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The January sentiment effect in the U.S. stock market

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ABSTRACT

We document the January sentiment effect in the U.S. stock market over the 1978–2017 period where January sentiment of individual investors has a significant impact on their asset allocation decisions and therefore, stock market returns from February to December. This effect is not likely driven by the other January effect and it appears to concentrate on riskier stocks including smaller stocks, higher market-to-book ratio stocks, and stocks with worse firm performance.

1. Introduction

The recent behavioral finance literature suggests that individual investors tend to overweight recent experience when predicting the future (Marciukaityte, Szewczyk, & Varma, 2005) and are more likely to re-evaluate their asset allocation decisions in January (Chen & Craig, 2018; Doran, Jiang, & Peterson, 2012). Therefore, individual investors' economic outlook in January might impact their asset allocation decisions and demand for risky assets (Campell & Cochrane, 1999) in the rest of the year. Consistent with this view, Chen and Craig (2018) find the January sentiment effect (JSE) where the January Index of Consumer Sentiment (ICS) as a proxy for individual investors' economic outlook, predicts monthly yield spreads of U.S. corporate bonds from February to December. Given the correlation between stock market and bond market (Chordia, Sarkar, & Subrahmanyam, 2005), if individual investors' economic outlook has a systematic impact on financial assets, we should observe a similar effect in the U.S. stock market. In this study, we test the JSE in the U.S. stock market by examining the relationship between the shift in individual investors' January economic outlook, measured by the change in the ICS, and stock market returns in the following 11 months.

We find evidence of the JSE in the U.S. stock market. When controlling for macroeconomic variables over the 1978–2017 period, a one unit increase in January ICS increases monthly excess equal- and value-weighted stock market returns from February to December by about 20 basis points. Not only the magnitude of January ICS change impacts monthly stock returns, but also the direction of January ICS change. Monthly excess equal- and value-weighted stock market returns following Januarys with a positive ICS change are about 0.93% and 0.76% higher, respectively, than those following Januarys with a negative ICS change. Moreover, we find January ICS change positively related to monthly ICS changes from February to December. This might be another channel through which January ICS change impacts subsequent stock market returns, given the correlation between the ICS and stock returns documented in the literature (Fisher & Statman, 2003; Otoo, 1999). This predictive power of January ICS change on monthly stock market returns is unique as we do not find similar effects with the ICS change in any other month. In addition, we find both the magnitude and the direction of January ICS change positively related to 11-month excess equal- and value-weighted stock returns from February to December. Similar results are found in unreported tests with raw equal- and value-weighted stock market returns. These results are robust to potential timing error of the ICS data, subperiod tests, and alternative definitions of the 2007 financial crisis.

The unique predictive power of January has been documented in recent studies on market efficiency. Cooper, McConnell, and Ovtchinnikov (2006), among others, find evidence of the other January effect (OJE) where the sign of January stock market returns predicts stock market returns in the following 11 months. A nature question to ask is whether the JSE is driven by the OJE through the correlation between stock returns and the ICS documented in the literature. In this study, we find limited evidence of the OJE in the U.S. stock market. The sign of January excess equal-weighted returns predicts monthly excess value-weighted returns in the following 11 months when

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macroeconomic variables are controlled in the estimates. We do not find the sign of January excess value-weighted returns predicts subsequent monthly returns from February to December. None of the signs of January stock market returns predicts 11-month holding-period returns from February to December. More importantly, we find that the JSE is not driven by the OJE. January ICS change continues to predict subsequent monthly and 11-month holding-period returns when the OJE is controlled in the empirical tests. In contrast, the OJE disappears in these tests. One explanation is that OJE is diminishing in the post-discovery period since the 1970s (Stivers, Sun, & Sun, 2009). Another explanation is that January ICS change contains more information about the future than the sign of January stock market returns.

To explore the implications of the JSE for portfolio management we form decile portfolios based on firm size, market-to-book ratio, and firm performance in the prior year. We find the JSE statistically and economically significant across all size decile portfolios and it appears to concentrate on smaller stocks. We also find the JSE tends to concentrate on stocks with a higher market-to-book ratio and stocks with worse firm performance. These results are consistent with those documented in Chen and Craig (2018). They suggest that the shift in individual investor sentiment over January impacts individual investors' demand for risky assets in the rest of the year, and this effect concentrates on riskier bonds.

When the Index of Investor Sentiment (IIS) constructed in Baker and Wurgler (2006, 2007) is employed as an alternative measure of January sentiment, we find both the magnitude and the direction of January IIS change negatively related to subsequent monthly and 11-month holding-period stock market returns. It is not surprising that January ICS change and January IIS change have opposing effects on stock market returns from February to December because they measure the sentiment of different groups and they are negatively correlated. These results are consistent with the findings in Chen and Craig (2018).

This study contributes to the literature on market efficiency and stock return anomalies. The new evidence indicates that individual investors' January economic outlook has a significant impact on their demand for risky assets and therefore, stock returns in the rest of the year. This is the first study documenting the JSE in the U.S. stock market, which echoes the findings on the U.S. corporate bond market documented in Chen and Craig (2018). This new evidence adds to the growing literature suggesting a correlation between investing mentality and stock returns (Ciccone, 2011; Lemmon & Portniaguina, 2006; Yu, 2013). It suggests that individual investors' economic outlook can explain a part of stock returns that can't be attributed to the fundamentals. This study also contributes to the ongoing debate over the OJE (Bohl & Salm, 2010; Easton & Pinder, 2007; Wen & Li, 2016). We find only weak evidence for the OJE controlling for macroeconomic variables. Ultimately, this study has implications for portfolio management (Akhtar, Faff, Oliver, & Subrahmanyam, 2011; Brown & Cliff, 2005). Results indicate that individual investors' January economic outlook has a more significant impact on riskier stocks.

The rest of the paper is organized as follows. We discuss the literature in Section 2 and describe the data and methodology in Section 3. In Sections 4 and 5, we present the empirical results. We perform robustness tests in Section 6 and conclude in Section 7.

2. Literature review

2.1. The index of consumer sentiment and investor asset allocation decisions

Behavioral finance literature suggests that investors tend to overweight recent experience when predicting the future. Evidence from public and private equity placements indicates investor over-optimism where they tend to overstate the probability of replicating current success (Hertzel, Lemmon, Linck, & Rees, 2002; Loughran & Ritter, 1997; Marciukaityte et al., 2005). Similarly, M&A announcements are likely to receive more positive market reactions if recent mergers by other firms were well received by the market or the stock market has been doing well (Madura & Ngo, 2008; Rosen, 2006). Even financial analysts are more optimistic about the performance of risky firms when sentiment is high (Hribar & Mclnnis, 2012).

Doran et al. (2012) suggest that in January, investors are more likely to make New Year's resolutions related to investments and re-evaluate their asset allocation decisions for the future (also see Ciccone, 2011). Therefore, it is possible that if the stock market has been doing well in January and investors' economic outlook is bullish, they might plan to invest more in the stock market in the rest of the year, leading to higher stock returns in the following months. In this study, we test this hypothesis with two measures for individual investors' economic outlook in January: January ICS change and its sign (Bange, 2000; Chen & Craig, 2018).

2.2. January sentiment and stock returns

We focus on the ICS as the primary measure for January sentiment in this study because the growing literature finds a correlation between the ICS and stock returns. Campell and Cochrane (1999) show a positive correlation between consumption and demand for risky assets. By its nature, the ICS measures future consumption expectations (Bram & Ludvigson, 1998; Carroll, Fuhrer, & Wilcox, 1994; Malgarini & Margani, 2007; Wilcox, 2007), and many studies find that the ICS predicts stock returns in the short term (Baker, Wang, & Wurgler, 2008; Fisher & Statman, 2003; Kalotay, Gray, & Sin, 2007; Neal & Wheatley, 1998; Otoo, 1999; Schmeling, 2009). Therefore, the ICS may explain stock return anomalies (Huang, Jiang, Tu, & Zhou, 2015; Stambaugh, Yu, & Yuan, 2012; Yu, 2013).

