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EFFECT OF SPREAD AND TRANSACTION COSTS ON FINANCIAL MARKETS

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Abstract: This paper examines the impact of bid-ask spreads and transaction costs on trading behaviour, market efficiency, and asset pricing in financial markets. Building on established theoretical models, including Roll (1984), Glosten and Milgrom (1985), Kyle (1985), and Amihud and Mendelson (1986), the study integrates recent empirical evidence from equity, fixed-income, and cryptocurrency markets up to 2026. The results show that bid-ask spreads represent not only execution costs but also reflect information asymmetry and market conditions. Transaction costs influence trading activity, portfolio decisions, and contribute to the liquidity premium in asset returns. Furthermore, modern developments such as zero-commission trading, high-frequency trading, and payment for order flow have reshaped cost structures in financial markets. Evidence from recent U.S. Treasury market volatility highlights the role of spreads in market stability. The study also evaluates financial transaction taxes, emphasizing their trade-offs between revenue generation and market efficiency.

Index Terms - Bid-Ask Spread, Transaction Costs, Market Liquidity, Asset Pricing, Market Microstructure, Liquidity Premium, Adverse Selection, High-Frequency Trading, Financial Transaction Tax

I. INTRODUCTION

A. Background

Financial markets operate with inherent frictions that affect how trades are executed and how prices are determined. Every transaction in equity, bond, foreign exchange, and digital asset markets involves costs such as bid-ask spreads, brokerage fees, taxes, slippage, and market impact. Among these, the bid-ask spread—defined as the difference between the buying (bid) and selling (ask) prices—represents the most fundamental cost of immediate execution. These trading frictions are not incidental but are a structural feature of financial markets, influencing liquidity, price formation, and overall market efficiency.

B. Theoretical Foundation

The study of trading costs has evolved significantly over time. Early work by Demsetz introduced the concept of the bid-ask spread as the "price of immediacy." Later, models developed by Roll, Glosten and Milgrom, and Kyle provided deeper insights into spread determination, highlighting the role of information asymmetry, order flow, and market depth. In addition, asset pricing theories proposed by Amihud and Mendelson, along with Constantinides, demonstrated that transaction costs directly influence expected returns and investor behavior, giving rise to the concept of a liquidity premium.

C. Modern Market Developments

In recent years, financial markets have undergone major structural changes. The introduction of zero-commission brokerage models, the rise of algorithmic and high-frequency trading, and the rapid growth of cryptocurrency markets have transformed how transaction costs appear in practice. While explicit costs such as commissions have declined, implicit costs—such as spreads and execution quality—remain significant. Furthermore, events like the COVID-19 liquidity crisis and recent U.S. Treasury market volatility have shown that spreads widen during periods of stress, affecting overall market stability.

D. Objective and Scope

This paper aims to provide a comprehensive analysis of how bid-ask spreads and transaction costs influence financial markets. It combines established theoretical models with recent empirical observations to examine their impact on liquidity, price discovery, trading behavior, and asset pricing. The study also considers modern structural changes and policy implications, offering a broader perspective on the role of trading frictions in contemporary markets.

E. Paper Organization

The remainder of this paper is structured as follows. Section II reviews existing literature and identifies research gaps. Section III presents the system model of financial markets. Section IV and V describe the methodology and analytical framework. Section VI discusses implementation and data analysis. Section VII presents results and discussion, followed by the conclusion in Section VIII.

II. LITERATURE REVIEW

A. Classical Models of Bid-Ask Spread

The foundation of bid-ask spread analysis originates from early theoretical models that explain how trading costs arise in financial markets. Roll (1984) introduced an implicit spread estimator based on price movements, showing that transaction prices exhibit negative serial correlation due to the bid-ask bounce effect. This model provided one of the first quantitative approaches to estimating spreads using only price data.

Glosten and Milgrom (1985) extended this framework by incorporating information asymmetry between traders. Their model demonstrated that market makers face adverse selection risk when trading with informed participants, leading to the existence of a positive bid-ask spread as compensation for potential losses. Similarly, Kyle (1985) introduced a dynamic model of trading in which price impact is determined by order flow, formalized through Kyle's Lambda (λ), which measures market depth and liquidity.

