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Inflation and Bank Valuations: Evidence of a Nonlinear Relationship

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Abstract

This paper investigates the relationship between inflation and bank valuations. Using a panel of U.S. banks from 2000 to 2024, we find evidence of an inverted U-shaped relationship between inflation and bank valuations. Specifically, inflation is positively associated with bank valuations when it is below a threshold of approximately 3%, but the relationship becomes negative once inflation exceeds the threshold. These results remain qualitatively unchanged when we address the potential endogeneity of inflation using an instrumental variable approach. Our findings suggest that banks are valued most highly during periods of moderate inflation.

JEL classification numbers: G21, E31.
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1. Introduction

In the aftermath of the COVID-19 pandemic, inflation rose sharply in many countries, reemerging as a major macroeconomic concern after decades of relative stability. As shown in Figure 1, U.S. CPI inflation averaged around 2% prior to the pandemic but increased rapidly beginning in 2021, reaching a peak of approximately 9% in 2022. Although inflation subsequently declined as monetary policy tightened and supply-chain disruptions eased, it remained above its pre-pandemic level.

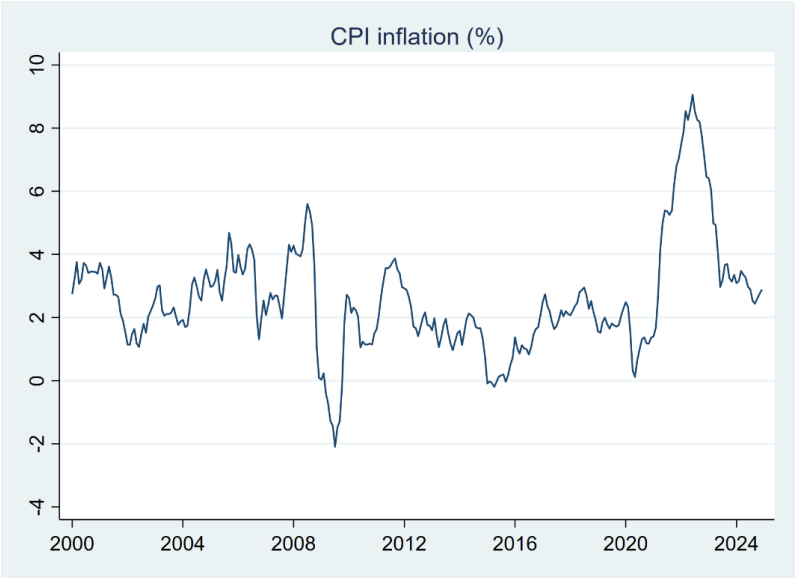

Figure 1: CPI inflation

In this paper, we investigate the relationship between inflation and bank valuations. Economic theory suggests that this relationship may be nonlinear. At relatively low levels of inflation, a rise in inflation may enhance bank profitability by increasing net interest margins (Demirgüç-Kunt and Huizinga, 1999). Moderate inflation may also improve borrowers' repayment capacity by reducing the real burden of outstanding debt (Fisher, 1933), which can strengthen bank performance. However, when inflation becomes sufficiently high, further increases may exacerbate financial market frictions (Choi, Smith, and Boyd, 1996) and reduce real and financial market activity (Boyd and Smith, 1998; Huybens and Smith, 1999). Consequently, theory suggests that inflation may have a positive effect on bank valuations at low levels but a negative effect once inflation exceeds a certain threshold.

To examine this relationship empirically, we construct a quarterly panel of U.S. banks spanning the 2000–2024 period. We regress bank valuations on inflation while controlling for a set of macroeconomic and bank-specific variables. We also

include bank fixed effects to account for unobserved time-invariant heterogeneity across banks. Our results reveal an inverted U-shaped relationship between inflation and bank valuations. Specifically, inflation is positively associated with bank valuations at low levels, but the relationship becomes negative once inflation exceeds approximately 3%. These findings suggest that moderate inflation may benefit banks, whereas high inflation reduces bank value. The results are robust to alternative measures of inflation and bank valuations and hold when we address the potential endogeneity of inflation using an instrumental variable approach.