Another popular measure for January sentiment is the IIS first constructed in Baker and Wurgler (2006) using stock market variables. They find that the returns on riskier stocks are subsequently higher when the IIS is lower. Baker and Wurgler (2007) suggest that this effect concentrates on stocks that are difficult to value or arbitrage. Chen and Craig (2018) employ the changes in the ICS and the IIS in January as measures of January sentiment and find those changes in January predictive of bond yields in the following 11 months. However, they find that these two measures have opposing impacts on subsequent bond yields. They argue it is because the two measures are constructed in different ways and they contain different information about the near future: the ICS measures overall economic outlook and the IIS measures the optimism specifically in the stock market. When overall economic outlook is bullish, the demand for risky assets might increase, leading to higher stock returns. In contrast, bullish outlook for stock market might be associated with overpricing of stocks, leading to market correction and lower stock returns (Baker & Wurgler, 2006; Brown & Cliff, 2005).

2.3. The January sentiment effect and the other January effect

Cooper et al. (2006) and Cooper, McConnell, and Ovtchinnikov (2010) find the OJE in the U.S. stock market over 1940–2003 and 1926–2008, respectively. Without controlling for other factors, stock returns following a positive January (where stock returns are positive) are significantly higher than those following a negative January (where stock returns are negative). Brown and Luo (2006) find consistent results in the U.S. stock market over 1975–2003 although negative Januarys provide more accurate predictions than positive Januarys. Stivers et al. (2009) also find evidence of the OJE in the U.S. market but they suggest that the OJE is diminishing in the post-discovery period from 1975 to 2006.

Given the interactions between stock returns and the ICS, it is possible that the OJE and the JSE might drive each other. Cooper et al. (2006) investigate the predictive power of January returns on stock returns in the following 11 months and find evidence of the OJE no matter January ICS is above or below average. We employ a different approach in this study to test the relationship between the ICS and

subsequent stock returns, using the ICS change over January as a proxy for the shift in investors' economic outlook for the rest of the year.

Cross-country analyses on the OJE yield mixed results. Easton and Pinder (2007) find only limited evidence of the OJE in their 44-country analysis and other non-January months are also able to predict stock returns over the following 11 months. Bohl and Salm (2010) find the OJE in three out of 14 sample countries. Similarly, Wen and Li (2016) find the OJE in one of six European countries. They suggest that factors such as the level of market efficiency and risk factors might have impacted the predictive power of January. Indeed, stocks have become more volatile and less predictable in recent decades (Antweiler & Frank, 2004; Bartram, Brown, & Stulz, 2012; Jin & Myers, 2006; Tetlock, 2007; Wei & Zhang, 2006). We therefore control for lagged macroeconomic variables in the empirical tests when examining the predictive power of January ICS change.

2.4. Macroeconomic variables and stock returns

The relationship between macroeconomic variables and stock returns has been well documented in the prior literature. Patelis (1997) suggests that macroeconomic variables are related to business cycles and therefore, impact stock returns. In line with this view, Flannery and Protopapadakis (2002) find that Consumer Price Index, Producer Price Index, money supply, and unemployment rate are related to stock returns. Ratanapakorn and Sharma (2007) find that short-term stock returns are related to money supply, inflation rate, and interest rates. Humpe and Macmillan (2009) find consistent results comparing the U.S. and Japan. Chen (2009) finds macroeconomic variables predictive of recessions in the U.S. stock market. In addition, Beltratti and Morana (2006) find a correlation between the volatility of stock market and that of macroeconomic variables. They suggest that macroeconomic variables appear to have a more significant impact on the volatility of stock market than the other way around. Ultimately, Pontiff and Schall (1998) find risk premium in the bond market positively related to monthly stock returns (also see Basistha & Kurov, 2008). We control for these variables in the empirical tests.

3. Data and methodology

3.1. Data description

We obtain the University of Michigan's monthly ICS data from Federal Reserve Bank of St. Louis database and use it to measure individual investor sentiment.[1] Because monthly ICS data are available for the period from January 1978 to December 2017, we limit our sample to this 40-year period, leaving us with 480 monthly observations. The monthly ICS surveys are conducted at the beginning of each month and the final data are released either at the end of that month or at the beginning of the next month. We assume this monthly index measures individuals' sentiment at the beginning of each month.[2] Because the ICS measures individuals' current financial situation, expectation on the economic conditions in the future (12 months to five years), and future consumption, it is a proper proxy for individuals' economic outlook (Fisher & Statman, 2003; Lemmon & Portniaguina, 2006). We use the change in the ICS in January to capture the shift in individuals' economic outlook in January (Chen & Craig, 2018). As shown in Table 1, the mean (median) monthly ICS is 85.7681 (89.3000) and the mean (median) change in monthly ICS is 0.0250 (−0.2000). In addition, 26 years in the 40-year sample period are associated with a negative January ICS change.

Table 1
Summary statistics.

	Mean	Median	Std.Dev.	25%	75%	N
ICS	85.7681	89.3000	12.6936	76.1000	94.4000	480
ICSCH	0.0250	−0.2000	3.9109	−2.3500	2.4000	480
EWR	0.0118	0.0152	0.0528	−0.0174	0.0431	480
EWR - RF	0.0081	0.0111	0.0529	−0.0219	0.0396	480
VWR	0.0173	0.0194	0.0439	−0.0095	0.0438	480
VWR - RF	0.0136	0.0159	0.0439	−0.0122	0.0416	480
RP	0.0109	0.0095	0.0046	0.0077	0.0127	480
M2	0.0050	0.0052	0.0059	0.0019	0.0087	480
PPI	0.0023	0.0022	0.0091	−0.0015	0.0067	480
CPI	0.0029	0.0025	0.0032	0.0013	0.0041	480
T10R	0.0635	0.0591	0.0327	0.0386	0.0847	480
UR	0.0639	0.0599	0.0166	0.0516	0.0738	480
IIS	0.1908	0.0300	0.7324	−0.2800	0.6200	453
IISCH	0.0026	0.0050	0.1422	−0.0688	0.0749	453

Notes: This table reports summary statistics for the following variables over the sample period 1978–2017: *ICS* is the monthly Index of Consumer Sentiment; *ICSCH* is the change in the ICS; *EWR* is raw equal-weighted monthly market return with dividends; *VWR* is raw value-weighted monthly market return with dividends; *RF* is monthly risk free rate; *RP* is risk premium calculated as the yield spread between Baa- and Aaa- rated bonds; *M2* is the monthly growth rate of M2 money supply; *PPI* is the monthly percentage change in Producer Price Index; *CPI* is the monthly percentage change in Consumer Price Index; *T10R* is the monthly ten-year Treasury rate; *UR* is monthly unemployment rate; *IIS* in the monthly Index of Investor Sentiment (from January 1978 to September 2015); *IISCH* is the change in the IIS.

