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ABSTRACT

We explore the limits of organizational expansion in the financial sector, highlighting how branch network growth impacts bank performance. Employing data from small and medium banks in China, we reveal that branch expansion at breakneck speed results in poor performance. We identify agency problems arising from poor governance, hindered information collecting, and heightened moral hazard that can intensify the costs associated with rapid growth. Our findings emphasize the dangers of ambitious expansion, offering critical insights for policymakers and bankers in managing the intertwined challenges of agency costs and the pace of growth, suggesting more balanced future bank branching strategies.

Keywords: Banking, Branching, Agency Problems, Governance, Performance, Risk

***JEL* Classification:** G21, G28, G30, L10

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1. Introduction

Expansion of business organizations via adding branch offices at high rates of speed is known from both theory and practice to be ill-advised, and yet it happens on a recurring basis.[1] This phenomenon is particularly evident in the financial sector, where banking organizations operate under stringent regulatory frameworks that complicate their incentives for expansion and corporate governance structures that often fail to impose constraints on empire building by management (Berger, El Ghoul, Guedhami, and Roman, 2017).[2]

In some cases, rapid branch expansion is by the best of bank management with likely favorable consequences for the banks. For example, from early 2018 to August 2021, JP Morgan Chase expanded its retail presence from approximately 5,130 branch offices in 23 U.S. states to over 5,600 offices across all 48 contiguous U.S. states. This rapid expansion gave Chase management the advantage of first mover to gain a desired expanded wealth management presence. However, for others, rapid expansion may be driven by less disciplined motives and more agency frictions, especially in emerging markets where corporate governance structures are weaker.

While there are substantial theoretical bases indicating that expansion can significantly adversely affect banks' asset quality and overall economic performance, empirical evidence of the potential inefficiencies and negative economic consequences associated with expansion in the banking industry remains limited. In this paper, we conduct an empirical study based on Chinese small and medium banks from 2007 to 2020, examining the impact of branch network growth on bank performance. China's

[1] Theoretical research indicates that organizations face resource constraints during the expansion process (Penrose, 1959; Rubin, 1973). When expansion costs outweigh its benefits, overall performance is particularly adversely affected when governance mechanisms and management capabilities are less than optimal.

[2] Corporate governance in the banking sector has garnered significant attention in the literature (Laeven and Levine, 2009; Berger, Imbierowicz, and Rauch, 2016). Mehran, Morrison, and Shapiro (2011), Laeven (2013), and Ellul (2015) highlight the importance of governance in financial institutions and the characteristics that differentiate them from nonfinancial companies.

financial market has been widely recognized because of its global importance, and the banking sector dominates China's financial markets with a unique institutional environment.[3] The rapid expansion, complex ownership structures, and weak corporate governance of small and medium banks offer an ideal setting for studying the risks of aggressive growth. The latent risks are intensified by underdeveloped governance systems, as evidenced by high-profile failures such as *Baoshang* Bank.

Our empirical evidence shows that moderate expansion yields benefits for banks, but once the pace of expansion surpasses a critical threshold, the marginal effect becomes a significant cost. The costs associated with organizational frictions and governance inefficiencies begin to dominate any benefits from economies of scale or scope. These results are robust across alternative samples and performance measures, offering vital empirical support for understanding the importance of maintaining a balanced approach in the pursuit of growth.

A key question is why excessive expansion leads to poor performance. One theoretical framework posits the existence of expectation bias (Fahlenbrach, Prilmeier, and Stulz, 2018), wherein banking executives overestimate future credit demand, leading to accelerated expansion and subsequent poor performance. However, we find no supporting evidence of this view.[4] The non-monotonic relation we observe between branch expansion and performance is even stronger among banks with lower loan growth and less affected by overoptimistic expectations. Controlling for demand-side factors also does not explain the observed relations.

Our approach is based on the extensive literature on agency problems in financial institutions (Laeven and Levine, 2009; Laeven, 2013). In the banking sector, agency problems are multifaceted.

[3] For instance, by the end of 2020, banking institutions held about 90.5% of China's total financial assets, highlighting the sector's dominant role in the financial system.
[4] Instead, we observe rapid branch expansion accompanied by slowing average loan growth per branch, suggesting that expansion is driven more by agency-motivated empire building than by actual business needs.

Unlike non-financial sectors where governance research predominantly addresses ownership structure and executive incentives, the banking sector, as a financial intermediary, confronts multidimensional agency conflicts stemming from internal hierarchies, organizational distance, and geographical separation. Numerous empirical studies have shown the complexities of agency problems in banking sector, developing a range of proxy variables to capture their effects (Hertzberg, Liberti, and Paravisini, 2010; Fahlenbrach and Stulz, 2011; Goetz, Laeven, and Levine, 2013; Girotti and Salvadè, 2022; Granja, Leuz, and Rajan, 2022).

We use several proxies to assess agency problems. First, concentrated ownership and profit-maximization incentives intensify executive-shareholder conflicts, worsening expansion outcomes. Second, the branch-headquarter distance and local information gaps weaken oversight and risk assessment. Third, in low-trust competitive markets, rapid expansion undermines monitoring effectiveness, thereby amplifying the risks associated with rapid organizational expansion. Additionally, a placebo test on larger, better-governed banks shows no significant expansion-risk link, supporting that the agency problems are particularly pronounced among small and medium banks during expansion.

We use a policy shock that influences expansion decisions independently of a bank's current performance conditions as an identification tool to establish causation, mitigating the biases that banks may opt for expansion to reduce their non-performing loans, or regulators may only permit expansion for banks with superior performance. Specifically, the central government implemented a significant regulatory reform in 2009 to encourage banks to expand their branch networks. If a bank has already established a branch in any provincial capital city, its expansion within that province would face no numerical limits, and the corresponding regulatory approval requirements would also be minimal. This policy initiative creates variation in expansion opportunities that is plausibly exogenous to unobserved bank characteristics, allowing us to identify bank expansions that are not driven by demand. Our findings indicate that banks affected by this policy are more likely to experience high risks and low performance during expansion, consistent with that such regulatory environments facilitate blind growth without considering long-term consequences.

Despite the rise of digital technologies and the narrative surrounding the death of physical banking channels, brick-and-mortar branch networks maintain their significance for facilitating information flow in local credit markets, particularly in information-intensive lending sectors (Gilje, Loutskina, and Strahan, 2016; Narayanan, Ratnadiwakara, and Strahan, 2025).[5] Recent trends suggest that both bankers and policymakers increasingly acknowledge the strategic advantages of physical branches in acquiring and maintaining customer deposits (Drechsler, Savov, and Schnabl, 2021; Benmelech, Yang, and Zator, 2023), and enhancing financial literacy (Célerier and Matray, 2019; Bonfim, Nogueira, and Ongena, 2021).

This paper broadens the theoretical framework for understanding the relation between bank expansion and risk by shifting the research focus from the risks associated with excessive credit expansion (Baron and Xiong, 2017) to the risks associated with excessive organizational growth. We distinguish between loan/asset growth and branch network growth. Branch growth typically reflects a "market expansion logic," indicating banks' efforts to enter new markets or attract new clients, whereas loan growth arises from either existing clients or new clients. The increase in total loan amounts reflects actual business operations and our analysis specifically examines branch expansion to highlight the role of managerial private interests and opportunistic behavior based on agency theory. We differentiate

[5] We find that higher digitalization does not significantly reduce expansion rates for small and medium banks, which continue to rely on physical branches, unlike larger banks that benefit more from fintech-driven digital shifts.

between top-level and lower-level officers, as well as between outside and inside bank governance, providing insights into the agency problems at various organizational levels.

Additionally, the dominant wisdom of the banking literature regarding branch networks has predominantly concentrated on the effects of geographic expansion, such as diversification or foreign expansion, and draws different conclusions (Hirtle, 2007; Deng and Elyasiani, 2008; Goetz, Laeven, and Levine, 2016; Berger, El Ghoul, Guedhami, and Roman, 2017; Chu Deng, and Xia, 2020; Aldasoro, Hardy, and Jager, 2022). In contrast, our study emphasizes branch network expansion rather than its shape or size. Examining changes in expansion velocity is crucial for understanding the causes of risk and poor performance, as focusing solely on network size may obscure the successes of banks that have expanded steadily.

Furthermore, we echo the literature that extensively explores the economic consequences of an enterprise's aggressive expansion strategy on its internal control effectiveness and performance (Bentley, Omer, and Sharp, 2013; Cooper and Maio, 2018) by identifying a specific cost associated with rapid expansion. While prior research has identified various growth-related costs in general sectors, such as management costs and coordination costs (Levinthal and Wu, 2010), we focus on governance issues in financial institutions, which not only differ from those in other industries but may also pose hidden systemic risks. Drawing parallels with the concept of diversification discount, we introduce the notion of a "race discount," which captures the unique challenges and inefficiencies that arise from accelerated expansion. Our work contributes to this gap by systematically analyzing how agency problems exacerbate the costs of rapid expansion, providing a deeper understanding of the interplay between growth and internal governance.

The rest of the article is organized as follows. Section 2 shows stylized facts of branch expansion of banks in China and summarizes our data. Section 3 provides baseline results, and Section 4 examines the mechanisms. Section 5 addresses robustness checks and explores identification issues. We conclude the paper in Section 6.

2. Institutional context, data, and samples

2.1 Branch expansion of China's City Commercial Banks (CCBs)

Since 2006, China's city commercial banks have undergone a significant and sustained expansion of their branch networks, in the absence of notable consolidation through mergers and acquisitions. In contrast to large state-owned banks that have actively streamlined their physical networks in favor of digital transformation, city commercial banks have pursued aggressive geographic expansion. Our calculations indicate that while the four largest state-owned banks in China (i.e., Industrial and Commercial Bank of China, Bank of China, Agricultural Bank of China, and China Construction Bank) have experienced a net decline in branch numbers over the past decade, these city commercial banks have added 10,912 new branches, representing a 136.4% increase since 2010. During the same period, their aggregate asset size expanded by 423.01%.

