

Breaking par-value spillovers and systemic risk

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Abstract

Using product-level data on wealth management products (WMPs) issued by subsidiaries of listed Chinese banks, this study examines the systemic implications of the breaking-par-value (BPV) episode in November 2022. WMP data are matched with parent-bank balance-sheet and market information, while systemic risk is measured using CoVaR and ΔCoVaR . The results reveal a dual pattern. A higher BPV ratio is associated with lower financial-system tail risk conditional on distress at the affiliated bank, suggesting a risk-dispersion role for wealth management subsidiaries. However, after the November 2022 episode, BPV is associated with a higher marginal contribution to systemic risk, particularly among non-Big Six banks. Large absolute WMP losses are also related to systemic stress, consistent with a net-worth and balance-sheet feedback mechanism. These effects are stronger for fixed-income products, relatively low-risk WMPs, and products with greater redemption flexibility. The study highlights the need for differentiated supervision, stronger liquidity-risk management, and closer monitoring of balance-sheet feedback between WMPs, wealth management subsidiaries, and parent banks.

JEL Classification: G21, G28, G01, G32

1. Introduction

China's rapid economic growth and sustained accumulation of household wealth have generated increasing demand for professional and diversified investment services. In response, the asset-management industry has expanded rapidly, with wealth management products (WMPs) becoming an important channel through which households preserve and allocate financial wealth. Commercial banks have accordingly established wealth management subsidiaries to provide specialized asset-management services and meet investors' growing demand for differentiated financial products.

Supported by the credit standing and distribution networks of their parent banks, these subsidiaries have become major participants in China's wealth management market. Their establishment has also enabled banks to separate asset-management activities from conventional deposit-taking and lending operations, improve the allocation of financial resources, and manage the risk-return profiles of their broader financial activities more flexibly. At the same time, the close institutional and reputational links between parent banks and their subsidiaries create channels through which shocks originating in WMP portfolios may be transmitted back to the banking system (Acharya et al., 2012; 2013).

The issuance of the *Guiding Opinions on Regulating the Asset Management Business of Financial Institutions*, commonly known as the New Asset Management Rules (NAMR), in 2018, followed by the completion of the regulatory transition in 2022, marked a major change in China's asset-management framework. The NAMR introduced more unified regulatory standards for asset-management activities, strengthened the separation between banks and their wealth management businesses, and promoted the transition from expected-return products to net-asset-value-based valuation. These reforms improved product standardization and transparency, strengthened investor protection, and accelerated the dismantling of implicit guarantees of principal and returns.

However, market-based valuation also makes changes in underlying asset prices more visible in WMP net asset values. While this improves risk transparency, it may increase short-term NAV volatility and expose wealth management subsidiaries to redemption and liquidity pressures. The U.S. money market fund market provides a useful comparison. Although U.S. investment products are clearly separated from insured deposits and may incur losses, Jacewitz et al. (2022) show that bank-sponsored prime institutional MMFs were still priced as if sponsors provided implicit liquidity insurance. After the Lehman crisis, these funds charged higher expense ratios and paid lower net yields than non-bank-sponsored funds, but did not face larger redemptions. This suggests that investors may value sponsor support even without a legal guarantee. This mechanism is particularly relevant to China's WMP market, where bank distribution networks, reputational backing, and expected-return arrangements historically reinforced implicit-guarantee beliefs. Therefore, under the NAMR, BPV events may have stronger implications for investor belief revisions, redemption pressure, and bank-affiliated systemic-risk transmission than similar NAV fluctuations in a regime where the boundary between deposits and investment products is clearer.

Because WMPs have become widely held by retail investors, declines in net asset value may lead investors to reassess products previously perceived as relatively safe, thereby generating concentrated redemptions and potential asset-sale pressures. These concerns became particularly salient during the large-scale BPV episode in November 2022. The episode reflected a substantial repricing of the fixed-income assets underlying many WMPs and was accompanied by concentrated investor redemptions. As shown in Fig. 1, the incidence of BPV increased sharply after November 2022. The proportion of WMPs with net asset values below par reached approximately 25% in December 2022 before gradually returning toward its pre-shock level by March 2023. This episode provides a valuable setting for examining whether BPV events merely reveal and redistribute existing losses or activate balance-sheet feedback mechanisms that amplify systemic stress. Against this background, this study investigates the systemic-risk spillovers associated with the November 2022 BPV episode and evaluates how risk is transmitted among underlying asset markets, wealth management subsidiaries, and their affiliated listed banks under the post-NAMR regime.

[Insert Fig. 1 Here]

A substantial body of literature examines the institution-level determinants of systemic risk, highlighting the roles of bank competition (Anginer et al., 2014), liquidity creation (Davydov et al., 2021), asset-price bubbles (Brunnermeier et al., 2020), financial technology adoption (Chen and Shen,

2024), and fire-sale spillovers (Duarte and Eisenbach, 2021; Yang and Yang 2026). A central insight from this literature is that financial fragility arises not only from the initial shock but also from endogenous amplification through leverage, asset valuations, and interconnected balance sheets. When adverse price movements reduce intermediary net worth and risk-bearing capacity, institutions may contract their balance sheets or liquidate assets, further depressing market prices and intensifying systemic stress (Kiyotaki and Moore, 1997; He and Krishnamurthy, 2013; Brunnermeier and Sannikov, 2014). However, existing studies largely focus on traditional financial intermediaries, leaving the role of bank-affiliated wealth management subsidiaries in transmitting and amplifying systemic risk comparatively underexplored.

This omission has become particularly important following the implementation of the NAMR, which incorporated the shadow-banking functions of WMPs into a more unified regulatory framework and accelerated the transition toward net-asset-value-based valuation. Although mark-to-market valuation improves transparency and helps dismantle implicit guarantees, it also allows changes in underlying asset values to be transmitted more rapidly to reported WMP net asset values and investor behavior. The U.S. MMF experience shows why breaking a nominal benchmark can matter beyond the direct portfolio loss: “breaking the buck” weakens investors’ belief that a cash-like investment product is safe (Schmidt et al., 2016). China’s BPV episode is institutionally different because WMPs are broader, more retail-oriented products and are not governed by the same stable-NAV rule. Nevertheless, both settings involve bank-affiliated sponsorship or distribution, expectations of implicit support, and the risk that visible NAV losses trigger redemptions and balance-sheet feedback. A BPV event may therefore do more than reveal a portfolio loss. It can reduce investors’ financial wealth, revise their perceptions of product risk, and test the credibility of implicit support after the shift to market-based valuation. These belief revisions may trigger redemptions, liquidity-buffer depletion, and asset sales by wealth management subsidiaries, placing additional pressure on commonly held assets and generating further BPV events. Parent banks may also face reputational costs or liquidity-support demands. Despite these potential channels, there remains limited micro-level evidence on how BPV events affect the systemic-risk contribution of affiliated banks under the post-NAMR regime.

The systemic implications of BPV spillovers can be understood from both network and balance-sheet perspectives. At the network level, the expansion of wealth management subsidiaries and WMPs has introduced additional peripheral nodes into the financial system, reinforcing the core–periphery structure linking parent banks, subsidiaries, investors, and underlying asset markets. Greater interconnectedness may improve risk sharing under normal conditions, but it can also amplify shock transmission once losses exceed the system’s absorption capacity (Allen and Gale, 2000; Acemoglu et al., 2015; Wang et al., 2018). Wealth management subsidiaries may therefore disperse risk away from parent-bank balance sheets in tranquil periods while simultaneously creating additional channels through which market-wide stress propagates.

At the balance-sheet level, WMPs provide banks with greater flexibility to reallocate exposures and manage the risk–return profiles of their consolidated financial activities. Yet this risk-transfer function may be weakened by maturity mismatches (Luo et al., 2019), funding pressures (Feng et al., 2022), and persistent expectations of implicit support from parent banks (Huang et al., 2023). During widespread BPV episodes, concentrated redemptions may force subsidiaries to sell assets into declining markets. The resulting price pressure reduces the net asset values of other WMPs, weakens intermediary risk-bearing capacity, and reinforces further redemptions and liquidation. BPV spillovers may thus activate a net-worth and balance-sheet feedback loop in which initially localized valuation losses develop into broader systemic stress. Whether wealth management subsidiaries primarily disperse risk or amplify it through this feedback mechanism remains an open empirical question.

This study contributes to the literature in three respects. First, it uses micro-level WMP data matched with bank-level financial and market information to examine the systemic implications of BPV events in China’s asset-management market. In doing so, it extends the systemic-risk literature beyond conventional bank balance sheets to the interaction between parent banks, wealth management subsidiaries, and off-balance-sheet investment products. Second, it introduces the net-worth and balance-sheet feedback mechanism into the analysis of BPV spillovers. This framework explains how declines in WMP net asset values can affect investor wealth, redemption behavior, intermediary liquidity, common-asset sales, and ultimately banks’ systemic-risk contributions. Third, the study documents the dual role of wealth management subsidiaries within a core–periphery financial network: they may facilitate risk dispersion at the affiliated-bank level under normal conditions, yet become channels of systemic-risk amplification when BPV events are widespread or accompanied by large losses. These findings provide micro-level evidence relevant to the NAMR’s emphasis on transparent valuation, the dismantling of implicit guarantees, and consolidated supervision of banks and their wealth management subsidiaries.

