Essays on the Dynamics and Cross-Section of Stock Returns (Abstract)

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Contents

1 Introduction

My thesis is an attempt trying to understand the changes in asset prices over time and cross assets and markets. It consists mainly five empirical works about the dynamics and cross-sections of stock returns, aiming to explore the driving forces and extract information in stock markets.

The centerpiece of modern asset pricing theory is that prices should equal expected cash flow discounted by stochastic discount factor. This present-valued framework provide a powerful organizing principle for empirical researches. It divides the underlying economic forces in financial markets mainly into two parts: one is the expected cash flow part, the other one is discounted part. Most of my work would focus on the second part about changing discount rates i.e. expected returns, or risk premia, over time and cross assets, rather than the efficient incorporation of information into asset prices.

In exploring the forces driving changes over time and across assets in financial markets, our approach is empirical based on a dynamic accounting framework in a present-value form rather than behavioral models. By applying this empirical approach to financial markets, we would be able to make statements at least about the proximate causes driving the dynamic and cross-sectional changes in asset prices. The cost, however, is that we may miss the fundamental factors affecting asset prices. We still need economic models to help understand the fundamental economic reasons about the proximate causes driving asset prices. However, our empirical discoveries may help us postulate the channels and mechanisms through which we can (and should) explore (and elaborate) further to link changes in asset prices to the fundamental economic events.

On the one hand, asset pricing theory could give us an economic explanation for why prices are what they are. On the other hand, it could also provide us a way to extract the information contained in asset prices and to predict how changes in underlying variables such as policy action and economic structure would affect asset prices. If we decide that our understanding of the financial market is not bad, we can extract information from asset prices based on the existing economic theory. In doing so, we may acquire comprehensive and timely information guiding our actions to evolving problems.

I hope that the empirical discoveries presented in my thesis would contribute to our understanding about markets.

2 The Predictability of Japanese Corporation's Equity Returns: Does Future Cash flow Matter?

The first two essays of my thesis aim to provide insights within the framework of asset pricing theory on the economic forces driving dynamic changes in the Japanese stock market based on historical data. The first essay explores the implications of a dynamic accounting identity for the dynamics of equity returns in a present-value framework by using data of cash flow and market equity value of Japanese private non-financial corporations. In particular, we study the role of fluctuations in dividend yield and equity payout yield for predicting equity returns.

Valuation ratios such as dividend yield and equity payout yield are central to forecasting because they reveal a slice of agent's expectation about expected future returns and expected future cash flow. We exploit the joint null hypothesis in which equity returns are not predictable must accompany that future cash flow is predictable. Our results provide economically and statistically significant evidence for the predictability of equity returns of Japanese corporations, and show that dividend yield is a better predictor of equity returns than equity payout yield. Moreover, we show that while the dividends are not predictable either by dividend yield or equity payout yield, there are predictable components in equity payout. The predictable components could largely be attributed to other cash flow such as equity repurchase and issuance rather than dividends.

In addition, we decompose equity returns into changes in current cash flow, changes in expected future cash flow and changes in expected equity returns, and compute the variance of each component to show how much variation in Japanese corporation's equity returns are due to changes in expected equity returns and expected changes in cash flow. Contrary to previous studies, we find that changes in expected future cash flow play a very small part in the variation of equity returns. This conclusion is robust whether we measure the cash flow by dividends or equity payouts. In other words, history tells us that the dramatic changes in the equity market over the last two years may have little to do with investor's gloomy prospect about future cash flow of Japanese corporations.

3 Exploring the Driving Force and Price Adjustment of the J-REIT Market

The second essay employs a similar methodology to explore forces driving the movement of the J-REIT market. The results indicate that the news about cash

flow plays an almost equally important role in the movement of the J-REIT return as well as changes in expectation of excess returns. This result is a little different from the first essay, which focus on the equity returns of Japanese corporations. It may attributed to the different characteristics of underlying assets between J-REIT equity and Japanese corporation's equity. J-REITs are required to distribute 90 percent of their income, while in return they are exempt from corporate income taxation. Therefore, the news about the dividends could be viewed as almost equivalent to the news about the rental income of the underlying properties in the case of J-REIT. It is thus the news about the rental income of the underlying properties that drives the J-REIT market. It suggests that dividends of Japanese corporations may represent mainly permanent components of cash flow to present no predictability, while dividends of J-REITs are expected to consist much more transitory components of cash flow.

I also take the question further to examine whether or not the J-REIT market has fully incorporated those news immediately. My results show that the J-REIT market has assimilated market news fully within a month lag. The much quicker price adjustment of the J-REIT market seems to suggest that it helped improve the informational efficiency of the real estate market in Japan. On the other hand, it also suggests that Japan may need to promote the securitization of real estate assets further on the basis of efficient asset pricing.