This sharp increase in branch number reflects a strategic orientation toward market share acquisition and competitive positioning within the banking sector. As shown in Figure 1, the loan market share of China's city commercial banks (grey dashed line) exhibits a persistent upward trend, surpassing 20%. Concurrently, the expansion of these banks (indicated by the boxes) was also driven by economic incentives stemming from deregulation and competitive pressures among local officials, positioning city commercial banks as increasingly influential players despite their relatively modest asset base. Although the city commercial banks collectively account for only about one-fifth of the total assets in China's banking sector, they once numbered as many as 145, a stark contrast to the state-owned banks that control nearly half of sectoral assets.

A key turning point in this expansion process was the 2009 regulatory reform that lifted long-standing restrictions on cross-provincial expansion by city commercial banks. Prior to this reform, CCBs were legally constrained to operate primarily within the jurisdiction of their home city or province. The reform then allowed qualified CCBs to establish branches in other provinces, provided they already maintained a branch in the capital city of the target province.

Following Gao, Ru, Townsend, and Yang (2019), we interpret this policy shift as a quasi-natural experiment that introduced sudden and asymmetric expansion opportunities across banks. The extent to which a CCB could capitalize on this deregulation depended on its pre-2009 branch presence in provincial capitals. As a result, banks with broader pre-policy footprints were better positioned to scale up rapidly, regardless of underlying demand conditions. This regulatory asymmetry serves as a critical identification strategy in our empirical design and allows us to isolate the causal effects of rapid expansion on risk and performance.

Another important policy shift occurred in 2015, when the Chinese government launched a nationwide deleveraging campaign aimed at curbing systemic financial risk. This policy sought to rein in the expansion of shadow banking and slow the rapid accumulation of debt by local governments and firms. The deleveraging effort had a clear dampening effect on overall bank expansion, as evidenced by a marked decline in branch growth rates across the sector in the right grey part of Figure 1.

However, unlike the 2009 reform, the 2015 policy imposed a broadly uniform tightening across the banking system, without generating meaningful heterogeneity in how different banks were affected. Prior to 2015, the bars in Figure 1 are tall and slender, indicating a wide dispersion in branch growth across banks, with some expanding aggressively while others remained more cautious. After 2015, however, the bars become shorter and more uniform in height, reflecting a sharp convergence that most banks significantly slowed their expansion under the deleveraging policy, and the cross-bank variance in growth rates substantially declined. As such, the 2015 deleveraging policy does not provide a viable source of causal identification tool in our empirical design.

We also examine whether heterogeneity in banks' digital transformation is associated with differences in branch expansion, as shown in Figure 1. Following Keil and Ongena (2023), we proxy digital adoption by the frequency of financial technology ("fintech") discussions in annual reports. Based on the annual median, we divide the sample into high- and low-digitalization groups (represented by darker and lighter boxes, respectively), thereby visualizing the distribution of branch growth intensity. Interestingly, technological adoption does not appear to be a strong determinant of branch expansion intensity across most sample years. If anything, in the pre-restriction period, banks with higher technological sophistication may have expanded more aggressively by leveraging digital capabilities. Overall, the divergence in branch expansion between high- and low-digitalization banks remains modest, both in terms of average growth and extreme values.

City commercial banks provide a theoretically and empirically relevant setting for analysis due to their elevated risk exposures and structural vulnerabilities. These small and medium-sized institutions have experienced more frequent risk events, more pronounced heterogeneity in risk-taking behavior, and greater challenges in risk resolution compared to their large state-owned counterparts. Their expansion trajectories, often motivated by economies of scale and growth imperatives, may outpace the development of core capabilities and result in greater systemic fragility. As depicted by the trends in Figure 1, the contribution of CCBs to non-performing loans (blue dashed line) began to rise disproportionately relative to their loan market share, eventually surpassing it after 2018.

Consequently, we theorize that rapid expansion yields dual economic consequences, giving rise to both efficiency gains and elevated risk exposures. In particular, we focus on identifying the underlying channels through which expansion may exacerbate risk, such as weakened monitoring, governance failure, and borrower moral hazard, and seek to contribute new empirical insights into this tradeoff.

2.2 Data sources

Our data sample includes 120 China's city commercial banks (CCBs) from 2007 to 2020.[6] We manually collected detailed data on the opening time, opening status, and affiliate information of the branch network of CCBs from Branch License Lists disclosed by China Banking and Insurance Regulatory Commission (CBIRC), and parsed the latitude and longitude information for each branch through a map geocoding interface to obtain detailed location information. Bank characteristics and financial information are collected from banks' annual reports. Our final sample covers a total set of 1367 observations and an unbalanced panel of 120 CCBs with a combined asset size exceeding 6 trillion USD at its peak.

2.3 Variable construction

Our key measure of a bank's expansion is the year-over-year growth in the total count of branches. For city commercial bank *i* in year *t*, we define the annual branch growth rate ($Growth'$) as:

$$Growth'_{i,t} = \frac{Branch\ Number_{i,t} - Branch\ Number_{i,t-1}}{Branch\ Number_{i,t-1}} \quad (1)$$

However, the consequence on a bank's performance would not immediately be exposed right after the expansion, and immediate loan growth could mechanically distort accounting metrics. We mitigate this by using a branch network growth over the past three years ($Growth$) as:

$$Growth_{i,t} = (Growth'_{i,t} + Growth'_{i,t-1} + Growth'_{i,t-2})/3 \quad (2)$$

While the $Growth'$ captures immediate expansion, the $Growth$ reflects sustained growth, filtering

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[6] Our sample starts in 2007 when China gradually established city commercial banks in all cities.

out short-term accounting noise from sudden loan increases. Also, considering the early stage of each bank's expansion, even a few new branches would lead to unusually large values in the above calculations. So, we censor the sample for the first three years of each bank's foundation, and winsorize the variables at the 5% and 95% quantiles.

To measure bank performance, we primarily focus on accounting-based indicators and measures of lending performance, such as loan quality, consistent with prior literature (e.g., Berger and Bouwman, 2013). Our core dependent variable is the ratio of non-performing loans to total loans (*NPL*), which serves as a proxy for loan quality. As a robustness check, we also examine alternative measures of bank performance, including *Z-score*, *return on equity* (*ROE*), and *profit margin*. The detailed definitions of all main variables are provided in Table 1, and summary statistics are reported in Table 2. On average, the number of branches for a single bank has grown at an annual rate of 10.6%. Among the fastest-growing banks, i.e., those in the top 5% of the branch growth distribution, the total number of branches more than doubled within a three-year period.

Our branch growth measure captures dimensions of bank expansion distinct from prior proxies such as loan growth (Fahlenbrach, Prilmeier, and Stulz, 2018), asset growth (Frame, McLemore, and Mihov, 2025), and geographic diversification indices (Goetz, Laeven, and Levine, 2016). First, "Branch" represents organizational decisions, i.e. where, when, and whether to enter, which are shaped by complex multi-agent dynamics and thus closely linked to the agency theory. Second, branch growth reflects a bank's integrated business strategy across both asset and liability sides, unlike loan or deposit growth in isolation. Even in the digital era, physical outlets remain vital, especially for retail banking, as digitalization often enhances rather than replaces network functionality. Lastly, lending and branching are parallel decisions. Opening a branch often serve strategic goals like market entry and client acquisition, while lending may occur through existing branches. Narayanan, Ratnadiwakara, and Strahan (2025) find limit evidence that the demand for lending explains branch restructuring.

Figure 2 illustrates the distinct informational content of our branch growth measure. Panel 1 compares *Growth* with the geographic diversification variable (*HHI*). In the lower spectrum of branch growth periods, the *HHI* measure exhibits more variation. In the top-right corner of the figure, both measures align to point to the most aggressive behavior. Panels 2 to 4 plot branch growth against various loan growth measures. The correlation with total loan growth is weak (0.11), indicating that rapid branch expansion often occurs without parallel loan growth. However, when focusing on loan growth per branch, a clearer substitution pattern emerges. Banks either grow by adding branches or by increasing business at existing branches. These correlations highlight the unique value of branch growth as a proxy for expansion strategy beyond traditional measures.

3. Branch growth and bank performance

We report our baseline estimation results in Table 3, with all specifications including year and bank fixed effects. Column (1) of Panel A presents a linear specification, where the coefficient on *Growth* is statistically insignificant. This null result suggests that any underlying relations between expansion pace and bank performance may be non-linear and potentially obscured in a linear framework.

In Column (2), we incorporate a quadratic term for *Growth* to capture potential non-linearity. The results reveal a statistically significant inverted-U relation at the 1% level: while the linear term is positive, the squared term is negative. This pattern indicates that moderate expansion enhances bank performance, but excessively rapid growth has adverse effects, particularly by increasing loan risk. Based on the estimated coefficients, the turning point is 0.175, which lies well within the sample range. Economically, this implies that when a bank's annual branch growth rate exceeds 17.5% (approximately the 75th percentile of the sample), the marginal impact on performance becomes negative.

To further illustrate the non-linear nature of this relation, we compute the marginal effects of *Growth* at several key percentiles. At the 50th percentile, the marginal effect is -1.397 (t = -2.37), indicating a favorable effect at moderate expansion pace. By the 75th percentile, the marginal effect becomes -0.323 (t = -0.91), suggesting that the effect flattens out as expansion approaches the estimated turning point. Beyond this inflection, however, the marginal effect reverses direction and becomes positive and increasingly steep: at the 90th percentile, it is 1.233 (t = 2.26), and at the 95th, it rises further to 2.495 (t = 2.69). These extreme values at the top end of the distribution are rather unrealistic, suggesting that we consider a somewhat different functional form. .

