by their producers; the analysis uses one documented vintage.

Real GDP is measured in constant 2015 US dollars. Its level changes reproduce the separately retrieved growth series to within 0.001 percentage points. Thus, the output comparisons are based on real volumes, not exchange-rate-driven changes in current-dollar GDP. Nominal dollar GDP is used only for ratios whose numerators are also current-dollar values. The reconstructed external-debt/GDP ratio avoids the changing GNP, GNI, and GDP denominators noted in the book's historical debt figure (Moreno & Bayangos, 2026, p. 9).

Table 1. Variables, official indicators, and available coverage

Variable	Indicator	Unit	Coverage	Role
GDP growth	NY.GDP.MKTP.KD.ZG	PH; WLD: %	1970–2025	Outcome / global proxy
Real GDP	NY.GDP.MKTP.KD	Constant 2015 US\$	1970–2025	Severity / reference path
Nominal GDP	NY.GDP.MKTP.CD	Current US\$	1970–2025	Ratio denominator
CPI inflation	FP.CPI.TOTL.ZG	% per year	1970–2025	Secondary outcome
Exchange rate	PA.NUS.FCRF	PHP per US\$	1970–2025	Annual-average depreciation
Reserves, including gold	FI.RES.TOTL.CD	Current US\$	1970–2025	Reserve/GDP numerator
Import cover	FI.RES.TOTL.MO	Months	1977–2025	Primary buffer
Short-term debt / reserves	DT.DOD.DSTC.IR.ZS	%	1970–2024	Financing exposure
Total external debt	DT.DOD.DECT.CD	Current US\$	1970–2024	External debt/GDP numerator
Private bank credit / GDP	FD.AST.PRVT.GD.ZS	%	1970–2025	Historical financing context
Average crude oil price	Pink Sheet annual prices	Nominal US\$/barrel	1970–2025 used	Supplementary control

All indicators are Philippine series unless WLD is specified. GDP growth supplies both Philippine and world observations. Constructed ratios use $100 \times \text{numerator} / \text{nominal GDP}$. Import cover and the three other buffer measures enter separately, lagged and sample-centered; changes are used after stationarity checks. Source: World Bank WDI and Pink Sheet.

Short-term debt uses original maturity of one year or less and includes relevant interest arrears; its denominator includes gold reserves. It is not residual-maturity debt or a claim on usable foreign-exchange liquidity alone. Depreciation is the percentage increase in the annual-average peso/US-dollar rate, so positive values denote peso weakening. Credit/GDP is retained for historical description because financial deepening and credit risk cannot be identified from the aggregate ratio alone. Other WDI-based studies likewise use domestic credit to the private sector by banks (% of GDP) as a macro-structural indicator alongside inflation (Atento, 2026). Annual oil prices from the World Bank (2026a) Pink Sheet supply a supplementary control, measured as the change in the logarithm of the nominal average crude-oil price.

3.3. Crisis severity and recovery measures

Severity is measured by the minimum annual growth rate and the maximum real-GDP drawdown over the fixed event window, including the immediately preceding year's level. The drawdown is the largest percentage decline from a previously attained level within that sequence. This differs from simply subtracting the trough from the pre-anchor level: output increased in 1983 before the contractions of 1984–1985. Recovery is recorded both against the pre-anchor level and

against the peak preceding the observed decline. Where output never falls below a benchmark, recovery is classified as not required rather than assigned a fictitious duration.

For the reference path, the logarithm of real GDP is regressed on a constant and a linear time index using the five pre-event observations. The fitted relationship is extrapolated through the follow-up window. The annual gap is defined as follows:

$$G_t = 100 \times [\ln(Y_t) - \ln(Y^*_t)]$$

Here, Y is observed real GDP, Y^* is the extrapolated reference, and t is the calendar year. G is measured in log points. For interpretation, the exact percentage deviation is $100[\exp(G/100) - 1]$. The endpoint percentage shortfall is reported alongside the observed decline and recovery date. It is not an estimate of the event's causal output cost or of potential GDP. No significance tests are performed on the four episode rows.

3.4. Supporting annual models and estimation

Let y denote Philippine GDP growth and w world GDP growth. The adverse deceleration measure S is $\max(0, w[t-1] - w[t])$; the acceleration measure A is $\max(0, w[t] - w[t-1])$. Both are measured in percentage points. They separate slowdowns from accelerations without labeling world growth an identified financial shock. The initial buffer specification is:

$$y_t = \alpha + \phi y_{t-1} + \beta S_t + \kappa A_t + \gamma B_{t-1} + \theta(S_t \times B_{t-1}) + \delta P_t + \eta R_t + \varepsilon_t$$

B is the lagged buffer centered over the estimation sample; P equals one in 2020; and R equals one in 2021–2022. Centering makes the slowdown coefficient refer to an average observed buffer. The interaction coefficient θ tests whether the conditional slowdown association differs with B . One buffer enters at a time. The import-cover level model uses 1978–2025, comprising 48 observations and eight coefficients including the intercept. The nested baseline omits B and its interaction. These samples are distinguished from the 56-year descriptive coverage.

The post-diagnostic model replaces $B[t-1]$ with the centered change $\Delta B[t-1]$. For import cover this yields 1979–2025 and 47 observations. A baseline is estimated on that same sample. Separate change models use short-term debt/reserves, external debt/GDP, and reserves/GDP. The era model instead uses a post-1993 indicator and its interaction with S . The date marks the new BSP institutional era described by Moreno and Bayangos (2026); it does not identify the effect of BSP reform because other conditions also changed.

OLS estimates use a Bartlett-kernel heteroskedasticity- and autocorrelation-consistent covariance matrix with two annual lags and the $n/(n-k)$ correction (Newey & West, 1987). Related Philippine annual WDI studies likewise combine HAC inference with controls for the pandemic period (Refozar et al., 2026). Reported 95% intervals and two-sided p -values use the t distribution with $n-k$ degrees of freedom. This convention does not make inference exact in a small time-series sample. Calendar spacing is preserved when observations are excluded. The 2020 indicator has unit leverage and absorbs that year's residual. HC3 covariance is consequently examined only after excluding 2020–2022, when that indicator is removed; its use in the full model would be undefined.

3.5. Diagnostics, robustness, and research integrity

ADF tests use one lag of differenced observations, with zero- and two-lag alternatives. MacKinnon (1994, 2010) response-surface approximations supply p -values and finite-sample critical values. KPSS tests use a Bartlett bandwidth of three and the published level- or trend-stationarity critical values (Kwiatkowski et al., 1992). ADF and KPSS have different null hypotheses. Small samples, breaks, and conflicting outcomes require caution rather than mechanical classification of every series.