The existing literature provides mixed evidence regarding the effects of inflation on banks. For example, Demirgüç-Kunt and Huizinga (1999) and Tan and Floros (2012) document a positive relationship between inflation and bank profitability, whereas Agarwal and Baron (2024) find that rising inflation reduces bank lending. More recently, Bergant et al. (2025) show that bank profitability is relatively insensitive to changes in inflation for most banks. Our study complements this literature by focusing on bank valuations rather than accounting-based performance measures. Market-based valuation measures are forward-looking and reflect market expectations of future profitability, risk, and growth opportunities. Examining how inflation affects bank valuations therefore provides additional insights into how financial markets assess the long-run implications of inflation for banks. In addition, while the existing literature largely focuses on the linear effects of inflation on bank outcomes, we document a nonlinear relationship, revealing that the impact of inflation critically depends on its level.

2. Sample and Variables

We use quarterly data on U.S. publicly traded bank holding companies (hereafter, banks) from 2000Q1 through 2024Q4. Bank balance sheet and income statement data are obtained from the Federal Reserve's Consolidated Financial Statements for Holding Companies (FR Y-9C), while stock market data are obtained from the Center for Research in Security Prices (CRSP) database. Following prior studies, we merge the FR Y-9C and CRSP databases using the CRSP–FRB link provided by the Federal Reserve Bank of New York. To be included in the sample, a bank must have the data necessary to construct the valuation measures and control variables used in the analysis. The final sample consists of 31,768 bank-quarter observations representing 800 unique banks. Table 1 provides definitions of all variables used in the study.

Following the existing literature, we employ two measures of bank valuations: Tobin's q and the market-to-book ratio (M/B). Tobin's q is calculated as the market value of equity plus the book value of liabilities, divided by the book value of assets. The market-to-book ratio is defined as the market value of equity divided by the book value of equity. Because both measures are based on stock market valuations, they are forward-looking and reflect investors' expectations regarding a bank's future profitability, risk, and growth opportunities.

We use two measures of inflation: CPI inflation and PCE inflation. CPI inflation is defined as the year-over-year percentage change in the Consumer Price Index (CPI), while PCE inflation is defined as the year-over-year percentage change in the Personal Consumption Expenditures (PCE) price index. These two indices are among the most widely monitored macroeconomic indicators and capture changes in the overall price level faced by consumers. Using both measures allows us to assess the robustness of our results to alternative measures of inflation.

Table 1: Variable definitions

Variable	Definition
Tobin's q	Market value of equity plus book value of liabilities, divided by book value of assets.
Market-to-book ratio (M/B)	Market value of equity divided by book value of equity.
CPI inflation	Year-over-year percentage change in the Consumer Price Index (CPI). Source: U.S. Bureau of Labor Statistics.
PCE inflation	Year-over-year percentage change in the Personal Consumption Expenditures (PCE) price index. Source: U.S. Bureau of Economic Analysis.
GDP growth	Year-over-year percentage change in real Gross Domestic Product (GDP). Source: U.S. Bureau of Economic Analysis.
Unemployment rate	The percentage of the labor force that is unemployed and actively seeking employment. Source: U.S. Bureau of Labor Statistics.
Shadow rate	The Wu-Xia shadow federal funds rate. Source: Wu and Xia (2016).
Economic Policy Uncertainty (EPU)	Natural logarithm of the U.S. Economic Policy Uncertainty index. Source: Baker, Bloom, and Davis (2016).
Size	Natural logarithm of total assets in constant 2024 dollars.
Capital ratio	Total equity capital divided by total assets.
Loans	Total loans divided by total assets.
Deposits	Total deposits divided by total assets.
Return on equity	Net income divided by total equity capital.

Our regressions control for several macroeconomic variables that may influence bank valuations. First, we use the growth rate of real GDP to account for fluctuations in overall economic activity. Second, we include the unemployment rate, which captures conditions in the labor market. Third, we include the Wu-Xia shadow federal funds rate (Wu and Xia, 2016), which captures the overall stance of monetary policy. Finally, we control for the natural logarithm of the U.S. Economic Policy Uncertainty (EPU) index developed by Baker, Bloom, and Davis (2016).