The remainder of this paper is organized as follows. Section 2 reviews the related literature and develops the hypotheses. Section 3 describes the data, variable construction, and empirical methodology. Section 4 presents the baseline results, mechanism analysis, heterogeneity tests, and robustness checks. Section 5 concludes and discusses the policy implications.

2. Literature review and hypothesis development

2.1 BPV Spillovers and Systemic Risk

Information asymmetry between investors and financial institutions may lead investors to underestimate the risks embedded in WMPs, particularly when they expect implicit support from affiliated banks. Such expectations weaken the perceived relationship between risk and return and encourage investment in products whose underlying risks are not fully understood (Feng et al., 2022; Wang et al., 2022). The transition to NAV-based valuation under the NAMR has reduced this opacity by allowing changes in underlying asset values to be reflected more directly in product

performance. Nevertheless, greater transparency does not eliminate risk. Instead, it may accelerate the realization and transmission of losses when WMP net asset values fall below par. Jacewitz et al. (2022) show that investors valued the perceived liquidity backstop provided by bank-affiliated sponsors. For China's WMPs, the relevant support is not formal deposit insurance, but the perceived willingness and ability of affiliated banks to protect reputation, stabilize products, or provide liquidity during stress. BPV events are therefore informative because they reveal whether investors continue to treat bank-affiliated investment products as quasi-safe claims once NAV losses become visible.

For investors, a BPV event represents both a potential loss of principal and a signal that the product's underlying risk has been underestimated. Such a signal may prompt investors to revise their expectations simultaneously, producing herding behavior and concentrated redemptions (Falato et al., 2021). Wealth management subsidiaries may then be forced to draw down liquidity buffers or liquidate portfolio assets. These responses increase selling pressure on commonly held securities, depress market prices, and generate further declines in the net asset values of other WMPs. BPV events may therefore activate fire-sale and balance-sheet feedback mechanisms that transform initially localized valuation losses into broader systemic stress (Duarte and Eisenbach, 2021).

This process also highlights the dual role of wealth management subsidiaries in risk transmission. By separating WMP activities from conventional banking operations, subsidiaries may disperse losses away from their parent banks. However, this organizational separation does not remove risk from the financial system. During widespread BPV episodes, simultaneous redemptions, common-asset sales, and reputational or liquidity-support pressures may increase the systemic-risk contribution of affiliated banks. The transmission of BPV shocks may be further amplified by deteriorating investor sentiment (Andrieș et al., 2022), market-microstructure frictions (BenSaïda, 2019), and heightened economic policy uncertainty (Yang, 2025). Therefore, under the post-NAMR regime, BPV events may reduce the amount of risk retained directly within affiliated banks while reallocating and amplifying risk through wealth management subsidiaries, investors, and underlying asset markets. Whether this risk-dispersion function dominates the balance-sheet feedback mechanism remains an empirical question with important implications for consolidated supervision and systemic-risk management. Accordingly, we propose the following hypothesis:

Hypothesis 1

BPV spillovers reduce the risk retained within affiliated commercial banks but increase their contribution to system-wide risk, particularly when BPV events become widespread.

2.2 The NAMR and Systemic Risk

The impact of the NAMR on systemic risk can be understood through two complementary channels: internal governance and external regulation. From an internal-governance perspective, the NAMR reshaped the relationship between commercial banks and their wealth management subsidiaries by requiring clearer organizational separation, more standardized risk controls, and greater accountability for asset-management activities. Banks must therefore incorporate the potential reputational, liquidity, and crisis-related costs of their subsidiaries into consolidated risk-management frameworks, including adjustments in information disclosure, leverage management, investment scope, and internal controls (Huang et al., 2023). Although these requirements increase compliance and operating costs, they also limit the direct accumulation of WMP-related risks on parent-bank balance sheets.

Nevertheless, the NAMR does not eliminate banks' incentives to transfer and reallocate risk. Commercial banks and their subsidiaries continue to pursue financial innovation and balance-sheet optimization in response to regulatory constraints and market competition (He and Jin, 2025). The separation of wealth management activities may therefore reduce the risk retained directly by parent banks while shifting part of that risk toward subsidiaries, investors, and underlying asset markets. In this sense, stronger internal governance can improve the resilience of individual banks without necessarily eliminating systemic vulnerabilities generated through interconnected financial activities (Davydov et al., 2021; Davis and Korenok, 2023).

From an external-regulation perspective, the NAMR promoted NAV-based and market-oriented valuation, allowing changes in the value of underlying assets to be reflected more accurately and promptly in WMP performance. Compared with the previous reliance on expected returns and implicit guarantees, NAV disclosure improves transparency, reduces information asymmetry, and strengthens investors' ability to assess product risk–return profiles. This logic is comparable to the post-crisis U.S. MMF reform, where floating NAV requirements shifted loss recognition from sponsors to investors and reduced the value of implicit sponsor insurance (Jacewitz et al. 2022). It also imposes stricter disclosure and risk-management requirements on wealth management subsidiaries, thereby facilitating the dismantling of implicit guarantees and encouraging more market-based risk pricing.

However, greater transparency does not remove underlying losses; rather, it makes them visible and allows them to be recognized and allocated more rapidly. Under normal market conditions, this process can strengthen investor discipline, improve capital allocation, and reduce the risk retained within affiliated banks. During periods of widespread BPV, however, rapid loss recognition may also induce redemptions and asset sales, activating the balance-sheet feedback mechanisms discussed above. The NAMR may therefore reduce bank-level risk through improved governance and the weakening of implicit guarantees, while the ultimate effect on system-wide risk depends on the scale and concentration of BPV

events. The mechanism implies that the systemic consequences of BPV depend not only on market-based valuation, but also on whether investors understand that investment losses are not bank-guaranteed. Here, we raise the following hypothesis:

Hypothesis 2

The implementation of the NAMR weakens implicit guarantees and shifts loss recognition toward investors, thereby reducing the risk retained within affiliated commercial banks, although such risk may be reallocated through wealth management subsidiaries and financial markets.

2.3 Financial Network Structure and Systemic Risk

Commercial banks, their wealth management subsidiaries, and associated WMPs form a multilayer financial network in which parent banks occupy core positions and subsidiaries and products function as peripheral nodes. This structure is embedded within the broader core–periphery organization of China’s banking system, encompassing state-owned commercial banks, national joint-stock banks, and city commercial banks (Brassil and Nodari, 2021). Because banks differ in their capital strength, liquidity buffers, asset quality, regulatory oversight, and network position, BPV spillovers are unlikely to affect all institutions uniformly.

The Big Six banks generally occupy more central positions in the financial system and tend to possess stronger capital and liquidity buffers, broader funding sources, more diversified customer bases, and greater capacity to absorb valuation and redemption shocks (Mirzaei et al., 2021). Their systemic importance also subjects them to closer regulatory supervision and more stringent risk-management requirements. These characteristics may allow them to contain losses arising from BPV events and prevent such shocks from developing into broader balance-sheet feedback loops. In this sense, the Big Six may function as risk absorbers within the financial network.

By contrast, non–Big Six banks typically operate with narrower funding bases and more limited loss-absorption capacity. Their wealth management subsidiaries may therefore be more sensitive to concentrated redemptions, liquidity shortages, reputational pressure, and declines in the value of commonly held assets. Once BPV events become widespread, these constraints may force more rapid balance-sheet adjustment and asset sales, strengthening the transmission of shocks from WMPs to affiliated banks and the wider financial system. Consistent with the network-stability framework of Acemoglu et al. (2015), peripheral institutions may contribute to risk diversification under normal conditions but become important channels of systemic amplification when shocks are sufficiently large.

Hypothesis 3

BPV spillovers have stronger adverse effects on the systemic-risk contribution of non–Big Six commercial banks, whereas Big Six banks are better able to absorb such shocks and mitigate their transmission.

2.4 Net-Worth Effects, Balance-Sheet Feedback, and BPV Spillovers

Kiyotaki and Moore (1997) show that when borrowing capacity depends on collateral values, a negative asset-price shock reduces constrained agents’ net worth, tightens financing capacity, and induces contraction or asset sales that depress collateral prices further. The net-worth effect therefore converts an initial valuation shock into a persistent endogenous feedback loop. Intermediary-based models extend this logic to the financial sector: when intermediary capital or net worth falls, risk-bearing capacity contracts, required risk premia rise, and asset prices may decline nonlinearly (He and Krishnamurthy, 2013; Brunnermeier and Sannikov, 2014). When balance sheets also contain liquidity mismatch, weak intermediary net worth can increase the likelihood of runs and inefficient liquidation (Gertler and Kiyotaki, 2015).