Risk free rates used to calculate excess returns are obtained from the online data library of Kenneth R. French.[3] Monthly equal- and value-weighted market returns are calculated with monthly returns of individual stocks in the Center for Research in Security Prices (CRSP) database. Stocks with a negative price or a negative trade volume in the CRSP database are excluded. As reported in Table 1, mean (median) raw equal-weighted, excess equal-weighted, raw value-weighted, and excess value-weighted monthly stock market returns are 1.18% (1.52%), 0.81% (1.11%), 1.73% (1.94%), and 1.36% (1.59%), respectively. Risk premium (*RP*) calculated as the yield spread between Moody's Baa- and Aaa-rated corporate bonds, monthly money supply growth rate (*M2*), monthly percentage change in Producer Price Index (*PPI*), monthly percentage change in Consumer Price Index (*CPI*), 10-year Treasury rate (*T10R*), and monthly unemployment rate (*UR*) are extracted from Federal Reserve Bank of St. Louis database.[4] The IIS data for robustness tests from January 1978 to September 2015 constructed in Baker and Wurgler (2006, 2007) are obtained from the online data library of Jeffrey Wurgler.[5] Summary statistics for these variables are reported in Table 1.

3.2. Methodology

We use two OLS models to investigate the JSE in the U.S. stock market. The first model, derived along the lines of Otoo (1999), Cooper et al. (2006), and Chen and Craig (2018), tests the relationship between January ICS change and subsequent monthly stock market returns:

$$Ret_{t,n} = \alpha + \beta_1 ICSCH_{t,Jan} + \beta_2 RP_{t,n-1} + \beta_3 M2_{t,n-1} + \beta_4 PPI_{t,n-1} + \beta_5 CPI_{t,n-1} + \beta_6 T10R_{t,n-1} + \beta_7 UR_{t,n-1} + \beta_8 Crisis_{t,n} + \varepsilon_{t,n} \quad (1)$$

Here, t denotes year and n denotes month. *Ret* is monthly stock

[1] https://fred.stlouisfed.org/series/UMCSENT/.

[2] Because a minimum of 500 surveys need to be conducted for each month, the process may take more than a week according to the Michigan Consumer Research Center. Therefore the monthly ICS may reflect consumers' average expectations in the first week. We address this timing issue in robustness tests.

[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[4] We replace 10-year Treasury rates with one-year Treasury rates in unreported tests and find similar results.

[5] http://people.stern.nyu.edu/jwurgler/.

market returns including raw equal-weighted returns (*EWR*), excess equal-weighted returns (*EWR − RF*), raw value-weighted returns (*VWR*), excess value-weighted returns (*VWR − RF*). *ICSCH* is January ICS change. A significant coefficient on *ICSCH* indicates the JSE. We control for *RP*, *M2*, *PPI*, *CPI*, *T10R*, and *UR* defined in the previous section because the literature suggests that they have a significant impact on stock return predictability and volatility. Therefore, they might impact the predictive power of January ICS change for the rest of the year.[6] Because stock returns are more volatile and hence less predictable during financial crises (Kim, Shamsuddin, & Lim, 2011; Schwert, 2011), we control for the 1998 Long Term Capital Management crisis (Kodres & Pritsker, 2002), the 1999–2000 dot-com crisis (Ljungqvist & Wilhelm Jr., 2003), and the 2007–2008 subprime crisis (Fahlenbrach & Stulz, 2011) with the dummy variable *Crisis* which is one for years 1998–2000 and 2007–2008. Following Cooper et al. (2006), we use bootstrapping OLS regressions with 1000 repetitions, excluding January observations. To test whether the direction (sign) of January ICS change matters for subsequent monthly stock returns, we estimate OLS Model (1) replacing *ICSCH* with *ICSD*, a January ICS dummy that is equal to one for the next 11 months if January ICS change is positive and zero otherwise. We run similar regressions for the other 11 months to search for similar monthly effects.

Next we test whether the magnitude and the sign of January ICS change can predict 11-month holding-period returns from February to December using OLS Model (2):

$$Ret_{t,Feb-Dec} = \alpha + \beta_1 ICSCH_{t,Jan} + \beta_2 RP_{t,Jan} + \beta_3 M2_{t,Jan} + \beta_4 PPI_{t,Jan} + \beta_5 CPI_{t,Jan} + \beta_6 T10R_{t,Jan} + \beta_7 UR_{t,Jan} + \beta_8 Crisis_t + \varepsilon_t \quad (2)$$

Here, t denotes year. $Ret_{t,Feb\text{-}Dec}$ is 11-month holding-period stock market returns from February to December in year t, including raw and excess equal- and value-weighted stock returns. We control for January macroeconomic variables defined in Model (1). We replace *ICSCH* with *ICSD*, both defined in Model (1), to test whether the sign of January ICS change impacts 11-month holding-period returns. We estimate Model (2) using bootstrapping OLS regressions with 1000 repetitions.

To test whether the JSE is driven by the OJE, we employ a January return dummy, which is equal to one if January return is positive and zero otherwise, and add it to Model (1) and Model (2).[7] If the OJE drives the JSE through the correlation between stock returns and the ICS, the coefficients on *ICSCH* and *ICSD* would be statistically insignificant.

4. The January sentiment effect

4.1. January ICS change and monthly stock market returns

In this section we estimate Model (1) to explore whether January ICS change predicts monthly stock market returns in the following 11 months. Pairwise correlations between independent variables are reported in Table 2 and regression results for Model (1) are reported in Table 3.[8]

Results reported in columns one and six of Table 3 show that January ICS change predicts monthly excess equal- and value-weighted stock market returns at the 5% and 1% level, respectively. A one unit increase in January ICS change increases these returns by around 20 basis points. This effect is economically significant because the mean (median) January ICS change is 2.68 (2.50) units, with a maximum of 9.40 units. Replacing January ICS change with its sign in Model (1) we find that the sign of January ICS change is positively related to subsequent monthly excess equal- and value-weighted stock market returns (columns two and seven). When January ICS change is positive, subsequent monthly equal- (value-) weighted stock market returns are on average, 0.93% (0.76%) higher, significant at the 10% (10%) level. These results suggest that both the magnitude and the direction of January ICS change have a significant impact on subsequent monthly stock market returns. The impact of the former is statistically more significant because it contains more information.

The results for OLS Model (1) where January ICS change is replaced with January return dummy are reported in columns three and eight of Table 3. Monthly excess equal-weighted stock market returns are on average 0.91% higher following Januarys with a positive excess equal-weighted return, significant at the 10% level. This relationship does not hold for monthly excess value-weighted returns. In contrast to the previous OJE studies (Cooper et al., 2006), we find only limited evidence for the OJE. One possible explanation is that our sample is more recent than those in the previous OJE studies and the increased amount of noise and volatilities in stock prices in recent decades (Antweiler & Frank, 2004; Bartram et al., 2012; Jin & Myers, 2006; Wei & Zhang, 2006) have impacted the predictive power of January for the rest of the year. This weak evidence of the OJE is consistent with Cooper et al. (2006) where the OJE is found to concentrate on smaller stocks. However, when January ICS change is controlled in the estimates (columns four and nine), the OJE disappears while January ICS change continues to predict monthly excess equal- and value-weighted stock market returns at the 5% and 1% level, respectively. When January ICS dummy is controlled in the estimates (columns five and ten), both January ICS dummy and January return dummy become insignificant. These results suggest that the JSE in the U.S. stock market is not driven by the OJE, and that January ICS contains more information than its sign or the sign of January stock returns.

Results for raw equal- and value-weighted stock market returns are similar to those for excess equal- and value-weighted stock market returns, and are thus unreported. In addition, because the ICS change and stock returns are highly correlated (Stambaugh et al., 2012; Yu, 2013), there might be a JSE in the ICS change itself. We therefore estimate OLS Model (1) with the dependent variable being the monthly ICS change. The unreported tests show that January ICS change is positively related to monthly ICS change from February to December, significant at the 10% level. This might be another channel through which January ICS change impacts monthly stock market returns. In contrast, neither January return dummies nor January ICS dummy predicts monthly ICS changes in the following 11 months.

