

## A SUPPLY-LOCK COMPETITIVE MARKET FOR INVESTABLE PRODUCTS



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### ABSTRACT

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We propose a new market structure, a supply-lock competition (SLC), for analyzing transactions of investable goods. This study explains and analyzes how the SLC is applicable for transactions of stock, art, real estate, currency, and scarce goods. We suggest that the formation and fluctuation of the market price for these investable assets are not only related to their intrinsic values or investors' behavior, but are also derived from supply restriction. A mechanism of the SLC market structure benefits market efficiency but also continues volatility of asset prices in secondary markets as well. We demonstrate that a demand orientation dominates the valuation of investable assets, resulting in a divergence of market price and intrinsic value.

#### JEL Classification:

D4, L1.

**Contribution/ Originality:** The study contributes to the literature by clearly describing and explaining a supply-lock competitive market structure, in a manner that previous studies have not analyzed. The supply-lock competitive market is more applicable for explaining the practical phenomenon of price dynamics for investable assets.

## 1. INTRODUCTION

It is well known that an important assumption in modern financial theory is that the financial market is regarded as a perfectly competitive market. Perfect competition plays a basic role for analyzing the equity market in these financial theories: the capital asset pricing model (Sharpe, 1964; Lintner, 1965) the arbitrage pricing theory (Ross, 1976) the mean-variance model of portfolio selection (Markowitz, 1952) and the efficient market hypothesis (Fama, 1970). Financial economists employ principles and methodologies of perfect competition to determine equity prices and to explain price dynamics. However, within the market structure for perfect competition it is difficult to describe asset misprice or continued fluctuation of equity prices over a long period of time.

In this study, we propose a new market structure, a supply-lock competition (SLC), to explain asset misprice and persistent fluctuation of asset prices over a longer period. The investable assets are underlying assets that can be traded, including equities, art, real estate, stamps, currencies, housing, and scarce goods. Supply quantity is restricted in the primary market for these investable assets. We find that the SLC can perfectly explain why investable assets have continued misprices and fluctuations, which cannot be solved by the perfect competition or

monopoly competition. We analyze market structure of investable assets by a supply-demand analysis in both primary markets and secondary markets.

Many previous studies focused on financial markets have presented significant evidences of continued mispricing of investable assets (Boswijk *et al.*, 2007; Beltratti and Morana, 2010; Gwilym and Verousis, 2010; Necula, 2012; Noussair *et al.*, 2016). A framework of market structures based on perfect competition or monopolistic competition does not easily explain continued mispricing over a prolonged period of time. We believe that the traditional market structures themselves hard explain the misprice and fluctuation phenomena that have been outlined by previous studies.

In fact, restricted to asset supply, the transaction of investable products in an organized market cannot be appropriately framed within perfect competition. The primary market for equity, or other investable assets, is restricted by supply quantity. Public-listings in the equity market are administered by the exchange and government through a series of supervised processes. Sources of art are limited by the artists' creativity, and the rarity of their works (for example, the artwork of a deceased artist). Land resources and houses cannot be developed immediately and easily. An issue or circulation of currencies is controlled by the central bank. A limited supply of investable assets restricts the ability of the market to be perfect competitive.

Although the supply sources for investable assets are limited in the primary market, the secondary market for investable assets tends to be perfectly competitive. The reasons for a perfectly competitive secondary market are followings. First, investors with speculation, hedging, or arbitrage motives participating in the equity markets maximize their interests. Second, the investors can freely enter or exit the secondary markets for trading investable assets. That is, the transactions in these secondary markets are rather efficient and competitive.

Many studies have examined various aspects of market structures and how structure itself explains organizational behavior and asset price (Anania and Scoppola, 2014; Braido and Shalders, 2015). Recent studies of market structures tend to focus on market integration and strategic interactions (Eső *et al.*, 2010; Ghossoub *et al.*, 2013; Legros and Newman, 2013; Fiocco, 2016). For example, explaining how market structure influences monetary policy, Ghossoub *et al.* (2013) suggest that a higher growth rate of monetary brings about a lower rate of interest and a many transactions of lending behavior under a perfect competition scenario. However, the capital cost tends to be higher and the trading activity tends to be lower for the monopoly financial sector. Braido and Shalders (2015) analyze a contestable market and find that the entrant is able to charge high prices.

