Corporate governance and individual sentiment beta

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Abstract

The purpose of this empirical study is to investigate the association between corporate governance and the individual sentiment beta. The first argument is to examine whether individual sentiment beta is affected by the change of external corporate governance mechanism. The governance proxy is measured with G index constructed by Gompers, Ishii and Metrick (2003). We also follow Glushkow (2006) to estimate the absolute value of sentiment beta for each individual firm by regressing the stock returns on the market sentiment index presented by Baker and Wurgler (2006). The empirical evidence shows that the individual sentiment beta is inversely associated with G index.

The evidence from Newey-West standard errors estimation provides the same support for the robustness. It implies that when the antitakeover provisions are less taken by a firm, it signals openness to the market and attracts the merger arbitraging institutions to provide more informative trading. The irrational trading behaviors are also active correspondingly. Therefore, the evidence that the sentiment sensitivities are further affected by the level of G index bridges the theories of Glushkov (2006) and Ferreira and Laux (2007).

Furthermore, we tend to examine whether the individual sentiment beta is affected by different level of corporate governance for different criteria of firm characteristics. The data of firms are equally divided into 3 portfolios to examine such association. With the sample of the period of 1990-2005, the sentiment betas of the firms with elder, larger sixe, higher growth and distress opportunities and operating performance increase gradually from the democracy portfolio to the dictatorship portfolio. The empirical results might contribute to the controversies in literatures that how the corporate governance affect stock returns

Key words: Corporate governance; Sentiment beta

JEL classification: G14, G3

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1. Introduction

The study tends to bridge the theories of Glushkov (2006) that the higher idiosyncratic risk leads to larger sentiment beta and of Ferreira and Laux (2007) that the merger arbitraging institutions provides informative trading through which the better external governance mechanism causes higher idiosyncratic risk to discuss the effect of corporate governance on sentiment beta. Specifically, we tend to explore whether the individual sentiment sensitivity is determined by its level of antitakeover provisions. The evidence suggests that firms with lower G index, presenting higher level of merger arbitraging institutional interest in collecting private information flow and in trading activity in the stock prices, are highly sensitive to investors' sentiment. It might contribute to the controversial argument that how the perceptions of merger arbitragers on external governance mechanisms affects the stock return.

Our investigation is motivated by two streams of literature. First, firms with lower G index tend to have higher idiosyncratic risk. The G index presented by Gompers, Ishii and Metrick (2003) that is composed of 24 antitakeover provisions reflects the shareholder's right. Such external governance mechanism of antitakeover provisions provides information on the level of whether the merger arbitragers are burdened with difficult-to-arbitrage. When governance level is changed, investors may perform corresponding investment decisions and trading

behaviors, resulting in change of investor sentiment for individual firms. Therefore, the lower level of amendments of takeover leads to higher probability of successful takeover (Ferreira and Laux, 2007). The hard-to-value, difficult-to-arbitrage hypothesis examined by Glushkov (2006) argues that firms which are easily affected by sentiment are hard-to-value and difficult-to-arbitrage. Therefore, firs with better governance mechanisms are more affected by investor sentiment than those with poor corporate governance.

Firms with lower level of antitakeover provisions tend to provide signals of openness to the market. Cremers and Nair (2005) find that corporate governance can directly affect securities prices. There are several reasons that investors have incentives to hold well-governance firms. The first inference is that well-governance firms with lower antitakeover provisions could imply a higher probability to be merged (Ambrose and Megginson, 1992), providing traders more incentives to arbitrage or speculate. Second inference suggests that firms with well external governance mechanism using less antitakeover provisions release signals of openness to the market for control right, including being open to sharing information with investors (Ferreira and Laux, 2007). The higher likelihood of successful merger also causes merger arbitragers and institutional investors interesting in inside information. The collections of more information on the future earnings and

ownership structure are prevalent correspondingly. In particular, the informative trading provided by arbitragers and institutional investors will be more active in the stock market.

The second stream of literatures contributing for our research provides the effect of stock returns on market sentiment especially sensitive for those firms with higher idiosyncratic risk. The information collection caused by lower antitakeover provisions not only provides the informative trading behaviors of merger arbitragers in former trading activity but also come into noise traders' notice subsequently. Such active trading causes rational and noisy information flow in the stock market and further leads to higher idiosyncratic risk (Ferreira and Laux, 2007). Furthermore, Glushkov (2006) find that the idiosyncratic risk provides higher sensitivity of investors' sentiment to individual stock returns.

This study is to ascertain whether the change of individual sentiment sensitivity is varied systematically with the level of external mechanism of corporate governance. We use sentiment beta, the coefficient of the regression of individual stock returns on market sentiment index, to measure the sensitivity of stock returns to sentiment for each firm. The evidence shows that the sentiment beta is significantly affected by corporate governance. It suggests that, with similar phenomenon of firm characteristics, the less antitakeover provisions are adopted by

a firm, causing higher probability of successful merger, informative trading and idiosyncratic risk, the more sensitive the individual sentiment of stock returns is. Furthermore, the effects of firm characteristics on the association between corporate governance and individual sentiment beta are also examined. The results show that such associations under different criteria of firm characteristics are significant. This paper tends to contribute to the understanding of the association among stock returns, sentiment factors, corporate governance, and firm characteristics.

The paper is organized as follows. Section II develops the hypothetical argument. Section III describes the data and models. Section IV discusses the empirical evidence, and Section V concludes this paper.

2. Hypothesis development

The G index constructed by Gompers, Ishii and Metrick (2003) is composed of 24 antitakeover provisions to evaluate the level of external corporate governance. In the takeover market, firms with more antitakeover provisions are difficult to be acquired and managers might use such privilege to earn for personal interests and further damage shareholders' right of the firms. They also find that firms with less antitakeover provisions provide stronger shareholder rights (better governance mechanism), higher firm value, higher profits, higher sales growth and lower capital expenditures.

Well governance mechanism plays an important role for the outstanding performance of stock returns in the 1990s (Gompers, Ishii and Metrick, 2003; Bebchuk, Cohen and Ferrell, 2005). Gompers, Ishii and Metrick (2003) also find the average premium of 8.5% each year by using the strategy of buying well-governance firms and shorting bad-governance firms. It implies that firms with bad (well) governance mechanisms suffer from severe (less) agency conflicts, resulting in poor performance (Fahlenbrach, 2003). Bebchuk, Cohen and Ferrell (2005) use similar[2] entrenchment index and find that such higher index is associated with negative abnormal returns during 1990 and 2003. Cremers and Nair (2005) also find the evidence that corporate governance can directly affect securities prices. Masulis, Wang and Xie (2007) suggest that acquisitions with more antitakeover provisions experience significantly lower announcement period abnormal stock returns.

Another argument suggests that the awareness of the significance of the level of corporate governance may not be the considerations for investors to change their investment decisions. Core, Guay and Rusticus (2006) find that firms with weak shareholder rights exhibit significant operating underperformance. Furthermore, the arbitrage opportunity of the overvaluation (undervaluation) causing from the change

[2] Bebchuk and Cohen and Ferrell (2005) follow procedure of Gompers, Ishii and Metrick (2003) and construct similar index that accounts for only six antitakeover provisions to estimate the level of corporate governance.

in the level of governance mechanism could be speculated by the investors. Core, Guay and Rusticus (2006) examine whether such association between corporate governance and stock returns exists. The evidence does not provide the support for such association. Although such puzzling argument of governance crisis does not provide the evidence for the hypothesis that rational investors does take into account the corporate governance mechanism directly for evaluating stock prices, there would be other mechanisms through which the irrational trading behaviors are affected by the level of corporate governance.

The inference from the phenomenon of rational investor may not provide a direct mechanism to link the association between corporate governance and stock returns. However, the irrational trading behavior presents another research phenomenon of the association between stock return and investor sentiment. Such non-systematic risk is presented by DeLong, Shleifer, Summers and Waldmann (1990) by identifying the noise traders with the effect of erroneous stochastic beliefs on prices and the aggressive betting of rational arbitrageurs against the irrational type. The phenomenon of the limit of arbitrage suggests that rational arbitragers bet against noise traders with cost and risk (Shleifer and Vishny, 1997). The noise traders in the stock market enlarge the misevaluation in the short run. Although the investor sentiment could arise from rational and irrational investors, the anomalies

and equilibrium deviation in the stock market are mostly caused by irrational sentiment. One explanation is that economic fluctuations can be partly explained by spontaneous (or exogenous) shifts in moods (optimism or pessimism).

