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# **Political cycle, investor sentiment and stock returns**

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## **Abstract**

In this paper, we test the mediator and moderator hypothesis in the relations among political cycles, investor sentiment and stock market returns. By using sentiment indicators like Baker and Wurgler's (2006) sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU) of Baker et al. (2016) from December 1965 to December 2018, we find only BW and MCSI function as a mediator between political cycles and stock markets. And the indirect effect via BW accounts for larger proportion (16.34%) of total effect than that via MCSI (4.87%). The direct effect still accounts for the major part of the total effect of political cycles on stock markets. The moderator hypothesis does not apply to the three-variable system of political cycles, investor sentiment and stock markets although the interaction term of political cycle and investor sentiment is significant.

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## **Acronyms**

BW	Baker and Wurgler's (2006) Investor Sentiment Index
CCI	The Conference Board Consumer Confidence Index
MCSI	The University of Michigan's Consumer Sentiment Index
EPU	The Economic Policy Uncertainty Index

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## **Declaration**

I declare that, except where explicit reference is made to the contribution of others, this thesis is a result of my work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Name: HU FEIYUAN

Signature:

## **1. Introduction**

Numerous literatures investigate the role of politics in the financial markets. Politics affect the stock market through the inherent uncertainty of different governmental policies. Nordhaus (1975) argues that within an incumbent's term in office, there is a predictable pattern of policy. Siokis and Kapopoulos (2007) confirm that the conditional mean and variance of the stock market index are affected by political developments (Pastor & Veronesi, 2012; Bialkowski et al., 2008; Goodell & Vähämaa, 2013). Wang et al. (2008) demonstrate that political change was originally intended as an incumbent party impetus to create opportunities for progress. Many researchers provide evidence that the stock market performs better during Democratic presidencies than during Republican presidencies such as Niederhoffer et al. (1970), Huang (1985), Hensel and Ziemba (1995), Johnson et al. (1999), Santa-Clara and Valkanov (2003), Leblang and Mukherjee (2005), and Belo et al. (2013). Kumar et al. (2015) prove that election affects the stock market performance and company's endogenous and exogenous factors. The return pattern during election period is further explored by Booth and Booth (2003), Wong and McAleer (2009).

Stock returns under Republican and Democratic presidencies are found to be different. Riley and Luksetich (1980) document that markets react positively when a Republican is elected and negatively following the election of a Democratic president, which reflects a widely held view that Republicans are better for business. Niederhoffer et al. (1970) find that the market performs significantly better during the third year of Democratic administrations than during the third year of Republican administrations. Huang (1985) finds Democratic administrations had higher mean annual rate of returns in Year 1 and 2 of the presidential cycle for the period 1961-80, and in Year 3 and 4 for the period 1929-80. Johnson et al. (1999) find that small-capitalization stocks have better performance during Democratic administrations, although the annual return

difference is not significant. Santa-Clara and Valkanov (2003) detect the higher excess returns in the stock market under Democratic presidencies than under Republican presidencies. Since they find the difference in returns is not explained by business-cycle variables, and is not concentrated around election dates, besides, there is no difference in the riskiness of the stock market across presidencies that could justify a risk premium, the difference in returns through the political cycle is therefore left with a puzzle. Leblang and Mukherjee (2005) examine stock returns in the U.S. and the UK. They find that expectation of higher (lower) inflation under left-wing (right-wing) administrations leads to lower (higher) trading volume. This leads to a decline (increase) in the mean and volatility of stock prices during the tenure of left-wing (right-wing) governments and when traders anticipate the left-wing (right-wing) party to win elections. Hensel and Ziemba (1995) indicate that small-cap stocks had significantly higher returns during Democratic administrations than during Republican administrations. Both small- and large-cap stock returns were significantly higher during the last two years of the presidential term than during the first two years. Belo et al. (2013) find that during Democratic presidencies, firms with high government exposure experience higher cash flows and stock returns, while the opposite pattern holds true during Republican presidencies.

Booth and Booth (2003) confirm the explanatory power of presidential cycle pattern beyond traditional business cycle in U.S. stock returns. Liu (2007) shows that stock markets generate positive abnormal returns fifteen-day period before and after the presidential elections, and that the magnitude of abnormal return is greatest in the presidential elections held in less-free countries when an incumbent loses. Foerster and Schmitz (1997) find U.S. and international stock returns are significantly lower and negative in Year 2 following U.S. presidential election relative to Year 1, 3 and 4. They conclude the U.S. election cycle variable may capture some form of U.S. and international market sentiment. However, Jones and Banning (2008) hold a different opinion that neither election results nor the election cycle appears to offer much help in predicting stock market returns.

The relations between stock markets and political climate are central topics which have been discussed by many previous researchers (Riley & Luksetich, 1980; Johnson et al., 1999; Santa-Clara & Valkanov, 2003; Leblang & Mukherjee, 2005; Belo et al., 2013; Booth & Booth, 2003; Liu, 2007; Foerster & Schmitz, 1997). However, traditional financial theories leave little space for noise traders. Behaviour financial theories gradually recognize the existence of noise traders and highlight the role of investor sentiment in explaining stock returns and volatility (De Long et al., 1990; Brown & Cliff, 2005; Baker & Wurgler, 2006; Lee et al., 2002).

Earlier researchers like Tversky and Kahneman (1974) propose three heuristics that are employed when people make judgments in face of uncertainty, namely representativeness, availability of instances or scenarios as well as adjustment from an anchor. Barberis et al. (1998) extend the research of Tversky and Kahneman (1974) on some important behavioural heuristics, and provide a parsimonious model of investor sentiment about the formation of investors' beliefs based on psychological evidences. Their model produces underreaction and overreaction for a wide range of parameter values. The results support the previous finding on the failures of individual judgment in face of uncertainty and the trading patterns of investors in experimental situations. They also find another behavioural heuristic, namely conservatism, defined as the slow updating of models in face of new evidences. These behavioural heuristics have important economic meanings and often result in bias in prediction.

The notable work of De Long et al. (1990) shows that the arbitrageurs are likely to have risk-aversion and restricted horizons, so their willingness to beat against noise traders would be limited, which may lead the price to be even further and arbitrageurs to suffer great loss (Shleifer & Vishny, 1995). Irrational noise traders with erroneous stochastic beliefs both impact prices and obtain higher expected returns in the asset market. Noise traders create risk in the asset price that prevents rational arbitrageurs from beating against them. Consequently, asset prices are significantly driven away from fundamental values even when fundamental risk is absent.

Brown and Cliff (2005) find that future returns are negatively related with sentiment, and the international evidence are provided by Schmeling (2009). Baker and Wurgler (2006) find that the impact of sentiment is larger on some categories of stocks such as small stocks, young stocks, and highly volatile stocks. Researchers like Tetlock (2007), Garcia (2013), Kräussl and Mirgorodskaya (2016), Cookson and Niessner (2019) find media contents help predict stock returns. Yu and Yuan (2011) show that the positive risk-return trade-off is strong during low-sentiment period and little in high-sentiment period. Brown (1999) indicates that noise trading may affect higher moments of return. Lee et al. (2002) reveal that sentiment is a systematic risk that is priced, and excess returns are contemporaneously positively correlated with shifts in sentiment, supported by Ho and Hung (2012). Baker et al. (2016) construct the Economic Policy Uncertainty Index (EPU) to measure policy-related economic uncertainty. Zhang (2019) explains the relationship between EPU and investor sentiment by using real option theory (Bernanke, 1983) and financial constraint theories. The greater the uncertainty of economic policy is, the larger the external financing pressures faced by enterprises are. These factors will ultimately inhibit corporate investment and lead to pessimistic investor sentiment. Antonakakis et al. (2013) find negative correlations between EPU and the U.S. stock market returns.

Policy changes increase volatilities and correlations among stocks (Pastor & Veronesi, 2012). Bialkowski et al. (2008) use event-study and conclude that the country-specific component of index return variance can easily double during the week around an election, which shows that investors are surprised by the election outcome. Goodell and Vähämaa (2013) find that the VIX volatility index, increases along with positive changes in the probability of success of the eventual winner. The presidential election process engenders market anxiety as investors form and revise their expectations regarding future macroeconomic policy.

