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Debt Composition, Institutional Demand, and Corporate Investment: Evidence from Thailand

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ABSTRACT

This paper examines how Thai firms utilize capital market debt – specifically, commercial papers (CPs) and bonds – to manage leverage, liquidity, and investment. Using a firm-quarter panel from 2001 to 2024, we find that firms with more diversified debt structures maintain higher leverage and invest more, consistent with financial flexibility theories. CP issuance is positively associated with both capital expenditures and working capital growth; firms adjust issuance dynamically in response to their liquidity needs. Notably, CPs are not merely used as bridge instruments but as a strategic financing tool. We further demonstrate that mutual fund holdings of CP, particularly by money market funds, are associated with higher firm-level investment. These findings highlight the role of non-bank financial intermediaries in facilitating access to credit, suggesting that monetary policy transmission increasingly depends on how liquidity is intermediated through capital markets.

Keywords: Capital market debt, Commercial paper, Debt composition, Institutional investors, Investment

JEL codes: G31, G32, G23, E44

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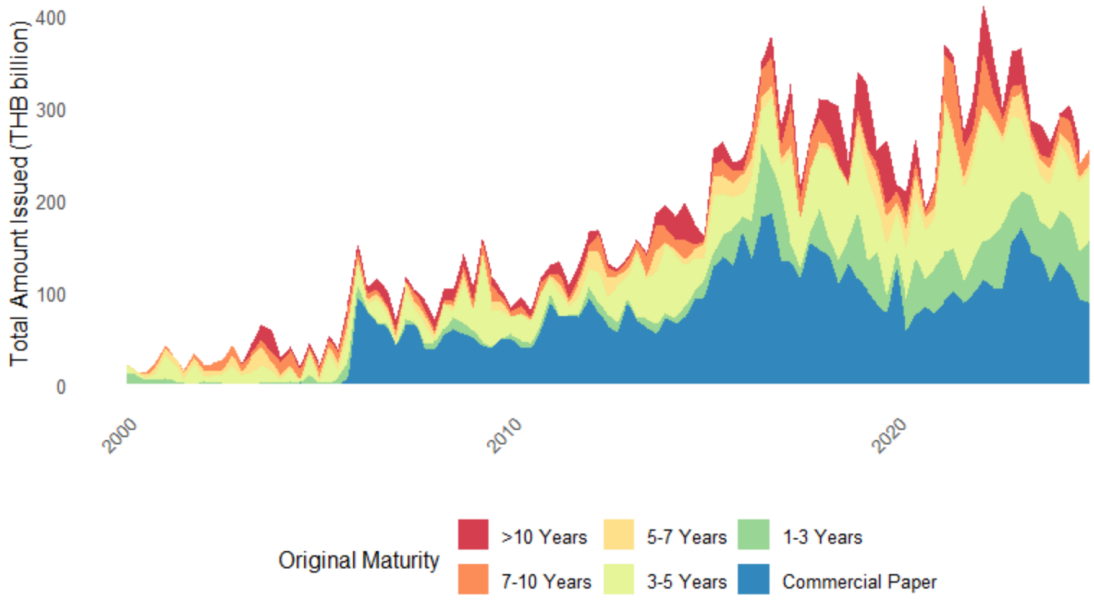
1. Introduction

Firms in emerging markets increasingly rely on capital market instruments, such as bonds and commercial papers (CPs), to supplement traditional bank financing. This trend reflects not only a growing demand for financial flexibility but also the evolution of investor structures and regulatory frameworks that shape access to external capital. Yet, the design and composition of corporate debt portfolios remain underexplored in emerging markets, particularly the strategic use of short-term instruments like CPs and the role of non-bank financial intermediaries in allocating liquidity (Chernenko & Sunderam, 2014; Colla et al., 2013).

Figure 1: Capital Market Debt Issuance (Excluding Financial Firms)

This figure shows the total quarterly issuance of corporate bonds and commercial papers by non-financial firms in Thailand from 2000 to 2024, categorized by original maturity. Short-term instruments, particularly commercial papers (represented by the dark blue line), have become the dominant source of capital market funding since the mid-2000s. Long-term debt (with a maturity of more than 7 years) remains relatively limited, highlighting the prevalence of short-term borrowing in Thailand's corporate bond market.



This paper examines how firms in Thailand – a representative emerging market with a relatively shallow long-term bond market and a rapidly growing mutual fund industry – leverage capital market debt, especially CPs, to manage leverage, liquidity, and investment. Regulatory changes in 2012 liberalized short-term debt issuance by allowing unrated, unsecured CPs through private placements, resulting in shorter debt maturity and an increase in unsecured debt, slimilat to the U.S. (Benmelech et al., 2024; Custódio et al., 2013). In parallel, institutional investors –particularly money market mutual funds – have become major

holders of CPs (Worasak et al., 2022), reshaping the landscape of corporate finance and prompting new questions about how firm behavior responds to capital market conditions.

Using firm-quarter panel data from 2001 to 2024, we find that firms with more diversified debt structures sustain higher leverage and invest more actively, consistent with theories of financial flexibility (Colla et al., 2013). More importantly, CP issuance is dynamically adjusted based on liquidity needs and is not merely a stopgap mechanism, in contrast to the bridge-financing role often observed in developed markets (Kahl et al., 2015). We also find that mutual fund demand for CPs – especially from money market funds – is positively associated with firm-level investment, underscoring how investor structure can act as a conduit for liquidity transmission (Cipriani & La Spada, 2021; Lugo, 2023).

These findings offer several contributions. First, they provide rare empirical evidence from an emerging market context where capital markets and institutional investors are still developing. Second, they highlight the strategic role of CPs as a persistent financing channel – contrasting with the bridge-financing narrative often documented in developed markets. Third, they illustrate how investor demand characteristics influence firm investment, offering new insight into how non-bank financial institutions affect monetary policy transmission in emerging economies (Xiao, 2020).

The paper contributes to literatures on capital structure in emerging markets, the role of institutional investors in credit allocation, and financial intermediation. It also offers practical implications for policymakers and regulators aiming to foster stable and efficient capital markets in the face of rapid financial innovation and non-bank intermediation.

The rest of the paper is structured as follows. Section 2 reviews the related literature and develops the main hypotheses. Section 3 describes the data sources, key variables, and empirical methodology. Section 4 examines the relationship between debt structure and firm leverage. Section 5 examines how debt composition and investor demand influence corporate investment behavior. Section 6 concludes with a discussion of the broader implications for financial intermediation and the transmission of monetary policy.

2. Literature Review and Hypothesis Development

2.1 Debt Maturity and Composition

Capital structure decisions extend beyond the amount of leverage to include debt maturity and type. In models with asymmetric information, firms with favorable private

information tend to prefer short-term debt to signal their asset quality (Diamond, 1991; Flannery, 1986; O'Hara, 1993). In these settings, short-term lenders can also exert stronger monitoring pressure. Empirically, Goyal and Wang (2013) demonstrate that a higher share of short-term debt is associated with a lower default probability, and Dang et al. (2018) find that firms with more short-term debt exhibit lower future stock price crash risk, consistent with the notion of enhanced discipline.

However, short-term debt can increase rollover risk, particularly for firms with weak fundamentals or during periods of market stress. Brunnermeier and Oehmke (2013) model strategic interactions among creditors, showing that the inability to commit to long maturities leads to a maturity rat race. Gopalan et al. (2014) and Clark and Park (2023) find that maturity structure directly affects credit quality and the cost of debt. When credit markets freeze, even high-quality collateral may be insufficient to guarantee refinancing (Acharya et al., 2011). These trade-offs are particularly important for emerging markets like Thailand, where long-term debt markets are relatively shallow and regulatory frictions are more pronounced.

At the same time, the composition of debt – whether bank loans, bonds, or commercial papers – can reflect distinct access to capital markets and agency considerations. Colla et al. (2013) and Rauh and Sufi (2010) show that firms often specialize in a few types of debt, with more diversified firms tending to be larger, more profitable, and more creditworthy. Debt heterogeneity may also reflect strategic optimization of maturity, covenants, and liquidity needs. During periods of low debt market liquidity, correlated default risk can increase (Javadi & Mollagholamali, 2018). When there is a sudden credit market freeze, refinancing is difficult even when collateralized by assets with little credit risk.

2.2 Debt Variety and Leverage

Access to multiple types of debt instruments may relax financial constraints and enhance a firm's borrowing capacity. Faulkender and Petersen (2006) document that firms with access to public bond markets hold more leverage, suggesting that access matters as much as preferences. More recently, Biguri (2023) shows that unsecured debt facilitates investment by avoiding collateral constraints. However, the relationship between debt variety and leverage may be shaped by endogenous selection. Firms with larger asset bases or higher creditworthiness may simultaneously gain access to multiple debt instruments and hold more debt overall.

Hypothesis 1. Firms with a greater variety of debt have higher leverage.

2.3 Debt Variety and Investment

A more flexible capital structure may also enhance investment capacity. Biguri (2023) provides evidence that firms with greater access to unsecured debt—such as commercial papers—invest more, even controlling for cash flow. This finding is related to Gilchrist and Himmelberg (1995) and Almeida and Campello (2007), who demonstrate that access to external finance, particularly flexible short-term debt, influences investment sensitivity to cash flow. This aligns with the notion that capital market access can alleviate financial constraints, allowing firms to finance both long-term capital expenditures and short-term liquidity needs.

Hypothesis 2. Firms with a greater variety of debt invest more.