The fact that irrational investor sentiment is significant in determining stock returns has been discussed comprehensively. Those literatures had provided the evidence that market sentiment explains time series returns (Kothari and Shanken, 1997; Neal and Wheatley, 1998; Shiller, 1981 and 2000; Baker and Wurgler, 2000). Baker and Wurgler (2007) provide the evidence of major fluctuations of sentiment on explaining current returns. The evidence in the phenomenon of cross-sectional stock returns is also provided (Baker and Wurgler, 2006; Frazzini and Lamont, 2006; Lemmon and Portniaguina, 2006).

With the fact that the stock returns is varied systematically with investor sentiment, the sentiment beta, presented by Glushkov (2006), could be appropriately used to measure the sensitivity of stock returns to market sentiment. Wurgler and Zhuravskaya (2002) argue that firms with higher idiosyncratic risk are easier to be arbitraged especially for those with short selling constraints (D'Avolio, 2002; Jones and Lamont, 2002). Furthermore, hard-to-value, difficult-to-arbitrage hypothesis is presented by Baker and Wurgler (2006) and further examined by Glushkov (2006). It suggests that the stock returns of firms with hard-to-value, difficult-to-arbitrage

are easily affected by investor sentiment. The characteristics of the firms with such criteria are small in size, younger, highly volatile, unprofitable, non-dividend-paying, and extremely high growing. It also suggests that if the beginning of sentiment indicator is low, firms in such criteria will have higher returns in the subsequent period.

The argument that whether the stock returns is associated with corporate governance remains controversial. The abnormal return can be achieved with long positions of well-governance firms and short positions of bad-governance firms (Gompers, Ishii and Metrick, 2003). Cremers and Nair (2005) also find the effect of securities prices on corporate governance. However, Core, Guay and Rusticus (2006) show that the stock return is not varied systematically with shareholder rights.

The reasoning that investor trading decisions are associated with the level of corporate governance is as following. First, management or directors of well governance firms would have limited bargaining power in the event of a control privilege (Comment and Schwert, 1995), implying that speculators may benefit by rationally anticipating a higher probability of future operating performance. Such mechanism also attracts speculators tending to quickly response to such event. Second, antitakeover provisions provide a signal of openness to the market for shareholder rights, including sharing information with investors. Therefore, it could

be suggested that the investment decisions of merger arbitragers and their trading behaviors take into account for the level of antitakeover provisions. Those informative trading leads to higher irrational sentiment effects, causing the stock returns are burdened with higher idiosyncratic risk.

Charkravarty (2001) and Hartzell and Starks (2003) find that institutional investors actively collect and trade on private information. Piotroski and Roulstone (2004) also find that institutional trading is positively associated with idiosyncratic volatility. There is a connection between the antitakeover provisions and the investment decisions of institutions (Bethel, Liebeskind and Opler, 1998).

Fewer antitakeover provisions can increase the possibility of successful takeover and reduce the control from insiders and managers to contribute to the incentives of speculation and collecting private information (Ambrose and Megginson, 1992; Comment and Schwert, 1995; Ferreira and Laux, 2007). Ferreira and Laux (2007) show that firms with fewer antitakeover provisions have higher level non-governance risk, unsystematic risk. And the individual sentiment measured by the sensitivity of individual stock returns to sentiment change is in such phenomenon of unsystematic risk.

Core, Guay and Rusticus (2006) do not find the evidence of the effect of corporate governance on stock returns. However, Ferreira and Laux (2007) provide

another irrational phenomenon to discuss the effect of corporate governance in stock market. Particularly, the lower G index, well governance mechanism, leads to higher idiosyncratic risk that is associated with individual sentiment sensitivities of stock returns (Glushkov, 2006). Baker and Wurgler (2006) also suggest that the stock returns of firms with properties of hard-to-value and difficult-to-arbitrage are easily affected by investor sentiment. In our study, we tend to explore the research question that whether the sensitivities of stock return to individual sentiment, i.e. the sentiment beta, is associated with the level of external governance mechanism, G index. Furthermore, we use the individual firm characteristics that had been supported to be associated with sentiment beta and further examine whether the different level of firm characteristics affects the association between the level of G index and the individual sentiment sensitivities.

3. Empirical methodology

3.1 The data

Due to the reason that one of our focuses is on external corporate governance that is measured by G index (constructed by Gompers, Ishii and Metrick, 2003), only those firms that are evaluated with the level of antitakeover provisions on the website of Investor Responsibility Research Center (IRRC)[3] are analyzed for our

[3] The IRRC has published six editions: September 1990, July 1993, July 1995, February 1998, November 1999, January 2002, January 2004, and January 2006. Each edition includes information between 1,400 to 1,800 firms, with some variation in the list of included firms from edition to edition.

research. The sampling period is from 1990 to 2005. Each of the firms in our sample constitutes a G index that is composed of 24 antitakeover provisions, representing the shareholders' rights and investor protection of the firm[4]. The data from IRRC is not declared periodically. Therefore, we follow Gompers, Ishii and Metrick (2003) and Ferreira and Laux (2007) to assume that the antitakeover provisions employed for each firm in our sample remains the same from the time of latest edition of G index data to the next declaration. In other words, if the year that IRRC do not revise the G-index, we use the same data provided by IRRC at prior period.

Mangers are monitored by the regulations which help reduce principal problem in some regulated industries (Kole and Lehn, 1997; Booth, Cornett and Tehranian, 2002). For example, financial and utilities firms are traditionally heavily regulated. Due to the reason of such regulations, the financing structures, accounting standards, and regulatory requirements are different from other industries. Therefore, we follow Ferreira and Laux (2007) to exclude financial institutions (SIC 4000-4999) and utility firms (SIC 6000-6999) from our sample. Other data of firm characteristics are acquired from Compustat. The stock returns and capitalization are acquired from Center for Research in Security Prices (CRSP) monthly database.

The direct measurement of sentiment index is to use questionnaires for which

[4] Gompers, Ishii, and Metrick (2003) mainly collect antitakeover provisions where firms are published on the New York Stock Exchange (NYSE), America Stock Exchange (AMEX), and NASDAQ.

the institutes or researchers design some questions[5] to capture the aggregate perception of the future prices behavior. However, the responses to those questions are the psychological thoughts. Such statistics may not capture the actual irrational behavior caused by the limits of arbitrage or trading constraints. Indirect measurement of sentiment index is estimated with realized trading activities that can capture current sentiment changes. The indices includes the number of initial public offering (Baker and Wurgler, 2000), the composite index (Brown and Cliff, 2005; Baker and Wurgler, 2006), the close-end fund discount (Sias, Starks and Tinic, 2001; Lee, Shleifer and Thaler, 1991; Neal and Wheatley, 1998), and the University of Michigan Consumer Confidence Index (Lemmon and Portniaguina, 2006; Qiu and Welch, 2005).

The advantages of using indirect measurement of market sentiment are the followings. First, it is easier to acquire such information. Second, the realized irrational trading behaviors cannot be captured by the direct measurement, whilst the indirect sentiment indices do capture such information. The information content of irrational trading activities coincides with the rational part. The only matter is to filter the indices in accordance with different purpose of research. However, the

[5] For example, in accordance with the questions of index of consumer confidence from Reuters or University of Michigan Surveys of Consumers, the questions are that which would you say is more likely that in the country as a whole we'll have continuous good times during the next five years or so or that what we will have periods of widespread unemployment or depression.

critique concerning the aggregate indices is that they may not capture all of the irrational part of sentiment behaviors. Although it is not perfect to include the comprehensive information on noise trading activities, it can be supported by the past literatures that most of the investor sentiments and their corresponding trading behaviors are captured in the indices. Therefore, the indirect measurement of investor sentiment, sentiment index, is used for our research.

The sentiment index[6], acquired from Wurgler's website, is composed of several variables in trading markets, including the closed-end fund discount[7], the dividend premium[8], the turnover rate, the numbers and returns of initial public offering, and the equity issues (Baker and Wurgler, 2007). They suggest that the sentiment index can capture major fluctuations in sentiment and explain the irrational part of stock returns.

For the purpose of our study to discuss the association between the level of external governance and the sensitivities of stock returns to individual sentiment, we follow Glushkov (2006) to measure such sensitivities with sentiment beta. Shefrin and Statman (1994) develop a behavioral asset pricing model (BAPM) as an

[6] Brown and Cliff (2004) have analogical result. They use two surveys, trading volume variables, type of trade, derivatives, and others, including close-end fund discount, return and number of IPO, FUNDFLOW, FUNDCASH, to composite sentiment index.

[7] The closed-end fund discount is the difference between the market price and net asset value of a fund's actual security holdings. Because closed-end funds usually are hold by retail investors, many researchers use it as an individual investor sentiment indicator.