There are some researchers investigating the links between sentiment and political factors. Adjei and Adjei (2017) find investor sentiment levels are lower and improve during Democratic presidential terms and are higher and decline during Republican

presidential terms. Perez-Liston et al. (2014) suggest that political variables not only influence stock returns, but also influence the way investors feel about the market. Bonaparte et al. (2017) show that people's optimism towards financial markets and the macroeconomy is dynamically influenced by their political affiliation and the current political climate. Individuals become more optimistic and perceive markets to be less risky and more undervalued when their preferred party is in power.

Combined with the prior literature which concentrates more on the bilateral relations between stock returns and political variables, these findings left us a question, if we include three variables, which are political factors, investor sentiment and stock market returns, in a system, then what is the role of investor sentiment among their relationship.

Since people's behaviours and sentiment are also been observed and studied in psychological field, we try to explore our question in a new perspective. There are many applications of the mediator and moderator hypothesis in psychological studies. For example, Woodworth's (1925) S-O-R model, which recognizes that an active organism intervenes between stimulus and response, is perhaps the most generic formulation of a mediation hypothesis. The central idea in this model is that the effects of stimuli on behaviour are mediated by various transformation processes internal to the organism. Schneider et al. (1963) suggest that choice may moderate the impact of incentive on attitude change induced by discrepant action, and this effect is in turn mediated by a dissonance arousal-reduction sequence. Baron and Kenny (1986) distinguish between the properties of moderator and mediator variables from conceptual, strategic, and statistical considerations. Their purpose is to clarify the different ways in which conceptual variables may account for differences in peoples' behaviours.

We use the framework provided by Baron and Kenny (1986) and try to study the mechanism in the three variable system including political cycles, investor sentiment and stock market returns. We contribute to the literature by exploring the research questions in economics and finance from a social psychological perspective.

In our first hypothesis, investor sentiment functions as a mediator and channelizes the

effect of political cycles on stock markets. In this case, political cycles not only directly impact stock markets but also indirectly impact stock markets via the mediator (investor sentiment). The three-variable system is triangular and has three paths including the path from political cycle to stock market, the path from political cycle to investor sentiment and the path from investor sentiment to stock market. Political cycle is causally antecedent to investor sentiment. This is the mediator hypothesis we propose for the system.

In the second hypothesis, we assume that political cycle and investor sentiment are at the same level antecedent to the outcome variable (stock market). Then the three-variable system also has three paths including the main effect of the predictor (investor sentiment), the main effect of the moderator (political cycle), and the interaction term of political cycle and investor sentiment. We test whether political cycles moderate the effect of investor sentiment on stock markets. If political cycle is a moderator, it influences the direction and strength, or any of them in the relation between an independent and dependent variable.

This paper contributes to literature in two ways. First, we test two mechanisms in the three-variable system, and the mediator and moderator hypothesis bring us a new social psychological perspective into the relations among political cycles, investor sentiment and stock markets. Second, we also calculate the magnitude of the indirect effect, the part which is mediated by investor sentiment and compare that with the magnitude of the direct effect of political cycles on stock markets, which gives us a more precise look into the different paths in the system.

We adopt four sentiment indicators, including the news-based Economic Policy Uncertainty Index (EPU) of Baker et al. (2016), the widely-used Baker and Wurgler's (2006) sentiment index (BW), the Conference Board Consumer Confidence Index (CCI) and the University of Michigan's Consumer Sentiment Index (MCSI). We use monthly excess returns of S&P 500 index from December 1965 to December 2018. There are 637 monthly observations, with 277 months under Democratic administration and 360

months under Republican administration. The dummy variable is used to indicate which party is in the presidential term. Our findings are summarized below. First, only BW and MCSI function as a mediator between political cycles and stock markets. The mediation effect of CCI is not significant. EPU does not change significantly when the president switches from a Republican to a Democrat. Second, 16.34% and 4.87% of the total effect of political cycles on stock market returns are mediated via BW and MCSI respectively. Although the direct effect is significantly reduced, it still accounts for the major part of the total effect. Third, although the effect of investor sentiment on stock markets shifts across different political parties, the moderator hypothesis does not apply here. Since political cycle is significantly related to stock market returns and investor sentiment, it cannot provide a clearly interpretable interaction term according to Baron and Kenny (1986).

The rest of the paper organizes as follows. Section 2 presents the literature review. Section 3 develops the hypotheses. Section 4 describes the data and variables. Section 5 introduces the methodology. Section 6 discusses the empirical results and section 7 concludes the remarks.

## **2. Literature review**

### **2.1 Political cycle and stock market**

#### **2.1.1 The rational partisan theory**

It is suggested by the rational partisan theory (RPT) that electoral and political uncertainties influence business cycle. Firms' abnormal returns can be impacted by presidential elections for the different economic policies of the elected political party. The government policies almost have influences on all aspects of economic and social life. Individuals have to choose between present welfare and future welfare. In a political framework provided by Nordhaus (1975), the public intertemporal choice is studied between inflation and unemployment. It is indicated by the famous Phillips



curve that there exists trade-off between the rate of inflation and the level of employment and output, which is regarded as the conventional macroeconomic wisdom. The evidences of voter behaviours show that voters are sensitive to both inflation and employment when they make electoral choices. Hibbs (1977) explores the postwar patterns in macroeconomic policies and outcomes under left-wing and right-wing governments in capitalist democracies. Governments are found to pursue macroeconomic policies which broadly match the objective economic interests and subjective preferences of their class-defined core political constituencies. For lower income and occupational status groups, their objective economic interests and subjective preferences may be a relatively low unemployment rate and high inflation level, while for upper income and occupational status groups, their interests and preferences may be the high unemployment rate and low inflation level. Of the two political parties, the unemployment rate has been driven down by Democratic and Labour administrations and lifted up by Republican and Conservative governments. Golden and Poterba (1980) test the validity of the political business cycle hypothesis which describes the macroeconomic policy process in the United States. Since the incumbent presidents could manipulate monetary and fiscal tools to strengthen their approval ratings, their paper takes this ability of incumbent presidents into consideration and estimates the potential political gains from economic expansion. The findings show that the stimulus needed to produce even small popularity gains is substantial. It is also examined in their paper that to which extent government economic policy has been impacted by the political environment. The results do not find strong evidence for the importance of the political business cycle theory to explain the macroeconomic policy process in the United States.

Following Hibbs (1977), Beck (1982) also studies the effect of the political party on unemployment rates for the postwar United States. But the results indicate that the political party has between one-third and one-half the effect on unemployment claimed by Hibbs. And in particular, during Democratic administration, the Kennedy and the Carter administration do not behave as Hibbs claims Democratic administration should.

During Republican administration, the Nixon administration does not behave as Hibbs claims Republican administrations should. Furthermore, Beck explores the question whether administration or political party has better predictive power of economic outcomes. Beck suggests that Party label does matter but the nature of the core coalition behind each administration provides a clearer account.

Previous macroeconomic theories provide many insights in the analysis framework regarding political business cycles, and Chappell and Keech (1986) look into the differences in the political party. Their results show that Republican presidency is observed with the recession at the beginning of a term followed by faster growth at the end of a term, while Democratic presidency is observed with the faster growth at the beginning of a term followed by the recession at the end of a term. In their model, there are two presidential terms that best match the political business cycle theory, which are Nixon from 1969 to 1972 and Reagan from 1981 to 1984, both under Republican administration. Alesina (1987) takes the interaction of two political parties into consideration, including their different objectives about inflation and unemployment as well as the forward-looking wage-setters. Alesina's model follows discretionary policies, and the equilibrium of an economic cycle related to the political cycle significantly differs from the conventional political business cycle. The repeated interaction of political parties, which contributes to a common policy rule, reduces or even eliminates the magnitude of the economic fluctuations. The repeated interaction of two parties also brings down the excess volatility of government policies, which benefits all aspects in social life since it is highly costly when the government policies change frequently and drastically due to the switch from one political party to another in power.

Nordhaus and Sachs (1988) support the partisan view of U.S. monetary policies and demonstrate that there are different macroeconomic outcomes during Democratic presidencies and Republican presidencies. Compared to Republican presidents, Democratic presidents concentrate more on the output target than the money growth target. And the new policies exhibit stronger impact in the early term of a new president.