2.4 Commercial Papers as Financing Tools

Commercial papers (CPs) are short-term, unsecured debt instruments that allow firms to access quick and flexible liquidity. In developed markets, CPs are often used as bridge financing for capital expenditures and later refinanced with longer-term bonds (Kahl et al., 2015). In contrast, emerging markets may lack deep bond markets or stable investor demand, increasing the risk that CPs become a persistent source of funding. Cheng et al. (2020) and Wang and Liu (2022) highlight that persistent maturity mismatch between short-term debt and long-term investment can exacerbate crash risk and liquidity distress. Saengchote (2024) also shows that during the COVID-19 crisis, Thai developers with maturing bonds faced a greater risk of fire sales, reflecting liquidity pressure.

Whether firms in Thailand use CPs as short-term bridge financing or as a long-term funding channel is an open empirical question. A persistent reliance on short-term CPs implies greater rollover risk and deviation from textbook asset-liability matching.

Hypothesis 3. Firms use commercial paper as a short-term financing instrument.

2.5 Intermediaries, Monitoring, and Investment Sensitivity

CP markets rely heavily on institutional investors such as money market mutual funds. While these funds offer liquidity and demand for short-term instruments (Cipriani & La Spada, 2021), their procyclical behavior can amplify firm-level financing constraints. Mutual fund runs or redemptions can propagate shocks to real investment, as seen during the 2008 Asset-Backed Commercial Paper (ABCP) crisis (Chernenko & Sunderam, 2014; Schmidt et al., 2016). Goldstein et al. (2017) find that mutual fund investors are sensitive to performance, especially on the downside, which can amplify asset liquidation pressures.

In Thailand, money market funds hold a disproportionately large share of CPs, creating the possibility that redemptions could disrupt corporate liquidity. Whether firms that rely more on mutual fund demand face greater investment sensitivity to funding shocks is an empirical question.

Hypothesis 4. Demand from money market funds influences corporate investment behavior.

3. Data and Methodology

3.1 Data Sources and Sample Construction

We construct a firm-quarter panel dataset of Thai listed companies from 2001Q1 to 2024Q4 by merging corporate debt issuance records from the Thai Bond Market Association (ThaiBMA) with financial statement data from SETSMART. The bond-level data are manually cleaned and consolidated across issuers to account for corporate name changes, mergers, and subsidiary roll-ups. Issuances are matched to redemptions to create consistent outstanding balances over time. We classify instruments into four debt types: commercial papers (CPs), short-term bonds (with an original maturity of no more than 3 years), long-term bonds (with an original maturity of more than 3 years), and perpetual bonds (capped at 15 years).

The firm-level panel includes 884 non-financial, non-property fund firms listed on the Stock Exchange of Thailand. We exclude financial firms (I_SECTOR codes 2, 11, 16, 66) and property funds (I_SECTOR code 33), consistent with prior literature. Financial variables are obtained from SETSMART.

To analyze the role of institutional investors, we merge firm-level debt data with quarterly mutual fund holdings data obtained from the Securities and Exchange Commission (SEC) public API. This dataset covers the period from 2021Q3 to 2024Q3 and enables us to determine the share of each firm's CP and bond holdings held by mutual funds, with a particular focus on money market funds.

3.2 Key Variables

We construct the following primary variables for analysis:

Debt Structure Measures

Debt shares are calculated as the proportion of CPs, short-term bonds, long-term bonds, perpetual bonds, and residual "other debt" in total interest-bearing debt. To measure the

concentration of a firm's debt portfolio, we compute a normalized Herfindahl-Hirschman Index (HHI) based on the firm's shares of different debt types. This normalization ensures comparability across firms by adjusting for the number of debt categories (Colla et al., 2013, 2020). Let $s_{j,it}$ denote the share of debt type $j \in \{CP, STB, LTB, PERP, Oth\}$ in total debt from firm i in quarter t. The unadjusted HHI is given by:

$$HHI_{it}^{unadj} = \sum_{j=1}^{5} s_{j,it}^2 \tag{1}$$

Since HHI is sensitive to the number of categories, we normalize it as:

$$HHI_{it} = \frac{HHI_{it}^{unadj} - 1/5}{1 - 1/5} \tag{2}$$

The index ranges from 0 (fully diversified across five debt types) to 1 (all debt concentrated in a single type). Firms without capital market debt have an HHI of 1 by construction.

Capital Market Participation

We define indicators for CP issuers and capital market debt issuers (firms with any bond or CP outstanding), along with net and gross issuance scaled by lagged total assets.

Leverage

We use total interest-bearing debt (the denominator in the debt share calculation) divided by total assets to measure the book leverage.

Investment Outcomes

Investment is measured as capital expenditures over lagged total assets. Net working capital (NWC) growth is calculated as the quarter-over-quarter change in NWC, scaled by the lagged total assets.

Control Variables

Controls include variables often used in the leverage and investment literature (Almeida & Campello, 2007; Booth et al., 2001; Chen & Chen, 2012): Tobin's q (calculated as the book value of long-term debt plus market capitalization divided by total assets), operating cash flow over assets, return on assets, log of total assets, asset tangibility, book leverage, and the Kaplan-Zingales index as implemented by Lamont et al. (2001). All regressions include firm and time fixed effects and use firm-clustered standard errors.

3.3 Propensity Score Matching

To strengthen causal interpretation, we construct matched samples of bond and CP issuers using propensity score matching (PSM). Firms are matched on lagged values of Tobin's q, size, ROA, and leverage using PSM with exact matching on industry and quarter. Matching reduces concerns over endogenous selection into capital market participation, allowing for cleaner comparisons in subsequent regression and event study analyses.

Table 1 presents summary statistics for the variables described above. Panel A covers the full sample of 884 listed Thai firms from 2001Q1 to 2024Q4, totaling 43,370 firm-quarter observations. Panel B restricts the sample to 563 matched firms (14,422 firm-quarters) selected using PSM. Control variables are winsorized at the 1st and 99th percentiles by quarter.

Table 1: Summary Statistics

This table presents summary statistics for firm-quarter observations used in the analysis of debt composition and investment behavior among Thai listed firms during the sample period. Panel A reports statistics for the full sample, comprising 884 firms (293 issuers, 185 CP issuers) and 43,370 firm-quarters. Panel B restricts the sample to the matched set of 563 firms (266 issuers, 170 CP issuers) and 14,422 firm-quarters, obtained through propensity score matching based on lagged firm characteristics (Tobin's q, size, ROA, and leverage). Variables include book leverage, investment (capital expenditures scaled by lagged assets), net working capital (NWC) growth, issuance activity, and debt structure (e.g., CP share, bond share). Control variables such as Tobin's q, operating cash flow, firm size, profitability, tangibility, the Kaplan-Zingales (KZ) index, and working capital ratios are winsorized at the 1st and 99th percentiles.

Panel A: Full Sample

Number of Firms: 884. 293 issuers, 185 CP issuers. Number of Observations: 43,370

Variable	Mean	Std Dev	5th pct	Median	95th pct
Leverage	28.5%	24.8%	0.2%	26.1%	64.6%
CapEx/Total Assets	0.5%	3.8%	-2.4%	0.0%	5.8%
NWC Growth	0.3%	5.1%	-7.2%	0.1%	8.4%
Non-Rated	90.8%	29.0%	0.0%	100.0%	100.0%
CP Issuer	5.7%	23.2%	0.0%	0.0%	100.0%
Capital Market Debt Issuer	19.2%	39.4%	0.0%	0.0%	100.0%
CP Issued/Total Assets	0.3%	1.6%	0.0%	0.0%	0.9%
Bond Issued/Total Assets	0.3%	2.0%	0.0%	0.0%	0.0%
Net CP Issued/Total Assets	0.0%	1.0%	0.0%	0.0%	0.0%
Net bond Issued/Total Assets	0.1%	2.0%	0.0%	0.0%	0.0%
Share CP	0.9%	5.1%	0.0%	0.0%	4.0%
Share Capital Market Debt	7.6%	19.4%	0.0%	0.0%	56.2%
Tobin's q	1.28	1.12	0.43	0.95	3.26
Cash Flow/Total Assets	6.2%	10.8%	-12.1%	6.2%	23.7%
Log(Total Assets)	15.22	1.56	13.10	14.99	18.20
Return on Assets	3.2%	12.0%	-13.9%	3.9%	16.9%
Asset Tangibility	35.6%	23.8%	2.0%	33.4%	78.1%
KZ Index	2.91	2.58	0.35	2.41	7.47
NWC/Total Assets	20.3%	21.6%	-5.4%	15.6%	64.3%

Panel B: Full Sample

Number of Firms: 562. 266 issuers, 170 CP issuers. Number of Observations: 14,422

Variable	Mean	Std Dev	5th pct	Median	95th pct
Leverage	36.2%	20.7%	3.1%	36.7%	64.9%
CapEx/Total Assets	0.6%	3.7%	-2.3%	0.1%	5.7%
NWC Growth	0.3%	4.4%	-6.0%	0.0%	7.2%
Non-Rated	75.7%	42.9%	0.0%	100.0%	100.0%
CP Issuer	15.1%	35.8%	0.0%	0.0%	100.0%
Capital Market Debt Issuer	50.0%	50.0%	0.0%	50.0%	100.0%
CP Issued/Total Assets	0.7%	2.6%	0.0%	0.0%	4.7%
Bond Issued/Total Assets	0.8%	2.9%	0.0%	0.0%	5.7%
Net CP Issued/Total Assets	0.1%	1.5%	-0.7%	0.0%	1.0%
Net bond Issued/Total Assets	0.3%	2.9%	-1.4%	0.0%	3.9%
Share CP	2.3%	7.9%	0.0%	0.0%	15.4%
Share Capital Market Debt	19.6%	27.0%	0.0%	0.0%	77.2%
Tobin's q	1.27	0.93	0.49	1.00	2.96
Cash Flow/Total Assets	5.6%	9.7%	-10.4%	5.6%	21.3%
Log(Total Assets)	16.52	1.50	14.10	16.38	19.21
Return on Assets	3.5%	8.9%	-8.3%	3.6%	14.8%
Asset Tangibility	35.3%	25.5%	1.0%	33.6%	79.6%
KZ Index	3.21	2.43	0.69	2.69	7.54
NWC/Total Assets	17.8%	23.2%	-5.5%	9.7%	72.8%

3.4 Empirical Strategy

We employ a panel regression framework with firm and quarter fixed effects to estimate the relationship between debt structure and corporate outcomes. Specifically, we estimate the following baseline model:

$$Y_{it} = \beta DebtVar_{it} + \boldsymbol{X}'_{i,t-1}\gamma + \alpha_i + \delta_t + \varepsilon_{it} \quad (3)$$

where Y_{it} is either leverage (H1), investment or NWC growth (H2), $DebtVar_{it}$ denotes one or more measures of debt structure (e.g., HHI, CP share, net CP issuance), and $\boldsymbol{X}'_{i,t-1}$is the vector of control variables. Firm fixed effects α_i account for unobservable time-invariant heterogeneity, and quarter fixed effects δ_t capture macroeconomic shocks.

