JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS

doi:10.1017/S0022109024000462

Visible Hands: Professional Asset Managers' Expectations and the Stock Market in China

John Ammer
Federal Reserve Board, International Finance Division
john.ammer@frb.gov

John Rogers
Fudan University, Fudan International School of Finance
Johnrogers@fudan.edu.cn

Gang Wang
Shanghai University of Finance and Economics, Institute of Accounting and Finance, School of Accountancy
wang.gang@mail.sufe.edu.cn

Yang Yu
Shanghai Jiao Tong University, Antai College of Economics and Management, Department of Economics
yu.yang.econ@sjtu.edu.cn (corresponding author)

Abstract

We study how professional fund managers' growth expectations affect their equity investments and the consequent effects on prices. Using novel data on China's mutual fund managers' growth expectations, we show that pessimistic managers decrease equity allocations and shift away from more cyclical stocks. We identify a statistically significant link between managers' growth expectations and returns on the stocks that they hold and trade. We also find that an earnings-based measure of price informativeness is increasing in forecasting managers' investment and forecast-consistent trading, implying that active fund managers in China help move stock prices closer to underlying fundamentals.

I. Introduction

In recent years, professional asset managers have played an increasing role in Chinese financial markets, mirroring a trend that began earlier in some other economies. An open question is the extent to which the more disciplined decision-making that professional analysis can bring to bear has a significant impact on market dynamics. In this article, we assess professional investors' portfolio decision-making through explicit consideration of the consequences of their macroeconomic outlook, which we infer through a systematic textual analysis. An advantage of our approach is that these opinions come from the investors

We thank the two anonymous referees and Stephan Siegel (the editor) for their valuable comments. We also thank Daniel Beltran, David Jenkins, Emilio Osambela, Ken Teoh, Jun Tu, and workshop participants at the Federal Reserve Board for their constructive feedback. The views in this article are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or any other person associated with the Federal Reserve System.

themselves, so they can be more directly linked to the investment decisions we observe for the asset managers in our data set. Through this, we document the links running from managers' macroeconomic growth expectations to their investment actions and to the price impact of those actions.

Expected macroeconomic growth is likely to be an important factor in investment decisions, given the potential impact on companies' earnings growth trajectory and investors' willingness and ability to bear risks. This affects the risk premium, a critical component of expected returns. Chinese financial investors have further reason to be concerned about economic growth as state-owned enterprises (SOEs), which comprise about 38% of listed companies and 55% of stock market value in China, are crucial stabilizing tools that the government actively employs (Bai, Lu, and Tao (2006)). These considerations again became prominent in the early 2020s, with pandemic-induced lockdowns in much of China.

Despite the potential importance of these topics, there has been relatively little previous analysis about the extent to which investors change their investments according to economic growth expectations, or the consequences for asset pricing. In this article, we provide evidence on these questions. We begin with a textual analysis of the qualitative discussion published in the quarterly reports of China's equity and mixed mutual fund managers. From this, we construct an extensive panel of near-term expectations about China's GDP growth rate between 2008:Q2 and 2020:Q2 from a panel of fund managers that includes 4,503 funds.[1]

We use our inferred growth expectation measure to show that when expecting strong economic growth, fund managers increase the equity share and raise the stock market beta in their portfolios. These shifts in portfolio allocations are consistent with the fact that economic growth improves companies' earnings prospects and increases investors' willingness to bear risks, making it more lucrative to invest in risky stocks. Furthermore, the positive correlation we find between managers' growth expectations and risk-taking is evidence that the variation across our panel measure of growth expectations reflects heterogeneous and time-varying beliefs among managers, rather than just measurement noise. The close relationship between exposure to stock market risks and expectations has also been documented in recent work by Giglio, Maggiori, Stroebel, and Utkus (2021a), who study a confidential survey of U.S. retail investors with accounts at Vanguard, but their setting is quite different than the institutional investors we consider.

We also identify a significant reallocation of investment across industries based on managers' growth expectations. Fund managers who are optimistic about economic growth reallocate funds away from countercyclical industries like agriculture toward pro-cyclical industries such as transportation. This result suggests that growth expectations may amplify cyclicalities at the sectoral level. It complements evidence reported by Kacperczyk, Nieuwerburgh, and Veldkamp (2014),

[1]Fund managers have an incentive to report their true expectations, despite potential costs of reporting and positive externalities on competitors. Part of their responsibility is to communicate with investors about expectations through presentations, newsletters, blogs, etc. The marginal cost of discussing the same expectation in their fund reports is negligible. It is also almost impossible for mutual fund managers to hide their expectations from competitors since communications with investors are mostly public. Section F of the Supplementary Material demonstrates that funds' abnormal returns are positively correlated with the accuracy of their managers' macroeconomic forecasts.

who document that U.S. fund managers actively adjust their allocations across industries over the business cycle. We also show that managers who are more optimistic about economic growth invest more in SOE stocks. This reallocation between SOEs and non-SOEs can be due to the former's higher sensitivity of earnings to aggregate economic conditions. In particular, SOEs expand faster in macroeconomic booms due to implicit guarantees from the government and greater monopoly power (see, e.g., Li, Liu, and Wang (2015)). Meanwhile, SOEs suffer a more significant earnings loss during economic slowdowns because they are responsible for maintaining social stability, which prohibits them from firing workers and cutting procurement of intermediate goods (Lin, Cai, and Li (1998), Song, Storesletten, and Zilibotti (2011)).

Having described how managers' macroeconomic growth expectations affect their investment activity, we next study the impact of this on prices. We first document a strong and positive comovement between the fund managers' consensus growth expectations and the log price-dividend ratio of the Chinese stock market index. A similar pattern shows up for the individual stocks too: The abnormal return of a company is correlated with the growth expectations of fund managers who hold this company's stocks. The magnitude of the correlation is economically large. A 1-standard-deviation rise (vs. fall) in the average growth expectation of fund managers investing in a stock is associated with a 0.19% increase (vs. decrease) in the monthly abnormal return, which is about 24.9% of the stock's average monthly excess return (0.76%).

What drives the positive correlation between growth expectations and stock prices? One possible mechanism is a price impact channel, arising from fund managers' consequent adjustments to their portfolios in response to their growth expectations. Another plausible interpretation is that causality goes in the opposite direction: Fund managers' growth expectations are influenced by changes in stock prices (a learning channel). While we cannot rule out the learning channel contributing to the observed correlation, we document a set of facts showing that the price impact channel plays a strong role in driving the positive relation between growth expectations and stock prices. First, we find that the index fund managers' growth expectations are not significantly correlated with stock prices. While the learning channel could affect growth expectations for managers of both types of funds, only the active fund managers' growth expectations have a direct price impact channel through their trading decisions.

Second, we find a stronger relation between growth expectations and a stock's abnormal return when holding managers have a negative growth expectation than when managers have a positive growth expectation. This asymmetry may arise because fund managers with pessimistic growth expectations can only sell stocks that they hold, due to a strict short-sale constraint on mutual funds in China, and this concentrates negative price pressure on the stocks that these forecasting managers already held. In contrast, fund managers with optimistic growth expectations may choose to add new holdings to their portfolios for diversification motives, entailing a weaker association with existing stocks' prices.[2] In practice, 41% of net buying by

[2]Our finding is also related to the literature on the effect of heterogeneous beliefs on stock prices (Hong and Stein (2003), Banerjee (2011), and Atmaz and Basak (2018)).

mutual funds in our sample is in new stocks rather than additions to existing long positions. We document that negative growth expectations on the part of a fund manager are strongly correlated with sales of stocks held by the fund in the previous period, while positive growth expectations are more weakly associated with both purchases of new equity positions and additions to existing holdings.

The previous results suggest that the way forecasting managers' growth expectations comove with stock prices is through the managers' trading decisions, which motivates us to investigate the role of trading in the price impact of growth expectations. We focus on traders of a given stock for whom the buy or sell decisions are consistent with their contemporaneous growth expectations. We define their weighted average of growth expectations as trading-consistent expectations (TCEs) and find their explanatory power for stock returns is much stronger than for our expectation measure based on beginning-of-period holdings of a stock, which does not incorporate contemporaneous portfolio re-allocations.

Motivated by the previous findings, our last empirical exercise turns to the question of whether active fund managers in China move stock prices closer to underlying fundamentals. Specifically, we examine the role of Chinese mutual fund managers in driving the "price informativeness" of the stock market. In a well-functioning market, security prices provide accurate signals for resource allocation, as prices at any time fully reflect all available information (Fama (1970)). China's 2 stock exchanges, in Shanghai and Shenzhen, were established in the early 1990s and have grown to become the second-largest national stock market in the world by total capitalization, trailing only the United States. Foreign investors, traditionally restricted from trading in the domestic "A-share" market, have gradually but increasingly been granted access to these 2 exchanges (Ma, Rogers, and Zhou (2022a)). We follow the approach of Dávila and Parlatore (2018) and measure price informativeness of the Chinese stock market as the extent to which a stock price reflects the future earnings of the firm, which presumably depends on macroeconomic conditions. We find that Chinese active fund managers who participate in macro forecasting and adjust their portfolios in response to their growth expectations help to improve price informativeness. In contrast, Chinese index fund managers who participate in macro forecasting and trade in the same direction as their growth expectations do not significantly impact price informativeness. The results imply that active asset management makes an important contribution to the informativeness of stock prices about future earnings.

Given that retail investors account for a large share of trading in the Chinese stock market, the significant role we find for active fund managers in bringing fundamental information into prices may seem counterintuitive.[3] However, two forces might contribute to the significant price impact of mutual funds' growth expectations and their contribution to price informativeness. The first is that aggregate stock demand by Chinese investors other than active fund managers is price-inelastic, as Gabaix and Koijen (2021) have found for the U.S. market. They show that in this situation, small changes in trading can have strong price impacts. Li, Pearson, and Zhang (2021) document a similar pattern in China: A demand shock of

[3]The annual statistical report of the Shanghai Stock Exchange shows that retail investors accounted for 85.2% of trading volume at the Shanghai Stock Exchange in 2014, the middle year of our sample.

0.1% can shift stock prices by about 0.3% to 0.5%. The second mechanism is that, based on stock prices as well as anonymous big trades and buying/selling orders, some retail investors may infer mutual fund managers' trading and strategically mimic these managers, amplifying the price impact of fund trading that is more grounded in fundamental analysis. Such trading tactics would be broadly consistent with the significant trend-chasing trading patterns of retail investors documented by Chen, Liang, and Shi (2022) and Jones, Shi, Zhang, and Zhang (2020).

Related Literature

Our article contributes to the literature examining the effect of expectations on investments. Data sets used include the retail investors' survey at Vanguard (Giglio et al. (2021a), (2021b)), expectations of large fund families (Dahlquist and Ibert (2021)), and expectations of public pension funds (Andonov and Rauh (2022)).[4] An advantage of our data set is the relatively large sample size and panel feature of the forecasts over a long period. This allows us to examine variations in the same investors' growth expectations over different phases of economic fluctuations. In comparison, for example, Giglio et al. (2021a) cover the period between 2017 and 2020. Ammer, Rogers, Wang, and Yu (2023) use the same Chinese mutual fund reports as in this article but to investigate a different topic, the effect on Chinese bond and money market funds' fixed-income investments of fund managers' monetary policy expectations. In contrast, this article focuses on equity and mixed funds' growth expectations and implications for the stock market.

Our article also contributes to the literature on how stock prices respond to changes in macroeconomic information. Previous work primarily focuses on the price impact of unexpected macro news (Ederington and Lee (1993), Mitchell and Mulherin (1994), Flannery and Protopapadakis (2002), Bernanke and Kuttner (2005), Boyd, Hu, and Jagannathan (2005), and Giglio et al. (2021b)), while we provide direct, new evidence that macroeconomic expectations (which can be determined by news or other factors) are associated with changes in stock prices in the short run.