4 Capital Ratios and the Cross-Section of Bank Stock Returns

The following two essays focus on proposing a market-valued capital ratio as a measure of bank risks, and explore forces driving the time-series and cross-sectional variations of bank capital ratios. In the third essay, we propose a market-valued capital ratio as an indicator to gauge the riskiness of banks. In particular, we study the question about whether the market-valued capital ratio or the BIS capital ratio is better at identifying risky banks by looking at the relationship between different measures of capital ratios and average returns of bank stocks.

In this essay, we take the position to extract information from asset prices based on the the asset pricing theory. In doing so, we may acquire comprehensive and timely information guiding our actions to evolving problems. Market-based indicators are generally forward looking, and could incorporate the relevant information, both in the form of formal knowledge and informal knowledge, from a wide range of sources very quickly. They reflect the overall assessment from the market instead of a bank's assessment of itself on specific on-balance-sheet

credit holding. They are also difficult to be manipulated by banks consistently. Moreover, the excess expected returns reflect both the quantity and price of risk. The quantity of risk would vary from bank to bank, while the price of risk is the same for all banks. Since a huge amount of researches report that the dynamics of share prices are affected significantly by changing risk prices, we would also like to exploit the information from the cross-sectional variations of stock returns to focus mainly on the quantity of risk rather than studying the dynamics of bank stock returns.

Asset pricing theory predicts that systematic difference in average returns are due to difference in risk, provided stocks are not mis-priced systematically and persistently. If higher capital ratios indicate lower riskiness, banks with higher capital ratios would earn lower average returns. By using Japanese listed bank's data from 1990 through 2008, my results show that market-valued capital ratios associate negatively with average returns, while the BIS capital ratio, widely used by bank regulators, is showed to be positively related with average returns. These facts imply that banks may be risky despite of reporting higher BIS capital ratios. On the other hand, the market-valued capital ratios seem to serve as an informative indicator to identify risky banks.

In addition, we investigate whether there are common risk factors in returns related with market-valued capital ratios. If the negative relation between average returns and market-valued capital ratios are due to rational pricing, there must be common risk factors in returns related with market-valued capital ratios. We show that market-valued capital ratios proxy for sensitivity to risk factors that capture common variation in returns. Finally, We also examine the cross-sectional variation of operating performance across banks with capital ratios to explore the economic reasons why market-valued capital ratios are related to risk in returns. The results show that low market-valued capital ratio signals persistently poor profitability.

5 What Drives the Time-Series and Cross-Sectional Variations in Bank Capital Ratios

In the forth essay, we document the time-series and cross-sectional variations in bank capital ratios and investigates their underlying driving forces by using listed Japanese commercial banks data from 1977–2009. Bank capital ratios vary over time and across banks. Intuitively, both expected stock returns and expected future profitability could influence the determination of bank capital ratios. We add to

the literature by providing an overall framework on how theses factors combine to explain the time-series and cross-sectional variations in capital ratios. While book values are inherently backward looking, capital ratios based on market values are generally forward looking. It is therefore important to capture this feature into our considerations in investigating the driving forces of variations in capital ratios.

In addition, although previous works point out that capital ratios could be affected by either profitability or stock returns, no existing research has ever provided quantitative assessment about the relative importance of these factors in the determination of bank capital ratios. We aim to fill the gap by identifying quantitatively the relative importance of these factors in determining both the time-series and cross-sectional variations of bank capital ratios.

In particular, by adapting the log-linearized present-value model we would be able to decompose the variations in capital ratios into three components: the variations in expected future discount rates, future profitability and expected leverage ratios. This decomposition allows us to conduct the variance decomposition to show exactly how much the variations in expected future discount rates and future profitability have contributed to the variations in bank capital ratios respectively. Our empirical results have showed that changes in expected discount rates dominate in the time-series variation of bank capital ratios, while changes in expected future profitability has played an almost equally important role as the expected discount rates in the cross-sectional variations.

Our results suggest that we could use bank capital ratios based on market values of equity as one of a list of potentially useful indicator to measure the riskiness of banks. It is not only readily available, but also forward-looking intrinsically. It allows us to acquire comprehensive and timely information impounded in markets to help guide our actions to evolving problems. However, rather than studying the time-series variation in bank capital ratios, it may be more informative for us to exploit the cross-sectional dispersions in bank capital ratios to help assess the riskiness of banks, since the time-series variations in discount rates are commonly considered to be affected significantly by time-varying price of risk. On the other hand, the prices of risk is the same for all banks at any given point of time, while the quantity of risk would vary from bank to bank. The cross-sectional dispersions in capital ratios would allow us to focus on the differences in the quantity of risk.

Although this research enables us to uncover the proximate causes of changes in capital ratios, our approach is silent on why the expected returns and profitability change so much, so never really provide an economic explanation of fundamental factors driving the variation in bank capital ratios. There is still much challenging work of constructing theoretical models to have a thoroughly theoret-

ical understanding of forces driving the changes of bank capital ratios. We need economic models to show the mechanisms that generate the observed variation in bank capital ratios by linking the risk premium to fundamental economic factors such as preference, productivity, or economic structure.