A short-term Phillips curve could be used if a more expansionary administration is elected, but the same expansionary policy does not have such strong impact on real outcomes when the economy has fully adapted to the new presidency. In Balke (1991)'s partisanship model of monetary policy, the voters were rational both in setting expectations and voting for the party. The voters pick the low inflation party when the economy is in expansion period and pick the high inflation party when the economy experiences recession. In a word, the voters choose the party whose policies best fit the current economy, so election outcomes are endogenous in this model. When the voters chose the party, they are forward-looking, thus the partisanship model of monetary policy does not necessarily imply the rise in the economic volatility as the political business cycle model does. The political parties facing the pressure may be pushed together into the center but their partisanship elements would not lead to the convergent platforms. Political parties have to make choice between reelection goals and the objectives of their constituency. Herron (2000) investigates the British general election in 1992, which was lost by the Labour Party and tries to explain the relations between the prices of publicly traded securities and the expected economic outcomes of general elections. Herron assumes that investors would face serious financial penalties unless they accurately assess the economic impact of shifts in government partisanship. The estimation results show that the government partisanship effect exists in the British general election in 1992. The prices of publicly traded securities deliver useful information about election campaign and the outcomes of political partisanship. The results also imply that if Labour party won the 1992 election, British interest rates were expected to have increased by approximately one percent, the stock markets were expected to have declined at least five percent, and the volatility was expected to rise.

The uncertainty about the outcome of elections will generate output growth fluctuations during post-election period, indicated by the Rational Partisan Theory of business cycles. Carlsen and Pedersen (1999) thus estimate the electoral uncertainty for 62 elections in seven countries and find mixed results for the Rational Partisan Theory. In countries like UK, Canada and Australia, the findings are consistent with the Rational

Partisan Theory, while in U.S. and Sweden, the findings are against the Rational Partisan Theory. In West Germany and Norway, they don't get conclusive results.

Snowberg et al. (2006) analyze the fluctuations in the U.S. stock market following the release of flawed exit poll data on the election day in 2004. They find that during the vote count, market was expected to have higher stock prices, higher interest rates, higher oil prices and a stronger dollar under the administration of Bush than under the administration of Kerry. The presidential election in 2000 also saw a similar Democrat-Republican difference in the contest of Bush and Gore. All presidential elections since 1880 were analyzed and a similar pattern of partisan effect is found that Republican administration lifts up the equity valuation, and since Reagan, Republican administration also tend to rise bond yields. Knight (2006) examines the performances of 70 firms under Bush or Gore administration during the U.S. presidential election in 2000. The results show a significant difference in the returns between Bush-favored firms and Gore-favored firms. The most sensitive sectors include tobacco, Microsoft competitors and alternative energy companies. Seltzer and Hutto (2016) investigate the influence of the administration of Barack Obama on people's perceptions of the economy. They use survey questions asking about the macroeconomy state and individual's own financial situation. The results show that Blacks give a more satisfied assessment of the macroeconomy state than Whites do after the presidential election in 2008, while there is a gap in the assessment between White Republicans and White Democrats. Their study hints that partisanship is the most important factor when the individual assess the macroeconomy state and their own financial situation. The assessment takes the political, social, and economic spectrums and the actual fiscal environment within the country into consideration. Seltzer and Hutto confirm in their study that Obama effect exists and Blacks prioritize the group interest over individual interest. Moreover, Obama effect extends to low-income class in Whites, implying that class is also an important factor in determining individual's perceptions of the economy.

Rational partisan theory suggests better performances for firms under right-leaning governments administration than under left-leaning governments administration, and

this should be partisan effects anticipated by investors in the pre-election period. Füss and Bechtel (2007) investigate such anticipated partisan effects in Germany by using conditional volatility models. Their results show that there is a positive relation between the small-firm stock returns and the probability of a right-leaning governments winning the election, while there is a negative relation between the small-firm stock returns and the probability of a left-leaning governments winning the election. Moreover, they find that the volatility rises with the improvement in the electoral prospects of the right-leaning parties, and the volatility reduces with larger electoral uncertainty.

Liano et al. (1999) compare the day-of-the-week effect over different presidencies of political parties. Their finding reveals that the day-of-the-week effect exists in the stock market under both parties. However, the pattern of the day-of-the-week effect differs across the two parties. The traditional pattern still exists during Republican presidencies, while the pattern changes during Democratic presidencies. In particular, the negative returns on Monday are more pronounced under Republicans than under Democrats. They point out that prior research did not take the change in the pattern in the day-of-the-week effect into consideration, so the future studies should notice this change across the presidential administrations. Wang and Wong (2015) examine whether there exist rational speculative bubbles, which represents a persistent stock market overvaluation, under Democratic administration and Republican administration. Their results show the presence of rational speculative bubbles under Republican administration but not under Democratic administration. As for the cause of the rational speculative bubbles, they suggest that bank credit to private sectors could be a major cause, and demand for assets, proxied by the savings rates, may also play a part. Blinder and Watson (2016) argue that the U.S. economy performs better under a Democratic president than under a Republican president. They provide evidences in real GDP growth and find a large and significant gap in performances. They analyze the reason and point out that it is not because of the systematically more expansionary monetary or fiscal policy during Democratic presidential terms. Rather, it seems that there appears to be more benign oil shocks and better total factor productivity performance under Democratic

administration. Besides, a more international environment is favored and consumers have more optimistic expectations about the forthcoming future when the president is a Democrat.

The cyclic and partisan patterns also contradict the random walk hypothesis, which is a proxy for examining the informational efficiency in the stock markets. Alvarez-Ramirez et al. (2012) demonstrate that the stock market behaviours in U.S. markets deviate from the random walk hypothesis. The deviations include the business cycles that are related to macroeconomic conditions, and a political partisan effect where the informational market efficiency is improved under Republicans and declined under Democrats. Therefore, there is opportunity to obtain the profit for well-informed investors with a diversified portfolio if they exploit the cyclic and partisan patterns in the stock market. Their paper demonstrates that the stock market contains information of the macroeconomic conditions and government policies during the presidential tenure.

Faraji et al. (2020) explore how political connections and political cycles affect the emerging market like Iran. Their findings indicate that political connections in a centrally planned economy matters and the importance becomes more evident during election periods. Their results support the political economy perspective in prior literature. Moreover, they find evidences that investors response to political uncertainties generated from presidential elections and possible power transfer, which consists with the rational partisan theory. They conclude that the political cycles impact the stock returns but the effect on politically connected firms can be different from time to time. Acker et al. (2018) investigate whether the firm directors' personal donations impact the political connections in UK firms. They study the sensitivity of company returns to opinion polls during the 2010 General Election and find that companies making donations only to the Conservatives are highly sensitive to the victory of the Conservative Party in the presidential election. However, there is no significant evidence within industries that the company whose directors make donations is more sensitive than the company whose directors do not. The results demonstrate that the

domestic political risk in UK, proxied by opinion poll changes, is priced around presidential elections. Lee et al. (2019) investigate the effect of political connections on stock returns in Taiwan. There are two main political parties, namely Kuomintang and Democratic Progressive Party. Due to the export-orientation showed in Taiwan's stock market, the different perspectives of the political parties may change the current trade treaties and affect the stock market performance. They make a comparison of the export rate during the leadership of Kuomintang and Democratic Progressive Party. The results indicate that there is a positive relation between the export rate and stock returns during the leadership of Kuomintang. The positive relation is stronger for firms with high export rate and political connection to Kuomintang than firms with low export rate and political connection to Democratic Progressive Party. The results also confirm the negative relation between the export rate and stock returns during the leadership of Democratic Progressive Party. Shen et al. (2017) investigate the impact of political factors such as government policy and political connections on stock returns during the presidential election. Their results show that firms which gained benefit from the proposed policy of the winning party exhibit positive stock returns during the election, while firms which were threatened by the proposed policy exhibit negative stock returns during the election. The effect of political connections is weak but become stronger with the rise in the support ratio of the winning party in polling data. Unlike the political connections, the government policy exhibits significant effect on different crash-risk and corporate-governance levels. And the investors could obtain positive abnormal returns by using the investment strategies based on political factors.