[8] Dividend premium is defined as the difference between the average market-to-book-value ratios of dividend payers and non-dividend payers.

alternative correspondent to the capital asset pricing model (CAPM) in traditional finance. In the BAPM model, due to the interaction among the noise and rational traders, the expected return of stocks are determined by behavior beta. The information content of sentiment sensitivities is like the market beta in CAPM model. It describes the slope of the market model and measures the sentiment sensitivity of the stock market returns. Particularly, if the absolute value of estimated sentiment beta is larger, the returns will be varied highly caused by irrational trading behaviors.

The individual sentiment beta defined by Glushkov (2006) is a sensitivity of stock returns to the sentiment index. It can be estimated directly using the coefficient of the OLS regression of individual stock returns on the sentiment index.

$$R_{i,t} = \alpha_{i,t} + \beta_i^{RMRF} RMRF_t + \beta_i^{SMB} SMB_t + \beta_i^{HML} HML_t + \beta_i^{Momentum} Momentum_t + \beta_i^{Sentiment} \Delta Sentindex_t + \varepsilon_{i,t} \quad (1)$$

where $R_{i,t}$ is the excess return of the stock i at time t. $RMRF_t$ is value-weighted market return minus the risk-free rate at time t. SMB_t (small-minus-big), HML_t (high-minus-low), and $Momentum_t$ are returns on zero-investment mimicking portfolio at time t to capture the size, book-to-market, and momentum effects[9]. $\Delta Sentindex_t$ is acquired from the Wurgler's website[10]. Following Fama and French

[9] $RMRF_t$, HML_t, SMB_t are the Fama-French (1993) three factor model and their data can obtained from French's website. The estimation procedure of momentum follows Carhart (1997).

[10] Baker and Wurgler (2006) build two sentiment indices: sentiment index, and orthogonalized sentiment index. The latter is the residual of sentiment variables to estimate sentiment index with no

(1993) and Glushkov (2006), the regression coefficients for each firm is estimated using a five-year window rolled forward every three months, *i.e.* if the first estimation period is from January 1990 to December 1994, the second estimation period is from April 1990 to March 1995. This procedure can alleviate the potential problem of the look-ahead bias. (Glushkov, 2006)

We use the equation (1) to estimate the sentiment beta for each firm *i* with the G index at time *t*. We follow Glushkov (2006) to use five year window rolled forward every three month so there are at least 59 firm/month returns that can be used to estimate the sentiment beta during the estimation period. Therefore, it constitutes 1,926 firms with sentiment beta that are also matched with the firms with available G index in our sample. The higher individual sentiment beta indicates that the stock returns is highly sensitive to the change of market sentiment. We use the absolute value of sentiment beta to evaluate the degrees of change of sentiment sensitivities.

The antitakeover provisions are used for the proxy of the external corporate governance mechanism in our paper. Jensen (1989) and Scharfstein (1988) show that takeover threats address principal problems in capital markets. A firm adopting more antitakeover provisions may be burdened with serious managerial agency

contamination of business cycle. In addition, Δ*Sentindex* is estimated by the change of sentiment variables by principal component analysis. The correlation coefficient between Δ*Sentindex* and orthogonalized Δ*Sentindex* is 0.84. We also use the latter to estimate sentiment beta. And we get the similar result on sentiment beta.

conflicts caused by the protection of takeover threats. It also reduces the possibility for merger arbitragers to speculate from the acquisitions. Therefore, we use the G index constructed by Gompers, Ishii and Metrick (2003) as the measure of external corporate governance mechanism.

The 5 groups of provisions (delay, voting, protections, others and state laws) compose 24 antitakeover scores. The G index is the sum of the credits measured by the number of antitakeover provisions a firm adopts, presenting the higher potential problem of the increase in manager privilege and the decrease in shareholder's rights. Following Gompers, Ishii and Metrick (2003), we refer the firms with the strongest shareholder rights ($G \leqq 5$) as the "Democracy" portfolio and refer the firms with the weakest shareholder rights ($G \geqq 14$) as the "Dictatorship" portfolio. From the score of 5 to 14 of the G index, the dictatorial management is protected with more provisions.

3.2 Research methodology

The evidence of Baker and Wurgler (2006) find that the firm characteristics of hard-to-value, difficult-to-arbitrage are significant for investor sentiment to affect stock returns. They find that if securities with several of the characteristics mentioned below, the subsequent returns will be affected by prior investor sentiment. The characteristics are small-sized, young, high volatility, unprofitable,

non-dividend-paying, extreme-growth, and distressed. We follow Baker and Wurgler (2006) to include the control variables with those firm characteristics. In order to examine the association among investor sentiment, corporate governance, and firm characteristics, we use absolute value of sentiment beta, measuring the power of the sentiment sensitivities of stock returns to sentiment index, as the dependent variable. Ordinary Least Squares (OLS) is used to estimate the parameters. The regression model is as following.

$$\begin{aligned}\left|\beta_i^{Sentiment}\right| = \gamma_t &+ \beta^{SIZE} SIZE_{i,t-1} + \beta^{AGE} AGE_{i,t} + \beta^{VOL} VOL_{i,t-1} + \beta^{G\&D} G\&D_{i,t-1} \\ &+ \beta^{ROE} ROE_{i,t-1} + \beta^{DVD} DVD_{i,t-1} + \beta^{GOV} GOV_{i,t} + \eta_{i,t}\end{aligned} \quad (2)$$

The firm size ($SIZE_{i,t}$) is measure by the logarithm of the market capitalization that is the stock prices multiplied by the number of shares outstanding. It is matched to monthly stock returns from June of year t through June of year t+1. Glushkov (2006) and Baker and Wurgler (2006) indicate that smaller firms are difficult to short. It is expected that with such limit to arbitrage, the firm size is inversely associated with sentiment beta.

The firm age ($AGE_{i,t}$) is the numbers of years of the firm *i* since first appearance on CRSP measured wt time *t*. Because daily and monthly data on CRSP is available from 1925, *AGE* is computed from 1925 to the nearest month in our sample period. The information on younger firms is difficult to reflect the reality (Glushkov, 2006; Baker and Wurgler, 2006). Therefore, it is expected that the firm

age is inversely associated with sentiment beta.

The volatility ($VOL_{i,t}$) is measured by the standard deviation of monthly stock returns over the 12 months ending in June of year t. If there are at least 9 stock returns available to estimate it, VOL is then matched to monthly returns from July of year t through June of year $t + 1$. Glushkov (2006) and Baker and Wurgler (2006) both find the evidence that when sentiment is large, the stock returns are highly volatile correspondingly. Therefore, the positive association between volatility and sentiment beta is expected.

The profitability ($ROE_{i,t}$) is the measured by the returns on equity. The earnings (E) are the sum of income before extraordinary items (Item 18) and income statement deferred taxes (Item 50) with deduction of preferred dividends (Item 19). If the earnings are positive; the book equity (BE) is the sum of shareholders equity (Item 60) and balance sheet deferred taxes (Item 35). Glushkov (2006) find the inverse association between past returns and sentiment beta. Such association between past profitability and sentiment beta is also expected.

The dividends ratio ($DVD_{i,t}$) is measured by the ratio of dividends per share at the ex date (Item 26) multiplied by Compustat shares outstanding (Item 25) to the book equity. The evidence from Glushkov (2006) and Baker and Wurgler (2006, 2007) suggest that the lower dividend yield cause the higher sentiment and its beta.

Therefore, it is expected that the dividends ratio is inversely associated with sentiment beta.

The growth opportunities and distress (*G&D*) is measured by external finance. It is the ratio of changes in assets (Item 6) with the deduction of changes in retained earnings (Item 36) to total assets. If the value of *G&D* is positive, the higher growth opportunity the firm will have. However, if the value of *G&D* is negative, it represents that the firm is in distressed situations. Furthermore, if the absolute value of *G&D* is larger, it indicates that the firm has growth opportunity or distressed situation. In accordance with past evidence (Glushkov, 2006), it is expected that the absolute value of *G&D* is positively associated with sentiment beta.

The governance index (*G*) is constructed by Gompers, Ishii and Metrick (2003). The decline noted by Fama and French (2001) in the percentage of firms that pay dividends is apparent. All explanatory variables are winsorized each year at 0.5% and 99.5% percentiles. Finally, following Fama and French (1992), the accounting data for fiscal years ending in calendar year $t - 1$ are matched to monthly returns from July of year t through June of year $t + 1$. Ferreira and Laux (2007) find the evidence that the lower G index, representing less antitakeover provisions and higher shareholders' right, causes more informative trading from rational merger arbitraging institutions in the stock market. It also causes the irrational trading

behaviors with noisy information flow. Furthermore, the idiosyncratic risk caused by from both rational and irrational trading activities increases the sentiment beta. Therefore, it is expected that the G index is inversely associated with the absolute value of sentiment beta.

