

**ESSAYS ON BEHAVIORAL ECONOMICS:
WEDDING GIFT EXCHANGE AND ASSET
PRICING UNDER RISK**

by

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This thesis contributes to economic research in two subfields of behavioral economics: asset pricing under risk and gift-exchange.

The first essay, “Risk, Information and Asset Pricing: An Experiment,” investigates how providing non-fundamental information in experimental asset market affects market pricing process. The information points to potential arbitrage opportunity in the market if market prices are different from the intrinsic values, which is expected to speed up market price convergence to intrinsic values. In contrast, persistent underpricing is observed in all experimental sessions. Providing non-fundamental information introduces price rigidity that disrupts the information diffusion process. As a result, share prices are anchored around levels that reflect different market appetite towards risk in different experimental sessions.

The second essay, “Giving According to The Rules: A Study of Monetary Gift Exchange in China,” explores the features of the social institution of monetary gift exchange for Chinese weddings using a survey study. Results show that the size of giving depends on the nature and quality of relationship, and gift history. The size of gift as a proportion of average social disposable income tends to decrease over time, which implies that monetary gift exchange does not intensify the status competition. Monetary gift exchange also tends to maintain the balance of giving as the size of return gifts as a proportion of average city-wise disposable income is often similar to the size of initial gifts received in the past.

Keywords: behavioral economics, risk, information, asset pricing, experiment; monetary gift exchange, reciprocity, social norms, status competition.

PREFACE

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1.0 INTRODUCTION

Over the last two decades, behavioral economics has captured the interest and imagination of economic researchers. Insight about human behavior from behavioral economics, e.g. [Kahneman and Tversky \(1979\)](#), [Kahneman and Tversky \(1981\)](#), [Fehr and Schmidt \(1999\)](#), [Loewenstein et al. \(2001\)](#), [Rabin \(1993\)](#)..., has improved our understanding of many perceived social “irregularities” such as economic decision making under risk and uncertainty, asset mispricing from fundamentals, other-regarding behavior and the coexistence of market economy and gift economy.

This thesis aims to contribute to these literatures by studying the impact of information on asset pricing under bankruptcy risk in a laboratory experiment and the social norms governing the institution of monetary gift exchange in urban China using a survey study.

Chapter 2 investigates how providing more information in an experimental asset market affects the outcomes of market pricing process. The experiment introduces uncertainty on asset quality to investigate market pricing decisions facing bankruptcy risk. I use non-fundamental information, which reveals asset mis-pricing from its fundamental values, to induce arbitrage in order to reduce price divergence from asset intrinsic value and improve the accuracy of market belief adjustments. On the contrary, providing the information actually reduces price fluctuations even when there is significant scope for arbitrage profits. As a result, prices become sticky in informed markets as they tend to oscillate closely around a fixed level for extended periods. This result is not affected by experience as each session contains at least ten repetitions of similar market conditions.

Chapter 3 analyzes the features of the institution of monetary gift exchange for Chinese weddings in order to understand how social status competition in China discovered in recent empirical research ([Brown et al. \(2011\)](#), [Chen et al. \(2011\)](#)) affects monetary giving decisions.

Through a survey study, I utilize private gift records kept by urban Chinese households to understand the dynamics of monetary gift exchange. Results show that the size of giving depends on the nature and quality of relationship, and gift history. Relatives are more generous towards each other while the effect is stronger for kinship of better relation quality. Though the size of CPI adjusted monetary gifts increases over time, it rises slower than the average city-wide disposable income. Thus the size of gifts as a proportion of social average disposable income is declining over time, which suggests that social status competition has limited impact on the size of monetary gifts. Further, within an existing relationship, past gift transactions influence future gift decisions. Return gifts tend to add a premium compared with the size of initial gifts though the size of premium is declining as initial gifts become larger.

2.0 RISK, INFORMATION AND ASSET PRICING: AN EXPERIMENT

2.1 INTRODUCTION

Since Vernon Smith, Gerry Suchanek and Arlington Williams (1988) first published the results of phenomenal rise and burst of bubbles in experimental asset markets, a large literature followed attempting to understand the origins of bubbles and crashes in financial markets. In contrast, less attention is paid to understanding the aftermath of the burst of financial bubbles, i.e. the distressed market conditions. After all, it is the self-fulfilling crises of confidence and the potentially prolonged recession that governments fear the most.

In this project, I attempt to explore the role of non-fundamental information on market pricing decisions for indefinitely lived assets (i.e. with bankruptcy risk). Fundamental information directly affects an asset's ability to generate value for an owner, e.g. the total profits that is expected to generate if one holds the asset to the liquidation. In contrast, non-fundamental information reveals other information that has no influence on an asset's intrinsic worth. For example, an asset's price history shows an asset's value generating ability in the past but may has no value for evaluating current and future intrinsic values.

Non-fundamental information may be derived from existing fundamental information but has no impact on an asset's intrinsic value. For instance, when a private firm hires financial analysts to estimate its worth in order to set an IPO price, the estimated value reveals the firm's worth; however, the intrinsic value is solely determined by the firm's profit generating ability rather than the estimated value. Similarly, a PLC may plan a share buy-back when the listed price is lower than its own estimated value for the firm. Thus, the non-fundamental information only provides guidance on the extent of market mis-pricing rather than affecting the firm's worth.

It is often difficult to distinguish fundamental and non-fundamental information in the field. In practice, fundamental information such as published accounting reports and dividend announcement often contains too much noise (e.g. manipulation from management, time lag on incorporating new information) to accurately reflect a firm's true value. So estimating a firm's intrinsic value is subject to analysts' ability to filter noise. A good analyst is able to correctly select and generate quality information that adds informative signal of intrinsic value to her report.

There is also information that may or may not contain fundamental information in the market. For instance, rumors of a potential merger could reflect true insider leaking (fundamental) or false information (non-fundamental and worthless).

Due to these difficulties of separating fundamental and non-fundamental information in the field, I use controlled experiment in order to evaluate the influence of information of different natures. I tackle the question of the effect of non-fundamental information on asset (mis-)pricing using experimental asset markets. The environment is comparable to market conditions where there is risk and uncertainty on the future of a publicly listed firm.

Related literature. A large literature in economics has been devoted to studying the ability of market to reflect an asset's intrinsic value. Economists are often concerned with what drives asset prices away from their intrinsic values.

One line of research focuses on verifying the validity of the rational expectations hypothesis advanced in the seminal works of [Muth \(1961\)](#) and [Lucas \(1972\)](#). According to the rational expectations hypothesis, the market system aggregates all relevant information to generate a market price that is consistent with the intrinsic value of an asset.

Asset experiments initiated by [Forsythe et al. \(1982\)](#) document that when there is no uncertainty on the value of an asset (i.e. publicly known dividend income in each period), asset prices converge over time toward the rational expectations prices. Another stylized fact of these experiments is that price convergence often happens from below, which reflects the caution shown by market participants in early stages of experimental sessions. Moreover, the convergence to the intrinsic value is not guaranteed when assets contain uncertain bankruptcy risk, i.e. the uncertainty on when the assets cease to exist with redemption value of zero. [Camerer and Weigelt \(1993\)](#) show that persistent divergence from intrinsic value can exist

when stochastic bankruptcy risk (a 1/8 chance of assets becoming worthless after each period) is introduced. With bankruptcy risk, the price divergence also tends to last longer, sometimes persisting to the end of session.

The elimination of price divergence depends on the existence of smart traders who are able to recognize the price discrepancy from the intrinsic value, to engage in arbitrage by taking on the bankruptcy risk. This finding provides a first glimpse of the importance of risk appetite (the willingness to take risk) composition on price convergence. Similarly, [Crockett and Duffy \(2013\)](#) report that more risk tolerant players (as identified through the Holt-Laury paired lottery choice task) typically hold more risky assets.

So what motivates these smart traders to take on risk in exchange for potential arbitrage profits? In the experiment reported in this paper, I use non-fundamental public information to reveal arbitrage opportunities in order to study its impact on price convergence. [Haruvy et al. \(2007\)](#) tested the effect of providing non-fundamental information in a bubble experiment: though the availability of information couldn't stop the formation of bubbles in inexperienced markets, the bubbles were eliminated as players gained more experience. By contrast in our experiment, the mis-pricing lasts to the end of session during which participants experience more than nine repetitions of similar markets.

Asset pricing experiments on information mainly focus on the question of markets' ability to successfully aggregate private fundamental information in asset markets (initiated by [Plott and Sunder \(1982\)](#), [\[1988\]](#) and reviewed in [Sunder \(1995\)](#)). In contrast, the experiment discussed in this paper focuses on the public non-fundamental information.

Another line of the literature initiated by [Smith et al. \(1988\)](#) focuses on the factors that create financial bubbles. [Palan \(2013\)](#) provides a comprehensive review of these bubble experiments which often find that when trading assets that generate *i.i.d.* dividend streams, investors were more likely to speculate about price movements which often produced the rise and burst of speculative bubbles. However, as [Palfrey and Wang \(2013\)](#) point out,

“In early periods, transaction prices are significantly below the equilibrium price ... Because the equilibrium price declines over time while the price adjustment process drives the below-equilibrium prices upward, the transaction prices eventually catch up with equilibrium prices ... the equilibrium price continues to fall ... results in a situation where prices exceed fundamental value—a bubble.”

In fact, [Noussair et al. \(2001\)](#) find that the probability of forming bubbles is reduced with constant fundamental values and less frequent dividend payments. Moreover, [Haruvy et al. \(2007\)](#) discover that traders tend to have adaptive beliefs which are “based on past trends in the current and previous markets in which they have participated.” Thus it seems that the sensitivity of belief adjustments to new information is the key factor underlying different price dynamics in asset markets. An alternative explanation put forth by [Palfrey and Wang \(2013\)](#) attributes speculation to traders’ heterogeneous beliefs after observing common public signals. Thus, optimistic players hold more assets to support the market prices in the hope of selling in the future to more optimistic players. In contrast to the present paper, these papers are mainly interested in the causes of bubbles and speculation, while my approach focuses on the effect of information and risk on mis-pricing.

In finance, the existence of volatility clustering, as when “large price changes tend to be followed by large changes, of either sign, and small changes tend to be followed by small changes” ([Mandelbrot \(1963\)](#)), has led to the use of GARCH models in financial forecasting and derivative pricing. The seminal works of the ARCH ([Engle \(1982\)](#)) and GARCH ([Bollerslev \(1986\)](#)) models aim to more accurately capture the phenomenon of volatility clustering and related effects such as kurtosis (i.e. fat tails), which are critical to financial pricing and risk management analysis.

Owing to the time constraints on lab experiments, there are limited experimental works studying volatility clustering. Using experimental asset markets with asymmetric fundamental information, [Huber and Kirchler \(2007\)](#) observe a significantly positive relationship between the degree of heterogeneity in fundamental information and absolute returns, and an intra-periodical pattern where absolute returns decrease after the arrival of new asymmetric fundamental information.

The design of the experiment reported in this paper is different from [Huber and Kirchler \(2007\)](#) in terms of the nature of information. In my experiment, the fundamental information (i.e. the dividend announcement) is public to all participants. The information available in the more informed treatment only serves to assist players’ evaluation and investment process but has no influence on an asset’s intrinsic value. If the rational expectations hypothesis holds, the non-fundamental information provided in our experiment would have no impact

on pricing decisions.

Surprisingly, results show that the availability of non-fundamental information actually reduces market price adjustments (in terms of price movements and estimated belief adjustments) both within and across periods perhaps due to the reduced heterogeneity of beliefs among market participants [Palfrey and Wang \(2013\)](#).

The paper is structured as follows: Section [2.2](#) presents the experimental design and main hypotheses, Section [2.3](#) analyzes a simple model of asset pricing under risky environment and the model calibrations in our paper. Section [2.4](#) summarizes the main findings of the study. Section [2.5](#) concludes.

2.2 EXPERIMENTAL DESIGN AND HYPOTHESES

The experiment was conducted using [Fischbacher \(2007\)](#) z-Tree software over networked computers in the Pittsburgh Experimental Economics Laboratory. A total of 60 subjects in six experimental sessions (three sessions for each of two treatments) were recruited from the student populations of the University of Pittsburgh and Carnegie Mellon University.

Each session hires 9 to 11 subjects with no prior participation in asset market experiment for two and half hours. A session began with the distribution of written instructions that were then read aloud to all subjects. A brief comprehension quiz was administered, subjects played two trial periods of the experiment and then completed between 40 to 48 paid periods in a session. The experiment currency is francs with 600 francs exchanged for 1 US dollar at the end of session.

In each session, “period” represents the basic time unit. The periods in a session are divided into distinct sequences that are divided by initiating and bankruptcy of a company. In each sequence, there is only one way to invest a player’s wealth: holding or purchasing shares of a company. There is uncertainty on the profit generating ability (i.e. quality) of the company and risk on the number of periods that the company would last before going bankrupt. The company distributes dividend in each period whose size is an imperfect signal for the underlying company quality. Thus a sequence resembles real life scenario where

Table 1: Features of Shares

Share	Payoff (Low Dividend)	Probability (Low Dividend)	Payoff (High Dividend)	Probability (High Dividend)	Expected Dividend in a Period
A	0	0.33	150	0.67	100
B	0	0.67	150	0.33	50

investors are uncertain of a listed company’s ability to generate periodic profits and when it may go bankrupt and get liquidated. The quality of the company in a sequence is either A or B.

Table 1 summarizes the characteristics of the shares of a company of Quality A and B. Both types of share can generate either a **HIGH** (150 francs) or **LOW** (0) periodic dividend that is determined by a random draw at the end of each period. But Share A is twice likely to generate a **HIGH** dividend per period as Share B. No player knows the underlying quality of shares traded until the sequence ends.

Figure 1 illustrates how the share type and the dividend are determined in a sequence and a period, respectively. Each sequence starts with a 50/50 random draw to determine the type of shares traded in the sequence. The chosen type dictates the dividend distribution of shares in all periods of the sequence. Though the chosen share type remains hidden to all players, players can use the history of announced dividends to update their beliefs of the hidden share type. A dividend is randomly determined by the central system at the end of each period based on the selected share type in the sequence. At the end of each period, there is a random chance of 1/4 that current sequence ends and all shares become worthless, then another sequence begins with a new draw of share type; otherwise, current sequence continues for another period. Given this exogenous probability of the ending of sequence, each sequence is expected last four periods, thus the intrinsic values (the expected total francs generated if a share is held to the end of a sequence) are 400 and 200 for Share A and Share B, respectively.