Regression diagnostics include the two-lag Breusch–Godfrey LM test, the Koenker form of the Breusch–Pagan test, RESET using squared and cubed fitted values, variance inflation factors, standardized condition numbers, leverage, and Cook's distance where defined. An OLS-residual CUSUM bridge supplies a supplementary asymptotic stability diagnostic. Its non-rejection is not evidence that parameters are invariant, particularly with nonzero-mean regressors and few observations. The test is not described as a recursive-residual CUSUM procedure.

Robustness checks use seven- and ten-year pre-event fits, endpoint-based constant-growth extrapolation, three-, five-, and seven-observation follow-up windows, and alternative anchors of 1981, 1998, 2007, and 2009. Other Asian growth studies have similarly used a post-crisis window to reduce sensitivity to late-1990s shock dynamics (Balingit et al., 2026). A seven-observation pandemic window is right-censored at 2025 and supplies no extra post-pandemic observation. Regression checks vary covariance assumptions, remove 2020–2022, omit each six-year crisis window, use symmetric world growth changes, add oil-price changes, and substitute buffer indicators. Excluding the pandemic year has likewise

been used in Philippine annual WDI work, where it shifted estimated inflation-growth thresholds (Chen & Atento, 2026). These are disclosed specifications, not a search for a preferred significant result.

The study uses public aggregate data and no personal records. The companion replication archive contains original API responses, source URLs and hashes, the assembled dataset, executable analysis, complete coefficient and diagnostic outputs, and figures. Analysis uses NumPy, pandas, SciPy, and Matplotlib. The archived statsmodels MacKinnon coefficient module is adapted only to remove its package-validation dependency, with its original license retained. No simulated observations, imputed values, or proprietary data enter the results.

4. Results

4.1. Long-run outcomes and pre-event conditions

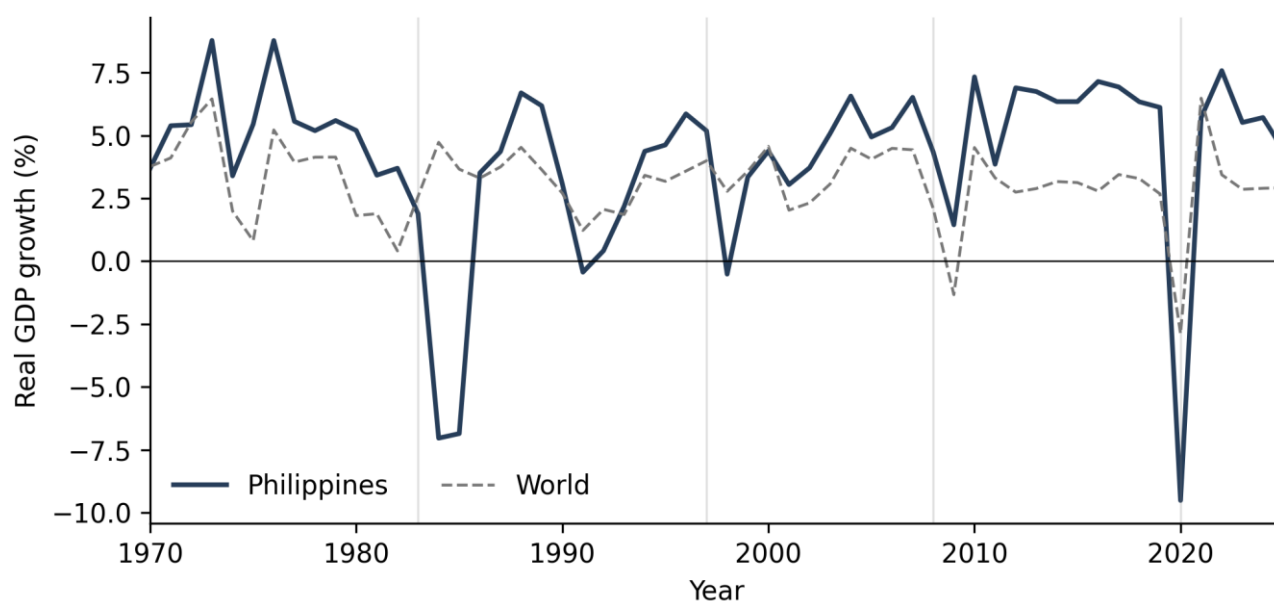
Over 1970–2025, Philippine GDP growth averages 4.20%, with a standard deviation of 3.50 percentage points. The minimum is -9.52% in 2020. Inflation averages 8.82% and reaches 50.34% in 1984. The latter date differs from the year attached to the peak in part of the overview's narrative (Moreno & Bayangos, 2026, pp. 4–6); the present paper uses the independently retrieved annual series. Such reconciliation matters when comparing annual maxima with historical accounts.

Table 2. Descriptive statistics for available annual observations

Variable	N	Mean	SD	Minimum	Maximum
PH GDP growth (%)	56	4.20	3.50	-9.52	8.78
World GDP growth (%)	56	3.16	1.58	-2.89	6.49
Inflation (%)	56	8.82	8.54	0.67	50.34
Private bank credit / GDP (%)	56	30.91	11.36	13.05	52.11
Import cover (months)	49	5.52	3.16	0.90	12.29
Short-term debt / reserves (%)	55	140.64	239.37	9.05	1120.31
External debt / GDP (%)	55	45.28	18.81	21.18	82.98
Reserves / GDP (%)	56	15.29	8.99	2.27	32.07

Coverage follows Table 1. Constructed external-debt/GDP ends in 2024; reserves/GDP covers 1970–2025. SD denotes the sample standard deviation. Source: World Bank WDI; authors' calculations.

Figure 1. Philippine and world annual real GDP growth, 1970–2025.



Vertical lines mark the four anchors. Source: World Bank WDI; authors' calculations.