This mechanism maps naturally to BPV events in the WMP market. A decline in a WMP’s net asset value below par not only reduces investors’ financial wealth but also signals deterioration in the quality or valuation of the underlying portfolio. If investors respond by redeeming their holdings, wealth management subsidiaries may be forced to draw down liquidity buffers or sell portfolio assets. Such sales can depress the prices of securities commonly held by other WMPs, leading to further declines in net asset values, additional BPV events, and a weakening of the risk-bearing capacity of exposed financial intermediaries. Parent banks may also face reputational costs or demands to provide liquidity support. BPV spillovers therefore represent more than a static transfer of losses across organizational boundaries; they can generate a balance-sheet feedback loop linking declining net wealth, tighter liquidity capacity, common-asset sales, and systemic stress. This mechanism predicts relatively limited effects when BPV events are isolated, but stronger and potentially nonlinear risk transmission when BPV becomes widespread or is accompanied by large absolute losses.

The strength of this feedback mechanism is likely to depend on the type, liquidity, and quality of the underlying assets, as well as on investors’ prior perceptions of product risk. Although the NAMR requires wealth management institutions to disclose observable product characteristics, including risk ratings, expected returns, investment orientation, and redemption structure, such disclosures may not fully reveal the quality, duration, liquidity, or commonality of the underlying assets. Investors must therefore infer underlying asset quality from disclosed product characteristics and realized changes in net asset value. The resulting selling pressure may further activate the net-worth and balance-sheet amplification mechanism described above. Accordingly, this study classifies WMPs by product type, disclosed risk rating, expected return, and redemption structure to examine whether the systemic effects of BPV vary across product characteristics. This analysis allows us to assess whether disclosed product characteristics

contain economically meaningful information about underlying risk and whether mismatches between perceived risk and realized BPV intensify systemic-risk transmission.

Hypothesis 4

Product characteristics disclosed under the NAMR, including asset type, risk rating, expected return, and redemption structure, shape the strength of BPV transmission and balance-sheet feedback effects.

3. Research design

3.1 Data and Sample Construction

This study focuses on WMPs issued by the wealth management subsidiaries of listed commercial banks in China. To ensure data consistency and comparability, we exclude products that had already matured, were not valued on a mark-to-market basis, or had an investment duration of less than one month. After applying these screening criteria, the final sample contains 28,216 WMPs. To examine the large-scale BPV episode that began in November 2022, we set the sample period from July 1, 2022, to March 31, 2023, and aggregate the product-level data to a weekly frequency. The resulting unbalanced panel contains 2,726,500 product–week observations. Figure 1 presents the temporal distribution of active WMPs and BPV events over the sample period.

The bank-level sample consists of 42 listed commercial banks, of which 22 had established wealth management subsidiaries during the observation period. These 22 banks constitute the treatment group, while the remaining listed banks without wealth management subsidiaries serve as the control group. This classification enables us to compare the systemic-risk dynamics of banks with and without direct exposure to subsidiary-issued WMPs. The main explanatory variables are three ratio-based measures: the BPV ratio, the relative loss ratio (RLR), and the absolute loss ratio (ALR). Their definitions are reported in Table 1. The BPV ratio measures the proportion of active WMPs whose net asset values fall below par, while RLR and ALR capture the incidence of relatively extreme and absolutely large NAV losses, respectively.

Table 1
Variable Definitions

Variable Category	Variable Name	Definition
Dependent Variable	Conditional Value at Risk (CoVaR, ΔCoVaR)	Following the definition of Adrian and Brunnermeier (2016), measuring systemic risk contribution.
	BPV Ratio (BPV)	Number of WMPs with $PV < 1$ divided by the total number of active WMPs.
	Relative Loss Ratio (RLR)	Number of WMPs with NAV declines in the top 5% (above the 95th percentile) divided by total WMPs.
	Absolute Loss Ratio (ALR)	Number of WMPs with NAV declines exceeding 5% divided by the total number of active WMPs.
Control Variables	Asset Size (SIZE)	Natural logarithm of total assets.
	Deposit-to-Loan Ratio (DLR)	Total deposits divided by total loans.
	Provision Coverage Ratio (COV)	(General + Special + Specific provisions) divided by (Substandard + Doubtful + Loss loans).
	Leverage Ratio (LEV)	Total assets divided by total liabilities.
	Capital Adequacy Ratio (CAR)	(Total capital – deductions) divided by risk-weighted assets.

Figure 1 illustrates the time-series evolution of BPV events, whereas Fig. 2 reports their cross-sectional distribution across wealth management subsidiaries. The incidence of BPV increased sharply after November 2022 and remained elevated until gradually returning toward its pre-shock level in March 2023. Considerable heterogeneity is also observed across institutions. The wealth management subsidiary affiliated with the Industrial and Commercial Bank of China recorded the largest number and proportion of BPV events, whereas the subsidiary affiliated with the Bank of Qingdao reported no BPV events during the sample period.

[Insert Table 1 Here]

The dependent variables are CoVaR and ΔCoVaR , which capture different dimensions of systemic risk. CoVaR measures the value at risk of the financial system conditional on a particular bank being in distress, whereas ΔCoVaR measures the change in system-wide risk when that bank moves from its normal state to distress. Thus, ΔCoVaR reflects the marginal contribution of an individual bank to systemic risk. We further control for bank-level characteristics that may affect systemic-risk exposure, including asset size, the deposit-to-loan ratio, the provision coverage ratio, the leverage ratio, and the capital adequacy ratio. Table 1 provides detailed variable definitions, while Table 2 reports the corresponding descriptive

statistics. At the product level, Group A of Table 2 reports the incidence of BPV events, relative extreme losses, and absolute large losses across the 2,726,500 product-level observations. BPV events occur more frequently than either relative or absolute extreme-loss events and exhibit substantial variation over the sample period. This variation provides a useful empirical setting for examining the transmission of BPV shocks.

Table 2
Descriptive Statistics

	Mean	Std. Dev.	Min	Max	Observations
Group A: Wealth Management Product Indicators					
UAP	0.111	0.314	0	1	2,726,500
RRT	0.051	0.220	0	1	2,726,500
ART	0.004	0.063	0	1	2,726,500
Group B: Dependent Variables					
CoVaR	2.118	0.392	0.000	5.600	7,728
ΔCoVaR	0.421	0.361	0.000	3.016	7,728
Group C: Key Explanatory Variables					
BPV	0.103	0.103	0	0.667	3,936
RLR	0.049	0.096	0	0.729	3,936
ALR	0.004	0.010	0	0.154	3,936
Group D: Control Variables					
LNA	27.561	1.645	25.166	30.831	7,728
DLR	1.203	0.164	0.860	1.759	7,728
COV	3.113	1.262	1.411	5.837	7,728
LEV	6.911	0.900	5.090	9.680	7,728
CAR	0.116	0.015	0.090	0.154	7,728

[Insert Table 2 Here]

To construct the main explanatory variables, we aggregate product-level outcomes to the level of each wealth management subsidiary. For each bank-period observation, the BPV ratio is calculated as the number of active WMPs with net asset values below par divided by the total number of active WMPs. The relative loss ratio (RLR) and absolute loss ratio (ALR) are constructed analogously using relative extreme-loss and absolute large-loss events, respectively. Their descriptive statistics are reported in Group C of Table 2. The BPV ratio has a mean of 0.103, a standard deviation of 0.103, and ranges from 0 to 0.667 across 3,936 bank-period observations. These statistics reveal considerable variation in the incidence of BPV across both institutions and time.

Because systemic-risk measures are unavailable at the wealth management subsidiary level, we match the WMP indicators of each subsidiary to the financial and market information of its affiliated listed parent bank. CoVaR and ΔCoVaR are estimated using parent-bank stock returns, while the control variables are obtained from the banks' quarterly financial statements and carried forward to the corresponding observation periods. Groups B and D of Table 2 report the descriptive statistics for the systemic-risk measures and bank-level controls. ΔCoVaR has a mean of 0.421, a standard deviation of 0.361, and ranges from 0 to 3.016 across 7,728 bank-period observations. Finally, WMP and bank stock returns are calculated as logarithmic returns, and all product, market, and financial-statement data are obtained from the iFinD database.

3.2 Systemic risk measures

Following Adrian and Brunnermeier (2016), we measure a bank's contribution to systemic risk using the CoVaR framework, which captures the tail risk of the financial system conditional on a particular bank being in distress. Let C^i denote the return loss of listed bank (i), and let C^s denote the return loss of the broader financial system. The (q)-quantile CoVaR of the financial system conditional on bank (i) being in distress is defined as

$$Pr\left(C^s \leq CoVaR_q^s | C^i = VaR_q^i\right) = q$$

Here, VaR_q^i represents the (q)-quantile loss of bank (i), while $\text{CoVaR}_q^{s|i}$ represents the corresponding (q)-quantile loss of the financial system when bank (i) is in distress. A higher CoVaR therefore indicates greater system-wide tail risk conditional on distress at bank (i). To measure the marginal contribution of bank (i) to systemic risk, we calculate ΔCoVaR as the difference between the system's CoVaR when bank (i) is in distress and when it is in its median state:

$$\Delta \text{CoVaR}_q^{s|i} = \text{CoVaR}_q^{s|C^i=\text{VaR}_q^i} - \text{CoVaR}_q^{s|C^i=\text{VaR}_{0.5}^i}$$

2

This measure captures the increase in system-wide tail risk associated with bank (i) moving from a normal condition to financial distress. Accordingly, ΔCoVaR reflects the marginal systemic-risk contribution of an individual bank rather than its standalone risk. Because the analysis is conducted using return losses, we set ($q = 0.95$) to represent extreme downside conditions. For ease of interpretation, both CoVaR and ΔCoVaR are expressed as positive loss measures, so that larger values indicate greater systemic risk. When constructing the financial-system return, bank i is excluded from the system portfolio to avoid a mechanical correlation between the bank-specific and system-wide loss measures.