Figure 1: Types of Share in a Sequence and Sizes of Dividend in a Period

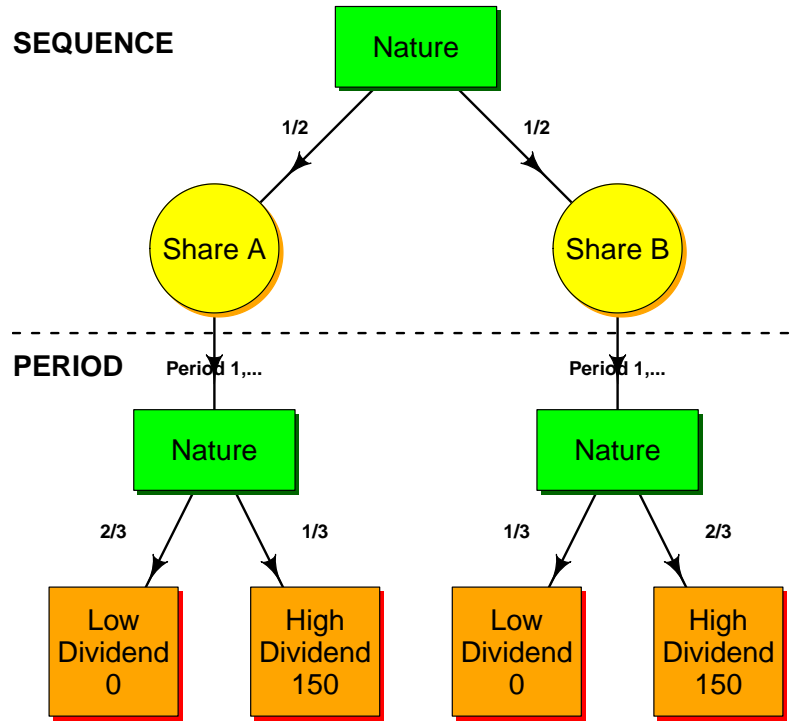
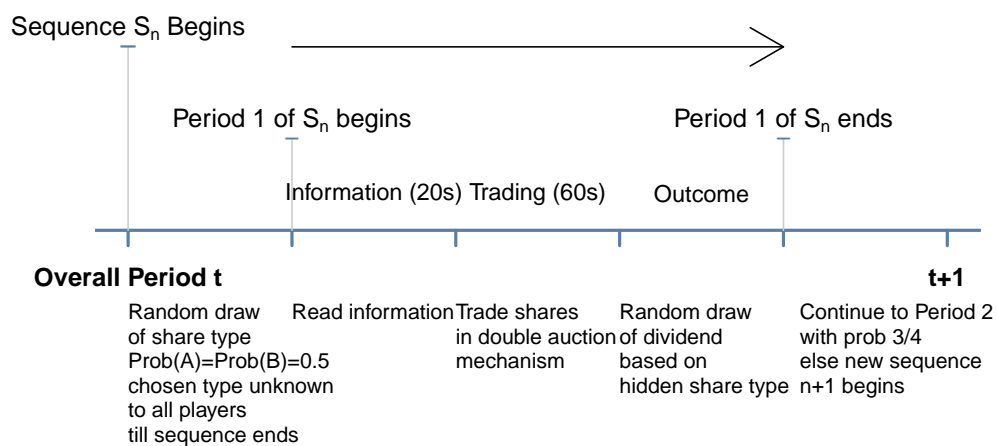


Figure 2 summarizes the time-line of events in a session. Each period in a sequence has three stages: information, trading, and outcome. The two treatments differ only at the information stage (Appendix A.1 Figure 12): players in less informed sessions (the Control) only have access to the dividend history of the current sequence; by contrast, in informed sessions (the Treatment), players are provided with additional information including current intrinsic value estimated according Bayes' rule using dividend history, a summary of current sequence (i.e. history of dividends, Bayesian intrinsic values, average trading prices), and a summary of all completed sequences (i.e. the average total dividend income generated by a share in all sequences, average cost per share in all sequences). The additional information in the informed sessions can help potentially smart players to determine whether shares are

Figure 2: Timing of Events



properly valued relative to the intrinsic value. For instance, current market price above (below) a share's intrinsic value implies that shares are over-priced (under-priced) and any difference is the potential arbitrage profits for less risk averse players; similarly, in the summary of completed sequence, the difference between the average value generated by a share and the average cost of a share indicates the extent of mis-pricing in the market.

At trading stage (Appendix A.1 Figure 13), players trade assets in a double-auction environment for one minute. Each trader has an initial endowment of 4 shares and 2,400 francs in each sequence. All dividend income can be used for trading but no short selling is allowed, thus the downside arbitrage is not possible. There is also a bankruptcy constraint that does not allow any trader to engage in a transaction that would result in her cash holdings to go below zero. All prices are in integer values and are bounded between 1 and 999 francs.

The outcome stage (Appendix A.1 Figure 14) reveals the size of dividend for the current period. In addition, the system notifies players whether current sequence ends (a 1/4 chance) or proceeds to another period. If the current sequence ends, the hidden share type is revealed; shares have no redemption value, thus the ending of a sequence resembles a scenario of liquidation.

In an experimental session, each subject is recruited for a two and half hour block of time. I informed them they would participate in one or more sequences, each of which consists of an indefinite number of trading periods for at least one hour after the instructions had been read and all questions answered. After a sequence ends, if less than 60 minutes have passed since the start of the first sequence, a new sequence will begin just like the first sequence. If more than 60 minutes have elapsed since the beginning of the first sequence then the current sequence will be the last sequence played. In order to increase the comparability between sessions, the sequence length and the chosen share type in each sequence are predetermined for each session but the actual dividends are randomly determined based on underlying asset types.

At the end of each session, subjects were paid in cash for three randomly selected sequences of the trading task (and a forecasting task¹). All sessions lasted two hours or less

¹The forecast task asks subjects to predict the average trading price in the trading stage of the period,

and the average earnings were approximately \$27.24, including a \$6.00 participation fee.

Since the experiment is designed specifically to evaluate the impact of non-fundamental information on market pricing decisions and price divergence from intrinsic values, the first hypothesis concerns the level of convergence to the intrinsic values.

HYPOTHESIS 1: *In the presence of non-fundamental information that reveals market mis-pricing, prices in informed sessions track intrinsic values more closely than less informed sessions.*

The second conjecture focuses on market reactions after a dividend announcement. Since dividend announcements are correlated with the underlying share type, a more informed market is expected to price in the information more effectively than less informed markets. Thus the second hypothesis compares derived market belief adjustments. Note, since tracking intrinsic values requires both correct belief adjustments and the market being risk neutral, the second hypothesis is weaker because it only requires better belief adjustments in more informed market.

HYPOTHESIS 2: *The belief adjustments in more informed sessions are closer to Bayesian belief adjustments.*

2.3 ASSET PRICING IN RISKY ENVIRONMENT AND MODEL CALIBRATIONS

In this section I describe an asset pricing framework in a risky environment induced by risky dividend payments and indefinite trading horizon, then I discuss the calibration method used in our data analysis to test the hypotheses.

As shown in Appendix A.2, based on the parameters used in the experiment, the risk neutral expected values of a share of quality A and B are 400 and 200 francs, respectively. Thus the ex ante intrinsic value of a share is 300 francs at the beginning of each sequence. We use a discount factor δ , which strictly decreases with the measure of risk attitude in

with an earning between 0 and 30 francs for each prediction.

exponential utility function (Appendix A.2), applied to the intrinsic value 300 to measure the risk appetite in a market: $P_1 = 300\delta$, i.e. more risk averse (loving) market would have first period market prices (P_1) that are more heavily discounted (over-priced) from the intrinsic value. Thus we can use the market price in the first period of each sequence to derive the risk appetite for the sequence:

$$\delta = \frac{P_1}{300} \quad (2.1)$$

$$\delta = \frac{P_1}{300} \quad (2.2)$$

Then assuming that the risk appetite remains stable in a sequence, the market valuation for a share of unknown quality is a function of the level of risk appetite and market beliefs on the underlying share quality being A:

$$P_t = 200\delta(1 + \rho_t), \quad t \geq 1 \quad (2.3)$$

where ρ_t is the market belief in period t of a sequence for the underlying share type being A.

Given the estimated risk appetite δ from first period price, we can estimate the subjective market beliefs and belief adjustments for later periods ($t \geq 2$) by rearranging Eq. (2.3):

$$\rho_t = \frac{P_t}{200\delta} - 1, \quad t \geq 2 \quad (2.4)$$

$$\Delta\rho_t = \frac{\Delta P_t}{200\delta}, \quad t \geq 2 \quad (2.5)$$

where $\Delta\rho_t$ is the estimated belief adjustment from period $t - 1$ to period t .

The analysis of market belief adjustment using Eq. (2.4)-(2.5) reveals the state and evolution of market beliefs. The market reactions to dividend announcement can be categorized into four groups: optimism, pessimism, caution, and exuberance and panic.

An optimistic (pessimistic) market would react more (less) than the Bayesian belief adjustment after a positive dividend announcement and less (more) than the Bayesian belief

adjustment after a negative dividend announcement, i.e. $\Delta\rho_t > \Delta prob(A)_t^{Bayesian}$ ($\Delta\rho_t < \Delta prob(A)_t^{Bayesian}$).

Alternatively, a market could show caution, which exhibits price stickiness or under-reaction to news (i.e. $\frac{\Delta\rho_t}{\Delta prob(A)_t^{Bayesian}} < 1$), or exuberance and panic, which is associated with price over-reaction to news (i.e. $\frac{\Delta\rho_t}{\Delta prob(A)_t^{Bayesian}} > 1$).

The design of our experiment also offers the opportunity to evaluate the impact of experience on market sentiment in terms of evolution of risk appetite in a session. While the assumption of stationarity suggests constant and stable risk appetite between repetitions of markets, the experience accumulated in previous markets could affect market participants' pricing decisions in the future. Thus by using Eq. (2.2) to estimate risk appetite in the first period of each sequence, we investigate how risk appetite evolves with the accumulation of experience.

Last, in addition to study market-level price adjustment (using the median price in a period), we also investigate the impact of information on the volatility of price within a period by comparing the standard deviation of prices (of completed trades) in each period.

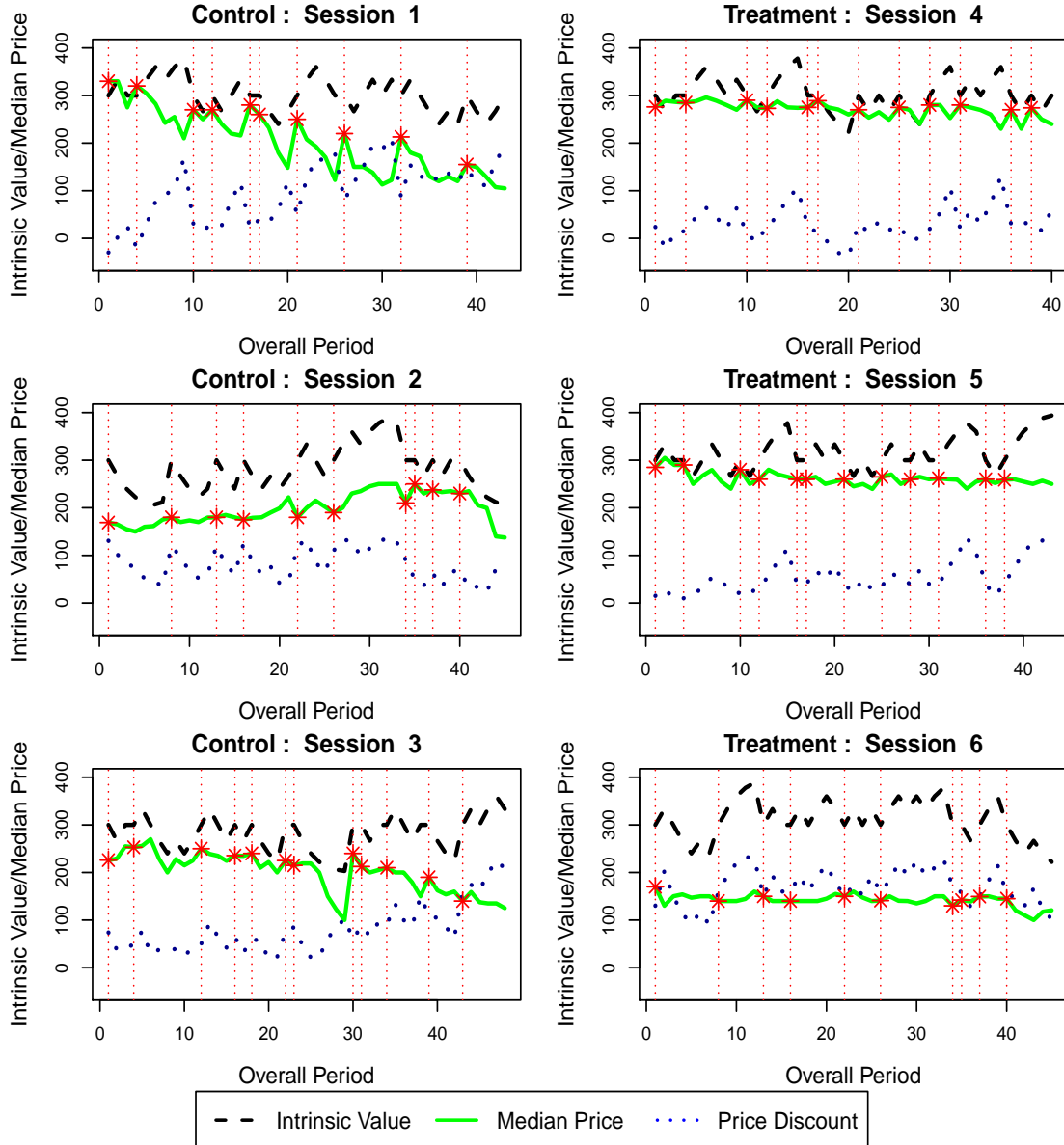
2.4 EXPERIMENTAL FINDINGS

2.4.1 Under-pricing Relative to the Intrinsic Values

Finding 1: Market prices are lower than suggested by the risk neutral Bayesian model; risk aversion contributes to the under-pricing in all sessions; market beliefs have mixed impact on under-pricing in less informed markets while continued caution (i.e. insensitive reactions to fundamental news) contributes to the continued under-pricing in more informed markets. The price divergence does not decrease with experience.

Figure 3 shows the dynamics of intrinsic values, market prices and price discount (i.e. *intrinsic price - market price*) in each session with the asterisks indicating the beginning of a sequence. In all sessions, market prices are significantly lower than the intrinsic values (*Paired-Sample Wilcoxon Signed Rank Test p-value < 0.01*), which shows persistent price

Figure 3: Intrinsic Values, Median Market Prices and Price Discounts



discounting at the presence of bankruptcy risk.

As shown in Eq. (2.3) of previous section, two factors contribute to the mis-pricing: risk appetite and belief adjustments. First, we investigate the impact of risk appetite on price divergence. Since the risk neutral valuation in the first period of each sequence is always 300, the effect of risk appetite can be identified by comparing first period prices with 300. As almost all ² first period prices are below the risk neutral valuation 300 in Figure 3, one reason for the under-pricing is the persistent risk aversion in all sessions.

Figure 4 compares the derived market beliefs (the circles) using Eq. (2.4) with the Bayesian beliefs (the asterisks). In the Control (less informed) treatment, the market of Session 1 believes that the underlying share type is more likely of low quality (*Paired-Sample Wilcoxon Signed Rank Test p-value* < 0.01). In contrast, the sentiment in Session 2 is the opposite to in Session 1 with consistent beliefs of being Share A (*p-value* < 0.01). Lastly, there is no clear bias in Session 3.

For the informed treatment, all three sessions exhibit negative sentiment towards the quality of the underlying company/shares (*p-value* = 0.045 for Session 4, *p-value* < 0.01 for Session 5 and 6).

Another important feature shown in Figure 4 is that, the market belief adjustments are less reactive to fundamental news than implied in the Bayesian model as all sessions have less than unit slope for the linear regression between the derived beliefs and Bayesian beliefs. Further, we find no significant difference between belief adjustments after a positive fundamental news or a negative fundamental news. Thus market participants exercise significant caution to fundamental news announcements, which is further confirmed by the regression analysis in later sections.

Since our findings are essentially the reverse of the results of bubble experiments without the burst of negative bubbles, we also test the impact of experience on price convergence. In bubble experiments, the over-pricing disappears and prices track the intrinsic values after the second or more repetitions of the same markets. By contrast, after dividing each session into two halves at just above period 20, we find that divergence doesn't decrease with experience for either treatment at any statistically significance level.

²The only exception is the first period in the first sequence of Control-Session 1.