4.2. Other monthly ICS change and subsequent monthly stock market returns

To show the uniqueness of the predictive power of January ICS change, we run regressions similar to those in the previous section for the other 11 months and report the result for monthly ICS change and its sign in Panel A and Panel B of Table 4, respectively. We report only the coefficients on monthly ICS change and its sign in Table 4 for brevity. Panel A of Table 4 shows that May (October) ICS change is positively associated with monthly excess value- (equal-) weighted stock market returns from June to April (from November to September), marginally significant at the 10% (10%) level. Panel B of Table 4 suggests that the sign of ICS change in any other month does not predict monthly excess equal- or value-weighted stock market returns. In addition, Panel B shows that the sign of December ICS change is negatively related to monthly ICS changes from January to November, significant at the 5% level. We find similar results with monthly raw equal- and value-weighted stock market returns in unreported tests. These results indicate the unique and systematic predictive power of January

[6] We do not find January ICS change or January returns related to subsequent stock market returns in unreported univariate tests.

[7] We find similar results when January return dummies are replaced by January returns in unreported tests.

[8] The correlation coefficients reported in Table 2 do not suggest multicollinearity issues among independent variables. Variance inflation factors in unreported tests do not suggest multicollinearity either.

Table 2
Pairwise correlations between independent variables.

		1	2	3	4	5	6	7	8	9	10	11
1	EXEWD $_{t,Jan}$	1.000										
2	EXVWD $_{t,Jan}$	**1.000*****	1.000									
3	ICSCH $_{t,Jan}$	**0.331*****	**0.331*****	1.000								
4	ICSD $_{t,Jan}$	**0.352*****	**0.352*****	**0.774*****	1.000							
5	RP $_{t, n-1}$	**−0.333*****	**−0.333*****	**−0.257*****	**−0.184*****	1.000						
6	M2 $_{t, n-1}$	−0.030	−0.031	−0.009	0.052	**0.189*****	1.000					
7	PPI $_{t, n-1}$	−0.018	−0.018	0.006	−0.039	**−0.169*****	**−0.117*****	1.000				
8	CPI $_{t, n-1}$	0.023	0.023	0.050	0.017	0.008	−0.045	**0.647*****	1.000			
9	T10R $_{t, n-1}$	0.053	0.053	0.021	−0.030	**0.365*****	0.019	**0.099****	**0.442*****	1.000		
10	UR $_{t, n-1}$	**−0.125*****	**−0.125*****	**0.089***	**0.130*****	**0.550*****	0.044	−0.014	0.025	**0.093****	1.000	
11	Crisis $_{t, n}$	−0.048	−0.048	0.046	0.068	−0.047	0.066	−0.035	**−0.121*****	−0.058	**−0.369*****	1.000

Notes: This table reports pairwise correlations between independent variables in OLS Model (1). *EXEWD* and *EXVWD* are the January returns dummies for January excess equal- and value-weighted returns, respectively, which are equal to one if January return is positive and zero otherwise. *ICSD* is the January ICS dummy that is equal to one if January ICS change is positive and zero otherwise. *Crisis* is an indicator variable that is equal to one for years 1998–2000 and 2007–2008, and zero otherwise. *IISD* is a dummy variable that is equal to one for years with a positive January IIS change and zero otherwise. Other variables are defined in Table 1.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

Table 3
January ICS change and monthly stock market returns.

	EWR t,n - RF t,n					VWR t,n - RF t,n				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ICSCH $_{t,Jan}$	**0.0020****			**0.0017****		**0.0019*****			**0.0018*****	
	2.32			*2.06*		*2.65*			*2.56*	
ICSD $_{t,Jan}$		**0.0093***			0.0077		**0.0076***			0.0064
		1.76			*1.39*		*1.66*			*1.47*
RetD $_{t,Jan}$			**0.0091***	0.0062	0.0073			0.0057	0.0030	0.0038
			1.63	*1.07*	*1.24*			*1.20*	*0.62*	*0.81*
RP $_{t, n-1}$	1.4428	1.1656	1.0687	1.6051	1.3877	1.0151	0.6700	0.5759	1.1229	0.8019
	1.45	*1.17*	*1.05*	*1.52*	*1.28*	*1.23*	*0.82*	*0.66*	*1.29*	*0.92*
M2 $_{t, n-1}$	−0.3349	−0.3537	−0.3074	−0.3449	−0.3612	−0.0149	−0.0221	0.0159	−0.0220	−0.0259
	−0.79	*−0.84*	*−0.74*	*−0.82*	*−0.86*	*−0.04*	*−0.06*	*0.05*	*−0.06*	*−0.08*
PPI $_{t, n-1}$	**0.9835****	**0.9737***	**0.8822***	**0.9778****	**0.9659****	**0.8170****	**0.7910***	**0.7429***	**0.8295***	**0.8019***
	1.95	*1.89*	*1.73*	*1.98*	*1.94*	*1.92*	*1.80*	*1.73*	*1.91*	*1.86*
CPI $_{t, n-1}$	−1.8524	−1.8412	−1.5201	−1.7658	−1.7348	**−2.1771****	**−2.1282***	**−1.9366***	**−2.1643****	**−2.1001***
	−1.31	*−1.28*	*−1.06*	*−1.31*	*−1.23*	*−1.93*	*−1.84*	*−1.71*	*−1.93*	*−1.84*
T10R $_{t, n-1}$	**−0.1892****	**−0.1708***	**−0.1929***	**−0.2023****	**−0.1889***	−0.0646	−0.0465	−0.0644	−0.0731	−0.0586
	−1.92	*−1.68*	*−1.91*	*−2.05*	*−1.83*	*−0.77*	*−0.54*	*−0.71*	*−0.82*	*−0.67*
UR $_{t, n-1}$	0.0661	0.1027	0.2396	0.0933	0.1325	−0.0699	−0.0142	0.0766	−0.0669	−0.0063
	0.32	*0.51*	*1.27*	*0.47*	*0.61*	*−0.41*	*−0.08*	*0.45*	*−0.37*	*−0.03*
Crisis $_{t, n}$	**−0.0231****	**−0.0223****	**−0.0197***	**−0.0229****	**−0.0223****	−0.0064	−0.0052	−0.0024	−0.0061	−0.0046
	−2.10	*−2.03*	*−1.84*	*−2.17*	*−2.03*	*−0.68*	*−0.54*	*−0.25*	*−0.65*	*−0.47*
Intercept	0.0075	0.0015	−0.0091	0.0000	−0.0064	**0.0185****	0.0126	0.0071	0.0156	0.0093
	0.72	*0.16*	*−0.81*	*0.00*	*−0.55*	*2.07*	*1.46*	*0.72*	*1.49*	*0.97*
R^2	0.0611	0.0561	0.0555	0.0635	0.0595	0.0336	0.0247	0.0224	0.0344	0.0260
N	440	440	440	440	440	440	440	440	440	440

Notes: This table reports regression results for OLS Model (1) over the 1978–2017 period where *t* denotes year and *n* denotes month. Dependent variables are monthly excess equal- (*EWR-RF*) and value-weighted (*VWR-RF*) stock market returns. *RetD* is the January return dummy which is equal to one if January return is positive and zero otherwise. Other variables are defined in the previous tables. Bootstrapping (repeat 1000 times) t-statistics are reported in *Italics*.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

ICS change documented in the previous section, which is significantly positively related to monthly raw and excess equal- and value-weighted stock market returns and monthly ICS changes in the subsequent 11 months. We therefore focus on January for the rest of this study.