Additionally, we categorized the data into 3 portfolios for each criterion of firm characteristic to examine the effect of democracy and dictatorship on the association between sentiment beta and corporate governance. Specifically, the firms in the data are divided into 3 equal proportions in accordance with different level of firm characteristics. In each portfolio, the sentiment betas are averaged for different level of G index. Under certain level of specific firm characteristic, the difference between the mean of sentiment beta on the lowest G index (G < 5) and the one on the largest G index (G > 14) is constructed. We define the difference as the G index acceleration (*G_ACL*), measuring the effect of the acceleration from democracy to dictatorship mechanism for the association between sentiment beta and corporate governance.

$$G\_ACL = \left|\beta_{Democracy}^{Sentiment}\right| - \left|\beta_{Dictatorship}^{Sentiment}\right| \quad (3)$$

Furthermore, we examine whether such acceleration effect is varied for different criteria of firm characteristics.

4. Empirical evidence

4.1 Preliminary analysis

Following Fama and French (1993) and Glshkov (2006), the regressions with five-year window rolling forward every three month are used to estimate sentiment beta for individual stock. The first estimation period is from Sep. 1985 to Sep. 1990, whilst the second period is from Jan. 1986 to Jan. 1991. Such estimation procedure of sentiment beta is for the purpose to mitigate the possibility of a look-ahead bias. The data is also matched with the firms recorded in the G index. The descriptive statistics of sentiment beta estimation are shown in Panel A of Table1. The mean of stock returns is 1.4% and the mean of Δ*Sentindex* from Wurgler's website is 0.004.

<Insert Table 1 about here>

Other descriptive statistics of full sample are shown in Panel B of Table 1. In whole sample period, there are 1,926 firms in our data with sentiment beta in frequency of 3 months (Glushkov, 2006). The mean of sentiment beta is -0.158 and its range are from -14.763 to 27.182. The lowest of G index in our sample period is 2, indicating that there are only two provisions are taken from shareholder rights. The largest of *GOV* is 18. The mean and standard deviation are 9.164 and 2.782, which are broadly consistent with the distribution of the *GOV* from 1990 to 1999.

The descriptive statistics of the data in the subsample period of 1990-1999 and 2000-2005 in Panel C and D of Table 1 are similar to the whole sample period. It

implies that the assumption that the stability of changing in antitakeover provisions is reasonable In addition, contrast to Panel C (from 1990 to 1999) and Panel D (from 2000 to 2005), the *SIZE* and *VOL* are smaller in the first subsample period than those in the second subsample period. However, *DVD* and *ROE* of the firms in the period of 1990 - 1999 are larger than those of 2000 - 2005.

<Insert Table 2 about here>

The Pearson correlation coefficients among the variables are shown in Table 2. The *GOV* and *AGE* is positively associated. The association between sentiment beta and firm characteristics are significant and in line with the sign of the evidence of Baker and Wurgler (2006). $\beta^{Sentiment}$ is significantly negative associated with *GOV*, *AGE, SIZE, DVD*, and *ROE*, whilst *VOL* and *G&D* are positively associated with $\beta^{Sentiment}$ in the same directions in all sample periods.

4.2 Regression analysis

With the purpose to the analysis of the effect of the G index, we first follow Gompers, Ishii and Metrick (2003) to examine that whether the estimation results hold with our subsample of their data. In the Panel A of Table 3, we replicate the procedure of Gompers, Ishii and Metrick (2003) to construct a trading strategy by taking a long position in a value-weighted portfolio of democracy firms ($G \leq 5$) and a short position in a value-weighted portfolio of dictatorship firms ($G \geq 14$). The

independent variables (*RMRF*, *SMB* and *HML*) are three factors in Fama and French (2003) and the Momentum is to follow the procedure of Carhart (1997). The evidence shows that the hedge portfolio[11] earns excess return of 71% per month from 1990 to 1999. The panel B of Table 3 shows the results of estimating four-factor regression models with value-weighted monthly returns for a trading strategy based on G index. Although the returns for this subsample are slightly larger than the results of Baker and Wurgler (2006), they are no evidence to reveal any systematic biases.

<Insert Table 3 about here>

To examine the question that whether the level of corporate governance of a firm is associated with the sentiment sensitivities of stock returns, we use model (2) with the OLS estimation. The negative estimates of $\beta^{Sentiment}$ are expected as the evidence of the associations between the level of corporate governance and the sentiment sensitivities. The results of the equation (2) are shown in Table 4. The Panel A of Table 4 shows the results for full sample, Panel B and Panel C show the evidence for the restricted samples that contain the 1990s and early of the 2000s. The regression coefficients of $\beta^{Sentiment}$ on *GOV* are all statistically negative with controlling firm characteristics in all different period of samples. The results are

[11] This portfolio are reset in September 1990, July 1993, July 1995, and February 1998 because the IRRC does not publish data every year, and the abnormal return of this portfolio is about 8.5 percent per year.

consistent with our hypothesis that individual sentiment sensitivities of a firm (sentiment beta) are inversely associated with the change of level of corporate governance.

The evidence implies that the varied effect of the market sentiment on stock returns is due to the different level of corporate governance. It can be further suggested that the different level of sentiment sensitivities of stock returns is due to the varied level merger arbitraging opportunities. It also signals that the firm provides the openness toward the takeover markets. With such incentives, merger arbitragers and institutional investors provide more active trading behaviors with informative trading flows. The noise traders correspond to the information flow with more frequent trading with irrational sentiment. Therefore, the level of corporate governance has powerful explanation in the effect of sentiment index on stock returns.

<Insert Table 4 about here>

Other evidence of independent variables concerning firm characteristics in model (2) are that sentiment beta is statistically inversely associated with *SIZE*, *AGE*, *ROE* and *DVD*, whilst *VOL* and |*G&D*| are positively associated with sentiment beta. It implies the extreme situation of earnings and dividend that fluctuates with the sentiment beta. However, *VOL* in our reduced sample period of 2000-2005 is

inversely associated with the change of sentiment beta that is contrast to the evidence provided by Glushkov (2006).

Although, in accordance with the evidence in Table 4, sentiment beta is inversely associated with corporate governance, such association may be also varied with different level of firm characteristics. Using the proxy of 6 firm characteristics from Baker and Wurgler (2006), we can find the accelerated changes of the slope of sentiment sensitivities. We divide the data equally into 3 parts for each level of firm characteristics to examine whether the absolute value of sentiment beta coefficient of the democracy portfolio is larger than the one of dictatorship portfolio.

<Insert Figure 1 about here>

In the first place, we tend to find the evidence that whether the association between sentiment beta and corporate governance is varied with different level G index for each firm characteristic. Figure 1 provides such associations in different criteria of firm characteristics. The solid line represents the sentiment betas in larger one-third level of specific firm characteristics, whilst the dotted line indicates the ones in smaller one-third level of specific firm characteristics. During the period of 1990-2005, the sentiment beta becomes gradually larger with the use of more antitakeover provisions in the smaller (Panel A), younger (Panel B), higher extreme growth and distressed (Panel D), and unprofitable (Panel E) portfolios.

Furthermore, we define the G index acceleration (*G_ACL*) to measure the change of the sentiment sensitivities. The higher the *G_ACL*, the larger effects present that the changes of sentiment sensitivities are caused by level of corporate governance. The *G_ACL* is measured by the difference of the change of sentiment beta in the democracy portfolio and the one in the dictatorship portfolio. We also assume that the associations between sentiment beta and firm characteristics remain the same[12] under other specific criterion of firm characteristic. For example, the *G_ACL* measured by the difference of the association between sentiment beta and corporate governance in the portfolio of smaller size and the larger is examined in the first column of Table 5 and the *G_ACL* concerning the age effect is given in column 2 of Table 5.

The examination results of the question that whether the change of sentiment beta in the democracy portfolio is larger than the one in the dictatorship portfolio are provided in Table 5. With the null hypothesis that the *G_ACL* is equal to zero, the results of t-statistics show that there are significant differences between the change of the sentiment beta coefficient in democracy portfolio and the one in dictatorship portfolio for each firm characteristic. The statistics of such effects in the *SIZE*, *AGE* and *ROE* phenomenon are significantly negative in the last one-third portfolio.

[12] The two critical points are on Appendix A.

However, the effects in the *DVD* phenomenon are significantly positive in all levels of portfolio. Most of the results are compatible with the financial implications of Baker and Wurgler (2006).