3.3 Baseline Regression Model and Identification Strategy

To test Hypothesis 1, we first estimate a two-way fixed-effects panel model examining the relationship between WMP BPV and banks' systemic-risk contributions:

$$\text{SysRisk}_{i,t} = \alpha + \beta \times \text{BPV}_{i,t} + \gamma \times X_{i,t} + \eta_i + \lambda_t + v_{i,t}$$

3

where $\text{SysRisk}_{i,t}$ denotes the systemic risk of listed bank i at time t , measured by either CoVaR or ΔCoVaR . $\text{BPV}_{i,t}$ is the BPV ratio of WMPs associated with bank i in week t . $X_{i,t}$ is a vector of control variables at the bank level, including asset size, capital adequacy ratio, leverage, deposit-to-loan ratio, and provision coverage. η_i captures bank fixed effects; λ_t captures time fixed effects. $v_{i,t}$ is the idiosyncratic error term. Standard errors are clustered at the bank level to account for heteroskedasticity and within-bank serial correlation.

The coefficient β captures the within-bank relationship between changes in the incidence of BPV and changes in the systemic-risk measure, after accounting for observed bank characteristics and common time effects. Because BPV may itself respond to changes in underlying asset prices and financial-market conditions, the baseline specification is interpreted primarily as evidence of conditional association rather than as a fully causal estimate.

To strengthen identification, we further exploit the large-scale BPV episode beginning in November 2022 and compare the evolution of systemic risk between banks with pre-existing wealth management subsidiaries and banks without such subsidiaries. Banks with subsidiaries are more directly exposed to WMP valuation and redemption shocks and are therefore classified as the exposed group, while the remaining listed banks form the comparison group. To examine whether the relationship between BPV and systemic risk differs according to banks' exposure through wealth management subsidiaries, we extend the baseline model by interacting the BPV ratio with a treatment-group indicator:

$$\text{SysRisk}_{i,t} = \alpha + \beta \times \text{BPV}_{i,t} \times \text{Treat}_i + \gamma \times X_{i,t} + \eta_i + \lambda_t + v_{i,t}$$

4

where Treat_i is a dummy variable equal to 1 if bank i has established a wealth management subsidiary and zero otherwise. The interaction term captures whether BPV exposure is associated with different systemic-risk outcomes for banks directly connected to wealth management subsidiaries. Bank fixed effects control for time-invariant institutional differences, while time fixed effects absorb common macroeconomic and financial-market shocks.

Equation (4) should be interpreted as an exposure-interaction specification rather than a conventional difference-in-differences model, because the BPV ratio varies over time and is directly observed only for banks affiliated with wealth management subsidiaries. It nevertheless provides evidence on whether the transmission of WMP valuation losses differs between directly exposed banks and the comparison group.

To examine whether this relationship changed after the large-scale BPV episode in November 2022, we introduce a post-shock indicator, POST which equals one for observations after November 2022 and zero otherwise. The extended specification is

$$\text{SysRisk}_{i,t} = \alpha + \beta \times \text{BPV}_{i,t} \times \text{TREAT}_i \times \text{POST} + \gamma \times X_{i,t} + \eta_i + \lambda_t + v_{i,t}$$

5

The coefficient β captures the change in the relationship between BPV exposure and systemic risk after the November 2022 episode for banks affiliated with wealth management subsidiaries. A negative coefficient when ΔCoVaR is the dependent variable would indicate that BPV exposure

is associated with lower conditional system-wide risk after the shock, whereas a positive coefficient for ΔCoVaR would suggest an increase in the marginal systemic-risk contribution of exposed banks.

This specification exploits the sharp increase in BPV events after November 2022 as a market-wide stress episode. However, because the timing and intensity of BPV exposure are not randomly assigned, the estimates are interpreted as evidence of differential post-shock transmission rather than as fully causal effects of the NAMR or the November 2022 event. The empirical analysis is therefore complemented by pre-trend tests, alternative observation windows, and additional robustness checks. To further investigate whether the effect of BPV depends on the severity of WMP losses, we augment Eq. (5) with the RLR and ALR. The corresponding specification is

$$\text{SysRisk}_{i,t} = \alpha + \beta \times \text{BPV}_{i,t} \times \text{TREAT}_i \times \text{POST} + \delta \times \text{CRASH}_{i,t} + \theta \times \text{BPV}_{i,t} \times \text{CRASH}_{i,t} + \gamma \times X_{i,t} + \eta_i + \lambda_t + v_{i,t}$$

6

where $\text{CRASH}_{i,t}$ represents either $\text{RLR}_{i,t}$ or $\text{ALR}_{i,t}$, reflecting the intensity of financial contagion at bank i in week t . RLR measures the proportion of WMPs experiencing relatively extreme NAV declines, whereas ALR measures the proportion experiencing losses above a fixed absolute threshold. These variables capture complementary dimensions of loss severity rather than direct measures of financial contagion. The coefficient δ captures the relationship between severe WMP losses and systemic risk, while θ indicates whether the effect of BPV becomes stronger when losses are more severe. A statistically significant interaction would be consistent with the balance-sheet feedback mechanism: widespread or large losses may trigger concentrated redemptions, liquidity-buffer depletion, and common-asset sales, thereby strengthening the transmission of BPV shocks to the broader financial system.

Furthermore, this empirical strategy provides deeper insights into the regulatory impact of the NAMR, particularly in enhancing market transparency and resilience. It contributes to a more nuanced understanding of the distinction and interplay between spillover effects and contagion risks in the WMP market. Overall, the findings offer valuable guidance for the design of effective regulatory frameworks and systemic risk mitigation policies in China's evolving asset management landscape.

4. Empirical Results

4.1 Baseline Regression Results

The coefficients on BPV in Columns (1) and (3) are negative and statistically significant at the 1% level. This result indicates that a higher incidence of BPV is associated with lower tail risk of the financial system conditional on distress at the affiliated bank. By contrast, the BPV coefficients in Columns (2) and (4) are statistically insignificant when ΔCoVaR is used as the dependent variable. Thus, the baseline results provide no evidence that BPV significantly affects the marginal contribution of an individual bank to system-wide risk. The estimated effect is also economically meaningful. Based on Column (3), a one-standard-deviation increase in the BPV ratio, equal to 0.103, is associated with a decline in CoVaR of approximately 0.043 units (-0.415×0.103). Relative to the sample mean of CoVaR, this corresponds to a reduction of approximately 2.0%. This finding is consistent with the view that wealth management subsidiaries may disperse part of the valuation losses away from the balance sheets of their affiliated banks.

[Insert Table 3 Here]

Table 3
Baseline Regression

BPV	(1)CoVaR	(2) ΔCoVaR	(3)CoVaR	(4) ΔCoVaR	(5) CoVaR	(6) ΔCoVaR
	-0.403*** (0.070)	-0.009 (0.035)	-0.415*** (0.070)	-0.031 (0.037)		
L.BPV					-0.426*** (0.070)	-0.045 (0.036)
LNA			-0.491*** (0.185)	-0.277*** (0.081)	-0.486** (0.185)	-0.228*** (0.079)
DLR			-0.574*** (0.182)	0.100** (0.047)	-0.589*** (0.183)	0.090* (0.047)
COV			-0.063* (0.036)	-0.045** (0.020)	-0.068* (0.036)	-0.044** (0.020)
LEV			-0.749 (3.316)	-0.023* (0.013)	-0.701 (3.143)	-0.022* (0.013)
CAR			6.894*** (1.557)	0.225 (0.669)	6.844*** (1.561)	0.196 (0.702)
Constant	2.204*** (0.008)	0.523*** (0.004)	16.468*** (5.534)	8.668*** (2.361)	16.337*** (5.523)	8.131*** (2.306)
Bank fixed effect	YES	YES	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES	YES	YES
Adj. R^2	0.734	0.933	0.737	0.933	0.732	0.934
Observations	3928	3928	3928	3928	3928	3928

Notes: Table 3 presents the baseline regression model: $SysRisk_{i,t} = \alpha + \beta \times BPV_{i,t} + \gamma \times X_{i,t} + \eta_i + \lambda_t + v_{i,t}$, where $SysRisk_{i,t}$ denotes the systemic risk of listed bank i at time t , measured by either CoVaR or ΔCoVaR. $BPV_{i,t}$ is the BPV ratio of WMPs associated with bank i in week t . $X_{i,t}$ is a vector of control variables at the bank level, including asset size, capital adequacy ratio, leverage, deposit-to-loan ratio, and provision coverage. η_i captures bank fixed effects; λ_t captures time fixed effects. $v_{i,t}$ is the idiosyncratic error term. * indicates the level of significance of 10%, ** a level of 5% and *** a level of 1%. In brackets we report the standard errors.