4.3. January ICS change and subsequent 11-month holding-period returns

In this section we estimate OLS Model (2) to investigate whether January ICS change predicts 11-month holding-period stock market returns from February to December. We replace January ICS change in Model (2) with January ICS dummy to test the impact of the direction of the shift in investors' economic outlook on stock market returns. We include January return dummies in the estimates to test whether the OJE drives the JSE in 11-month holding-period returns. Results are reported in Table 5.

Table 5 indicates that, controlling for January macroeconomic variables, a one unit increase in January ICS change increases 11-month excess equal- (value-) weighted returns by 2.43% (2.48%), significant at the 5% (1%) level. Moreover, 11-month excess equal- (value-) weighted returns are on average, 11.43% (9.13%) higher when following Januarys with a positive ICS change than those following Januarys with a negative ICS change, significant at the 10% (10%) level. Similar to the results reported in Table 4, January ICS change has a more statistically significant impact on 11-month holding-period returns than its sign

Table 4
Monthly ICS change and subsequent monthly stock market returns.

Monthly effect	Panel A - monthly ICS change			Panel B - monthly ICS change dummy			N
	EWR $_{t,n}$ - RF $_{t,n}$	VWR $_{t,n}$ - RF $_{t,n}$	ICSCH $_{t,n}$	EWR $_{t,n}$ - RF $_{t,n}$	VWR $_{t,n}$ - RF $_{t,n}$	ICSCH $_{t,n}$	
	(1)	(2)	(3)	(4)	(5)	(6)	
February	−0.0001	−0.0004	−0.0578	−0.0029	−0.0024	−0.2478	439
	−0.09	*−0.73*	*−1.23*	*−0.61*	*−0.56*	*−0.64*	
March	0.0008	0.0009	0.0398	−0.0014	0.0032	−0.0174	438
	1.00	*1.41*	*0.65*	*−0.25*	*0.71*	*−0.04*	
April	0.0005	0.0001	−0.0563	0.0018***	−0.0010	−0.5017	437
	0.70	*0.15*	*−0.99*	*0.36*	*−0.22*	*−1.30*	
May	0.0012	**0.0011***	0.0052	0.0073	0.0055	0.2324	436
	1.61	*1.75*	*0.08*	*1.50*	*1.26*	*0.58*	
June	0.0009	−0.0003	−0.0832	−0.0027	−0.0056	−0.5515	435
	0.76	*−0.33*	*−1.13*	*−0.48*	*−1.13*	*−1.36*	
July	0.0006	0.0006	−0.0055	−0.0054	−0.0010	−0.0618	434
	0.69	*0.84*	*−0.07*	*−1.02*	*−0.22*	*−0.15*	
August	0.0001	0.0004	−0.0429	0.0018	0.0020	−0.0526	433
	0.14	*0.69*	*−0.85*	*0.36*	*0.50*	*−0.14*	
September	−0.0004	−0.0002	−0.0486	0.0022	0.0027	−0.0017	432
	−0.63	*−0.31*	*−0.94*	*0.44*	*0.63*	*0.00*	
October	**0.0010***	0.0006	0.0323	0.0029	0.0012	0.0911	431
	1.88	*1.26*	*0.66*	*0.57*	*0.28*	*0.22*	
November	−0.0007	−0.0002	0.0031	−0.0079	−0.0035	−0.2708	430
	−1.26	*−0.45*	*0.07*	*−1.46*	*−0.76*	*−0.60*	
December	−0.0012	−0.0002	−0.1013	−0.0045	0.0024	**−0.9093****	429
	−1.37	*−0.30*	*−1.60*	*−0.78*	*0.56*	*−1.96*	

Notes: This table reports regression results for OLS Model (1) over the 1978–2017 period where January ICS change is replaced with other monthly ICS changes in Panel A and other monthly ICS dummy in Panel B. A monthly ICS dummy is equal to one for the next 11 months if the ICS change in that month is positive and zero otherwise. In addition, in columns three and six, the dependent variable is replaced with monthly ICS changes in the following 11 months. Only coefficients on monthly ICS change and monthly ICS dummy are reported in Panel A and Panel B, respectively. All variables are defined in the previous tables. Bootstrapping (repeat 1000 times) t-statistics are reported in *Italics*.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

because it contains more information for the rest of the year.

We do not find the sign of January excess equal- (value-) weighted returns predictive of 11-month excess equal- (value-) weighted returns from February to December. In addition, Table 5 suggests that the JSE is not driven by the sign of January returns. When January return dummy is controlled in columns four and nine of Table 5, January ICS change continues to predict 11-month excess equal- (value-) weighted returns, significant at the 10% (5%) level.

Moreover, Table 5 shows that January macroeconomic variables do not have much predictive power for 11-month holding-period returns from February to December, suggesting the uniqueness and importance of the information contained in January ICS change. Ultimately, in unreported tests we find similar results with 11-month raw equal- and value-weighted stock market returns from February to December.

5. The January sentiment effect and portfolio returns

In this section we explore the implications of the JSE for portfolio management. Because investors are more likely to overprice risky assets when they are bullish about the future (Huang et al., 2015; Stambaugh et al., 2012; Yu, 2013), January ICS change as a measure of investors' economic outlook might have a more significant impact on riskier stocks. We form decile portfolios based on three measures of risk in the prior year: firm size, market-to-book ratio (MTB), and firm performance. Firm size might impact individual investors' demand because smaller firms are riskier than larger firms (Keim, 1983). We use market capitalization of stocks as a measure for firm size. MTB might impact investors' asset allocation decisions because it is a robust predictor of stock returns and a proxy for firm risk level (Barber & Lyon, 1997; Fama & French, 1992; Penman, 1996). Past firm performance might impact investors' asset allocation decisions as well, because they might consider stocks of poorly performing firms risky investments. We use return on assets (ROA) calculated as net income before extraordinary items divided by total assets to measure firm performance (Grullon & Michaely, 2002). For brevity, we estimate OLS Model (1) for the decile portfolios and only report the coefficients on January ICS Change with bootstrapping (1000 repetitions) t-values in Table 6. Results for size portfolios, MTB portfolios, and ROA portfolios are reported in Panels A, B, and C of Table 6. January observations are excluded from the estimates. We replace January ICS change in OLS Model (1) with January ICS dummy and also report the coefficients on January ICS dummy in Table 6.

Regression results reported in Panel A of Table 6 indicate that January ICS change has a statistically significant (at least at the 5% level, columns one and three) impact on all size portfolios. However, the economic significance of this effect decreases in firm size. In the smallest decile, a one unit increase in January ICS change is associated with a 0.21% (0.28%) increase in monthly excess equal- (value-) weighted returns, and only a 0.17% (0.17%) increase in the largest decile. In addition, Panel A shows that the sign of January ICS change matters most for smaller deciles, both economically and statistically (columns two and four).

Results reported in Panel B of Table 6 suggest that the JSE has a more significant impact on stocks with a higher MTB. A one unit increase in January ICS change is associated with a 0.21% (0.14%) increase in monthly equal- (value-) weighted returns on the decile with the lowest MTBs and a 0.32% (0.24%) increase in monthly returns on the decile with the highest MTBs (columns five and seven). The difference between higher and lower MTB deciles is more significant with January ICS dummy. The sign of January ICS change does not impact monthly equal- and value-weighted returns on stocks with the lowest MTBs (columns six and eight). In contrast, it impacts monthly equal-

Table 5
January ICS change and subsequent 11-month holding-period returns.