<Insert Table 5 about here>

The anomalies that the firms that are not easily affected by market sentiment have larger sentiment beta may be due to the reason of fewer restrictions on shareholder rights (more democratic portfolio). The evidence in Panel F of Figure 1 shows that the difference between the means of sentiment beta of those firms with higher dividend payout ratio in the dictatorship portfolio and the one in the democracy portfolio is significantly different with a t-statistic of 2.43. Besides, there is no significant evidence of the trend of the association between governance and sentiment beta when focusing on the *VOL* phenomenon during the period of 1990-2005.

<Insert Figure 2 about here>

The same anomalies of *AGE*, *DVD* and *G&D* can also be found in Figure 2 (with the sample of the period of 1990-1999). Sentiment beta becomes larger from the higher antitakeover provisions to fewer ones with a t-statistic of 6.33, 2.74, and 0.11, respectively. The anomalies that why the sentiment betas of the firms with elder, lower paying-dividend, and *G&D* characteristics in the democracy portfolio

are larger than those in the dictatorship portfolio are still controversies. The Figure 3 shows that the effect of *AGE* seems to coincide with the hypothesis of Baker and Wurgler (2006), with a t-statistic of 2.03. Nevertheless, we do not find any significant trend in other characteristics.

<Insert Figure 3 about here>

Furthermore, we use the Newey-West standard errors approach to estimate the regression with the same regression model (2) to reduce the potential problem of heterogeneity and autocorrelation for the residuals. The estimation results of robustness are shown in Table 6. The changes of firm characteristics with the sentiment beta coincide well with the evidence of Baker and Wurgler (2006) with the data of 1990-2005. Besides, the coefficients of *VOL* and *G&D* are significantly positive with t-statistics of 4.1, 2.75 and 3.21. This result shows that *VOL* and *G&D* are larger when the sentiment beta increases. *SIZE*, *AGE*, *ROE*, *DVD*, and *GOV* are significantly negative with t-statistics of -12.96, -45.23, -15.04, -4.41 and -5.3 respectively. It implies that sentiment beta increases with the decrease in *SIZE*, *AGE*, *DVD* and *ROE*. The significantly inverse association between *GOV* and sentiment beta is also supported to our hypothesis. It implies that firms with fewer antitakeover provisions signal higher levels of trading activities, more private information flow, and more information about future earnings in stock prices (Ferreira and Laux,

2007), implying that investor sentiment will be more easier affected through the private information.

<Insert Table 6 about here>

With the robustness examination of Newey-West approach, the G index and firm characteristics have powerful influences on absolute value of sentiment beta. These results not only provides evidence that firm characteristics do affect on investor sentiment but also support our hypothesis that the different levels of corporate governance does have effect on investor sentiment sensitivities. In addition, we also have similar results with the sample of the period during 1990-1999 and 2000-2005. G index and the sentiment beta are significant with t-statistics of -3.12 and -4.7 in both subsamples, respectively. These results are robust and coincide with our hypothesis.

5. Conclusions

The purpose of this study is to resolve the controversies that whether the association between corporate governance and stock returns is significant and/or that how they are associated. Core, Guay and Rusticus (2006) show that the stock return is not varied systematically with corporate governance. However, Ferreira and Laux (2007) find that the merger arbitraging institutions provides informative trading through which the better external governance mechanism causes higher

idiosyncratic risk. Glushkov (2006) also suggest that higher idiosyncratic risk leads to higher sentiment beta. This paper examines the effect of individual sentiment beta through which the external corporate governance indirectly affects the stock returns. Particularly, we suggest that the individual sentiment beta measured by the sensitivities of stock returns to market sentiment index is affected by the level of corporate governance.

The first argument is to examine whether individual sentiment beta is affected by the change of external corporate governance mechanism. The governance proxy is measured with G index constructed by Gompers, Ishii and Metrick (2003). We follow Glushkow (2006) to estimate the absolute value of sentiment beta for each individual firm by regressing the stock returns on the market sentiment index presented by Baker and Wurgler (2006). The empirical evidence shows that the individual sentiment beta is inversely associated with G index. It implies that when the antitakeover provisions are less taken by a firm, it signals openness to the market and attracts the merger arbitraging institutions to provide more informative trading. The irrational trading behaviors are also active correspondingly. Therefore, the sentiment sensitivities are further affected by the level of G index. Furthermore, the evidence from Newey-West standard errors estimation provides the same support for the robustness.

Additionally, we tend to examine whether the individual sentiment beta is affected by different level of corporate governance for different criteria of firm characteristics. The data of firms are equally divided into 3 portfolios to examine such association. With the sample of the period of 1990-2005, the sentiment betas in the larger *AGE*, *SIZE*, |*G&D*| and *ROE* increase gradually from the democracy portfolio to the dictatorship portfolio. The results coincide with the arguments in previous studies and are due to the reason that the specific characteristic would lead to higher trading cost and difficulty in shorting their positions (Amihud and Mendelsohn, 1986; Baker and Wurgler, 2006). The idiosyncratic risks are immunized through the diversification of well-governance firms. It also supports our argument that the difference of individual sentiment beta is affected by corporate governance after controlling other phenomenon of firm characteristic. However, we do not find any significant trend with the sample period of 2000-2005. The anomalies may be left for further research in the future.

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Appendix

The upper and lower bound in each criterion of firm characteristics

	1990-2005		1990-1999		2000-2005	
	UB	*LB*	*UB*	*LB*	*UB*	*LB*
AGE	30.170	17.500	29.170	19.330	31.250	15.330
SIZE	2025.470	545.060	1735.550	440.880	2564.130	705.210
VOL	11.916	7.890	10.048	6.949	14.433	9.734
DVD	3.559	0.000	4.948	2.494	2.446	0.000
ROE	17.065	10.323	14.030	7.280	17.820	9.428
|G&D|	9.512	3.636	9.529	3.645	9.477	3.604

UB is the upper bound with larger one-third percentile, whilst LB is the lower bound with the smaller one-third percentile. The firms in which the characteristics value that are above the UB are the "Upper" portfolio, whilst the firms in which the characteristics value that are below the LB are the "Lower" portfolio.

Table 1
Descriptive statistics

		N	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*
Panel A:	*R*	337507	1.400	14.98	-98.30	937.05
1985~2005	*RMRF*	244	0.670	4.46	-23.13	12.43
	SMB	244	0.050	3.51	-16.70	22.18
	HML	244	0.330	3.22	-12.80	13.80
	Momentum	244	0.470	6.15	-53.13	22.80
	Δ*Sentindex*	244	0.004	0.54	-4.60	3.48
Panel B:	*GOV*	127814	9.164	2.782	2.000	18.000
1990-2005	*AGE*	127814	27.205	17.798	5.080	76.750
	SIZE	127814	3,893.700	8,310.590	8.830	55,098.140
	VOL	127814	11.020	5.869	2.989	48.245
	DVD	127814	3.782	21.705	0.000	1782.310
	ROE	127814	6.766	72.033	-676.738	396.149
	G&D	127814	5.518	26.874	-59.467	1099.600
	|*G&D*|	127814	10.290	25.432	0.000	1099.600
	$\beta^{Sentiment}$	127814	-0.158	2.504	-14.763	27.182
Panel C:	*GOV*	71759	9.158	2.891	2.000	18.000
1990-1999	*AGE*	71759	27.384	17.272	5.080	74.000
	SIZE	71759	3,241.080	7,415.830	8.834	55,098.144
	VOL	71759	9.252	4.323	2.989	40.824
	DVD	71759	3.950	11.180	0.000	830.769
	ROE	71759	7.376	49.724	-676.738	396.149
	G&D	71759	5.309	18.695	-59.467	1099.600
	|*G&D*|	71759	9.763	16.804	0.000	1099.600
	$\beta^{Sentiment}$	71759	0.101	2.488	-11.306	27.182
Panel D:	*GOV*	56055	9.171	2.637	2.000	18.000
2000-2005	*AGE*	56055	26.978	18.447	5.080	76.750
	SIZE	56055	4,729.164	9,264.855	8.834	55,098.144
	VOL	56055	13.283	6.745	2.989	48.245
	DVD	56055	3.567	30.235	0.000	1782.310
	ROE	56055	5.985	93.086	-676.738	396.149
	G&D	56055	5.786	34.629	-59.467	1099.600
	|*G&D*|	56055	10.964	33.353	0.000	1099.600
	$\beta^{Sentiment}$	56055	-0.490	2.485	-14.763	15.228

In panel A, *R* is the excess stock returns; *RMRF* is the market return premium; *SMB* is small-minus-big in the Fama-French (FF) model; *HML* is high-minus-low in the FF model; *Momentum* is the factor in the FF model. In panel B, the sample period is from 1990 to 2005, whilst panel C and D are from 1990 to 1999 and 2000 to 2005 respectively. *GOV* is the G index; *AGE* is the firm age; *SIZE* is the firm size; *VOL* is the volatility for the individual stock returns; *DVD* is the dividend payment ratio; *ROE* is the returns on equity; *G&D* is the growth and distress ratio; |*G&D*| is its corresponding absolute value; $\beta^{Sentiment}$ is the sentiment beta.