To better capture this non-monotonicity in a more transparent and interpretable way, Column (3) adopts a piecewise linear approach inspired by the logic of regression discontinuity design. We treat branch growth as a running variable and construct an indicator function $I(Growth_{i,t} > Q^{75th})$ that takes a value of 1 when the growth rate exceeds the 75th percentile. This allows us to flexibly test for slope changes beyond the identified inflection point.[7] The regression specification is as follows:

$$Performance_{i,t} = \beta_0 + \beta_1(Growth_{i,t}) + \beta_2 \mathrm{I}(Growth_{i,t} > Q^{75th}) + \beta_3(Growth_{i,t}) \times \mathrm{I}(Growth_{i,t} > Q^{75th}) + \beta \sum Controls + \delta_i + \delta_t + \varepsilon_{i,t} \quad (3)$$

In this equation, β_1 captures the slope of the relation between branch growth and performance within a "reasonable" range (i.e., below the threshold), while $\beta_3 + \beta_1$ reflects the slope above the threshold. The coefficient β_2 measures the level shift at the breakpoint. The findings for all three major coefficients and the marginal effects shown at the bottom of Column (3) suggest that this is a much more reasonable specification than those shown in Columns (1) and (2). First, the estimates for β_1 and β_3 of -1.653 and 2.445 are both statistically significant and economically significant and combine to

7 We also employ spline regressions in the Appendix A to further confirm the increased risks associated with excessive rapid expansion.

show reasonable marginal effects at the bottom of Column (3). Nonperforming loans decline significantly at modest levels of branch expansion below the 75th percentile and significantly shift upward after that point, yielding a modest marginal effect of $\beta_3 + \beta_1 = 0.792$ above this level. Thus, although the marginal effect of $\beta_3 + \beta_1$ is not statistically significant, the difference between the slopes below and above the inflection point of $\beta_3 = 2.445$ is highly statistically and economically significant, consistent with a clear switch in the direction of the effect. The level shift at the 75th percentile β_2 is statistically insignificant and of negligible economic magnitude, consistent with a smooth transition to higher marginal effects of branch expansion on nonperforming loans above the 75th percentile.

This finding motivates our subsequent analysis: to explore the mechanisms behind this threshold effect, we conduct sub-sample analyses based on bank characteristics. In several subsamples, we find not only that β_3 remains significant, but also that the post-threshold marginal effect ($\beta_1 + \beta_3$) becomes statistically significant. These results indicate that certain bank-specific features, such as governance capacity, risk controls, or regional factors, can explain why excessive growth is particularly harmful in some contexts.

4. What explains the perils of speed?

To better understand the mechanisms behind the non-monotonic relations between branch growth and bank performance, we examine two competing explanations commonly discussed in the literature: the biased expectations hypothesis and the agency theory. This section starts by testing the biased expectations theory in Fahlenbrach, Prilmeier, and Stulz (2018), who argue that high loan growth often leads to deteriorating performance due to managerial over-optimism. In our context, we aim to assess whether a similar logic applies to the rapid expansion of bank branches in China. While both frameworks can theoretically coexist, our evidence suggests that the agency theory offers a more compelling explanation for the performance risks associated with aggressive branch expansion in

Chinese city commercial banks[8].

4.1 Biased expectation and optimism-driven expansion

One possible explanation for aggressive branch expansion is biased expectations: managers might overestimate future loan demand and economic conditions, leading them to expand prematurely or excessively. This mechanism does not necessarily involve self-interest or internal conflicts, but reflects honest errors in judgment, often driven by optimism or cognitive biases. Under this view, new branches are opened in anticipation of future business growth. If those expectations are not realized, asset quality and overall bank performance may decline.

However, several pieces of evidence from our analysis suggest that biased expectations alone cannot explain our findings. First, if branch expansion is driven by overoptimism about future credit demand, we would expect to see this reflected not only in the number of branches (extensive margin) but also in the loan growth per branch (intensive margin). Yet, as shown in Panel 4 of *Fig. 2*, there is a clear negative correlation between branch proliferation and per-branch loan growth. It is unlikely that banks' overoptimism would only manifest as a scramble for new markets while sacrificing growth in existing markets.

To further explore this, we divide the sample into subsamples based on the loan growth of individual branches. One with high loan growth per branch (where overoptimism might plausibly play a larger role), and one with low loan growth per branch (where it should be less relevant). Results in columns (1) and (2) of Table 4 show that the non-monotonic relation between branch expansion and performance is significantly stronger in the low-loan-growth-per-branch subsample, and less consistent

[8] We stress, however, that this does not imply the biased expectations theory is flawed. Rather, its assumptions and predictions, derived primarily from U.S. institutional settings, may not fully align with the dynamics of other countries' banking sector.

in the high-loan-growth-per-branch subsample. This pattern casts doubt on the notion that biased expectations are the dominant driver of our results.

Second, we examine whether variation in sentiment across time aligns with the strength of the expansion-performance relation. Using annual survey data from the People's Bank of China, we classify years into "Optimistic" and "Not Optimistic" periods based on bankers' collective expectations about the macroeconomy and loan demand.[9] If sentiment-driven misjudgment drives over-expansion, the performance decline should be more pronounced in optimistic years. However, as shown in Columns (3) and (4) of Table 4, the non-monotonic effect is stronger in the "Not Optimistic" years, suggesting that other forces rather than managerial sentiment play a more substantial role.

In addition, we control for demand-side factors and conduct a placebo test using a sample of large state-owned and listed joint-stock banks, which are typically less susceptible to agency problems, to rule out the expectation hypothesis. The detailed results are in the Appendix A.

Taken together, these findings indicate that poor performance following aggressive branch expansion is less about mistaken optimism alone. Instead, it points to interest conflicts and inconsistent risk-sharing, such as expanding for personal promotion or branch officers taking excessive risk that is beyond the control of headquarters. These are core concerns of the agency theory, which we explore more directly in the next subsection.

4.2. Agency problems in branch expansion

As an alternative to the biased expectations hypothesis, we propose that the non-monotonic relation between branch expansion and performance is better explained by agency problems inherent in the

[9] In a given year, if the proportion of bankers expressing optimism about economic activity and loan demand exceeds the median for the sample period, that year is classified as the "Optimistic" group; otherwise, it falls into the "Not Optimistic" group.

organizational structure of banks, particularly smaller, fast-growing institutions.

Our conceptual foundation builds on Berger and Udell (2002), which outlines a top-to-bottom hierarchy of contracting problems in small banks: the management contracts with the bank's stockholders, loan officers in turn contract with the bank's senior management, and the borrower in turn contracts with the bank's loan officers. Each of these layers is associated with a different kind of agency problem, and a bank's performance may go down if efficiency is reduced for any of the agency costs described above or if the additional assets have low expected returns or high variation of returns.

Our empirical aim is to assess whether certain agency problems tip the balance from the potential benefits of expansion to harmful consequences. The first involves ownership-related issues, where concentrated shareholding and ownership type influence managerial incentives. The second links to delegation frictions between headquarters and branches, where greater distance impairs effective monitoring and control. The third focuses on contracting problems in the lending process, where weak borrower discipline exacerbates moral hazard and undermines loan quality, particularly under low social trust and intense competition.

4.2.1 Ownership

We show the results for the first layer of agency problems in Table 5, which are standard corporate governance issues between the bank management and stockholders, such as the ownership concentration and the ownership type. Banks with a more concentrated ownership structure, where a single largest shareholder holds a higher percentage of cash flow rights, are theoretically motivated to take on more risk (Laeven and Levine, 2009) since the controlling shareholders tend to expropriate wealth from minority shareholders by pursuing personal benefits. The original motivation for the expansion with insufficient governance creates Type II agency costs. The existing body of research has clearly established standard governance proxy variables such as the ownership percentage of the single largest shareholder (Beltratti and Stulz, 2012). So, we set *Top1share* to capture governance quality inside a bank, where higher values indicate greater ownership concentration and more severe agency problems. The columns (1) and (2) in Table 5 provide the results from subsample analyses grouped by the annual median of *Top1share*. The nonlinear relation between branch expansion and bank performance emerges only in the high ownership concentration subsample where agency problems are expected to be acute, with no significant pattern observed in the low ownership concentration group, suggesting that concentrated ownership exacerbates agency costs, which in turn distort banks' ability to translate expansion into sustained performance improvements.

Ownership type matters in the bank governance, and we classify banks into two groups as highly private banks and highly government-owned banks.[10] Columns (3)-(4) of Table 5 present results from regressions for these two ownership groups. The nonlinear relation between branch expansion (*Growth*) and performance is observed only among highly private banks, with statistically significant coefficients at 1% level. In contrast, no such pattern is evident among highly government-owned banks. This divergence suggests that government ownership may mitigate agency problems, thereby insulating performance from expansion-related risks.

While prior research on non-bank institutions often emphasizes that government-owned enterprises suffer greater agency problems generated from owners' absence and political incentives (Bailey, Huang, and Yang, 2011), the link between ownership and agency issues in banks remains inconclusive, and governance mechanisms aimed at maximizing shareholder value can expose individual banks to risks

[10] See the Appendix A for group-specific descriptive statistics. Compared to government-owned peers, private banks are generally smaller in size, expand more aggressively, take on higher risk, and pursue higher returns to shareholders.

(Ellul, 2015). Compared to privately owned banks, banks with greater government ownership are typically subject to tighter oversight and have executives with political affiliations, leading to more conservative expansion and reduced opportunism. In contrast, privately owned banks, facing fewer institutional constraints, may pursue aggressive growth, greater appetite for risk, and stronger incentives to maximize returns, which in turn exacerbates managerial agency problems.

4.2.2 Delegation

For the second layer, we turn to Table 6 to examine the agency problems that arise between branches and headquarters due to the delegation of authority by senior managers to loan officers and differing incentives. We focus on two dimensions: the functional distance between branches and headquarters, and the nature of the geographic expansion, i.e., whether it targets cities where the bank already has a presence, or entirely new cities.