Finally, our article contributes to recent literature on the price informativeness of the stock market, which plays an active role in resource allocation (Chen, Goldstein, and Jiang (2007)). Bai, Philippon, and Savov (2016) and Carpenter, Lu, and Whitelaw (2021) estimate upward time trends in the informativeness of stock prices in the United States and China, respectively. Other determinants of price informativeness in prior studies include enforcement of law (Fernandes and Ferreira (2009)), product market structure (Kacperczyk, Nosal, and Sundaresan (2018)), and transparency of information (Dasgupta, Gan, and Gao (2010)). The work that is most related to this article is Piotroski and Roulstone (2004), who document that analysts and institutional investors improve price informativeness. Using the price informativeness measure developed by Dávila and Parlatore (2018) —which is different than that used in the articles previously—we document novel

[4]More broadly, Brunnermeier, Farhi, Koijen, Krishnamurthy, Ludvigson, Lustig, Nagel, and Piazzesi (2021) discuss the popular data sets that measure expectations of other agents such as households and professional forecasters.

evidence that informativeness in the Chinese stock market is improved by macroeconomic research by active, but not passive, mutual fund managers.

II. Data Description

A. Mutual Fund Reports

During our sample period 2008:Q2 to 2020:Q2, all mutual fund managers in China were asked by the China Securities Regulatory Commission (CSRC) to discuss their expectations for near-term conditions in the real economy and financial markets. These commentaries were published in the market outlook subsections of the quarterly, semiannual, and annual reports of the *China Securities Journal*, which we obtain from Wind.[5] The CSRC does not assign topics, so managers are free to address what they find most relevant. They are not allowed to mention any stock or company names. Managers provide qualitative forecasts of economic policies, economic conditions, and other subjects. Mutual fund managers have a reputational incentive to write the market outlook section carefully, as investors can evaluate managers' ability and credibility from the cohesiveness of their opinions.

While managers do not specify their forecast horizon in most cases, we conjecture that the horizon for the quarterly reports is 1 quarter, because we find that the consensus growth expectation constructed from the quarterly reports has the most predictive power as a 1-quarter ahead forecast. Section B of the Supplementary Material discusses the detailed timing structure, such as when growth expectations are formed and when stock prices are observed by the fund managers, behind our analysis.

Since the first Chinese mutual fund launch in Sept. 2001, the industry has experienced strong growth. At the end of 2020, the mutual fund industry had 7,403 funds, consisting of 1,277 equity funds, 2,370 bond funds, 3,202 mixed funds, 333 money market funds, 166 Qualified Domestic Institutional Investor (QDII) funds, and 55 funds of other types.[6] In this article, we focus on actively managed equity and mixed funds that invest in the stock market. Total assets under management were USD 3.2 trillion for the mutual fund industry, including 755 billion in equity and mixed funds, of which 577 billion was in actively managed funds. These active equity and mixed funds held 0.8% and 4.5% of the Chinese stock market's capitalization, respectively.[7] The average number of stocks held by each fund was 120 for active funds and 308 for index funds.

[5]Wind is the leading commercial financial data supplier to financial institutions and research institutes in China; it can be regarded as the Bloomberg counterpart for Chinese data.

[6]QDII are domestic financial institutions that are allowed to invest in offshore markets. Funds of other types are specialized in commodity markets (29), stock straddle option strategies (25), and other markets (1). Due to the flexibility in investments, most active funds claim themselves as mixed funds rather than pure equity funds. This results in a small number of pure equity funds.

[7]The annual statistical report of the Shanghai Stock Exchange shows that in 2020, retail investors, corporate, the Shanghai–Hong Kong Stock Connect program (the main channel for foreign investment), and other institutional investors, respectively, held 23%, 56%, 3%, and 12% of the stock market's capitalization traded at the Shanghai Stock Exchange (Shanghai Stock Exchange (2021)).

To map the qualitative information on expected GDP growth embedded in mutual fund reports to quantitative measures, we first construct a dictionary of words and phrases. This dictionary includes words and phrases relating to China's GDP growth (e.g., "GDP growth" and "national income"), implying expected strength of GDP growth (e.g., "increase" and "stagnant"), reflecting the perceived probability or magnitude of GDP growth (e.g., "mildly" and "potentially"), and indicating negation (e.g., "no" and "not"). Each word and phrase is assigned a numerical score between -1 and 1.

Then, we compute the *growth expectation*, our growth expectation measure, of each report according to the combination of words and phrases from the dictionary. Section C of the Supplementary Material provides details on the textual analysis algorithm, and Section D of the Supplementary Material shows an example of how we map from report text to a growth expectation. The growth expectation is denoted $E_t^i(\Delta y_{t+1})$ for manager i in period t, with $E_t^i(\Delta y_{t+1}) \in [-1, 1]$. The sign of $E_t^i(\Delta y_{t+1})$ indicates the expected strength of GDP growth in period $t+1$. It is positive if the expectation is for strong economic growth, 0 if for moderate growth, and negative if for weak growth.

Summary statistics of the growth expectation are reported in Panel A of Table 1. The data set has 73,361 quarterly reports. Of this total, 20,662 and 52,699 are reported by managers of equity and mixed funds, respectively, and 29,852 have a valid GDP growth expectation. A significant fraction of our sample is written by passive funds such as index funds, which have 5,632 valid growth expectations. We exclude them in our benchmark analyses. Section G of the Supplementary Material presents time-series evidence showing that the average growth expectation across managers has statistically significant predictive power for near-term economic growth in China.

B. Fund Characteristics and Investment Data

A crucial detail of the mutual fund report for our purposes is that it identifies each fund and its manager. This enables us to match manager and fund characteristics as well as investment history, to managers' growth expectations in a relatively long panel. The matched panel structure enables us to identify the effect of those growth expectations on investment behavior and returns.

We obtain information on the characteristics of both mutual funds and their managers from Wind and RESSET.[8] We obtain monthly fund return, quarterly information on fund size (total net asset value under management), fund investments at the asset-type level, stock investment at the industry level, and semiannual detailed holdings in stocks.[9]

We observe fund expense ratios and their turnover ratio of equities semiannually. At the fund level, we observe characteristics such as founding dates, management fees, and purchase and redemption fees. We obtain stocks' characteristics, including their daily and monthly returns, quarterly market capitalization,

[8]RESSET is an academic-oriented financial database that can be considered the CRSP counterpart for Chinese data.

[9]Asset types include stocks, bonds, deposits, derivatives, and other financial assets.

TABLE 1

Summary Statistics

Table 1 reports summary statistics for the main variables. Panels A–E report the summary statistics for the growth expectations, the variables at the fund level, the time series, the variables at the stock level, and the variables at the bin level, respectively. Variables in Panel B–E are for active funds except those with an index label. Section A of the Supplementary Material provides detailed definitions for all variables.

Panel A. Summary Statistics of Growth Expectations

Variable	No. of Reports	No. of Forecasts	Mean	Std. Dev.	Min	p25	Median	p75	Max
ALL	73,361	29,852	−0.02	0.79	−1.00	−1.00	0.00	0.94	1.00
MIXED_FUNDS	52,699	22,059	−0.04	0.78	−1.00	−1.00	0.00	0.94	1.00
EQUITY_FUNDS	20,662	7,793	0.03	0.79	−1.00	−1.00	0.00	0.94	1.00

Panel B. Summary Statistics of Variables at the Fund Level

Variable	No. of Obs.	Mean	Std. Dev.	Min	p25	Median	p75	Max
EQUITY (%)	19,073	67.43	28.84	0.00	56.89	79.32	89.10	114.13
BETA	19,070	0.78	0.38	−1.98	0.59	0.84	1.00	3.13
PRO–CYCLE/EQUITY (%)	19,011	90.93	9.35	0.00	86.79	93.20	98.10	100.00
SOE/EQUITY (%)	13,498	45.95	20.37	0.00	30.61	45.61	60.83	99.99
ADJ_EQUITY (%)	13,648	65.79	28.88	0.75	50.95	77.86	87.91	94.84
ADJ_PRO–CYCLE/EQUITY (%)	13,644	91.86	9.13	53.49	88.32	94.56	98.84	100.00
ADJ_SOE/EQUITY (%)	13,461	45.30	21.09	0.96	29.52	44.82	60.52	95.01
BUY_NEW	5,324	0.39	0.28	0.00	0.17	0.36	0.55	1.65
EXPANDING_BUY	5,324	0.44	0.29	0.00	0.25	0.43	0.59	2.00
SELL_OLD	5,842	0.47	0.33	0.00	0.22	0.45	0.66	1.68
FUND_FLOW_VOL.	19,073	0.57	2.03	0.00	0.09	0.16	0.29	19.06
LIQUID_ASSET_PROPORTION (%)	19,073	12.41	12.52	0.00	5.06	9.07	16.10	92.16
VW_REAL_BETA	19,073	−0.01	0.44	−3.95	−0.13	0.01	0.14	4.00
CAPM_ABNORMAL_RETURN (%)	49,294	8.75	24.51	−50.72	−4.87	5.74	20.69	89.16
FAMA–FRENCH_ABNORMAL_RETURN (%)	49,294	5.66	31.84	−92.72	−10.03	4.14	22.39	98.87
PARTICIPATED	49,294	0.42	0.49	0.00	0.00	0.00	1.00	1.00
CORRECT	49,294	0.21	0.41	0.00	0.00	0.00	0.00	1.00
ln(TNA)	49,294	6.26	1.59	2.21	5.10	6.32	7.48	10.40
ln(AGE)	49,294	2.47	0.90	0.69	1.79	2.48	3.18	4.04
FUND_INFLOW (%)	49,294	0.07	0.80	−0.85	−0.14	−0.04	0.05	7.07
EXPENSE_RATIOS (%)	49,294	0.94	0.68	0.06	0.57	0.73	1.04	5.12

Panel C. Summary Statistics for Time Series

ACTIVE_CONSENSUS_GROWTH_EXPECTATION	49	−0.04	0.30	−0.46	−0.28	−0.14	0.16	0.60
INDEX_CONSENSUS_GROWTH_EXPECTATION	49	0.04	0.29	−0.76	−0.17	0.05	0.23	0.54
LOG_PRICE_DIVIDEND_RATIO	49	4.22	0.29	3.78	4.01	4.15	4.31	5.07
GDP_GROWTH_RATE (%)	49	7.35	1.96	−2.35	6.48	7.14	8.52	10.39
STOCK_MARKET_RETURN	49	−0.00	0.14	−0.34	−0.07	−0.01	0.06	0.37
CYCLICAL_STOCK_RETURN	49	0.09	0.26	−0.43	−0.04	0.07	0.15	0.98
SOE_STOCK_RETURN	25	0.07	0.23	−0.41	−0.06	0.06	0.12	0.73

Panel D. Summary Statistics of Variables at the Stock Level

Variable	No. of Obs.	Mean	Std. Dev.	Min	p25	Median	p75	Max
Summary statistics for March or September (Tables 5 and 6)								
STOCK_AR_IN_MARCH_OR_SEPTEMBER (%)	26,906	1.29	10.60	−41.18	−4.95	−0.37	5.89	75.69
HOLDING_MANAGERS'_EXPECTATION (HGE)	26,906	−0.02	0.63	−1.00	−0.51	0.00	0.50	1.00
FORECASTING_MANAGERS'_HOLDINGS (FMH) (%)	26,906	1.61	2.75	0.00	0.04	0.39	1.82	13.83
HGE_FOR_INDEX_FUNDS	17,342	0.05	0.63	−1.00	−0.44	0.07	0.57	1.00
FMH_FOR_INDEX_FUNDS (%)	17,342	0.27	0.41	0.00	0.02	0.09	0.32	1.90
ln(MARKET_CAP)	26,906	9.11	1.10	6.33	8.34	8.95	9.72	14.67
ln(TURNOVER_RATIO)	26,906	3.29	0.92	−1.88	2.69	3.31	3.95	6.22
EPS	26,906	0.10	0.27	−5.83	0.02	0.08	0.17	8.56
ln(M/B_RATIO)	26,906	1.04	0.68	−0.92	0.57	1.00	1.45	8.71
SOE	26,906	0.51	0.50	0.00	0.00	1.00	1.00	1.00
Summary statistics for June or December (Tables 8)								
STOCK_AR_IN_JUNE_OR_DECEMBER (%)	30,718	−1.55	11.10	−61.53	−7.10	−1.89	3.78	67.84
TRADING_CONSISTENT_EXPECTATION (TCE)	30,718	−0.14	0.66	−1.00	−0.74	−0.25	0.48	1.00
HOLDING_MANAGERS'_EXPECTATION (HGE)	30,718	−0.07	0.58	−1.00	−0.50	−0.10	0.41	1.00