Table 2
Correlation coefficients

		GOV	*AGE*	*SIZE*	*VOL*	*DVD*	*ROE*	*G&D*	$\beta^{Sentiment}$
Panel A: 1990-2005	*GOV*	1.000							
	AGE	**0.271** ‡	1.000						
	SIZE	**0.022** ‡	**0.328** ‡	1.000					
	VOL	**-0.148** ‡	**-0.255** ‡	**-0.134** ‡	1.000				
	DVD	**0.037** ‡	**0.115** ‡	**0.063** ‡	**-0.084** ‡	1.000			
	ROE	**0.024** ‡	**0.032** ‡	**0.052** ‡	**-0.154** ‡	**0.078** ‡	1.000		
	G&D	0.003	**-0.042** ‡	**0.013** ‡	**0.042** ‡	**-0.021** ‡	**-0.041** ‡	1.000	
	$\beta^{Sentiment}$	**-0.020** ‡	**-0.077** ‡	**-0.011** ‡	**0.023** ‡	**-0.023** ‡	**-0.024** ‡	**0.011** ‡	1.000
Panel B: 1990-1999	*GOV*	1.000							
	AGE	**0.259** ‡	1.000						
	SIZE	**0.023** ‡	**0.345** ‡	1.000					
	VOL	**-0.174** ‡	**-0.301** ‡	**-0.196** ‡	1.000				
	DVD	**0.041** ‡	**0.135** ‡	**0.117** ‡	**-0.158** ‡	1.000			
	ROE	**0.039** ‡	**0.083** ‡	**0.077** ‡	**-0.156** ‡	**0.102** ‡	1.000		
	G&D	**-0.016** ‡	**-0.088** ‡	**0.011** ‡	**0.041** ‡	**-0.037** ‡	**-0.069** ‡	1.000	
	$\beta^{Sentiment}$	**-0.024** ‡	**-0.069** ‡	**-0.029** ‡	**0.138** ‡	**-0.061** ‡	**-0.035** ‡	-0.002	1.000
Panel C: 2000-2005	*GOV*	1.000							
	AGE	**0.288** ‡	1.000						
	SIZE	**0.021** ‡	**0.319** ‡	1.000					
	VOL	**-0.155** ‡	**-0.249** ‡	**-0.165** ‡	1.000				
	DVD	**0.043** ‡	**0.121** ‡	**0.049** ‡	**-0.068** ‡	1.000			
	ROE	**0.016** ‡	0.00002	**0.042** ‡	**-0.163** ‡	**0.073** ‡	1.000		
	G&D	**0.018** ‡	**-0.015** ‡	**0.014** ‡	**0.042** ‡	**-0.017** ‡	**-0.031** ‡	1.000	
	$\beta^{Sentiment}$	**-0.013** ‡	**-0.090** ‡	**0.028** ‡	**0.011** ‡	**-0.010** ‡	**-0.020** ‡	**0.023** ‡	1.000

GOV is the G index; *AGE* is the firm age; size is the firm size; *VOL* is the volatility for the individual stock returns; *DVD* is the dividend payment ratio; *ROE* is the returns on equity; *G&D* is the growth and distress ratio; $\beta^{Sentiment}$ is the sentiment beta. They are significant at 1% (‡).

Table 3
Attribution analysis of the effect of the G index

	Intercept	*RMRF*	*SMB*	*HML*	*Momentum*
			Panel A		
Coeff.	**0.71‡**	-0.04	**-0.22†**	**-0.55‡**	-0.01
Std.	0.26	0.07	0.09	0.10	0.07
t-statistic	2.73	-0.57	-2.44	-5.50	-0.14
			Panel B		
Coeff.	**0.75†**	-0.12	**-0.30†**	**-0.61‡**	0.11
Std.	0.37	0.11	0.13	0.15	0.09
t-statistic	2.01	-1.13	-2.26	-3.95	1.19

The data abnormal return is from Sep. 1990 to Dec. 1999. We use the four-factor regression model of value-weighted monthly returns for a trading strategy based on G index. Following Gompers, Ishii and Metrick (2003), their trading strategy is taking a long position in a value-weighted portfolio of Democracy firms ($G \leq 5$) and taking a short position in a value-weighted portfolio of Dictatorship firms ($G \geq 14$). The dependent variables are Fama and French three factors. *RMR*F is the excess market returns; *SMB* is the small-minus-big; *HML* is the high-minus-low. The *Momentum* is estimated following the procedure of Carhart (1997).The parameters are significant at the 1% (‡), 5% (†), and 10% (*) levels.

Table 4
The effect of the absolute value of sentiment beta on corporate governance

	Intercept	*SIZE*	*AGE*	*VOL*	*|G&D|*	*ROE*	*DVD*	*GOV*
Expected signs		−	−	+	+	−	−	−
				Panel A: 1990-2005				
Coeff.	**3.0808‡**	**-0.000000007‡**	**-0.8504‡**	**0.0616‡**	**0.0005‡**	**-0.0014‡**	**-0.0021‡**	**-0.0089‡**
Std.	0.0251	0.0000000006	0.0183	0.0114	0.0002	0.0001	0.0002	0.0018
t-statistic	88.8100	-10.9900	-46.5300	5.4200	2.8500	-21.7400	-9.5900	-4.9900
Adj-R^2	3.23%							
Obs.	127814							
				Panel B: 1990-1999				
Coeff.	**3.0552‡**	**-0.000000002***	**-0.9201‡**	**0.2050‡**	**0.0006***	**-0.0023‡**	**-0.0080‡**	**-0.0069‡**
Std.	0.0344	0.0000000009	0.0249	0.0159	0.0003	0.0001	0.0006	0.0023
t-statistic	-10.43	-1.7800	-36.9400	12.9100	1.9100	-18.1700	-14.1500	-3.0100
Adj-R^2	4.12%							
Obs.	71759							
				Panel C: 2000-2005				
Coeff.	**3.0659‡**	**-0.000000012‡**	**-0.6931‡**	**-0.1258‡**	**0.0005†**	**-0.0010‡**	**-0.0012‡**	**-0.0120‡**
Std.	0.0371	0.0000000008	0.0272	0.0164	0.0002	0.0001	0.0002	0.0028
t-statistic	82.5800	-14.7800	-25.4900	-7.6900	2.2700	-13.7600	-5.0600	-4.2200
Adj-R^2	2.94%							
Obs.	56055							

. $\left|\beta_i^{Sentiment}\right| = \gamma_t + \beta^{SIZE} SIZE_{i,t-1} + \beta^{AGE} AGE_{i,t} + \beta^{VOL} VOL_{i,t-1} + \beta^{G\&D} G\&D_{i,t-1} + \beta^{ROE} ROE_{i,t-1} + \beta^{DVD} DVD_{i,t-1} + \beta^{GOV} GOV_{i,t} + \eta_{i,t}$

We use firm characteristics from Baker and Wurgler (2006), G index from GIM (2003) and follow Gompers, Ishii and Metrick (2003) to estimate sentiment beta. The first panel is our main sample from 1990 to 2005. The second and third panels are subsample period. *SIZE* is the firm size; *AGE* is the firm age; *VOL* is the volatility for the individual stock returns; *G&D* is the growth and distress ratio; *|G&D|* is its corresponding absolute value; *ROE* is the returns on equity; *DVD* is the dividend payment ratio. The parameters are significant at the 1% (‡), 5% (†), and 10% (*) levels.