In Columns (1) and (2), we split the sample based on *Distance*, which captures the functional or geographic separation between loan origination and central decision-making. In columns (3) and (4), we distinguish between *New_City* expansion that branches set up in cities without prior presence and *Existing_City* expansion where the bank already has operations. The regression results in Table 6 show the adverse nonlinear relation between high-speed expansion and bank performance is only observed in high functional distance group and in banks that expand into new cities. In contrast, this pattern is less evident in expansions within existing operational footprints or where oversight is more direct. It suggests that organizational distance and market unfamiliarity amplify agency costs, thereby undermining the benefits of expansion.

These findings point to the salience of second-layer agency problems within the bank organization. When authority is delegated to branch-level officers in far-flung or unfamiliar markets, monitoring becomes costlier and enforcement of headquarter policies weaker. The literature highlights several key channels: one is the degraded quality of soft information transmission due to a far-flung functional distance (Berger and DeYoung, 2006; Qian, Strahan, and Yang, 2015), and the other is the diminished effectiveness of loan officers as information collecting agents (Liberti and Mian, 2008; Hertzberg, Liberti, and Paravisini, 2010; Skrastins and Vig, 2019). Additionally, "new city" expansion exposes banks to heightened information asymmetry and local market unfamiliarity, which is beyond their existing expertise and results in impaired efficiency (Berger, Hasan, and Zhou, 2010; Loutskina and Strahan, 2011). The distant branch's management may resort to opportunistic behavior to quickly establish a foothold in the new market, such as aggressive lending or inadequate risk assessment, leading to higher default rates, lower profitability, and overall poorer performance (Granja, Leuz, and Rajan, 2022).

4.2.3 Contracting

The third layer of agency problems, as shown in Table 7, arises from friction between borrowers and banks, where low social trust and high market competition constrain effective contract enforcement and increase borrower moral hazard. Specifically, we weigh the city *f*'s number of outstanding branches per 10,000 people ($perBranch_{f,t}$)[11] by the number of newly opened branches of bank i in city f in year t ($New\ Branch_{i,f,t}$). Then, we divide it by the bank i's aggregate number of newly opened branches in year t across all cities: $Competition_{i,t} = \frac{\sum_{f=1}^{F} perBranch_{f,t} * New\ Branch_{i,f,t}}{\sum_{f=1}^{F} New\ Branch_{i,f,t}}$. To empirically capture the heterogeneity of social trust, we follow the literature and measure it using dialect complexity (e.g. Gu, Liu, and Peng, 2022), which proxies for regional cultural fragmentation. Specifically, we construct a trust index based on the dialect diversity of each bank's branch network, weighted by the number of

[11] This is analogous to measuring competition in terms of the density of bank branches in a region. We also construct the Herfindahl index to characterize competition and obtain similar regression results.

new branches opened in each city. If the weighted average dialect complexity exceeds the sample median, the bank is classified as operating in a low-trust environment.

The results in Table 7 reveal that the perils of rapid expansion are significantly more pronounced in markets with intense competition or low trust. Specifically, the interaction terms and marginal effects of high-speed expansion are statistically and economically significant at the 1% level in both high-competition and low-trust subsamples, while no significant effects are found in their counterparts. These findings suggest that borrower-bank agency costs critically shape the performance outcomes of branch expansion.

We interpret these patterns through the lens of borrower moral hazard and post-loan monitoring challenges. Banks play a crucial role as "delegated monitors" representing investors and depositors in the financial intermediation theories (Diamond, 1984). When banks expand their branch network to serve new customers, they may face challenges in credit negotiation and monitoring, leading to potential moral hazards of borrowers and ineffective post-loan management, ultimately impacting bank performance.

On the one hand, in highly competitive markets, banks struggle to establish long-term lending relationships (Petersen and Rajan, 1995; Boot and Thakor, 2000). This weakens banks' incentives to screen and monitor borrowers, thereby impairing both financial intermediation and credit quality. As competition escalates, information rents embedded in lending relationships are compressed (Hauswald and Marquez, 2006), reducing banks' incentives to produce borrower-specific information, and in turn, increases the likelihood of misjudgment in credit allocation and makes it easier for borrowers to conceal their true creditworthiness. Interbank competition can also incentivize loan officers to engage in excessive risk-taking, such as extending loans to borrowers with inadequately evaluated risk profiles due to performance-based pressures (Granja, Leuz, and Rajan, 2022). Furthermore, heightened competition can exacerbate borrower moral hazard. Hou, Liang, and Basu (2023) provide novel evidence showing that banking deregulation, by intensifying competition, inadvertently amplifies borrower moral hazard.

On the other hand, low levels of social trust can also aggravate agency problems between banks and borrowers, especially in the presence of asymmetric information and limited enforceability. In such environments, monitoring costs are higher and enforcement is weaker, leading to lower intermediation efficiency and reduced loan performance (Feigenberg, Field, and Pande, 2013). Therefore, banks that aggressively expand in low-trust regions are likely to face greater challenges in maintaining performance due to amplified agency frictions.

Overall, our findings from Table 5 to Table 7 suggests that banks have not adequately addressed the agency problems exacerbated by rapid branch expansion. These issues stem from managerial opportunism, misaligned incentives between headquarters and branches, and borrower-level moral hazard. Specifically, weak internal governance, coordination inefficiencies, and structural mismatches between expansion strategies and bank capabilities collectively lead to resource misallocation and higher supervision costs, undermining performance.

5. Additional analyses

We address robustness tests and casual identification in this section. First, we test the robustness of our main findings in Table 8. Risk is proxied by Z-score, and loan loss provisions (*Provisions*), where higher values indicate greater stability and prudence. Profitability and shareholder value is measured by Return on Equity (*ROE*) and Profit Margin (Laeven and Levine, 2009). Results consistently show that moderate branch growth below the 75th percentile is generally associated with improved outcomes, though not always significant. In contrast, aggressive expansion above the 75th percentile leads to significant performance deterioration, with interaction terms consistently significant across all four metrics. Marginal effects are also statistically significant in three of the four outcomes, confirming a clear turning point where the benefits of expansion reverse.

We further conduct a series of robustness checks. These tests address potential concerns related to omitted variable bias, self-selection issues from M&A activity and incomplete disclosure, and a horse racing analysis involving other common activities of banks. The results remain robust and consistent with our main findings. Detailed procedures and regression results are provided in the Appendix B.

Second, we conduct the causal identification for our main results. The specification of our regressions assumes that a bank's decision to expand is independent of its performance. However, there is a possible link between a bank's performance and its decision to branch. Either a high or low performance can encourage a bank to expand its branch network. In the case of strong performance, a bank could decide to extend its competitive advantage to new markets or to consolidate its position in the markets where it is already present. Alternatively, in the case of weak performance, a bank could expand its branch network to seek new profit opportunities.

We attempt to disentangle the portion of bank branch expansion decisions that have a weaker association with operational conditions. We exploit a quasi-natural experiment to examine how deregulation affects the consequences of aggressive branch expansion in Table 9. Following Gao, Ru, Townsend, and Yang (2019), we interpret the liberalization of inter-provincial branching rules for city commercial banks in 2009 as an exogenous policy shock. See the section 2.1 for the details of this policy shock. The reform allowed banks to freely establish branches across provinces, provided they already had a branch in the capital city of the target province.[12] Banks that had a broader pre-policy

[12] Banks that had no experience in inter-provincial operation before the policy was introduced were also affected

presence across provincial capitals were therefore more exposed to deregulation and positioned to expand rapidly in the post-policy period, not necessarily in response to market demand, but due to the institutional relaxation. This may trigger adverse outcomes if expansion outpaces governance and risk management, particularly through the channels of weakened monitoring, poor governance, and borrower moral hazard.

We define a post-policy period indicator ($Policy_{2009}$) that equals one from 2009 onwards. *BankDiv* captures the number of provincial capitals outside the bank's home province in which it had branches before 2009, thus measuring each bank's potential to benefit from deregulation. *Deregulation* is defined as the interaction between *Policy2009* and *BankDiv*, capturing bank-specific exposure to the reform.

Our primary interest lies in the interaction term, $Growth \times \mathbb{1}(Growth > Q^{75th}) \times Deregulation$, which captures the marginal effect of high-speed expansion under policy-induced deregulation. This coefficient is positive and statistically significant at the 5% level (coefficient = 5.541). It suggests that for banks with high growth rates above the 75th percentile, the adverse effects of expansion on loan quality are more pronounced when combined with greater exposure to deregulation. This is consistent with our agency framework that when expansion is driven more by institutional opportunity than organic growth, the risks associated with inadequate screening, moral hazard, and weak internal controls become more severe.

The marginal effect of *Growth* in the high-growth and high-deregulation setting is also significant (5.988, t = 2.51), further confirming the compounding risks of fast expansion under lax regulatory constraints. By contrast, interaction terms involving only two of the three key variables (e.g., $Growth \times Deregulation$, or $\mathbb{1}(Growth > Q^{75th}) \times Deregulation$) are statistically insignificant, reinforcing that the

by the policy, but they were more restricted, and most of them were still operating within the same province where the head office was located.

risk is conditional on all three dimensions being simultaneously present. Overall, the results demonstrate that deregulation can well identify the perils of rapid branch growth, particularly when banks aggressively expand in a short period, likely outstripping their capacity to manage loan quality effectively.

6. Conclusion

While prior literature highlights the advantages of branch network expansion, aggressive strategies pose risks, especially for small and medium banks more prone to agency problems and governance weaknesses. China's city commercial banks underwent rapid expansion to boost growth and market share following the 2009 cross-regional reform. However, this fast-paced growth often came at the cost of foundational capacity building and effective risk management.

We find a clear non-monotonic relation between branch growth and loan risk, where a modest expansion within a reasonable speed improves performance and a rapid expansion decreases performance. This pattern is driven by internal agency problems, such as weakened oversight, poor information quality, and governance failures, which impair risk control in fast-growing networks.

Our findings deepen the understanding of how branch expansion shapes bank risk and performance, providing practical insights for banking stakeholders. Moreover, it should be viewed in a global context. While U.S. branch numbers have remained roughly unchanged since 1995, China has witnessed continuous growth in banking outlets, and many other countries have seen sharp declines. These divergent trends raise a key question: why do some banks continue expanding their physical footprint in the digital age? One possibility is the role of underlying cultural norms in shaping how banks perceive proximity, trust, and customer relationships. This opens avenues for future research on the deeper behavioral and normative drivers behind branching decisions beyond purely economic calculations.