In addition to panel regressions, we conduct an event study around each firm's first entry into the CP market. We identify the initial CP issuance quarter for each firm and examine the dynamic effects on leverage within a window of eight quarters before and after the first CP issuance. Treated firms are matched to non-issuers using propensity scores based on lagged characteristics. We estimate a difference-in-differences (DiD) model with firm and quarter fixed effects to trace the evolution of capital structure following market access.

$$Leverage_{it} = \delta_t \times CPIssuer_i + \boldsymbol{X}'_{i,t-1}\gamma + \alpha_i + \delta_t + \varepsilon_{it} \quad (4)$$

To test hypothesis 3, we classify CP issuance into three distinct strategies: (i) Direct Rollover (issuance equals maturing), (ii) Leveraging (issuance exceeds maturing), and (iii) Deleveraging (maturing exceeds issuance). This delineation enables us to isolate investment behavior associated with different types of CP rollover.

$$Investment_{it} = \sum_{k=1}^{3} \beta_k CPRollover_{it}^{k} \times NetCPIssued_{it} + \boldsymbol{X}'_{i,t-1}\gamma + \alpha_i + \delta_t + \varepsilon_{it} \quad (5)$$

Finally, we test whether firms with greater exposure to mutual fund ownership adjust their investments more sensitively to liquidity shocks by including the share of CP or bonds held by mutual funds in the regression, while keeping the net issuances constant.

$$Investment_{it} = \beta_1 ShrHeldFund_{it} + \beta_2 NetIssued_{it} + \boldsymbol{X}'_{i,t-1}\gamma + \alpha_i + \delta_t + \varepsilon_{it} \quad (6)$$

4. Debt Structure and Leverage

4.1 Debt Strategy Clusters

To explore the heterogeneity of debt strategies among Thai firms, we apply K-means clustering to issuer-quarters with positive capital market debt issuance. The clustering algorithm uses standardized shares of five mutually exclusive debt instruments – commercial papers (CP), short-term bonds (STB), long-term bonds (LTB), perpetual bonds (PERP), and residual "other debt" (OTH) – to group firms by their financing mix. This approach follows Colla et al. (2013), who show that debt specialization and composition reflect meaningful financial strategy choices beyond leverage ratios.

We identify three distinct issuer clusters: (1) CP issuers, (2) perpetual bond issuers, and (3) long-term bond issuers. Firms without any capital market debt are assigned to a fourth group (Cluster 0: Non-Issuers) but are excluded from the clustering algorithm. Table 2 presents summary statistics by cluster. Cluster 1 firms (CP Issuers) tend to have moderate leverage (42.5%) and relatively concentrated debt structures (average HHI = 0.53). Cluster 2 firms (Perpetual Issuers) are substantially larger (average log assets = 18.6) and hold the most diversified portfolios (HHI = 0.28), with significant allocations to long-term and perpetual bonds. Cluster 3 firms (Bond Issuers) also display high bond usage, but with a greater reliance

on both short-term and long-term bonds. In contrast, non-issuers in Cluster 0 have the lowest leverage and typically employ alternative forms of debt, such as bank loans.

Figure 2 provides a visual summary of the joint distribution of leverage, debt concentration (HHI), and firm size across clusters. Larger firms tend to have more diversified debt portfolios and higher leverage, consistent with the notion that capital market access and debt variety are complementary. Non-issuers display a high concentration by construction and cluster tightly in the lower-left region of the plot, whereas the issuers cluster over broader ranges of leverage and firm size.

The clustering results reveal several stylized facts. First, firms with access to capital market debt hold significantly higher leverage, consistent with Faulkender and Petersen (2006). Second, perpetual bond issuers are a distinct group of large, diversified firms. Third, CP issuers tend to exhibit higher leverage and lower credit ratings, possibly indicating their use of CPs as flexible but risky short-term funding instruments.

These results suggest that debt variety and capital market participation are closely linked to leverage outcomes and may reflect systematic financial strategies. We explore this further in the multivariate regression analysis that follows.

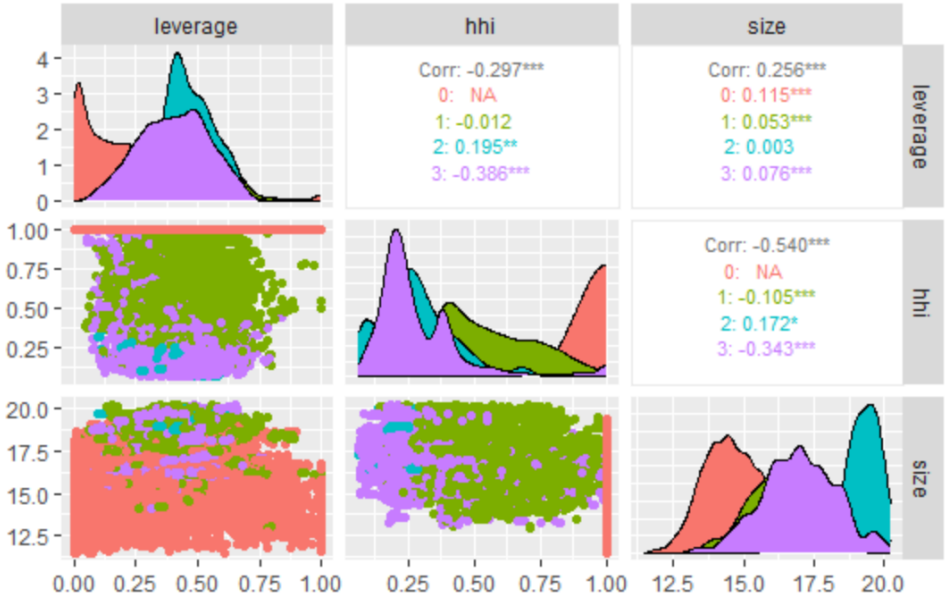
Table 2: Summary Statistics by Debt Strategy Cluster

This table presents firm-level and debt composition characteristics across four clusters of Thai listed firms classified using K-means clustering based on debt structure. Clusters are labeled by dominant financing instrument: Cluster 1 (CP Issuers), Cluster 2 (Perpetual Issuers), and Cluster 3 (Bond Issuers). Cluster 0 (Non-Issuers) is included for reference but was excluded from the clustering procedure. Reported statistics include the number of firms and firm-quarter observations, average book leverage, firm size (log of total assets), debt concentration (Herfindahl-Hirschman Index, HHI), and the percentage share of each debt instrument type in total debt (commercial papers, short-term bonds, long-term bonds, perpetual bonds, and other debt). The "Non-Rated" column indicates the proportion of firm-quarters that do not have a credit rating.

Cluster	(0) Non-Issuer	(1) CP Issuer	(2) Perp Issuer	(3) Bond Issuer
Firms	848	276	12	163
Num Obs	35,029	4,766	202	3,371
Leverage	25.4%	42.5%	45.3%	40.4%
Log(Total Assets)	14.81	16.96	18.60	16.98
HHI	1.0000	0.5269	0.2793	0.2977
Non-Rated	100.0%	57.6%	18.3%	45.9%
CP	0.0%	5.5%	0.1%	3.6%
ST Bonds	0.0%	9.9%	13.2%	32.6%
LT Bonds	0.0%	11.6%	25.5%	33.0%
Perpetual	0.0%	0.1%	11.9%	0.1%
Others	100.0%	72.9%	49.3%	30.9%

Figure 2: Correlation Plot by Debt Strategy Cluster

This figure displays the pairwise relationships among leverage, debt concentration (HHI), and firm size (log of total assets) across four debt strategy clusters. Clusters are color-coded as follows: Cluster 0 (red, Non-Issuers), Cluster 1 (green, CP Issuers), Cluster 2 (blue, Perpetual Issuers), and Cluster 3 (purple, Bond Issuers). Diagonal panels show kernel density estimates of each variable within each cluster. Off-diagonal panels display scatterplots and Pearson correlation coefficients between variable pairs, with correlations reported separately for each cluster. Notably, debt concentration (HHI) is negatively correlated with firm size and leverage overall, consistent with the observation that larger firms tend to employ more diversified debt structures.