Table 5
The effects of G index acceleration

		SIZE	*AGE*	*VOL*	*|G&D|*	*ROE*	*DVD*
Panel A:	*First one-third level*	0.78	1.09	0.47	**6.77‡**	**1.85***	**2.43†**
1990 - 2005		(0.437)	(0.277)	(0.641)	(<0.001)	(0.064)	(0.015)
	Middle level	-0.12	**-3.36‡**	**6.81‡**	0.17	0.72	**4.72‡**
		(0.903)	(0.001)	(<0.0001)	(0.862)	(0.469)	(<0.001)
	Last one-third level	**-5.62‡**	**-2.56†**	-0.84	-1.55	**-6.18‡**	**6.39‡**
		(<0.001)	(0.011)	(0.402)	(0.121)	(<0.001)	(<0.001)
Panel B:	*First one-third level*	0.45	**6.33‡**	**3.52‡**	**8.65‡**	**1.65***	**2.74‡**
1990 - 1999		(0.650)	(<0.001)	(0.0004)	(<0.001)	(0.100)	(-0.006)
	Middle level	**2.25†**	**-4.95‡**	**4.1‡**	-1.48	**3.98‡**	**-4.03‡**
		(0.0247)	(<.0001)	(<.0001)	(0.140)	(<.0001)	(<.0001)
	Last one-third level	**-7.22‡**	**4.02‡**	**-2.45****	-0.11	**6.07‡**	**4.32‡**
		(<0.001)	(<0.001)	(0.014)	(0.909)	(<0.001)	(<0.001)
Panel C:	*First one-third level*	-0.37	**-3.04‡**	**-4.66‡**	**-3.08‡**	**-3.58‡**	0.46
2000 - 2005		(0.713)	(0.002)	(<0.001)	(0.002)	(0.0004)	(0.648)
	Middle level	**-1.67***	-1.00	**-1.93***	**1.89***	-0.02	**3.87‡**
		(0.095)	(0.320)	(0.054)	(0.059)	(0.981)	(0.0001)
	Last one-third level	**-2.44†**	**2.03†**	**4.12‡**	**-3.36‡**	-1.02	-0.47
		(0.015)	(0.044)	(<0.001)	(0.001)	(0.309)	(0.637)

$G\_ACL = \left|\beta_{Democracy}^{Sentiment}\right| - \left|\beta_{Dictatorship}^{Sentiment}\right|$

We divide every characteristic into 3 equal proportions with different firm characteristics to examine the association between the sentiment beta and corporate governance. G-ACL is the acceleration of the association between stock returns and sentiment index caused by different level corporate governance. *AGE* is the firm age; *SIZE* is the firm size; *VOL* is the volatility for the individual stock returns; *DVD* is the dividend payment ratio; *ROE* is the returns on equity; *G&D* is the growth and distress ratio; |*G&D*| is its corresponding absolute value. The solid line is the sentiment beta in the democracy portfolio. The dotted line is sentiment beta in the dictatorship portfolio.

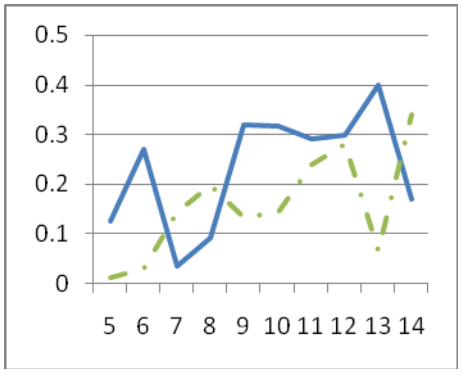
Table 6
Robustness with Newey-West standard errors estimation

	Intercept	*SIZE*	*AGE*	*VOL*	*| G&D |*	*ROE*	*DVD*	*GOV*
Expected signs		−	−	+	+	−	−	−
				Panel A: 1990-2005				
Coeff.	**0.6556‡**	**-0.000000006‡**	**-0.8504‡**	**0.0616‡**	**0.0005‡**	**-0.0014‡**	**-0.0021‡**	**-0.0089‡**
N-W Std.	0.0404	0.0000000005	0.0188	0.0150	0.0002	0.0001	0.0005	0.0017
t-statistic	16.2400	-12.9600	-45.2300	4.1000	2.7500	-15.0400	-4.4100	-5.3000
Obs.	127814							
				Panel B: 1990-1999				
Coeff.	**3.0552‡**	**-0.000000002†**	**-0.9201‡**	**0.2050‡**	**0.0006**	**-0.0023‡**	**-0.0080‡**	**-0.0069‡**
N-W Std.	0.0379	0.0000000008	0.0275	0.0248	0.0005	0.0002	0.0020	0.0022
t-statistic	80.5700	-2.0400	-33.4000	8.2500	1.4100	-11.1300	-4.1100	-3.1200
Obs.	71759							
				Panel C: 2000-2005				
Coeff.	**3.0659‡**	**-0.000000012‡**	**-0.6931‡**	**-0.1258‡**	**0.0005†**	**-0.0010‡**	**-0.0012‡**	**-0.0120‡**
N-W Std.	0.0378	0.0000000007	0.0273	0.0165	0.0002	0.0001	0.0003	0.0025
t-statistic	81.0300	-17.4400	-25.4300	-7.6100	2.4900	-10.0400	-3.7800	-4.7000
Obs.	56055							

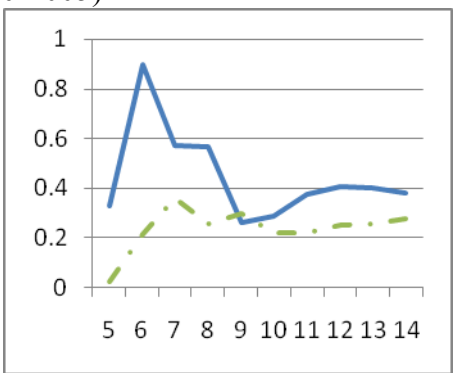
. $\left|\beta_i^{Sentiment}\right| = \gamma_t + \beta^{SIZE} SIZE_{i,t-1} + \beta^{AGE} AGE_{i,t} + \beta^{VOL} VOL_{i,t-1} + \beta^{G\&D} G\,\&\,D_{i,t-1} + \beta^{ROE} ROE_{i,t-1} + \beta^{DVD} DVD_{i,t-1} + \beta^{GOV} GOV_{i,t} + \eta_{i,t}$

We use firm characteristics from Baker and Wurgler (2006), G index from Gompers, Ishii and Metrick (2003) and follow Glushkov (2006) to estimate sentiment beta. The first panel is our main sample from 1990 to 2005. The second and third panels are subsample period. *SIZE* is the firm size; *AGE* is the firm age; *VOL* is the volatility for the individual stock returns; *G&D* is the growth and distress ratio; |*G&D*| is its corresponding absolute value; *ROE* is the returns on equity; *DVD* is the dividend payment ratio The parameters are significant at the 1% (‡), 5% (†), and 10% (*) levels.

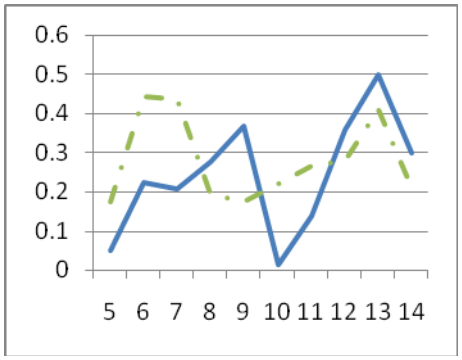
Figure 1
Sentiment beta in each firm characteristic (1990-2005)