	EWRt-RFt					VWRt-RFt				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$ICSCH_{t,Jan}$	**0.0243****			**0.0216***		**0.0248*****			**0.0237****	
	1.98			*1.81*		*2.49*			*2.26*	
$ICSD_{t,Jan}$		**0.1143***			0.0980		**0.0913***			0.0798
		1.63			*1.26*		*1.64*			*1.39*
$RetD_{t,Jan}$			0.0979	0.0649	0.0801			0.0590	0.0312	0.0402
			0.99	*0.74*	*0.81*			*0.95*	*0.54*	*0.63*
$RP_{t,Jan}$	**23.6864***	19.8860	18.5592	**25.3390***	22.4214	15.2344	10.1865	8.7842	16.3456	11.6055
	1.67	*1.40*	*1.21*	*1.65*	*1.51*	*1.20*	*0.79*	*0.70*	*1.31*	*0.91*
$M2_{t,Jan}$	−6.5117	−4.5034	−1.9375	−6.8663	−5.1966	−7.6022	−4.6484	−2.4231	−7.8959	−4.9641
	−0.67	*−0.49*	*−0.20*	*−0.66*	*−0.47*	*−0.96*	*−0.64*	*−0.37*	*−0.97*	*−0.66*
$PPI_{t,Jan}$	3.9356	3.2067	2.1643	4.0581	3.4501	0.2571	−0.8419	−1.3409	0.5729	−0.4631
	0.58	*0.48*	*0.31*	*0.63*	*0.52*	*0.06*	*−0.16*	*−0.24*	*0.12*	*−0.09*
$CPI_{t,Jan}$	−7.5864	−7.1635	−5.8025	−8.9413	−8.8719	−2.1073	−0.7578	−0.3478	−3.4476	−2.3285
	−0.41	*−0.39*	*−0.31*	*−0.49*	*−0.45*	*−0.16*	*−0.05*	*−0.02*	*−0.25*	*−0.15*
$T10R_{t,Jan}$	−1.2351	−1.2959	−1.7115	−1.2375	−1.2929	−0.0764	−0.2499	−0.5704	−0.0569	−0.2433
	−0.90	*−0.88*	*−1.17*	*−0.82*	*−0.82*	*−0.06*	*−0.21*	*−0.50*	*−0.05*	*−0.21*
$UR_{t,Jan}$	−2.7676	−2.0916	−0.6133	−2.5884	−1.9557	−2.2104	−1.1727	−0.2001	−2.2657	−1.2143
	−0.90	*−0.65*	*−0.19*	*−0.81*	*−0.56*	*−1.01*	*−0.50*	*−0.08*	*−0.94*	*−0.49*
$Crisis_t$	**−0.2074***	−0.2155	−0.2009	**−0.2073***	**−0.2142***	−0.0277	−0.0326	−0.0143	−0.0244	−0.0271
	1.64	*−1.53*	*−1.49*	*−1.78*	*−1.64*	*−0.25*	*−0.24*	*−0.11*	*−0.20*	*−0.20*
Intercept	0.1385	0.0709	−0.0241	0.0635	−0.0122	0.1996	0.1325	0.0915	0.1718	0.1010
	0.73	*0.34*	*−0.11*	*0.32*	*−0.06*	*1.42*	*0.86*	*0.52*	*1.01*	*0.57*
R^2	0.3108	0.2741	0.2665	0.3254	0.2970	0.2138	0.1056	0.0791	0.2211	0.1174
N	40	40	40	40	40	40	40	40	40	40

Notes: This table reports regression results for OLS Model (2) over the 1978–2017 period where *t* denotes year. Dependent variables are 11-month excess equal- (*EWR-RF*) and value-weighted (*VWR-RF*) stock market returns from February to December. All variables are defined in the previous tables. Bootstrapping (repeat 1000 times) t-statistics are reported in *Italics*.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

and value-weighted returns on stocks with the highest MTBs at the 5% and 10% levels, respectively.

The results for ROA portfolios reported in Panel C of Table 6 indicate that the JSE has a more significant impact on stocks with a lower ROA. A one unit increase in January ICS change increases monthly equal- (value-) weighted returns by 0.38% (0.56%) in the decile with the lowest ROAs and by 0.16% (0.18%) in the decile with the highest ROAs. The results with January ICS dummy tell a similar story. The analysis on ROA portfolios also indicates that the JSE is not driven by the interactions between the ICS and firm performance (Bergman & Roychowdhury, 2008). Because January ICS change has a significant impact on all ROA decile portfolios.

The evidence suggests that the JSE impacts stocks of different characteristics, and it appears to concentrate on smaller stocks, higher MTB stocks, and lower ROA stocks, consistent with the findings in Hribar and Mclnnis (2012). It indicates that the shift in individual investors' January economic outlook has an economically and statistically more significant impact on riskier stocks, consistent with previous studies (Huang et al., 2015; Stambaugh et al., 2012; Yu, 2013). Moreover, these results are consistent with Chen and Craig (2018) where they find the JSE has a more significant impact on riskier bond portfolios.

6. Robustness tests

6.1. Timing error of the ICS survey data

In the data description section, we assume that the ICS survey data measure consumer sentiment at the beginning of each month. As a matter of fact, the Michigan Consumer Research Center states that the monthly survey may be completed within the first one or two weeks of each month. A critical concern is that the ICS data may actually reflect average consumer sentiment in the first one or two weeks of each month. Therefore, "January ICS change" may instead measure the difference between the average consumer sentiment in early January and that in early February. Unfortunately, it is impossible to rule out this timing error. The potential consequence is that "January ICS change" may capture part of the interaction between consumer sentiment and stock returns in early February and therefore, lead us to a biased correlation between January ICS change and subsequent monthly stock returns.

To show the irrelevance of the potential timing error to our main conclusions, we examine whether January ICS change can explain subsequent monthly returns from March to December controlling for lagged macroeconomic variables. In unreported tests we find that January ICS change predicts monthly raw and excess equal- and value-weighted stock market returns at least at the 5% level, and predicts 11-month raw and excess equal- and value-weighted stock market returns at least at the 10% level.

6.2. Subperiod results and alternative definition of the 2007 financial crisis

In this section, we explore whether our results hold in subperiod tests. In unreported tests, we drop years of financial crisis and find similar results. Next, we drop years after the 2007 financial crisis and the main conclusions do not change.

Previously, the crisis indicator for the 2007 financial crisis is one for years 2007 and 2008. In this section we test the robustness of our findings using alternative definitions of the 2007 financial crisis. In unreported tests we find similar results when the 2007 financial crisis is defined from July 2007 to December 2009 or from July 2007 to December 2010.

6.3. Alternative measure of January sentiment

In this section we measure January sentiment with the IIS

Table 6
The January sentiment effect and portfolio returns.