4.2 Determinants of Leverage

Next, we investigate whether debt structure and capital market participation account for cross-sectional variation in firm leverage. Table 3 reports firm fixed effects regressions of book leverage on debt variety, debt composition, and issuer status. Panel A uses the full sample of 884 firms (43,370 firm-quarters), while Panel B restricts the analysis to the matched sample of 562 firms (14,422 observations) to address endogenous selection into capital market borrowing.

In column (1), we proxy debt variety with a normalized Herfindahl-Hirschman Index (HHI) of debt composition. A lower HHI reflects greater diversification across CP, short- and long-term bonds, perpetuals, and other debt. The coefficient on HHI is negative and statistically significant in both the full and matched samples, indicating that firms with more diversified debt portfolios tend to operate at higher leverage. This result is consistent with theoretical predictions that access to multiple instruments can relax borrowing constraints (Faulkender & Petersen, 2006).

Column (2) introduces indicator variables for three debt strategy clusters based on the K-means classification in Section 4.1, omitting non-issuers as the reference group. In the full sample, Cluster 1 (CP Issuers) is associated with significantly lower leverage. However, this effect disappears in the matched sample, suggesting that the observed differences may be driven by firm characteristics rather than strategic differences in financing policy.

In column (3), we replace cluster indicators with issuer dummies. CP issuers have significantly higher leverage, with coefficients of 2.4% in the full sample and 3.5% in the matched sample, which is statistically significant at the 5% level. In contrast, the broader capital market debt issuer dummy is positive and significant only in the full sample. This finding suggests that CP issuance, rather than capital market participation per se, is more directly associated with higher debt usage.

Column (4) replaces issuer indicators with continuous measures of debt composition: the share of CP and total capital market debt in interest-bearing liabilities. In the full sample, both variables are positively correlated with leverage. However, these effects are not statistically significant in the matched sample, confirming the selection issue between issuers and non-issuers that necessitate matching.

Across all specifications, control variables exhibit expected signs and magnitudes. Larger firms, those with higher asset tangibility, and firms with higher Tobin's q tend to operate with more leverage, while more profitable firms (as measured by ROA) hold less debt. Notably, the non-rated dummy is consistently negative and significant, suggesting that limited credit transparency is associated with lower debt capacity, which may reflect investor aversion or regulatory frictions.

Overall, the results support Hypothesis 1: firms with greater debt variety (lower HHI) and access to flexible instruments such as CPs maintain higher leverage. Importantly, the relationship between CP issuance and leverage is robust in the matched sample, suggesting that short-term capital market access enables an expansion in debt capacity. We further examine this dynamic in the event study in the next section.

Table 3: Debt Structure and Leverage

This table presents panel regressions of firm leverage on various measures of debt structure and firm characteristics. Panel A presents results from the full sample of 884 Thai listed firms (43,368 firm-quarter observations), while Panel B displays results for the matched sample of 563 firms (14,422 observations) obtained through propensity score matching on lagged Tobin's q, size, ROA, and leverage. The dependent variable is the book leverage ratio. Column (1) includes debt concentration as measured by the Herfindahl-Hirschman Index (HHI) of debt composition. Column (2) includes indicator variables for three clusters: Cluster 1 (CP Issuers), Cluster 2 (Perpetual Issuers), and Cluster 3 (Bond Issuers), omitting non-issuers. Column (3) replaces these with issuer dummies for CP and capital market debt issuers. Column (4) uses continuous measures of capital market debt composition (share of CP and share of capital market debt instruments). All specifications include firm and quarter fixed effects. Standard errors are clustered at the firm level and reported in parentheses. Stars correspond to the statistical significance level, with *, **, and *** representing 10%, 5%, and 1%, respectively.

Panel A: Full Sample

	(1) Leverage	(2) Leverage	(3) Leverage	(4) Leverage
Debt HHI	-0.107***			
	(-5.995)			
Cluster 1: CP Issuer		-0.069***		
		(-5.018)		
Cluster 2: Perp Issuer		0.005		
		(0.500)		
Cluster 3: Bond Issuer		0.016		
		(0.937)		
CP Issuer			0.024***	
			(2.711)	
Capital Market Debt Issuer			0.065***	
			(5.517)	
Share CP				0.091**
				(2.565)
Share Capital Market Debt				0.067***
				(3.211)
Non-Rated	-0.027**	-0.025**	-0.025**	-0.042***
	(-2.455)	(-2.317)	(-2.292)	(-3.978)
Tobin's q	0.017***	0.017***	0.017***	0.017***
	(3.286)	(3.281)	(3.281)	(3.251)
Log(Total Assets)	0.066***	0.065***	0.065***	0.069***
	(7.174)	(7.081)	(7.081)	(7.538)
Return on Assets	-0.474***	-0.474***	-0.474***	-0.476***
	(-9.908)	(-9.939)	(-9.944)	(-9.964)
Asset Tangibility	0.232***	0.229***	0.230***	0.234***
	(8.445)	(8.416)	(8.437)	(8.487)
NWC/Total Assets	0.078***	0.078***	0.076**	0.079***
	(2.612)	(2.623)	(2.556)	(2.608)
Observations	43,368	43,370	43,370	43,368
Number of Firms	884	884	884	884
Adjusted R-squared	0.197	0.199	0.199	0.193
Firm FE	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES

Panel B: Matched Sample

	(1) Leverage	(2) Leverage	(3) Leverage	(4) Leverage
Debt HHI	-0.044**			
	(-2.374)			
Cluster 1: CP Issuer		-0.019		
		(-1.277)		
Cluster 2: Perp Issuer		0.013		
		(1.290)		
Cluster 3: Bond Issuer		-0.015		
		(-1.283)		
CP Issuer			0.035***	
			(3.796)	
Capital Market Debt Issuer			0.018	
			(1.343)	
Share CP				0.028
				(0.710)
Share Capital Market Debt				-0.010
				(-0.456)
Non-Rated	-0.039***	-0.039***	-0.040***	-0.051***
	(-3.401)	(-3.258)	(-3.234)	(-4.597)
Tobin's q	0.030**	0.029**	0.029**	0.029**
	(2.183)	(2.154)	(2.133)	(2.149)
Log(Total Assets)	0.088***	0.089***	0.087***	0.091***
	(7.213)	(7.230)	(7.182)	(7.387)
Return on Assets	-0.596***	-0.597***	-0.597***	-0.600***
	(-3.682)	(-3.685)	(-3.698)	(-3.710)
Asset Tangibility	0.145***	0.142***	0.144***	0.142***
	(3.533)	(3.500)	(3.531)	(3.472)
NWC/Total Assets	0.011	0.010	0.006	0.010
	(0.317)	(0.280)	(0.190)	(0.294)
Observations	14,422	14,422	14,422	14,422
Number of Firms	562	562	562	562
Adjusted R-squared	0.259	0.260	0.264	0.257
Firm FE	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES

4.3 Leverage After Commercial Paper Issuance

To examine the dynamic effect of CP market access on capital structure, we implement an event-study framework centered on the quarter in which each firm's first CP issuance occurred. This approach isolates the causal effect of CP entry by comparing treated firms to a matched control group of non-issuers over an eight-quarter window before and after the event. Matching is performed using propensity scores based on lagged firm characteristics (Tobin's q, size, ROA, and leverage), with exact matching on industry and quarter.

Figure 3 summarizes the event dynamics. Panel 3A shows the time series of first-time CP issuers. The number of new entrants surged between 2013 and 2016, coinciding with

regulatory liberalization and growing investor demand for short-term debt. This wave of market access provides a natural setting to examine the capital structure effects of CP financing.

Panel 3B plots the average book leverage of treated and control firms relative to the quarter of first CP issuance ($t = 0$). Prior to CP entry, leverage trajectories are similar. Following issuance, treated firms exhibit a marked and persistent increase in leverage, while the control group remains flat or declines slightly. This divergence suggests that CP market access enables a meaningful expansion in debt capacity.

We formally estimate a difference-in-differences (DiD) specification with firm and quarter fixed effects described in Equation (4). Panel 3C reports the estimated dynamic treatment effects from the interaction between event time dummies and the treatment indicator. The coefficient at $t = 0$ is 4.1%, statistically significant at the 1% level, and the effect persists across subsequent quarters.[1] Importantly, pre-trend coefficients are not statistically different from zero, supporting the identifying assumption of parallel trends.

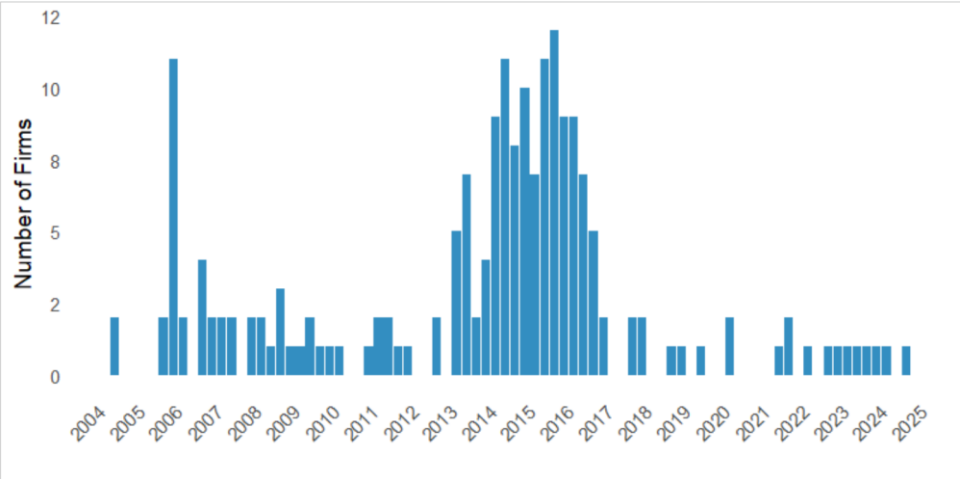
The leverage expansion is driven almost entirely by CP issuance. Figure 4 shows that CP issuance increases sharply at $t = 0$ and remains elevated for at least eight quarters, while net CP issuance remains positive for two quarters. In contrast, bond issuance rises only marginally following CP entry and does not exhibit a systematic post-event trend. These results suggest that firms use CP not as a bridge financing toward longer-term debt (Kahl et al., 2015), but rather as a recurring component of their capital structure (i.e., the long-term use of short-term debt). This persistence has implications for rollover risk exposure and debt maturity management in emerging market contexts (Cheng et al., 2020). The continued reliance on CP as a primary funding tool is consistent with Benmelech et al. (2024), who show that firms – particularly those with higher credit quality – often avoid secured borrowing in order to preserve collateral capacity. This behavior reflects a broader strategy of maintaining financial flexibility through the use of unsecured, short-term instruments, especially when firms are not yet financially constrained.