(continued on next page)

TABLE 1 (continued)
Summary Statistics

Panel D. Summary Statistics of Variables at the Stock Level (continued)

Variable	No. of Obs.	Mean	Std. Dev.	Min	p25	Median	p75	Max
FORECASTING_MANAGERS'_HOLDINGS (FMH) (%)	30,718	2.74	4.46	0.00	0.12	0.88	3.39	47.94
TRADING_INCONSISTENT_EXPECTATION (TIE)	28,588	0.05	0.55	−1.00	−0.37	0.04	0.50	1.00
ln(MARKET_CAP)	30,718	9.08	1.07	6.27	8.34	8.92	9.67	14.55
ln(TURNOVER_RATIO)	30,718	3.35	0.88	−1.96	2.80	3.39	3.96	6.31
EPS	30,718	0.12	0.23	−2.92	0.02	0.08	0.16	10.42
ln(M/B_RATIO)	30,718	1.03	0.68	−1.02	0.57	0.99	1.44	8.71
SOE	30,718	0.50	0.50	0.00	0.00	0.00	1.00	1.00
Panel E. Summary Statistics at the Bin Level								
PRICE_INFORMATIVENESS (BIN, %)	480	5.51	8.02	0.00	0.49	2.24	6.91	47.25
ACTIVE_MANAGER_HOLDING (BIN, %)	480	3.69	1.65	1.18	2.43	3.32	4.61	10.01
ACTIVE_FORECASTING_MANAGER_HOLDING (BIN, %)	480	1.93	1.11	0.31	1.05	1.67	2.64	6.21
ACTIVE_FORECAST_CONSISTENT_TRADING (BIN, %)	480	0.95	0.61	0.12	0.47	0.82	1.34	3.53
INDEX_MANAGER_HOLDING (BIN, %)	480	3.25	1.29	1.17	2.28	2.98	3.93	8.49
INDEX_FORECASTING_MANAGER_HOLDING (BIN, %)	480	0.12	0.10	0.00	0.04	0.10	0.19	0.40
INDEX_FORECAST_CONSISTENT_TRADING (BIN, %)	480	0.03	0.02	0.00	0.02	0.03	0.04	0.12

prices, earnings and earnings per share, monthly turnover ratio, and B/M ratios from RESSET, and stocks' CAPM beta, SOE nature, and dividend payment information from the China Stock Market & Accounting Research Database (CSMAR). We also obtain monthly information on Fama–French factors and risk-free rates from CSMAR. We obtain the real GDP growth rate from CEIC.

Panels B and C of Table 1 report the summary statistics for the main variables for funds and stocks, respectively. We winsorize the top and bottom 1 percentile of fund abnormal returns, fund characteristics, monthly stock returns, and stock characteristics.

III. Actions: Managers' Growth Expectations and Investment

We begin by relating managers' growth expectations to investment decisions. Do growth expectations comove positively with measures of their funds' equity exposure, as would be consistent with much of the literature on asset pricing and portfolio choice? One mechanism that points to such a result is that higher macroeconomic growth should predict higher earnings growth. Specifically, future activity growth is positively associated with stock returns, as shown by Schwert (1990), and corporate profits are procyclical. When prices do not fully reflect these growth expectations, fund managers have an incentive to increase their exposures to equities. Second, the risk appetite of fund managers and their customers should improve if the economic outlook becomes more favorable, either when the mean of future macroeconomic growth is higher or when the variance is lower (these 2 events are strongly correlated in the data). This leads to a lower risk premium and higher stock price.

The previous mechanism is embedded in many textbook asset pricing models that analyze the effect of time-varying consumption risks on changing risk appetite (Campbell and Cochrane (1999), Bansal and Yaron (2004), Wachter (2013), and Cieslak and Pang (2021)). For example, in the Campbell and Cochrane habit formation model, investors become less risk-averse and are willing to take more risks when their expected consumption rises beyond their habitual level. A potentially offsetting effect is that news about higher macroeconomic growth can raise the risk-free rate, as Beechey and Wright (2009) find in a U.S. event study. However, Campbell and Ammer (1993) find that variations in equity risk premiums are a much stronger driver of stock returns.[10] In our implementation, we consider two dimensions of portfolio choice: exposure to stock market risks and reallocation of investment across industries and companies with various degrees of cyclicality.

A. Exposure to Stock Market Risks

We quantify exposure to stock market risks with two measures. The first is equity share, denoted EQUITY, which is the proportion of net asset value invested in equity rather than other types of assets such as bonds and cash. The second measure is the stock market beta, denoted BETA, estimated from a CAPM using daily data of the Chinese stock market in the reporting period. For each measure of stock market risk exposure, we estimate

$$(1)\quad S_t^i = \alpha + \eta E_t^i\left(\Delta y_{t+1}\right) + X_t + Z_t^i + \chi^i + \epsilon_t^i,\ S \in \{\text{EQUITY\_SHARE}, \text{BETA}\},$$

where S_t^i is equity share or stock market beta; $E_t^i\left(\Delta y_{t+1}\right)$ is the fund manager's growth expectation; and X_t is a vector of aggregate-level controls, including GDP growth rate and lagged stock market return. Z_t^i is a vector of fund-level controls, including lagged fund size, fund age, fund flows, expense ratio, fund flow volatility, proportion of liquid assets, and exposure to macroeconomic risks.[11] χ^i represents fund fixed effects. We use fund fixed effects to control for the unobserved fund-level fixed variables, which allows us to isolate variation over time in managers' growth expectations and the effects on portfolio choices without having to model explicitly how portfolio choices differ across funds. In comparison, Giglio et al.

[10]Bansal and Yaron (2004) demonstrate that positive growth news raises stock prices when the elasticity of intertemporal substitution is greater than 1. In a model with a forward-looking Taylor rule, Cieslak and Pang (2021) show that positive shocks to economic growth raise stock prices if the central bank tightens the short rate less than one-for-one with growth expectations.

[11]Following Ma, Xiao, and Zeng (2022b), we use the share of cash and Treasury holdings to control for funds' liquidity position. Following Kacperczyk, Van Nieuwerburgh, and Veldkamp (2016), we measure a fund's exposure to macro risks with the comovement between the earnings growth of its portfolio and shocks to the GDP growth rate. In particular, we first estimate each stock j's "fundamental-based beta" (b_j) with the following regression: $e_{j,t} = a_j + b_j\eta_t + \epsilon_{j,t}$, where $e_{j,t}$ is stock j's standardized unexpected earnings (SUE) in quarter t calculated as the growth of the seasonal-adjusted earnings per share scaled by its 1-year rollover standard deviation. η_t is the AR(1) residual of Δy_t. Then, we compute each fund's exposure to macro risks as the average b_j weighted by stock values in the portfolio. Section I of the Supplementary Material reports the correlation matrix of explanatory variables and variance inflation factor (VIF) vectors, which shows that collinearity between the explanatory variables is very unlikely.

TABLE 2

Growth Expectation and Portfolio Adjustment

Data in Table 2 are quarterly between 2008:Q2 and 2020:Q2 for active funds. EQUITY is the proportion of net asset value invested in equity. BETA is the stock market beta estimated from a CAPM using daily data in the reporting period. All standard errors are clustered at the fund and the quarter levels. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable			
	EQUITY (%)		BETA	
	1	2	3	4
GROWTH_EXPECTATION	1.116***	0.442***	0.020**	0.007***
	(3.78)	(3.36)	(2.67)	(2.81)
LAGGED_log(TNA)	−1.555***	−1.817***	−0.020***	−0.025***
	(−4.31)	(−5.46)	(−3.34)	(−3.58)
LAGGED_log(AGE)	2.360***	3.003***	0.059***	0.045***
	(3.25)	(5.50)	(6.43)	(5.50)
LAGGED_FUND_FLOWS	0.217	0.125	−0.001	0.003
	(0.65)	(0.43)	(−0.19)	(0.75)
EXPENSE_RATIO	2.135***	1.971***	0.026***	0.037***
	(3.25)	(4.17)	(3.56)	(5.22)
FUND_FLOW_VOL.	−0.318*	−0.312*	−0.006**	−0.006**
	(−1.68)	(−1.75)	(−2.28)	(−2.14)
LAGGED_LIQUID_ASSET_PROPORTION	−0.217***	−0.196***	−0.005***	−0.004***
	(−12.53)	(−11.51)	(−12.86)	(−13.09)
LAGGED_VW_REAL_BETA	0.397	−0.022	−0.010	−0.009
	(1.12)	(−0.07)	(−0.83)	(−1.07)
GDP_GROWTH_RATE	0.221		−0.006	
	(0.62)		(−1.08)	
LAGGED_MARKET_RETURN	2.270		−0.092	
	(0.76)		(−1.61)	
Fund FE	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	Yes
Adj R^2	0.843	0.856	0.724	0.749
No. of obs.	19,073	19,073	19,070	19,070

(2021a) mainly focus on the cross-sectional variations since their sample period is too short to control for the individual fixed effects. The standard errors are 2-way clustered at the fund and quarter levels.

Column 1 of Table 2 shows that fund managers increase (vs. decrease) investment in equity when expecting more (vs. less) robust economic growth. A 1-standard-deviation (0.79) increase (vs. decrease) in growth expectation is associated with about a 0.88 (0.79 × 1.116) percentage point larger (vs. smaller) equity share, about 3.1% of the standard deviation of equity share.[12] Our result is consistent with the fact that, on average, listed companies' earnings growth is positively correlated with GDP growth, inducing investors to invest in their stocks. Moreover, robust economic growth enables investors to be more capable of bearing risks through holding riskier assets such as stocks. Our result is broadly in line with Giglio et al. (2021a), who find a higher equity share for surveyed retail investors at Vanguard who forecast a higher GDP growth rate, but also different in that nearly all of the variation in their survey expectations is cross-sectional, implying that the

[12]A large proportion of the dispersion in equity share across mutual fund portfolios is driven by factors such as investment style and mandate that are not affected by differences in growth expectations.

heterogeneity in responses reflects sentiment, rather than information or competent analysis.

A possible explanation of the positive correlation between equity share and growth expectation is that stock market returns drive both simultaneously. As the stock market return is an aggregate variable, we can purge it from our estimation with time fixed effects. Column 2 of Table 2 confirms that the positive and highly statistically significant correlation between growth expectations and equity share remains robust even after accounting for time fixed effects. These fixed effects capture the consensus growth expectations that are correlated across different managers. However, it's worth noting that the magnitude of the estimate is approximately half of its value in the regression model that excludes time-fixed effects. This suggests that a significant portion of the comovement between managers' equity share and growth expectations can be attributed to the common trends observed in both variables.

The results for the stock market beta are displayed in columns 3 and 4 of Table 2: A 1-standard-deviation increase (0.79) in growth expectation increases a fund's portfolio beta by 0.016 (0.79×0.020), about 4.2% of the standard deviation of funds' portfolio beta. This reinforces our findings in columns 1 and 2, as beta is a complementary measure of exposure to stock market risks. Moreover, valuations of non-equity assets, such as convertible bonds, can be highly correlated with stock prices. Investment decisions for these assets are not reflected in the equity share of fund portfolios but will be reflected in stock market beta. Table E.1 in the Supplementary Material verifies that the changes in equity share reflect fund managers' active and strategic portfolio choice rather than the valuation effect passively driven by changes in asset prices.