Stone and Jacobs (2020) present novel findings about presidential elections and business cycles. Unlike the previous studies which provide strong evidence for a Democratic advantage in economic growth but only weak evidence for a rise in growth prior to election when incumbent president is from either political party, Stone and Jacobs find a much smaller Democratic advantage in economic growth and strong evidence for a rise in growth prior to election when incumbent president is from Republican party rather than Democratic party. They attribute their new finding to the

use of repeated party-change reversals in adjacent terms. They also detect a strong partisan Federal Reserve effect on growth.

### **2.2.2 The presidential stock market puzzle**

The Wall Street has a folklore about the stock market behaviours pre- and post-presidential elections. It appears that the stock market has better performances under Republican administration at least in the short run after elections. The Wall Street reveals that it is the problem of price dependency that behind this folklore. Trading rules which earn positive returns need to correctly anticipate the election outcome and act quickly to the news of the victory of a particular party in the presidential election. And it is found that trading rules which are triggered by a victory of a Republican president or the correct anticipation of such a victory consistently provide opportunities for profit. There is statement about the different constituencies and the economic policies of the two political parties such as the Democratic party is the party of labor, and the Republican party is the party of business. The stock market, as a leading indicator of economic activities, reflects the voters' mood and the investors' expectations about the future.

The market movement around the presidential election is in line with the conventional belief of Wall Street about the market's preferences for Republican presidents in power. If the Republican bias exist, investors should expect the significantly better performances under Republicans than under Democrats. However, Niederhoffer et al. (1970) find no long-run patterns in market movements, so the Republican bias of Wall Street cannot be justified. Although there seems to be no systematic differences in the market performances under Democrats and Republicans, they do detect the significantly better performances during the third year of Democratic presidencies than during the third year of Republican presidencies. MacRae (1977) proposes a political model of the business cycles and shows that, if a myopic electorate is assumed, vote-loss-minimizing behaviour by the party in power, which is subject to a dynamic inflation-unemployment relation, generate a stable electoral policy cycle. MacRae



provides empirical evidences that Democratic presidents appear to undertake policies which assume that the voters are interested in short-term objectives, while Republicans tend to pursue policies which assume that the electorate vote to achieve long-run economic considerations.

Despite the fact that the economy fluctuates with the presidential electoral cycle at the same time, which often preoccupies political leaders, it is suggested by Tufte (1994) that the real political impact on the economic performance of the industrial democracies depends on the economic priorities. The ideology of the political party in power determines the macroeconomic performances, and is proved to be the single and most important determinant. The electoral calendar contributes to the time setting of policies, so the ideology of political party leaders helps shape the substance of economic policies. Anderson et al. (2008) conduct their research in Australia and New Zealand for the consideration of their political systems which allow for examining the impact of political parties precisely. They argue that the different focus on the unemployment and inflationary patterns under left-leaning government and right-leaning government lead to different consequences for the equity market. They detect higher inflation under left-of-centre governments and this flows through to higher property returns during presidencies of left-of-centre governments. The stock markets tend to perform better during presidencies of right-of-centre governments when inflation is lower. But there is no clear political cycle effect in total bond returns. They observe the bond capital losses during presidential tenure governed by the left-wing party and evident capital gains during presidential tenure governed by the right-wing party.

Johnson et al. (1999) examine the patterns for small-cap stocks and large-cap stocks. Their results show that the returns of small-cap stocks are significantly higher during Democratic presidencies, which are over four times higher than that during Republican presidencies. However, the returns of large-cap stocks do not show significant differences during Democratic or Republican presidencies. They also examine the patterns of stock returns in the first and the second halves of presidential terms. The finding indicates the substantially higher stock returns in the second half of the

presidential term. The difference in stock returns is persistent across political parties, and stronger under Democratic administration. Hudson et al. (1998) analyze the stock market movement in UK and get different results in short-run and long-run. The results in short-run price movements show that the stock market reacts both to the elections and the opinion polls in the run up to elections. And they do observe a clear preference for Tory governments when compared to Labour governments in stock market performance. However, the results in long-run price movements show that there is no statistically significant difference in the stock market performance under Tory governments and Labour governments. And there is no evidence indicating that either party is able to manipulate the economy for election purposes. Therefore, the results for the long-run stock price movements do not consist with the short-run stock price movements. They also examine some important macroeconomic variables and reveal that although Tory governments do not perform better in either real GDP growth or increase in company profits, but have seen significant lower average inflation level and higher average real interest rates.

Santa-Clara and Valkanov (2003) test the value-weighted portfolio and the equal-weighted portfolio, and confirm that the excess return in the stock market is higher under Democrats than under Republicans. Higher real stock returns and lower real interest rates contribute to the statistically significant and robust return differences. But they cannot explain the return differences by simply using the macroeconomic variables which are related to the business cycle. And they find that the return differences are not concentrated around the presidential election days. Besides, no difference in the riskiness of the stock market across political parties can be observed to justify a risk premium. Thus, they conclude that the return difference is a presidential puzzle of political cycles and the stock market. Leblang and Mukherjee (2005) investigate how government partisanship and traders' expectations of victory in the presidential election impact the mean and variance of stock prices. They construct a model of speculative trading and the results reveal that higher inflation under left-wing party reduces the trading volume of stocks in the market, and the fall in the trading volume results in

decline in the mean and variance of the stock prices. This happens not only during the presidencies of the incumbent left-wing party, but also happens when investors expect the victory of left-wing governments in elections. On the contrary, lower inflation under right-wing party rises the trading volume, and higher trading volume results in increase in the mean and variance of the stock prices during the presidencies of the incumbent right-wing party and when investors anticipate the victory of right-wing governments in elections. Belo et al. (2013) study the government spending channel through which political cycle has impact on the stock prices. They evaluate the stock market performances of firms which have different exposure to government spending. Their results show that firms in industries with high exposure to government spending have better performance than firms in industries with low exposure to government spending under Democratic administration, while the former underperform the latter under Republican administration. Their finding extends Santa-Clara and Valkanov (2003) by revealing that the presidential puzzle in the stock market is mainly concentrated in industries which have high exposure to government spending. And this anomaly is particularly large among firms in the U.S. that have disproportionate benefit from the federal funds. They also confirm that the presidential puzzle in the stock market cannot be explained by business cycles, firm characteristics, and standard risk factors. Cahan et al. (2005) find that in New Zealand the stock market returns are lower under the administration of the left-leaning Labour party and higher under the administration of the National party. They suggest that although New Zealand and U.S. has similar party democracies, the presidential puzzle in stock market does not simply transfer from one country to another. Döpke and Pierdzioch (2006) find similar results in Germany that the stock market tends to perform better under left-wing party than under right-wing party. They do not detect the presidential election cycle effect in German stock market. They suggest that the stock market reflect the agents' expectations about the future state of the economy. There exists the possibility that stock market movements explain the governments' popularity. The explanatory power may reflect a sociotropic reaction, a psychological element, or a kind of pocketbook voting. There are researchers trying to

study how the political landscape as well as the monetary conditions connect to the stock market performances. Beyer et al. (2004) explore the long-run stock returns by taking two dimensions of the political landscape into consideration, which are political gridlock and the party label of the president. They also consider the Federal monetary policy. Unlike the popular belief, their findings show that political gridlock does not benefit the stock market performances. There exist strong relations between the long-run stock market returns and the changes in the Federal monetary policy, but the relation is weak between the long-run stock market returns and the shifts in the political landscape. As for the influence on the stock market, the monetary policy dominates the political landscape, whichever dimension considered. They suggest that investors should concentrate more on the actions of Federal Reserve and the monetary policy than the election outcomes and political considerations.

Bohl and Gottschalk (2006) test whether the presidential puzzle and the presidential cycle effect is global phenomena, and the results are not strikingly conclusive. Only the evidences in Denmark, Germany and the U.S. support the Democrat premium hypothesis that stock returns are higher under the left-wing party. Similarly, only the evidences in Austria, Canada and the Netherlands support the presidential cycle effect which implies higher stock returns during the last two years of the tenure than during the first two years of the tenure. And the panel regressions reject both anomalies in the stock market thus concluding that the presidential puzzle and the presidential cycle effect are not prevalent widespread phenomena. Bialkowski et al. (2007) examine the Democratic premium in 24 OECD countries and find the return differences between left-wing and right-wing party are not statistically significant during the election period or throughout the presidential term. The Democratic premium observed in the U.S. seems to be country-specific anomaly. It is suggested that investors with internationally diversified portfolios should not allocate their assets based merely on the political orientation of the countries' leaders.