	Panel A - Size Portfolios			
Deciles	EWR $_{t,n}$ - RF $_{t,n}$		VWR $_{t,n}$ - RF $_{t,n}$	
	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$
	(1)	(2)	(3)	(4)
1	**0.0021*****	**0.0122*****	**0.0028*****	**0.0148*****
(Smallest)	*2.60*	*2.53*	*2.91*	*2.56*
2	**0.0022*****	**0.0118*****	**0.0026*****	**0.0123****
	2.72	*2.46*	*2.90*	*2.19*
3	**0.0023*****	**0.0124*****	**0.0025*****	**0.0118****
	2.95	*2.47*	*2.93*	*2.21*
4	**0.0024*****	**0.0129*****	**0.0026*****	**0.0124****
	3.00	*2.48*	*3.02*	*2.24*
5	**0.0020*****	**0.0101****	**0.0021*****	**0.0093***
	2.47	*1.93*	*2.43*	*1.78*
6	**0.0021*****	**0.0106****	**0.0022*****	**0.0097***
	2.45	*2.01*	*2.60*	*1.72*
7	**0.0018****	0.0086	**0.0019****	0.0072
	2.11	*1.57*	*2.36*	*1.32*
8	**0.0018****	0.0088	**0.0019****	0.0077
	2.14	*1.60*	*2.25*	*1.48*
9	**0.0019****	**0.0088***	**0.0019*****	0.0077
	2.32	*1.75*	*2.47*	*1.57*
10	**0.0017****	**0.0075***	**0.0017*****	**0.0071***
(Largest)	*2.27*	*1.67*	*2.62*	*1.71*
N	440	440	440	440
	Panel B - MTB Portfolios			
Deciles	EWR $_{t,n}$ - RF $_{t,n}$		VWR $_{t,n}$ - RF $_{t,n}$	
	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$
	(5)	(6)	(7)	(8)
1	**0.0021****	0.0090	0.0014	0.0037
(Lowest)	*2.29*	*1.55*	*1.50*	*0.61*
2	**0.0021*****	**0.0097****	**0.0016****	0.0060
	2.88	*2.08*	*1.93*	*1.14*
3	**0.0018*****	**0.0081***	**0.0013***	0.0044
	2.49	*1.82*	*1.66*	*0.94*
4	**0.0015****	0.0073	**0.0015****	0.0051
	2.12	*1.49*	*2.07*	*1.17*
5	**0.0017****	**0.0082***	**0.0014****	0.0053
	2.30	*1.82*	*2.09*	*1.27*
6	**0.0017****	**0.0079***	**0.0015*****	0.0056
	2.28	*1.68*	*2.48*	*1.34*
7	**0.0019****	**0.0084***	**0.0012***	0.0043
	2.18	*1.68*	*1.79*	*0.96*
8	**0.0020****	**0.0105****	**0.0016****	0.0061
	2.27	*1.96*	*2.39*	*1.48*
9	**0.0024*****	**0.0131****	**0.0019*****	**0.0081***
	2.47	*2.06*	*2.74*	*1.80*
10	**0.0032*****	**0.0164****	**0.0024*****	**0.0090***
(Highest)	*3.03*	*2.21*	*2.95*	*1.75*
N	440	440	440	440
	Panel C - ROA Portfolios			
Deciles	EWR $_{t,n}$ - RF $_{t,n}$		VWR $_{t,n}$ - RF $_{t,n}$	
	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$
	(9)	(10)	(11)	(12)
1	**0.0038*****	**0.0196****	**0.0056*****	**0.0249*****
(Worst)	*2.96*	*2.22*	*3.77*	*2.54*
2	**0.0030*****	**0.0137****	**0.0034*****	**0.0124***
	2.69	*1.96*	*2.76*	*1.64*
3	**0.0028*****	**0.0142****	**0.0028*****	**0.0119***
	3.02	*2.32*	*2.78*	*1.85*

(*continued on next page*)

Table 6 (*continued*)

	Panel C - ROA Portfolios			
Deciles	EWR $_{t,n}$ - RF $_{t,n}$		VWR $_{t,n}$ - RF $_{t,n}$	
	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$	ICSCH $_{t,Jan}$	ICSD $_{t,Jan}$
	(9)	(10)	(11)	(12)
4	**0.0022*****	**0.0111****	**0.0023*****	0.0081
	3.03	*2.39*	*2.58*	*1.49*
5	**0.0018*****	**0.0077***	**0.0019*****	**0.0075***
	2.80	*1.81*	*2.68*	*1.69*
6	**0.0015****	**0.0075***	**0.0017*****	**0.0070***
	2.03	*1.65*	*2.67*	*1.70*
7	**0.0014****	**0.0079***	**0.0015****	**0.0071***
	1.93	*1.72*	*2.28*	*1.72*
8	**0.0015***	0.0068	**0.0013****	0.0052
	1.83	*1.41*	*2.07*	*1.30*
9	**0.0016****	0.0072	**0.0014****	**0.0074***
	2.04	*1.50*	*2.24*	*1.81*
10	**0.0016****	0.0075	**0.0018*****	0.0066
(Best)	*1.95*	*1.41*	*2.57*	*1.41*
N	440	440	440	440

Notes: This table reports results for OLS Model (1) for decile portfolios over the 1978–2017 period. Dependent variables are monthly excess equal- (*EWR-RF*) and value-weighted (*VWR-RF*) returns on decile portfolios based on firm size, market-to-book ratio (MTB), and return on assets (ROA), for which the results are reported in Panel A, Panel B, and Panel C, respectively. Only the coefficients on January ICS change in Model (1) are reported for brevity. We estimate Model (1) replacing January ICS change with January ICS dummy and report the coefficients on this dummy variable also in this table. All variables are defined in the previous tables. Bootstrapping (1000 repetitions) t-statistics are reported in *Italics*.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

Table 7
January IIS change and monthly stock market returns.

	EWR t,n - RF t,n				VWR t,n - RF t,n			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IISCH $_{t,Jan}$	**−0.0381***		**−0.0351***		**−0.0339***		**−0.0302***	
	−1.84		*−1.65*		*−1.80*		*−1.65*	
IISD $_{t,Jan}$		**−0.0102****		**−0.0090***		**−0.0086***		**−0.0080***
		−2.01		*−1.65*		*−1.80*		*−1.83*
RetD $_{t,Jan}$			0.0094	0.0089			0.0040	0.0051
			1.60	*1.49*			*0.85*	*1.03*
RP $_{t,\ n-1}$	0.7271	0.6662	1.0701	0.9854	0.3204	0.2639	0.5051	0.5045
	0.72	*0.65*	*1.00*	*0.93*	*0.40*	*0.31*	*0.55*	*0.57*
M2 $_{t,\ n-1}$	−0.3462	−0.3976	−0.3764	−0.4203	0.0249	−0.0193	0.0074	−0.0366
	−0.80	*−0.96*	*−0.85*	*−0.98*	*0.07*	*−0.06*	*0.02*	*−0.10*
PPI $_{t,\ n-1}$	**0.8895***	**0.9018***	**0.8957***	**0.9049***	0.7166***	**0.7256***	**0.7403***	**0.7559***
	1.74	*1.82*	*1.73*	*1.78*	*1.56*	*1.66*	*1.70*	*1.77*
CPI $_{t,\ n-1}$	−1.6730	−1.6488	−1.5959	−1.5802	−1.9559	**−1.9352***	**−1.9646***	**−1.9480***
	−1.14	*−1.15*	*−1.11*	*−1.04*	*−1.60*	*−1.62*	*−1.79*	*−1.72*
T10R $_{t,\ n-1}$	−0.1602	**−0.1872***	−0.1761	**−0.1983***	−0.0409	−0.0632	−0.0517	−0.0754
	−1.46	*−1.80*	*−1.60*	*−1.87*	*−0.45*	*−0.68*	*−0.54*	*−0.82*
UR $_{t,\ n-1}$	0.1648	0.2419	0.1954	0.2652	0.0301	0.0996	0.0317	0.0911
	0.83	*1.18*	*0.93*	*1.27*	*0.17*	*0.54*	*0.18*	*0.50*
Crisis $_{t,\ n}$	**−0.0173***	−0.0171	**−0.0175***	−0.0174	−0.0011	−0.0010	−0.0010	−0.0008
	−1.63	*−1.53*	*−1.63*	*−1.56*	*−0.11*	*−0.10*	*−0.10*	*−0.08*
Intercept	0.0055	0.0079	−0.0062	−0.0035	**0.0161***	**0.0178***	0.0121	0.0130
	0.49	*0.65*	*−0.46*	*−0.25*	*1.62*	*1.62*	*1.14*	*1.15*
R^2	0.0567	0.0576	0.0624	0.0624	0.0266	0.0264	0.0281	0.0288
N	418	418	418	418	418	418	418	418

Notes: This table reports regression results for OLS Model (1) over the 1978–2015 period where *t* denotes year and *n* denotes month. January ICS change and January ICS dummy in Model (1) are replaced with January IIS change and January IIS dummy, respectively. Dependent variables are monthly excess equal- (*EWR-RF*) and value-weighted (*VWR-RF*) stock market returns. Other variables are defined in the previous tables. Bootstrapping (repeat 1000 times) t-statistics are reported in *Italics*.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

Table 8
January IIS change and subsequent 11-month holding-period returns.