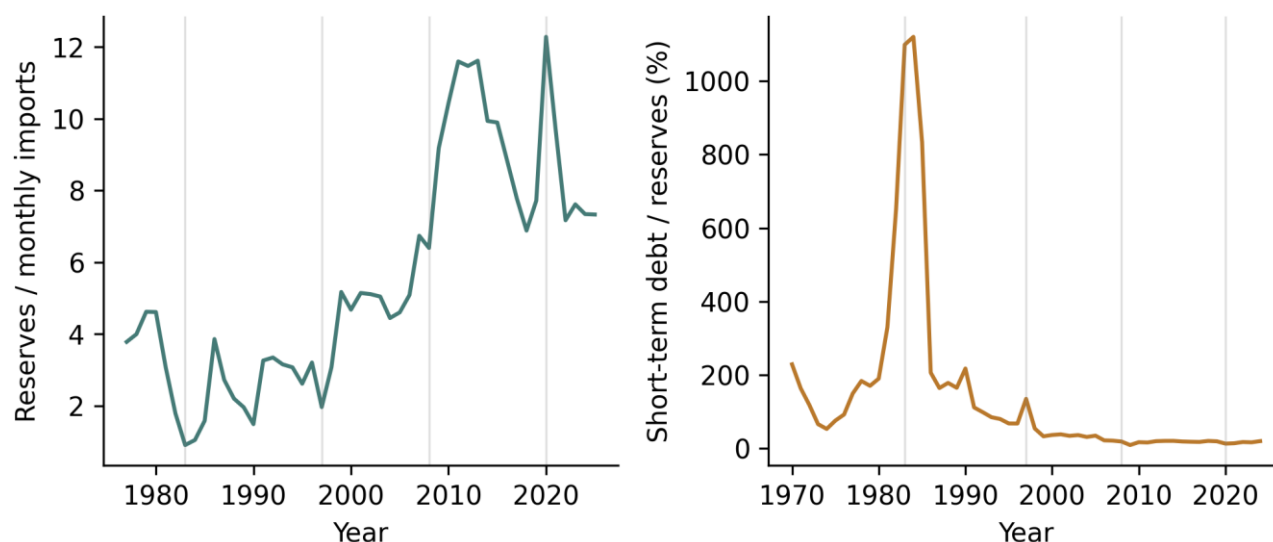
External liquidity conditions before the episodes changed substantially. Import cover was 1.79 months in 1982, 3.20 in 1996, 6.74 in 2007, and 7.72 in 2019. Short-term external debt was 650.74% of reserves in 1982 and 19.22% in 2019. Reconstructed external debt/GDP declined from 57.84% to 22.39% between those pre-event years. These comparisons substantiate the historical observation that the later episodes began with stronger aggregate external liquidity positions. They do not reveal the separate effects of those positions on output.

Table 3. External conditions in the year before each event anchor

Episode (year)	Import cover, months	Short-term debt / reserves, %	External debt / GDP, %	Reserves / GDP, %	Bank credit / GDP, %
Debt crisis (1982)	1.79	650.74	57.84	4.12	29.41
Asian financial crisis (1996)	3.20	67.68	46.48	12.44	42.87
Global financial crisis (2007)	6.74	21.00	37.93	21.63	27.64
COVID-19 (2019)	7.72	19.22	22.39	23.76	47.97

Reserves include gold. Short-term debt follows original maturity, including relevant arrears. These stocks and ratios describe pre-event conditions; they are not causal effect estimates. Source: World Bank WDI; authors' calculations.

Figure 2. External liquidity indicators, available years through 2025.



Import cover begins in 1977; short-term debt/reserves ends in 2024. Ratios include gold reserves. Source: World Bank WDI; authors' calculations.

Private bank credit/GDP does not move monotonically across the pre-event observations: 29.41% in 1982, 42.87% in 1996, 27.64% in 2007, and 47.97% in 2019. A larger ratio may indicate deeper intermediation as well as exposure; it is not automatically interpreted as deterioration. The peak annual inflation rates in the six-observation windows are 50.34%, 9.23%, 8.26%, and 5.98%, respectively. The corresponding maximum annual-average depreciation rates are 50.27%, 38.76%, 7.57%, and 10.60%. The pandemic window includes the later inflation and exchange-rate disturbance of 2022, illustrating why window maxima cannot be assigned solely to the initiating event.

4.2. Crisis severity and recovery

The 1980s crisis produces the largest peak-to-trough annual GDP decline, 13.41%. Growth is still positive in 1983, at 1.90%, before falling by 7.04% in 1984 and 6.86% in 1985. The annual peak preceding those contractions is therefore 1983, not 1982. GDP regains the 1982 pre-anchor level in 1988 and the higher 1983 peak in 1989. This distinction prevents two legitimate recovery dates from being treated as contradictory.

Table 4. Annual GDP severity, level recovery, and reference-path gaps

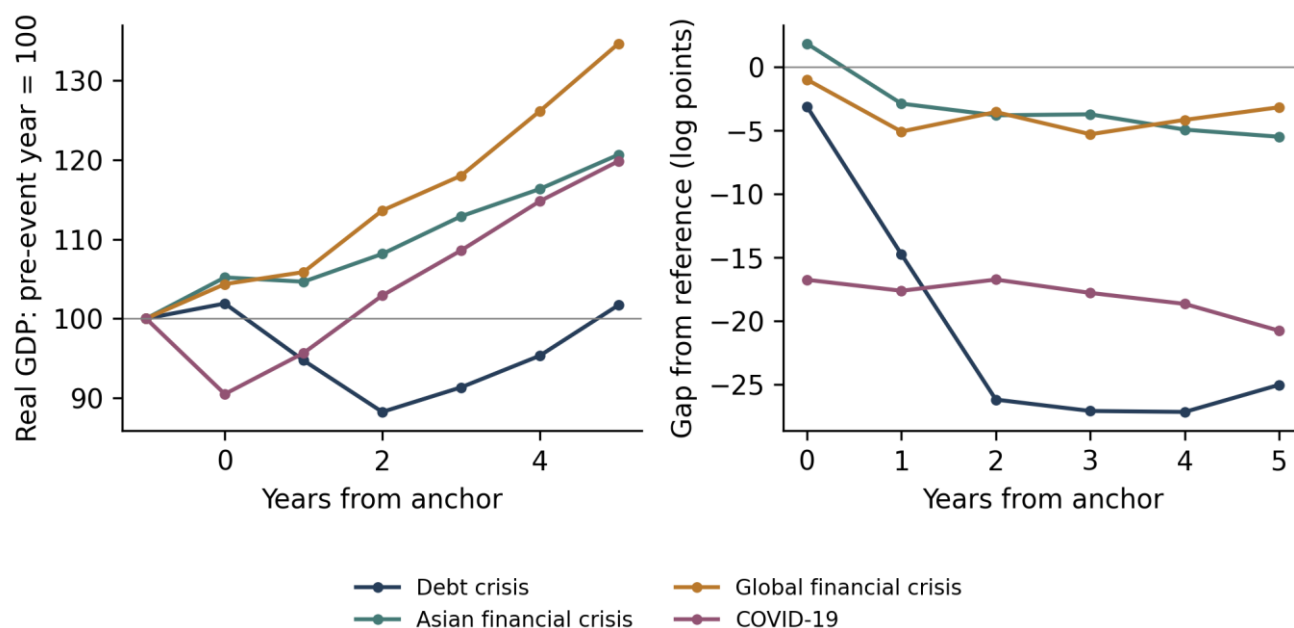
Episode / window	Minimum growth, %	Peak-to-trough decline, %	Pre-anchor level recovery	Pre-decline peak recovery	Endpoint gap, %
Debt crisis 1983–1988	-7.04	13.41	1988	1989	-22.16
Asian financial crisis 1997–2002	-0.51	0.51	Not required	1999	-5.35
Global financial crisis 2008–2013	1.45	0.00	Not required	Not required	-3.13
COVID-19 2020–2025	-9.52	9.52	2022	2022	-18.77

The reference path uses a five-year pre-event OLS log-linear fit. Recovery dates are observed through 2025, beyond the fixed follow-up window where needed. “Not required” means the benchmark level was never lost in the event window. The AFC peak is 1997; the debt-crisis peak is 1983. Source: World Bank WDI; authors’ calculations.