Pastor and Veronesi (2017) try to explain the widely-discussed presidential puzzle of Santa-Clara and Valkanov (2003) by constructing a model of political cycles driven by

time-varying risk aversion. In their model, agents choose to work in the public or private sector and to vote Democrat or Republican. In equilibrium, when risk aversion is high, agents vote Democratic party who promises more redistribution. The model can also be used to explain the faster economic growth during Democratic presidential terms. Their results confirm the connection between the risk aversion and voting preferences. They show that Democratic voters have higher risk aversion, and the risk aversion declines under a Democratic president. Furthermore, the model also predicts that public workers elect Democrat while entrepreneurs elect Republican. Jha et al. (2018) study the effect of the political leanings and social capital of the region around firms' headquarters on corporate and individual decisions. The ratio of votes cast for Democrats to those cast for Republicans in presidential elections is calculated to proxy for the Democratic political leanings. Their results show that counties with more social capital are more likely to exhibit higher Democratic political leanings. They conduct additional tests and find that this positive relation between the social capital and Democratic political leanings is stronger in counties with higher incomes and less religiosity.

Sy and Zaman (2020) discuss the question left in Santa-Clara and Valkanov (2003) that whether the higher stock returns during Democratic presidencies represent abnormal return, risk premium, or merely statistical fluke. Sy and Zaman consider the possible explanation like spurious-regression bias, data mining, or economic policy uncertainty. They investigate this question by decomposing the presidential premium into expected and unexpected components, and find that unexpected components account for over two-thirds of the presidential premium. This does not support the spurious regression bias explanation. They also reject the other two explanation since the presidential premium persists during the post-publication period, and remains robust even if they purge returns of the covariation with economic policy uncertainty.

Montone (2022) discovers a new channel to explain how political opinions influence investor behaviours. Montone considers nonpartisan evaluations of the executive from Gallup's presidential approval rating polls instead of the political affiliation used in

prior literature. Since parties are often divided within their own ranks, it brings up the concern about political evaluations not necessarily according with party lines. The finding shows that low stock returns follow the large net disapproval over the U.S. president's job, especially during high political uncertainty and low market-wide sentiment period. Montone's finding to some extent help explain the presidential puzzle. Overall, it is also suggested that nonpartisan political views have a substantial effect on stock market.

### **2.2.3 The presidential cycle effect**

Allvine and O'Neill (1980) observe that the stock prices increase relative to the trend over the two years before a presidential election. They then examine the trading strategy which buys stocks on the last trading day of October two years preceding the presidential election, and sells stocks on the last trading day of October prior to the election. From 1960 to 1978, this buy and hold strategy returned 2 percent per year. Previous literature asserts that stock prices have random walk in the market, so the prices movements are unpredictable and unexploitable, but many researchers failed to test the efficient market hypothesis against a powerful alternative, which in Allvine and O'Neill's paper, is the four-year presidential election cycle of stock prices. Their conclusion is that except over the short periods like day, week or month investigated by researchers, changes in stock prices are not random. Herbst and Slinkman (1984) suggest that the electorate affect the stock prices, which reflects common expectations of the government economic policies or solely the consensus perception of political cycle. They find there exists both two and four-year presidential election cycles. The four-year cycles reach the maximum in the November during the presidential election years, while the two-year cycles peak in the ninth month after the presidential election. Their results strongly support the four-year presidential election cycle, but only provide weak evidence for the two-year presidential election cycle. Huang (1985) offers some evidences on the pattern of stock returns across different presidencies and over the four-year election cycle. The results show that the political control of the economy appears

to be stronger and more deliberate since 1960. Previous research left a myth of the stock market that traditional belief views the Republican party as the party of business but higher average stock market returns is observed during Democratic presidencies. Huang adds to the literature by revealing the higher annual return in Year 1 and 2 of the presidential cycle from 1961 to 1980, and Year 3 and 4 of the presidential cycle from 1929 to 1980. And Huang also points out the reason why some earlier researchers do not find evidence of the different stock market performance over Democratic presidencies and Republican presidencies. It may be because they confined their research in large-capitalization stocks.

Rogoff and Sibert (1988) study the taxes, government spending and money growth in the election cycle and add these factors into an equilibrium signaling process. They argue that the presidential election cycle is driven by temporary information asymmetries such as more current information owned by government at issues like providing national defense. The incumbent party has the least possibility to cheat when the private information hold by them is either extremely favorable or extremely unfavorable. The increase in the popularity of the incumbent party does not signify a damped government policy cycle. Stovall (1992) finds that since the presidential election of William McKinley in 1900, the fluctuation in the stock market around the presidential term is observed by many researchers. The presidential term of Woodrow Wilson, Franklin D. Roosevelt, Richard M. Nixon and Jimmy Carter witnessed a short initial honeymoon market for days or weeks. Stovall observed the longest initial honeymoon market at the inception of the second presidential term of Ronald Reagan and the inception of the presidential term of George Bush. In mid-July 1990, the stock market had a decline due to the invasion of Kuwait by Iraq. During each presidential term, stock prices fall from the peak in the honeymoon period, and drop part or all of their previous gains. Herbert Hoover is the only president who witnessed the stock market decline over the four years during the presidential term. But the quadrennial pattern occurred, as the market recovered in the final months during the tenure of Herbert Hoover. Stovall explains the presidential cycle pattern as the initial passion for

a new president, followed by a rise from the prior low level, either because of the high probability of returning of the popular president for another tenure, or an unpopular one who is in the process of leaving.

Aggarwal and Schirm (1992) study the effect of political business cycle on the predictive ability of January returns documented by prior literature. Their results show that in the years after presidential and congressional elections, January returns is an important indicator of the stock performance in the rest of the year. The predictive power of January returns is proved to be weak for other years, but it appears to be significantly impacted by the political business cycle. Aggarwal and Schirm confirm the significant relations between stock market seasonality and the political business cycle. And they suggest that the higher predictive ability of January returns may reflect higher levels of isolation release and uncertainty resolution especially in January followed by congressional and presidential elections. Gemmill (1992) detects a close connection between opinion polls and the stock prices during the 1987 election in UK. In the last week of the election, the options prices showed gross inefficiency, implying a declining chance of victory of Conservative party while the polls indicated the opposite. The gross inefficiency was large for speculators pursuing a volatility arbitrage. The results indicate that a speculative bubble may exist in the options. The ill-informed investors rush into the options market during the last week of the election, attracted by the talk of Japanese wall of money and investment in UK following the election. Dobson and Dufrene (1993) investigate whether there are different relations between the S&P 500 and major stock indexes on the London, Tokyo, and Toronto exchanges over election periods and non-election periods. Their result reveals a significant structural change in the relations between these markets surrounding the U.S. presidential elections. The stock market in UK, Japan, and Canada shows a highly stronger correlation with U.S. market around the U.S. presidential election. Dobson and Dufrene suggest that additional diversification may be needed for international portfolio managers in the election periods since the stock market tends to move together. The risk of international portfolios rises during election periods because a high



uncertainty level precedes the election outcome. Their findings also address the important role of politics and economics in determining the shareholder wealth and the functioning of financial markets.