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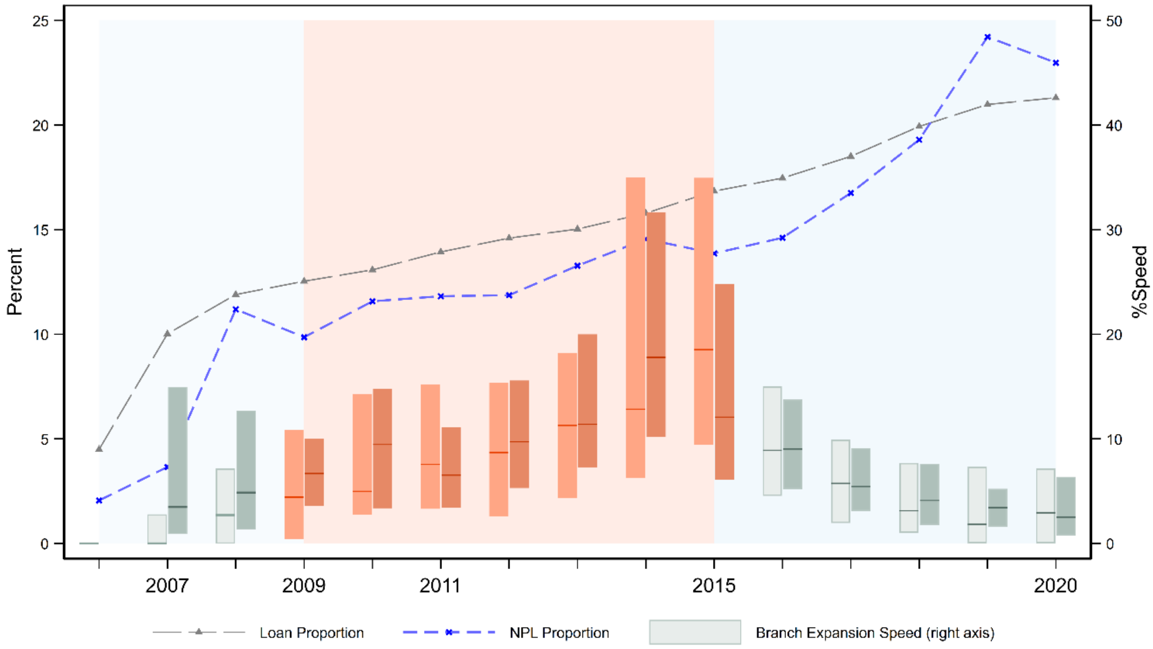

Figure 1. Branch growth of China's city commercial banks and changes in their market share and non-performing loans.

This figure plots the total loans and non-performing loan balances of China's city commercial banks (CCBs) as a percentage of all commercial banks and their branch expansion at annual frequencies from 2006 to 2020. The box plots represent the quartile distribution of branch growth, whose values are shown on the right axis. The branch growth has shown variations based on the digital transformation of banks. Light-colored boxes represent the distribution of branch growth for banks with lower levels of digital transformation, while dark-colored boxes represent the distribution of branch growth for banks with higher levels of digital transformation. The short-dashed line with crosses illustrates the proportion of CCBs' non-performing loan balances, and the long-dashed line with triangles illustrates the proportion of CCBs' total loan balances.

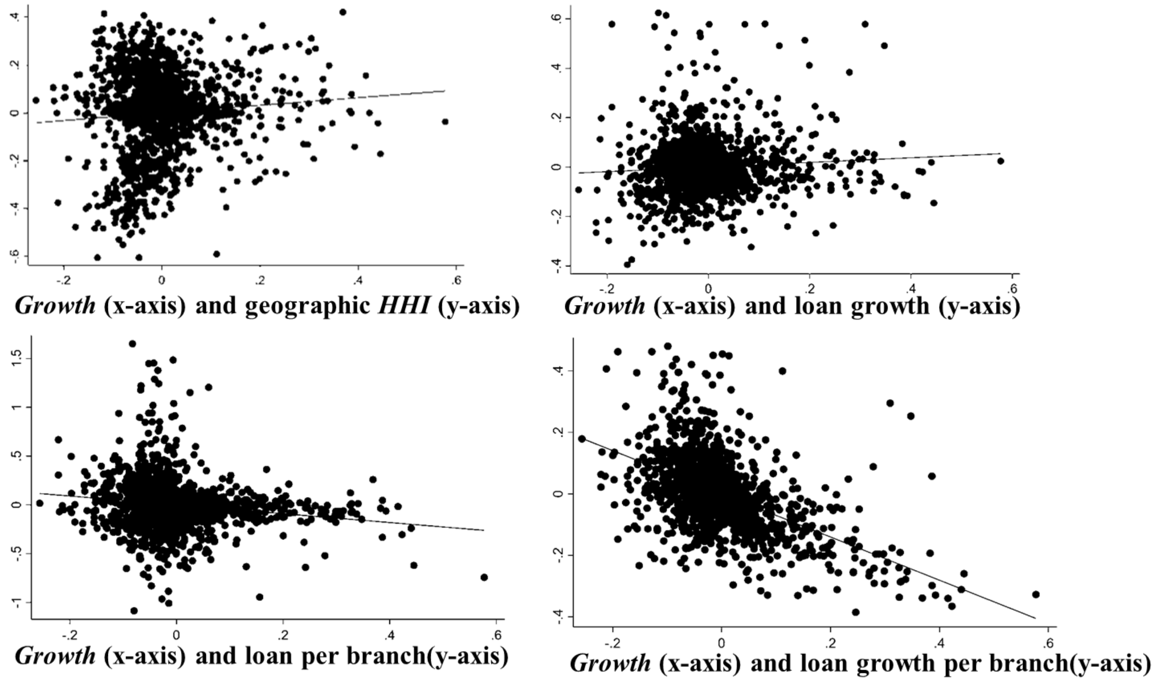

Figure 2. Correlation between branch *Growth* and other measures of bank operations.
This figure plots the *branch growth* versus *loan growth / geographic HHI* measures. The branch growth measure is plotted on the x-axis versus the *others* on the y-axis. *Loan growth* is year-over-year growth in total loan balance. *Geographic HHI* is the Herfindahl-Hirschman Index on branch location. *Loan per branch* is the loan balance divided by the number of existing branches, and *Loan growth per branch* is the year-over-year growth in *Loan per branch*. All the dots are residualized by the bank fixed effects.

Table 1. Definition of variables.

Variable name		Definition
Panel A: Key Dependent variables		
NPL	=	The ratio of non-performing loans to total loans (%)
Panel B: Other Dependent variables		
Zscore	=	Ln(Stdv.*ROA*/ [Avg.(*ROA*)+Avg.(Equity/Assets)]; means of ROA and Equity/Assets are computed over the 3 years (t−2 to t)); the standard deviation of ROA is computed over each bank's available period
Provisions	=	The ratio of loan loss provisions to non-performing loans (%)
ROE	=	The ratio of net profit to net assets (%)
Profit_Margin	=	The ratio of net profit to revenue (%)
Panel C: Key Explanatory variables		
Growth	=	Rolling three-year average of the yearly percentage change in the count of a bank's branches.
$Growth^{\wedge 2}$	=	The quadratic term of *Growth*
$I(Growth>Q^{75th})$	=	An indicator that equals one when *Growth* exceeds the 75th percentile threshold and zero otherwise
Panel D: Other variables		
Top1share	=	The ownership percentage of the single largest shareholder
GovOwnership	=	The government ownership shares among the top ten shareholders of a bank each year
Distance	=	Average distance of newly opened branches from the headquarter (in 100 miles)
New_City	=	An indicator variable that equals one if the bank opened a branch this year in a new city where it had never had a branch before, and equals zero if the bank opened a branch limited to previously entered cities
Competition	=	Area-weighted average of the branch density where the bank operates
Social_Trust	=	Local dialect complexity weighted by the number of bank branches in each city
$Policy_{2009}$	=	An indicator variable that equals one for observations after the policy shock in 2009
BankDiv	=	The count of out-of-province capital cities in which the bank has established branches prior to 2009 (i.e., a higher value indicates a more deregulated bank)
Deregulation	=	The interaction term of $Policy_{2009}$ *and BankDiv*
Panel E: Control variables		
L.Size	=	The natural logarithm of total assets lagged by one year
L.CAR	=	The ratio of total equity capital to total risk-weighted assets lagged by one year (%)
L.CIR	=	The ratio of operating cost to operating income lagged by one year (%)
L.SLR	=	The ratio of total loans to total deposits lagged by one year (%)
L.Em	=	The ratio of total assets to total debt lagged by one year (%)

Table 2. Summary statistics.

This table presents the summary statistics of our main variables. *NPL* is the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches, capturing the smoothed trend in branch network expansion. The sample spans the period from 2007 to 2020 at the bank-year level. We censor the sample for the first three years of each bank's expansion, and winsorize it at the top and bottom 5% of the distribution. Overall, we obtain 1367 observations for the baseline regression using an unbalanced panel of 120 city commercial banks. The number of observations varies across variables due to missing data for some bank-year pairs.