The Asian Financial Crisis produces a 0.51% annual decline in 1998 from the 1997 level. GDP exceeds the 1997 peak in 1999. It never falls below the lower 1996 pre-anchor level during the selected event window. The small aggregate contraction is compatible with the episode's classification as a systemic banking crisis; output and financial-distress criteria answer different questions. During the Global Financial Crisis, annual Philippine growth remains positive, with a minimum of 1.45% in 2009. There is therefore no annual GDP drawdown or required recovery to a previously lost annual level.

COVID-19 differs sharply. The 9.52% contraction in 2020 is the largest single-year decline in the 56-year series, even though the pre-event liquidity indicators are stronger than before the earlier episodes. GDP regains and exceeds its 2019 level in 2022. Relative to the fitted 2015–2019 path, however, it is 18.77% lower in 2025, equivalent to –20.79 log points. Level recovery and reference-path recovery give different assessments of the same episode.

Figure 3. Event output levels and deviations from five-year pre-event paths.



Each series uses six annual follow-up observations. The left panel normalizes the pre-anchor year to 100. The right panel reports log-point gaps. Source: World Bank WDI; authors' calculations.

At the common six-observation endpoint, the estimated percentage gaps are –22.16% in 1988, –5.35% in 2002, –3.13% in 2013, and –18.77% in 2025. These values do not follow a chronological pattern of steadily improving recovery. The two later financial disturbances have smaller observed output losses than the debt crisis, but the pandemic has a substantial shortfall. Furthermore, the smaller extrapolated gaps are less robust to baseline selection, as examined below.

4.3. Preliminary time-series tests and model revision

ADF rejects a unit root in Philippine growth, world growth, and the deceleration and acceleration measures at conventional levels; their KPSS statistics do not reject level stationarity at 5%. Import cover behaves differently. Its level ADF p-value is .556 and its level KPSS statistic is .992, above the .463 critical value. Allowing a deterministic trend changes the KPSS conclusion, but the trend ADF still does not reject a unit root ($p = .240$). The tests do not establish a stable buffer-level process suitable for an unqualified interaction interpretation.

Table 5. Unit-root and stationarity diagnostics

Variable	N	ADF statistic	ADF p	KPSS statistic
PH GDP growth	56	-4.529	<.001	0.151
World GDP growth	56	-5.944	<.001	0.195
Import cover, level	49	-1.455	.556	0.992
Short debt / reserves, level	55	-3.573	.006	0.474
External debt / GDP, level	55	-1.772	.395	0.399
Reserves / GDP, level	56	-1.280	.638	1.277
Import cover, lagged change	47	-5.270	<.001	0.087
Short debt / reserves, lagged change	54	-5.375	<.001	0.040
External debt / GDP, lagged change	54	-3.949	.002	0.208
Reserves / GDP, lagged change	54	-4.957	<.001	0.082

ADF includes an intercept and one lagged difference; N is the input-series count, before ADF lag losses. KPSS tests level stationarity using bandwidth 3; its 5% critical value is .463. Rejection of ADF supports stationarity; rejection of KPSS challenges it. Full lag and trend alternatives are in the archive.

External debt/GDP also presents uncertainty: the level ADF does not reject a unit root, while trend KPSS rejects trend stationarity. Reserves/GDP fails the level-stationarity checks. Short-term debt/reserves has a rejecting ADF result but a KPSS statistic of .474, just above the level critical value, illustrating sensitivity to the null tested. Trends and historical breaks remain plausible. It would be inappropriate to treat every level model as stationary simply because one test rejects a unit root.

Changes in all four buffer measures have rejecting ADF results and KPSS statistics below the level critical value. The regression analysis therefore emphasizes lagged buffer changes and retains the original level estimates only as explicitly exploratory outputs. A comparable sequence of unit-root pre-testing followed by first-difference estimation has been used in Philippine WDI time-series work (Atento, Feng, & Tolentino, 2026). In another Philippine annual-series application, a levels specification proved inconclusive because of shared secular trends, whereas a first-differenced specification isolated year-over-year variation (Atento, Quinto, Espelita, et al., 2026). This revision preserves a statistically more defensible annual specification but does not answer the original stock-insurance hypothesis. No long-run causal effect, cointegrating relationship, or reserve-adequacy threshold is estimated.

4.4. Supporting regression evidence and diagnostics

In the same-sample 1979–2025 baseline, a one-percentage-point deceleration in world growth is associated with a 1.04-percentage-point reduction in Philippine growth, conditional on lagged domestic growth and the pandemic controls. Its 95% interval is $[-1.72, -0.36]$. The corresponding association in the buffer-change model is -1.06 , with interval $[-1.66, -0.46]$. The acceleration coefficient is imprecise, and its magnitude should not be interpreted as a confirmed asymmetry.

Table 6. Supporting annual GDP-growth regressions

Term	Baseline 1979–2025	Buffer 1979–2025	changes Era 1978–2025	comparison
Intercept	2.180 [0.492, 3.868]	2.067 [0.233, 3.901]	1.016 [-2.177, 4.210]	
Lagged PH growth	0.564 [0.313, 0.814]	0.639 [0.315, 0.963]	0.496 [0.242, 0.749]	
World deceleration	-1.039 [-1.716, -0.362]	-1.059 [-1.657, -0.461]	-0.123 [-2.098, 1.852]	
World acceleration	0.227 [-0.586, 1.039]	-0.095 [-1.153, 0.962]	0.130 [-0.657, 0.917]	
Lagged import-cover change	—	0.801 [-0.641, 2.243]	—	
Post-1993 indicator	—	—	2.080 [-0.871, 5.030]	
Deceleration interaction	—	-0.099 [-0.991, 0.793]	-1.148 [-3.355, 1.058]	
2020 indicator	-9.363 [-12.953, -5.773]	-9.790 [-13.334, -6.247]	-8.572 [-12.278, -4.867]	
2021–2022 indicator	6.060 [1.806, 10.315]	6.729 [0.604, 12.854]	5.821 [2.107, 9.536]	
N	47	47	48	
Adjusted R ²	0.537	0.561	0.567	

Entries are OLS coefficients with 95% intervals in brackets. HAC covariance uses two annual lags and $n/(n-k)$; intervals use $t(n-k)$. Buffer changes are centered within the sample. Interaction means deceleration $\times$ lagged buffer change in column 3 and deceleration $\times$ post-1993 in column 4. These models estimate associations, not causal effects.