Figure 4: Derived Market Beliefs and Bayesian Beliefs

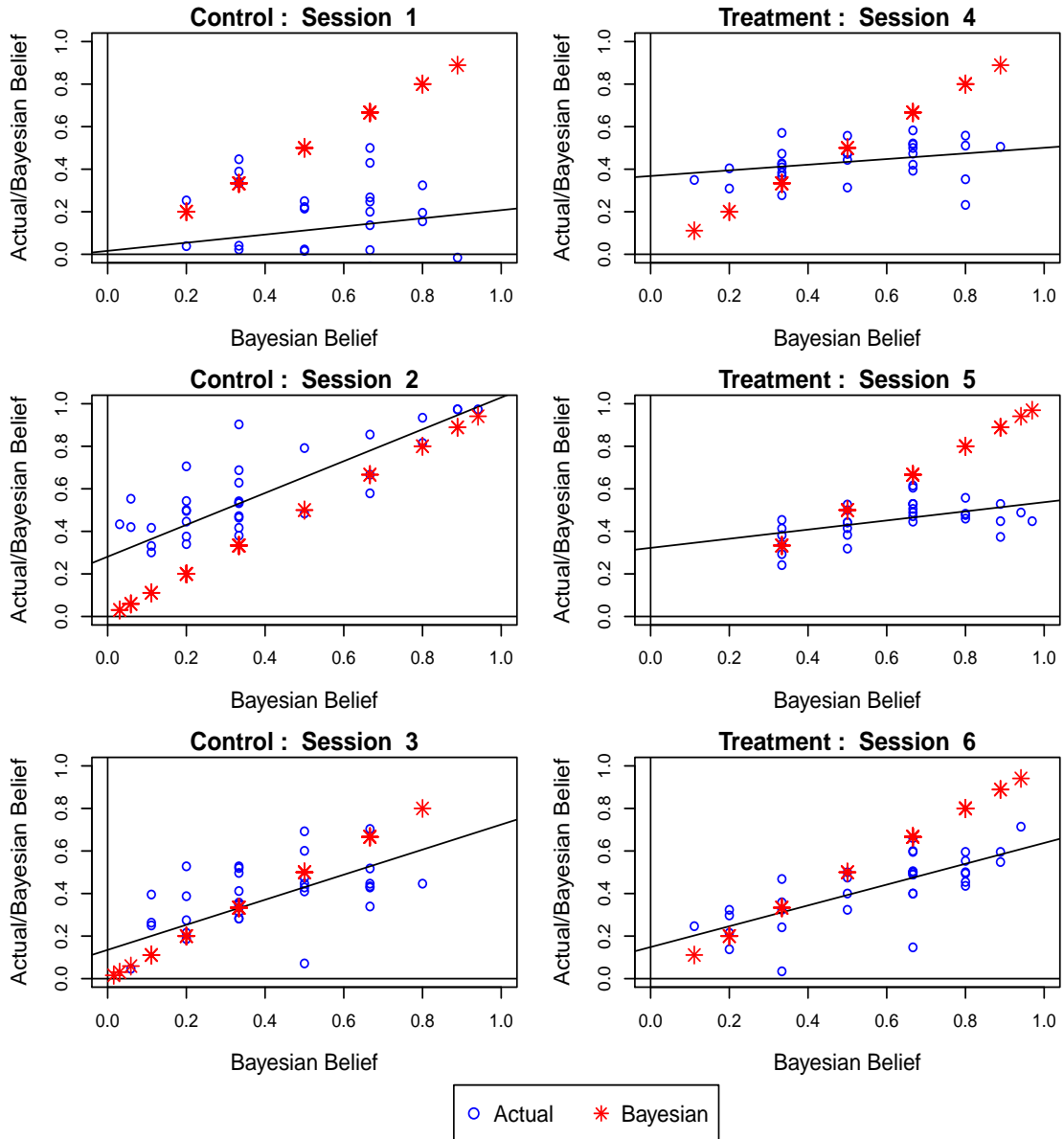
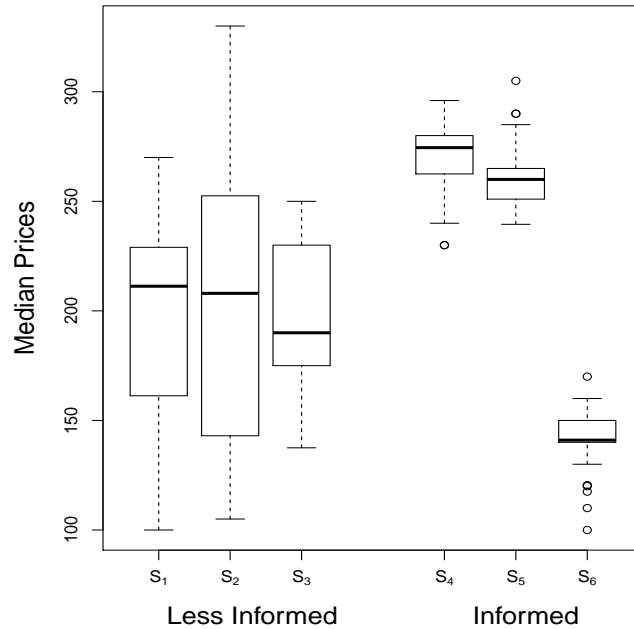


Figure 5: Price Volatility Between Periods



2.4.2 Price Divergence for Informed and Less Informed Markets

Finding 2: There is no significant difference between the price divergence from the intrinsic values in informed and less informed sessions. Prices are more volatile in less informed sessions in which prices oscillate around fixed levels.

After pooling all price deviations based on treatment, there is no significant difference of the price deviations between the two treatments (*Welch Two Sample t-test: p-value = 0.78*). However, as shown in Figure 3, sessions tend to show different price dynamics. Moreover, price actions in less informed sessions are more volatile while prices in informed sessions appear to oscillate closely around price levels that are specific to each session.

Figure 5 illustrates the distribution of prices in each session. While prices in less informed sessions fluctuate in wide ranges, market valuations in more informed sessions are anchored at

opposing extremes. Among pair-wise session comparisons, prices in informed Sessions 4 and 5 are significantly higher than in all less informed sessions (*Welch Two Sample t-test p-value* < 0.01) while prices in informed Session 6 are significantly lower than in all less informed sessions (*p-value* < 0.01); furthermore, price activities in all three informed sessions are less volatile than in all less informed sessions (*F-test p-value* < 0.01). Thus providing non-fundamental information reduces price movements rather than improving price convergence.

Because subjects interacted repeatedly with randomly determined dividend sequences in each session, market pricing decisions in each period cannot be treated as independent observations. To account for this, the rest of the analysis below uses panel data regression with standard errors clustered at the session level to account for unobserved heterogeneity.

2.4.3 Stability of Risk Appetite between Treatments

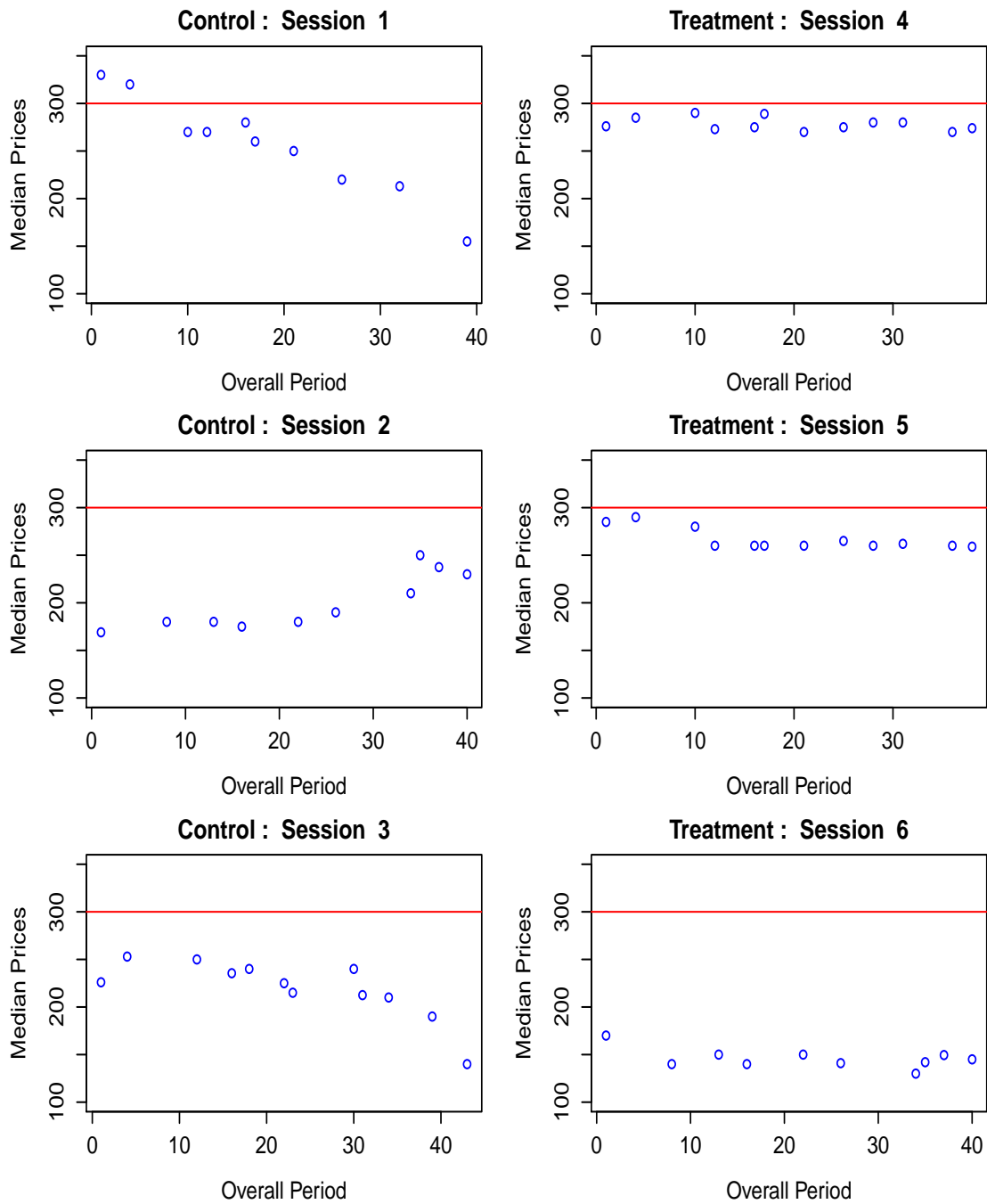
Finding 3: Markets exhibit different levels of risk appetite between sessions. The risk appetite is more stable in sessions with more non-fundamental information.

In Section 2.4.1, instead of assuming stationary risk appetite throughout entire sessions, we derive market beliefs in each sequence based on estimated risk appetite for the sequence. The reason, as we show in this section, is that the availability of non-fundamental information affects how markets adjust the level of risk appetite during a session.

We focus on the dynamics of the derived risk appetite from the first period of each sequence because the probability of being Share A is always 0.5 at the beginning of a sequence while prices in later periods reflect the evolution of both risk appetite and market beliefs.

Figure 6 shows the dynamics of first period prices of each session while Table 2 summarizes the evolution of these prices using a simple regression of prices on session dummies and sequences. The results show that the markets become increasingly risk averse in less informed Session 1 and 2 by dropping valuations of -6.7 and -16.1 francs per sequence, respectively, while less informed Session 3 exhibits more optimism as first period prices increase by 8.6 francs per sequence. By contrast, first period prices remain relatively stable in all

Figure 6: Market Prices in First Periods



informed sessions with 4 and 6 exhibiting no trend and 5 showing a slight downtrend of -2.3 francs per sequence. In light of the instability of risk appetite, our later regression analysis controls the level of risk appetite at sequence level to take account of the non-stationarity when evaluating belief adjustments.

2.4.4 Beliefs and Under-Adjustment for Beliefs

In this section, we investigate the impact of information on belief adjustments. In order to separate the belief adjustment and risk appetite adjustment, we implicitly assume that the risk appetite remains constant through the sequence, and thus only re-measure the risk appetite in the first period of each sequence. In addition, the way that risk appetite is measured means that there is no need to introduce session dummies in our regression analysis. For instance, as shown in Figure 6, in the informed sessions, the first period prices remain almost constant, thus introducing a session dummy would only create multicollinearity problem which prevents us from measuring the impact of risk appetite accurately.

Table 3 reports results of the OLS regression analysis for the derived belief adjustments using Eq. (2.5).

Finding 4: Between periods, markets react to dividend announcements in expected directions but display significant caution which results in under-adjustment of belief. Overall, providing more non-fundamental information makes markets less reactive to news.

This finding rejects **Hypothesis 2** which predicts that providing more information should have guided market belief adjustments closer to Bayesian adjustments than less informed markets. The less informed markets significantly under-react to dividend news: only 22.1% to 31.3% of predicted by Bayesian belief updating. By contrast, the market reactions from the informed markets (14.4%) are merely less than half of in less informed markets (31.3%). This result confirms the observations in Figure 3 that prices in informed sessions tend to oscillate closely around fixed price levels till the end of session.

Thus when markets are risk averse, the price searching process in less informed market is more active than sessions provided with non-fundamental information. Providing non-intrinsic information generates a type of price stickiness. The stickiness prevents markets

Table 2: Stationarity of Market Prices in First Periods

	Dependent Variable
	Median Prices in First Periods
Sequence*D(Uninformed- S_1)	-6.706*** (1.156)
Sequence*D(Uninformed- S_2)	-16.085*** (1.522)
Sequence*D(Uninformed- S_3)	8.585*** (1.522)
Sequence*D(Informed- S_4)	-0.738 (1.156)
Sequence*D(Informed- S_5)	-2.332** (1.156)
Sequence*D(Informed- S_6)	-1.439 (1.522)
D(Uninformed- S_2)	81.926*** (12.713)
D(Uninformed- S_3)	-110.408*** (12.713)
D(Informed- S_4)	19.538 (12.034)
D(Informed- S_5)	18.568 (12.034)
D(Informed- S_6)	-109.674 (12.713)
N	66
R^2	0.942

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 3: Price and Belief Adjustment to Dividend Announcement

	Belief Adjustments		
	(1)	(2)	(3)
Information	0.028*	-0.111*	-0.114*
(1 if More Informed)	(0.016)	(0.067)	(0.067)
$\Delta Prob_{A, Bayesian}$	0.221***	0.228***	0.313***
	(0.053)	(0.053)	(0.075)
$Information * \Delta Prob_{A, Bayesian}$			-0.169*
			(0.105)
Risk Appetite	-0.140***	-0.260***	-0.266***
	(0.043)	(0.071)	(0.071)
Information*Risk Appetite		0.189**	0.191**
		(0.089)	(0.089)
Constant	0.050	0.137***	0.143***
	(0.033)	(0.052)	(0.052)
Observations	197	197	197
R^2	0.145	0.164	0.175

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

from large price drop after negative news but also reduces the upside of price movements after good news, which results in market valuations trapped at a level for a long time. This effect is most striking when comparing the price dynamics between less informed **Session 2** and informed **Session 6** in **Figure 4.1**. Both sessions begin at similar price levels below 200 francs. As sessions progress, prices in **Session 2** move above 200 level for later periods while prices in **Session 6** gradually move downwards at -2.3 francs per sequence.

2.4.5 Additional Observation: Price Volatility

So far our analysis is restricted to the periodical median prices. This approach helps us filter the noisy price rediscovery process within each period after each dividend announcement in order to focus on price reactions between periods attributed to the new fundamental information conveyed by latest dividend announcement. In this section, we investigate the impact of non-fundamental information on price volatility in a period during the price rediscovery process.

Finding 5: Providing more information decreases price volatility in a period after a dividend announcement. The price stickiness introduces volatility clustering in both treatments. Volatility clustering is stronger in informed markets.

Table 4 summarizes the results of OLS regression analysis for the dynamics of price volatility. Providing more information reduces price volatility in a period, which implies that in informed sessions, not only price movements between periods is low, the price activity is also lowered within each period. By contrast, in less informed sessions, a dividend announcement is followed by larger price movements in the next period, which generates more potential for price searching to correct mis-pricing. Moreover, providing more information also doubles volatility clustering from 0.241 to 0.497, thus a low volatility period is more likely to be followed by another low volatility period.

Table 4: Volatility Analysis

	Dependent Variable	
	Volatility in Period t	
	Standard Deviation of Price ($\sigma_{t,Price}$)	
	(1)	(2)
Information	-2.282***	-5.253**
(1 if More Informed)	(0.986)	(2.029)
Information*Lag1 Volatility		0.256*
		(0.153)
Lag1 Volatility	0.316***	0.241***
	(0.069)	(0.082)
<i>Dividend</i> _{$t-1$} (1 if HIGH)	-1.198	-1.185
	(0.937)	(0.932)
Risk Appetite	-2.076	-0.885
	(2.641)	(2.723)
Period	-0.186	-0.204
	(0.309)	(0.308)
Constant	12.535***	12.834***
	(2.722)	(2.715)
Observations	198	198
R^2	0.182	0.194
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$		

2.4.6 Discussion

What can we learn from these findings, and how should we interpret them? The experimental data presented in the paper exhibit three features in asset markets with indefinite horizon: persistent risk aversion, under-reaction to fundamental information and longer memory for prices in more informed markets with non-fundamental information.

Bankruptcy risk appears to be the main reason behind the persistence of risk aversion. As discussed in the literature review, risk aversion in early periods tend to be a common feature in asset market experiments, i.e. the convergence from below in rational expectations experiments and “prices start out below fundamental value” in bubble experiments. One explanation for the early under-pricing is the caution inexperienced participants show in early stages of a market and the resulting thin liquidity in the market, which reduces the effectiveness of the price searching functionality of markets. As market participants trade more actively, the forces of demand and supply, which often react to the realization of an asset’s fundamental value and experience, guide market valuation toward the intrinsic value.