At the bank level, we control for several bank-specific characteristics that are likely to influence bank valuations. First, we control for bank size, measured as the natural logarithm of total assets in constant 2024 dollars. Second, we include the capital

ratio, defined as total equity capital divided by total assets. Third, we account for asset composition by including the ratio of total loans to total assets. Fourth, we use the ratio of total deposits to total assets to capture the extent of deposit funding. Finally, we include return on equity, computed as net income divided by total equity capital.

To mitigate the influence of extreme observations, we winsorize all bank-level variables, except size, at the 1st and 99th percentiles. Table 2 presents the summary statistics for all variables used in the analysis. Tobin's q has a mean of 1.043, while the market-to-book ratio has a mean of 1.473. CPI inflation averages 2.5% over the sample period and ranges from −1.4% to 9.1%, reflecting substantial time-series variation. Similarly, PCE inflation has a mean of 2.1% and ranges from −1.0% to 7.2%.

Table 2: Summary statistics

	Mean	Median	Std. Dev.	Min	Max
Tobin's q	1.043	1.033	0.060	0.941	1.251
M/B	1.473	1.337	0.663	0.379	3.800
CPI inflation	0.025	0.024	0.016	-0.014	0.091
PCE inflation	0.021	0.021	0.013	-0.010	0.072
GDP growth	0.022	0.023	0.020	-0.074	0.124
Unemployment rate	0.058	0.054	0.018	0.035	0.110
Shadow rate	0.015	0.011	0.025	-0.029	0.065
EPU	4.820	4.762	0.411	3.898	6.054
Size	22.267	21.960	1.689	19.336	29.112
Capital ratio	0.098	0.095	0.026	0.043	0.189
Loans	0.670	0.690	0.130	0.146	0.887
Deposits	0.757	0.786	0.120	0.180	0.904
Return on equity	0.020	0.025	0.034	-0.221	0.065

3. Empirical Results

To examine the relationship between inflation and bank valuations, we estimate the following regression model:

$$Valuation_{i,t} = \alpha + \beta_1 Inflation_t + \beta_2 Inflation_t^2 + \gamma' M_t + \rho' X_{i,t} + \mu_i + \varepsilon_{i,t}$$

where $Valuation_{i,t}$ is either Tobin's q or the market-to-book ratio for bank i in quarter t. $Inflation_t$ is either CPI inflation or PCE inflation, and $Inflation_t^2$ is its squared term. M_t is a vector of macroeconomic control variables, $X_{i,t}$ is a vector of bank-specific control variables, μ_i denotes bank fixed effects, and $\varepsilon_{i,t}$ is the error term. We estimate the model using ordinary least squares (OLS) and cluster standard errors at the bank level.

Table 3: Inflation and bank valuations

	(1) Tobin's q	(2) M/B	(3) Tobin's q	(4) M/B
CPI inflation	0.348*** (0.036)	4.102*** (0.421)		
CPI inflation squared	-6.108*** (0.539)	-68.345*** (5.792)		
PCE inflation			0.663*** (0.050)	7.723*** (0.592)
PCE inflation squared			-11.149*** (0.857)	-124.939*** (9.244)
GDP growth	0.051** (0.020)	0.635*** (0.226)	-0.009 (0.021)	-0.064 (0.235)
Unemployment rate	-0.942*** (0.035)	-9.700*** (0.372)	-0.969*** (0.035)	-10.013*** (0.369)
Shadow rate	-0.326*** (0.031)	-3.173*** (0.315)	-0.363*** (0.032)	-3.598*** (0.322)
EPU	-0.027*** (0.001)	-0.294*** (0.011)	-0.028*** (0.001)	-0.302*** (0.012)
Size	-0.020*** (0.002)	-0.217*** (0.022)	-0.020*** (0.002)	-0.221*** (0.022)
Capital ratio	-0.294*** (0.053)	-6.772*** (0.556)	-0.287*** (0.053)	-6.690*** (0.557)
Loans	0.015 (0.016)	0.094 (0.168)	0.016 (0.016)	0.101 (0.168)
Deposits	-0.052*** (0.017)	-0.596*** (0.172)	-0.052*** (0.017)	-0.595*** (0.172)
Return on equity	0.284*** (0.020)	3.555*** (0.250)	0.281*** (0.020)	3.521*** (0.250)
Constant	1.724*** (0.049)	9.264*** (0.508)	1.732*** (0.049)	9.371*** (0.510)
Turning point	2.85%	3.00%	2.97%	3.09%
Bank fixed effects	Yes	Yes	Yes	Yes
Observations	31,768	31,768	31,768	31,768
R-squared	0.329	0.364	0.330	0.365