Other studies have analyzed market structure of trading assets, focusing on the impacts of market structure on prices, profits, and firm policies (e.g., (Eső *et al.*, 2010; Wang and Zheng, 2012; Erto, 2013; Ferrer, 2013; Balmaceda *et al.*, 2014; Dionne and Santugini, 2014)). Guriev and Kvasov (2009) develop a model for imperfect competition in financial markets with an endogenous capital structure for analyzing firms' financing decisions. The authors suggest that a strategic interaction between oligopolistic intermediaries derives multiple equilibriums. Eső *et al.* (2010) analyze the behavior of an industry requiring scarce input, in which firms compete to purchase capacity in an upstream market, showing that industry structure is symmetric if input capacity is sufficiently sparse. Erto (2013) proposes that most markets are characterized by a small number of large firms that utilize strategic behavior in their decisions related to investments and production. By considering the impact of market structure on firm profits, Wang and Zheng (2012) suggest that production elasticity has less of an influence than demand elasticity in a perfect competition, and that a monopoly makes the impact of demand and production elasticity more obvious on the firm's profits in an imperfect competition market. Previous studies have examined firm behavior, profit, and demand for investable assets in a traditional framework of market structures, while our study aims to further analyze market price formation and supply-demand influence for investable assets in a supply-lock competitive market.

We propose a new perspective of market structure for rationally explaining and correctly analyzing the markets for investable goods, such as equity, art, real estate, currency, and other scarce assets. Differing from

perfect competition, oligopoly, and monopolistic competition, the supply-lock competition is based on a limited supply quantity in the primary market and non-limited transactions for the investors in the secondary market. The determination and characteristics of asset price in the supply-lock competitive market have unique features compared to other traditional market structures.

This article contributes to the financial theory and industrial organization by providing a new perspective on market structure in order to analyze and explain stylist facts regarding practical transactions of investable assets. Supply-lock competition is more appropriate for analyzing investable assets than perfect competition or monopolistic competition.

We concretely explain why investable asset markets are more appropriately analyzed by a *SLC* market structure, not by perfect competition or monopoly. The underlying reason is that all investable assets are restrictedly supplied by artificial managements and natural limits. For example, equity assets, a major representative class of investable assets, are not adequately issued by firms. Government financial ministry or exchange control equity shares outstanding in total.

In addition, this study further analyzes the misprice problem and continued fluctuation of investable assets in the markets. The *SLC* is useful to explain stylist facts that the markets appear misprice and continued fluctuation over a longer period of time. Employing a reason of locked supply for investable assets, we can demonstrate that a divergence of market price and intrinsic value is continually existed in the markets.

This study is organized in four sections. In next section, we explain the practicalities of the supply-lock competitive market in terms of equity. Next, we show our analysis of a theoretical framework for supply-lock competitive market. Finally, we outline the findings and conclusion of our study.

## 2. SUPPLY-LOCK EQUITY MARKETS

Equity markets are generally regarded as the standard example of perfectly competitive markets, whereby a large number of buyers and sellers, who receive perfect information, can freely enter and exit the markets and trade a homogeneous product (Browning and Zupan, 2012; Mankiw, 2012). In this type of market structure, asset prices immediately reflect information that is available without costs. Specifically, asset supply for these perfect homogeneous products is provided by the firms without restrictions. Although research on equity markets with an assumption of perfect competition has attracted considerable attention and has yielded ample results in the academic literature, it has not been appropriately analyzed in terms of its applicability restrictions.

From a practical perspective, in a comprehensive trading environment for equity markets, the exchange governs and sets barriers for equity issuing in the primary markets to keep a constant or stable supply in the markets. The initial public-offerings (IPOs) of stocks are limited by the total amount of available trading in the primary market, while the seasoned equity offerings (SEOs) and stock repurchases, approved by the exchange, extend or contract outstanding shares in the secondary market, respectively. Specifically, the exchange institutes a threshold of equity issues by a series articles or audit procedures. Thus, the supply of stock shares is locked in the primary market and is controllable in the secondary market.

This locked supply creates a scarcity in financial trading and generates a monopolistic premium for equity markets, in which many investors pursue premiums in the secondary markets. Investors freely entering or exiting the secondary market of stock transactions can aid in achieving an efficient and competitive mechanism.