However, when an asset has bankruptcy risk without redemption value, the risk of holding an asset significantly increases. The bankruptcy risk generates a vacuum between any non-zero market price and zero. This risk drives away less risk tolerant investors and reduces the incentive for active trading from speculators. As a result, the reduced market liquidity and enthusiasm for speculation invalidate the functioning of price mechanism in searching for and reflecting an asset’s intrinsic value. Thus in order for market prices to track the intrinsic values, one of two conditions must be satisfied: powerful fundamental traders and/or sufficient incentive for trading.

In a forecasting experiment reported in [Hommes et al. \(2005\)](#), price deviations from intrinsic values are significantly reduced by using “robot” traders who arbitrage against the deviation. Another significance of the “robot” traders is that no matter what the market condition is, they always generate liquidity to push market price towards the intrinsic values. Clearly, the “robot” traders resemble the role of central banks in stabilizing the market. However, the effectiveness of fundamental players to reduce mis-pricing is often uncertain because of the difficulty of accurately estimating an asset’s or a market’s intrinsic value in

real life.

The other way to eliminate fundamental deviation is to introduce incentive to trade, which accelerates the price searching process. The main method for this approach is to introduce heterogeneous values for different market participants. Both [Camerer and Weigelt \(1993\)](#) and [Crockett and Duffy \(2013\)](#) design experiments of indefinite duration in which assets have different and switching values for different types of players. In their designs, the value generated by an asset for each player rotates between high and low across periods: in each period, a portion of players have low values while others have high values. This structure generates incentive for players with high values in one period to buy shares from low value players and then sell back in the next period. The effectiveness of this approach in eliminating fundamental deviations is mixed, with price oscillating closely around intrinsic values in some sessions while bubbles or persistent under-pricing observed in other sessions.

Another reason for the persistence of under-pricing is the market's inability to fully digest fundamental information or react to changes in intrinsic value. The inability to incorporate new information results in an anchoring effect that slows down the market revaluation process toward new fundamentals. [Palan \(2013\)](#) summarizes that "subjects' price forecasts are biased and serially correlated," thus traders' forecasts for future price heavily rely on current and past prices. Two recent papers ([Huber et al. \(2015\)](#) and [Baghestanian and Walker \(2015\)](#)) confirm the existence of this anchoring effect in asset markets without bankruptcy risk. [Huber et al. \(2015\)](#) find efficient pricing in markets with constant fundamental values; however, the sticky prices fail to follow declining fundamental value, which generates the rise and burst of bubbles; similarly, market prices could not rise fast enough to catch increasing fundamental values, which results in under-valuation.

[Baghestanian and Walker \(2015\)](#) adopt a novel approach to explicitly test the influence of this anchoring effect. For assets of constant intrinsic value, adding a visual aid on price charts at an asset's intrinsic value can reliably eliminate mis-pricing; by contrast, the anchoring effect of visual aids at randomly selected non-fundamental value disappears as players acquire more experience. Thus anchoring at fundamental values can potentially remove mis-pricing.

The anchoring at intrinsic value is certainly attractive if the asset's intrinsic value is constant across periods. However, this is unlikely in real world where market prices contin-

uously fluctuate to search for the evolving intrinsic value of a(n) asset/company. In fact, as shown in the seminal paper [Smith \(1962\)](#), the main benefit of the free market is its ability to automatically search for the competitive equilibrium price. Thus the anchoring effect could introduces significant price divergence from fundamentals if an asset's intrinsic value changes frequently.

Anchoring effect is attractive only if the intrinsic value is relatively stable and prices often drift away from fundamentals when without proper anchors. Under these conditions, for example, at the presence of bankruptcy risk as in our experiment, providing non-fundamental information can anchor prices close to the intrinsic value and strengthen the anchoring effect with reduced price movements.

The benefit is clearly not guaranteed as observed in Session 6. In Session 6, market prices started significantly below the intrinsic value, and were trapped at the low level to the end of session as a result of the reduced market reactions to fundamental news. Thus a natural question for future research is to how to use information to induce market to choose desired anchor near the intrinsic value.

2.5 CONCLUSIONS

In this paper, I test the effectiveness of providing non-fundamental information in eliminating asset mis-pricing in experimental asset markets. By making arbitrage opportunities more salient, we predict that the information would reduce price divergence and improve belief adjustment process. On the contrary, the results show that the availability of information generates price stickiness so that price movements are significantly reduced. On the positive side, there are informed sessions where the anchored prices stay close to the ex ante intrinsic value; however, it is also possible that prices remain significantly below intrinsic values for extended periods. In addition, this effect does not decrease with experience.

One limitation of our study is that we do not have adequate control of market risk profile as the risk appetite is derived from market prices. This approach forces us to assume constant risk appetite in a sequence, which may not be valid at least in the less informed sessions

where we observe unstable and trendy risk appetite adjustments between market sequences. Thus future work should focus on using induced risk appetite through experimental control on payoff profile to refine the results of our findings.

3.0 GIVING ACCORDING TO THE RULES: A STUDY OF MONETARY GIFT EXCHANGE IN CHINA

3.1 INTRODUCTION

“IT WAS a big week for Wang Wei. On a recent Wednesday she had two weddings to attend, then on Saturday, two funerals. ... by custom she was obliged to bring cash gifts. That was no hardship a decade ago, when the going rate for four banquets was the equivalent of \$5-10... It is a hardship now...This week Ms Wang’s outlays added up to 350 yuan, or close to \$60—about a month’s income. A pleasant, open-faced woman of 41, she says it is money she could have used to buy basic appliances. A water heater would be nice, she says, so her husband, in-laws and two teenage children wouldn’t have to boil water to bathe...”
-*The Economist* (Nov 30, 2013)

Human society spends an enormous amount of money on gifts each year. For example, the American households typically spend 3-4% of their income on gift purchases ([Prendergast and Stole \(2001\)](#)). The welfare loss due to sub-optimal choice of gift can amount to approximately 10% of the face value of gifts ([Caplow \(1982\)](#), [Waldfogel \(1993\)](#), [\(2002\)](#)).

Gift exchange plays an important role in social interactions to build and improve social ties. A proper gift can signal the goodwill to strengthen family bond and/or improve both giver’s and receiver’s emotional well-being while a poor choice of gift not only results in social welfare loss but also potentially causes emotional damage due to deteriorating quality of relationship and the loss of “face.”

Gift exchange could also impose financial burdens on participants involved in the process. Academic studies of the rural gift culture in China ([Chen \(2014\)](#), [Chen et al. \(2011\)](#)) find that there is significant increase in gift expenditure in recent years. In Guizhou, from 2005 to 2009 average gift amounts in three rural villages grew by 18-45% annually, compared with 10% annual income growth; a study by [Brown et al. \(2011\)](#) shows that between 2004 and

2006, the share of spending on gifts and festivals soared from 8 to 14 percent and the average wedding cost for the groom's family was approximately 5.5 times the per capita income. So it is important that we understand the motivations and social norms behind people's giving behaviors, and the economic impact on people involved in the gift-exchange process.

The nature of gift economy is the subject of a fundamental debate in anthropology. The early anthropological research on gift exchange begins with the study of *Kula Ring* in the Trobriand Islands by [Malinowski \(1922\)](#). [Mauss \(1967\)](#) emphasizes the exchange nature of gifts in "primitive societies," where gifts are similar to loans which are expected to be repaid in the future, thus reciprocity plays an essential role.

Sociologists follow and expand the view of anthropologists by focusing on social functions associated with gift exchange behavior including building and confirming identity, exerting control, and defining social status ([Schwartz \(1967\)](#)).

For economists, one of the most puzzling features of gift exchange is the choice of non-monetary gifts over simply giving money, which offers recipients complete freedom of choice. Thus economic research on gift exchange often focuses on the strategic benefits of giving.

One explanation for the preference for non-monetary gifts is "the thought that counts." What's important is a giver's willingness to spend time and effort searching for the right gift. For instance, carefully chosen non-monetary gifts could signal the quality of a donor's information on the preference of the recipient ([Prendergast and Stole \(2001\)](#)). Similarly, the transfer of a non-monetary gift of proper value can demonstrate the giver's intention for future cooperation ([Camerer \(1988\)](#)). In both cases, the benefits from conveying meaningful messages outweigh the welfare loss of using non-monetary gifts.

Gift exchange can also help establish reciprocal relationships. [Akerlof \(1982\)](#) interprets involuntary unemployment in terms of the response of firms to workers' group behavior, i.e. firms use above market-clearing wage as gifts to induce more effort from workers. A large literature in experimental economics including [Fehr et al. \(1998\)](#), [Gneezy and List \(2006\)](#), [Falk \(2007\)](#) and [Kube et al. \(2012\)](#) investigates the gift-exchange relationship in laboratory and field experimental markets, often finding evidence of increased reciprocity and cooperation through gift exchange.

In an extreme time of crisis, a reciprocal relationship through gift exchange could mean

the difference between normality and catastrophe. [Coate and Ravallion \(1993\)](#) invent a mutual insurance model in which households give gifts to others with whom they have fewer enforcement problems. [Schechter \(2007\)](#) illustrates how farmers use gifts to deter theft and encourage honesty in rural Paraguay.

Historically, anthropologists and sociologists have made significant contributions to improve our understanding of social changes in China's gift culture. Using a survey study based on detailed written accounts collected from 283 families living in Peiping (now Beijing), [Gamble \(1933\)](#) analyzes urban Chinese families' income and expenditure in 1920s, which includes records on ten local weddings. [Lang \(1946\)](#) combines both historical research and field work to detail the cultural changes experienced in China in the 1940s, which also includes the study on Chinese weddings and marriage in urban China based in Beijing.

Through a survey study conducted in Xiajia village, Heilongjiang province, [Yan \(1996\)](#) investigates the cultural changes of gift exchange in rural China under communist rule, and documents the intensified social competition in local gift economy in terms of larger wedding banquets and larger share of income spent on gifts.

[Joy \(2001\)](#) explores the social norms in gift-giving practices by conducting interviews in Hong Kong to demonstrate how the existence of a continuum of social ties in social relationships influences giving behaviors.

Conducting empirical economic research on gift exchange often faces several difficulties. First, monetary and non-monetary gifts coexist in the field while the latter often create difficulty for the valuation of gifts. The difficulty of collecting, tracking and valuing gift transactions in complex social networks also limits the scope of research on relation-specific giving.

Another issue posed by non-monetary gifts is the diverse meanings and sentiments associated with different choices of gift. For instance, giving an expensive engagement ring or an apartment demonstrates the commitment for a long term relationship whereas a token gift to a potential business client simply signals the intention of starting a relationship. This complexity of non-monetary gift exchange makes it difficult to understand the composition of a family's gift expenditure.

Due to these practical difficulties, economic research in recent times on giving mainly

focuses on analyzing total gift expenditure of households over a fixed period (e.g. one year). Peer effect and status concerns often dictate socially observable spending. Social spending is either positional in nature or subject to herding behavior ([Brown et al. \(2011\)](#)). A study by [Chen et al. \(2011\)](#) tests three competing hypotheses of the poor households' over-spending on gifts including peer effect, status concern, and risk-pooling based on a census-type household survey in three Chinese rural villages, and they find that gift giving is largely influenced by peer effect and status concern.

The approach of focusing on aggregate gift expenditure improves our understanding of the impact of the community-wide social comparison on giving. However, in addition to social comparison, giving is often specific to the features of dyadic relationship, e.g. reciprocity and the desire to maintain the balance of giving within a personal relation. Thus in this paper, I make a first attempt to explore the social norms that dictate monetary gift exchange for Chinese weddings. Using this method, I investigate the evolution of the size of monetary giving over time.

In recent years, monetary wedding gift exchange has become the social norm in more affluent urban areas in China and the monetary gifts collectively can have significant impact on the welfare of recipients. Thus giving decisions often involve careful consideration. Through a survey by collecting thirty-five families' private gift records, I trace each gift transaction to individual relationship in order to discover the rules governing dyadic giving over time ([Lowrey et al. \(2004\)](#)). More specifically, the study focuses on the impact of the nature of relationship (kinship vs. friendship/working relationship) and gift history, and the evolution of the size of monetary gifts over time.

Results show that people calibrate in favor of their relatives compared with their friends and colleagues. This preference towards kinship holds even after we control the quality of relationships, which implies the higher value Chinese place on kinship over other types of social ties. People are also more generous towards others with whom they consider having better quality of relationship.

In addition, the size of monetary gifts grows slower than the average city-wide disposable income, which contradicts the status competition model. Though the size of initial giving increases faster than the price level, its size as a proportion of the average disposable income

declines over time. This result suggests that the burden of giving due to status competition is not caused by the size of monetary giving, but is more likely to be associated with other factors, e.g. non-monetary giving on visible status goods, rising frequency of giving caused by more social events and/or larger scope of giving due to larger social network.

When examining the impact of gift history, I find that return gifts tend to add a premium compared with the size of initial gifts. The added premium also exists when measured as a proportion of average disposable income though its size declines as initial gifts become larger.

The remainder of this paper is organized as follows: next section discusses the wedding gift exchange culture in China. Then I provide a conceptual framework to illustrate the impact of social reference on giving behaviors in both social norm model and status competition model. Section 3.4 describes the methodology of data collection, while Section 3.5 summarizes results. The last section concludes.

3.2 WEDDING GIFT-EXCHANGE IN CHINA

The recorded social custom of monetary gift exchange in urban China can be traced back to as early as 1920s in the survey study presented in [Gamble \(1933\)](#):

“In order to distribute the burden somewhat and make it possible for friends and relatives to help meet the extraordinary expenses, it is the custom in Peiping to give presents of money at the time of weddings.”

Further, non-monetary presents including cloth, flowers, food and objects for personal use were often sent back then.

[Yan \(1996\)](#) reveals similar customs in rural village Xiajia: cash gifts are given by the guests to the wedding host while various kinds of non-monetary gifts are given to the bride and groom as a property-owning unit for their own use; however, “the monetary gifts to the hosts are the most salient prestations, both quantitatively and qualitatively.”

One common feature of wedding gifts in China pointed out in [Yan \(1996\)](#) is the alienability of gifts that gifts do not contain any “supernatural power” or special meaning in

and of them. For instance, unlike a chocolate given to a lover on Valentine's day or an engagement ring for marriage proposal that are closely associated with the givers' identity or status, the main purpose of giving in China is to generate utility for recipients rather than exerting power or confirming superior status over them. Thus "most material gifts are consumer goods such as wine, cigarettes, and canned food," all of which are expected to be used by the recipient. In fact, it is common practice that wine and food received on the wedding day could be used in the wedding dinner immediately. Thus the choices of wedding gift in China have the tendency to cut welfare loss or offer more help while meaning or spirit is mainly reflected in the value of gifts. This feature makes it a natural process to transform to pure monetary gift exchange as people's spending power increases with the country's fast economic growth in recent years.

Today, people in China give monetary gifts for selected but often very important occasions and sometimes only within particular nature of relationship. For example, like in many other cultures, Chinese rarely use money as birthday gifts as the spirit of birthday party is clearly more important, and during Chinese New Year celebration only seniors give money to children. By contrast, giving monetary gifts for Chinese wedding has become the social norm in more affluent urban areas where large monetary gifts are more affordable due to the fast rising urban income and property price.

With \$4,644¹ annual disposable income per person in 2014 according the National Bureau of Statistics of China (2014), the total bill of a Chinese wedding could easily exceed \$20,000 counting a pair of rings, a bridal gown, a banquet, a photo shoot, a professional planner and a honeymoon tour, not including the sky-rocketing housing price in major cities. Thus donating monetary gifts could potentially have major effect on receiving families' cash flow that bears the burden of wedding, which also accentuates the need to reduce the waste resulted from suboptimal non-monetary gifts.

Studying wedding gift exchange brings several benefits to improve the quality of our analysis. First, each wedding has a large number of gift transactions (typically more than

¹The estimate is obtained from converting 28844 RMB at exchange rate of 6.21:1 CHY:USD at the end of 2014.

one hundred²) with a wide range of relationship including kinship, friendship and working relationship.

The private monetary gift records kept by many people³ simplify the data collection process. Moreover, China's single child policy since 1980s means that the majority of urban Chinese families hold only one wedding for their children, thus we can match wedding gifts into unique initial-return pairs, which helps us identify the impact of different relation specific features on giving behaviors.

Since the gift transaction process is initiated by the wedding couple's family rather than givers (e.g. a giver may initiate giving in order to establish business relation), focusing on wedding gift exchange reduces the complexity of analyzing the motivations for giving.