Gärtner and Wellershoff (1995) provide evidence for the four-year presidential election cycle followed by the U.S. stock market for more than three decades. They find the stock prices decline during the first two years of the presidential term, and increase during the last two years of the presidential term. Investors could gain profit by taking advantage of the presidential election cycle as compared to the simple buy-and-hold strategy. Hensel and Ziemba (1995) conduct their study by using small-capitalization stocks and large-capitalization stocks and find the results differ across the Democratic party and the Republican party. They observe significantly higher returns under Democratic presidents than under Republican presidents. And they also observe a significant small-cap effect outside January under Democratic administration. Large-capitalization stocks do not show significant differences in returns under Democratic and Republican presidents. For both small-capitalization stocks and large-capitalization stocks, returns are significantly higher during the second half of the presidential tenure than during the first half of the presidential tenure. Foerster and Schmitz (1997) find significantly lower and negative stock returns in U.S. market in year 2 following a presidential election when compared to years 1, 3 and 4. They suggest that the presidential election cycle in U.S. is either proxying for information not included in their model or capturing investor sentiment in U.S. and international market. The presidential election cycle is a significant political factor which cannot be diversified and determines the international conditional expected stock returns. Pantzalis et al. (2000) show a positive abnormal return during the two-week period precedes the election week. They find that the positive response of the stock market to presidential elections is not only a function of the degree of freedom in political, economic and press of a country, but also a function of the election timing and the probability of the incumbent party to be re-elected. The large positive abnormal returns may indicate the victory of the opposite political party in the election and the failure of the incumbent

party in countries with less degree of freedom. Their results support the uncertain information hypothesis proposed by Brown et al. (1988) and the model of election behaviour of Harrington (1993). Lamb (1997) reports on the calendar effect in the U.S. stock market, which reveals the relations between the stock market performance and the schedule of the U.S. Congress. Lamb finds that almost all the surge in the stock prices since 1897 was related to the recess period of Congress. Moreover, the average daily returns in the recess period of Congress are almost thirteen times that when Congress is in session. Throughout the year, cumulative returns when Congress is not meeting are eight times higher than that when Congress is in session.

Booth and Booth (2003) also conduct the study on small-cap and large-cap stock returns and find both returns exhibit a presidential cycle pattern that the performances are better in the last two years of the presidency than the first two year of the presidency. Since it is indicated by the political business cycle theory that monetary and fiscal measures adopted by presidents are usually translated into the business cycle, Booth and Booth try to use the conventional business cycle indicators including the term spread, dividend yield and default spread to explain this presidential cycle pattern. But what they find is that the explanatory ability of presidential cycle pattern is beyond the conventional business conditions proxies. Stock returns express low sensitivity to the dividend yield in the last two years of the presidency. The presidential cycle effect still exists after controlling for the party in power and the incumbent versus nonincumbent presidents. Wong and McAleer (2009) provide evidence and confirm that stock prices in U.S. market follow the four-year presidential election cycle. In general, stock prices decline in the first two years of an administration, reach a bottom level in the second year, then increase during the last two year of an administration, and reach a peak in the third or fourth year. This cyclical pattern holds for most of the presidencies, especially when the incumbent president belongs to Republican party. Their results show that Republicans may have greater chance to engage in active policy manipulation to acquire the victory in re-election than Democrats. Chrétien and Coggins (2009) argue that investment opportunities are not different over minority parliaments and majority

parliaments. Only money market returns show difference across Conservative party and Liberal party. Chrétien and Coggins also confirm the presidential election cycle effect that the better performance in stock market is observed in the late half of the election cycle than in the first half the election cycle. The U.S. election outcomes also exhibit the impact on the Canadian dollar. However, there is no significant variation in risk or expected state of the economy which could account for the differences in returns. Jones and Banning (2008) hold the opinion that both election results and political cycle offer limited help in explaining the stock market returns. They use a much longer sample period up to 104 years and the results show that there is no significant difference in stock market returns when the partisan control of the Senate or the House changes. Besides, the common belief of presidential cycle effect, which predicts higher returns during the last two years of a presidential tenure, is proved to be weaker and less straightforward.

Shaikh (2017) explores the stock, FX and VIX markets after the U.S. presidential election 2016 and the results confirm the profound effect of the U.S. presidential election in equity and FX markets across the global financial markets. The finding reveals that markets are inefficient in the short-term, and abnormal profit could be obtained from the markets. Besides, the victory of Republican president in the election exhibits positive impact on FTSE100, DJIA, Top40, EuroStoxx50 and Nikkei225, but negative impact on Nifty50, S&PASX200, and IPC equity markets. The proposal in the international trade by Trump leads to substantial loss in the global currency market against the U.S. dollar. The Asia-pacific markets show Bearish-run election effects during the election period but Bull-run effects during post-election period.

Khemani (2004) studies the presidential elections and public policies in Indian, a developing country with a history of regular elections and stable democracy. The results show a pattern of policy manipulation which refers to targeting the special interest groups during the election year to obtain their support in the election campaign. Khemani also proposes an alternative theory to explain the stronger incentives for re-election as approaches the election times, which is the political myopia in face of high

policy uncertainties in each year of the presidential tenure. Jayachandran (2006) demonstrates the Jeffords effect which reveals that shifts in the political landscape strongly affect the market value of firms. Jayachandran uses the soft-money donations from the firm to the political parties to measure the degree of the firm aligning itself to the political environment. The results show that the firm who donates soft-money to Republicans in the previous election cycle lost some part of the market capitalization during the week of Jeffords's switch. And the rise in the stock price related with the soft-money donations to Democrats is less than the loss related with the soft-money donations to Republicans. Siokis and Kapopoulos (2007) find evidences in Greece, a country with two main political parties and a high density of elections, that the stock prices on the Athens stock exchange can be partly explained by the shifts in the political environment. The political development in Greece impacts the conditional mean and variance of the stock market index.

Białkowski et al. (2008) study the stock market variance in OECD countries and investigate whether the larger stock market variance is induced by the presidential elections. They find the increase in the country-specific component of index return volatility during the week around the election, which may imply the surprise from investors about the election outcome. The magnitude of the election shock can be affected by many political factors such as a narrow margin of victory, lack of compulsory voting laws, switch in the political party in power, or unsuccessfully forming a government with parliamentary majority. Furthermore, evidences show that there may be a stronger response in the markets which have short trading history. Their findings are meaningful for the institutional and individual investors with direct or indirect exposure to volatility risk. Francis et al. (2013) explore the effect of political uncertainty on the institutional investors' behaviours, and their results indicate that institutional investors hold less common stock during election years. To be more specific, when a Republican is elected, institutional investors tend to sell large proportions of their positions and then keep their positions below the average level during the first year of the new presidential term. When a Democrat is elected,

institutional investors tend to buy large proportions of their positions and then keep their positions above the average level during the first year of the new presidential term. The uncertainty of the election outcome affects the institutional ownership during election years. And their results also show that institutional investors even get benefit from these holding strategies prior to the election. Addoum and Kumar (2016) highlight the role of changes in political climate in the stock market. They point out that there would be systematic shifts in the industry-level composition of investor portfolios when the political party in power transits from one to another. The arbitrage forces would be lower and predictable patterns can be observed in industry returns. Addoum and Kumar find evidences that the predictive power is stronger in times of transition of political party in power. There is also a trading strategy to exploit demand-based return predictability which gains an annual risk-adjusted profit. The demand-based predictability pattern found by Addoum and Kumar differs from the previous cash flow-based predictability pattern.

Kräussl et al. (2014) confirm the higher annual excess return of the S&P 500 during the last two years of the presidential tenure than during the first two years. And business cycle variables which capture time-varying risk premia, various risk levels, and investor sentiment do not account for this return pattern. They conclude that the presidential cycle effect cannot be easily explained by politicians employing their economic influence to stay in power. Chien et al. (2014) study the stock market returns after each election day and economic performances during the presidential tenure. Based on the theoretical framework of political economy, they examine the predictive ability of the reaction of Wall Street to a presidential election on the economic performance in the future. Their results show that the predictive power of stock market movement is stronger following the presidential election, especially in future GDP growth, but not in future unemployment rates. Their finding provides clues for predicting the potential economic output during presidential administrations. Blanchard et al. (2018) argue that the surge in the stock prices in U.S. market following the presidential election is due to the higher actual and expected dividends. The major reasons for the increase in stock

markets is because the economic performance improves and economic policy uncertainty declines around the world. Although part of the increase in stock markets is attributed to a fall in the equity risk premium, this decline is limited and the premium is about the level of the first half of the 2000s. Chavali et al. (2020) compare the response of stock market during the first presidential term of a party and the second consecutive term when the same party is in power. Their results reveal that the stock market has a positive response to significantly positive average abnormal returns, and the effect on the stock market differs between any two presidential elections even when the same party wins the election and has the second presidential term. Their finding supports the semi-strong form of efficient market hypothesis in the context of emerging markets like India.