A potential concern is reverse causality. For example, deteriorating financial conditions or rising perceptions of systemic risk may simultaneously affect investor demand for WMPs and the incidence of BPV. To partially address this concern, Columns (5) and (6) re-estimate the baseline model using lagged values of the BPV ratio and control variables. The coefficient in Column (5) remains significantly negative and of comparable magnitude, reinforcing the robustness of the findings and lending further support to Hypothesis 1.

These results suggest that WMPs may perform a risk-dispersion function for their affiliated banks. A higher BPV ratio is associated with lower financial-system tail risk conditional on distress at the parent bank, indicating that part of the underlying valuation losses may be transferred away from the bank's balance sheet. However, the insignificant effect on ΔCoVaR implies that BPV does not significantly reduce the bank's marginal contribution to system-wide risk. WMPs may therefore reallocate risk among parent banks, wealth management subsidiaries, and investors rather than eliminate it from the financial system. The estimates for the control variables further show that larger asset size, lower deposit-to-loan ratios, and higher provision coverage ratios are generally associated with lower conditional system-wide tail risk. These findings highlight the role of strong balance-sheet fundamentals and loss-absorption capacity in limiting the transmission of bank-specific distress to the broader financial system.

4.2 Dynamic Difference-in-Differences Regression Results

The baseline analysis shows that a higher BPV ratio is significantly associated with lower financial-system tail risk conditional on distress at the affiliated bank. However, because BPV and systemic risk may be jointly affected by macroeconomic conditions, asset-price movements, and bank-specific characteristics, the baseline estimates may be subject to endogeneity concerns. We therefore complement the baseline analysis with a difference-in-differences framework that examines whether the November 2022 BPV episode produced differential changes in systemic risk across banks with varying exposure to the wealth management sector.

Following the full implementation of the NAMR, WMP issuance became increasingly concentrated within bank-affiliated wealth management subsidiaries. Banks that had established such subsidiaries before the November 2022 episode were directly exposed to WMP valuation losses, redemption pressures, and potential reputational or liquidity-support demands. We therefore classify these banks as the treatment group, while listed banks without wealth management subsidiaries constitute the comparison group. This institutional distinction provides a basis for examining whether systemic-risk dynamics evolved differently across the two groups following the large-scale BPV episode.

The DID analysis does not assume that subsidiary establishment was randomly assigned. Instead, identification relies on the parallel-trends assumption that, in the absence of the November 2022 BPV shock, the systemic-risk measures of treatment and comparison banks would have followed similar trajectories. We assess this assumption using an event-study specification that examines the evolution of the treatment–control difference before and after the shock. This analysis provides further evidence on the risk-dispersion and systemic-amplification components of Hypothesis 1.

[Insert Table 4 Here]

$BPV \times Treat$	(1)CoVaR	(2) Δ CoVaR	(3)CoVaR	(4) Δ CoVaR	(5) CoVaR	(6) Δ CoVaR
	-0.412*** (0.045)	0.038 (0.025)				
$BPV \times Treat \times Post$			-0.306*** (0.037)	0.035* (0.021)	-0.304*** (0.043)	0.065*** (0.025)
LNA	-0.405*** (0.126)	-0.040 (0.005)	-0.353** (0.126)	-0.045 (0.005)	-0.420*** (0.128)	-0.059*** (0.053)
DLR	-0.413*** (0.112)	0.044 (0.037)	-0.389*** (0.112)	0.043 (0.037)	-0.318*** (0.113)	0.035 (0.038)
COV	-0.051*** (0.016)	0.006 (0.007)	-0.054* (0.016)	0.006 (0.007)	-0.040** (0.017)	0.007 (0.007)
LEV	-0.036* (0.019)	-0.025** (0.009)	-0.035* (0.019)	-0.025** (0.010)	0.010 (0.024)	-0.024* (0.013)
CAR	0.698 (1.208)	-0.792 (0.656)	1.163 (1.233)	-0.869 (0.674)	-2.898* (1.577)	-0.916 (0.917)
Constant	14.121*** (3.545)	1.721 (1.459)	12.622*** (3.551)	1.858 (1.468)	14.282*** (3.549)	2.254 (1.455)
Bank fixed effect	YES	YES	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES	YES	YES
Adj. R^2	0.706	0.916	0.706	0.916	0.694	0.910
Observations	7728	7728	7728	7728	6624	6624

Columns (1) and (2) of Table 4 report the estimates based on Eq. (4). In Column (1), the coefficient on $BPV_{i,t} \times Treat_i$ is negative and statistically significant at the 1% level. This result indicates that, among banks directly exposed through wealth management subsidiaries, a higher incidence of BPV is associated with lower financial-system tail risk conditional on distress at the affiliated bank. The finding is consistent with the risk-dispersion function of wealth management subsidiaries. In Column (2), the corresponding coefficient is positive but statistically insignificant

when ΔCoVaR is used as the dependent variable. Thus, before explicitly accounting for the November 2022 episode, there is no statistically significant evidence that BPV exposure affects the marginal systemic-risk contribution of treated banks.

Columns (3) and (4) present the estimates based on Eq. (5), which captures the relationship between BPV exposure and systemic risk following the large-scale BPV episode in November 2022. In Column (3), the coefficient remains negative and statistically significant at the 1% level, although its absolute magnitude is smaller than that reported in Column (1). This result suggests that the association between BPV and lower conditional system-wide tail risk persists after the shock, but that the risk-dispersion effect becomes weaker during a period of widespread valuation losses.

By contrast, the coefficient in Column (4) is positive and statistically significant at the 10% level. This finding indicates that, following the November 2022 episode, greater BPV exposure is associated with an increase in the marginal contribution of affiliated banks to system-wide risk. Thus, although wealth management subsidiaries may continue to disperse part of the losses away from parent-bank balance sheets, this organizational separation does not eliminate risk from the financial system. When BPV events become widespread, redemption pressures, common-asset sales, and liquidity or reputational support demands may strengthen balance-sheet feedback and increase the systemic-risk contribution of exposed banks.

Taken together, the results reveal an asymmetric pattern of risk transmission. BPV exposure is associated with lower financial-system tail risk conditional on distress at an affiliated bank, but its risk-dispersion capacity weakens after a market-wide shock, while the marginal systemic-risk contribution of exposed banks increases. These findings support the dual risk-dispersion and systemic-amplification mechanisms proposed in Hypothesis 1 and are also consistent with Hypothesis 2, which emphasizes that the post-NAMR separation of wealth management activities may reduce the risk retained within parent banks without fully removing that risk from the broader financial system.

Finally, we examine whether the results are driven by the inclusion of China's six major state-owned commercial banks: the Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, and Postal Savings Bank of China, collectively referred to as the Big Six. These institutions differ systematically from other listed banks in terms of capital strength, funding access, asset quality, regulatory oversight, and loss-absorption capacity. Their inclusion may therefore obscure the heterogeneous transmission of BPV shocks across different types of banks. To address this concern, we re-estimate Eq. (5) after excluding the Big Six from the treatment sample. The results are reported in Columns (5) and (6) of Table 4.

In Column (5), the BPV-related coefficient remains negative and statistically significant at the 1% level, with a magnitude similar to that reported in Column (3). This finding indicates that the negative association between BPV exposure and financial-system tail risk conditional on distress at the affiliated bank is not driven solely by the Big Six. The risk-dispersion pattern therefore remains evident among non-Big Six banks. In Column (6), however, the corresponding coefficient for ΔCoVaR becomes larger and statistically significant at the 1% level. This result suggests that, following the large-scale BPV episode, greater BPV exposure among non-Big Six banks is associated with a stronger increase in their marginal contribution to system-wide risk. Compared with the full-sample estimates, the larger coefficient indicates that the systemic amplification effect is more pronounced among banks with relatively weaker capital, liquidity, and diversification capacity.

These findings are consistent with the view that the Big Six possess greater capacity to absorb valuation and redemption shocks, thereby limiting the transmission of BPV-related stress. By contrast, non-Big Six banks may be more vulnerable to liquidity pressures, common-asset sales, and reputational or support demands from their wealth management subsidiaries. Overall, the results provide support for Hypothesis 3 and highlight the heterogeneous systemic effects of BPV spillovers across banks with different balance-sheet strength and network positions.

4.3 Further Analysis: Loss Severity and BPV Transmission

To examine whether the transmission of BPV depends on the severity of WMP losses, we extend Eq. (6) by incorporating two extreme-loss indicators: RLR and ALR. These variables capture different dimensions of loss severity and allow us to assess whether severe portfolio losses reinforce the relationship between BPV and systemic risk. The analysis is conducted using the sample that excludes the Big Six state-owned commercial banks, which are likely to possess greater loss-absorption and liquidity-support capacity.

Columns (1) and (2) of Table 5 report the results using RLR as the loss-severity measure. In Column (1), where CoVaR is the dependent variable, the coefficient on the post-shock BPV term remains negative and statistically significant. Its absolute magnitude is larger than that reported in Column (5) of Table 4. This finding indicates that, after accounting for relatively extreme WMP losses, BPV exposure remains associated with lower financial-system tail risk conditional on distress at a non-Big Six affiliated bank. The result is consistent with the continued risk-dispersion function of wealth management subsidiaries.