The interaction between deceleration and the lagged change in import cover is -0.099 , with a 95% interval of $[-0.991, 0.793]$ and $p = .823$. It provides no precise evidence that recent reserve-cover changes attenuate the slowdown association. The original level interaction is 0.016 , with interval $[-0.418, 0.451]$ and $p = .941$, but the stationarity concerns independently preclude a strong inference from that estimate. Neither result establishes that larger reserve stocks are ineffective.

The post-1993 interaction is -1.148 , with a 95% interval of $[-3.355, 1.058]$ and $p = .299$. Its point estimate is opposite to the hypothesized attenuation, but the interval admits both weaker and stronger exposure. Excluding 2020–2022 yields -1.096 , with interval $[-3.114, 0.922]$. The annual data do not establish a decline in conditional exposure to this global-growth proxy across the chosen eras. This result concerns a pooled growth association, not the effectiveness of BSP reform.

Table 7. Regression diagnostic results

Model	BG p	BP p	RESET p	CUSUM p	Max. VIF
Baseline (1979–2025)	.108	.512	.849	.283	2.25
Import-cover changes	.277	.188	.972	.455	3.81
Era comparison	.025	.130	.594	.896	9.67
Short-debt changes	.050	.658	<.001	.661	1.94

BG: two-lag Breusch–Godfrey LM; BP: Koenker–Breusch–Pagan; RESET: two added fitted-value powers; CUSUM: OLS-residual bridge with asymptotic calibration; VIF: variance inflation factor. Non-rejection does not establish validity or stability. The short-debt BG p-value is .04974; rounding to .050 obscures its marginal rejection.

The import-cover change model has Breusch–Godfrey $p = .277$, Koenker–Breusch–Pagan $p = .188$, and RESET $p = .972$. Its maximum VIF is 3.81 and standardized condition number 4.23. These checks reveal no rejection at 5%, but the sample is small and influence is concentrated. Cook's distances are .565 in 1986 and .531 in 2010, above the descriptive $4/n$ threshold; 1984 and 1985 are also influential. The 2020 indicator has leverage one, so its Cook's distance is undefined and is not presented as an ordinary influence estimate.

The era model fails the two-lag autocorrelation diagnostic ($p = .025$), reinforcing its supporting role despite HAC inference. The alternative short-term-debt change model fails RESET ($p < .001$) and narrowly rejects the autocorrelation null ($p = .04974$). Its interaction cannot serve as clean corroboration of a leverage mechanism. OLS-residual CUSUM does not reject for the displayed models, but its low-power and calibration limitations prevent a conclusion of proven parameter stability.

4.5. Robustness and sensitivity

The largest reference-path shortfalls survive alternative pre-event assumptions. Across five-, seven-, and ten-year baselines and the two extrapolation methods, six-observation endpoint shortfalls range from 21.80% to 27.68% for the debt crisis and 16.94% to 18.77% for the pandemic. In contrast, the Asian Financial Crisis endpoint ranges from -6.02% to $+5.01\%$, and the Global Financial Crisis from -4.18% to $+4.10\%$. The sign of these smaller deviations is therefore not robust, although the observed GDP contractions and level-recovery dates remain unchanged by the reference calculation.

Alternative anchors also matter. Starting the debt comparison in 1981 gives a 28.56% endpoint shortfall in 1986 and still contains the 1984–1985 collapse. Starting the Asian Financial Crisis comparison in 1998 yields a 10.10% shortfall in 2003 because the fitted baseline now includes the strong 1997 level. Global Financial Crisis anchors of 2007 and 2009 yield shortfalls of 2.92% and 0.23% at their respective six-observation endpoints. These differences are evidence about reference sensitivity, not alternative causal estimates.

Table 8. Sensitivity of the import-cover change interaction

Specification	Coefficient	95% interval	p	N
Primary change model	-0.099	[-0.991, 0.793]	.823	47
HAC lag 1	-0.099	[-0.938, 0.740]	.812	47
Exclude 2020–2022, HAC	-0.181	[-1.436, 1.073]	.771	44
Exclude 2020–2022, HC3	-0.181	[-1.561, 1.198]	.792	44
Add oil-price changes	-0.100	[-0.985, 0.785]	.820	47
Omit 1983–1988	0.056	[-0.342, 0.454]	.777	41
Omit 1997–2002	-0.230	[-1.200, 0.741]	.633	41
Omit 2008–2013	1.078	[-0.161, 2.317]	.086	41
Omit 2020–2025	-0.163	[-1.433, 1.107]	.796	41
Symmetric world-growth change	0.089	[-0.304, 0.483]	.650	47

HAC lag 2 is used unless stated otherwise. HC3 is restricted to the pandemic-excluded sample because the full model contains a unit-leverage 2020 indicator. Calendar lags are retained across omitted windows. The symmetric specification changes the sign convention of the global-growth regressor. No coefficient in this table has a 95% interval excluding zero.

The import-cover change interaction remains imprecise under one-lag HAC inference, pandemic exclusion, HC3 on the pandemic-excluded sample, and the oil-price control. Omitting the 2008–2013 observations changes its estimate to 1.078, with interval $[-0.161, 2.317]$ and $p = .086$. The movement is substantial even though the interval still includes zero at 5%. It indicates sensitivity to a small group of observations and does not justify a firm insurance claim. Symmetric world-growth changes produce a different sign convention and also an interval containing zero.

Alternative change interactions are -0.0030 for short-term debt/reserves, -0.0168 for external debt/GDP, and -0.0358 for reserves/GDP. Their 95% intervals all include zero. They use longer samples than import cover and different units, so their coefficient sizes are not directly comparable. Moreover, the short-term-debt specification has the diagnostic failures already reported. The combination of weak precision, changing estimates, and imperfect shock measurement leaves the original buffer mechanism unresolved.