[1] The full table is omitted for brevity, but the results are available upon request.

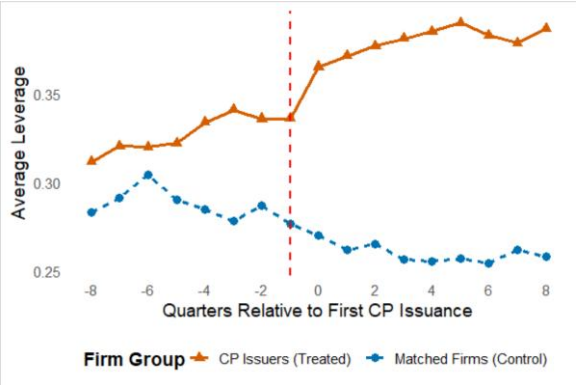
Figure 3: Event Study Around First-Time Commercial Paper Issuance

This figure presents results from an event study using a ±8-quarter event window examining changes in firm leverage around the first issuance of commercial paper (CP). The first CP issuance is identified at the firm level using ThaiBMA data (available since 1993). A matched sample of non-issuers is used as a control group. Panel 2A shows the number of first-time CP issuers per quarter. Panel 2B plots average book leverage for CP issuers (treated group) and matched non-issuers (control group) relative to the quarter of first issuance (t = 0). Panel 2C presents the estimated dynamic treatment effects from a difference-in-differences (DiD) regression with firm and quarter fixed effects, as well as standard firm-level controls (Equation 4). Shaded bands represent 95% confidence intervals.

Panel 3A: First-Time Commercial Paper Issuers Over Time



Panel 3B: Average Leverage



Panel 3C: Residual Leverage

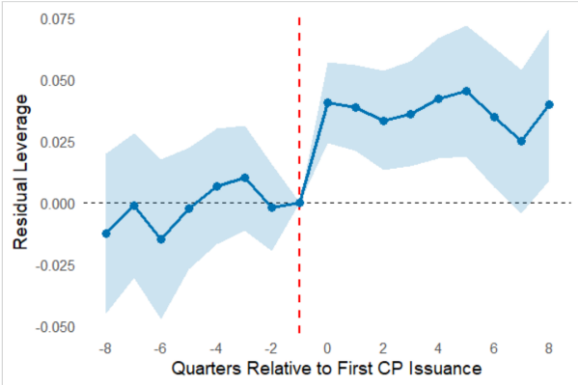
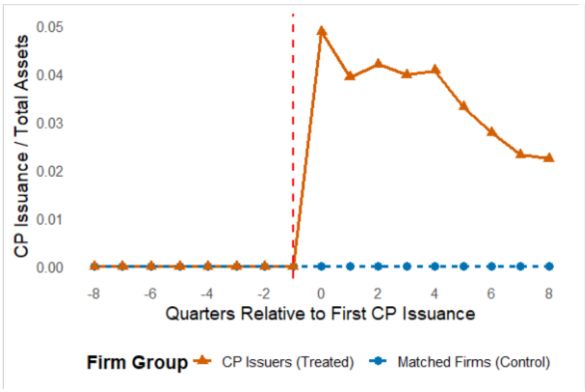


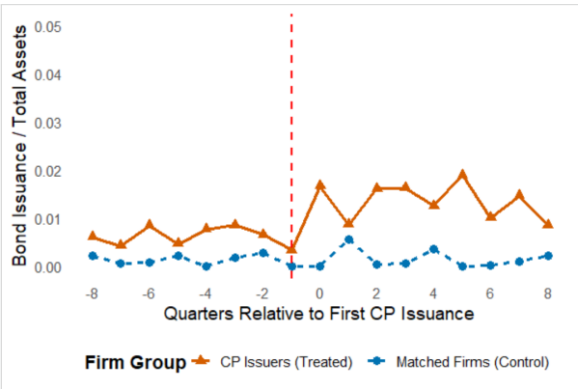
Figure 4: Issuance Behavior Around First-Time Commercial Paper Entry

This figure examines the debt issuance dynamics of firms around the quarter of their first commercial paper (CP) issuance (t = 0), using an eight-quarter event window pre- and post-issuance, and comparing CP issuers (treated firms) with a matched sample of non-issuers (controls). Issuance amounts are scaled by total assets. Panel 4A shows gross CP issuance, Panel 4B shows gross bond issuance, Panel 4C shows net CP issuance (gross issuance minus redemption), and Panel 4D shows net bond issuance (gross issuance minus redemption).

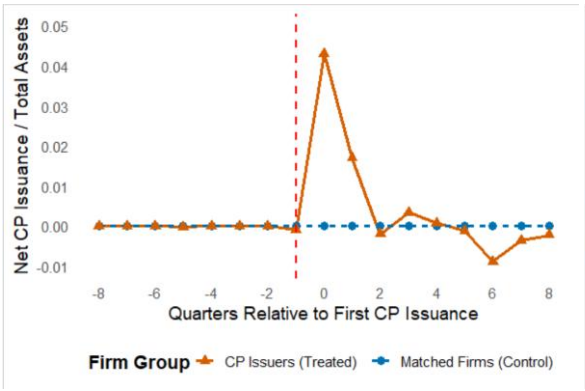
Panel 4A



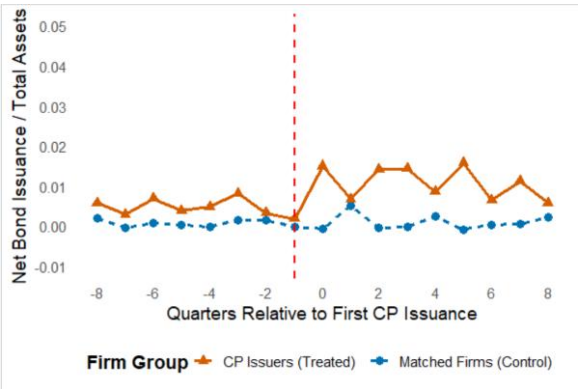
Panel 4B



Panel 4C



Panel 4D



5. Debt Structure and Corporate Investment

5.1 Baseline Results

We now examine whether debt structure influences corporate investment decisions. Table 4 reports fixed effects panel regressions of capital expenditures scaled by lagged total assets on various measures of debt variety and market participation. As in the previous section, Panel A uses the full sample of 884 listed firms, while Panel B restricts the analysis to the matched sample of 562 firms to mitigate concerns over selection into capital market borrowing.

In the full sample (Panel A), we find weak and somewhat inconsistent relationships between debt structure and investment. Debt concentration, as measured by the Herfindahl-Hirschman Index (Column 1), is unrelated to investment. While CP issuer status is positively associated with investment (Column 2), the broader capital market debt issuer dummy is not. In column (3), the share of CP is positively correlated with investment, but the share of total capital market debt is negatively correlated. Similarly, gross CP and bond issuance (Column 4) are both positively associated with investment, while net CP issuance (Column 5) has an insignificant coefficient.

Turning to the matched sample (Panel B), the results become clearer. CP issuer status is strongly associated with higher investment (Column 2), with a coefficient of 0.6%, statistically significant at the 1% level. The magnitude represents a substantial effect, given that the sample mean of investment is also 0.6%, implying that CP issuance more than doubles investment relative to comparable firms. Columns (4) and (5) show that both gross and net CP issuance are positively associated with investment, with economically meaningful magnitudes. Bond issuance is also associated with increased capital expenditures, although the estimated effects are smaller in magnitude. From this point onward, we will focus on the 562 matched firms.

Control variables exhibit expected signs and are generally consistent across specifications. Higher Tobin's q and profitability (ROA) are associated with greater investment, while larger firms and those with higher leverage invest less. Interestingly, internal cash flow is negatively associated with investment, and the Kaplan-Zingales index is insignificant across all models. These patterns echo the findings of Chen and Chen (2012), suggesting that investment-cash flow sensitivity may not be a reliable proxy for financial constraints, particularly in emerging markets.

Table 4: Debt Structure and Corporate Investment

This table presents fixed-effects panel regressions examining the relationship between debt composition and firm investment, measured as capital expenditures scaled by lagged total assets. Panel A reports results for the full sample of 884 listed firms (43,368 firm-quarter observations), while Panel B restricts the analysis to a matched sample of 563 firms (14,422 observations) based on propensity scores estimated using lagged Tobin's q, size, ROA, and leverage. Across specifications, the relationship between investment and various measures of debt structure is investigated: (1) debt concentration (HHI), (2) CP issuer and capital market debt issuer indicators, (3) the share of CP and total capital market debt in total debt, and (4) gross and (5) net debt issuance scaled by total assets. All regressions control for Tobin's q, operating cash flow, firm size, ROA, book leverage, and the Kaplan-Zingales index, and include firm and quarter fixed effects. Standard errors are clustered at the firm level and reported in parentheses. Stars correspond to the statistical significance level, with *, **, and *** representing 10%, 5%, and 1%, respectively.