Bonaparte and Kumar (2013) investigate whether political activism rise people's tendency to join in the stock market. They find that people who are active to political environment response more to the political news, which increase their opportunity of the exposure to financial news. Thus, the high exposure reduces costs of the information collecting and rises the tendency to engage in the stock market. The individuals who are politically active spend more time on daily news in politics and economy and seem to have more knowledge about the financial markets.

The presidential honeymoons refer to the first 100 days of the administration under a newly-elected president, which are often along with substantial and concentrated policy change. Chan et al. (2020) observe the rise in the uncertainty level and risk aversion during the presidential honeymoons. Besides, they also document striking spread returns to value, investment and profitability anomalies during this period.

Killins et al. (2021) examine the relation between Canadian stock market and political power, polarization, and economic policy uncertainty in Canada and the United States. They do not find strong evidence of significant liberal government return premiums and the corresponding risk for the overall market and many industry sectors. And for presidential election cycle effect, they only find evidence in the IT sector. The Canadian

equity market appears to have better performance during Democratic party in the United States. The venture, small-cap, and IT sector are impacted by the political polarization and trade uncertainty in Canada and the United States. The domestic economic policy uncertainty in Canada affects the overall Canadian stock market, small-cap, and venture firm returns, while economic policy uncertainty in U.S. affects the overall Canadian stock market, energy, industrials, retail, and transportation industries. They conclude that the effect of the alignment of political ideology in Canada and the United States is limited on the Canadian stock market. It is suggested that since the effect of political climate appears to be limited, dynamic and industry-specific, investors should distinguish their investment choices from the political views or affiliations and not mix them.

## **2.2 Investor sentiment and stock market**

### **2.2.1 Investor sentiment**

Tversky and Kahneman (1974) propose three heuristics that are employed when people make judgments in face of uncertainty, namely representativeness, availability of instances or scenarios as well as adjustment from an anchor. Representativeness usually occurs when people are required to make judgments about the chances of an object belonging to class. Availability of instances or scenarios is often employed when people are required to make assessment for the frequency of the plausibility of a particular development. Adjustment from an anchor usually occurs in numerical prediction when a relevant value is available. These three heuristics described by Tversky and Kahneman have important economic meanings and often result in bias in prediction. Tversky and Kahneman suggest that it is better to study these heuristics and the systematic and predictable errors they lead to, which would be useful in making judgments and decisions in face of uncertainty. Barberis et al. (1998) extend the research of Tversky and Kahneman (1974) on some important behavioural heuristics, and provide a parsimonious model of investor sentiment about the formation of

investors' beliefs based on psychological evidences. Their model produces underreaction and overreaction for a wide range of parameter values. The results support the previous finding on the failures of individual judgment in face of uncertainty and the trading patterns of investors in experimental situations, especially in line with the well-known behavioural heuristic, namely representativeness, describing the tendency of experimental subjects to view events as typical or representative of some specific class and to ignore the laws of probability in the process. They also find another behavioural heuristic, namely conservatism, defined as the slow updating of models in face of new evidences.

A simple overlapping generations model is provided by De Long et al. (1990) that irrational noise traders with erroneous stochastic beliefs both impact prices and obtain higher expected returns in the asset market. Noise traders' beliefs are unpredictable, which create risk in the asset price that prevents rational arbitrageurs from betting against them. In consequence, asset prices are significantly driven away from fundamental values even when fundamental risk is absent. Moreover, noise traders gain a higher expected return when compared to rational investors by undertaking a disproportionate amount of risk that noise traders themselves create. The results give a hint on many financial anomalies such as the excess volatility of asset prices, the mean reversion of stock returns, the underpricing of closed-end mutual funds, and the Mehra-Prescott equity premium puzzle. An equilibrium model of stock price behaviours is constructed by Campbell and Kyle (1993) who study the interaction of noise traders and smart-money investors. In their model, smart-money investors aim to maximize utility and have constant absolute risk aversion. The noise traders do not maximize utility but instead trade exogenously. The stock price in the market can be impacted by the noise traders because of the risk aversion of smart-money investors. Their results also show that a random supply of risky assets which has negative relations with fundamental value could lead to overreaction among the investors. If the labor income is related with risky asset returns, it would impact the demands of smart-money investors for risky assets. Shefrin and Statman (1994) develop a capital asset pricing



theory including the determination of the mean-variance efficient frontier, the return on the market portfolio, the term structure, and option prices in a market with both noise traders with cognitive errors and information traders who are free of cognitive errors. Shefrin and Statman explore the necessary and sufficient condition of price efficiency when noise traders exist and to which extent noise traders impact the price efficiency, volatility, return anomalies, volume, and noise trader survival. They find that the presence of noise traders undermines the relation between security returns and beta, but instead creates a positive conditional relation between abnormal returns and beta. Moreover, noise traders are not eliminated in markets where prices are efficient. Rather, price efficiency protects particular noise traders, implying a trader survival. Shleifer and Vishny (1995) point out that traditional models imply that arbitrage in a given security is through a large number of diversified investors who undertake small positions against the mispricing of asset value. However, in reality, arbitrage is performed through a relatively small number of investors who are highly specialized and use other people's money to undertake large positions. Such professional arbitrage may become ineffective in extreme circumstances and prices are driven far from fundamental values. Shleifer and Vishny also suggest that arbitrage cannot eliminate the anomalies in financial markets.

The noise-trader theory by De Long et al. (1990) implies that the coherent action from irrational investors on a noisy signal could lead to systematic risk. If noise traders impact the prices, the noisy signal is investor sentiment. The risk caused by them is volatility which is related to the investor sentiment. Brown (1999) finds the correlations between the unusual levels of individual investor sentiment and greater volatility of closed-end funds. Brown confirms the effect of noise traders on asset prices and additional volatility generated by their irrational behaviours. Furthermore, only when the market is open, this type of volatility occurs and it is related with heightened trading activity since noise traders influence prices only through trading. Brown also finds that closed-market volatility over weekends is associated with the change in closed-end fund discounts. Apart from the asset price and volatility, investor sentiment also exhibit

impact on the number of trades and average trade size. The number of trades in closed-end funds increases when there exists unusual bullish or bearish investor sentiment but the average trade size declines with unusual bullish or bearish investor sentiment. Brown gets a surprising finding that the overall trading volume is not impacted by noise trading, implying that rational investors based on the fundamental values leave their space to noise traders during the time period when sentiment is strong. By using the Investors' Intelligence sentiment index, Lee et al. (2002) employ a generalized autoregressive conditional heteroscedasticity in mean model to examine the effect of noise trader risks. Their results show that investor sentiment is a systematic risk that is priced. Excess returns have contemporaneous positive relations with changes in investor sentiment. Furthermore, the magnitude of bullish shifts in investor sentiment results in downward revisions in volatility and higher future excess returns, while the magnitude of bearish shifts in sentiment results in upward revisions in volatility and lower future excess returns. The results provide support to the Friedman effect and create-space effect suggested by De Long et al. (1990). Noise trading have permanent impact on expected return through its effect on the market's formation of risk. The positive association between shifts in sentiment and excess returns implies that the hold-more effect, which leads to the rise in risk premium, dominates the price-pressure effect, which has the negative influences on the expected return. Investor sentiment is thus not an individual investor phenomenon that only small capitalization stocks are impacted.

Wang (2001) constructs an evolutionary game model with a population dynamic for a large economy where the growth rate of wealth accumulation drives the evolutionary process. Wang tries to examine whether noise trader survive in this specification. The focus of the question is the survival of noise traders and investor sentiment. The results show that irrational investors who are pessimistic or with under-confidence cannot make survival, but irrational investors who are optimistic or with moderate overconfidence can survive and even dominate, particularly during the time with large fundamental risks. Wang's finding provides a clue for the survival of active fund

management and shows the importance of the psychology of investors when studying financial markets.

