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LIQUIDITY EFFECT ON THE ASSET PRICE FORECASTING

H. Merdan and H. Çakmak *†‡

Abstract. The effect of the high/low liquidity in the market on the asset price forecasting is studied by deriving a system of ordinary differential equations. The model is an extension of that introduced by Caginalp and Merdan for the system involving a single asset traded by heterogenous groups. Derivation is based on the finiteness of assets (rather than assuming unbounded arbitrage) in addition to investment strategies that are based on not only price momentum (trend) or valuation considerations but also the liquidity value. The time evolution of the asset price yielded by both models is compared for an example by numerical simulations.

Keywords. Asset pricing, asset flow differential equations, liquidity effect, liquidity value, steady states of asset prices, close-end funds.

AMS subject classification. 91G99, 34A34, 91B25, 91B26, 91G80.

1 Introduction

Classical finance theory largely depends on two basic assumptions. First of these is the assumption that there is general agreement on the valuation of an asset among market participants since the information is public and the second is the assumption that there is a huge amount of "arbitrage" capital that would quickly take advantage of any discrepancies from realistic value of the asset. Although these idealizations may be useful for the academic studies, the most of the market participants pay attention to other things such as the derivative of the price called as trend and/or the high/low liquidity in the asset market beside the valuation of the stock. On the practical level, one can see each day that differing views are held by different market participants, and there is also ample evidence that practitioners have no faith in these assumptions [1, 7]. For example, in the initial or secondary public offering market there are always analysis and speculation as to whether there is enough demand for the shares. In particular, closed-end funds that specialize in a single country or region typically would be eager to issue more shares without bound, since the fees of the parent company are based upon the net asset value. If they believed that arbitrage capital were adequate to maintain a trading price that is not too far below the net asset value, they would not hesitate to issue shares relentlessly. A nice discussion criticizing above assumption can be found in the paper by Caginalp and Merdan and the references therein [6].

Since early 1990's, there is a series of research that has introduced a dynamical systems approach in order to study the asset price dynamics. Caginalp and his collaborators have been studied the forecasting of the asset pricing by driving a set of differential equations that utilize the basic microeconomics principles of adjustment to supply and demand without making these two idealized assumption of unique price concept and sufficiently large capital in the market that exploit any deviations from the trading price [2, 3, 4, 5, 6, 10]. In these studies, unlike the classical economics models, it is assumed that the supply and demand may depend upon not only the value of the asset but also the price trend. In addition, it is also assumed that the total asset reserved for the specific trading asset in the market is limited so that unlimited arbitrage is impossible.

Liquidity is one of the important quantity effecting the price of an asset and its time evolution and also effecting the investor's psychology and the trader's strategy. Financial Market analysts often assert that if the market involves too much cash, the stock prices have potential for higher prices. In other words, if the most of the possible cash that can be used to buy an asset is already invested, the potential for higher prices is limited even if all other factors push the stock price up. In the stock exchanges, the average percentage of all mutual funds that is in cash is one of the sign of the access cash in the market. Similarly, decreasing interest rates, easy credits from the banks and the tax returns raise the pool of the cash in the financial market for purchasing stocks. Caginalp and Balenovich have discussed the effect of the liquidity by defining the concept of the liquidity value as the total cash divided by the number of the shares in the system [3]. They consider a single asset market traded between a homogenous investor group and derived a nonlinear first order differential equation incorporating several motivations for the stock trading with together the assumption of the finiteness of the assets and basic microeconomics principles of

*H. Merdan and H. Çakmak are with TOBB University of Economics and Technology, Faculty of Arts and Sciences, Department of Mathematics, Söğütözü Cad, No: 43. 06530, Ankara, Turkey. E-mails: merdan@etu.edu.tr, hcakmak@etu.edu.tr

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