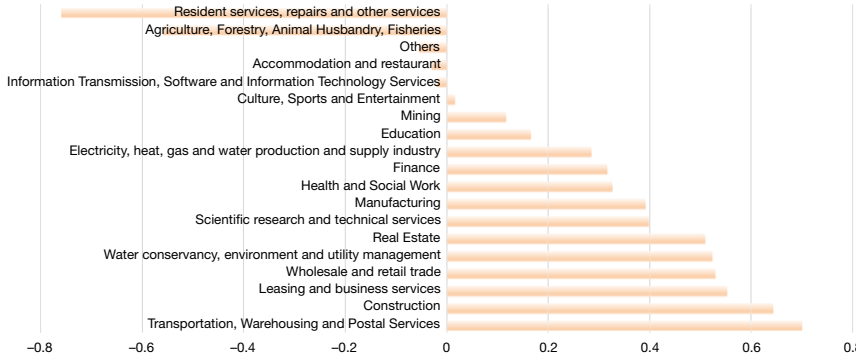
B. Industries with Different Cyclicalities

Next, we study how fund managers allocate investment across industries according to their growth expectations. We first calculate the correlation coefficient between actual GDP growth and the earnings growth rate for the 19 CSRC primary-level industries. This identifies pro-cyclical and countercyclical industries. Figure 1 displays the correlation coefficients for each industry from the most negative to most positive. While most industries' earnings growth is pro-cyclical, a few are significantly countercyclical, such as resident services/repairs/other services and agriculture/forestry/animal husbandry/fisheries. Several articles have documented the countercyclicality of the agricultural sector's value-added (e.g., Yao and Zhu (2021)), pointing out that the critical factor behind this is the reallocation of labor between agricultural and nonagricultural sectors. This intuition also applies in our setting to companies' earnings: An economic slowdown can induce rural migrant workers to return from cities to the rural areas where they own farmland. The influx of labor supply would depress wages and thus improve profitability in the agricultural sector. The countercyclicality of the resident services/repairs/other services industry is less established in the literature. However, the pattern can be intuitively explained by the reallocation of time between home and work over the business cycle.

FIGURE 1

Correlation Between GDP Growth and Industries' Earnings Growth

Data in Figure 1 are quarterly between 2013:Q1 and 2020:Q4. Each bar displays the correlation between industries' earnings growth and the GDP growth rate.



To study how fund managers reallocate their investment between pro- and countercyclical industries, we estimate the following regression:

$$\omega^i_{\mathrm{PRO},t} = \alpha + \eta E^i_t\left(\Delta y_{t+1}\right) + X_t + Z^i_t + \chi^i + \epsilon^i_t, \tag{2}$$

where $\omega_{\mathrm{PRO},t}$ is the fraction of fund i's equity investment allocated to the pro-cyclical industries. $E^i_t\left(\Delta y_{t+1}\right)$ is the growth expectation. Aggregate-level control variables include the lagged average return on the cyclical industries, in addition to the controls used in Table 2, and the fund-level control variables are the same as those used in Table 2. χ^i denotes the fund fixed effects.

Columns 1 and 2 of Table 3 report the results. Column 1 shows that expecting strong economic growth, fund managers increase their allocation of equity investment in pro-cyclical industries. A 1-standard-deviation (0.79) increase in growth expectation is associated with about a 0.612 (0.79 × 0.775) percentage point larger fraction of equity investment in pro-cyclical industries, about 6.5% of the standard deviation of the dependent variable. Column 2 shows that this is robust to including time fixed effects. Table E.1 in the Supplementary Material further verifies that changes in exposure to pro-cyclical industries reflect fund managers' active and strategic portfolio choice rather than the valuation effect passively driven by changes in asset prices.

Our results imply that growth expectations are a novel mechanism that could amplify sectoral dispersion and volatility. In periods of robust economic growth prospects, companies in pro-cyclical industries receive more investment, propagating their development and making them even more pro-cyclical. Conversely, companies in countercyclical industries receive less investment, depressing their output and making them even more countercyclical.

C. SOEs and Non-SOEs

SOEs comprise a significant share of exchange-traded Chinese firms. As shown by the gray areas in Figure 2, SOE stocks account for 55% of the market cap and 38%

TABLE 3

Growth Expectation and Portfolio Adjustment in Cyclical Industry and SOEs

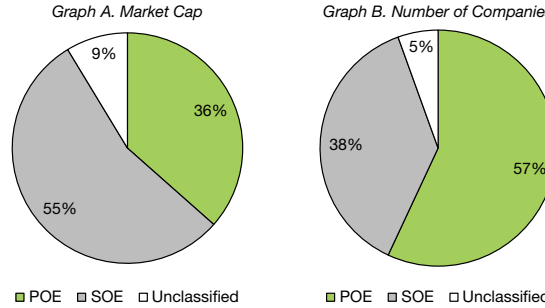
Columns 1 and 2 of Table 3 are quarterly between 2008:Q2 and 2020:Q2 for active funds. The dependent variable, PRO-CYCLE/EQUITY (%), is the mutual fund's proportion of equity market value in pro-cycle industries. Columns 3 and 4 are semiannual between June 2008 and June 2020 for active funds. The dependent variable, SOE/EQUITY (%), is the mutual fund's proportion of equity market value in SOE stocks. All standard errors are clustered at the fund and quarter levels. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable			
	$\frac{\text{PRO-CYCLE}}{\text{EQUITY}}$ (%)		$\frac{\text{SOE}}{\text{EQUITY}}$ (%)	
	1	2	3	4
GROWTH_EXPECTATION	0.775***	0.346***	1.546***	0.217
	(3.44)	(3.12)	(3.45)	(1.00)
LAGGED_log(TNA)	0.219	0.131	0.599	0.036
	(1.42)	(0.81)	(1.34)	(0.08)
LAGGED_log(AGE)	0.882**	0.482	0.194	0.158
	(2.46)	(1.66)	(0.11)	(0.25)
LAGGED_FUND_FLOWS	−0.026	−0.029	0.877*	0.548*
	(−0.21)	(−0.25)	(1.74)	(1.98)
EXPENSE_RATIO	−0.197	−0.363**	0.111	−0.916**
	(−1.05)	(−2.19)	(0.14)	(−2.40)
FUND_FLOW_VOL.	0.036	0.104*	−0.050	0.002
	(0.59)	(1.84)	(−0.23)	(0.01)
LAGGED_LIQUID_ASSET_PROPORTION	0.011	0.017*	−0.006	−0.003
	(1.08)	(1.94)	(−0.20)	(−0.15)
LAGGED_VW_REAL_BETA	−0.899***	−0.246	1.489	0.714
	(−2.73)	(−1.20)	(1.55)	(1.33)
GDP_GROWTH_RATE	0.356**		5.607***	
	(2.26)		(4.76)	
LAGGED_MARKET_RETURN	3.198		13.959	
	(1.32)		(1.37)	
LAGGED_CYCLICAL_STOCK_RETURN	−1.908			
	(−1.52)			
LAGGED_SOE_STOCK_RETURN			−6.369	
			(−0.92)	
Fund FE	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	Yes
Adj R^2	0.317	0.370	0.439	0.511
No. of obs.	19,011	19,011	13,498	13,498

FIGURE 2

The Significant Proportion of SOE Stocks

Figure 2 displays the fractions of market cap (Graph A) and numbers of companies (Graph B) accounted for by the SOEs, privately owned enterprises (POEs) and unclassified stocks. For both measures, we compute the mean between 2008:Q2 and 2020:Q2.



of listed companies in China's stock market between 2008:Q2 and 2020:Q2. In addition, production decisions at SOEs serve as a countercyclical stabilization tool that is actively deployed by the government (Bai et al. (2006)). We investigate how growth expectations affect fund managers' investment decisions in SOEs. In Section H of the Supplementary Material, we show that SOEs' earnings are more pro-cyclical than those of non-SOEs, conditional on industry. This is unsurprising. In booms, SOEs expand faster due to cheaper financing costs from an implicit government guarantee (Song et al. (2011)) and greater monopsony power that enables them to take advantage of the rising market demand (Fernández-Villaverde, Mandelman, Yu, and Zanetti (2021)). However, SOEs suffer more significant earnings losses during economic slowdowns because they have a responsibility to maintain social stability (Bai et al. (2006)), which prevents them from firing workers and cutting procurement of intermediate goods.

Greater cyclicality of SOE earnings suggests that fund managers will reallocate investment toward SOE stocks when expecting strong economic growth. We test this by estimating

$$\omega^i_{\text{SOE},t} = \alpha + \eta E^i_t\left(\Delta y_{t+1}\right) + X_t + Z^i_t + \chi^i + \epsilon^i_t,$$

where $\omega^i_{\text{SOE},t}$ is the fraction of fund i's equity investment allocated to SOE stocks. $E^i_t\left(\Delta y_{t+1}\right)$ is the growth expectation. X_t is a vector of aggregate-level control variables, including the lagged average return on SOE stocks and the ones used in Table 2. The fund-level control variables stacked in Z^i_t are the same as the ones used in Table 2. χ^i is the fund fixed effects.

Column 3 of Table 3 shows that fund managers allocate more value to SOE stocks when expecting strong economic growth, consistent with the strong cyclicality of SOEs' earnings documented earlier. A 1-standard-deviation (0.79) increase (vs. decrease) in growth expectation is associated with about a 1.22 (0.79 × 1.546) percentage point larger (vs. smaller) fraction of equity investment in SOE stocks, about 6% of the standard deviation of the dependent variable. However, column 4 of Table 3 shows that the result becomes insignificant once we include time fixed effects, which suggests that the correlation between growth expectations and SOE investments is primarily driven by the comovement of their time trends. Table E.1 in the Supplementry Material shows that the result is robust after we filter out the valuation effect of changes in asset prices on the measured changes in holdings.

IV. Effects on Prices

Given that growth expectations influence fund managers' portfolio choices, changes in optimism about economic growth should affect asset prices through shifts in demand. Greater (lower) optimism about economic growth encourages managers to take on more (less) stock market risk, pushing up (down) stock prices. In this section, we examine the price impact of managers' growth expectations. We also investigate longer-term asset pricing implications of these growth expectations by examining how growth expectations and investments shape how stock prices are related to companies' future earnings growth, following the literature on "price

informativeness" (Bai et al. (2016), Dávila and Parlatore (2018), and Carpenter et al. (2021)). We find evidence that active, but not passive, fund managers' macro analysis improves price informativeness.

A. Evidence at the Aggregate Level

Beginning with aggregate data, Figure 3 displays a positive relationship between the consensus growth expectations (blue solid curve) and the log market price-dividend ratio (LOG_P-D_RATIO) in the last month of each quarter (black dashed curve). The consensus expectation (i.e., the average expectation across managers of active funds) is defined here as

$$E_t^{\text{CONS}}\left(\Delta y_{t+1}\right) = \frac{\sum_{i=1}^{N_t} E_t^i\left(\Delta y_{t+1}\right)}{N_t},$$

where N_t is the number of reports with a usable GDP growth expectation in period t. For example, a decline in the P-D ratio in 2018:Q3 was associated with pessimism about economic growth, possibly due to weakness in growth and a series of announcements on trade restrictions between the United States and China. The lower equity valuation may have been driven by pessimistic investors' decreasing their stock market risk exposure.

We examine the relationship between consensus growth expectations and stock prices by estimating

$$\text{PD}_t = \alpha + \eta E_t^{\text{CONS}}\left(\Delta y_{t+1}\right) + \rho \text{PD}_{t-1} + \gamma \Delta y_t + \epsilon_t, \tag{3}$$

where PD_t is the log P-D ratio of the stock market index in the last month of each quarter. $E_t^{\text{CONS}}\left(\Delta y_{t+1}\right)$ is the consensus expectation. PD_{t-1} is the lagged log P-D ratio, which is a strong predictor of economic growth (Bekaert, Harvey, Lundblad, and Siegel (2007)). Δy_t is the actual GDP growth. Standard errors are adjusted for serial correlation with the Newey–West method with a lag of 4 quarters.