The customs for wedding gift exchange in the city of Qingdao where the survey was conducted are described as following⁴. The hosts (i.e. the groom, the bride and their parents) send invitations to guests one to two months before the wedding day. Then to plan the reception, they start the headcount of the number of guests each invited individual plans to bring to the wedding banquet. Gift money is sealed in a red envelope with the giver's name written on the back. Upon their arrival on the wedding day, guests deliver the envelope to a red box at the reception. Depending on the preference of hosts, the red envelopes may be opened on-site and recorded immediately (with givers' name and the amount), or the hosts may opt to check and record gifts after the wedding. A return gift happens when there are similar events happening to the initial giving family, e.g. a wedding or a childbirth.

Another important feature of monetary gift exchange for modern Chinese weddings is that, unlike western weddings in which the groom and bride keep all the gifts, the ultimate receiver of each monetary gift depends on who owns the relationship with the giver. For instance, a groom's parents keep and record all gifts received from people in their social network, and thus are also responsible for any return gift in the future, i.e. gift exchange is always relationship specific. Note, even though kinship is maintained at the family level, each

²The large and elaborate ritual seems to a phenomenon formed after the 1949 Revolution. [Yan \(1996\)](#) reports that according to older informants for the survey, the number of guests normally ranged from 30 to 50 for ordinary villagers, and only landlords or the local elite would have more than 100 guests prior to 1949.

³The existence of private gift books is widely found in research on gift exchange in China, for example, [Gamble \(1933\)](#), [Lang \(1946\)](#), [Yan \(1996\)](#) and [Chen et al. \(2011\)](#).

⁴[Jiang et al. \(2015\)](#) provide a more detailed description of the procedure of Chinese wedding.

giving often targets a specific person within the receiving family. For example, gifts from one of the groom's (paternal) cousins and the cousin's parents would be recorded separately as one gift from the cousin to the groom and one gift from the cousin's parents to the groom's parents; or if the cousin and the cousin's parents gave a gift together, the gift would be recorded as one gift from the cousin's parents to the groom's parents. This structure of gift transactions simplifies the process of distinguishing the impact of different types of relationship and different gift histories.

With monetary gifts, any potential meaning conveyed through gifts is simplified to the monetary value of gifts. However, the meaning conveyed by each gift can still be complex, including the signaling of a giver's wealth, altruism/reciprocity, the face/status related competition and merely following social norm.

The nature and quality of relationship are important factors that determine the combinations of motivation behind a gift decision. As noted in [Yang \(1994\)](#), "the value of a gift (or the amount of money) reflects the degree of closeness between giver and recipient." Using a survey study conducted in Hong Kong, [Joy \(2001\)](#) finds that as the closeness of relationships increases, the nature of gift dynamics evolves from satisfying obligations or formality to the desire to impress by demonstrating intimate sentiments. For instance, a close relative can give a large monetary gift due to the long term nature of kinship. In addition, when the relationship is close and long term, givers tend to focus on receivers' needs and are less concerned with balancing the gift exchange relationship. In contrast, when givers are casual friends, an inappropriately large gift not only puts givers at the risk of financial loss with less than expected payback but also could be interpreted as an exertion of power and status by putting receivers in an inferior position. Thus one focus of our research questions is the social norms that Chinese society follows to balance the needs for the willingness to help, the risk of financial loss and the status.

3.3 MONETARY GIFT-EXCHANGE, SOCIAL NORM AND STATUS COMPETITION

This section provides a conceptual framework to illustrate the impact of social norm and status competition on giving behaviors in the institution of monetary gift exchange.

Following the approach adopted in [Brown et al. \(2011\)](#), I start with a general specification that captures the idea that people care about their own consumption and status relative to those of others through the comparisons of monetary giving.

Define I_i as individual i 's financial constraint that restricts her ability to spend, and define x_{i_j} as i 's choice of a "visible" good (i.e. a monetary gift) that is transferred to receiver j and carries certain message to the receiver, e.g. wealth, status, the desire for a reciprocal relationship; thus $y_i = I_i - x_{i_j}$ is i 's spending on private goods and/or visible non-monetary goods. Also define $r(\bar{x}, k_{i_j}, h_{i_j})$ as the measure of social reference for i 's giving. It depends on the average spending on monetary gifts by the general public in the reference community \bar{x} , a social norm for monetary giving that reflects the nature of relationship k_{i_j} (e.g. relatives, friends or colleagues), and the state of the relationship h_{i_j} , i.e. the quality of relationship and past gift history between i and j . Z_i is a vector of socioeconomic and demographic variables. Assume agent i 's utility as follows:

$$U_i = U(x_{i_j}, r; Z_i; I_i) \tag{3.1}$$

where we have used the budget constraint $I_i = x_{i_j} + y_i$ to eliminate y_i .

If subject i is concerned with following the social norm r , i.e. the absolute difference between x_{i_j} and r , then one possible specification of the previous utility function is as follows:

$$U_i = \alpha_i S(-|x_{i_j} - r|) + (1 - \alpha_i) V(x_{i_j}, I_i - x_{i_j}) \tag{3.2}$$

In Eq. (3.2), S is a sub-utility function capturing the benefits of following social norms with $S' > 0$ (i.e. the marginal distaste towards deviating from the norm increases with the size of the deviation), V is a sub-utility function capturing utility from other consumption. Adding concern for social comparison increases the motive to adjust spending on gifts in order to

follow the herd. $\alpha_i \in [0, 1]$ measures the strength of concerns for social comparison relative to own consumption. As $\alpha_i \rightarrow 0$, the problem reduces to a conventional utility maximization exercise in which social comparison plays no role.

$$U_i = \alpha_i S(x_{i_j} - r) + (1 - \alpha_i) V(x_{i_j}, I_i - x_{i_j}) \quad (3.3)$$

By contrast, in the status competition model (Eq. (3.3)) studied in [Brown et al. \(2011\)](#), the desire for higher status through outspending the social reference level r (i.e. the average yearly family gift spending in the studied village) accelerates the rise of the family gift spending in the village over time so that it increases faster than the growth of income. The intensifying status competition increases the burden of local families and causes significant waste on status gifts.

However, the question of status competition becomes more complicated when taking account of giving between individuals and/or families. After all, a family's total gift spending is the sum of all individual giving to other individuals or families, so the escalating status spending could arise from increasing giving to members of existing relations through larger and/or more frequent giving, expanding the scope of giving (i.e. giving to more people), or both.

For $\alpha_i > 0$, both the social norm model and the status model imply that giving increases with the reference level.

$$\frac{\partial x_{i_j}}{\partial r} > 0 \quad (3.4)$$

Two implications are derived from Eq. (3.4) for the relation between the size of monetary gifts and the reference. First, social comparison triggers a "keep up with the Joneses" response, thus people choose the size of monetary gifts based on their respective reference group. When calibrating, givers acknowledge that they value some recipients more highly than others and adjust their giving to reflect this difference. To follow the social norm, a relative should follow other relatives who have similar quality of relationship with the recipient.

In contrast, status driven givers would compete to beat the social reference giving, which in turn is derived from all individual giving. Thus as the real income rises, status competition

would drive social reference to accelerate faster than the growth of real income, i.e. the size of giving accounts for a larger proportion of real income as income increases.

In our analysis, I compare the impact of two different types of relationship on the size of gifts: kinship vs other types of relationship including both friendship and working relationship. Then I test the effect of rising local average disposable income on the size of gifts.

Second, current gift decision correlates with past gift transaction history between the giver and the recipient. For wedding gift exchange studied in this paper, the return gift from individual j to i should correspond to the size of the initial gift received from i . Again, the real disposable income should have limited impact on the size of norm driven return gifts in contrast to the status model.

However, the impact of gift history is more difficult to identify. For any dyadic relationship, common sense tells us that the mutual feelings tend to be symmetric, which implies that similar initial and return gifts may merely suggest that the feelings between the two parties are similar rather than the interdependence between future and past gift transactions. Thus to capture the effect of gift history requires accurately measuring any difference of mutual feelings, which is a very difficult task in practice.

Instead, we focus on the factors that influence the difference between the initial and return gifts. As Eq. (3.4) shows, when a giver has more concern for the deviation from social norms, the difference between of the initial gift and the return gift decreases; by contrast, the difference between the return gift and the initial gift always increases with the concern for status.

$$\begin{aligned}
 \textit{Social norm} : \quad & \frac{\partial |x_{ij} - r|}{\partial \alpha_i} < 0 \\
 \textit{Status seeking} : \quad & \frac{\partial (x_{ij} - r)}{\partial \alpha_i} > 0 \quad ; \quad (3.5)
 \end{aligned}$$

In this study, I use the nature and quality of relationship as proxy that affects the level of concern over the deviation from the reference. For instance, due to the concern for family reputation, the incentive to return a larger real gift may be stronger between relatives while following others or equality dictates the size of return gift to a colleague.

3.4 METHODOLOGY

The data used in this paper are collected from a 2014 survey study conducted in Qingdao, a major city in eastern China. Thus unlike previous studies ([Wei and Zhang \(2011\)](#), [Brown et al. \(2011\)](#), [Chen et al. \(2011\)](#)) whose survey data is collected from remote rural villages of China, our results are most relevant to giving behaviors in a more affluent modern city where monetary gifts are more affordable.

The survey uses a snowball sampling method which sends survey questionnaires to thirty-five individuals from the researcher and his family’s social network. The survey questionnaire includes two sections⁵ that collect basic demographic information and gift records, respectively. The section for demographic information asks subjects’ sex, marriage status and year of marriage, and financial situation. The gift records collect detailed information on each monetary gift transaction (The detailed questionnaire of the survey is included in Appendix [B.1](#)).

The study uses three sets of parameters to evaluate the impact of different types of social references on giving decisions. To verify the existence of gift calibration that is based on the type of relationship ([Joy \(2001\)](#) and [Lowrey et al. \(2004\)](#)), all types of relationship are divided into two groups: kin and non-kin (including friends or colleagues).

Kinship is often considered as having stronger social ties than friendship and working relationship as it reflects a long history of norm, trust and reciprocity among blood relations. According to [Yan \(1996\)](#), when members in this social network engage in gift exchange, they not only represent themselves but also their own family’s “face.” Thus they have strong incentive to maintain and protect family image and status in this social network, which explains why people appear to be most generous when giving to relatives.

In addition to the natural bonds between relatives, people could also voluntarily form long term relationship with friends when they find common interests and mutual affection through repeated social interactions. However, since friendship usually happens at individual level, it is not subject to as much peer influence and monitoring as from family members. So

⁵The survey actually used two versions of questionnaire. For those individuals or families who or whose children hadn’t got married thus had no opportunity to receive wedding gifts, I used a shorter and simpler questionnaire that contained two sections including demographic information and giving first record only

a friend may feel less obligated to follow the herd, thus giving and/or returning from friends is often less than a relative.

In contrast, a working relationship is explicitly formed for a common purpose, thus there is neither natural bonds through family connections nor mutual affection through voluntary friendship between colleagues, which limits the potential for building long term reciprocal relationship, therefore, a colleague give the least though s/he may also have strongest tendency to follow the herd.

However, there is a practical difficulty in separating friendship from working relationships because friendship and working relationships may coexist. Thus this paper focuses on comparing giving decisions of kin and unrelated actors.

Another complication arises from the complex structure of kinship networks. Different giving from relatives could also reflect the higher quality of relationships associated with kinship. In order to separate the influences of these two factors, the survey also asks subjects to evaluate the quality of each relationship on a 1-10 scale (See Appendix [B.2](#)).

Gift exchange may also reflect a dynamic and repeated process. As we discussed previously, in addition to the tendency to follow the herd, gift transactions within each relation could follow different tracks that depend on past giving actions. In order to measure this dynamic effect, we investigate the factors behind the difference between the wedding gift one received in the past and the wedding gift she returns in the future including the type of relationship, the quality of relationships and the size of initial gifts.

Last, in order to test the evolution of social giving over time, we use two metrics for the measure of gift size: real gifts adjusted by 2014 CPI in Qingdao to take account of the effect of inflation, and the size of gift as a proportion of average disposable income in the year of gift transaction.

3.5 EMPIRICAL RESULTS

3.5.1 Data and Descriptive Statistics

We collected records of 912 (611 initial gifts and 301 return gifts, i.e. 301 initial-return gift pairs) wedding-gift transactions from 33 individuals through the survey conducted in Qingdao in August 2014. Among the 27 surveyed subjects who voluntarily reported their income range, 21 of them belong to high or highest income group⁶ in Qingdao based on their income level in 2010. In addition, all 23 married subjects own an apartment. Thus given the income level and the residential housing price level (\$1472 per square meter on average with average residential housing area of 29.8 square meters per person) in Qingdao in 2014 according to the 2014 Qingdao Yearbook (2014), the majority of survey subjects are unlikely to face significant financial constraint when making gift decisions.

Nearly half (47%) of the initial gift decisions and the majority (84%) of the return decisions were made between 2010 and 2014. Figure 7 shows the distribution of the size of initial and return gifts using two metrics: real gifts valued at 2014 CPI price level of Qingdao and the size of gifts as a proportion of the average disposable income in the year of gift transaction. The real value of initial gifts ranges from 100 Yuan to 10,000 Yuan⁷ with the median gift of 600 Yuan, and the real value of the return gifts ranges from 100 Yuan to 22,800 Yuan with the median gift of 800 Yuan. Nearly one quarter (22.2% of initial gifts and 23.9% of return gifts) of the gifts are worth more than 5% of the city-wide average disposable income. Both types of gifts are highly skewed to the left with 82% of the initial gifts and 69% of the return gifts less than or equal to 1,000 Yuan. 79% and 21% of the initial gifts were exchanged between colleagues/friends and relatives, respectively; 85% and 15% of the return gifts were traded between colleagues/friends and relatives, respectively.

Finding 1: Giving between relatives is larger than from other types of relationship.

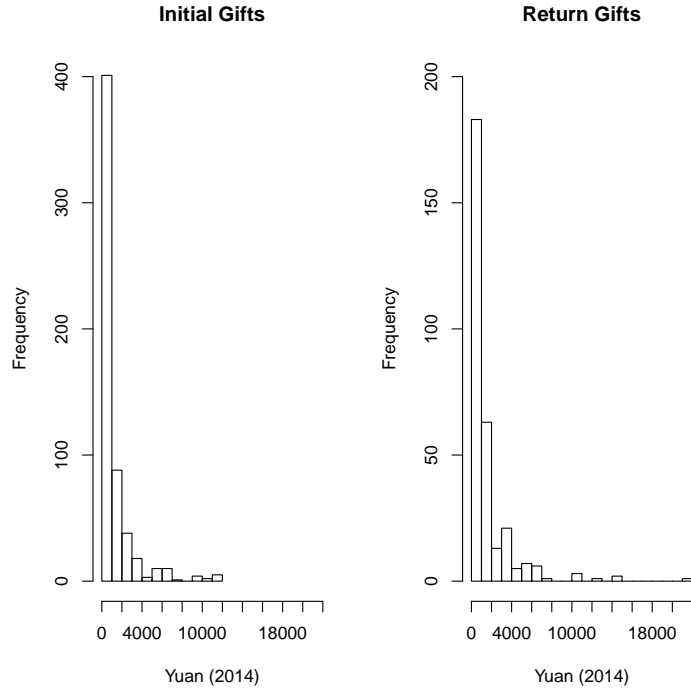
Figure 8 shows the relation between the size of monetary gifts and the type of relationship. The three panel groups compare the distribution of the gift size between kin and non-kin

⁶The categorization is adopted from the one used in the 2010 Yearly Book created by National Bureau of Statistics of China, Qingdao.