4.6 Discussion

The historical comparison confirms one part of the BSP account and qualifies another. Independently retrieved data confirm that pre-event external liquidity was much stronger before the Global Financial Crisis and the pandemic than before the 1983 debt crisis. The annual GDP losses associated with the 1997 and 2008 episodes were also much smaller than the 1980s drawdown. This pattern is consistent with improved absorption of some financial disturbances. It does not demonstrate that the improvement was produced by any particular reserve policy, regulation, or institutional reform.

The pandemic qualifies a broad claim of increasing macroeconomic resistance. Large external buffers coexisted with the deepest annual contraction in the sample. This is economically coherent because liquidity can support payments and intermediation without overcoming restrictions on production, mobility, or health. Abenoja et al. (2026) emphasize financial-system responses during the pandemic, while the present evidence measures aggregate output. The findings therefore distinguish the domain in which resilience is assessed rather than treating a real-economy contraction as proof that financial safeguards failed.

Recovery also requires a specified benchmark. Regaining the 2019 GDP level in 2022 is an observable achievement. Remaining below the extrapolated pre-pandemic path in 2025 indicates that level recovery did not restore that historical trajectory. This is consistent with the scarring literature, but the 18.77% deviation incorporates subsequent developments as well as the pandemic. The persistence and cross-specification size of the deviation make it relevant for assessment; they do not convert the extrapolation into an identified estimate of permanent damage.

The 1997 episode illustrates why financial classification cannot be inferred solely from national output. The updated Laeven–Valencia classification includes a systemic Philippine banking crisis beginning in that year. The book's interpretation of comparatively limited macroeconomic damage can coexist with that classification. Claims that the country entirely avoided systemic distress would require a different definition and supporting evidence. This paper accordingly compares output outcomes while preserving the distinction between historical banking distress and recession severity.

The supporting regression results impose a further qualification. A slowdown in world growth is associated with weaker Philippine growth, but the observed relationship does not demonstrably attenuate after 1993. This does not contradict the smaller output declines in the selected financial crises. Annual world-growth deceleration measures changes in aggregate activity, not foreign funding withdrawals, risk premia, or domestic debt overhang. World growth actually accelerated in 1983, while the Philippine contraction intensified in 1984–1985. The mismatch limits the proxy's ability to represent the principal mechanism of the debt episode.

The buffer-change results also cannot validate the original stock hypothesis. Moving to changes addresses stationarity concerns but loses the direct question of whether a large inherited buffer cushions a disturbance. There is consequently a defensible boundary between what the paper establishes and what remains open. It establishes measured differences in historical severity, recovery, and pre-event conditions. It documents a conditional global-growth association. It does not identify the mechanism explaining the differences or establish the absence of a beneficial buffer effect.

5. Conclusions, Implications and Limitations

5.1 Conclusions

Philippine resilience improved in identifiable dimensions, but the evidence does not support an unqualified progression toward immunity from major economic disruption. The Asian and Global Financial Crisis episodes recorded substantially smaller annual output losses than the 1980s debt crisis. External liquidity indicators were stronger before the later episodes. COVID-19 nevertheless had the largest single-year contraction, and its output trajectory remained materially below the extrapolated pre-pandemic path through 2025.

The contribution is to distinguish three outcomes that are often combined: financial-distress classification, recovery of observed output levels, and recovery to a historical growth path. The comparisons are strongest for observed declines and for the large shortfalls surrounding the debt crisis and pandemic. Smaller extrapolated deviations depend on the chosen baseline. Supporting regressions do not establish the proposed buffer mechanism or a weaker global slowdown association after 1993. Resilience is therefore better understood as conditional shock absorption with identifiable remaining vulnerabilities.

5.2 Policy Implications

First, crisis monitoring should report output growth, the recovery of previous levels, and deviation from a clearly documented reference path separately. The pandemic evidence shows why a return above the 2019 level can coexist with an economically large gap from the earlier trajectory. Policy assessments should display sensitivity to the chosen path rather than presenting one extrapolation as potential output or an established loss attributable to the crisis.

Second, external-liquidity monitoring should retain complementary indicators and their maturity and reserve definitions. The historical improvement in import cover and short-term debt coverage is observable, but this analysis does not estimate an optimal reserve stock or a threshold. Recommendations to accumulate a specified additional quantity of reserves would exceed the evidence. Monitoring usable liquidity, currency mismatch, and residual-maturity financing needs would better connect the indicators to the underlying mechanism.

Third, preservation of financial intermediation and restoration of real activity require separate assessment. A strong banking system cannot by itself ensure recovery after a shock that restricts production and human-capital formation. The pandemic comparison supports tracking the pace and composition of real recovery alongside financial stability. Fiscal space matters in this broader assessment, as Philippine debt-sustainability research demonstrates, but the present results do not estimate the return to any specific spending instrument.

Finally, the sensitivity of the buffer interactions argues for better measurement before assigning historical improvements to a particular policy. Higher-frequency funding, exchange-rate, credit-quality, and bank-balance-sheet data would support more informative stress analysis. The policy implication is a disciplined evaluation framework, not a conclusion that safeguards were ineffective because a small annual model lacks statistical precision.

5.3 Limitations and Directions for Future Research

The four selected episodes are historically important but not a random sample of comparable shocks. Their nature, intensity, duration, and transmission channels differ. The paper estimates neither a causal treatment effect nor a Philippine advantage relative to neighboring economies. Subsequent developments within the event windows also affect observed recovery. The descriptive comparison cannot separate those influences from the initiating disturbance.

Annual aggregation conceals quarterly drawdowns, intra-year currency movements, anticipation, and the timing of policy responses. The 1981 debt-anchor sensitivity partly addresses anticipation but cannot recover an unobserved untreated path. WDI series are harmonized retrospectively and subject to revisions and national-account rebasing. A single archived vintage ensures reproducibility without eliminating measurement uncertainty.

Reference paths are extrapolations from short historical intervals. Their sensitivity is particularly consequential for the Asian and Global Financial Crisis episodes, where endpoint signs change across baselines. The persistence of the larger debt-crisis and pandemic deviations does not establish permanence. The pandemic sample ends in 2025; no complete 2026 observation is used, and seven-year follow-up is unavailable. Recovery of per-capita income, employment, sectoral output, and distributional outcomes may differ from aggregate GDP recovery.

The regression samples are small, and the global-growth proxy is an imperfect measure of financial pressure. Lagging buffers does not establish exogeneity. The unit-leverage 2020 control, influential rebound observations, trending buffer levels, autocorrelation in the era model, and misspecification of the short-term-debt change model materially limit inference. HAC intervals address a covariance problem; they do not repair identification, omitted variables, or all finite-sample weaknesses. Single-country Philippine annual series of modest length have elsewhere been analyzed with ARDL bounds testing, which accommodates regressors of mixed integration order (Atento, Teodosio, et al., 2026). Multiple robustness specifications are exploratory and are not adjusted into a formal family of hypothesis tests.