Notes: Turning point is the rate of inflation at which the estimated marginal effect of inflation on bank valuation changes from positive to negative. Standard errors are clustered by bank and reported in parentheses. *** and ** indicate statistical significance at the 1% and 5% level, respectively.

Table 3 reports the estimation results. The dependent variable is Tobin's q in regressions (1) and (3) and the market-to-book ratio (M/B) in regressions (2) and (4). Regressions (1) and (2) use CPI inflation as the inflation measure, whereas regressions (3) and (4) use PCE inflation. Across all four regressions, the coefficient on inflation is positive and significant at the 1% level, while the coefficient on its squared term is negative and significant at the 1% level, indicating an inverted U-shaped relationship between inflation and bank valuations. Figure 2 illustrates the estimated relationships graphically. At relatively low levels of inflation, an increase in inflation is associated with higher bank valuations. However, once inflation exceeds a threshold of approximately 3%, a further increase in inflation is associated with lower bank valuations. The estimated turning points range from 2.85% to 3.09% across the four regressions, suggesting that the nonlinear relationship is stable across alternative measures of inflation and bank valuation.

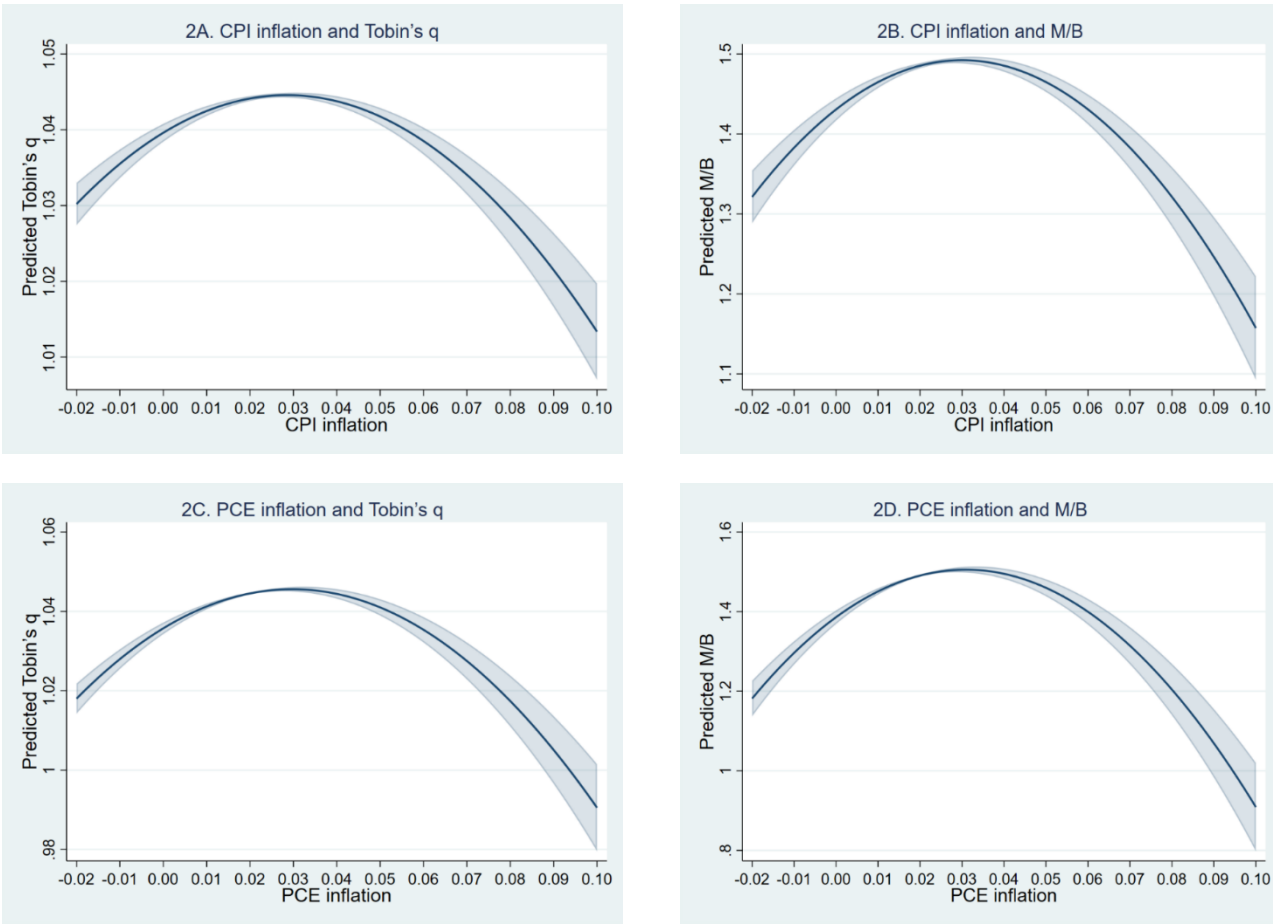

Figure 2: Inflation and bank valuations

Notes: These figures are based on the regression results in Table 3. Shaded areas indicate 95% confidence intervals.

Turning to the control variables, it is interesting to note that the coefficient on EPU is negative and statistically significant across all specifications. This finding is consistent with He and Niu (2018) and indicates that higher EPU is associated with lower bank valuations. In periods of heightened policy uncertainty, banks typically reduce loan growth (Bordo, Duca, and Koch, 2016) and increase loan loss provisions (Ng, Saffar, and Zhang, 2020). These responses can weaken banks' expected profitability and, in turn, depress their forward-looking valuations.