On the other hand, the weakness is also the strength. Since we are only using dynamic accounting identities and the variance decomposition approach to derive the results, our results are robust on tests that infer variations in expected profitability and expected stock returns based on capital ratios. Put it in another way, any forward-looking intertermporal equilibrium model can be nested and tested as restrictions within our framework. Therefore, any specific theoretical model should be consistent with our results uncovered from the data to derive the relative importance of these factors in driving the time-series and cross-sectional variations of bank capital ratios. In this sense, our empirical discoveries could help us postulate the specific economic mechanisms to fully grasp the time-series and cross-sectional variations in bank capital ratios.

6 Volatility Spillover between Chinese and Major International Stock Markets

The last essay looks at the question about how changes in one stock market could influence the others. In particular, we employ the CCF and multivariate GARCH approaches to investigate the causality-in-variance linkage between Chinese stock markets and major international stock markets by using the daily data of recent two years. We find surprisingly that there is significant empirical evidence to show that the A-shares market of China caused international major markets in variance, indicating the volatility spillover from the former to the latter, while there appears no feedback in variance in the reverse direction. In contrast, the B-shares and H-shares indices of Chinese enterprises, in which more international investors participate, are not only affected by the A-shares, but also significantly sensitive to the U.S. market. The inconsistent results compared with the A-shares market seem to suggest that there may be remarkable distortion in the information enclosure, underestimated risks, or investors with much less risk-aversion in the A-shares market of mainland China, allowing potential room for sudden adjustments.

The last essay could be considered as an attempt to address the question about how information becomes reflected in stock prices. Our analysis is based on the simple idea that information flow may not be reflected in the first-moment (mean) of price changes but in the second-moment (variance) of price changes. On the

other hand, there is as well another approach focusing on the relation between stock prices and information-based trading. Empirical results have provided fruitful evidence supporting the claim that the prices and information-based trading are related. In essence, this string of researches associated the prices to the trading volume which is abstract from the current main-stream economic theory. I expect that understanding information-based trading and its price effects could help sharpen our understanding about how information is reflected in stock prices. Therefore, this area could be a potential direction for future researches.

7 Conclusions

In sum, there are mainly three important implications from my analysis. First, we would be able to provide insights on the proximate causes driving the dynamics of the Japanese stock market, by applying this empirical approach to financial markets. Our results show that risk premia, reflected in variation of discount rates or expected returns, may be the key factor that matters most for the dynamics of stock returns. However, our empirical approach is silent on why the expected returns changes so much, so never really provide an economic explanation of fundamental forces in stock markets. We still need economic models to help understand the fundamental economic reasons about the proximate causes driving stock prices. Our empirical discoveries could help us postulate the channels and mechanisms through which we can (and should) explore (and elaborate) further to link changes in asset prices to the fundamental economic events. In other words, if we really want to have an economic understanding of stock markets, to provide a convincing economic explanation about why prices are what they are over time, to predict how changes in policy action or economic structure would affect stock markets, we may need to link the stock market to macroeconomic events by exploring the subtle economics of risk premia rather than mechanisms causing fluctuations in cash flow alone.

Second, we would be able to extract information from asset prices. In doing so, we may acquire comprehensive and timely information guiding our actions to evolving problems. In particular, we propose of using a market-valued capital ratio as a measure of bank risks. Of course, rather than proposing a market-valued capital ratio as one all-encompassing measure, we are expecting that it could be one of a list of potentially useful indicators to guide regulator's actions to evolving problems. In addition, our analysis also suggests that regulatory structure may not be a substitute for market discipline, since regulators could obtain comprehen-

sive and timely information by monitoring market-based indicators. Therefore, it makes sense for regulators to enhance market discipline rather than replacing it. On the other hand, there are still much challenging work to do with bank capital ratios. We need economic models to help understand what the fundamental economic forces is in driving the variation in market-valued capital ratios, for instance. We need economic models to explain why banks with lower capital ratios earn higher expected returns, and why risk factors that help account for the cross-section of bank stock returns would get risk premium. We need to show the mechanisms that generate the observed variation in bank capital ratios by linking the risk premia to fundamental economic factors such as preference, productivity, and economic structure.

Third, our results show that risk premia, or discount rate variations across different markets could be somehow isolated. Markets could maintain segmented discount rates for a long period of time. However, what I want to emphasize is that this fact does not necessarily mean an "informational inefficiency". In the context of our analysis, the fact that Chinese markets are not incorporating information from other markets, or influenced by other markets, does not necessarily mean the existence of cash flow information not being correctly reflected in stock prices. Anyway, much of the dynamic movement of stock prices corresponds to the variation in discount rates. Stock prices could move much even when there is no cash flow news. Therefore, we could view the volatility spillover effects largely as information transmission about discount rates rather than information about cash flow, whether discount rate variations are connected to the real economy. This question can only be answered by linking asset prices to macroeconomic events, which is on my research agenda for the following years.