	EWR t - RF t				VWR t - RF t			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$IISCH_{t,Jan}$	**−0.5514***		**−0.5311***		**−0.5363*****		**−0.5064****	
	−1.87		*−1.77*		*−2.45*		*−2.30*	
$IISD_{t,Jan}$		−0.1339		−0.1254		**−0.1246****		**−0.1216****,y
		−1.55		*−1.43*		*−2.31*		*−1.94*
$RetD_{t,Jan}$			0.1077	0.1043			0.0333	0.0579
			1.02	*1.07*			*0.52*	*0.97*
$RP_{t,\ Jan}$	15.8080	17.4044	19.6627	21.0130	5.5349	6.9873	6.9567	9.4823
	0.96	*1.00*	*1.15*	*1.15*	*0.41*	*0.49*	*0.49*	*0.62*
$M2_{t,\ Jan}$	−6.1279	−7.3397	−7.9956	−8.9537	−6.4399	−7.3889	−6.8496	−8.3761
	−0.71	*−0.83*	*−0.80*	*−0.83*	*−1.00*	*−1.03*	*−1.00*	*−1.10*
$PPI_{t,\ Jan}$	2.4602	2.7626	3.2433	3.5209	−3.1056	−2.7947	−2.6056	−1.9803
	0.38	*0.46*	*0.51*	*0.61*	*−0.64*	*−0.61*	*−0.53*	*−0.42*
$CPI_{t,\ Jan}$	−0.1986	−2.9136	−3.1137	−5.6077	4.2808	1.6872	2.6169	−1.0336
	−0.01	*−0.16*	*−0.17*	*−0.32*	*0.33*	*0.13*	*0.20*	*−0.08*
$T10R_{t,\ Jan}$	−1.9025	−2.1594	−1.7407	−1.9985	0.5714	0.3141	0.6129	0.4232
	−1.00	*−1.12*	*−0.88*	*−1.01*	*0.41*	*0.21*	*0.39*	*0.27*
$UR_{t,\ Jan}$	0.9896	1.7337	1.0861	1.8106	−0.8831	−0.1439	−0.9915	−0.4292
	0.31	*0.52*	*0.35*	*0.55*	*−0.34*	*−0.05*	*−0.37*	*−0.16*
$Crisis_t$	−0.0715	−0.0785	−0.0723	−0.0796	0.1058	0.0981	0.1055	0.0996
	−0.56	*−0.66*	*−0.58*	*−0.67*	*1.02*	*0.99*	*1.01*	*0.98*
Intercept	−0.0282	−0.0106	−0.1579	−0.1392	0.1336	0.1472	0.1038	0.0995
	−0.14	*−0.05*	*−0.68*	*−0.57*	*0.87*	*0.95*	*0.57*	*0.57*
R^2	0.2620	0.2493	0.3028	0.2874	0.2241	0.1901	0.2320	0.2155
N	38	38	38	38	38	38	38	38

Notes: This table reports regression results for OLS Model (2) over the 1978–2015 period where *t* denotes year. January ICS change and January ICS dummy in Model (2) are replaced with January IIS change and January IIS dummy, respectively. Dependent variables are 11-month excess equal- (*EWR-RF*) and value-weighted (*VWR-RF*) stock market returns from February to December. All variables are defined in the previous tables. Bootstrapping (repeat 1000 times) t-statistics are reported in *Italics*.

*** Denote the significance level of 1%.

** Denote the significance level of 5%.

* Denote the significance level of 10%.

constructed in Baker and Wurgler (2006, 2007) and investigate the relationship between January IIS change and stock market returns from February to December. Chen and Craig (2018) suggest that the ICS measure overall economic outlook and the IIS specifically measures the optimism in the stock market, and they have opposing effects on financial assets. In addition, the correlation coefficients reported in Table 2 show a negative correlation between January ICS change (dummy) and January IIS change (dummy). We therefore expect the change in the IIS in January to be negatively related to stock market returns. We estimate OLS Model (1) and Model (2) with January IIS change and January IIS dummy, and report the results for monthly stock market returns and 11-month holding-period returns in Tables 7 and 8, respectively.

Results reported in Table 7 show that January IIS change is negatively related to monthly excess equal- and value-weighted stock market returns, both significant at the 10% level (columns one and five). Monthly excess equal- (value-) weighted stock market returns are on average 1.02% (0.86%) lower following Januarys with a positive IIS change than those following January with a negative IIS change, significant at the 5% (10%) level (columns two and six). The JSE is not driven by the OJE, as indicated in columns three, four, seven, and eight. The results for monthly raw equal- and value-weighted stock market returns in unreported tests are similar to those reported in Table 7. We find that January ICS change has a more statistically significant impact on monthly stock market returns than January IIS change, comparing Table 3 with Table 7.

Table 8 shows that January IIS change is negatively related to 11-month excess equal- and value-weighted stock market returns, significant at the 10% and 1% level (columns one and five). It appears that January IIS change has a more statistically significant impact on 11-month excess value-weighted returns than on 11-month excess equal-weighted returns. Consistently, we find that January IIS dummy predicts 11-month excess value-weighted returns at the 5% level but does not predict 11-month excess equal-weighted returns (columns two and six). Moreover, the impact of January IIS change on subsequent stock market returns is not driven by the OJE, as shown in columns three, seven, and eight.

In conclusion, these results confirm the predictive power of January sentiment for stock market returns from February to December. Consistent with the findings documented in Chen and Craig (2018), January ICS change and January IIS change have opposing effects on subsequent stock market returns.

7. Conclusions

January might be special for individual investors because at the beginning of a year they are more likely to re-evaluate and adjust their asset allocation decisions for the rest of the year. Behavioral theories suggest that individuals might be over-optimistic (over-pessimistic) about the future if the current situations are good (bad). Therefore, the shift in individual investors' economic outlook in January will likely influence their asset allocation decisions for the rest of the year. In this study, we test this hypothesis by examining the relationship between the change in the Index of Consumer Sentiment (ICS) in January, a proxy for the shift in individual investors' January economic outlook, and subsequent stock market returns from February to December.

The empirical results show that the magnitude and the direction of January ICS change are positively related to subsequent monthly stock market returns from February to December, including raw and excess equal- and value-weighted returns. These relationships are not only statistically significant, but also economically significant. Tests show that these relationships are not driven by the other January effect where the sign of January stock returns predicts stock returns in the rest of the year. In contrast, neither the magnitude nor the direction of the

ICS change in any other month systematically predicts subsequent monthly stock returns. In addition, we find January ICS change predicts 11-month holding-period returns from February to December. When investors' economic outlook is measured with the Index of Investor Sentiment (IIS), we find a negative relationship between the magnitude and the direction of January IIS change and stock market returns in the following 11 months. These results are consistent with the January sentiment effect where individual investors' January economic outlook impacts their asset allocation decisions for the rest of the year and therefore, stock market returns from February to December.

The analysis on decile portfolios based on firm size, market-to-book ratio, and firm performance shows that the JSE concentrates on riskier stocks including smaller stocks, higher market-to-book ratio stocks, and stocks with worse firm performance.

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