Panel A: Full Sample

	(1) Invest	(2) Invest	(3) Invest	(4) Invest	(5) Invest
Debt HHI	0.001				
	(0.368)				
CP Issuer		0.005***			
		(3.620)			
Capital Market Debt Issuer		-0.001			
		(-0.662)			
Share CP			0.022***		
			(3.340)		
Share Capital Market Debt			-0.005*		
			(-1.894)		
CP Issued/Total Assets				0.083***	
				(3.992)	
Bond Issued/Total Assets				0.041***	
				(2.865)	
Net CP Issued/Total Assets					0.043
					(1.257)
Net Bond Issued/Total Assets					0.039***
					(2.818)
Tobin's q	0.004***	0.004***	0.004***	0.004***	0.004***
	(7.186)	(7.217)	(7.206)	(7.210)	(7.189)
Cash Flow/Total Assets	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***
	(-3.536)	(-3.478)	(-3.408)	(-3.376)	(-3.462)
Log(Total Assets)	-0.002*	-0.002**	-0.002*	-0.002**	-0.002**
	(-1.960)	(-2.115)	(-1.816)	(-2.150)	(-1.992)
Return on Assets	0.026***	0.026***	0.026***	0.026***	0.026***
	(5.803)	(5.785)	(5.804)	(5.786)	(5.776)
Book Leverage	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***
	(-4.180)	(-4.269)	(-4.144)	(-4.356)	(-4.217)
Kaplan-Zingales Index	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.746)	(-0.811)	(-0.779)	(-0.788)	(-0.751)
Observations	43,368	43,370	43,368	43,370	43,370
Number of Firms	884	884	884	884	884
Adjusted R-squared	0.037	0.038	0.038	0.039	0.038
Firm FE	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES

Panel B: Matched Sample

	(1) Invest	(2) Invest	(3) Invest	(4) Invest	(5) Invest
Debt HHI	0.002				
	(0.765)				
CP Issuer		0.006***			
		(4.025)			
Capital Market Debt Issuer		-0.002			
		(-1.132)			
Share CP			0.023***		
			(3.071)		
Share Capital Market Debt			-0.008**		
			(-2.252)		
CP Issued/Total Assets				0.085***	
				(4.013)	
Bond Issued/Total Assets				0.048***	
				(3.004)	
Net CP Issued/Total Assets					0.086***
					(3.547)
Net Bond Issued/Total Assets					0.042***
					(2.604)
Tobin's q	0.005***	0.005***	0.005***	0.005***	0.005***
	(4.880)	(4.888)	(4.839)	(4.808)	(4.819)
Cash Flow/Total Assets	-0.016**	-0.015**	-0.014**	-0.014**	-0.014**
	(-2.558)	(-2.495)	(-2.378)	(-2.198)	(-2.354)
Log(Total Assets)	-0.003*	-0.003**	-0.003*	-0.003*	-0.003*
	(-1.921)	(-2.120)	(-1.702)	(-1.953)	(-1.933)
Return on Assets	0.022**	0.021**	0.021**	0.020**	0.021**
	(2.518)	(2.478)	(2.539)	(2.406)	(2.436)
Book Leverage	-0.013***	-0.013***	-0.013***	-0.013***	-0.012***
	(-3.184)	(-3.421)	(-3.250)	(-3.491)	(-3.225)
Kaplan-Zingales Index	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.952)	(-0.976)	(-0.929)	(-0.899)	(-0.909)
Observations	14,422	14,422	14,422	14,422	14,422
Number of Firms	562	562	562	562	562
Adjusted R-squared	0.047	0.049	0.050	0.051	0.049
Firm FE	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES

Overall, these results support Hypothesis 2: firms with access to flexible capital market instruments, particularly CPs, undertake significantly more investment. The fact that CP issuance is associated with higher investment even in the matched sample suggests that short-term market-based financing plays a key role in supporting capital formation among Thai firms.

These findings are consistent with Biguri (2023), who shows that access to unsecured debt, such as CP, enhances investment by relaxing collateral constraints, particularly for firms that face frictions in secured borrowing markets.

5.2 Net Working Capital

We next examine how firms use debt structure to finance short-term investment, measured as the growth in net working capital (NWC) scaled by lagged total assets. While capital expenditures reflect long-term investment, changes in NWC – particularly in inventories and receivables – are critical for day-to-day operations and can also respond to financing conditions.

Table 5 reports fixed effects regressions using the matched sample. We consider multiple measures of capital market participation. In column (1), CP issuer status is positively and significantly associated with NWC growth, while the broader capital market debt issuer dummy remains insignificant. In column (2), the share of CP is unrelated to NWC growth, but a higher share of total capital market debt is associated with lower NWC growth.

Column (3) shows that gross CP issuance is significantly and positively associated with NWC growth, while bond issuance is unrelated. In column (4), net CP issuance is strongly associated with NWC growth, with a coefficient of 0.18 and significance at the 1% level. Net bond issuance again shows a weaker and statistically insignificant relationship. These results suggest that firms use newly issued CP to support short-term liquidity needs.

The findings are consistent with Hypothesis 3, which posits that CPs function as flexible short-term financing instruments. Firms appear to use CP issuance not only for long-term investment (as shown in Section 5.1), but also to manage short-term working capital requirements. This dual role raises concerns about rollover risk, particularly if CP is used to fund operating liquidity that must be continuously refinanced.

These concerns are especially relevant for Thai property developers. As shown in Saengchote (2024), firms in the real estate sector often rely on CP to finance property development, which is classified as inventory. During periods of financial stress, such as the COVID-19 pandemic, these firms faced substantial refinancing risk, which manifested in the form of fire sales of inventory that impacted the resale markets. Although classified as working capital on financial statements, these investments are economically long-term and illiquid, suggesting a potential maturity mismatch when funded with CP.

Table 5: Debt Issuance and Net Working Capital Growth

This table reports firm fixed-effects regressions examining the relationship between debt structure and changes in net working capital (NWC), measured as the quarterly growth in net working capital scaled by lagged total assets. The analysis is based on the matched sample of 563 firms (14,422 firm-quarter observations). The specifications include alternative measures of debt market participation: indicator variables for CP and capital market debt issuers (Column 1), debt composition shares (Column 2), gross issuance relative to total assets (Column 3), and net issuance (Column 4). All regressions control for Tobin's q, operating cash flow, firm size, return on assets, book leverage, the Kaplan-Zingales index, and lagged NWC levels. Firm and quarter fixed effects are included in all models. Standard errors are clustered at the firm level and reported in parentheses. Stars correspond to the statistical significance level, with *, **, and *** representing 10%, 5%, and 1%, respectively.

	(1) NWC Growth	(2) NWC Growth	(3) NWC Growth	(4) NWC Growth
CP Issuer	0.005***			
	(2.643)			
Capital Market Debt Issuer	-0.001			
	(-0.605)			
Share CP		-0.007		
		(-0.755)		
Share Capital Market Debt		-0.007**		
		(-2.229)		
CP Issued/Total Assets			0.061**	
			(1.999)	
Bond Issued/Total Assets			0.002	
			(0.144)	
Net CP Issued/Total Assets				0.180***
				(3.702)
Net Bond Issued/Total Assets				0.021
				(1.604)
Tobin's q	0.004**	0.004**	0.004**	0.004**
	(2.179)	(2.214)	(2.116)	(2.058)
Cash Flow/Total Assets	-0.035***	-0.035***	-0.034***	-0.034***
	(-3.417)	(-3.454)	(-3.360)	(-3.344)
Log(Total Assets)	-0.000	0.000	0.000	0.000
	(-0.127)	(0.137)	(0.006)	(0.106)
Return on Assets	0.024***	0.025***	0.024***	0.024***
	(3.106)	(3.158)	(3.121)	(3.100)
Book Leverage	-0.022***	-0.021***	-0.022***	-0.021***
	(-3.885)	(-3.856)	(-3.853)	(-3.765)
Kaplan-Zingales Index	0.001	0.000	0.001	0.001
	(1.448)	(1.380)	(1.482)	(1.513)
Net Working Capital/ Total Assets	-0.103***	-0.102***	-0.103***	-0.103***
	(-8.805)	(-8.902)	(-8.793)	(-8.803)
Observations	14,422	14,422	14,422	14,422
Number of Firms	562	562	562	562
Adjusted R-squared	0.061	0.061	0.062	0.065
Firm FE	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES

Our findings suggest that Thai firms, particularly CP issuers, utilize short-term capital market instruments to finance both working capital and long-term investments. While this strategy provides financing flexibility, it also increases firms' exposure to refinancing risk, especially in the absence of committed backup credit lines or well-functioning secondary markets.

5.3 Commercial Paper Rollovers

To better understand how firms actively manage short-term debt, we examine variation in CP rollover strategies and their implications for corporate investment. We divide CP issuances into four mutually exclusive strategies: (i) Direct Rollover (issuance equals maturing), (iia) Pure Leveraging (new issuance with no maturing obligations), (iib) Leveraging Rollover (issuance exceeds maturing); and (iii) Deleveraging Rollover (maturing exceeds issuance). This classification allows us to distinguish between CP issuance intended to maintain liquidity, expand leverage, or reduce leverage.