FIGURE 3

Comovement of the Consensus Growth Expectation and the P-D Ratio

The blue solid curve in Figure 3 is the consensus growth expectation; the black dashed curve is the log P-D ratio of the stock market.

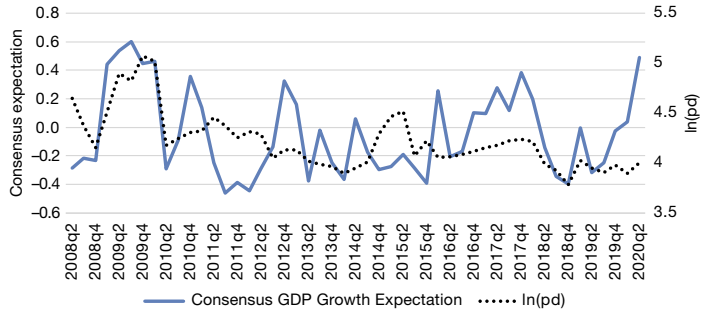


TABLE 4

Growth Expectations and Stock Market Valuation: Time Series

Data in Table 4 are quarterly between 2008:Q2 and 2020:Q2. The dependent variable is the log price-dividend ratio. ACTIVE_CONSENSUS_GROWTH_EXPECTATION is the average growth expectation across active-fund managers. INDEX_CONSENSUS_GROWTH_EXPECTATION is the consensus growth expectation of index funds. GDP_GROWTH_RATE is the year-on-year GDP growth rate, ending in the current quarter. Standard errors are adjusted for serial correlation with the Newey–West method with a lag of 4 quarters. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: LOG_PRICE_DIVIDEND_RATIO	
	1	2
ACTIVE_CONSENSUS_GROWTH_EXPECTATION	0.319**	0.446***
	(2.53)	(3.87)
GDP_GROWTH_RATE	0.031***	0.026***
	(2.99)	(2.79)
LAGGED_LOG_PRICE_DIVIDEND_RATIO	0.542***	0.566***
	(6.75)	(6.69)
INDEX_CONSENSUS_GROWTH_EXPECTATION		−0.166*
		(−2.00)
CONSTANT	1.707***	1.652***
	(5.68)	(5.33)
Adj R^2	0.700	0.704
No. of obs.	49	49

Column 1 of Table 4 shows that conditional on the lagged P-D ratio and actual GDP growth, the consensus growth expectation is positively correlated with the log P-D ratio, consistent with our hypothesis that greater allocation of equity and more risk-taking induced by optimism about economic growth boosts stock prices. Given that the standard deviation of the consensus growth expectation and the log P-D ratio are 0.30 and 0.29, respectively, a 1-standard-deviation increase (vs. decrease) in the consensus growth expectation is associated with a 0.096 (0.3 × 0.32) rise (fall) in the log P-D ratio, about 33% of the standard deviation of the log P-D ratio, an economically significant effect.[13]

Column 2 of Table 4 shows that index funds' consensus growth expectation is not positively correlated with the log P-D ratio conditional on active funds' consensus growth expectations and the control variables. The negative coefficient for the index funds' consensus growth expectation is primarily driven by its positive correlation (0.80) with the active funds' consensus growth expectation, but the negative sign indicates that the relation between equity valuations and growth expectations is weaker for passive managers than it is for active managers. As index funds do not actively adjust their portfolios due to their investment mandate, our result suggests that prices might be affected when active managers' growth expectations lead them to change their investment decisions. We next dig deeper into this comparison between active and index funds in subsection IV.B.

B. Stock Level Evidence: Holders' Growth Expectations and Abnormal Returns

Growth expectations of active fund managers can also have asset pricing implications at the individual stock level. We show that these effects can be more

[13]Section G of the Supplementary Material shows that the active funds' consensus expectation also predicts both real GDP growth and an alternative measure of macroeconomic growth.

clearly identified in panel data. We start by testing whether the stock return of a company is correlated with the growth expectations of active fund managers who held that stock at the end of the previous period. We estimate

$$\text{AR}_{j,M3(t)} = \alpha + \eta \text{HGE}_{j,t} + \mu \Delta y_t + \text{FMH}_{j,t-1} + Z_{j,t-1} + \chi_j + \epsilon_{j,t}, \tag{4}$$

where $\text{AR}_{j,M3(t)}$ is stock j's monthly CAPM abnormal return in the ending month of the reporting period (indicated by $M3(t)$).[14] Because we use abnormal returns, our inferences about the effects of manager expectations on prices are not likely to be affected by the correlation between the stock market index and growth expectations. Consequently, our panel results are unlikely to be driven by fund managers' learning from the market return when forming their growth expectations. $\text{FMH}_{j,t-1}$ is the fraction of the stock's market capitalization held by forecasting managers of active funds (i.e., the active fund managers with growth expectations). $\text{HGE}_{j,t}$ is holders' growth expectation, computed as the average growth expectations of forecasting managers who held stock j at the end of the *previous* quarter weighted by the number of shares held by the funds that they manage. $Z_{j,t-1}$ is a vector of stock-level controls, including the logarithm of market capitalization, the logarithm of the stock's turnover rate, the M/B ratio, and earnings per share, each of which is measured in the previous quarter; and a dummy indicating whether the firm was classified as an SOE the previous year. χ_j is the stock fixed effect. The coefficient of greatest interest is η, which captures the impact of growth expectations on stock prices. As detailed stock holding information is disclosed only in the midyear and end-of-year reports, the estimation of equation (4) uses 2 observations per year.[15] The standard errors are clustered at the stock level.

Benchmark results for holders' growth expectation (HGE) are in column 1 of Table 5. The coefficient on $\text{HGE}_{j,t}$ is positive and statistically significant. Given that the standard deviation of $\text{HGE}_{j,t}$ is 0.63, a 1-standard-deviation increase (vs. decrease) in the average growth expectation of fund managers investing in a stock is associated with a 0.199 (0.316×0.63) percent increase (vs. decrease) in the monthly abnormal return, which is about 26.2% of the stocks' average monthly excess return (0.76%) and thus economically significant.[16] Column 2 shows that the result is robust to including conventional stock-level controls.[17]

Weak Correlation Between Index Funds' Growth Expectations and Stock Returns

One possible mechanism driving the positive correlation between growth expectations and stock prices is that growth expectations affect stock prices by shifting fund managers' stock demand. An alternative explanation is that the causality goes

[14] In calculating the CAPM abnormal returns, the stock betas are estimated with monthly Chinese stock market returns in the past 12 months (from 13 months ago to 1 month ago).

[15] By construction, estimation of equation (4) is restricted to the sample of stocks that are held by forecasting managers.

[16] The excess return is the raw return minus the 3-month Shanghai Interbank Offered Rate (SHIBOR).

[17] All of the other stock-level panel results reported in this section are also broadly similar with and without stock controls, so for parsimony, we show only results for specifications that have the stock controls included.

TABLE 5

Growth Expectation and Abnormal Stock Returns

Data in Table 5 are semiannual from Sept. 2008 to Mar. 2020. The dependent variable is the stock's CAPM abnormal 1-month return. HOLDERS'_GROWTH_EXPECTATION (HGE) is the average contemporaneous growth expectation of active-fund managers weighted by their reported position in the stock at the end of the previous quarter (Dec. 31 or June 30). HGE_FOR_INDEX_FUNDS is the average growth expectation of index-fund managers who held the stock. FORECASTING_MANAGERS'_HOLDINGS (FMH) is the share of the stock's market cap held by active-fund managers with valid growth forecasts. In columns 2 and 4, the stock controls are the logarithm of the market cap, the logarithm of the turnover rate, the M/B ratio, and earnings-per-share, measured in the previous quarter; and a dummy indicating whether the firm was classified as an SOE the previous year. The standard errors are clustered at the stock level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: STOCK_AR_IN_MARCH_OR_SEPTEMBER			
	1	2	3	4
HOLDERS'_GROWTH_EXPECTATION (HGE)	0.316***	0.301***		
	(3.00)	(2.85)		
FORECASTING_MANAGERS'_HOLDINGS (FMH)	−0.054*	−0.019		
	(−1.80)	(−0.59)		
HGE_FOR_INDEX_FUNDS			−0.208	−0.094
			(−1.63)	(−0.73)
FMH_FOR_INDEX_FUNDS			0.173	0.084
			(0.74)	(0.34)
GDP_GROWTH_RATE	−0.149***	−0.212***	−0.095**	−0.175***
	(−4.20)	(−5.55)	(−2.22)	(−3.76)
Stock controls	No	Yes	No	Yes
Stock FE	Yes	Yes	Yes	Yes
Adj R^2	0.010	0.017	0.003	0.010
No. of obs.	26,905	26,905	17,342	17,342

in the opposite direction, with fund managers making inferences about growth prospects from their own portfolio performance, which will generally be stronger, all else being equal, when a manager holds more stocks with stronger abnormal returns. In the following exercise, we provide evidence that at least some of the causality runs from manager expectation to prices by comparing active and passive funds.

Specifically, as noted previously, while our article focuses on active funds, managers of index funds also provide growth forecasts and are likely to learn from stock prices when forming growth expectations. Index funds do not act on their growth expectations due to their investment mandates; hence, any differences between the growth expectations of active and passive managers can help in identifying the determinants of the correlation between price changes and growth expectations. Thus, we include the average growth expectations of index funds that held stock *j* as an alternative explanatory variable in equation (4). Columns 3 and 4 of Table 5 show that index funds' growth expectations are not significantly correlated with stock returns.[18] This finding suggests that the correlation between stock returns and active funds' growth expectations is, at least partially, driven by the price impact of portfolio shifts in response to growth expectations.

[18]The different results between columns 1–2 and 3–4 are consistent with the low correlation between the active funds' HGE and index funds' HGE at the stock level (0.14), in contrast to their much higher correlation at the aggregate level (0.81).

TABLE 6

Asymmetric Price Impact of Positive and Negative Growth Expectations

Data in Table 6 are semiannual from Sept. 2008 to Mar. 2020. The dependent variable is the stock's CAPM abnormal 1-month return. HOLDERS'_GROWTH_EXPECTATION (HGE) is the average contemporaneous growth expectation of active-fund managers weighted by their reported position in the stock at the end of the previous quarter (Dec. 31 or June 30). HGE_FOR_INDEX_FUNDS is the average growth expectation of index-fund managers who held the stock. The full sample results reported in column 3 incorporate stock-period cases with negative, positive, and zero HGE. FORECASTING_MANAGERS'_HOLDINGS (FMH) is the share of the stock's market cap held by active-fund managers with valid growth forecasts. The stock controls are the logarithm of the market cap, the logarithm of the turnover rate, the M/B ratio, and earnings-per-share, measured in the previous quarter; and a dummy indicating whether the firm was classified as an SOE the previous year. The standard errors are clustered at the stock level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: STOCK_AR_IN_MARCH_OR_SEPTEMBER		
	Negative HGE	Positive HGE	All
Sample	1	2	3
HOLDERS'_GROWTH_EXPECTATION (HGE)	1.938***	0.048	1.513***
	(5.68)	(0.15)	(5.30)
POSITIVE × HOLDERS'_GROWTH_EXPECTATION (HGE)			−1.829***
			(−4.26)
POSITIVE			−0.474*
			(−1.81)
FORECASTING_MANAGERS'_HOLDINGS (FMH)	−0.091*	0.051	−0.033
	(−1.81)	(1.12)	(−1.00)
GDP_GROWTH_RATE	−0.119*	−0.274***	−0.214***
	(−1.93)	(−5.05)	(−5.61)
Stock controls	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes
Adj R^2	0.014	0.034	0.018
No. of obs.	13,108	12,258	26,905

Asymmetric Price Impact of Positive and Negative Growth Expectations

Should the market dynamics related to fund manager expectations depend on whether the growth outlook is improving or deteriorating? Given short-sale constraints in Chinese markets, fund managers have more trades to choose from when increasing their exposure to the stock market than they do when making defensive portfolio shifts. In this subsection, we document a strongly asymmetric price impact between growth expectations of different signs that provides further evidence in support of fund manager trading as a mechanism for price discovery related to macroeconomic growth prospects in the Chinese economy.