Table 4: Regression results for small and large banks

Panel A: Small banks				
	(1) Tobin's q	(2) M/B	(3) Tobin's q	(4) M/B
CPI inflation	0.357*** (0.043)	4.357*** (0.513)		
CPI inflation squared	-7.163*** (0.708)	-79.169*** (7.801)		
PCE inflation			0.710*** (0.061)	8.549*** (0.718)
PCE inflation squared			-12.459*** (1.119)	-138.482*** (12.213)
Controls	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Observations	23,426	23,426	23,426	23,426
R-squared	0.299	0.323	0.300	0.324
Panel B: Large banks				
	(5) Tobin's q	(6) M/B	(7) Tobin's q	(8) M/B
CPI inflation	0.414*** (0.076)	3.754*** (0.842)		
CPI inflation squared	-5.360*** (0.885)	-50.135*** (9.733)		
PCE inflation			0.586*** (0.105)	5.155*** (1.169)
PCE inflation squared			-8.920*** (1.468)	-81.482*** (16.153)
Controls	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Observations	8,342	8,342	8,342	8,342
R-squared	0.457	0.497	0.458	0.497

Notes: Standard errors are clustered by bank and reported in parentheses. *** indicates statistical significance at the 1% level.

Banks of different sizes often operate under distinct business models and face different regulatory and competitive environments (e.g., Bolívar, Duran, and Lozano-Vivas, 2023). To examine whether the relationship between inflation and bank valuations varies with bank size, we partition the sample into small and large banks. Small banks are defined as those with total assets of up to $10 billion, while large banks are defined as those with total assets exceeding $10 billion.[2] We then estimate our regression model separately for the two groups. Panel A of Table 4 reports the results for small banks, and Panel B reports the results for large banks. Across both groups, the coefficient on inflation is positive and significant, whereas the coefficient on its squared term is negative and significant. These results indicate that the inverted U-shaped relationship between inflation and bank valuations holds for both small and large banks.