Figure 5: Commercial Paper Issuance by Rollover Strategy

This figure displays the quarterly breakdown of commercial paper (CP) issuance by rollover type from 2004 to 2024 in Thai Baht (THB) millions. Issuance is categorized into four mutually exclusive strategies: Deleveraging Rollover (light gray), where gross issuance is less than maturing CP; Direct Rollover (dark gray), where issuance matches maturities; Leveraging Rollover (red hatched), where issuance exceeds maturities; and Leveraging (solid red), where firms issue CP without any maturing obligations.

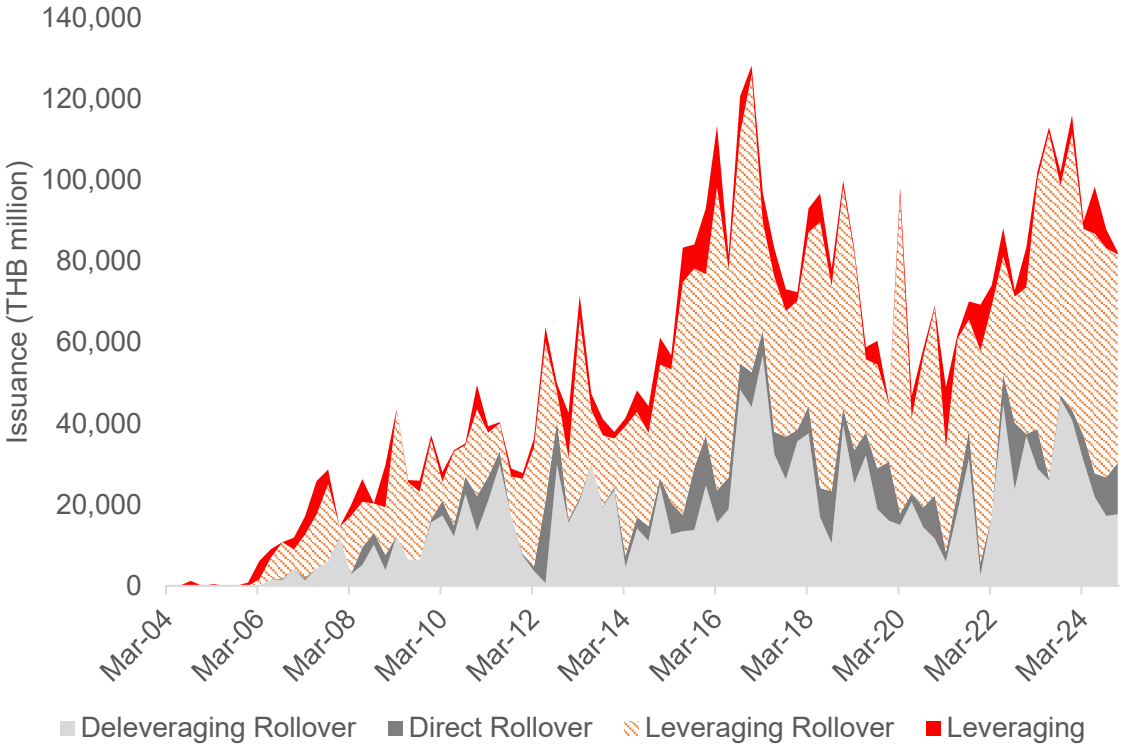


Figure 5 illustrates the time series of CP issuance by rollover type from 2004 to 2024. The majority of activity is concentrated in leveraging and deleveraging rollover episodes, which tend to move closely together over time. In contrast, pure leveraging and direct rollover constitute a smaller share of the market. This pattern suggests that CP markets serve as a mechanism for dynamic liquidity management.

Next, we combine categories (iia) Pure Leveraging and (iib) Leveraging Rollover together, then interact the indicators with net CP issuance scaled by total assets and estimate fixed effects regressions of Equation (5). Table 6 presents the results for capital expenditures (Column 1) and NWC growth (Column 2) on CP rollover types. The results highlight several key patterns.

First, leveraging rollover activity, captured by the interaction of a dummy for issuance exceeding redemption and the net CP issued scaled by total assets, is positively and significantly associated with both capital expenditures and NWC growth. Thus, CP funding appears to be used to both expand their investment and fund operating liquidity. The magnitude is economically large, with coefficients of 0.142 for CapEx and 0.165 for NWC growth.

Second, the deleveraging rollover interaction term is also positive and statistically significant in the NWC regression. However, since net CP issuance is negative by construction in these observations, the implied effect is a reduction in NWC. This finding can be consistent with (1) firms reducing CP issuance when they have less NWC needs, or (2) a reduction in demand for CP diminishes their ability to raise financing to fund net working capital.

Third, direct rollover, defined as issuance exactly equal to maturing, is associated with higher capital expenditures but has no significant effect on NWC. Even if the firm is not bringing in additional capital via net issuance, the ability to rollover may reduce funding uncertainty, giving firms greater confidence in making new investments. All else equal, net bond issuance remains positively associated with both CapEx and NWC growth, although the magnitude of the effects is smaller compared to CP-based funding strategies.

Taken together, these findings provide strong support for Hypothesis 3: commercial papers are not used merely for passive refinancing but represent an actively managed funding channel. Firms dynamically adjust their CP issuance to align with short-term financing needs, and these adjustments have significant implications for both fixed investment and liquidity management. However, reliance on CP amplifies exposure to rollover and liquidity risk, particularly when firms use short-term debt to support economically long-term activities.

Table 6: Rollover Type and Investment Behavior

This table presents fixed-effects panel regressions examining the relationship between commercial paper (CP) rollover strategies and corporate investment behavior. The dependent variables are capital expenditures scaled by lagged total assets (Column 1) and net working capital (NWC) growth (Column 2). The analysis is based on a matched sample of 563 firms (14,422 firm-quarter observations). The key independent variables capture variation in CP rollover strategy. Direct CP Rollover is an indicator equal to one if gross CP issuance equals redemption in a given quarter. Leveraging Net CP Issued/Total Assets interacts net CP issuance with a dummy equal to one when issuance exceeds redemption, while Deleveraging Net CP Issued/Total Assets captures the equivalent when redemption exceeds issuance. Net bond issuance is included for comparison. All regressions control for Tobin's q, operating cash flow, firm size, return on assets, book leverage, the Kaplan-Zingales index, and (in Column 2) lagged NWC scaled by total assets. Firm and quarter fixed effects are included in all models. Standard errors are clustered at the firm level and reported in parentheses. Stars correspond to the statistical significance level, with *, **, and *** representing 10%, 5%, and 1%, respectively.

VARIABLES	(1) CapEx	(2) NWC Growth
Direct CP Rollover	0.004**	-0.001
	(2.287)	(-0.385)
Leveraging Net CP Issued/Total Assets	0.142***	0.165***
	(3.799)	(2.701)
Deleveraging Net CP Issued/Total Assets	-0.025	0.207***
	(-0.698)	(3.304)
Net Bond Issued/Total Assets	0.040**	0.022*
	(2.468)	(1.662)
Tobin's q	0.005***	0.004**
	(4.786)	(2.070)
Cash Flow/Total Assets	-0.014**	-0.034***
	(-2.285)	(-3.361)
Log(Total Assets)	-0.003*	0.000
	(-1.931)	(0.104)
Return on Assets	0.020**	0.024***
	(2.407)	(3.109)
Leverage	-0.013***	-0.021***
	(-3.303)	(-3.760)
Kaplan-Zingales Index	-0.000	0.001
	(-0.891)	(1.507)
Net Working Capital/Total Assets		-0.103***
		(-8.808)
Observations	14,422	14,422
Number of Firms	562	562
Adjusted R-squared	0.050	0.065
Firm FE	YES	YES
Quarter FE	YES	YES

5.4 Money Market Fund and Commercial Paper

CPs are intricately linked to money market funds, which serve both as a source of short-term liquidity and a conduit for financial shocks. These funds are popular due to their money-like features and perceived safety (Cipriani & La Spada, 2021). However, they also operate as key lending intermediaries – often referred to as part of the "shadow banking" system (Chernenko & Sunderam, 2014) – through which monetary policy and financial stress can transmit to the real sector (Xiao, 2020).

Figure 6 underscores the systemic importance of mutual funds in Thailand's CP market. Panel 6A shows that money market fund assets under management (AUM) have grown steadily since the early 2000s, but also exhibit periods of contraction, suggesting exposure to liquidity shocks. Panel 6B highlights a key asymmetry: while the share of corporate bonds held by mutual funds is relatively stable, the share of CP held by mutual funds fluctuates widely, reaching over 80% in some quarters before sharply declining in 2024. This concentration implies that CP-issuing firms may be vulnerable to fund flow risk and rollover uncertainty.

To examine whether firms exposed to mutual fund demand adjust their investments in response to liquidity conditions, we estimate fixed effects regressions using quarterly mutual fund holdings data from the Thai Securities and Exchange Commission's (SEC) public API. The data span 2021Q3 to 2024Q3 and cover 380 firms. While valuable, this limited time frame restricts our ability to study longer-term trends and structural breaks.