As shown in columns 1 and 2 of Table 6, when we estimate equation (4) separately for stocks for which holders have negative and positive average growth expectations, the price impact is significant for negative growth expectations stocks only. Column 3 of Table 6 shows that the coefficient on the interaction between the dummy of positive expectation and HGE is negative, confirming that the lower price impact for positive HGE than for negative HGE is statistically significant. We argue that this asymmetry is consistent with the limitations that short-sale constraints in Chinese markets impose on the choices available to managers with negative growth expectations. In particular, fund managers with pessimistic growth expectations sell stocks they hold, in part because they cannot short stocks that they do not hold, and this leads negative price pressure to be concentrated on the stocks that these forecasting managers are able to sell. In contrast, fund managers with optimistic growth expectations can buy any stock that is trading, and they may

choose to add new holdings to their portfolios for diversification motives. In practice, we find that about 41% of net buying by mutual funds is in new stocks rather than expanding existing positions. In the following subsection, we will investigate the asymmetry in fund managers' trading in greater detail.

Overall, our results suggest that the way forecasting managers' growth expectations move stock prices is by the managers' trading decisions, a conjecture that we will explore more directly in the following subsection, with the limitation that security-level fund positions are only reported semiannually.

C. Trading by Forecasting Managers and Abnormal Returns

To more fully assess the effect of positive and negative growth expectations on portfolio buying and selling decisions, we estimate the following regressions for positive and negative growth expectations, respectively:

$$\text{BUY\_NEW}_t^i = \alpha_1 + \eta_1 E_t^i(\Delta y_{t+1}) + X_t^i + \gamma_t + \epsilon_t^i, \text{ for } E_t^i(\Delta y_{t+1}) > 0, \tag{5}$$

$$\text{EXPANDING\_BUY}_t^i = \alpha_2 + \eta_2 E_t^i(\Delta y_{t+1}) + X_t^i + \gamma_t + \epsilon_t^i, \text{ for } E_t^i(\Delta y_{t+1}) > 0, \tag{6}$$

$$\text{SELL\_OLD}_t^i = \alpha_3 + \eta_3 E_t^i(\Delta y_{t+1}) + X_t^i + \gamma_t + \epsilon_t^i, \text{ for } E_t^i(\Delta y_{t+1}) < 0, \tag{7}$$

where BUY_NEW represents the fraction of the value of stocks in quarter t's portfolio that were not present in quarter $t-2$'s portfolio, out of fund TNA in quarter $t-1$. A higher value of BUY_NEW indicates increased buying of new stocks. EXPANDING_BUY is the fraction of stocks in quarter t's portfolio that were also part of quarter $t-2$'s portfolio, reflecting the expansion of existing holdings. Conversely, SELL_OLD captures the fraction of the value of stocks that were in quarter $t-2$'s portfolio but were sold between quarter $t-2$ and quarter t. A higher value of SELL_OLD implies a larger proportion of stocks being sold from previously held positions. $E_t^i(\Delta y_{t+1})$ is the growth expectation for fund i.[19]

Results are shown in Table 7. For baseline specifications without fund or time fixed effects (as displayed in columns 1, 4, and 7), managers' positive expectations are associated with buying new stocks and expanding old holdings. Conversely, their negative expectations lead to selling existing stocks. Specifically, a 1% increase in positive growth expectation of a fund is associated with a 0.031% increase in net buying of new stocks and a 0.034% increase in net buying of existing stocks. In contrast, a 1% decrease in negative growth expectation of a fund is associated with a 0.082% increase in net selling of existing stocks. However, with fund fixed effects included, the buy results become statistically insignificant. The substantial increase in R^2 from fund fixed effects suggests significant heterogeneity in trading intensity across funds, and such effects likely persist throughout the entire 6-month measurement period for changes in portfolio positions, while managers' growth expectations reported in the final month may primarily affect trading later in that period.

[19]Note that the dependent variables are affected by changes in stock prices from quarter $t-2$ to quarter t. We winsorize them at the top and bottom 1% to mitigate the effect of extraordinary changes in stock prices.

TABLE 7

Buy New Stocks When Optimistic and Sell Old Stocks When Pessimistic

Data in Table 7 are semiannual between June 2008 and June 2020 for active funds. BUY_NEW is the fraction of the value of stocks in quarter *t*'s portfolio, but not in quarter $t-2$'s, out of fund TNA. EXPANDING_BUY is the fraction of the value of stocks in quarter *t*'s portfolio, and also in quarter $t-2$'s, out of fund TNA. SELL_OLD is the fraction of the value of the stocks that were in quarter $t-2$'s portfolio, and sold between quarter $t-2$ and quarter *t*. The subsamples for columns 1–6 and 7–9 include the fund-semiannual observations with positive and negative growth expectations. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable								
	BUY_NEW			EXPANDING_BUY			SELL_OLD		
Sample	Positive Expectations						Negative Expectations		
	1	2	3	4	5	6	7	8	9
GROWTH_EXPECTATION	0.032*	0.001	0.004	0.034*	−0.010	−0.013	−0.082***	−0.034**	−0.020*
	(1.78)	(0.08)	(0.33)	(1.88)	(−0.72)	(−0.91)	(−3.22)	(−2.26)	(−1.87)
LAGGED_log(TNA)	−0.060***	−0.097***	−0.105***	−0.057***	−0.101***	−0.106***	−0.048***	−0.080***	−0.076***
	(−8.49)	(−9.83)	(−13.13)	(−7.80)	(−10.04)	(−11.37)	(−5.42)	(−7.40)	(−8.56)
LAGGED_log(AGE)	0.065***	−0.055***	−0.001	0.067***	−0.027*	0.015	0.086***	−0.029	0.007
	(5.69)	(−3.90)	(−0.11)	(5.30)	(−1.78)	(1.13)	(5.32)	(−1.21)	(0.45)
LAGGED_FUND_FLOWS	0.032**	0.030***	0.035***	0.058***	0.054***	0.057***	−0.080***	−0.074***	−0.063***
	(2.80)	(3.48)	(3.87)	(3.85)	(4.83)	(5.11)	(−6.10)	(−5.61)	(−4.95)
EXPENSE_RATIO	−0.020**	−0.049***	−0.047***	−0.048***	−0.091***	−0.092***	0.114***	0.117***	0.142***
	(−2.14)	(−5.10)	(−3.87)	(−5.01)	(−7.28)	(−6.29)	(4.68)	(5.50)	(10.42)
FUND_FLOW_VOL.	−0.014***	0.002	−0.003	−0.016***	0.001	−0.003	−0.012*	−0.002	−0.003
	(−8.40)	(0.54)	(−1.02)	(−7.39)	(0.16)	(−0.96)	(−1.95)	(−0.43)	(−0.57)
LAGGED_LIQUID_ASSET_PROPORTION	0.002***	0.001**	0.001	0.001**	0.001	0.000	0.002***	0.001	0.000
	(3.43)	(2.71)	(1.28)	(2.55)	(1.67)	(0.62)	(3.60)	(1.23)	(0.23)
LAGGED_VW_REAL_BETA	−0.051***	−0.028***	−0.026**	−0.046*	−0.030**	−0.028***	−0.014	−0.004	−0.008
	(−3.00)	(−3.14)	(−2.76)	(−1.77)	(−2.28)	(−3.11)	(−0.50)	(−0.30)	(−0.76)
GDP_GROWTH_RATE	0.026***	−0.017**		0.034***	0.004		0.053***	0.004	
	(3.26)	(−2.18)		(4.44)	(0.52)		(4.19)	(0.35)	
LAGGED_MARKET_RETURN	−0.031	0.025		0.006	0.066		−0.393*	−0.238	
	(−0.15)	(0.18)		(0.05)	(0.88)		(−1.82)	(−1.44)	
Fund FE	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	Yes	No	No	Yes	No	No	Yes
Adj R^2	0.126	0.456	0.519	0.122	0.466	0.500	0.231	0.542	0.591
No. of obs.	5,324	5,324	5,324	5,324	5,324	5,324	5,842	5,842	5,842

It is at least conceivable that the correlation between pessimistic growth expectations and low abnormal returns arises from managers of active funds being more attentive to negative news about the prospects of companies they hold than of firms that lie outside their research efforts. If so, it could be that this information colors their macroeconomic growth expectations, while it is only trades by other investors that bring the information into stock prices. To rule out this possibility, we next construct a more direct test of whether forecasting managers' trading causes their growth expectations to affect stock prices. Ideally, we would focus this exercise on funds' trades during a fairly narrow window around the time their managers are producing the reports from which we extract their growth expectations. In practice, we observe their security-level portfolio positions only twice per year, so we use semiannual data on changes in fund positions as a proxy for the trades occurring toward the end of those 6-month periods. These are the portfolio decisions most likely to be affected by managers' growth expectations at that time.[20] In particular, we aim to examine whether the price impact is higher for a stock that is being bought (vs. sold) by managers with positive (vs. negative) growth expectations than one that is being bought (vs. sold) by managers with negative (vs. positive) growth expectations, or one that is simply held by managers.

To this end, for each stock j, we compute the average growth expectations of forecasting managers who trade the stock (i.e., net buying is nonzero) and whose growth expectations are in the same direction as their trading, weighted by the absolute value of net buying. We label the new expectation measure TCE. The mechanical difference between TCE and HGE is that they are constructed by applying different weights to the same underlying sample of manager growth expectations, but in any given period, the 2 measures potentially focus on completely different subsets of the manager sample. TCE includes positive growth expectations of some forecasting managers who made new purchases of a stock but have zero weight in HGE, because they did not hold stock j in the previous period. On the other hand, TCE puts zero weight on the holding managers who did not trade the stock in the direction that would be consistent with their growth expectations.

Column 1 of Table 8 reports the estimation results for equation (4) where TCE replaces HGE as the key independent variable. TCE is positively correlated with a stock's abnormal return.[21] Conditional on FMH, a 1-standard-deviation (0.66) increase (decrease) in TCE is associated with a 0.876 (1.328 × 0.66) percent increase (decrease) in the stock's abnormal return, which is about 115.3% of the stock's average monthly excess return. This is larger than the explanatory power of HGE shown in Table 5. The results reveal that the price impact of growth expectations is much more substantial when fund managers act on these growth expectations and imply that managers' net buying plays a crucial role for price impact.

[20]Accordingly, our "net buying" measure is the change in position compared to what managers reported 6 months earlier. Detailed fund holdings in stocks are reported comprehensively at the end of the second and fourth calendar quarters. The noise in our trading measurement suggests that any causality we find may understate the actual effect of expectation-driven fund trades on stock prices.

[21]Table J.1 in the Supplementary Material shows that when HGE is included as an independent variable, the coefficient of TCE is still positive and significant, whereas the coefficient of HGE is negative, which is because HGE is positively correlated with TCE but has less explanatory power.

