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# Size and price-to-book effects: Evidence from the Chinese stock markets



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### ARTICLE INFO

#### Article history:

Received 5 July 2013

Accepted 2 February 2015

Available online 16 February 2015

#### JEL classification:

G14

G15

#### Keywords:

Size effect

Price-to-book ratio effect

Herding behavior

Chinese stock markets

Conditional asset pricing

### ABSTRACT

We examine the size and price-to-book effects in Chinese markets. We find strong evidence for the size effect but little evidence for the price-to-book effect. We further examine these effects in the context of the monetary policy of the People's Bank of China. We find that the size effect is stronger during the time of restrictive monetary policy. We attribute these results to specific characteristics of Chinese markets, such as potentially lower bankruptcy costs of partially state-owned enterprises. We also examine the herding behavior and find significant effects between 2002 and 2012. Herding behavior decreases after 2006 suggesting that the information asymmetries in Chinese markets are decreasing as the markets mature. Herding is also a significant information variable in a four-factor conditional pricing model.

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## 1. Introduction

The purpose of this paper is to study the size and P/B effects in Chinese stock markets and to investigate whether these effects are influenced by the monetary policy of the People's Bank of China. We find evidence that the size effect exists across all levels of systematic risk in Chinese markets. We do not, however, find support for the price-to-book effect (P/B effect). In contrast to U.S. markets, the size effect in Chinese markets is consistent and significant only during the times of a restrictive monetary policy environment.

Our findings on the size and P/B effects in Chinese markets differ from those found in U.S. markets. This could be due to differences among the U.S. and Chinese markets. The main differences include higher informational asymmetries and high level of state ownership in Chinese companies. In addition, Chinese investors, who are dominant players in Chinese markets, are generally investors with limited knowledge of the stock

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markets. These market/investor characteristics create favorable conditions for investor herding. We find evidence of herding behavior on both the Shanghai and Shenzhen stock exchanges.

Our findings on the size and P/B effects, and the presence of herding have two implications for Chinese stock markets. First, investors in China do not require higher returns for small versus large and low versus high P/B stocks in times of expansive monetary policy. This may relate to the generally low bankruptcy cost in Chinese markets. The Chinese government is an important shareholder in many Chinese corporations and therefore may assist distressed firms by providing them with preferential loans or other support designed to prevent their bankruptcy. Second, the size effect and P/B effects in Chinese markets can, to some extent, be affected not only by monetary policy but also by investor herding that may mitigate these effects.

In the second part of the paper, we examine the effect of monetary policy and herding on the risk factors in an asset pricing model. We create “herding” and “monetary policy” factors and use them as information variables in a four-factor conditional beta model. We find evidence that herding and monetary policy affect conditional betas of the market risk premium as well as *SML*, *HML* and *MOM*<sup>1</sup> risk factors. Herding has an especially strong effect on conditional betas for stocks on the Shenzhen stock exchange.

The main contribution of our paper lies in identifying herding as a possible information variable in a conditional asset-pricing model. Previous results on investor herding in Chinese markets differ among studies. To exclude the possibility that investor herding is caused by changes in the flow of funds caused by governmental regulations in the real estate markets, we examine herding in months immediately after these regulations and find that herding cannot be attributed to these events. Pricing errors on both the Shanghai and Shenzhen stock exchanges are insignificant when herding and monetary policy are included as information variables in our four-factor conditional asset pricing model.

The rest of the paper is organized as follows. Section 2 consists of a brief description of Chinese markets and herding behavior. Section 3 describes the data and Section 4 explains the methodology of portfolio formation, tests of herding behavior and the conditional beta model. Section 5 concludes the paper.

## 2. The Chinese markets: brief review

The Chinese stock market is a new market compared to the markets of most western countries. The Shanghai stock exchange started trading in December of 1990, and the Shenzhen stock exchange began trading in July of 1991. At the end of 2012, there were 998 stocks listed on the Shanghai stock exchange and 1581 stocks listed on the Shenzhen stock exchange. In the future, the Shanghai stock exchange is expected to develop into a Main Board Market and the Shenzhen stock exchange into a Growth Enterprise Market, much like the role of the NYSE and NASDAQ exchanges in the U.S.

There are several important differences between the Shanghai and Shenzhen stock exchanges. First, the Shanghai stock exchange has larger capitalization than the Shenzhen stock exchange. Figs. 1 and 2 show the number of stocks trading and the capitalization of the exchanges. At the end of 2012, the total capitalization of the Shanghai stock exchange was 15.8 trillion Renminbi (\$2.5 trillion) compared to 7.2 trillion Renminbi (\$1.16 trillion) for the Shenzhen stock exchange. Second, the stocks trading on the Shanghai stock exchange are mainly large state-owned enterprises while the Shenzhen stock market consists mainly of manufacturing and export companies doing business with Hong Kong (Demirer and Kutan, 2006). Third, informational asymmetries in the Shanghai and Shenzhen stock exchanges may also be different. The Shenzhen listed companies are mainly export oriented. They may have closer connection with foreign and institutional investors in Hong Kong. Their investors may have better knowledge of global markets and therefore be able to better value these companies (Demirer and Kutan, 2006). Fourth, the probability of bankruptcy may differ among the exchanges. Since companies trading on the Shanghai stock exchange tend to have large state ownership (22.3% of stocks trading on the Shanghai exchange has more than 50% of state ownership compared to only 6.07% on the Shenzhen exchange), they are less likely to experience financial distress than similar companies with individual or private ownership. Therefore, the bankruptcy cost for companies trading on the Shanghai exchange is potentially lower (Huang and Song, 2006; Zhang and Fung, 2006).

<sup>1</sup> The *SML*, *HML* and *MOM* are the Chinese equivalents of the Fama and French (1992); Carhart (1997) risk factors.

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