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Liquidity and asset prices in a monetary model with OTC asset markets

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Abstract

We study how asset prices are affected by the amount of liquidity that is available in over-the-counter asset markets where dealers post prices and quantities at which they are willing to buy and sell assets. We find that higher levels of market liquidity lead to higher asset prices and lower bid–ask spreads. Hence, an increase in inflation—which lowers market liquidity—*increases* asset returns and *decreases* asset prices. When agents' immediate consumption needs are stochastic, asset prices will fluctuate even though asset fundamentals are unchanging. The fluctuations in asset prices reflect the stochastic availability of market liquidity that results from agents' changing consumption opportunities.

JEL classification: E41; E44; G12

Keywords: Liquidity; Asset pricing; OTC markets; Inflation

1. Introduction

This paper investigates how liquidity affects asset prices and returns for assets that are traded in over-the-counter (OTC) markets. We focus on OTC markets because many important asset classes, e.g., U.S. Treasuries, trade OTC. In a typical OTC transaction, a buyer or seller contacts

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an intermediating agent—a dealer—and either transacts at posted bid and ask prices or privately negotiates a price and quantity. We propose a model that captures some of the basic characteristics of OTC markets such as: (i) the existence of search frictions; (ii) the role of dealers that make "two-way" markets by posting bid and ask prices and quantities; and (iii) the role that money plays on both sides of the dealer's trades, where assets trade for money and money trades for assets.

One can imagine two distinct situations where agents trade assets: before and after uncertainty regarding random consumption opportunities is resolved. *Before* uncertainty is resolved, monetary and non-monetary assets can be viewed as substitutes. Prices of non-monetary assets may reflect a liquidity premium since they can, e.g., be collateralized and used indirectly for transactions purchases. *After* uncertainty is resolved, monetary and non-monetary assets can be viewed as complements since the latter cannot be used in monetary trade. As a result, prices of non-monetary assets may reflect a "liquidity discount." Because of these differences one might expect that when the economy is hit by an exogenous shock, the *ex ante* price response would be different than the *ex post* price response. If, for example, the exogenous shock is an increase in inflation, then a vast literature predicts that *ex ante* asset prices will increase. This result, sometimes referred to as the Mundell–Tobin effect (Mundell, 1963; Tobin, 1965), captures the idea that an increase in inflation induces a substitution away from money into non-monetary assets, which in turn increases the price (and decreases the return) of non-monetary assets. Understanding how *ex post* asset prices respond to an increase in inflation, however, is complicated by the fact that the future is uncertain and the *ex post* asset price will reflect its future substitutability and the liquidity premium that goes with it. Put another way, the future Mundell–Tobin effect on asset prices contaminates the pure *ex post* liquidity reallocation effect on asset prices. In this paper, we focus on OTC asset trade that is driven solely by *ex post* liquidity reallocation considerations and we do so by essentially shutting down the *ex ante* motive for trading assets. As a result, the Mundell–Tobin effect is absent from our economic environment.

Here is a preview of our results. Our first important finding is that asset prices are positively correlated with the amount of liquidity that is available in OTC markets. A related result is that if there are aggregate shocks to consumption opportunities, asset prices will fluctuate over time even though asset fundamentals are unchanging. The fluctuations in asset prices reflect changing availability of liquidity in OTC markets that result from changing consumption opportunities. Our second important finding is that an increase in inflation *decreases* asset prices and *increases* asset returns. This prediction, which runs counter to the standard Mundell–Tobin effect, is consistent with evidence compiled in Lagos and Zhang (2013) and with the observation that periods of low inflation are usually associated with periods of high asset prices (Christiano et al., 2010). The intuition that underlies the negative correlation between inflation and asset prices is fairly straightforward. An increase in inflation reduces agents' holdings of real balances since money is more costly to hold. If an agent gets a consumption opportunity, his valuation of an additional unit of real balances—which are needed to exploit the consumption opportunity—is now higher since he is holding less real balances. As a result the agent is willing to part with his asset—for needed real balances—at a lower price. Our third important finding relates to bid and ask prices. Since a dealer intermediates agents, buyers and sellers will transact at different asset prices: the ask price for the former and the bid price for the latter. We find that there is a positive relationship between asset returns and bid–ask spreads, as well as a positive relationship between inflation and bid–ask spreads. These