TABLE 8

Growth Expectations, Fund Holdings, and Managers' Net Buying

Data in Table 8 are semiannual from June 2008 to June 2020. The dependent variable is the stock's CAPM abnormal 1-month return. Trading is measured as the absolute value of 6-month changes in fund positions, ending in the month of the abnormal stock returns. TRADING_CONSISTENT_EXPECTATION (TCE) is the trading-weighted average growth expectation of active-fund managers whose growth expectations are in the same direction as their trading. TRADING_INCONSISTENT_EXPECTATION (TIE) is the trading-weighted average growth expectation of active-fund managers whose growth expectations are in the opposite direction as their trading. Forecasting Managers' Holdings (FMH) is the share of the stock's market cap held (at the beginning of the 6-month period over which trading is measured) by active-fund managers with valid growth forecasts (at the end of the 6-month period). The subsamples for columns 3 and 4 include the stock-period observations with negative and positive TCE, respectively. The stock controls are the logarithm of market capitalization, the logarithm of the turnover rate, the M/B ratio, and earnings-per-share, measured in the previous quarter; and a dummy indicating whether the firm was classified as an SOE the previous year. The standard errors are clustered at the stock level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

	Dependent Variable: STOCK_AR_IN_JUNE_OR_DECEMBER			
Sample	All		Negative TCE	Positive TCE
	1	2	3	4
TRADING_CONSISTENT_EXPECTATION (TCE)	1.328***	1.406***	2.140***	1.497***
	(12.87)	(13.12)	(7.11)	(3.76)
TRADING_INCONSISTENT_EXPECTATION (TIE)		−1.178***	−0.509***	−2.051***
		(−9.41)	(−3.11)	(−9.41)
FORECASTING_MANAGERS'_HOLDINGS (FMH)	0.176***	0.201***	0.248***	0.138***
	(8.15)	(9.09)	(8.91)	(3.66)
GDP_GROWTH_RATE	−1.049***	−1.110***	−0.968***	−1.096***
	(−15.80)	(−15.79)	(−9.77)	(−9.76)
Stock controls	Yes	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes	Yes
Adj R^2	0.038	0.043	0.050	0.039
No. of obs.	30,718	28,588	16,281	11,756

A related question is, how do fund managers' expectations affect prices of stocks for which the direction of their trades is inconsistent with the manager's growth expectation? Such inconsistent trading might occur because of rebalancing trades, company-specific developments, or net customer flows with the opposite sign as growth expectations. We compute trading-inconsistent expectation (TIE) as the average growth expectations of managers whose growth expectations are in the opposite direction of their trading, weighted by the absolute value of net buying. Column 2 of Table 8 reports the estimation results for equation (4) where both TCE and TIE are included as additional regressors. TIE is negatively correlated with the stock's abnormal return, which implies that managers' growth expectations tend to be reflected in stock prices only when managers act on those expectations.

Next, we consider whether the contemporary correlation between buyers' growth expectations and a stock's abnormal return depends on the sign of the growth expectations. In contrast to our previous analysis of HGE and abnormal returns, where short-sale constraints point to a more-concentrated effect of bearish expectations, there is no obvious reason to expect an asymmetric relationship between TCE and abnormal returns. Columns 3 and 4 of Table 8 indeed confirm that the positive relation holds for both positive and negative trading-consistent growth expectations.[22] The estimated coefficients are of similar magnitude. We verify that the difference between the 2 coefficients is not significantly different from 0 at the 10% level, which is unsurprising, because by construction of the TCE

[22]The coefficient of TCE is positive and significant if TIE is not controlled for.

measure the specific stock is being traded by the managers whose forecasts are included in TCE. This contrasts with the asymmetry in Table 6 between positive and negative growth expectations for the price impact of HGE.

D. Price Informativeness

The evidence above that mutual fund trading contributes to short-run price discovery related to macroeconomic growth prospects implies that fund managers' investment analysis helps push stock prices closer to their fundamental values. We next assess more directly the extent to which funds' investment choices (including those driven by their growth expectations) contribute to equity valuations that reflect underlying fundamentals, which should depend mainly on companies' prospects for future payoffs. We explore this by computing measures of the "price informativeness" of Chinese stocks, following Dávila and Parlatore (2018), by estimating the extent to which a stock price reflects the future earnings of the firm. Specifically, we compare the fit of 2 alternative regressions for each stock j in quarter t, using its prices and earnings in a 32-quarter rolling window:

$$\Delta p_{j,\tau} = \overline{\beta}_{j,t} + \beta_{0,j,t}\Delta x_{j,\tau} + \beta_{1,j,t}\Delta x_{j,\tau+1} + d^q_{j,\tau} + \varepsilon_{j,\tau},\ \tau \in \{t-31, t-30, \ldots, t\} \tag{8}$$

and

$$\Delta p_{j,\tau} = \overline{\zeta}_{j,t} + \zeta_{0,j,t}\Delta x_{j,\tau} + d^q_{j,\tau} + \varepsilon_{j,\tau}, \tag{9}$$

where $\Delta p_{j,\tau}$ denotes the change in stock price, and $\Delta x_{j,\tau}$ is the earnings growth. Here, $d^q_{j,t}$ are the stock-specific quarterly dummies that control for potential seasonality. We denote the R^2 for regressions (8) and (9) as $R^2_{j,t,t+1}$ and $R^2_{j,t}$, respectively. Price informativeness for stock j in quarter t is then computed as

$$\mathrm{PI}_{j,t} = \frac{R^2_{j,t,t+1} - R^2_{j,t}}{1 - R^2_{j,t}}.$$

As in Dávila and Parlatore (2018), $\mathrm{PI}_{j,t}$ is a number between 0 and 1 that measures the reduction in uncertainty about future earnings growth $\left(\Delta x_{j,\tau+1}\right)$ induced by the knowledge of price $(p_{j,\tau})$. Finding that $\mathrm{PI}_{j,t} = x\%$ indicates that the uncertainty faced by an external observer about earnings growth is reduced by x% after observing the price.[23] The panel of price informativeness we construct for Chinese stocks from Dec. 2008 to June 2020 in the market is right skewed, with a median of 2.2% and a mean of 5.5%;[24] these sample statistics are slightly higher than those reported by Dávila and Parlatore (2018) for U.S. stocks from 1980 to 2017.[25]

[23] As shown by Dávila and Parlatore (2018), in a Gaussian environment, an alternative interpretation of $\mathrm{PI}_{j,t} = x\%$ is that an external observer puts a weight of x% on the price signal, and a weight of $1 - x$ % on the prior, when forming a posterior belief over future earnings growth.

[24] Chinese listed companies began reporting quarterly earnings only after 2001. To ensure a robust estimation of PI, we initiate our analysis from Dec. 2008, which covers at least 24 quarters in the estimation of PI.

[25] Similarly, using a different measure of informativeness geared toward a longer horizon for future earnings growth, Carpenter et al. (2021), calculate higher stock price informativeness for China than Bai et al. (2016) did for U.S. stocks.

In our empirical implementation, we sort stocks by price informativeness into 20 bins in each quarter (i.e., ventiles, again following Dávila and Parlatore (2018)) and calculate average informativeness by bin in the quarter. Then, we estimate

$$\overline{\mathrm{PI}}_{b,t} = a_0 + a_1 \overline{M}_{b,t} + Z_{b,t} + \gamma_t + \chi_b + \epsilon_{b,t},\ b \in \{1,2,\ldots,20\}, \tag{10}$$

where $\overline{\mathrm{PI}}_{b,t}$ is the average price informativeness per ventile in period t; the key regressor, $\overline{M}_{b,t}$, is the average of fund managers' holdings or trading per ventile period; $Z_{b,t}$ is a vector of control variables, including the average logarithm of market capitalization, the average B/M ratio, and the average turnover ratio of the stock in each ventile bin, which are the main independent variables in Dávila and Parlatore (2018); and γ_t and χ_b are the year and bin fixed effects, respectively.

The benchmark results for managers of active funds are in Panel A of Table 9. Column 1 shows that ACTIVE_MANAGER_HOLDING is positively correlated with price informativeness. A 1-standard-deviation increase in mutual fund holdings is associated with a 0.90 (0.546 × 1.65) percent increase in price informativeness, which accounts for 11.2% (square bracket in the table) of the standard deviation of price informativeness (8.02%). Dávila and Parlatore (2018) similarly find that institutional ownership is positively associated with the price informativeness of U.S. stocks.

We cannot be certain of the underlying mechanism from the positive correlation alone, but the simplest interpretation is that active fund managers are better than at least some of the other investors in the Chinese stock market at judging fundamental value, so that causality running from well-judged portfolio decisions by active fund managers to stock prices drives at least part of the estimated effect. There are other plausible determinants, but a direct form of reverse causality, in which active fund managers actively seek stocks that are correctly priced, seems unlikely, because managers should be able to earn higher returns from putting more weight on stocks that are significantly underpriced, relative to the market. A third possibility is that price informativeness and mutual fund investment have some common determinants, which could include firm-level characteristics such as informational transparency and trading liquidity. Accordingly, with an objective of better identifying the effect of fund managers on price informativeness, the controls in our specification include firm size and turnover, and we also include bin fixed effects.

The statistically significant result for ACTIVE_MANAGER_HOLDING may seem counterintuitive, given that mutual funds hold a relatively small share of Chinese market capitalization. However, there is precedent in the empirical literature to find that a minority group of investors can have an outsized influence on market prices. Specifically, Kacperczyk, Sundaresan, and Wang (2021) document that foreign institutional investors' holdings significantly increase the domestic stock market's price informativeness across various countries, even though in their data set, foreign institutional investors hold relatively modest stakes: for example, just 2.62% of the market capitalization in the United States, 2.18% in China, and 4.01% in India. While the source of informational value differs between our article (macro research) and theirs (self-selection of knowledgeable investors), both

TABLE 9

Price Informativeness and Firm Characteristics

Data in Table 9 are semiannual between Dec. 2008 and June 2020. The dependent variable is the average price informativeness in each ventile bin. The independent variables are the average value of stock characteristics in each bin. ACTIVE_(INDEX)_MANAGER_HOLDING is the weight of stock value held by active (index) mutual fund managers, ACTIVE_(INDEX)_FORECASTING_MANAGER_HOLDING is the weight of stock value held by active (index) mutual fund managers with growth expectations, ACTIVE_(INDEX)_FORECAST_CONSISTENT_TRADING is the sum of the absolute value of net buying of active (index) forecasting managers whose growth expectations are in the same direction as their trading. Bin-level SIZE, VALUE, and TURNOVER_RATIO are included as controls, where SIZE is the average logarithm of market capitalization in each ventile bin, VALUE is the average B/M ratio in each ventile bin, and TURNOVER is the average turnover ratio of the stock in each ventile bin. *t*-values are reported in the parentheses. Reported in the square brackets are the fraction of the standard deviation of the price informativeness associated with a standard deviation change in the corresponding independent variables. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Active Funds

	Dependent Variable: PRICE_INFORMATIVENESS				
	1	2	3	4	5
ACTIVE_MANAGER_HOLDING	0.546***		0.353***		−0.054
	(6.21)		(2.71)		(−0.22)
	[11.2%]		[7.3%]		[−1.1%]
ACTIVE_FORECAST_CONSISTENT_TRADING		1.587***	0.794**		0.640
		(5.92)	(2.01)		(1.59)
		[12.1%]	[6.0%]		[4.9%]
ACTIVE_FORECASTING_MANAGER_HOLDING				0.991***	0.813**
				(6.68)	(2.01)
				[13.7%]	[11.2%]
Stock controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Bin FE	Yes	Yes	Yes	Yes	Yes
No. of obs.	480	480	480	480	480
Adj R^2	0.970	0.970	0.970	0.970	0.970

Panel B. Index Funds

	1	2	3	4	5	6
INDEX_MANAGER_HOLDING	0.486***	−0.361				
	(4.92)	(−1.55)				
	[7.8%]	[−5.8%]				
ACTIVE_MANAGER_HOLDING		0.841***				
		(4.02)				
		[17.3%]				
INDEX_FORECAST_CONSISTENT_TRADING			−8.262	−16.479***		
			(−1.49)	(−3.03)		
			[−1.8%]	[−3.6%]		
ACTIVE_FORECAST_CONSISTENT_TRADING				1.779***		
				(6.51)		
				[13.5%]		
INDEX_FORECASTING_MANAGER_HOLDING					0.691	−1.160
					(0.49)	(−0.84)
					[0.1%]	[−1.4%]
ACTIVE_FORECASTING_MANAGER_HOLDING						1.016***
						(6.71)
						[14.0%]
Stock controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bin FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	480	480	480	480	480	480
Adj R^2	0.969	0.970	0.967	0.970	0.967	0.970

articles find that a small proportion of holding can significantly affect price informativeness.