⁷The exchange rate between Yuan and US dollar from 2010 and 2014 declined from 6.8:1 to 6.1:1

Figure 7: Distribution of the Size of Gifts

(a) Real Gifts (Base Year: 2014)



(b) Size of Gifts Relative to Average Income

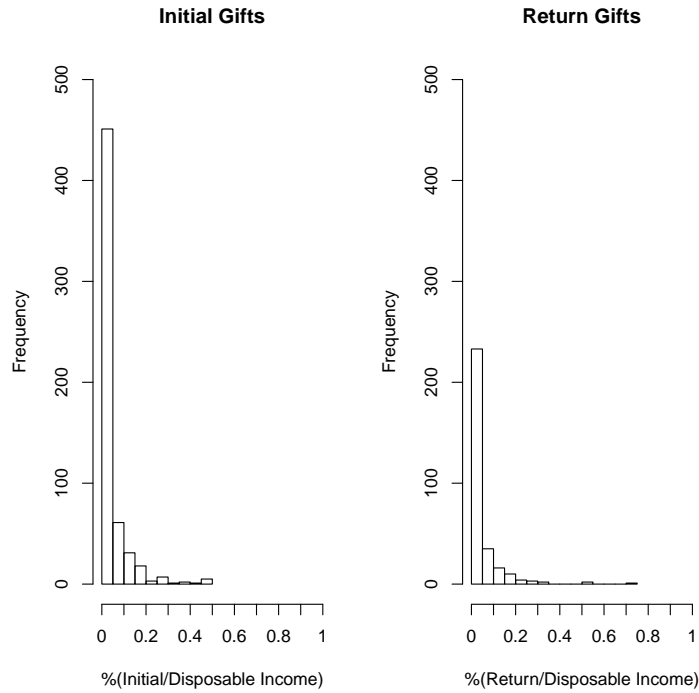
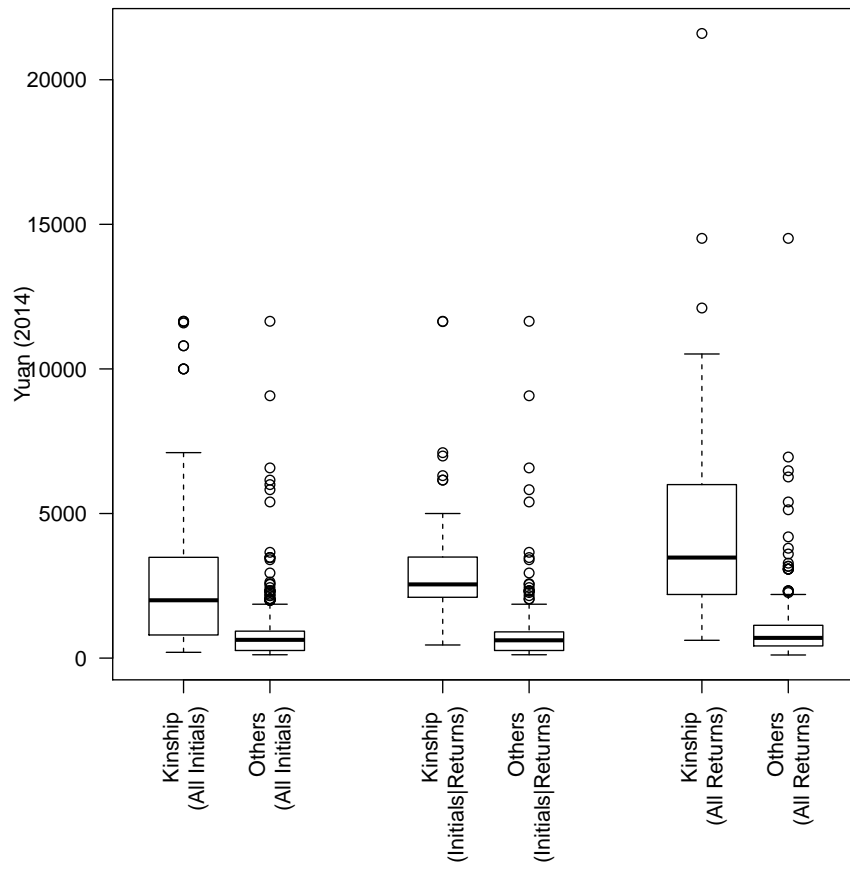


Figure 8: Size of Gifts and Nature of Relationship



for all initial gifts, initial gifts that have had return gifts recorded at the time of survey (Initials—Returns) and all return gifts, respectively. The purpose to analyze the initial gifts conditional on the existence of return gifts is to reduce the possibility that some initial givers might give less because they did not expect any return gift in the future.

In all three groups, relatives tend to give and return significantly more than friends and/or colleagues ($p - value < 0.001$ for Welch Two Sample t-test). However, gifts from relatives are less predictable than from other types of relationship in terms of the variance of gift size ($p - value < 0.001$ for F-test).

A potential reason for the latter result is the significant variance of kinship structure. For instance, the giving from a distant cousin may not be significantly different from a friend or colleague while a brother who wishes to build on an existing strong bond is more likely to give more than other relatives. This potential difference between the quality of relationship and social ties raises an important question as to whether the higher giving from relatives is driven by the natural bond of blood relationship or merely originates from better quality of relationship. Thus we try to separate the effect of kinship from the quality of relationship next.

Figure 9 compares the size of gifts from relatives with gifts from friends/colleagues in different relation quality groups for all initial gifts, initial gifts that have return gifts and return gifts, respectively. The categories are based on the definitions of relation quality subjects used in the survey questionnaires (See Appendix B.1), i.e. very good: 9-10, good: 7-8 and average or below: < 7 (We use 9-10 and less than 9 because there are only two initial-return gift pairs for relation quality below 7).

Table 5 summarizes the test results of pairwise comparison in different relation quality groups. Even after controlling the relation quality, giving from relatives is larger than friends and colleagues at 5% or lower significance level in all testing groups. The result remains when we focus on initial gifts that have return gifts. Thus kinship is on average valued higher than friendship and working relationship. In addition, the variance of gift size from relatives is again more pronounced than other relationships, which suggests that social norms for giving between relatives are more complex than for other types of relationship.

Finding 2: Real return gifts are larger than real initial gifts. However, there is no signif-

Figure 9: Distribution of the Size of Gifts

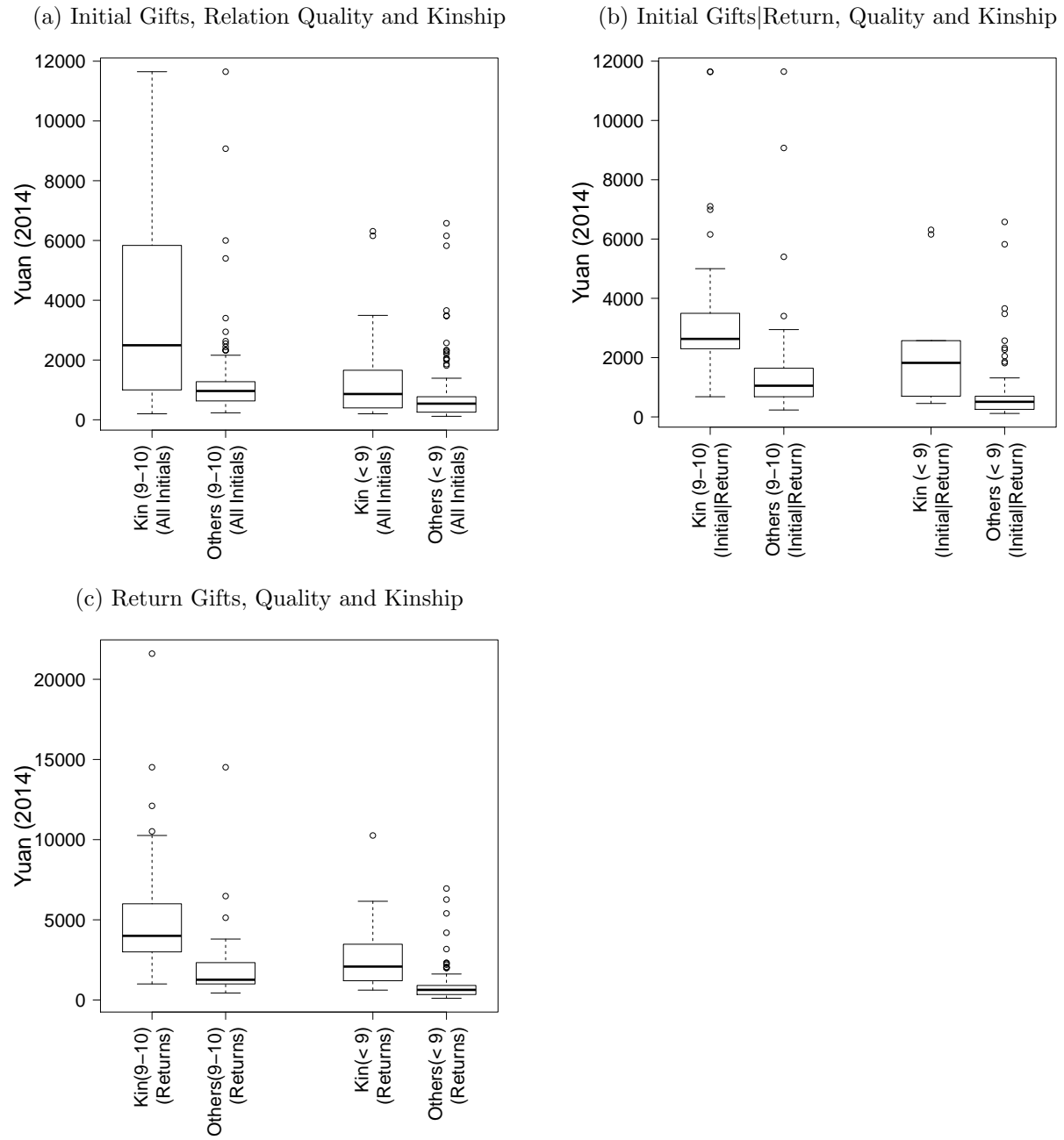


Table 5: Testing $Gift_{kinship} > Gift_{others}$ in Different Relation-Quality Groups

Quality	Welch Two Sample t-test (p-value)			F-test of variances (p-value)		
	Initials	Initials Returns	Returns	Initials	Initials Returns	Returns
9 - 10	0.000***	0.000***	0.000***	0.000***	0.056*	0.000***
Below 9	0.001***	0.015**	0.018**	0.000***	0.000***	0.000***

Figure 10: Initial-Return Gift Pairs for Kin and Non-kin

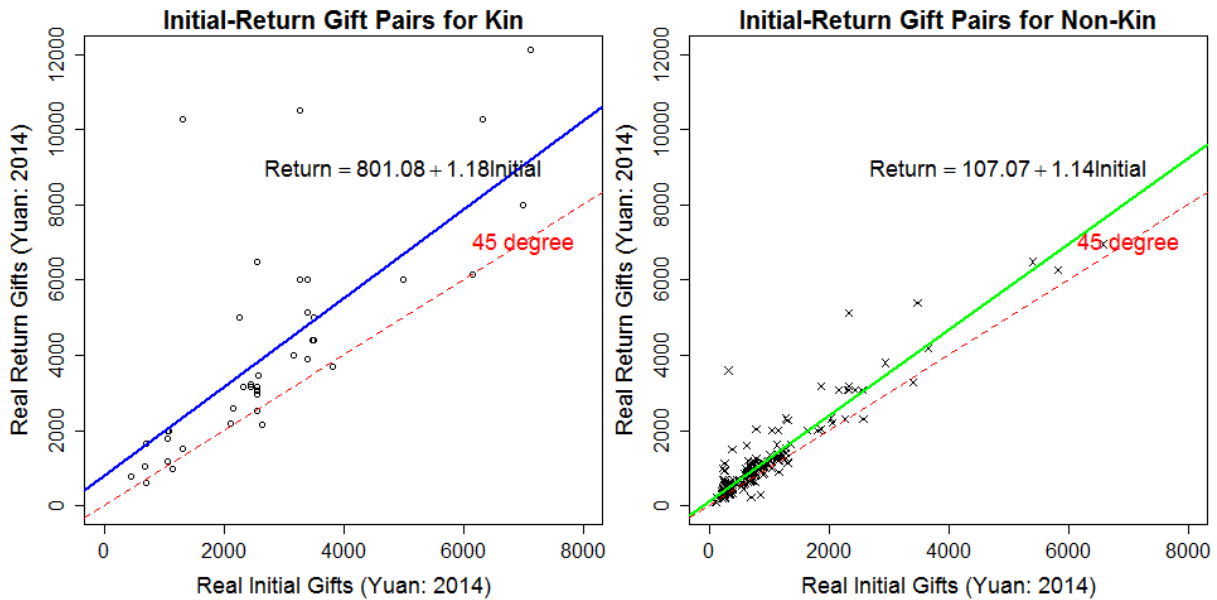
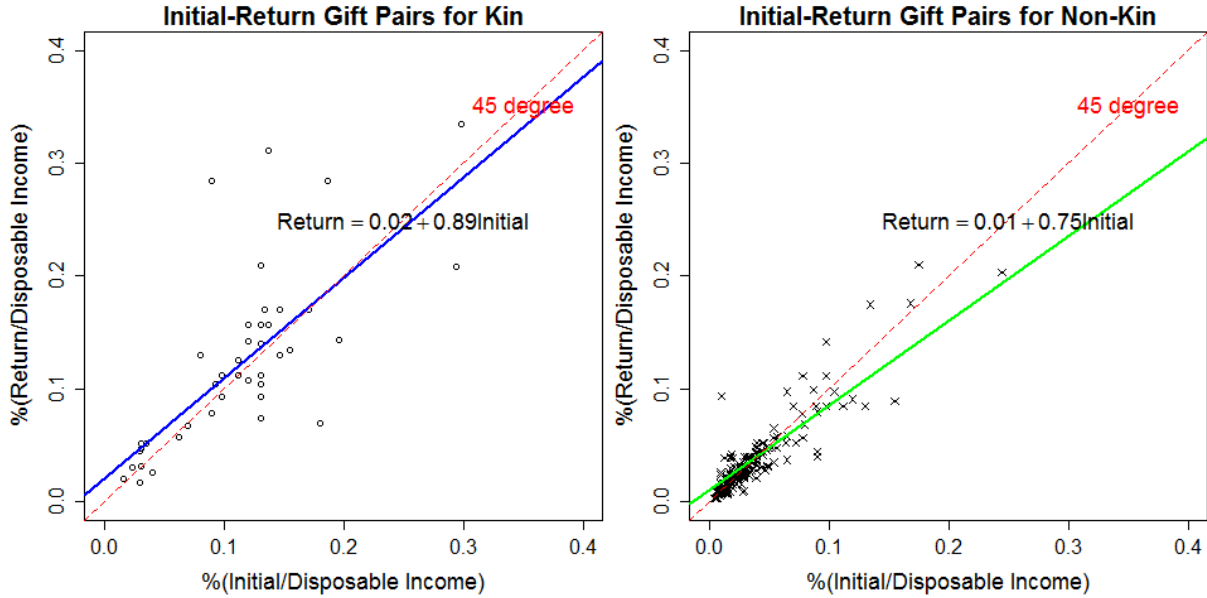


Figure 11: Initial-Return Gift Pairs (% Income) for Kin and Non-kin



ificance between the size of return gifts and initial gifts after accounting for the rising disposable income.

Figure 10 compares the initial-return gift pairs between related and non-kin pairs for real initial gifts (adjusted by CPI) less than 8000 Yuan. The return gifts are larger than initial gifts received in the past using paired t-test (p -value : 0.000). In addition, given an initial gift, returns from relatives tend to be larger than friends/colleagues (p -value : 0.005) using a simple regression of return gifts on initial gifts (with interaction with relation type). Thus not only relatives tend to give more but also return more.

The larger real return gifts than the initial gifts may merely reflect the fast rising real disposable income in the city of Qingdao as the real disposable income increased on average 10.4% per year between 2005 and 2014, according to the National Bureau of Statistics of China in Qingdao (2014). Indeed, on average there is no significant difference between the initial gifts and the return gifts when the size of gifts is measured as a proportion of disposable income. However, the result depends on the type of relationship: the return gifts from relatives are still larger than the initial gifts at 10% significance level according to

the paired t-test (*p-value*: 0.093); by contrast, there is no significant difference between the initial and return gifts for non-kin.

3.5.2 Regression Analysis

Results in the previous section illustrate the significant value that Chinese society places on kinship over other types of social ties. However, there are still significant unaccounted variations in gifts between relatives even after controlling the quality of relationship.

Similarly, a casual inspection of the initial-return relation in Figure 10 and Figure 11 reveals that at larger gift levels, the initial-return relationship exhibits significant larger volatility; in contrast, the initial-return link between friends and colleagues is relatively stable across different sizes of initial gifts. Thus in this section, I seek to refine our analysis to incorporate more factors using regression analysis. We begin with the analysis of initial gifts, turning to return gifts and initial-return relation later.