Table 5: Instrumental variable regressions

	(1) Tobin's q	**(2) M/B**	**(3) Tobin's q**	**(4) M/B**
CPI inflation	2.764*** (0.528)	27.913*** (5.534)		
CPI inflation squared	-27.091*** (5.526)	-269.897*** (57.683)		
PCE inflation			3.296*** (0.605)	33.583*** (6.359)
PCE inflation squared			-38.357*** (7.477)	-385.545*** (78.331)
Turning point	5.10%	5.17%	4.30%	4.36%
Controls	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Observations	31,768	31,768	31,768	31,768
R-squared	0.225	0.283	0.253	0.305
Kleibergen-Paap rk LM statistic	314.719	314.719	282.846	282.846
Kleibergen-Paap rk Wald F statistic	848.092	848.092	835.902	835.902

Notes: Regressions are estimated using two-stage least squares. Standard errors are clustered by bank and reported in parentheses. *** indicates statistical significance at the 1% level.

[2] The Federal Reserve defines banks with assets of up to $10 billion as community banks.

One potential concern with our analysis is endogeneity. Although our regressions control for a comprehensive set of macroeconomic and bank-specific variables, it is possible that an omitted factor influences both inflation and bank valuations, thereby biasing our estimates. To address this concern, we employ a two-stage least squares (2SLS) framework using the Global Supply Chain Pressure Index (GSCPI), developed by the Federal Reserve Bank of New York, as an instrument for inflation.[3] The GSCPI captures disruptions to global supply chains by combining information on supply shocks in the manufacturing sector and international transportation costs. Benigno et al. (2022) show that the GSCPI is strongly correlated with inflation, satisfying the relevance condition for a valid instrument. Regarding the exclusion restriction, we argue that the GSCPI affects bank valuations only indirectly through its effect on inflation and the macroeconomic conditions already controlled for in our regression model. Because the GSCPI reflects global, exogenous supply-side disruptions rather than bank-specific fundamentals, it is unlikely to have a direct effect on bank valuations after conditioning on the included control variables. Accordingly, the GSCPI provides a plausible instrument for identifying the causal effect of inflation on bank valuations. Table 5 reports the results of the instrumental variable (IV) regressions. The Kleibergen-Paap rk LM statistics strongly reject the null hypothesis of underidentification, while the Kleibergen-Paap rk Wald F statistics are well above conventional critical values, indicating that weak instruments are not a concern. Across all four specifications, the coefficient on inflation is positive and significant, whereas the coefficient on its squared term is negative and significant. Hence, although the IV estimates are substantially less precise than the OLS estimates, the results continue to support an inverted U-shaped relationship between inflation and bank valuations. Interestingly, the estimated turning point increases from approximately 3% in the OLS estimates to above 4% in the IV estimates. This difference may reflect the fact that the IV estimates identify the relationship using variation in inflation associated with global supply-chain pressure, which may differ from the broader sources of inflation captured by the OLS estimates. However, given the substantially larger standard errors of the IV estimates, the difference in the estimated turning points should be interpreted with caution.

[3] https://www.newyorkfed.org/research/policy/gscpi#/overview

4. Conclusion

We document an inverted U-shaped relationship between inflation and bank valuations using a panel of U.S. banks. Specifically, inflation is positively associated with bank valuations when it is below a threshold of approximately 3%, but the relationship becomes negative once inflation exceeds the threshold. The results are robust to alternative measures of inflation and bank valuation, hold for both small and large banks, and remain qualitatively unchanged when we address the potential endogeneity of inflation using an instrumental variable approach. Our findings suggest that both too little and too much inflation are associated with lower bank valuations, whereas moderate inflation is associated with higher valuations.

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