The exchange requires that fees be paid for equity issuing, listing maintenance, and preventing defaults on tradable stocks. As a result, an entry barrier and a limitation of equity supply are formed in equity primary market. First, a high cost related to administrative activities and maintenance restricts or locks the supply quantity. Second, the requirement of an information disclosure of business operations and financial statements also creates a cost that may prevent defaults or bankruptcies for the listing of equities. For example, the Sarbanes-Oxley act of 2002,

derived from the bankruptcy of Enron Corporation, increases the information cost to prevent bankruptcy of publicly-listed companies.

Although the equity issuing of a primary market is limited, the primary market differs from a monopolistic market in terms of premium sharing. In a monopolistic market the monopolists decide a market price (issuing price), supply assets with a constant amount, and then receive a monopolistic premium. However, in the equity market, the exchange and public-listing companies lock the equity supply but they leave the monopolistic premium to the investors in equity market. The investors can purchase and sell the stocks to pursue these monopolistic premiums.

An entry barrier in the primary market for equities effectively prohibits a publicly issued stock from entering the security markets of companies with weak prospects or low competitions, resulting in a limit of tradable amounts for publicly-listed equities in the secondary markets. In addition, investors tend to devalue bad stocks in a highly competitive security market. Thus, whether or not they go to the public firms have discretion on the costs and interests. A series of equity issues can neutrally restrict or lock the supply amount allocated to security markets.

In short, subject to a restriction of supply, the equity market is not demonstrated as to be perfect competition or monopolistic competition. Due to a limited supply of equity, the equity market naturally generates a monopolistic premium, which it is shared by the market traders.

### 3. THEORETICAL ANALYSIS FOR A SUPPLY-LOCK COMPETITIVE MARKET

A *SLC* market structure is not only applicable in the equity markets, but also appropriate in the markets of various investable assets, such as art, stamp-collection, real estate, currency, some agriculture products, and scarce goods. The reason is that the primary markets for these investable assets are subject to supply and their secondary markets exhibit a competitive feature. In fact, the perfect competition or monopolistic competition is not appropriate for these analyses on the transactions of these investable assets. Specifically, a monopolistic premium generated from the supply-lock mechanism is not enjoyed by the monopolists, whereas the market investors can competitively pursue the premium by freely entering or exiting the market. In this study, the supply-lock competitive market is defined as a market structure which incorporates a temporary supply-lock in the primary market, and perfect competition in the secondary market, in which the monopolistic premium is shared by the investors in the secondary market.

#### 3.1. *Temporary Locked-Supply*

Locked supply in the primary market creates a special form of monopoly, in which the supply quantity temporarily keeps a constant or controllable state. Due to a limit of supply sources, the supply-lock market appears to have several reasons for its natural and artificial factors. For example, due to a genuine limit of art created by artists, art trading belongs to a market structure with supply-lock. An artificial system of regulation restricts potential supplies in the equity market, money market, and stamp-collection market. In addition, subject to both artificial factors of government administration and natural factors of land capacity, the real estate market appears to have a supply-lock structure.

In a supply-lock competitive market, given a short period of time, the supply quantity is temporarily constant, resulting in an inelasticity of supply. However, given a longer period of time, the exchanges, farmers, house construction developers, firms, or individuals can gradually adjust supply quantity of investable assets by issuing new assets or repurchasing existing assets.

#### 3.2. *Asset Pricing by Demand Orientation*

Asset demand plays a key role in the price determination of a supply-lock market because the asset supply is temporarily controlled or restricted such that the excess demand can be mitigated by market price increases. Investors tend to expect a monopolistic premium, which appears in the supply-lock market. Thus, a motivation for

pursuing the monopolistic premiums derives an endogenous mechanism in the price dynamic, in which a continued trend of upward or downward changes for the asset price further stimulates a demand for the asset. As a result, price dynamic is mainly dominated by demand orientation in the market, not by supply orientation. If a demand for the asset increases, the equilibrium price increases.

In short, the determination of market price for the investable assets relies on the asset demand. While the intrinsic value of the asset turns out to have less of an impact on the asset price. Instead of intrinsic value, a demand for pursuing the monopolistic premium appears to have a stronger impact on the determination of market price.