Next, we adjust our specification to focus on whether the role of active fund managers' growth expectations in short-term price discovery that we found in our abnormal-return exercises also leaves an imprint on price informativeness. To this

end, for each stock, we define forecast-consistent trading as the sum of the absolute value of net buying of active forecasting managers whose growth expectations are in the same direction as their trading (i.e., the managers we considered in computing TCE). Then, we compute the average forecast-consistent trading per ventile and use it as the independent variable in equation (10). As shown by column 2 in Panel A of Table 9, forecast-consistent trading is positively correlated with price informativeness. A 1-standard-deviation increase in forecast-consistent trading is associated with an increase in price informativeness of 0.968 (1.587 × 0.61) percent, about 12.1% (as shown in the square bracket in the table) of the standard deviation of price informativeness, slightly stronger than the improvements reported for active forecasting-manager holdings in column 1. When included together in column 3, both coefficients are reduced but remain statistically significant at the 5% level.

The last 2 columns in Panel A of Table 9 bring back the ACTIVE_FORECASTING_MANAGER_HOLDING (FMH) measure used in our abnormal return regressions as an explanatory variable for price informativeness. FMH is the most successful of our proxy measures for active fund managers' impact, increasing price informativeness by 13.7% when entering alone in column 4, and as the only statistically significant effect when all 3 fund-related measures are included in column 5. That said, the weaker effect estimated for ACTIVE_FORECAST_CONSISTENT_TRADING may reflect that the measure's construction is based on significantly fewer active forecasting fund managers per stock period than FMH, because forecast-consistent trading typically only occurs in a fraction of a fund's portfolio holdings. The weaker coefficient for MH, despite incorporating the full set of funds in our data set, suggests that the subset of managers who are not producing fund reports from which growth expectations can be inferred are not helping contribute to price informativeness, while the fund managers who actively employ macroeconomic analysis are improving stocks' price informativeness.

For comparison, Panel B of Table 9 reports estimates of equation (10), but with $\overline{M}_{b,t}$ measured for index fund managers, instead of active fund managers. Column 1 shows that index fund manager holdings are positively correlated with price informativeness. A 1-standard-deviation increase in mutual funds' holdings is associated with a 7.8% improvement in price informativeness, less than the improvement reported for active fund manager holdings in column 1 in Panel A (11.2%). The positive relationship between index fund manager holdings and price informativeness might be due to the positive correlation between index and active fund holdings. Column 2 in Panel B shows that index fund manager holdings do not exhibit a significant correlation with price informativeness conditional on active manager holdings. Columns 3–6 show that, with or without controls for active fund managers' investments, the forecast-consistent trading and holdings of forecasting managers of index funds are economically insignificant and do not positively affect price informativeness, with estimated contributions ranging from −5.8% to 0.1%. The contrast between the results in Panels A and B underscores the critical role of fund managers' active but not passive asset management in shaping their impact on price informativeness.

V. Conclusion

We construct a novel measure of Chinese mutual fund managers' macroeconomic growth expectations. We analyze how they invest according to these growth expectations, the subsequent effect on stock returns, and whether these actions improve price informativeness. We do this using a systematic textual analysis of the discussion in the quarterly reports of China fund managers. We have 3 main findings. First, expectations of lower GDP growth robustly explain bearish portfolio shifts; fund managers adjust exposure to stock market risks and reallocate between industries and companies with different degrees of cyclicality accordingly. Second, growth expectations have statistically significant short-run effects on the prices of the stocks for which forecasting managers trade in the same direction as their growth expectations. These effects are followed by a partial reversal in stocks' abnormal returns, broadly consistent with fund managers' trading accelerating growth-related price discovery for the manager-traded stocks, and the prices of other stocks "catching up" to the growth-related news in the following period. Finally, active but not passive fund managers improve price informativeness in the Chinese stock market, bringing prices into closer alignment with future company earnings.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109024000462.

References

Ammer, J.; J. Rogers; G. Wang; and Y. Yu. "Chinese Asset Managers' Monetary Policy Forecasts and Fund Performance." *Management Science*, 69 (2023), 598–616.

Andonov, A., and J. D. Rauh. "The Return Expectations of Public Pension Funds." *Review of Financial Studies*, 35 (2022), 3777–3822.

Atmaz, A., and S. Basak. "Belief Dispersion in the Stock Market." *Journal of Finance*, 73 (2018), 1225–1279.

Bai, C.-E.; J. Lu; and Z. Tao. "The Multitask Theory of State Enterprise Reform: Empirical Evidence from China." *American Economic Review*, 96 (2006), 353–357.

Bai, J.; T. Philippon; and A. Savov. "Have Financial Markets Become More Informative?" *Journal of Financial Economics*, 122 (2016), 625–654.

Banerjee, S. "Learning from Prices and the Dispersion in Beliefs." *Review of Financial Studies*, 24 (2011), 3025–3068.

Bansal, R., and A. Yaron. "Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles." *Journal of Finance*, 59 (2004), 1481–1509.

Beechey, M. J., and J. H. Wright. "The High-Frequency Impact of News on Long-Term Yields and Forward Rates: Is It Real?" *Journal of Monetary Economics*, 56 (2009), 535–544.

Bekaert, G.; C. R. Harvey; C. Lundblad; and S. Siegel. "Global Growth Opportunities and Market Integration." *Journal of Finance*, 62 (2007), 1081–1137.

Bernanke, B. S., and K. N. Kuttner. "What Explains the Stock Market's Reaction to Federal Reserve Policy?" *Journal of Finance*, 60 (2005), 1221–1257.

Boyd, J. H.; J. Hu; and R. Jagannathan. "The Stock Market's Reaction to Unemployment News: Why Bad News is Usually Good for Stocks." *Journal of Finance*, 60 (2005), 649–672.

Brunnermeier, M.; E. Farhi; R. S. Koijen; A. Krishnamurthy; S. C. Ludvigson; H. Lustig; S. Nagel; and M. Piazzesi. "Perspectives on the Future of Asset Pricing." *Review of Financial Studies*, 34 (2021), 2126–2160.

Campbell, J. Y., and J. Ammer. "What Moves the Stock and Bond Markets? A Variance Decomposition for Long-Term Asset Returns." *Journal of Finance*, 48 (1993), 3–37.

Campbell, J. Y., and J. H. Cochrane. "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior." *Journal of Political Economy*, 107 (1999), 205–251.
Carpenter, J. N.; F. Lu; and R. F. Whitelaw. "The Real Value of China's Stock Market." *Journal of Financial Economics*, 139 (2021), 679–696.
Chen, Q.; I. Goldstein; and W. Jiang. "Price Informativeness and Investment Sensitivity to Stock Price." *Review of Financial Studies*, 20 (2007), 619–650.
Chen, W.; S. Liang; and D. Shi. "Who Chases Returns? Evidence from the Chinese Stock Market." Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4150725 (2022).
Cieslak, A., and H. Pang. "Common Shocks in Stocks and Bonds." *Journal of Financial Economics*, 142 (2021), 880–904.
Dahlquist, M., and M. Ibert. "Return Expectations and Portfolios: Evidence from Large Asset Managers." Research Paper, Swedish House of Finance (2021).
Dasgupta, S.; J. Gan; and N. Gao. "Transparency, Price Informativeness, and Stock Return Synchronicity: Theory and Evidence." *Journal of Financial and Quantitative Analysis*, 45 (2010), 1189–1220.
Dávila, E., and C. Parlatore. "Identifying Price Informativeness." NBER Working Paper No. 25210 (2018).
Ederington, L. H., and J. H. Lee. "How Markets Process Information: News Releases and Volatility." *Journal of Finance*, 48 (1993), 1161–1191.
Fama, E. F. "Efficient Capital Markets: A Review of Theory and Empirical Work." *Journal of Finance*, 25 (1970), 383–417.
Fernandes, N., and M. A. Ferreira. "Insider Trading Laws and Stock Price Informativeness." *Review of Financial Studies*, 22 (2009), 1845–1887.
Fernández-Villaverde, J.; F. Mandelman; Y. Yu; and F. Zanetti. "The "Matthew Effect" and Market Concentration: Search Complementarities and Monopsony Power." *Journal of Monetary Economics*, 121 (2021), 62–90.
Flannery, M. J., and A. A. Protopapadakis. "Macroeconomic Factors do Influence Aggregate Stock Returns." *Review of Financial Studies*, 15 (2002), 751–782.
Gabaix, X., and R. S. Koijen. "In Search of the Origins of Financial Fluctuations: The Inelastic Markets Hypothesis." NBER Working Paper No. 28967 (2021).
Giglio, S.; M. Maggiori; J. Stroebel; and S. Utkus. "Five Facts About Beliefs and Portfolios." *American Economic Review*, 111 (2021a), 1481–1522.
Giglio, S.; M. Maggiori; J. Stroebel; and S. Utkus. "The Joint Dynamics of Investor Beliefs and Trading During the COVID-19 Crash." *Proceedings of the National Academy of Sciences*, 118 (2021b), e2010316.
Hong, H., and J. C. Stein. "Differences of Opinion, Short-Sales Constraints, and Market Crashes." *Review of Financial Studies*, 16 (2003), 487–525.
Jones, C. M.; D. Shi; X. Zhang; and X. Zhang. "Understanding Retail Investors: Evidence from China." Available at SSRN 3628809 (2020).
Kacperczyk, M.; S. V. Nieuwerburgh; and L. Veldkamp. "Time-Varying Fund Manager Skill." *Journal of Finance*, 69 (2014), 1455–1484.
Kacperczyk, M.; S. Sundaresan; and T. Wang. "Do Foreign Institutional Investors Improve Price Efficiency?" *Review of Financial Studies*, 34 (2021), 1317–1367.
Kacperczyk, M.; S. Van Nieuwerburgh; and L. Veldkamp. "A Rational Theory of Mutual Funds' Attention Allocation." *Econometrica*, 84 (2016), 571–626.
Kacperczyk, M. T.; J. Nosal; and S. Sundaresan. "Market Power and Price Informativeness." Available at SSRN 3230005 (2018).
Li, J. J.; N. D. Pearson; and Q. Zhang. "Impact of Demand Shocks on the Stock Market: Evidence from Chinese IPOs." Working Paper, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3731219 (2021).
Li, X.; X. Liu; and Y. Wang. "A Model of China's State Capitalism." Available at SSRN 2061521 (2015).
Lin, J. Y.; F. Cai; and Z. Li. "Competition, Policy Burdens, and State-Owned Enterprise Reform." *American Economic Review*, 88 (1998), 422–427.
Ma, C.; J. Rogers; and S. Zhou. "The Effect of the China Connect." Working Paper, Fudan University (2022a).
Ma, Y.; K. Xiao; and Y. Zeng. "Mutual Fund Liquidity Transformation and Reverse Flight to Liquidity." *Review of Financial Studies*, 35 (2022b), 4674–4711.
Mitchell, M. L., and J. H. Mulherin. "The Impact of Public Information on the Stock Market." *Journal of Finance*, 49 (1994), 923–950.
Piotroski, J. D., and D. T. Roulstone. "The Influence of Analysts, Institutional Investors, and Insiders on the Incorporation of Market, Industry, and Firm-Specific Information into Stock Prices." *Accounting Review*, 79 (2004), 1119–1151.

Schwert, G. W. "Stock Returns and Real Activity: A Century of Evidence." *Journal of Finance*, 45 (1990), 1237–1257.

Shanghai Stock Exchange. "Shanghai Stock Exchange Statistics Annual." China Financial Publishing House. Available at https://www.sse.com.cn/aboutus/publication/yearly/documents/c/10061073/files/3434d1799d1145dc826c16c34bd097bf.pdf (2021).

Song, Z.; K. Storesletten; and F. Zilibotti. "Growing Like China." *American Economic Review*, 101 (2011), 196–233.

Wachter, J. A. "Can Time-Varying Risk of Rare Disasters Explain Aggregate Stock Market Volatility?" *Journal of Finance*, 68 (2013), 987–1035.

Yao, W., and X. Zhu. "Structural Change and Aggregate Employment Fluctuations in China." *International Economic Review*, 62 (2021), 65–100.