3.5.2.1 Initial Gifts For initial gifts, I estimate models of the following reduced form:

$$Initial_{i,j} = \alpha Kinship_{i,j} + \beta Quality_{i,j} + \delta Cost_{i,j} + yearly\ trend + fixed\ effect \quad (3.6)$$

$Initial_{i,j}$ stands for the size of initial gift from person i to person j . Dummy variable $Kinship_{i,j}$ captures the nature of relationship as discussed earlier. $Quality_{i,j}$ measures the quality of relationship estimated by surveyed subject i . $Cost_{i,j}$ are measures for the cost of wedding: a dummy variable that controls for the prestige of restaurants (1 if 4 star hotel or above) and the number of guests given i brought to the wedding banquet. The former is a measure of wedding cost determined by the host's choice, which also reflects the host's ability to pay, e.g. wealth. The latter approximates the cost of the wedding banquet caused by the invited guest, i.e. the more guests she brings, the more the host has to pay for the wedding. The *yearly trend* captures the trend of gift size over time. Last, *fixed effect* controls for the unobserved heterogeneity of surveyed subjects' social networks.

Table 6 and 7 present the results of the OLS regressions for initial gifts. All initial gifts are divided into two groups: initial gift decisions made by the surveyed subjects and initial

Table 6: Initial Gift Decisions Made by Surveyed Families

	FROM Surveyed Subjects			
	Real Initial (Base: 2014)		% (Initial/Disposable Income)	
	(1)	(2)	(3)	(4)
<i>Kinship</i>	1294.47***	251.76	4.18***	1.11
<i>(1 if from a relative)</i>	(202.47)	(289.69)	(0.71)	(1.03)
<i>Quality of Relationship</i>	646.36***	358.47**	2.69***	1.84***
<i>(1 if "very good": 9 or 10)</i>	(147.08)	(153.36)	(0.51)	(0.55)
<i>Kinship * Quality</i>		1639.63***		4.82***
		(337.22)		(1.20)
<i>Restaurant</i>	-31.88	-20.47	0.20	0.23
<i>(1 if 4 star or above)</i>	(114.35)	(110.01)	(0.40)	(0.39)
<i>Number of Guest Brought</i>	511.58***	486.44***	2.12***	2.05***
	(91.90)	(88.55)	(0.32)	(0.32)
<i>Yearly Trend</i>	29.01	36.97	-0.29***	-0.26***
	(24.30)	(23.43)	(0.09)	(0.08)
<i>Fixed Effect</i>	Yes	Yes	Yes	Yes
R^2	0.64	0.67	0.63	0.65
N	311	311	311	311

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Initial Gifts Received by Surveyed Families

	TO Surveyed Subjects			
	Real Initial (Base: 2014)		% (Initial/Disposable Income)	
	(1)	(2)	(3)	(4)
<i>Kinship</i>	1317.88***	240.48	2.29**	1.13
<i>(1 if from a relative)</i>	(205.08)	(297.97)	(0.90)	(1.03)
<i>Quality of Relationship</i>	662.75***	392.01**	2.83***	1.68*
<i>(1 if "very good": 9 or 10)</i>	(149.79)	(154.55)	(0.80)	(0.94)
<i>Kinship * Quality</i>		1659.54***		3.68**
		(344.15)		(1.65)
<i>Restaurant</i>	-26.85	-20.38	-1.44	-3.79**
<i>(1 if 4 star or above)</i>	(115.30)	(110.84)	(1.44)	(1.78)
<i>Number of attendees</i>	495.35***	475.67***	1.05***	0.94**
	(93.66)	(90.13)	(0.37)	(0.37)
<i>Fixed Effect</i>	Yes	Yes	Yes	Yes
R^2	0.65	0.68	0.35	0.39
N	311	311	254	254
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$				

gifts received by the surveyed subjects. For the former, the fixed effect controls for the individual giving pattern specific to each surveyed subject, e.g. different levels of generosity caused by different ability to pay. For the latter, the fixed effect captures the heterogeneity of giving patterns between different subjects' social groups. For example, if social networks are formed based on members' financial situations, a surveyed subject who is financially better off is more likely to receive larger gifts than others because of her friends' higher ability to pay. Note, there is no variable to control yearly trend in Table 7 because the gifts received by surveyed subjects concentrated on ten weddings hosted by their families in different years, and adding both fixed effect and yearly trend would result in perfect multi-collinearity.

Results are similar between the gift decisions made by the surveyed subjects and the gifts received by them. The regression analysis confirms earlier findings in the non-parametric analysis: for both measures of the size of gifts, the relationship of better quality tends to generate larger gifts; giving from relatives is larger than from friends and colleagues. This premium for the size of gifts traded between relatives is caused by the larger giving associated with kinship of higher relation quality (**Column 2 and 4**). Thus the marginal benefit of a better relationship is larger for kinship than for other types of relationship.

Another feature stands out is the relative constant real value of initial gifts (adjusted by the CPI) shown in the analysis of gift decisions made by the surveyed subjects. Taking account of the fast rising real disposable income in Qingdao in the last decade, the size of initial gifts grows slower than the average city-wise disposable income. Thus social competition for status appears to have limited impact on giving at individual level. This result implies that the burden of giving is more likely to be attributed to other factors such as the increase in the frequency of giving and/or the larger scope of giving due to more social events and larger social network.

3.5.2.2 Return Gifts and Initial-Return Gift Relation Because the same factors may underlie the giving decisions for both initial and return gifts, the analysis for the influence of the size of initial gifts on return gifts is more complex. In this subsection, we first investigate whether there is systematic difference between the size of initial and return gifts by introducing a dummy variable $DReturn_{i,j}$ (1 for return gifts) to Model (3.6). The

coefficient of the return dummy captures the difference between initial and return gifts:

$$\begin{aligned} Size\ of\ Gift_{i_j} = & \theta DReturn_{i_j} + \alpha Kinship_{i_j} + \beta Quality_{i_j} + \\ & \delta Cost_{i_j} + yearly\ trend + fixed\ effect \end{aligned} \quad (3.7)$$

The estimation focuses on initial-return pairs recorded in our survey (i.e. drop initial giving that has no return gifts recorded at the time of survey) to filter out giving that anticipates no return.

First, I estimate Model (3.7) to measure the average difference between the size of initial and return gifts controlling for other variables. Then the interactions $DReturn_{i_j} * Kinship_{i_j}$ and $DReturn_{i_j} * Quality_{i_j}$ are added to measure the marginal effect of kinship and relation quality on the size of return gifts, respectively.

Table 8 reports the results for the comparison between initial and return gifts. The return gifts are on average larger than the initial gifts for both metrics of the size of gift, *ceteris paribus*. The premium of return gifts over initial gifts could potentially result in escalating gift exchange if the trade of gifts is a repeated process.

Note, the insignificant yearly trend in Column 4-6 is the result of multi-collinearity problem caused by the presence of fixed effect (i.e. many return and initial gifts are recorded for the ten weddings reported in the survey). After dropping the fixed effect, the result in Column (7) shows that the size of gift as a proportion of income declines over time.

Next, we investigate the determinants for the difference of initial-return gift pairs. Specifically, we estimate the following model:

$$\begin{aligned} Diff(gift)_{j_i} = & \eta Initial_{i_j} + \alpha Kinship_{j_i} + \beta Quality_{j_i} + \delta_{initial} Cost_{i_j} + \\ & \delta_{return} Cost_{j_i} + Diff(year)_{j_i} + fixed\ effect \end{aligned} \quad (3.8)$$

$Diff(gift)_{j_i}$ is the difference between the initial-return gift pair for relation ij , i.e. $Return_{j_i} - Initial_{i_j}$. $Initial_{i_j}$ is the size of initial gifts, which captures the impact of the size of initial gifts on returning decisions. Because common factors may denominate both $Initial_{i_j}$ and $Return_{j_i}$, we use the fitted values of $Initial_{i_j}$ as proxy for the size of initial gifts when

Table 8: Compare the Size of Initial and Return Gifts

	Real Gift (Base: 2014)			% (Gift/Disposable Income)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>DReturn</i>	3155.45***	2922.24***	3047.64***	5.67**	5.73**	6.15**	1.11**
<i>(1 for return gifts)</i>	(730.64)	(739.29)	(745.91)	(2.75)	(2.79)	(2.81)	(0.52)
<i>DReturn * Kinship</i>		651.04*			-0.18		
		(343.29)			(1.29)		
<i>DReturn * Quality</i>			200.53			-0.89	
			(276.50)			(1.04)	
<i>Kinship</i>	1243.00***	948.77***	1247.64***	4.43***	4.52***	4.41***	5.45***
<i>(1 if from a relative)</i>	(210.79)	(261.35)	(210.97)	(0.79)	(0.99)	(0.79)	(0.77)
<i>Quality of Relation</i>	977.84***	976.69***	883.15***	3.73***	3.73***	4.16***	3.55***
<i>(1 if "very good")</i>	(153.34)	(152.99)	(201.43)	(0.58)	(0.58)	(0.76)	(0.56)
<i>Restaurant</i>	-25.97	-23.23	-20.20	0.15	0.15	0.12	0.04
<i>(1 if 4 star or above)</i>	(146.32)	(146.00)	(146.60)	(0.55)	(0.55)	(0.55)	(0.47)
<i>Number of attendees</i>	501.45***	495.78***	497.59***	1.69***	1.69***	1.71***	1.77***
	(80.00)	(79.87)	(80.21)	(0.30)	(0.30)	(0.30)	(0.29)
<i>Yearly Trend</i>	44.35	47.37	44.82	-0.21	-0.21	-0.21	-0.46***
	(37.46)	(37.41)	(37.48)	(0.14)	(0.14)	(0.14)	(0.10)
<i>Fixed Effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	No
<i>R²</i>	0.50	0.50	0.50	0.45	0.45	0.45	0.36
<i>N</i>	605	605	605	605	605	605	605
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$							

evaluating Model (3.8). In addition, we also measure the time value of money by adding the difference between the year of return gift and the year of initial gift, $Diff(year)_{j_i}$ with a negative coefficient implying that return gifts are losing value.

Table 9 reports the impact of each determinant on the difference between initial and return gift (we drop $Restaurant_{Initial}$ and $Number\ of\ Guests_{Initial}$ in the column (2) (3) (5) and (6) analysis to reduce the multi-collinearity when adding the fitted value of initial gift).

For real gifts adjusted by CPI, in Column (2), in the absence of the nature and quality of relationship, the difference between a return gift and its corresponding initial gift increases with the size of the initial gift. Given that return gifts tend to be larger than initial gifts (according to results in Table 8), this result means that there is a 17% premium of return gifts over initial gifts.

When taking account of the rising disposable income, the premium of return gifts over initial gifts is declining. Though as a proportion of disposable income, return gifts are still larger than initial gifts (Table 8), one percent increase in $\%$ (initial gift/income) only results in slightly more than half (0.52) percent increase in $\%$ (return gift/income) in return. Therefore, though giving larger initial gifts can generate profits in the future, the profit margin is quickly declining because as the size of initial gifts increases, it becomes more expensive to return with a premium of constant percentage. This reduced premium as a proportion of initial gifts decreases the incentive to compete for higher status through monetary giving. Similarly, in Column (4) and (5), there is a tendency for the size of return gifts as a proportion of disposable income to drop by 0.20-0.23% of average disposable income per year.

3.6 DISCUSSION AND CONCLUSIONS

Using data gathered from personal monetary gift records for urban Chinese weddings, this paper examines the factors behind giving behaviors within individual relationships. The results document that people calibrate their monetary gift decisions based on the nature and quality of relationships. Kinship and better relationship are often associated with both larger initial and return gifts.

Table 9: Difference between Initial and Return Gifts

	Real Return - Real Initial			%Return/Income – %Initial/Income		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Constant</i>	590.04**	320.18	612.67**	0.99	0.62	2.14*
	(266.33)	(265.21)	(277.48)	(0.94)	(0.94)	(1.09)
<i>Fitted Initial</i>		0.17**	-0.22		-0.09	-0.48***
		(0.07)	(0.14)		(6.66)	(0.16)
<i>Kinship</i>	474.13***		584.62***	0.29		1.55**
<i>(1 if from a relative)</i>	151.97		(211.51)	(0.53)		(0.77)
<i>Quality of Relationship</i>	210.23**		387.35**	0.16		1.65***
<i>(1 if “very good”)</i>	(107.01)		(156.12)	(0.38)		(0.63)
<i>Restaurant (Initial)</i>	101.67			-0.03		
<i>(1 if 4 star or above)</i>	(97.36)			(0.34)		
<i>No. of Guests (Initial)</i>	-173.60**			-0.81***		
	(72.44)			(0.25)		
<i>Restaurant (Return)</i>	-202.35*	-239.03**	-231.13**	-0.90**	-0.85**	-0.70*
	(108.83)	(106.76)	(105.37)	0.38	(0.37)	(0.37)
<i>No. of Guests (Return)</i>	268.36***	235.08***	242.05***	0.70***	0.54***	0.66***
	(54.10)	(50.57)	(51.88)	(0.19)	(0.18)	(0.19)
<i>Time Value</i>	55.99**	57.57**	49.99**	-0.23***	-0.20**	-0.13
	(22.94)	(23.25)	(23.04)	(0.08)	(0.08)	(0.08)
<i>R²</i>	0.39	0.36	0.38	0.17	0.15	0.17
<i>N</i>	288	288	288	288	288	288
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$						

Several potential explanations exist for the more generous giving behavior towards kin. As reviewed in [Cheng \(2014\)](#), Chinese tend to put much stronger trust in family members than western cultures shown in the extensive research on the significant family influence over private business management in China. This trust and the need to maintain the trust are reflected in the larger initial gifts to relatives and the corresponding larger reciprocal return gifts in the future. Similarly, due to the stronger social ties from kinship than other relationships, a giving decision not only shows a giver's attitude towards the relationship but is also an opportunity to solidify her family's status or "face" in the kin network.

The growth of the size of monetary gifts in Qingdao lags behind the rising average city-wide disposable income. Thus giving within a relationship do not escalate as suggested by the status competition model. Rather, people tend to follow the social norm that requires return more than initial gift (adjusted by CPI) for kinship and better relations but maintain the balance between the initial and return gifts.

The burden of status competition is more likely to show in other forms of giving including the increasing frequency and scope of giving, and/or larger giving or spending on non-monetary goods (e.g. hosting a large and luxury wedding). For example, [Yan \(1996\)](#) discusses that in early years after the 1949 Revolution, the land reform and the subsequent political campaigns altered the previous system of social hierarchy, thus raising the hopes of ordinary villages. With the potential aid of monetary and non-monetary gifts received for wedding to partially relieve financial burden, people expand the size of wedding banquets with the number of invited guests rising from between 30 and 50 prior to 1949 to today's often over 100. This expansion raises the scope of receiving and giving. Similarly, the social transformations due to China's economic reform since 1978 again motivate a new round of competition for higher social status ([Brown et al. \(2011\)](#)). Moreover, other factors such as imbalanced gender ratio reported in [Wei and Zhang \(2011\)](#) also intensify the race to compete for limited social resources through building larger social networks through giving.

There are several limitations of the results in this paper. First, the results only apply to monetary gift exchange. The perfect transferability nature of money hides or reduces the incentive for status competition which often requires burning money through consuming visible status goods not affordable by less wealthy families. Thus, the status competition

may be reflected in the amount of money spent on weddings, which is not captured in our data.

Our analysis uses self-reported data from surveyed subjects. This data collecting technique inevitably introduces selection bias and errors, thus future research should put in more effort on collecting data of higher quality, e.g. collecting data at or immediately after wedding.

In addition, we made a simplified assumption that the initial-return gift pairs are standalone events by disregarding prior- and post-wedding gift transactions.

Last, it is also important to investigate whether monetary giving restrains or encourages burning money. On the surface, the monetary gifts reduce the financial burden of receiving families. However, by anticipating the monetary supports through collecting monetary wedding gifts, the hosts can afford more expensive status goods which potentially further intensifies the social competitions.

4.0 CONCLUSION

The preceding chapters each provide a perspective into the study of behavioral economics in market economy and gift economy, respectively. These separate inquiries into each subfield attempt to shed light on understanding the collective market action of asset pricing and individual giving decisions under social influence.

Chapter 2 analyzed experimental data to investigate the impact of non-fundamental information on asset pricing in markets with bankruptcy risk. The key finding is the reduced price movements both within and between experimental periods when provided with public information on a share's intrinsic value and price histories. Providing more information enhances price anchoring effect rather than improving price convergence toward intrinsic values.