### *3.3. Monopolistic Interests Shared in the Secondary Market*

With the exception of acquiring expected cash flows from the payouts of the firms, investors pursue a monopolistic premium in the secondary markets, in which the monopolistic premium is generated from a supply monopoly or lock. Specifically, the monopolistic premium in the primary market is not captured by the exchange or issuing firms and is left in the secondary market for the investors. In a supply-lock market, limited amounts of investable assets in the secondary markets derive a higher trading price and the price continues for a longer period of time. The supply is inelastic in response to the trading price; inversely, the demand performs elastic in the supply-lock competitive markets. As a result, the secondary market gradually tends to appear perfectly competitive because the investors chase the monopolistic premium, whereby many investors freely enter and exit the secondary market for these gains.

### *3.4. Variance in Asset Price over Time*

The asset price is more variable in the secondary market. First, given just a short period of time, the supply is not effectively adjusted with the market price, resulting in a significant effect of demand on the prices. A change in demand turns out to have a greater influence on asset price and exhibits higher variance of prices, compared to perfectly competitive markets, in which the supply can be elastically adjusted to the market price in the perfectly competitive market. Thus, as market news is released or as investors perform herding, the asset price varies mainly due to a change in asset demand if the supply quantity keeps constant over a temporary period of time.

Second, due to investors pursuing a monopolistic premium, market prices have themselves endogenous self-enhancement mechanisms. That is, asset prices tend to continuously change in response to trends, in which each trend further stimulates more or less demand as the price goes upwards or downwards, respectively.

Third, the market price exhibits an overreaction to good news or bad news. Subject to the lock supply quantity of assets, the market supply displays inelasticity and the market demand demonstrates more elastic in the secondary market. Thus, a signal or shock in the market can cause more frequent, continuous, and various impacts on asset price.

### *3.5. A Divergence of Market Price and Intrinsic Value*

Investable assets have intrinsic value. Market investors appreciate stock with a high expected value of future cash flows or growth opportunity, and depreciate stock with a bad prospect. Specifically, the intrinsic value varies with business operation, profit possibility, and market uncertainty. In a perfectly competitive market, the investors give a more correct valuation based on the evaluations of the firm's intrinsic value. However, in a supply-lock market, investors associate higher valuation with investable assets rather than intrinsic value, resulting in a divergence between market price and intrinsic value. This divergence tends to vanish in the long run since a larger number of investors can freely enter and exit to capture the potential monopolistic premium and because the restriction of locked supply is gradually reduced.

In short, based on these analyses, our study suggests that a *SLC* market structure is effective and adequate to analyze practices of transactions for investable assets, even though supply is temporarily limited. The monopolistic

premium generated from the supply lock turns out to be a means of promoting market efficiency and continuing asset volatility.

#### 4. CONCLUSION

Many investable assets are governed by some forms of supply restrictions, leading to the inappropriate assumption that perfect competition or monopolistic competition is employed to analyze the transactions of investable assets. Our study presents a significant contribution to both the financial economics literature and industrial organizations by describing, explaining, and analyzing investable assets using a market structure based on a supply-lock competitive market. Specifically, we have defined market structure and analyzed price characteristics to better explain the transactions of equity, art, stamp-collection, real estate, and scarce goods, from a perspective of monopolistic premium and locked supply.

The supply-lock competitive market is defined as a market structure that incorporates a temporary monopoly or locked supply in the primary market and perfect competition in the secondary market. Subject to a temporary locked-supply quantity, the monopolistic premium is formed in the primary market and is then shared by investors in the secondary market. Specifically, an increase of supply quantity by SEOs or a decrease by stock repurchasing, can lead to continue volatility of asset price for a longer period of time. A demand orientation dominates the valuation of investable assets, resulting in a divergence of market price and intrinsic value.

Overall, our study concludes that the supply-lock competitive market is more applicable for explaining the practical phenomenon of price dynamics for investable assets. The study contributes to the literature by clearly describing and explaining a supply-lock competitive market structure, in a manner that previous studies have not analyzed. This type of market structure can be further applied in the real estate market, art market, and others, and solves problems that could not be completely and applicably analyzed by traditional market structures.

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