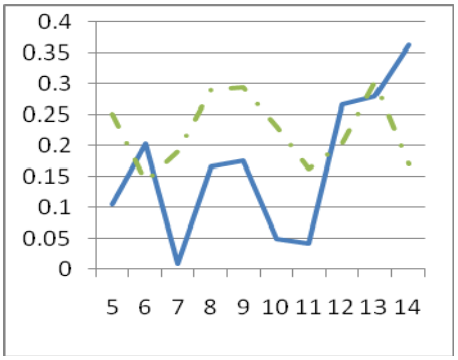
Panel A: SIZE



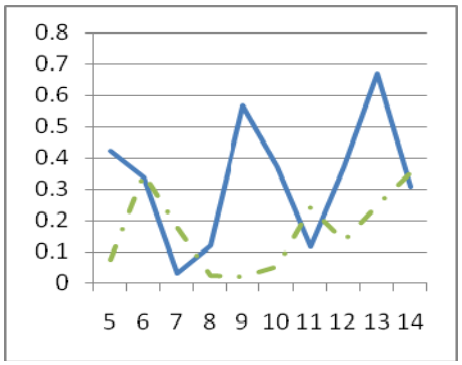
Panel B: AGE



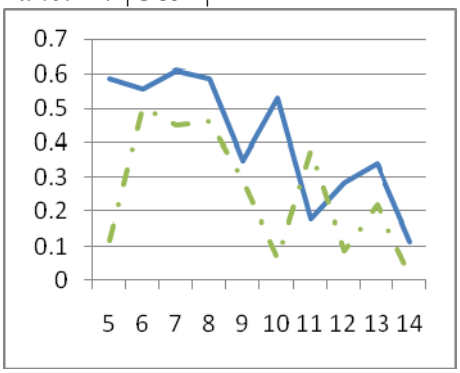
Panel C: VOL



Panel D: |G&D|



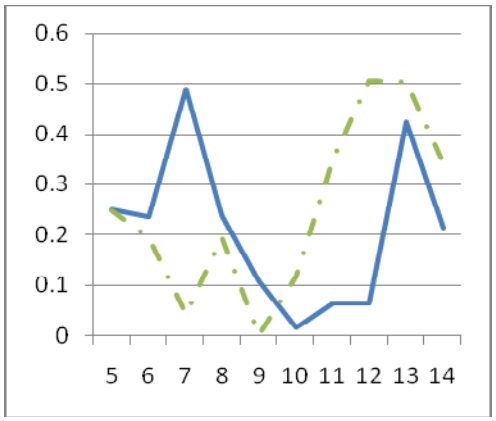
Panel E: ROE



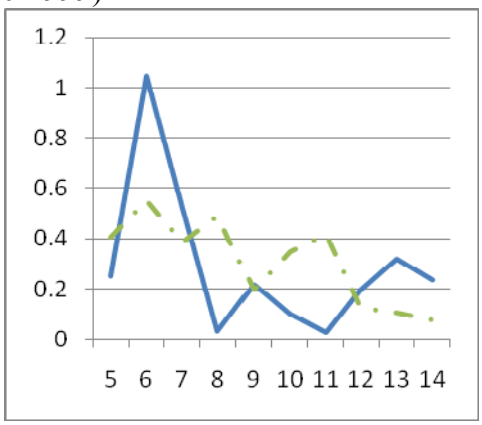
Panel F: DVD

We divide every characteristic into 3 equal proportions with different firm characteristics to examine the association between the sentiment beta and corporate governance. *G_ACL* is the acceleration of the association between stock returns and sentiment index caused by different level corporate governance. *AGE* is the firm age; *SIZE* is the firm size; *VOL* is the volatility for the individual stock returns; *DVD* is the dividend payment ratio; *ROE* is the returns on equity; *G&D* is the growth and distress ratio; *|G&D|* is its corresponding absolute value. The solid line is the sentiment beta in the larger one-third larger firm characteristic portfolio. The dotted line is sentiment beta in the smaller one-third larger firm characteristic portfolio.

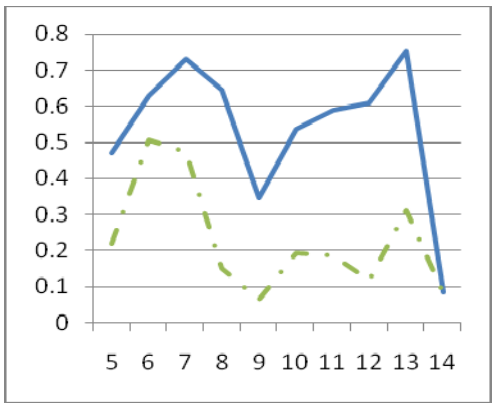
Figure 2
Sentiment beta in each firm characteristic (1990-1999)



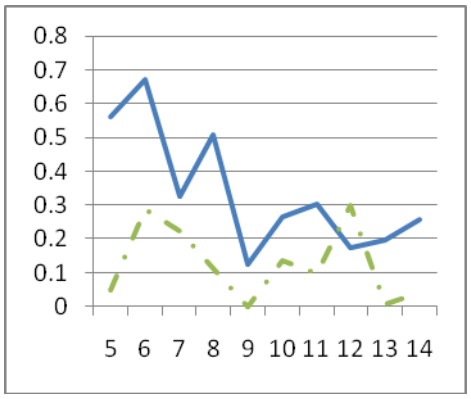
Panel A: SIZE



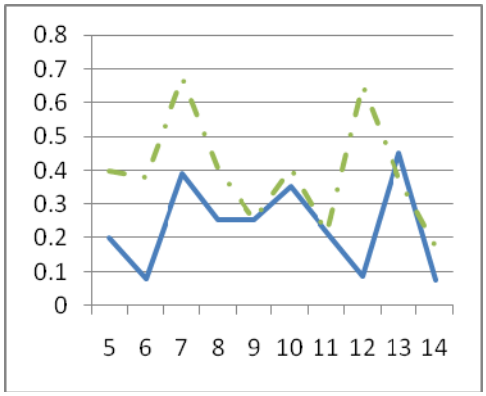
Panel B: AGE



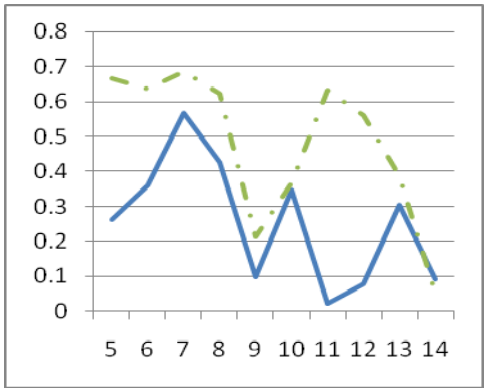
Panel C: VOL



Panel D: |G&D|



Panel E: ROE



Panel F: DVD

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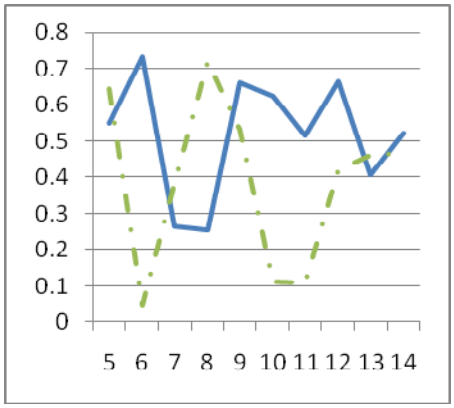
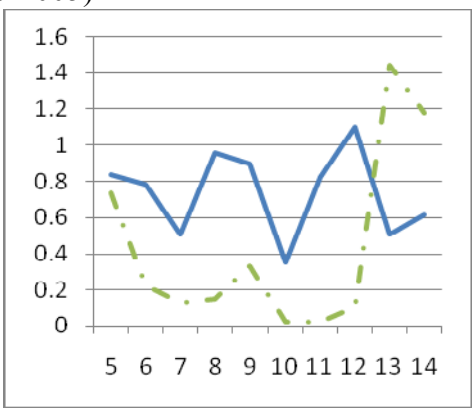
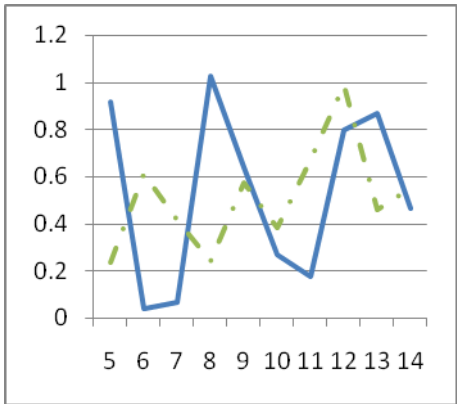
Figure 3
Sentiment beta in each firm characteristic (2000-2005)



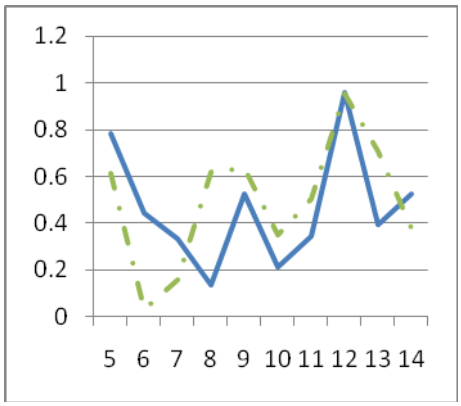
Panel A: SIZE



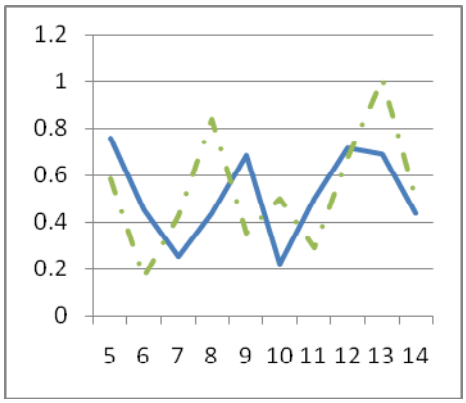
Panel B: AGE



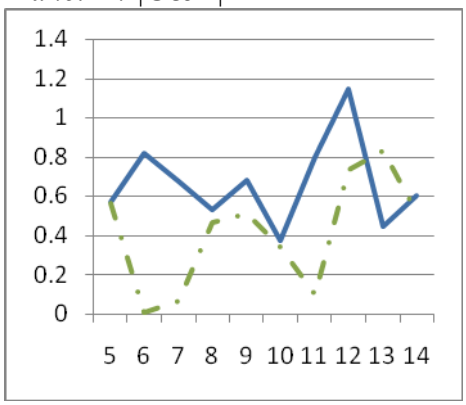
Panel C: VOL



Panel D: |G&D|



Panel E: ROE



Panel F: DVD

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