Future research should investigate the mechanisms with quarterly stress measures, maturity- and currency-specific liabilities, and bank-level balance sheets. Harmonized ASEAN comparisons could distinguish shock exposure from shock absorption, while a credible identification strategy would be needed to evaluate particular reforms. Fiscal and banking indicators can be analyzed over their own defensible shorter samples instead of being artificially extended to 1970. Those extensions would complement this paper's measured historical comparison without treating its imprecise interactions as definitive causal findings.

6. References

- Abenoja, Z. R. R., Bayangos, V. B., & Lapid, D. D. (2026). Pandemic shockwaves: How COVID-19 reshaped the Philippine financial system. In R. Moreno & V. Bayangos (Eds.), *Risk and resilience in the Philippine financial system: How much has changed?* (pp. 209–256). Bangko Sentral ng Pilipinas.
- Atento, A. G., Quinto, L. F., & Atento, R. G. O. (2026). Relief or recovery? A comparative policy assessment of household cash transfers and MSME credit support as crisis-response instruments in the Philippines. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/p4hr6f59>
- Atento, A. G., Teodosio, G. M., Mesias, R. G., Roxas, C., & Atento, R. G. O. (2026). Education, income, and the dynamics of formal business entry in the Philippines: An ARDL analysis. *Journal of Enterprise Strategy and Management Innovation*, 1(3). <https://doi.org/10.65166/qntwsr74>

- Atento, R. G. (2025a). The credibility imperative 2025: Governance integrity, economic resilience, and strategic adaptability in Philippine diplomacy. *International Journal of Health & Business Analytics*, 1(2). <https://doi.org/10.65166/6amaz997>
- Atento, R. G. (2025b). Valuation metrics, market efficiency, and investor sentiment: A descriptive analysis of Philippine Stock Exchange-listed firms. *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/6kbeat87>
- Atento, R. G. (2026). Macroeconomic and structural determinants of formal business entry in ASEAN: Evidence from a linear mixed-effects model using World Development Indicators. *Journal of Enterprise Strategy and Management Innovation*, 1(1). <https://doi.org/10.65166/bh0gx302>
- Atento, R. G., Atento, A. G., & Espelita, C. A. M. (2026). Below the trendline: Oil price shocks, the Strait of Hormuz crisis, and the disrupted growth trajectory of global health sector equities (2024–2026). *International Journal of Health & Business Analytics*, 2(1). <https://doi.org/10.65166/emmhmm48>
- Atento, R. G., Feng, T., & Tolentino, G. (2026). Do remittances save or spend? Testing the consumption-investment allocation hypothesis for the Philippines using WDI time-series evidence, 2000–2023. *Journal of Enterprise Strategy and Management Innovation*, 1(2). <https://doi.org/10.65166/dewg3q39>
- Atento, R. G. O., Atento, A. G., Espelita, C. A. M. H., Del Mundo, F., Nonog, R. G., Mangubat, M. M., Dela Costa, V. G., Manzana, P., & Espina, A. (2026). Value and size premiums in the Philippine equity market: Evidence from an extended dataset with volatility analysis. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/nbsg0j88>
- Atento, R. G. O., Quinto, L. F., Espelita, C. A. M. H., Atento, A. G., Teodosio, G. M., Feng, T., Tan, Q., & Chen, S. (2026). Global shocks, local ventures: Oil prices, dollar strength, and China's economic shifts as determinants of entrepreneurial activity in the Philippines, 2006–2022. *Journal of Enterprise Strategy and Management Innovation*, 1(3). <https://doi.org/10.65166/dyv5eh53>
- Balingit, F. G., Atento, R. G. O., & Espelita, C. A. M. H. (2026). PPP income convergence in Asia: Evidence from ASEAN-10 and selected Asian comparators, 1995–2019. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/ym2vt625>
- Basilio, J. R., Britt-Fermo, L., & Cacnio, F. C. Q. (2022). *Quantifying the macroeconomic impact of the Philippine fiscal and monetary responses to the COVID-19 pandemic* (BSP Research Academy Discussion Paper Series No. 014). Bangko Sentral ng Pilipinas. <https://www.bsp.gov.ph/Sites/researchsite/Publications/BSP-Discussion-Papers/DP202205.pdf>
- Canlas, D. B., Parcon-Santos, H. C., & Tancangco, J. A. M. (2026). The 2007–2009 Global Financial Crisis and the Philippines: Coping with and learning from the crisis. In R. Moreno & V. Bayangos (Eds.), *Risk and resilience in the Philippine financial system: How much has changed?* (pp. 163–208). Bangko Sentral ng Pilipinas.
- Cerra, V., & Saxena, S. C. (2017). *Booms, crises, and recoveries: A new paradigm of the business cycle and its policy implications* (IMF Working Paper No. 17/250). International Monetary Fund. <https://doi.org/10.5089/9781484325759.001>
- Chen, S., & Atento, R. G. O. (2026). Nonlinear inflation regimes and per-capita growth: Comparative evidence from China and the Philippines (1987–2024). *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/t70qvn52>
- Chen, S., Atento, R. G. O., Feng, T., Tan, Q., Refozar, R. F., & Manalo, L. (2026). Capital depth and entrepreneurial vitality: Market capitalization growth and cross-border investment flows in the Philippines and ASEAN. *Journal of Enterprise Strategy and Management Innovation*, 1(3). <https://doi.org/10.65166/b4vrds73>
- Debuque-Gonzales, M., Diokno-Sicat, C. J., Corpus, J. P. P., Palomar, R. H. G., Ruiz, M. G. C., & Miral, R. M. L. (2026). *Fiscal effects of the COVID-19 pandemic: Assessing public debt sustainability in the Philippines* (Research Paper Series No. 2026-01). Philippine Institute for Development Studies. <https://doi.org/10.62986/rps2026.01>
- Fernandez, J. R. A. J., & Remolona, E. M., Jr. (2026). La década perdida ensnares the Philippines. In R. Moreno & V. Bayangos (Eds.), *Risk and resilience in the Philippine financial system: How much has changed?* (pp. 31–62). Bangko Sentral ng Pilipinas.
- Geca, M., Atento, A. G., Espelita, C. A. M. H., & Atento, R. G. O. (2026). Closing the backdoor: Fintech license strategies, regulatory reclassification, and the architecture of digital bank supervision in the Philippines. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/d0m0k596>