Variable Names	Obs.	Mean	SD	P25	Median	P75	P90	P95
NPL	1367	1.514	0.917	0.890	1.400	1.900	2.560	3.140
Growth	1367	0.106	0.098	0.032	0.075	0.152	0.262	0.352
Top1share	1082	0.184	0.119	0.110	0.171	0.200	0.286	0.397
GovOwnership	1036	0.483	0.276	0.287	0.488	0.687	0.878	0.934
Distance	1367	1.866	2.341	0.524	1.292	2.343	4.143	5.994
New_City	1367	0.414	0.493	0.000	0.000	1.000	1.000	1.000
Competition	1367	1.127	0.680	0.725	1.080	1.566	1.954	2.254
Social_Trust	1367	0.257	0.178	0.089	0.250	0.409	0.503	0.566
Zscore	1367	3.266	0.488	2.927	3.217	3.578	3.899	4.063
Provisions	1332	2.557	1.285	1.646	2.110	3.041	4.599	6.031
ROE	1339	13.062	6.398	8.762	12.511	16.805	21.683	24.941
Profit_Margin	1364	31.913	10.808	24.917	32.824	39.306	45.095	48.174
Size	1367	6.659	1.200	5.807	6.675	7.503	8.182	8.641
CAR	1367	13.171	2.778	11.640	12.740	14.230	15.980	17.720
CIR	1367	34.305	8.171	28.970	33.650	38.980	44.330	49.550
SLR	1367	61.473	11.354	53.750	63.090	69.420	73.657	78.243
Em	1367	107.734	2.433	106.253	107.316	108.752	110.285	112.315

Table 3. Branch growth and bank performance

This table reports the estimation results of the regressions for bank branch expansion and performance. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches, capturing the smoothed trend in branch network expansion. Column (1) includes the linear term of branch growth. Column (2) further includes the quadratic term of branch growth. The turning point of the quadratic relation falls around the 75th quartile of the *Growth*. Column (3) presents the threshold regression analysis. We define $\mathbb{1}(Growth > Q^{75th})$ as an indicator variable equal to 1 if the growth rate exceeds the 75th percentile of the distribution. We also compute the marginal effects of *Growth* on *NPL* across different growth quantiles to show the varying impact of expansion on the performance. Bank fixed effects and year fixed effects are included. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*		
	(1)	(2)	(3)
Growth	-0.044	-2.454***	-1.653**
	(-0.13)	(-2.68)	(-2.40)
$Growth^{\wedge 2}$		7.032***	
		(2.89)	
$Growth \times \mathbb{1}(Growth > Q^{75th})$			2.445***
			(2.70)
$\mathbb{1}(Growth > Q^{75th})$			0.066
			(0.81)
L.Size	0.513***	0.516***	0.513***
	(4.07)	(4.11)	(4.09)
L.CAR	-0.069***	-0.069***	-0.069***
	(-4.07)	(-4.06)	(-4.05)
L.CIR	0.017***	0.017***	0.017***
	(3.56)	(3.48)	(3.52)
L.SLR	0.007**	0.008**	0.007**
	(2.08)	(2.22)	(2.14)
L.Em	0.047**	0.046**	0.046**
	(2.30)	(2.26)	(2.27)
Marginal Effect at $Growth = Q^{50th}$	-0.044	-1.397**	-1.653**
	(-0.13)	(-2.37)	(-2.40)
Marginal Effect at $Growth = Q^{75th}$	-0.044	-0.323	0.792
	(-0.13)	(-0.91)	(1.39)
Marginal Effect at $Growth = Q^{90th}$	-0.044	1.233**	0.792
	(-0.13)	(2.26)	(1.39)
Marginal Effect at $Growth = Q^{95th}$	-0.044	2.495***	0.792
	(-0.13)	(2.69)	(1.39)
Year FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
N	1367	1367	1367
Adj. R^2	0.536	0.540	0.539

Table 4. Biased expectation and optimism-driven expansion

This table presents the results of testing potential mechanisms using subsamples. If the biased expectation theory fully explains the results, the nonlinear relations between branch growth and performance would be more significant when biased expectations are severe. Otherwise, agency theory is more applicable. We group the sample with high or low loan growth in columns (1) and (2). *Loan growth per branch* is the year-over-year growth in the loan balance divided by the number of existing branches. The sample is grouped by year median of loan growth per branch. We group the sample in columns (3) and (4) with positive or relative negative expectations. The People's Bank of China regularly conducts surveys of bankers and publishes aggregated results. Each year, if the proportion of bankers expressing optimism regarding both economic activity and loan demand exceeds the median for the sample period, that year is classified into the "optimistic expectation" group. Notably, years of 2009, 2010, 2011, 2012, and 2013 fall into this category, coinciding with the period of substantial credit stimulus implemented in China. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. We define $\mathbb{1}(Growth>Q^{75th})$ as an indicator variable equal to 1 if the growth rate exceeds the 75th percentile of the distribution. The marginal effect of *Growth* when $Growth>Q^{75th}$ is calculated using linear combination tests following interaction regressions. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*			
	(1)	(2)	(3)	(4)
	Low loan growth per branch	High loan growth per branch	Not Optimistic	Optimistic
Growth	-3.698***	-1.041	-2.542**	0.299
	(-2.77)	(-1.16)	(-2.40)	(0.16)
$Growth \times \mathbb{1}(Growth>Q^{75th})$	3.814***	1.629	3.173**	0.782
	(2.85)	(1.20)	(2.41)	(0.34)
$\mathbb{1}(Growth>Q^{75th})$	0.192*	0.067	0.112	-0.082
	(1.69)	(0.52)	(1.12)	(-0.95)
Marginal Effect at $Growth>Q^{75th}$	0.116	0.588	0.631	1.081
	(0.15)	(0.67)	(0.90)	(0.84)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	691	676	904	463
Adj. R^2	0.596	0.483	0.466	0.510

Table 5. Agency problems in the governance structures.

This table reports the estimation results of the OLS regressions of bank loan quality with interaction terms. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. We define $\mathbb{1}(Growth>Q^{75th})$ as an indicator variable equal to 1 if the growth rate exceeds the 75th percentile of the distribution. *Top1share* is the ownership percentage of the single largest shareholder. Columns (1) and (2) group the sample by the annual median of *Top1share*. Columns (3) and (4) divide the sample according to the annual median of government ownership share among the top ten shareholders (*GovOwnership*), capturing variation in state influence at the shareholder level. If the government equity of a bank is greater than the annual median, it is a highly state-owned bank, otherwise it is a highly private bank. The marginal effect of *Growth* when $Growth>Q^{75th}$ is calculated using linear combination tests following interaction regressions. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*			
	(1)	(2)	(3)	(4)
	Low Top1share	High Top1share	Highly Government-Owned Banks	Highly Private Banks
Growth	-0.025	-2.640***	-1.528	-2.379*
	(-0.03)	(-2.64)	(-1.62)	(-1.96)
$Growth\times\mathbb{1}(Growth>Q^{75th})$	0.957	3.874***	2.455*	3.769**
	(0.94)	(2.98)	(1.95)	(2.35)
$\mathbb{1}(Growth>Q^{75th})$	-0.119	0.191*	0.030	0.059
	(-1.23)	(1.77)	(0.29)	(0.55)
Marginal Effect at $Growth>Q^{75th}$	0.932	1.234*	0.927	1.390**
	(1.43)	(1.77)	(1.23)	(1.96)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	539	543	515	521
Adj. R^2	0.596	0.555	0.679	0.599

Table 6. Agency problems between the loan officer and the senior management.

This table reports the estimation results of the OLS regressions of bank loan quality with interaction terms. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. We define $\mathbb{1}(Growth>Q^{75th})$ as an indicator variable equal to 1 if the growth rate exceeds the 75th percentile of the distribution. *Distance* measures the average distance (in 100-mile units) of newly opened branches from headquarters, with columns (1) and (2) splitting the sample by its annual median. Columns (3) and (4) partition banks based on geographic expansion behavior: New_City (expansion into cities with no prior branches) versus Existing_City (expansion limited to previously entered cities). The marginal effect of *Growth* when $Growth>Q^{75th}$ is calculated using linear combination tests. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*			
	(1)	(2)	(3)	(4)
	Short Distance	Long Distance	Existing_City	New_City
Growth	-1.166	-1.264	-2.449**	-0.367
	(-1.00)	(-1.40)	(-2.57)	(-0.34)
$Growth\times\mathbb{1}(Growth>Q^{75th})$	1.324	2.458**	2.281*	2.114*
	(0.73)	(2.45)	(1.72)	(1.86)
$\mathbb{1}(Growth>Q^{75th})$	0.162	-0.052	0.123	-0.079
	(1.36)	(-0.46)	(1.09)	(-0.81)
Marginal Effect at $Growth>Q^{75th}$	0.158	1.194*	-0.168	1.747**
	(0.15)	(1.66)	(-0.21)	(2.30)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	683	684	801	566
Adj. R^2	0.557	0.537	0.508	0.583

Table 7. Agency problems between the borrower and the bank.

This table reports the estimation results of the OLS regressions of bank loan quality with interaction terms. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. We define $\mathbb{1}(Growth>Q^{75th})$ as an indicator variable equal to 1 if the growth rate exceeds the 75th percentile of the distribution. *Competition* measures the area-weighted average of the branch density where the bank operates, with columns (1) and (2) splitting the sample by its annual median. Columns (3) and (4) compare banks with high versus low social trust level, measured by the region's dialect complexity weighted by the number of bank branches in each city. If the dialect complexity of the bank's operating environment is higher than the median, it is marked as low social trust. The marginal effect of *Growth* when $Growth>Q^{75th}$ is calculated using linear combination tests. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*			
	(1)	(2)	(3)	(4)
	Low Competition	High Competition	Low Social Trust	High Social Trust
Growth	-1.495	-0.731	-2.762**	-0.633
	(-1.31)	(-0.78)	(-2.22)	(-0.84)
$Growth\times\mathbb{1}(Growth>Q^{75th})$	1.204	2.175**	4.338***	1.106
	(0.78)	(2.07)	(3.07)	(1.12)
$\mathbb{1}(Growth>Q^{75th})$	0.129	-0.033	0.073	0.007
	(0.92)	(-0.35)	(0.57)	(0.06)
Marginal Effect at $Growth>Q^{75th}$	-0.291	1.444*	1.576*	0.473
	(-0.33)	(1.83)	(1.70)	(0.69)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	683	684	688	679
Adj. R^2	0.606	0.499	0.486	0.601

Table 8: Branch growth and other bank outcomes.