Table 5
Mechanism Test: Loss Severity, Balance-Sheet Feedback, and BPV Transmission

$BPV \times Treat \times Post$	(1)CoVaR	(2) Δ CoVaR	(3) CoVaR	(4) Δ CoVaR
	-0.375*** (0.049)	-0.014 (0.028)	-0.279*** (0.048)	0.105*** (0.028)
BPV $\times$ CRASH	0.592 (0.365)	0.379 (0.294)	-3.898 (3.102)	-7.734*** (1.932)
CRASH	0.014 (0.086)	0.135*** (0.046)	1.933** (0.809)	1.867*** (0.538)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.695	0.911	0.695	0.911
Observations	6624	6624	6624	6624

In Column (2), where Δ CoVaR is the dependent variable, the coefficient on RLR is positive and statistically significant. This result suggests that a higher incidence of relatively extreme WMP losses is associated with an increase in the marginal contribution of non-Big Six banks to system-wide risk. Relative extreme losses may therefore represent an important source of systemic stress, even when the direct post-shock BPV coefficient is statistically insignificant.

The interaction between BPV and RLR is positive in both Columns (1) and (2), but neither coefficient is statistically significant. Thus, although relative extreme losses are directly associated with a higher systemic-risk contribution, there is no strong evidence that they significantly amplify the marginal effect of BPV. Collectively, these results suggest that RLR captures an additional dimension of WMP-related stress rather than serving as the primary mechanism through which BPV spillovers affect systemic risk.

[Insert Table 5 Here]

Columns (3) and (4) of Table 5 present regression results using the ALR as an alternative proxy for financial contagion. In Column (3), the coefficient on BPV remains significantly negative, but its absolute magnitude is notably smaller than that reported in Column (1), suggesting that the risk-mitigating effect of BPV is weaker when contagion is measured using absolute losses rather than relative losses. Both Columns (3) and (4) yield positive and statistically significant δ coefficients, with effect sizes larger than those observed in Columns (1) and (2). These results indicate that absolute loss-based contagion serves as a more powerful channel of systemic risk transmission than its relative counterpart. This distinction underscores the heightened sensitivity of the financial system to large, absolute declines in WMP NAVs, which are more likely to trigger panic-driven behavior such as herded redemptions or fire-sale dynamics. More critically, Column (4) reveals a positive and statistically significant β coefficient, with an absolute magnitude substantially greater than that found in Column (6) of Table 4. This finding implies that under conditions of intensified financial contagion, an elevated BPV significantly increases the systemic risk contribution of non-Big Six banks. In other words, when financial stress escalates, BPV events act as amplifiers of systemic instability, transforming individualized BPV into broader threats to financial system resilience.

Lastly, Column (4) reports a significantly negative coefficient on the interaction term θ , aligning with the baseline result from Table 3, Column (4). This finding suggests that in the absence of systemic stress, even large individual losses in WMPs do not offset their overall risk-mitigating effects. In other words, under normal market conditions, the establishment of wealth management subsidiaries, the issuance of WMPs, and even moderate episodes of BPV may contribute positively to systemic risk management at the bank level. However, this stabilizing role shifts under large-scale BPV events, which serve as system-wide stress episodes. During such periods, WMPs no longer function as buffers against risk but instead act as catalysts for systemic fragility. These results offer further empirical validation of the theoretical insight from Acemoglu et al. (2015): while a more interconnected financial network represented here by additional nodes such as WMPs and subsidiaries may enhance resilience during tranquil periods, it can amplify the transmission of systemic shocks during crises, thereby increasing the overall vulnerability of the financial system.

4.4 Heterogeneity Tests: Product Type, Risk Grade, and Structural Features

To test Hypothesis 4 and explore the heterogeneous impact of BPV events across different types of WMPs, we conduct a cross-sectional analysis along three key dimensions: product type, risk grade, and structural features. We begin by classifying WMPs into four categories—fixed-income, equity, hybrid, and other—based on their primary investment orientation. These categories entail differing exposures to underlying asset risks and, therefore, may exhibit distinct spillover effects on systemic risk. Columns (1) to (4) of Table 6 present the estimated coefficients from Model (5) for

each product type. The results reveal substantial heterogeneity in BPV spillovers. In Panel A, where CoVaR is the dependent variable, fixed-income WMPs exhibit the most pronounced spillover effect, followed by equity-type products, while other types show relatively weak or insignificant effects. In Panel B, using ΔCoVaR as the dependent variable, both fixed-income and hybrid WMPs demonstrate positive and statistically significant spillover effects following the large-scale BPV events in November 2022. This indicates that these product types contributed more substantially to systemic risk propagation during the stress period. These findings provide empirical support for the view that the 2022 implementation of the NAMR had its most significant impact on debt-backed WMPs. The mark-to-market valuation and real-time price discovery mechanisms embedded in these products facilitate more effective risk signaling, enhancing their dual role in micro-level risk reallocation and macro-level risk transmission.

Table 6
Heterogeneity Test: Wealth Management Product Types

	(1) Fixed Income	(2) Equity-Based	(3) Mixed-Type	(4) Other Types
Panel A. Dependent Variable: CoVaR				
$BPV \times Treat \times Post$	-0.311*** (0.044)	-0.161*** (0.019)	0.013 (0.024)	-0.106*** (0.030)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.699	0.707	0.684	0.699
Observations	6504	6328	4893	6429
Panel B. Dependent Variable: ΔCoVaR				
$BPV \times POST$	0.074*** (0.026)	0.014 (0.009)	0.018** (0.006)	-0.015 (0.018)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.919	0.923	0.930	0.922
Observations	6504	6624	4893	6429

[Insert Table 6 Here]

Next, we examine heterogeneity in BPV spillovers across WMPs with varying risk levels, as disclosed in their regulatory filings. Specifically, we classify products into four categories based on their risk ratings: low-to-medium risk (R2-rated products), medium risk (R3-rated products), medium-to-high risk (R4-rated products), and high risk (R5-rated products). These categories reflect increasing levels of underlying asset risk exposure and may therefore differentially affect systemic risk. To capture this heterogeneity, we re-estimate Model (5) for each risk category and report the estimated β coefficients in Columns (1) to (4) of Table 7. The results reveal significant variation across risk classifications. In Panel A, where CoVaR is the dependent variable, we find that the magnitude of the BPV spillover effect is inversely related to the product's risk rating—that is, WMPs with lower disclosed risk levels exhibit greater spillover effects on systemic risk. This pattern is further corroborated in Panel B, where ΔCoVaR is used as the dependent variable. These findings suggest that, following the large-scale BPV events in November 2022, BPV events in ostensibly low-to-medium risk WMPs disproportionately elevated systemic risk at the financial system. This outcome reinforces the conclusions from Table 6, and highlights the potential mismatch between perceived and actual risk in the WMP market—a critical issue for both regulatory oversight and investor protection.

Table 7
Heterogeneity Test: Risk Profiles of Wealth Management Products

	(1) Low-to-Medium Risk	(2) Medium Risk	(3) Medium-to-High Risk	(4) High Risk
Panel A. Dependent Variable: CoVaR				
$BPV \times Treat \times Post$	-0.334*** (0.044)	-0.099*** (0.003)	-0.068*** (0.018)	-0.038** (0.016)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.700	0.696	0.684	0.709
Observations	6453	6105	5520	5550
Panel B. Dependent Variable: $\Delta CoVaR$				
$BPV \times POST$	0.083*** (0.024)	0.057*** (0.002)	0.042*** (0.009)	0.016** (0.006)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.922	0.922	0.922	0.930
Observations	6453	6105	5520	5550

[Insert Table 7 Here]

In addition, we explore heterogeneity in BPV spillovers by dividing WMPs into high-yield and low-yield groups, based on whether their expected annualized return exceeds 4%. We then estimate Model (5) separately for these two categories, and present the results in Columns (1) and (2) of Table 8. The analysis reveals no statistically significant difference in the systemic risk implications of BPV between high-yield and low-yield products. In Panel A, low-yield WMPs exhibit marginally stronger spillover effects at the individual bank level, but this difference is economically modest. In Panel B, the systemic impact at the aggregate financial system is statistically indistinguishable between the two groups. These findings suggest that expected returns are not reliable indicators of systemic risk exposure or spillover potential. Instead, they underscore the importance of product structure and underlying asset risk over nominal yield expectations. Importantly, this result lends further support to the view that the NAMR have been effective in breaking implicit guarantees and recalibrating investor risk perception, thereby enhancing pricing transparency and risk-based product differentiation in the Chinese WMP market.