C. Market Liquidity and Price Discovery

Market liquidity is closely linked to bid-ask spreads and transaction costs. A narrow spread typically indicates a liquid market, while a wider spread reflects higher trading costs and reduced liquidity. Studies have shown that spreads affect price discovery by influencing the flow of information into market prices. Hasbrouck (1991) demonstrated that both trades and quotes contribute to price discovery, with quotes playing a significant role in reflecting market expectations. Additionally, empirical research suggests that lower transaction costs improve market efficiency by encouraging informed trading, while higher costs may slow down the incorporation of information into prices.

D. Structural Changes in Modern Markets

Recent developments have significantly altered the structure of financial markets. The introduction of zero-commission trading has reduced explicit costs but increased reliance on mechanisms such as payment for order flow (PFOF), which may affect execution quality. High-frequency trading has contributed to tighter spreads under normal conditions but may lead to reduced liquidity during periods of market stress. The rise of cryptocurrency markets has introduced new dynamics, including higher volatility and varying liquidity conditions. These markets often exhibit wider spreads compared to traditional financial markets, highlighting the continued importance of transaction costs in emerging trading environments.

E. Research Gap

Despite extensive research, several gaps remain in the literature. Many studies focus on individual aspects such as spread estimation or asset pricing, with limited integration across different market segments. Additionally, recent structural changes—including algorithmic trading, PFOF, and digital asset markets—are not fully incorporated into traditional models.

Feature	Existing Studies	This Study
Multi-market analysis	Limited	Included
Modern market structure	Partial	Covered
Behavioural impact	Limited	Considered
Integration of theories	Fragmented	Unified

III. SYSTEM ARCHITECTURE

A. Architecture Overview

The proposed system models the interaction between market participants, trading mechanisms, and transaction cost components within a financial market environment. Unlike traditional software systems, the architecture represents a conceptual financial framework where trades are executed through a structured flow involving order placement, price determination, and cost application.

The system captures how bid-ask spreads and transaction costs influence the execution process, liquidity conditions, and final transaction prices. It integrates both explicit costs (such as commissions and taxes) and implicit costs (such as market impact and slippage), providing a unified representation of trading frictions.