This table presents results for regressions of bank outcomes on the branch growth using the alternative measures. Ex-ante risk-taking measures are the log of (Avg.*ROA*+ Avg.Equity/Assets)/sd(*ROA*) (i.e., *Zscore*) and the ratio of loan loss provisions to non-performing loans (*Provisions*). Profitability measures are the ratio of net profit to net assets (*ROE*) and the ratio of net profit to revenue (*Profit_Margin*). Control variables include each bank's characteristics in year t-1. Some banks did not fully disclose all the information we needed, resulting in varying degrees of observation loss. The marginal effect of *Growth* when $Growth>Q^{75th}$ is calculated using linear combination tests. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Zscore	*Provisions*	*ROE*	*Profit Margin*
Growth	0.131	1.723	5.286	17.915*
	(1.17)	(1.49)	(1.24)	(1.73)
$Growth \times \mathbb{1}(Growth>Q^{75th})$	-0.276**	-3.252*	-11.818**	-33.220***
	(-2.00)	(-1.80)	(-2.15)	(-2.75)
$\mathbb{1}(Growth>Q^{75th})$	0.002	0.129	0.590	-0.167
	(0.19)	(0.84)	(1.15)	(-0.16)
Marginal Effect at $Growth>Q^{75th}$	-0.145*	-1.529	-6.532*	-15.305**
	(1.75)	(-1.24)	(-1.75)	(-1.97)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	1367	1332	1339	1364
Adj. R^2	0.963	0.528	0.660	0.560

Table 9. Policy shock and the perils of speed.

This table presents results for regressions of bank loan quality on the branch growth with a policy shock. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. We define $\mathbb{1}(Growth>Q^{75th})$ as an indicator variable equal to 1 if the growth rate exceeds the 75th percentile of the distribution. *Deregulation* is the interaction of $Policy_{2009}$ and *BankDiv*, capturing the intensity of the deregulation shock experienced by each bank. A higher value of *Deregulation* indicates a greater relaxation of geographic constraints post-2009 for banks that were more diversified beforehand. $Policy_{2009}$ is a post-policy indicator variable that equals one for observations after the policy shock in 2009. *BankDiv* equals the number of outstanding inter-provincial branches in the capital city before 2009 (i.e., a higher value indicates a more deregulated bank). Our main focus is on the coefficients of the interaction term involving *Growth*, $\mathbb{1}(Growth > Q^{75th})$, and *Deregulation*, which captures the heterogeneous effects of branch expansion conditional on policy exposure and bank-level deregulation. Interaction terms involving only two of these variables (e.g., $Growth \times Policy_{2009}$, $Policy_{2009} \times BankDiv$) or three-way interactions excluding one of the key variables are included in the regressions for completeness but are not the primary coefficients of interest, and therefore omitted from the table for brevity. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	NPL
	(1)
Growth	-1.996**
	(-2.46)
$Growth\times\mathbb{1}(Growth>Q^{75th})$	2.795***
	(2.74)
$Growth\times\mathbb{1}(Growth>Q^{75th})\times Deregulation$	5.541**
	(2.18)
$Growth\times Deregulation$	-0.352
	(-0.43)
$I(Growth>Q^{75th})$	0.092
	(1.05)
$\mathbb{1}(Growth>Q^{75th})\times Deregulation$	0.234
	(0.87)
Marginal Effect at $Growth>Q^{75th}$ *after Deregulation*	5.988**
	(2.51)
Other Terms of Interaction	Yes
Bank Controls	Yes
Year FE	Yes
Bank FE	Yes
N	1367
Adj. R^2	0.536

Appendix A. Supplementary tables

Table A1 reports descriptive statistics by ownership type, comparing highly government-owned banks and highly private banks. Government-owned banks tend to be larger, expand more conservatively, have lower ownership concentration, and exhibit lower risk levels with better cost control. In contrast, private banks pursue more aggressive expansion strategies, generating higher shareholder returns but at the cost of poorer asset quality, reflecting a more extensive, riskier growth model.

Table A2 presents regression spline results that directly test for non-linearity between branch expansion and loan quality. The coefficients confirm a threshold effect: moderate expansion (up to the 75th or 90th percentile) is associated with lower NPLs, while rapid expansion above these thresholds significantly increases credit risk.

Tables A3 and A4 explore the biased expectations hypothesis as an alternative explanation for the non-monotonic relationship.

In Table A3, we control for objective, time-varying demand-side factors. We add controls for city-level economic indicators and incorporate region-year fixed effects to absorb regional macroeconomic trends. The non-monotonic relations between branch expansion and performance remain robust, reinforcing our conclusion that the observed risks are not simply driven by misjudged demand.

In Table A4, we conduct a placebo test using a sample of large state-owned and listed joint-stock banks, which together account for more than half of total banking assets in China. These banks are typically less susceptible to agency problems due to better corporate governance and stronger regulatory oversight. If the biased expectations mechanism were generalizable, we should observe similar patterns in this placebo group. However, results show no significant linear or non-linear association between branch expansion and performance in these banks, further indicating that our main results are more consistent with agency problems than with mistaken optimism.

Table A1. Statistics by ownership.

This table presents summary statistics of the key variables, categorized by bank ownership type. We divide the sample based on the annual median of government ownership share among the top ten shareholders (*GovOwnership*), which captures variation in political influence at the shareholder level. Banks with government equity above the annual median are classified as highly government-owned, while those below the median are classified as highly private. Due to incomplete ownership disclosure by some banks, the final sample consists of 1,036 observations. Additionally, missing data for certain bank-year pairs result in varying numbers of observations across different variables.

	Highly Private Banks		Highly Gov-Owned Banks		Diff	T-value
	Obs.	Mean	Obs.	Mean		
NPL	521	1.450	515	1.494	-0.045	-0.897
Growth	521	0.129	515	0.101	0.028***	4.637
Top1share	476	0.150	486	0.221	-0.071***	-9.344
Distance	521	1.838	515	2.091	-0.253*	-1.680
New_City	521	0.449	515	0.410	0.039	1.282
Competition	521	1.204	515	1.187	0.017	0.403
Social_Trust	521	0.231	515	0.264	-0.033***	-3.022
Zscore	521	3.230	515	3.373	-0.143***	-4.952
Provisions	514	2.576	505	2.521	0.055	0.728
ROE	502	12.995	512	12.060	0.934**	2.546
Profit_Margin	520	31.439	515	32.131	-0.692	-1.067
Size	521	6.641	515	7.136	-0.496***	-7.475
CAR	521	13.137	515	13.434	-0.297*	-1.854
CIR	521	35.247	515	33.866	1.381***	2.833
SLR	521	62.172	515	61.643	0.529	0.736
Em	521	107.827	515	107.803	0.024	0.169

Table A2. Branch growth and bank performance: regression spline

This table presents the estimation results of the regression spline between bank branch expansion and performance. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. *Growth* [0, 75] equals *Growth* if *Growth* < Q^{75th} and equals Q^{75th} otherwise. *Growth* (75, 100) equals 0 if *Growth* < Q^{75th}, and equals *Growth* minus Q^{75th} otherwise. Other variables are constructed similarly. Bank fixed effects and year fixed effects are included. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*	
	(1)	(2)
Growth [0,75]	-1.390**	
	(-2.22)	
Growth (75,100]	1.048**	
	(2.08)	
Growth [0,90]		-0.463
		(-1.11)
Growth (90,100]		1.821*
		(1.70)
Bank Controls	Yes	Yes
Year FE	Yes	Yes
Bank FE	Yes	Yes
N	1367	1367
Adj. R^2	0.539	0.537

Table A3. Control for demand side factors.

This table presents results for regressions of bank loan quality on the branch growth with controls for demand side factors. Controls for city-level economic indicators are GDP growth, fiscal conditions, and firm count, which capture changes in local credit demand. Additionally, we incorporate *Zone×Year* fixed effects based on seven major economic regions (East China, South China, North China, Central China, Southwest China, Northwest China, and Northeast China) to absorb regional macroeconomic trends. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*			
	(1)	(2)	(3)	(4)
Growth	-1.601*	-1.657*	-1.184*	-1.216*
	(-1.73)	(-1.81)	(-1.73)	(-1.75)
Growth^2	3.951*	3.937*		
	(1.72)	(1.73)		
$Growth \times \mathbb{1}(Growth > Q^{75th})$			1.425*	1.400*
			(1.69)	(1.68)
$\mathbb{1}(Growth > Q^{75th})$			0.038	0.034
			(0.52)	(0.47)
GDPgrowth		-0.026**		-0.026**
		(-2.00)		(-1.99)
perGDP		-0.066		-0.064
		(-0.39)		(-0.38)
FiscalDeficit		0.135		0.134
		(1.34)		(1.33)
FirmNum		-0.045		-0.044
		(-0.51)		(-0.51)
Bank Controls	Yes	Yes	Yes	Yes
*Zone*Year FE*	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	1367	1367	1367	1367
Adj. R^2	0.590	0.593	0.589	0.592

Table A4. Placebo test using 16 big banks.

This table presents results for the placebo test based on 6 state-owned banks and 10 listed joint-venture banks. The dependent variable in all specifications is *NPL*, the ratio of non-performing loans to total loans. *Growth* is defined as the rolling three-year average of the yearly percentage change in the count of a bank's branches. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: *NPL*	
	(1)	(2)
Growth	0.069	-1.976
	(0.11)	(-1.26)
Growth^2		3.484
		(1.70)
L.Size	0.652**	0.714**
	(2.53)	(2.83)
L.CAR	-0.082**	-0.073**
	(-2.35)	(-2.49)
L.CIR	-0.016	-0.018
	(-1.27)	(-1.47)
L.SLR	0.005	0.003
	(0.41)	(0.21)
L.Em	0.031	0.030
	(0.48)	(0.47)
Constant	-7.581	-7.893
	(-1.18)	(-1.25)
Year FE	Yes	Yes
Bank FE	Yes	Yes
N	214	214
Adj. R^2	0.658	0.662

Appendix B. Additional robustness checks

A series of other robustness checks are shown in Table B1 to Table B3. First, we address the issue related to omitted variables in Table B1. The banks that implement high-speed expansions may typically have higher productivity and efficiency, which may result in significant differences between the high-speed and low-speed groups, creating self-selection problems. We apply the Propensity Score Matching (PSM) method to alleviate the ex-ante differences between the banks with different branch growth year-by-year. The detailed procedure is provided in the captions of the corresponding tables.