This result reveals a challenge to the conventional wisdom that more information and transparency promote market efficiency. As observed in one of more informed sessions, under the threat of bankruptcy risk, the reduced price volatility can trap share prices away from its intrinsic value for extended periods. Even when prices are near intrinsic values, they are not able to fully track the evolution of intrinsic values, thus the price stickiness can potentially result in significant mis-pricing when assets experience large fundamental changes.

Chapter 3 investigated the social norms behind monetary gift exchange for urban Chinese weddings. The paper shows that urban Chinese place more value on maintaining kinship than other types of relationship. The size of monetary gifts as a proportion of average city-wide disposable income decreases over time though for dyadic relationship, people are conscious of maintaining the balance of giving by returning gifts of similar or larger size. This result suggests that the size of monetary gifts is unlikely to be the source of status competition (Wei and Zhang (2011), Brown et al. (2011), Chen et al. (2011)).

APPENDIX A

CHAPTER 2

A.1 EXPERIMENTAL PLATFORM SCREENS

Figure 12: Information Stage Screen for Informed Sessions

Remaining Time 19

FORECAST

C

CURRENT PERIOD 2

Forecast for CURRENT period
Expected value per share for CURRENT period 333
Your forecast of average trading price for CURRENT period

Forecast for NEXT period
If CURRENT period generates HIGH dividend, your average-price forecast for NEXT period
If CURRENT period generates LOW dividend, your average-price forecast for NEXT period

OK

SUMMARY OF ALL PREVIOUS SEQUENCES

A

AVERAGE EARNING PER SHARE 450
AVERAGE PRICE OF ALL COMPLETED TRANSACTIONS 316
AVERAGE EXPECTED VALUE 331

B

PERIOD	AVERAGE TRADING PRICE	EXPECTED VALUE	DIVIDEND
1	205	300	150

SUMMARY OF CURRENT SEQUENCE

Figure 13: Trading Stage Screen

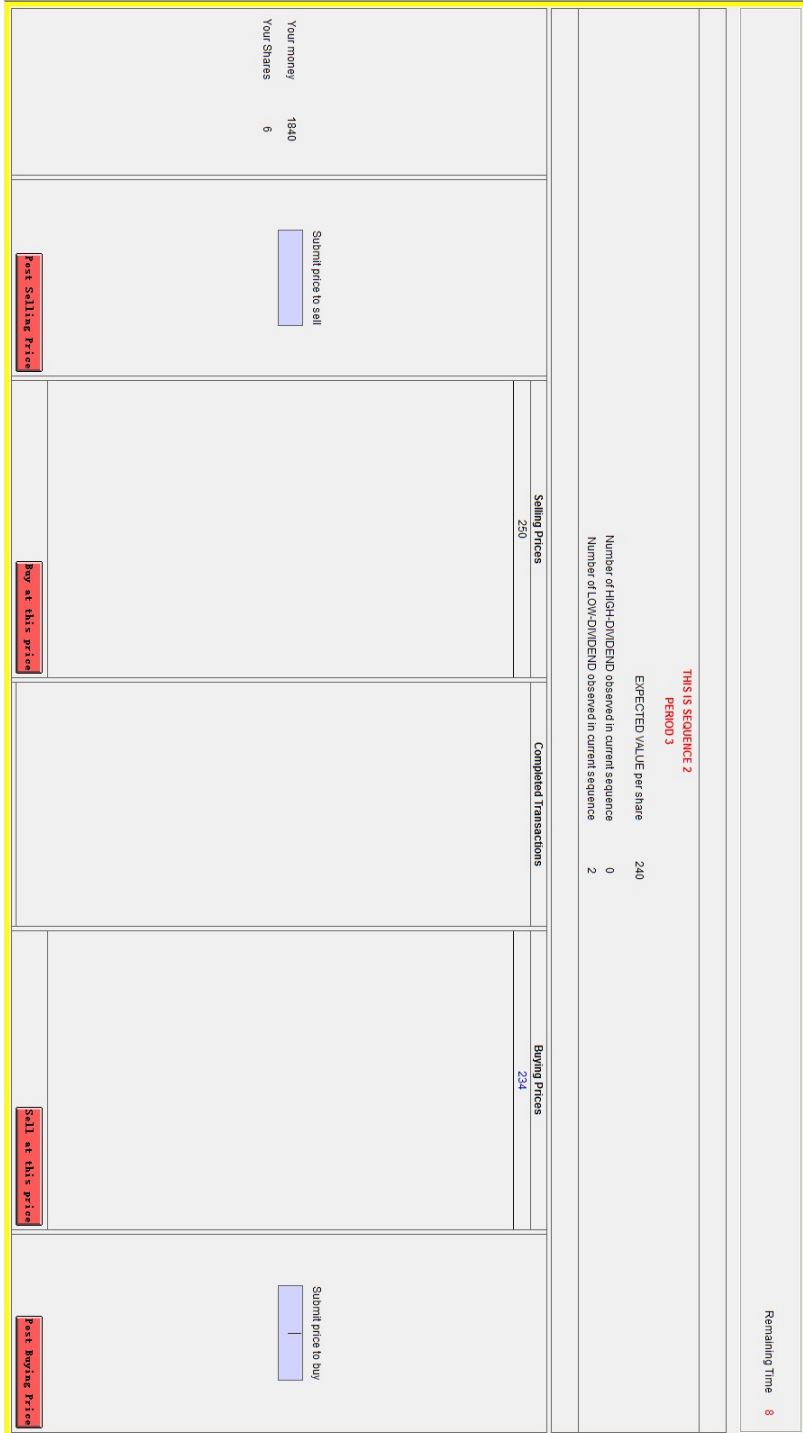


Figure 14: Outcome Stage Screen

TRADER REPORT

DIVIDEND INCOME PER SHARE	150
TOTAL DIVIDEND INCOME IN CURRENT PERIOD	450
CURRENT TOTAL WEALTH	
Shares:	3
Money:	3170

Remaining Time **8**

Sequence	Sequence Trading Earning	Total Forecast Earning in all sequences
1	4824	100

[CONTINUE TO NEXT PERIOD](#)

A.2 ASSET VALUATION WITH EXPONENTIAL UTILITY FUNCTION

The model consists of n players. Each player obtains value from periodic payoffs (i.e. dividend) by owning shares or selling shares to other players for cash. We assume that the value for each player is determined by the exponential utility function $v(\cdot)$. As shown in Eq. (A.1), the value of risky shares depends on players' attitude/appetite towards risk. The level of risk appetite is captured by α : a positive (negative) α implies risk aversion (risk seeking) while $\alpha = 0$ means risk neutrality.

$$v(c) = \begin{cases} c & \text{if } \alpha = 0 \\ \frac{1-e^{-\alpha c}}{\alpha} & \text{if } \alpha \neq 0 \end{cases} \quad (\text{A.1})$$

In order to simplify the analysis, the model analysis adopts the parameters discussed in previous section. The market valuation V_i for a share of quality i ($i = A, B$) is equal to:

$$V_i = \sum_{t=1}^{\infty} \beta^{t-1} (\lambda_{i,High} v(c_{High}) + (1 - \lambda_{i,High}) v(c_{Low})), \quad i = A, B \quad (\text{A.2})$$

Players are impatient, which is captured by the discount factor β . We follow [Camerer and Weigelt \(1993\)](#) and [Crockett and Duffy \(2013\)](#) to introduce discounting by using an indefinite horizon with a constant continuation probability ($\beta = \frac{3}{4}$) in place of implementing an infinite horizon with constant time discounting. $\lambda_{i,j}$ ($i = A, B, j = High, Low$) is the probability that the share of quality i generates a dividend of size j . c_j ($j = High, Low$) is the dividend earning of a share given a dividend announcement of j .

Using the numeric parameters for the experiment, the risk-neutral expected value of a share of quality i simplifies to:

$$V_i = 4\lambda_{i,High} \frac{1 - e^{-150\alpha}}{\alpha}, \quad i = A, B \quad (\text{A.3})$$

Thus in a risk neutral environment ($\alpha = 0$), the value of owning a share is $V_{A,\alpha=0} = 400$ for share A and $V_{B,\alpha=0} = 200$ for share B, which are also the intrinsic values. Moreover, since the value function strictly decreases with the level of risk aversion α , the value of a share is below (above) its intrinsic value for a risk averse (risk seeking) player.

In order to simplify¹ the comparison of risk appetite between sessions, we adopt a simpler measure of risk appetite δ in place of the measure α used in the exponential value function (Eq. (A.1)), where δ satisfies:

$$V_i(\alpha) = V_i(0) * \delta, \quad i = A, B \quad (\text{A.4})$$

i.e. δ is the discount factor used to derive the risk-adjusted value from the the risk-neutral value. Note, as shown in **Eq. (A.4)**, since the exponential value function $v(\cdot)$ strictly decreases in the level of risk appetite α , δ strictly decreases in α . Thus δ is also a measure of risk appetite, i.e. the higher (lower) is δ , the larger (smaller) is a player's risk appetite. Then the risk-adjusted value for each type of share can be rewritten as:

$$\begin{aligned} \text{Share A : } V_A &= 400\delta \\ \text{Share B : } V_B &= 200\delta \quad ; \end{aligned} \quad (\text{A.5})$$

Lemma 1: $v(\cdot)$ strictly decreases with the level of absolute risk aversion α

Proof. $\frac{dv(c)}{d\alpha} = \frac{1}{\alpha^2} * (ce^{-c\alpha}\alpha + e^{-c\alpha} - 1)$

Since $\max(ce^{-c\alpha}\alpha + e^{-c\alpha} - 1) = 0$ at $\alpha = 0$ (because $\frac{d(ce^{-c\alpha}\alpha + e^{-c\alpha} - 1)}{d\alpha} = -c^2e^{-c\alpha}\alpha$),

$\frac{dv(c)}{d\alpha} = \frac{1}{\alpha^2} * (ce^{-c\alpha}\alpha + e^{-c\alpha} - 1) < 0$, $\alpha \neq 0$ and $\frac{dv(c)}{d\alpha} = 0$, $\alpha = 0$

Thus $v(c)$ strictly decreases with the level of absolute risk aversion α . □

A.3 EXPERIMENT INSTRUCTIONS

- [Instruction for Less Informed Sessions](#)
- [Instruction for More Informed Sessions](#)

¹The measure of risk appetite α in **Equation 3.3** has a non-linear relationship with the value of a share's value.

APPENDIX B

CHAPTER 3

B.1 ENGLISH TRANSLATION OF SURVEY QUESTIONNAIRE

B.1.1 Demographic Information

Question list:

1. Your gender: Male/Female
2. Your year of birth _____
3. Are you married? Yes/No. If you answer “Yes,” please specify the year when you got married _____
4. Please fill the following table with you and your spouse’s average yearly income from your permanent job or pension Your family (including you and your spouse)’s total family income during 2003-2006 _____; 2007-2010 _____; 2011-2014 _____.
5. Do you or your spouse keep a record of monetary gifts you received in the past?
Yes/No.
6. Do you or your spouse keep a record of monetary gifts you gave to others in the past?
Yes/No.

B.1.2 “Receiving First + Giving Later” Gift Record Instructions

You are reading the “Receiving First + Giving Later” gift record instructions, so please write your answers for each gift to the “Receiving First + Giving Later” forms. If you have any

question, please call (omitted) or send email to (omitted).

This part records the gifts that you received first then gave later.

(1a) Please describe the nature of your relationship with the person who gave you the gift: Relatives, Friends, Classmates, Colleagues, Other -----

(1b) You first met in Year -----(You can ignore this question if you are relatives)

(1c) Your counterpart is Male/Female

(1d) Please describe her/his family's economic situation a. Very difficult b. Slightly worse than average c. Average d. Slightly better than average e. Very good

(2) Year of the wedding: -----

(3a) Please choose a number between 1 and 10 that best describes the quality of your relationship.(Note: the question asks the relationship quality at the year when you exchange gift)

- “1” or “2” very bad, for example, both parties hate each other;
- “3” or “4” bad, for example, both parties dislike each other;
- “5” or “6” average, no special feelings;
- “7” or “8” good, for example, a friend or relative you care about but cannot fully trust.
- “9” or “10” very good, for example, someone who you will do your best to help.

(3b) In the past three months, how many times did you or your spouse make personal contacts with him/her?

a. None b.1-5 times c.6-10 times d. more than 10 times

(4) The wedding is for -----: a Yourself, b Your son, c Your daughter

(5) Is the wedding ceremony is held in Qingdao? Yes/No

(6) The name of the restaurant is -----(if you cannot remember the exact name, please specify “below 3 stars,” “3 stars,” “4 stars” or “5 stars”)

(7) The number of guests (10 years old or above, including the giver herself/himself) the giver brought to attend the wedding: ----- (if the giver didn't attend, please write “0”)

(8) The value of the monetary gift is: ----- Yuan

(9) Have you given a monetary gift to the counterpart in wedding or other important events after you received the gift? Yes/No.

If you choose “Yes,” please answer Question 10-11.

(10a) Please describe the event where you gave the gift (for example their child's 100th day birth celebration, or their daughter's wedding)-----

(10b) The event took place in Year-----

(10c) The monetary gift you gave is -----Yuan.

If this occasion is a wedding, please answer question 11(a)-11(d)

(11a) The wedding is for ____: a herself/himself, b her/his son, c her/his daughter

(11b) The name of the restaurant is: ----- (if you cannot remember the exact name, please specify "below 3 stars," "3 stars," "4 stars" or "5 stars")

(11c) The number of guests (10 years old or above, including yourself) you brought to attend the wedding dinner is -----

(11d) Is the wedding ceremony is held in Qingdao? Yes/No

B.1.3 "Giving First + Receiving Later" Gift Record Instructions

You are reading the "Giving First + Receiving Later" gift record instructions, so please write your answers for each gift to the "Giving First + Receiving Later" forms.

(1a) Please describe the nature of your relationship with the person you gave the gift to: Relatives, Friends, Classmates, Colleagues, Other -----

(1b) You first met in Year -----(You can ignore this question if you are relatives)

(1c) Your counterpart is Male/Female

(1d) Please describe her/his family's economic situation

a. Very difficult b. Slightly worse than average c. Average d. Slightly better than average
e. Very good

(2) Year of the wedding: -----

(3a) Please choose a number between 1 and 10 that best describes the quality of your relationship. (Note: the question asks the relationship quality at the year when you exchange gift)

- "1" or "2": very bad, for example, both parties hate each other;
- "3" or "4": bad, for example, both parties dislike each other;
- "5" or "6": average, no special feelings;

- “7” or “8”: good, for example, a friend or relative you care about but cannot fully trust.
- “9” or “10”: very good, for example, someone who you will do your best to help.

(3b) In the past three months, how many times did you or your spouse make personal contacts with him/her?

a. None b.1-5 times c.6-10 times d. more than 10 times

(4) The wedding is for ____: a herself/himself, b her/his son, c her/his daughter

(5) Is the wedding ceremony is held in Qingdao? Yes/No

(6) The name of the restaurant is _____(if you cannot remember the exact name, please specify “below 3 stars,” “3 stars,” “4 stars” or “5 stars”)

(7) The number of guests (10 years old or above, including the giver herself/himself) you brought to attend the wedding: _____ (if you didn’t attend, please write “0”)

(8) The value of the monetary gift is: _____ Yuan

(9) Have you received a monetary gift from the counterpart in wedding or other important events after you gave the initial gift? Yes/No.

If you choose “Yes,” please answer Question 10-11.

(10a) Please describe the event where you received the gift (for example your child’s 100th day birth celebration, or your daughter’s wedding)_____

(10b) The event took place in Year_____

(10c) The monetary gift you received is _____Yuan.

If this occasion is a wedding, please answer question 11(a)-11(d)

(11a) The wedding is for ____: a yourself, b your son, c your daughter

(11b) The name of the restaurant is: _____ (if you cannot remember the exact name, please specify “below 3 stars,” “3 stars,” “4 stars” or “5 stars”)

(11c) The number of guests (10 years old or above, including herself/himself) she/he brought to attend the wedding dinner is _____

(11d) Is the wedding ceremony is held in Qingdao? Yes/No

B.2 DEFINITION OF RELATIONSHIP QUALITY USED IN THE SURVEY

- “1” or “2” very bad, for example, both parties hate each other;
- “3” or “4” bad, for example, both parties dislike each other;
- “5” or “6” average, no special feelings;
- “7” or “8” good, for example, a friend or relative you care about but cannot fully trust.
- “9” or “10” very good, for example, someone who you will do your best to help.

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