Table 8
Heterogeneity Test: Other Characteristics of Wealth Management Products

	(1) High Yield	(2) Low Yield	(3) Open-End	(4) Closed-End
Panel A. Dependent Variable: CoVaR				
$BPV \times Treat \times Post$	-0.245*** (0.041)	-0.311*** (0.044)	-0.317*** (0.050)	-0.221*** (0.032)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.694	0.704	0.699	0.709
Observations	6593	6608	6504	6468
Panel B. Dependent Variable: $\Delta CoVaR$				
$BPV \times POST$	0.052** (0.022)	0.046* (0.025)	0.032 (0.029)	0.096** (0.015)
Controls	YES	YES	YES	YES
Bank fixed effect	YES	YES	YES	YES
Time fixed effect	YES	YES	YES	YES
Adj. R^2	0.910	0.925	0.922	0.923
Observations	6593	6608	6504	6468

[Insert Table 8 Here]

Finally, we conduct further heterogeneity analysis based on the liquidity characteristics of WMPs, categorizing products as either open-end or closed-end. These two structures differ significantly in redemption flexibility and liquidity management, which may lead to heterogeneous effects on systemic risk. Table 8 presents the results from estimating Model (5) separately for each group, with a focus on the coefficients β to assess how BPV under different liquidity regimes influences systemic risk. The findings reveal a clear divergence. In Panel A, open-end WMPs exhibit stronger BPV spillover effects at the individual bank level, likely due to their higher liquidity sensitivity and investor redemption options. In contrast, Panel B shows that closed-end WMPs contribute more significantly to systemic risk at the aggregate financial system. This suggests that closed-end products may have been ill-prepared for the redemption pressures that followed the November 2022 BPV shock, resulting in forced asset sales (Falato et al., 2021) and amplifying systemic stress across the broader financial network (Duarte and Eisenbach, 2021). This distinction is critical, as spillover effects may remain relatively subdued under normal market conditions but can intensify dramatically during periods of stress, supporting the hypothesis of negative feedback loops driven by fire-sale mechanisms (Shleifer and Vishny, 1992).

Taken together, the heterogeneity analyses across product type, risk grade, expected yield, and liquidity structure indicate that fixed-income WMPs, low-to-medium risk WMPs, and open-end WMPs exhibit stronger BPV spillover effects than their respective counterparts. These results underscore the critical role of product transparency and classification in reflecting the underlying risk–return profile. Overall, the empirical findings provide evidence consistent with Hypothesis 4, confirming that the implementation of the NAMR has meaningfully reshaped the risk transmission channels within China’s wealth management market.

4.5 Robustness Checks

To ensure the robustness and credibility of causal inference, we conduct a series of robustness checks, including the use of lagged explanatory variables, adjustments to the observation window, and refinements to the sample composition. A central component of these checks is the parallel trends test, which evaluates whether the treatment and control groups followed similar trajectories in systemic risk prior to the November 2022 BPV shock. While our identification strategy is based on a dynamic DID framework, the presence of pre-treatment parallel trends is a necessary but not sufficient condition for causal inference. Accordingly, we place particular emphasis on whether the post-treatment coefficient β remains statistically significant and displays a consistent directional pattern.

Panel A of Fig. 3 presents the parallel trends graph using CoVaR as the dependent variable. The results indicate that, prior to the BPV shock, the impact of WMP BPV on CoVaR was statistically insignificant, suggesting no differential trends between treatment and control groups. However,

after November 2022, the coefficient becomes significantly negative and remains so over subsequent periods, consistent with enhanced risk absorption at the individual bank level. Panel B of Fig. 3 reports the corresponding trends for ΔCoVaR . Similarly, no significant effects are observed prior to the BPV shock. Yet, following November 2022, the coefficient becomes significantly positive, indicating that BPV events increased the marginal contribution of banks to systemic risk at the aggregate level.

Collectively, the two panels underscore the dual role of BPV spillovers: while they help mitigate systemic risk at the individual bank level, they amplify systemic instability at the system-wide level. These findings hold particular relevance for China's regulatory landscape: under conditions of extreme BPV events, peripheral institutions, such as wealth management subsidiaries, may fail to insulate core banking entities from systemic contagion. This underscores the necessity of integrated supervision and early-warning mechanisms. In this regard, the study contributes meaningfully to the literature on systemic risk management in the context of the asset management sector. Overall, the findings are consistent with our main empirical results and confirm the validity and internal consistency of the identification strategy.

[Insert Fig. 3 Here]

5. Conclusion and Policy Implications

Using product-level data on WMPs matched with financial and market information for 42 listed commercial banks in China, including 22 banks with affiliated wealth management subsidiaries, this study examines the systemic implications of BPV events surrounding the large-scale market episode of November 2022. The baseline results show that a higher BPV ratio is associated with lower financial-system tail risk conditional on distress at the affiliated bank, as measured by CoVaR. However, no statistically significant relationship is found between BPV and ΔCoVaR , which captures a bank's marginal contribution to system-wide risk. These findings suggest that wealth management subsidiaries may disperse part of the valuation losses away from parent-bank balance sheets, but such organizational separation does not necessarily eliminate risk from the broader financial system.

The post-shock analysis reveals a more pronounced dual pattern. Following the November 2022 BPV episode, the negative association between BPV and conditional system-wide tail risk remains significant but becomes weaker, while BPV is positively associated with the marginal systemic-risk contribution of exposed banks. This systemic-amplification effect is particularly strong among non-Big Six banks, which generally possess more limited capital, liquidity, and diversification capacity. The results therefore indicate that large state-owned banks are better positioned to absorb valuation and redemption shocks, whereas smaller or less diversified institutions may become important channels through which WMP-related stress is transmitted to the wider financial system.

Further analysis highlights the roles of both the breadth and severity of WMP losses. BPV captures the prevalence of products whose net asset values fall below par, whereas RLR and ALR capture the severity of realized losses. Large absolute declines in WMP net asset values are strongly associated with systemic stress, consistent with a net-worth and balance-sheet feedback mechanism in which declining investor wealth induces redemptions, liquidity-buffer depletion, and common-asset sales. The interaction results, however, suggest that BPV and absolute losses contain partially overlapping information and that their systemic effects are nonlinear rather than uniformly reinforcing.

The heterogeneity analysis further shows that the systemic implications of BPV vary across product characteristics. Fixed-income WMPs exhibit the clearest dual pattern of risk dispersion and systemic amplification, reflecting their direct exposure to the bond-market repricing that characterized the November 2022 episode. BPV effects are also more pronounced among products with relatively low disclosed risk ratings, suggesting that losses in products perceived as safe may generate larger revisions in investor expectations. In addition, redemption structure and liquidity exposure materially affect the transmission of BPV shocks. These findings indicate that product disclosures under the NAMR contain economically meaningful information about underlying risk, while also showing that greater transparency and market-based valuation can accelerate the recognition and transmission of losses during periods of financial stress.

The findings have several policy implications. First, regulators should strengthen consolidated and differentiated supervision of wealth management subsidiaries and their affiliated parent banks. Supervisory requirements should reflect differences in capital strength, liquidity capacity, network position, and the ability of banks to provide support during stress episodes. Particular attention should be paid to non-Big Six banks, whose wealth management activities appear more closely associated with systemic-risk amplification. Second, regulators should enhance liquidity-risk management for WMPs that invest heavily in fixed-income assets or hold securities commonly owned by multiple institutions. Wealth management subsidiaries should maintain adequate liquidity buffers, conduct redemption stress tests, and develop contingency arrangements to limit forced asset sales during periods of concentrated withdrawals. Monitoring should focus jointly on the breadth of BPV and the magnitude of absolute NAV losses, as these indicators capture complementary dimensions of market stress. Third, the disclosure framework should provide investors and regulators with more detailed information about the duration, liquidity, concentration, and commonality of underlying WMP assets. Product risk ratings and redemption structures should be regularly reassessed to ensure that disclosed risk profiles remain consistent with realized market exposure. Fourth, regulation should further clarify the boundary between deposit-like claims and investment products. The U.S. MMF experience shows that even when products are legally outside deposit insurance, investors may still value implicit sponsor support when the sponsor is affiliated with a bank. China's WMP regulation should therefore not only disclose that investors bear market losses, but also monitor whether pricing, redemption behavior, and sales practices continue to embed expectations of sponsor rescue. Strengthening such disclosure would preserve

the NAMR’s role in dismantling implicit guarantees while reducing the likelihood that unexpected BPV events trigger panic-driven redemptions and destabilizing balance-sheet feedback. Effective regulation therefore requires not only greater transparency and organizational separation, but also close monitoring of the feedback mechanisms connecting investor wealth, WMP liquidity, common-asset prices, wealth management subsidiaries, and their affiliated banks.

Abbreviations

Bank Name
Bank of Beijing
BOB
Industrial and Commercial Bank of China
ICBC
China Everbright Bank
CEB
Bank of Hangzhou
BOHZ
Huaxia Bank
HXB
China Construction Bank
CCB
Bank of Jiangsu
BOJS
Bank of Communications
BoCom
China Minsheng Bank
CMBC
Bank of Nanjing
BONJ
Bank of Ningbo
BONB
Agricultural Bank of China
ABC
Ping An Bank
PAB
Shanghai Pudong Development Bank
SPDB
Bank of Qingdao
BOQD
Bank of Shanghai
BOS
Industrial Bank Co., Ltd.
CIB
Postal Savings Bank of China
PSBC
Chongqing Rural Commercial Bank
CQRCB
China Merchants Bank
CMB
Bank of China
BOC
China CITIC Bank
CNCB

Declarations

Author Contribution

K.C.H., Y.L., and Q.W. conceived and designed the research framework. K.C.H. and X.S. collected the data and performed the empirical analyses. K.C.H. and Y.L. drafted the main manuscript text. Q.W. and X.S. revised and edited the manuscript. All authors reviewed and approved the final manuscript.