B. Architecture Diagram

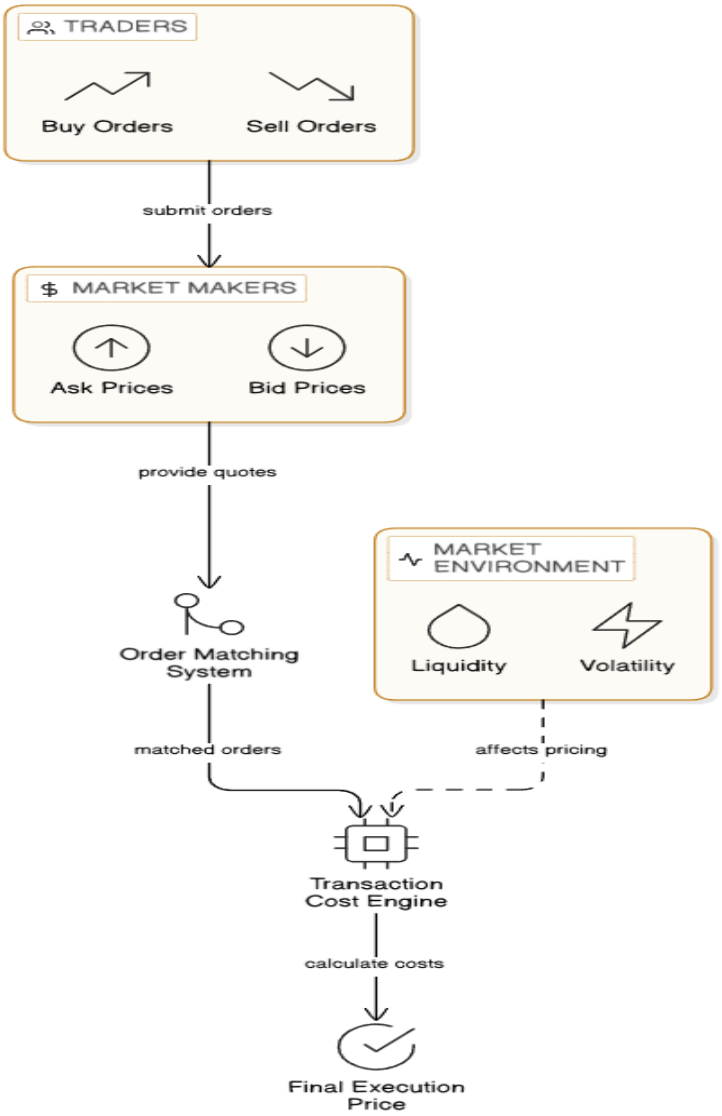

Fig. 1. Financial Market Transaction Cost Architecture

C. Architecture Components

Component	Function
Traders	Initiate buy/sell orders
Market Makers	Provide liquidity and set bid-ask prices
Order Matching System	Matches buy and sell orders
Transaction Cost Engine	Calculates total trading cost
Market Environment	Determines liquidity and volatility

D. Functional Layers
The system is divided into multiple functional layers:

Layer	Description
Input Layer	Receives trade orders from market participants
Processing Layer	Matches orders and determines execution
Cost Layer	Applies spread and transaction costs
Output Layer	Generates final execution price

D. Data Flow
The overall process follows a sequential flow:

1. Trader places an order (buy/sell)
2. Market maker provides bid and ask prices
3. Order matching system executes the trade
4. Transaction costs are applied
5. Final execution price is generated

IV. CONCEPTUAL FRAMEWORK AND COST MODEL

A. Bid-Ask Spread Model
The bid-ask spread represents the primary cost of immediate trade execution in financial markets. It is defined as the difference between the ask price (selling price) and the bid price (buying price). The spread reflects market liquidity, information asymmetry, and transaction risk faced by market makers.

A wider spread indicates higher trading costs and lower liquidity, while a narrower spread suggests a more efficient and liquid market.

B. Types of Transaction Costs
Transaction costs can be broadly classified into two categories:

Type	Components
Explicit Costs	Brokerage fees, commissions, taxes
Implicit Costs	Bid-ask spread, market impact, slippage

Explicit costs are directly observable, whereas implicit costs arise from market conditions and execution quality.

C. Cost Components Interaction
Different cost components interact to determine the total cost of trading. For example, large trade sizes may increase market impact, while volatile conditions may widen spreads and increase slippage.
These interactions make transaction cost analysis essential for understanding real trading performance.

D. Total Cost Model

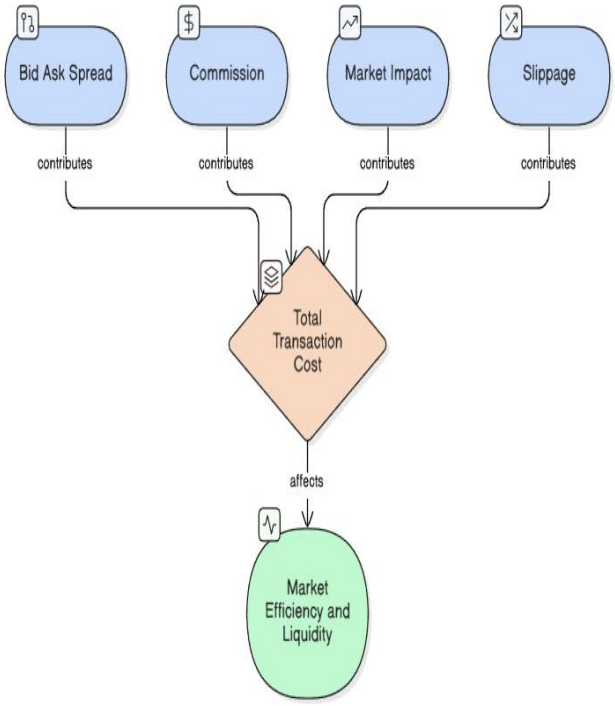

Fig. 2. Transaction Cost Model

The overall transaction cost can be expressed as:

$$T_{total} = Spread + Commission + Market\ Impact + Slippage$$

This model provides a simplified representation of trading costs and is used throughout the study to analyse market behaviour.

E. Impact on Market Efficiency

Transaction costs directly influence market efficiency by affecting trading activity and price discovery. Higher costs reduce participation and slow down the incorporation of information into prices, while lower costs improve liquidity and efficiency.