Second, we then address selection procedures that may lead to bias in our observations and try to mitigate these concerns:

We do not fully account for branches acquired by banks through M&A activity in our baseline regressions due to limitations in our data regarding the source of branch formation. However, we can track instances where banks acquire microbanks (i.e., rural community banks), which typically have a limited number of branches. The growth in the number of acquired rural community banks can be approximated as the growth in acquisitions for city commercial banks. We calculate this growth and incorporate it into the regression in Panel A of Table B2. Our findings indicate that this acquisition growth does not significantly impact bank performance, while general branch opening growth remains significantly influential.

In fact, Regulatory hurdles have made mergers more challenging for banks in China, prompting a shift towards organic growth strategies such as expanding through the opening of new branches. During our sample period of 14 years, only a limited number of mergers were observed. These mergers were primarily driven by the external pressures from local governments and regulatory demands, thus leading to a passive form of restructuring rather than being driven by proactive decisions rooted in marketing considerations. So, we additionally analyze subsamples that exclude any banks with merger experience in Panel B of Table B2 to further address the potential effects of mergers. After excluding observations involving M&A events, the baseline regression results remain robust, suggesting that our documented pattern is not primarily driven by expansion through mergers and acquisitions.

Since city commercial banks comply with non-mandatory disclosures, they are likely to selectively withhold performance information during the crisis, leading to bias in our observations. We try to mitigate these concerns with some subsamples in panel C of Table B2. First, to account for the potential distortions caused by major economic shocks, we exclude observations from 2008 (the Global Financial Crisis) and 2020 onward (the COVID-19 pandemic and subsequent global economic turbulence). Second, to address potential bias arising from distressed banks, we remove banks that experienced failures or severe financial distress from the sample and re-estimate the baseline model. The results remain robust across these alternative specifications, suggesting that our findings are not driven by extreme events or selective disclosure behavior.

Our branch data sources include only each bank's domestic offices and do not allow us to observe overseas branch expansion. Although city commercial banks rarely engage in overseas operations, there could still be a potential impact on our estimates. To minimize these effects, we manually read a bank's most recent annual report to collect whether it mentions operating overseas branches, and we censor these banks from our sample in panel D Table B2, and the results remain robust.

We introduce another set of robustness tests to demonstrate that our characterization of bank expansion growth through branch networks differs from the impact of other operational behaviors. In Table B3, we conduct a horse racing analysis involving other common variables, specifically *Loan Growth*, *geoHHI,* and *Network Size*. By including these measures alongside branch growth in a single regression, the relation between performance and branch growth remains significant, suggesting that branch growth offers more meaningful insights than loan size or geographical diversification.

Table B1: Addressing omitted characteristics.

This table presents the robustness of the results in Table 2, addressing the endogeneity issues due to omitted characteristics. The banks that implement high-speed expansions may typically have higher productivity and efficiency, which may result in significant differences between the high-speed and low-speed groups, with poor comparability. We apply the Propensity Score Matching (PSM) method to alleviate the ex-ante differences between the banks with different branch growth year-by-year. This is done using a 1:1 nearest-neighbor matching technique within a caliper of 0.01 and without replacement. We repeat the baseline regression using these matched samples. Specifically, we define the sample above the 75^{th} quartile of the growth of all the banks each year as the treatment group and the sample below the 25^{th} quartile as the control group. We then use logit regression, including control variables and fixed effects, to obtain the propensity scores. Next, we match each period individually. For each successfully matched treatment sample, there is a closest control sample in the same period with a difference of propensity scores less than 0.01. In total, we obtain 195 matched pairs. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
		PSM	
		Dependent variable: *NPL*	
Growth	-0.573	-4.384***	-3.266**
	(-0.82)	(-2.85)	(-2.28)
$Growth^{\wedge 2}$		11.209***	
		(2.94)	
$Growth \times \mathbb{1}(Growth > Q^{75th})$			4.468***
			(2.66)
$\mathbb{1}(Growth > Q^{75th})$			0.073
			(0.46)
Bank Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
N	390	390	390
Adj. R^2	0.484	0.495	0.492

Table B2: Other robustness checks

This table presents the robustness of the non-monotonic relation between branch growth and bank performance. In panel A, we compare the growth of banks expanding by acquiring small rural community banks with organic growth by opening branches. Panel B further excludes the effect of the M&A events. We censor the sample within three years of the mergers in columns (1) and (2) or use only banks that never had mergers in columns (3) and (4). Panel C addresses survivorship bias. In the columns (1) and (2), we remove the sample in the year of the two crisis events, the 2008 financial crisis and the 2020 outbreak of the COVID epidemic. In columns (3) and (4), we remove *Baoshang* Bank and *Jinzhou* Bank, the only two banks that were subject to public risk disposal by the central regulatory authorities during the sample period. Panel D accounts for overseas expansion. A total of 8 banks in our sample reported having overseas branches. To address the confounding effect of banks' offshore expansion behavior on our results, we use only banks that never operated overseas in columns (1) and (2). Our main results remain consistent in these subsamples. The growth measure in columns of odd numbers is *Growth*. The growth measure in columns of even numbers is *Growth3Y*. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Include the growth through acquisitions of smaller banks

	(1)	(2)	(3)
	Dependent variable: *NPL*		
AcquisitionGrowth	-0.032	-0.023	0.018
	(-0.37)	(-0.07)	(0.06)
AcquisitionGrowth ^2		-0.009	-0.055
		(-0.03)	(-0.19)
Growth			-2.464***
			(-2.68)
Growth^2			7.047***
			(2.88)
Bank Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
N	1367	1367	1367
Adj. R^2	0.536	0.536	0.539

Panel B. Removing samples involving mergers

	(1)	(2)	(3)	(4)
	Subsample: remove the year the merger occured and three years thereafter		Subsample: remove banks that experienced mergers	
	Dependent variable: *NPL*			
Growth	-2.459***	-1.808***	-2.341**	-1.656**
	(-2.69)	(-2.66)	(-2.45)	(-2.37)
Growth^2	6.935***		6.582**	
	(2.81)		(2.53)	
Growth×𝟙(*Growth*>Q^{75th})		2.446***		2.267**
		(2.67)		(2.37)
𝟙(*Growth*>Q^{75th})		0.093		0.077
		(1.08)		(0.87)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Bank FE	Yes	Yes	Yes	Yes
N	1298	1298	1218	1218
Adj. R^2	0.536	0.536	0.542	0.541

Panel C. Addressing survivorship bias.

	(1)	(2)	(3)	(4)
	Subsample: remove 08&20		Subsample: remove failure bank	
	Dependent variable: *NPL*			
Growth	-1.635*	-1.055*	-2.336**	-1.684**
	(-1.90)	(-1.68)	(-2.56)	(-2.46)
$Growth^{\wedge 2}$	5.081**		6.325**	
	(2.20)		(2.60)	
$Growth \times \mathbb{1}(Growth>Q^{75th})$		1.847**		2.258**
		(2.21)		(2.47)
$\mathbb{1}(Growth>Q^{75th})$		0.037		0.069
		(0.49)		(0.84)
Bank Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
N	1191	1191	1343	1343
Adj. R^2	0.557	0.557	0.545	0.544

Panel D. Addressing overseas expansion.

	(1)	(2)
	Subsample: remove banks that has overseas branches	
	Dependent variable: *NPL*	
Growth	-2.911***	-1.947***
	(-3.16)	(-2.77)
$Growth^{\wedge 2}$	7.941***	
	(3.23)	
$Growth \times \mathbb{1}(Growth>Q^{75th})$		2.784***
		(3.04)
$\mathbb{1}(Growth>Q^{75th})$		0.058
		(0.69)
Bank Controls	Yes	Yes
Year FE	Yes	Yes
Bank FE	Yes	Yes
N	1268	1268
Adj. R^2	0.539	0.538

Table B3: Horse racing with other measures.

This table presents the horse racing of branch growth to other explanations, i.e., network size, loan growth, and geographic diversification, as suggested by previous literature. *Branch_num* is the natural logarithm of the total existing branches of a bank. *Loan_Growth* is year-over-year growth in total loan balance. *geoHHI* is defined as the (1- Herfindahl Index) using each bank's city-level branch distribution, a higher value of which indicates higher diversification. We control for these possible factors in our baseline regression and observe whether the coefficients of our growth measure will be absorbed. The branch growth measure in columns of odd numbers is *Growth*. The growth measure in columns of even numbers is *Growth3Y*. Control variables include each bank's characteristics in year t-1. All columns also control for year and bank fixed effects. Reported in the parentheses are t-statistics based on robust standard errors clustered at the bank level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Loan Growth	*geoHHI*	Network Size
		Dependent variable: *NPL*	
Growth	-2.269**	-2.434**	-3.014***
	(-2.50)	(-2.55)	(-3.02)
Growth$^{\wedge 2}$	6.903***	6.963***	8.092***
	(2.84)	(2.76)	(3.16)
Loan_Growth	-2.438***		
	(-3.50)		
Loan_Growth$^{\wedge 2}$	2.453**		
	(2.53)		
geoHHI		-0.031	
		(-0.06)	
geoHHI$^{\wedge 2}$		0.070	
		(0.12)	
L.Size			1.644
			(7.30)
L.Size$^{\wedge 2}$			-0.032
			(-1.33)
Branch_num			0.606
			(1.62)
Branch_num$^{\wedge 2}$			-0.058
			(-1.52)
Bank Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
N	1367	1367	1367
Adj. R^2	0.552	0.539	0.545