Footnotes

1. To facilitate a more direct and intuitive interpretation of the results, this paper transforms the originally negative systemic risk measures into positive values. In other words, higher values of CoVaR and ΔCoVaR correspond to greater levels of systemic risk.
2. We exclude low-risk WMPs (R1-rated products) from the subgroup analysis, as there are no observed instances of BPV events for this category.

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Figures

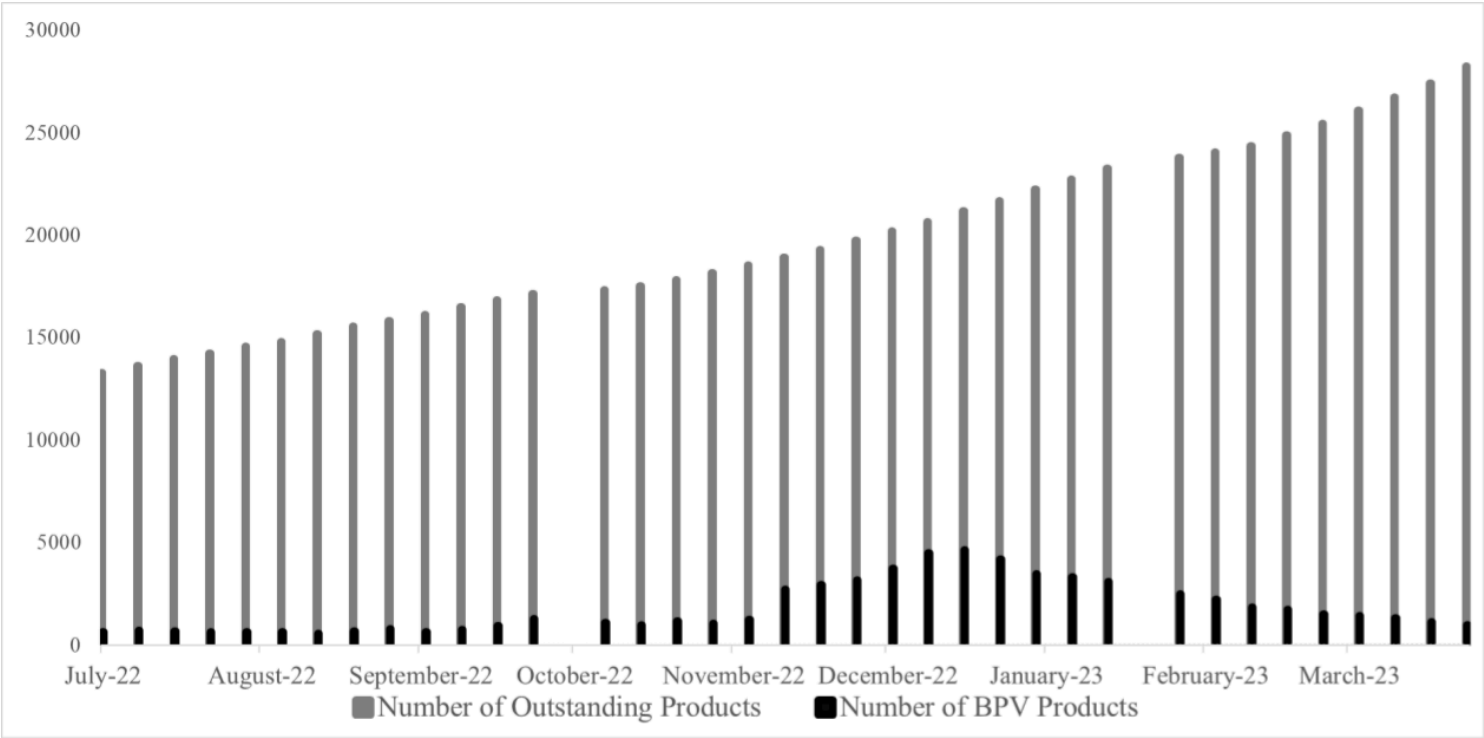


Figure 1

Weekly flow of outstanding and BPV WMPs

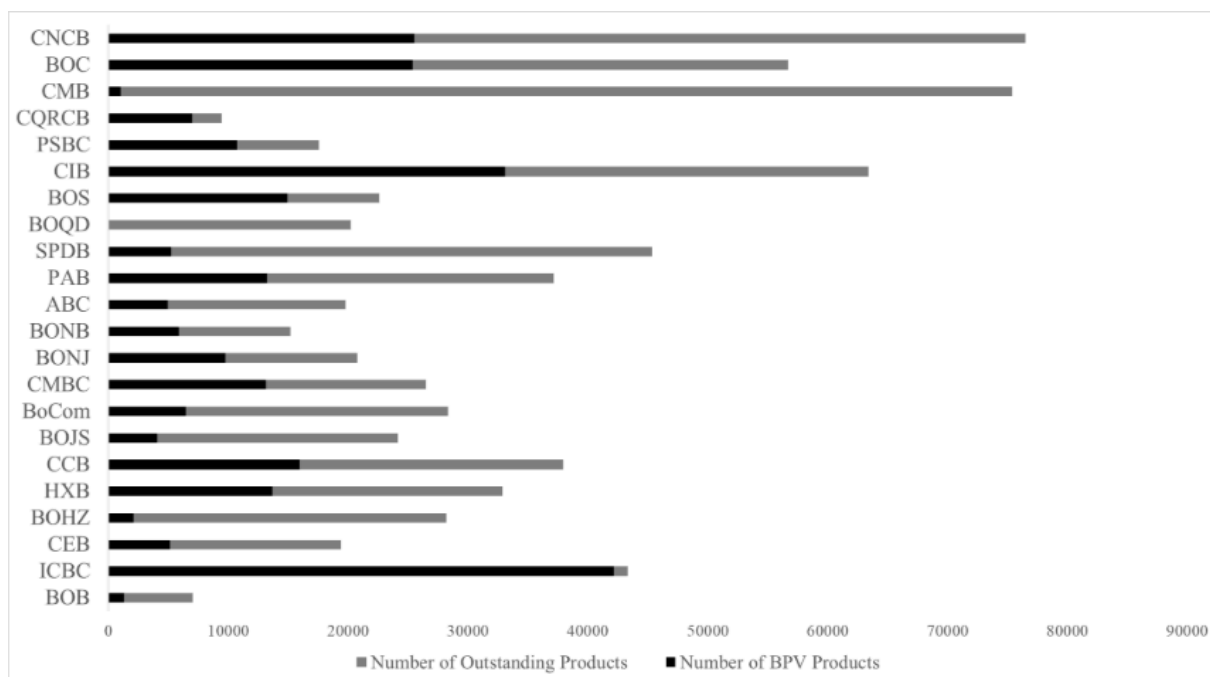
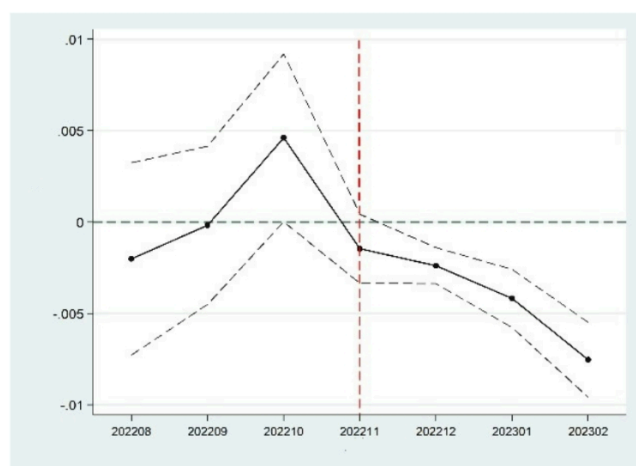
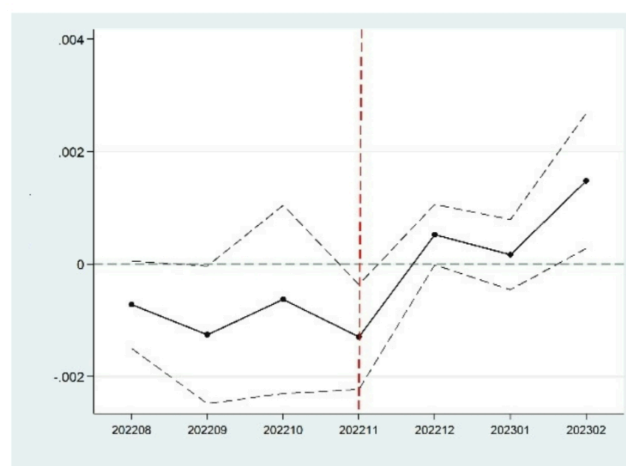


Figure 2

Outstanding and BPV WMPs Issued by Bank-affiliated Wealth Management Subsidiaries



Panel A: CoVaR



Panel B: Δ CoVaR

Figure 3

Parallel Trends Test

Note: This figure illustrates the dynamic trends in systemic risk (CoVaR and Δ CoVaR) between the treatment and control groups before and after the large-scale BPV in November 2022. A parallel trend prior to the event supports the validity of the DID design.