V. LOW LEVEL DESIGN (LLD)

A. Component Overview

The low-level design represents the internal functional components of the financial model used to analyse transaction costs and bid-ask spreads. Each component focuses on a specific aspect of trading behaviour and market dynamics.

B. Module Description

Module	Responsibility
Spread Module	Calculates bid-ask spread and execution cost
Transaction Cost Module	Computes total trading cost including fees and slippage
Liquidity Module	Evaluates market depth and trading conditions
Pricing Module	Determines asset price adjustments
Analysis Module	Interprets impact on trading behaviour

C. Component Interaction

The modules interact sequentially:

1. Market data is received
2. Spread is calculated
3. Transaction costs are computed
4. Liquidity conditions are evaluated
5. Final impact on pricing is determined

VI. METHODOLOGY

A. Analytical Framework

The study follows a structured analytical approach to examine the impact of bid-ask spreads and transaction costs on financial markets. It combines theoretical models with simplified empirical observations to understand how trading frictions affect liquidity, price discovery, and investor behaviour.

The methodology focuses on identifying key cost components and analysing their influence on trading decisions and market efficiency.

B. Transaction Cost Model

The total cost of executing a trade can be expressed as:

$$T_{total} = Spread + Commission + Market\ Impact + Slippage$$

Each component contributes differently to the overall cost:

- **Spread**: Cost of immediate execution
- **Commission**: Broker-related charges
- **Market Impact**: Price movement caused by trade
- **Slippage**: Difference between expected and actual price

C. Processing Pipeline

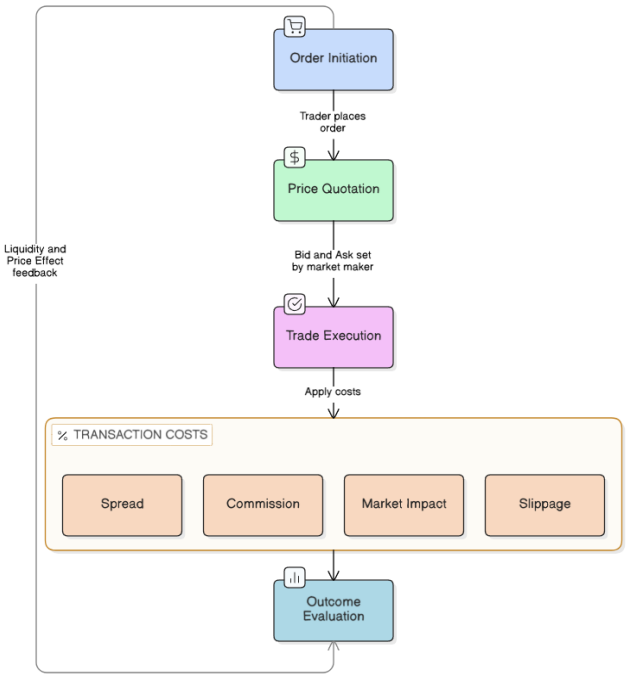

Fig. 3. Transaction Cost Analysis Pipeline

The analysis follows a step-by-step pipeline:

1. **Order Initiation** – Trader places buy/sell order
2. **Price Quotation** – Market maker sets bid and ask prices
3. **Trade Execution** – Order is matched in the market
4. **Cost Application** – All transaction costs are applied
5. **Outcome Evaluation** – Final impact on price and liquidity is analysed

D. Key Factors Considered

The study evaluates several factors affecting transaction costs:

- Market volatility
- Trade size
- Liquidity level
- Information asymmetry
- Market structure

E. Optimization Objective

The primary objective is to minimize total transaction cost while maintaining efficient trade execution. This involves balancing speed, cost, and market impact to achieve optimal trading outcomes.

VII. ANALYSIS AND APPLICATION

A. Data and Market Scope

The study is based on observations from multiple financial markets, including equity, fixed-income, and cryptocurrency markets. It incorporates recent market conditions and real-world examples to analyse the behaviour of bid-ask spreads and transaction costs.

B. Application of Theoretical Models

The theoretical models discussed in earlier sections are applied to understand real market behaviour. Spread estimation models help evaluate trading costs, while liquidity and market impact models explain how trades influence prices.