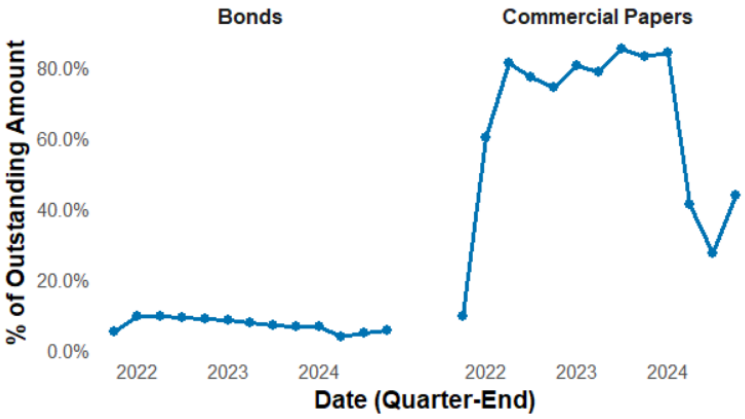
Table 7 reports regressions of capital expenditures (Panel A) and net working capital (NWC) growth (Panel B) on the share of a firm's CP and bond holdings held by mutual funds, controlling for debt issuance and standard financial variables. Because the sample period (2021–2024) is shorter than in previous analyses, column (1) presents baseline specifications for comparison. Column (2) adds the share of CP and bond held by mutual funds, while column (3) includes net issuance variables, as specified in Equation (6). The results show that the share of CP held by mutual funds is positively associated with both CapEx and NWC growth, even after controlling for net CP and bond issuance. The sensitivity to funds' holdings suggests that investment and liquidity management decisions are more responsive to market conditions among firms that rely more on mutual fund demand.

Figure 6: Mutual Funds and Their Holdings of Corporate Debt Instruments

This figure illustrates the role of mutual funds, particularly money market funds, in Thailand's corporate debt market. Panel 6A plots the total assets under management (AUM) of money market funds from 2000 to 2024 (in THB million). Panel 6B presents the percentage of outstanding corporate bonds and commercial papers (CPs) held by mutual funds, based on quarterly data from 2021 to 2024.

Panel 6A: Total Assets Under Management (AUM) of Money Market Funds

Panel 6B: % Corporate Debt Held by Mutual Funds



These findings align with a growing literature on the fragility of money market funds. Strahan and Tanyeri (2015), Schmidt et al. (2016), and Cipriani and La Spada (2021) document how these funds are susceptible to investor redemptions, especially during periods of market stress. Redemptions can trigger asset fire sales or a withdrawal of funding, transmitting shocks to the real sector. Contributing factors include competition among funds, performance-sensitive flows (Goldstein et al., 2017; La Spada, 2018), reaching for yield (Di Maggio & Kacperczyk, 2017; La Spada, 2018), and regulatory frictions such as monitoring requirements (Lugo, 2023).

In contrast, the share of bonds held by mutual funds appears more stable in our sample and is not significantly related to investment activity, consistent with the longer maturity and lower redemption sensitivity typically associated with bond funds. However, this relative stability warrants caution in interpretation. Thailand experienced a bond fund run at the onset of COVID-19 in March 2020, which prompted the establishment of the Corporate Bond Stabilization Fund (BSF). As documented by Saengchote (2024), the BSF intervention supported continued bond and CP issuance but may have delayed deleveraging and contributed to a buildup of rollover risk in subsequent quarters.

In addition, Worasak et al. (2022) show that monetary policy easing leads to increased risk-taking by mutual funds, which reallocate their portfolios toward lower-rated corporate bonds. These portfolio shifts lower bond yields and facilitate access to market-based debt financing, particularly for firms with weaker credit quality. While their focus is on medium-term bonds rather than CP per se, the findings suggest that mutual fund behavior – driven by search-for-yield incentives – can significantly influence corporate borrowing conditions, highlighting their role as an important transmission channel of monetary policy to the real economy.

Overall, the evidence supports Hypothesis 4: firms more reliant on mutual fund demand –especially in the CP market – adjust real activity more sharply when facing potential liquidity constraints. These results suggest that CP-financed firms may internalize funding fragility and proactively manage investment in response to shifts in investor demand. Given the short maturity and concentration risk of CPs, the interconnectedness of short-term debt markets and asset managers deserves close attention in discussions of corporate financial stability, particularly in emerging markets.

Table 7: Corporate Investment and Mutual Fund Ownership of Securities

This table presents fixed-effects panel regressions examining whether corporate investment behavior is influenced by the extent to which mutual funds hold a firm's commercial paper (CP). The analysis is based on a sample of 380 firms with mutual fund holdings data, covering 3,166 firm-quarter observations from 2021 to 2024. The dependent variables are capital expenditures scaled by lagged total assets (Panel A) and net working capital (NWC) growth (Panel B). Column (1) in each panel replicates the baseline regression specification using this smaller sample to establish comparability. Columns (2) and (3) introduce measures of mutual fund exposure. Share CP Held by Funds and Share Bond Held by Funds represent the fraction of a firm's outstanding CP and bond securities, respectively, that are held by mutual funds (including money market funds). These measures capture the potential sensitivity of firm financing to liquidity conditions in the asset management sector. All regressions control for net CP and bond issuance (except where excluded for specification clarity), Tobin's q, operating cash flow, firm size, return on assets, book leverage, the Kaplan-Zingales index, and, in Panel B, lagged NWC scaled by total assets. Firm and quarter fixed effects are included in all models. Standard errors are clustered at the firm level and reported in parentheses. Stars correspond to the statistical significance level, with *, **, and *** representing 10%, 5%, and 1%, respectively.

Panel A: CapEx

	(1) CapEx	(2) CapEx	(3) CapEx
Share CP Held by Funds		0.006**	0.005*
		(2.054)	(1.888)
Share Bond Held by Funds		0.000	0.000
		(0.041)	(0.044)
Net CP Issued/Total Assets	0.103		0.067
	(1.604)		(1.095)
Net Bond Issued/Total Assets	0.006		0.005
	(0.264)		(0.209)
Tobin's q	0.003	0.003	0.003
	(1.624)	(1.610)	(1.608)
Cash Flow/Total Assets	-0.012	-0.012	-0.011
	(-0.928)	(-0.900)	(-0.881)
Log(Total Assets)	-0.012	-0.012	-0.012
	(-1.306)	(-1.339)	(-1.323)
Return on Assets	0.040**	0.040**	0.040**
	(1.984)	(1.985)	(1.989)
Book Leverage	-0.029	-0.030	-0.029
	(-1.293)	(-1.338)	(-1.288)
Kaplan-Zingales Index	0.000	0.000	0.000
	(0.314)	(0.234)	(0.238)
Observations	3,166	3,166	3,166
Number of Firms	381	381	381
Adjusted R-squared	0.035	0.036	0.035
Firm FE	YES	YES	YES
Quarter FE	YES	YES	YES

Panel B: NWC Growth

	(1) NWC Growth	(2) NWC Growth	(3) NWC Growth
Share CP Held by Funds		0.011**	0.009*
		(2.226)	(1.873)
Share Bond Held by Funds		-0.001	-0.002
		(-0.278)	(-0.387)
Net CP Issued/Total Assets	0.280**		0.221*
	(2.148)		(1.756)
Net Bond Issued/Total Assets	0.057***		0.056***
	(2.708)		(2.719)
Tobin's q	0.007**	0.007**	0.007**
	(2.090)	(2.216)	(2.067)
Cash Flow/Total Assets	-0.005	-0.006	-0.004
	(-0.190)	(-0.206)	(-0.162)
Log(Total Assets)	0.001	0.000	0.001
	(0.133)	(0.012)	(0.097)
Return on Assets	0.007	0.007	0.007
	(0.216)	(0.223)	(0.227)
Book Leverage	-0.049**	-0.054***	-0.049**
	(-2.551)	(-2.816)	(-2.546)
Kaplan-Zingales Index	0.000	0.000	0.000
	(0.156)	(0.118)	(0.105)
Net Working Capital/Total Assets	-0.243***	-0.242***	-0.243***
	(-4.602)	(-4.553)	(-4.592)
Observations	3,166	3,166	3,166
Number of Firms	381	381	381
Adjusted R-squared	0.136	0.135	0.136
Firm FE	YES	YES	YES
Quarter FE	YES	YES	YES

6. Conclusion

This paper examines how Thai firms utilize capital market debt – specifically, commercial paper (CP) and bonds – to manage liquidity and finance their investments. Using firm-quarter panel data from 2001 to 2024, we find that access to CP markets allows firms to operate with higher leverage and invest more aggressively, even after controlling for firm characteristics through propensity score matching. CP issuance is positively associated with both capital expenditures and net working capital growth, consistent with the view that short-term unsecured debt enhances financial flexibility (Biguri, 2023)

Firms actively manage CP issuance as part of a dynamic funding strategy. Expanding CP beyond redemptions supports both capital expenditures (capex) and liquidity (net working capital), while net reductions are associated with cutbacks in net working capital. Even direct rollover – where new issuance matches maturing CP – coincides with higher capital expenditures, suggesting that CP is not merely used as bridge financing (Kahl et al., 2015), but as a targeted instrument aligned with firm-specific needs. While CP issuance enhances financial flexibility, it increases exposure to rollover risk, especially when used to finance illiquid assets. These risks are amplified during market stress or investor redemptions (Acharya et al., 2011; Brunnermeier & Oehmke, 2013).

Debt composition also influences outcomes. Firms with more diversified debt structures maintain higher leverage (Colla et al., 2013), and those with greater mutual fund ownership of CP – particularly by money market funds – exhibit higher investment. This pattern suggests that institutional demand for short-term instruments relaxes financing constraints, enabling firms to expand their liquidity buffers and investment outlays.

These dynamics suggest a broader mechanism through which non-bank financial intermediaries influence firm behavior. As mutual funds account for a growing share of corporate debt holdings, their search-for-yield incentives and performance-sensitive flows influence how credit is allocated across firms. Monetary policy, therefore, transmits not only through interest rate levels but also through the responsiveness of institutional investors to policy signals (Goldstein et al., 2017; Worasak et al., 2022). To fully assess the impact of monetary easing, central banks should also consider how liquidity is intermediated through capital markets and the potential vulnerabilities inherent in this transmission channel.

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