- Guinigundo, D. C., & Cacnio, F. C. Q. (2026). Fragile foundations, enduring lessons: The 1997 Asian Financial Crisis revisited. In R. Moreno & V. Bayangos (Eds.), *Risk and resilience in the Philippine financial system: How much has changed?* (pp. 117–162). Bangko Sentral ng Pilipinas.
- International Monetary Fund. (2016). *Guidance note on the assessment of reserve adequacy and related considerations*. <https://www.imf.org/external/np/pp/eng/2016/060316.pdf>
- International Monetary Fund. (2026, September 25). *IMF staff completes 2026 Article IV mission to the Philippines* (Press Release No. 26/304). <https://www.imf.org/en/news/articles/2026/09/25/pr26304-imf-staff-completes-2026-article-iv-mission-to-the-philippines>
- Jordà, Ò., Schularick, M., & Taylor, A. M. (2015). *Leveraged bubbles* (Working Paper No. 2015-10). Federal Reserve Bank of San Francisco. <https://www.frbsf.org/research-and-insights/publications/working-papers/2015/08/leveraged-bubbles/>
- Kwiatkowski, D., Phillips, P. C. B., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? *Journal of Econometrics*, 54(1–3), 159–178. [https://doi.org/10.1016/0304-4076\(92\)90104-Y](https://doi.org/10.1016/0304-4076(92)90104-Y)
- Laeven, L., & Valencia, F. (2020). Systemic banking crises database II. *IMF Economic Review*, 68, 307–361. <https://doi.org/10.1057/s41308-020-00107-3>
- Laeven, L., & Valencia, F. (2026). *Systemic banking crises database: 1970–2025* (IMF Working Paper No. 26/94). International Monetary Fund. <https://doi.org/10.5089/9798229045971.001>
- MacKinnon, J. G. (1994). Approximate asymptotic distribution functions for unit-root and cointegration tests. *Journal of Business & Economic Statistics*, 12, 167–176. <https://qed.econ.queensu.ca/pub/faculty/mackinnon/jbes/>
- MacKinnon, J. G. (2010). *Critical values for cointegration tests* (Queen's Economics Department Working Paper No. 1227). Queen's University. <https://www.econ.queensu.ca/research/working-papers/1227>
- Moreno, R., & Bayangos, V. B. (2026). Risk and resilience in the Philippine financial system: An overview. In R. Moreno & V. Bayangos (Eds.), *Risk and resilience in the Philippine financial system: How much has changed?* (pp. 1–30). Bangko Sentral ng Pilipinas.
- Newey, W. K., & West, K. D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica*, 55(3), 703–708. <https://www.jstor.org/stable/1913610>
- Quinto, L., & Atento, R. G. (2025). Economic growth and developmental equity in four ASEAN economies: Linking macroeconomic trends to employment and child nutrition (1999–2024). *International Journal of Health & Business Analytics*, 1(1). <https://doi.org/10.65166/nq75nv94>
- Refozar, R. F., Atento, R. G. O., Atento, A. G., & Espelita, C. A. M. H. (2026). Foreign direct investment and manufacturing performance in the Philippines: Evidence from WDI, 2000–2024. *Asian Financial Economics and Policy*, 1(1). <https://doi.org/10.65166/qasnh058>
- Suphaphiphat, N., & Shi, Y. (2022). *Economic scarring: Channels and policy implications* (IMF Working Paper No. 22/248). International Monetary Fund. <https://doi.org/10.5089/9798400227257.001>
- World Bank. (2026a). *Commodity price data (the Pink Sheet): Annual prices* [Data set]. Retrieved October 4, 2026, from <https://www.worldbank.org/en/research/commodity-markets>
- World Bank. (2026b). *World development indicators* [Data set]. Retrieved October 4, 2026, from <https://data.worldbank.org/>

Appendix A. Reference-path sensitivity

Table A1. Endpoint percentage deviations across pre-event path choices

Episode	Minimum deviation, %	Maximum deviation, %
Debt crisis	-27.68	-21.80
Asian financial crisis	-6.02	5.01
Global financial crisis	-4.18	4.10
COVID-19	-18.77	-16.94

Six path choices per episode: 5-, 7-, and 10-year baselines, each with OLS or endpoint-growth extrapolation. Negative values denote output below the reference. Ranges measure specification sensitivity, not statistical uncertainty.

The sensitivity ranges compare the same six-observation horizon within each episode. Baselines contain five, seven, or ten pre-event observations. “OLS” fits log GDP on a linear time index; “endpoint growth” extrapolates the compound annual rate between the first and last baseline observations from the final pre-event level. The ranges are descriptive and do not represent confidence intervals.

Table A2. Alternative follow-up windows with five-year pre-event OLS paths

Episode	Requested observations	Endpoint year	Gap, %
Debt crisis	3	1985	-23.06
Debt crisis	5	1987	-23.80
Debt crisis	7	1989	-20.86
Asian financial crisis	3	1999	-3.74
Asian financial crisis	5	2001	-4.82
Asian financial crisis	7	2003	-4.64
Global financial crisis	3	2010	-3.49
Global financial crisis	5	2012	-4.09
Global financial crisis	7	2014	-2.53
COVID-19	3	2022	-15.43
COVID-19	5	2024	-17.03
COVID-19	7	2025	-18.77

Follow-up includes the anchor year. The seven-observation COVID-19 row contains only six available observations and is censored at 2025. Source: authors’ calculations.

Three-, five-, and seven-observation follow-up windows change the calendar endpoint as shown. The primary six-observation endpoints are reported in Table 4. For COVID-19, the requested seven-observation window is capped at 2025 and therefore duplicates the six-observation result; it is not an independent robustness observation.

Appendix B. Model interpretation and replication

For a buffer-level model, the conditional slope with respect to deceleration is $\beta + \theta(B[t-1] - \text{mean } B)$. The buffer-change model replaces B with ΔB and consequently evaluates a different moderator. For symmetric world growth changes, a positive coefficient means stronger comovement with a global acceleration; its sign cannot be compared directly with the positive deceleration convention. All coefficient units follow the moderator and growth units listed in Table 1.

The archive includes complete results for every reported model, all ADF lag variants and trend specifications, observation-level influence diagnostics, all event-path alternatives, and the raw data. Missing debt observations in 2025 remain missing. Their lagged 2024 values are used only where the model calls for a lag. The main import-cover and era specifications are estimated over their stated samples; the alternative debt and reserve-ratio specifications also include longer available samples and separate common-sample level estimates. No interpolation extends banking, fiscal, or external-debt series beyond verified coverage.