These models are used to interpret how transaction costs affect trading activity, portfolio decisions, and market efficiency across different market environments.

C. Market-Based Observations

The analysis highlights several practical observations:

- Transaction costs vary across different asset classes
- Liquidity conditions directly influence spread size
- Volatility leads to higher execution costs
- Hidden costs such as slippage and market impact remain significant

D. Comparative Market Analysis

Different market structures exhibit different cost behaviours:

Market Type	Cost Behaviour
Equity Market	Moderate spreads, high liquidity
Bond Market	Lower liquidity, variable spreads
Cryptocurrency	High volatility, wider spreads

E. Key Insights

- Lower transaction costs increase trading activity
- Higher costs lead to reduced market participation
- Liquidity plays a critical role in cost determination
- Modern markets have shifted costs from visible to hidden forms

VIII. RESULTS AND DISCUSSION

A. Performance Metrics

The analysis evaluates the impact of bid-ask spreads and transaction costs on key market indicators such as liquidity, trading activity, and price efficiency. The following table summarizes the observed relationships:

Metric	Observation
Bid-Ask Spread	**Increases during high volatility**
Trading Volume	**Decreases with higher transaction costs**
Market Liquidity	**Inversely related to spread size**
Price Efficiency	**Slows down with increased trading frictions**

B. Key Observations

The study reveals several important patterns in financial markets:

- **Bid-ask spreads widen during periods of uncertainty and market stress**
- **Higher transaction costs reduce trading frequency and participation**
- **Liquidity decreases as spreads increase, especially in less active markets**
- **Transaction costs contribute to longer holding periods for investors**
- **Implicit costs such as market impact and slippage remain significant**

C. Comparative Analysis

The behaviour of transaction costs varies across different market structures:

Feature	Traditional Markets	Modern Markets
Cost Visibility	Transparent	Partially hidden
Liquidity	Stable	Dynamic
Trading Type	Manual	Algorithmic
Spread Behaviour	Moderate	Highly variable

D. Discussion

The results confirm that transaction costs are a central factor in determining market efficiency. Higher costs discourage trading activity and slow down the process of price discovery, leading to temporary inefficiencies in the market. At the same time, spreads serve an important function by compensating liquidity providers and reflecting underlying information asymmetry.

Modern market developments have significantly altered cost structures. While explicit costs such as brokerage commissions have declined, implicit costs have become more important. Mechanisms such as payment for order flow and high-frequency trading have improved liquidity under normal conditions but may contribute to instability during periods of stress.

Additionally, empirical observations from recent market events, including Treasury market volatility and cryptocurrency fluctuations, highlight that spreads remain sensitive to macroeconomic conditions and investor sentiment. These findings suggest that transaction costs continue to play a critical role in shaping financial market behaviour.

IX. CONCLUSION

This paper examined the impact of bid-ask spreads and transaction costs on financial markets by combining
established theoretical models with recent market observations. The analysis shows that trading frictions are
not merely operational costs but fundamental components that influence liquidity, price discovery, and investor behaviour.

The findings indicate that higher transaction costs reduce trading activity, increase holding periods, and contribute to the existence of a liquidity premium in asset returns. Bid-ask spreads, in particular, serve as key indicators of market conditions, reflecting both liquidity levels and information asymmetry. While narrower spreads are associated with efficient and liquid markets, wider spreads often emerge during periods of volatility and uncertainty, affecting overall market stability.

Furthermore, structural changes in modern financial markets—including zero-commission trading, high-frequency trading, and the rise of digital asset markets—have altered how transaction costs are observed and experienced. Although explicit costs have declined, implicit costs such as market impact and execution quality remain significant. This shift highlights the importance of understanding the full cost structure of trading rather than focusing only on visible expenses.

The study also emphasizes that policy measures such as financial transaction taxes must be carefully evaluated, as they may reduce market efficiency by increasing trading costs and lowering liquidity. Overall, the results demonstrate that transaction costs continue to play a critical role in shaping financial markets.

Future research can focus on integrating artificial intelligence-based trading strategies with transaction cost models, as well as exploring cost dynamics in emerging markets and decentralized financial systems.

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