Lee et al. (1991) test whether the shifts in individual investor sentiment affect the fluctuations in discounts of closed-end funds. They find evidences supporting the co-movement of the discounts on various funds. Their results reveal that new funds get started when seasoned funds sell at a premium or a discount, and that discounts have correlations with other security prices impacted by the investor sentiment. Particularly, their finding shows the tendency of both closed-end funds and small stocks to be held by individual investors, and lower discounts of closed-end funds when small stocks perform well. It is suggested by the market folklore that the best time to purchase stocks is during the bearish sentiment period of individual investors, and the best time to sell stocks is during the bullish sentiment period of individual investors. Neal and Wheatley (1998) adopt three popular measures of individual investor sentiment, namely the level of discounts on closed-end funds, the ratio of odd-lot sales to purchases, and net mutual fund redemptions to test its predictive ability on stock market. Their results show that fund discounts and net redemptions have the forecast power of the size premium, which stands for the difference between small and large firm returns, but odd-lot ratio has limited forecast power of returns. Fisher and Statman (2000) explore three types of investors, which are small investors or individual investors, medium investors or writers of investment newsletters, and large investors or Wall Street strategists. What they find is that the sentiment of three types of investors do not move together. There is a significantly positive connection between shifts in the sentiment of individual investors and the sentiment of newsletter writers, but insignificant relations between shifts in the sentiment of Wall Street strategists and the sentiment of either individual investors or newsletter writers. They also find the predictive power of the sentiment of individual investors and Wall Street strategists, and the combination of the sentiment of the three types of investors on future S&P 500 index returns.

Barberis et al. (2005) examine two broad theories of return moving together in their paper. The traditional theory of co-movement based on the fundamental value is derived

from economies with rational investors and no frictions. The traditional theory argues that returns move together due to the correlation in news about fundamentals. The alternative theory argues that, return co-movement is driven away from the fundamental value because of market frictions or noise-trader sentiment. They take three specific variants of co-movement based on friction or based on sentiment into consideration, and label them the category, habitat, and information diffusion views. The fundamentals-based view is not sufficient to explain their finding and the alternative friction- or sentiment-based view may have explanatory power. Kumar and Lee (2006) use retail investors' trading activities to get direct measures of retail investor sentiment changes. They try to investigate the effect of retail trading patterns on co-movement in stock returns. The results show that retail investor sentiment have explanatory power on return co-movements for stocks with high retail concentration such as small-cap, value, lower institutional ownership, and lower-priced stocks, especially when these stocks have high cost to arbitrage, which supports noise trader models by Barberis et al. (2005). When retail investors become relatively bullish, the stocks in these portfolios show higher excess returns. On the contrary, when retail investors become relatively bearish, the stocks in these portfolios show lower excess returns. Kumar and Lee do not find evidence that macroeconomic news and analyst earnings forecast revisions have explanatory power on these results.

Antweiler and Frank (2004) investigate the messages posted on Yahoo! Finance and Raging Bull about the companies included in the Dow Jones Industrial Average Index. They find that stock messages have significant predictive power on stock market volatility. The stock messages exhibit statistically significant but economically small impact on stock returns. They also find that disagreement among the posted messages is related with the increase in trading volume. Brown and Cliff (2005) use a direct survey measure of investor sentiment and show its predictive ability on market returns over the next 1 to 3 years. And this measure of investor sentiment also has explanatory power on the deviations of stock prices from the intrinsic value. Brown and Cliff's results are consistent with important behavioural theories, which suggest the sentiment

of irrational investors affects asset price levels. The stock market thus needs to place emphasis on the role of investor sentiment. It is also suggested for market regulators and government officials to concern about the potential for market bubbles or irrational exuberance. Abrupt shifts in investor sentiment may lead to a negative wealth shock that impairs economic activities. Besides, individual investors should bear in mind that investor sentiment exhibit impact not only on their own but also on money managers' investment strategies. Baker and Wurgler (2006) challenge the classical finance theory which does not recognize the role of investor sentiment on the cross-section of stock prices, realized returns, or expected returns. They confirm the significant cross-sectional effects of the broadly defined investor sentiment in their paper. The results also indicate that the impact of investor sentiment is larger on securities who are hard to arbitrage and whose valuations are highly subjective. When the sentiment is low at the beginning of the period, subsequent returns are relatively high for small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme growth stocks, and distressed stocks. When sentiment is high at the beginning of the period, subsequent returns are relatively low for these categories of stocks. Baker and Wurgler suggest that a better understanding of investor sentiment is needed in corporate finance, which may provide new perspective when studying patterns in security issuance and the supply of firm characteristics. To improve the accuracy of the models estimating the prices and expected returns, an important role of investor sentiment needs to be incorporated. Lemmon and Portniaguina (2006) use consumer confidence to gauge investor optimism and study the associations between investor sentiment and the small-stock premium. They find the forecast power of investor sentiment on the returns of small stocks and stocks which have low institutional ownership. However, their results indicate that investor sentiment does not exhibit significant forecast power on time-series variations in momentum premiums. Wang et al. (2006) point out that previous researchers ignore the lagged returns information when examining the impact of sentiment on volatility, so it may be possible that prior literature overestimates the role of sentiment in predicting volatility. The results show

that most of sentiment measures are caused by returns and volatility rather than vice versa. Besides, they demonstrate that lagged return information causes volatility. The predictive ability of investor sentiment reduces when returns are incorporated as a forecasting variable. Tetlock (2007) studies how stock market interacts with media by extracting daily content from a popular Wall Street Journal column. The results indicate that high media pessimism has predicative power on the downward pressure on market prices, which is followed by a reversion to fundamentals, and unusually high or low pessimism leads to high market trading volume. Tetlock's findings support the theoretical models of noise and rational traders but are contrary to the theories which view media content as a proxy for new information about intrinsic values of assets, as a proxy for market volatility, or as a sideshow with no association to stock markets.

Verma et al. (2008) compare the relative impact of the sentiment of rational investors and the sentiment of noise traders on Dow Jones Industrial Average and S&P 500 returns. They find the sentiment of rational investors exhibits larger effect on stock market returns than the sentiment of noise traders does. There are immediate positive reactions of stock market returns to the sentiment of rational investors corrected by negative reactions in the upcoming periods. The past stock market returns have positive effects on the sentiment of noise traders rather than the sentiment of rational investors. Their finding is consistent with the economic fundamentals-based arguments of stock returns and supports that investor sentiment is a significant factor in determining stock returns. Ho and Hung (2009) incorporate investor sentiment as conditioning information in asset-pricing models and investigate whether the inclusion of investor sentiment is useful in capturing the size, value, liquidity and momentum effects on risk-adjusted returns of individual stocks. They use survey sentiment measures and a composite index to proxy investor sentiment. Their results show that the size effect reduces in the conditional asset-pricing models which incorporates the investor sentiment, and become insignificant in all the other models. Furthermore, the conditional asset-pricing models still capture the value, liquidity and momentum effects. Schmeling (2009) examines the effect of consumer confidence, measuring individual

investor sentiment, on expected stock returns. The results show that investor sentiment has negative forecasting power on aggregate stock market returns, which is consistent with previous evidences found in United States. During the time when investor sentiment is high, future stock returns tend to be lower, while during the time when investor sentiment is low, future stock returns tend to be higher. This relationship between investor sentiment and expected returns also holds for value stocks, growth stocks, small stocks, and for different forecasting periods. Schmeling provides a cross-sectional perspective and indicates that investor sentiment exhibits larger effect on stock returns in countries with less market integrity and higher cultural propensity to herd-like behaviour and overreaction. Ho and Hung (2012) investigate how investor sentiment predicts the return and volatility at the aggregate market level in the United States, four largest European countries and three Asia-Pacific countries. Their results show that high consumer confidence levels are followed by low market returns in the U.S., France and Italy. Both the level and shifts in consumer confidence rise the market return in Japan. Besides, conditional volatility is impacted by changes in consumer confidence in most of the countries.

Baker et al. (2012) construct investor sentiment indicators and decompose them into global and local sentiment indicators. Their results reveal that relative sentiment is associated with the relative prices of dual-listed companies. Both global and local sentiment negatively predict the time-series of cross-sectional returns within markets. During high-sentiment periods, future returns are low for stocks which are relatively hard to arbitrage. It seems that investor sentiment spreads across markets through the private capital flows and forms global sentiment. Chen et al. (2013) reveal that global optimism results in overvalued industry returns while global pessimism results in undervalued industry returns. They also show that higher local sentiment lifts up the returns of basic materials, telecommunications, and utilities industries. Their results confirm that the connection of industry returns and investor sentiments is subject to shifts between different sentimental intervals. Bathia and Bredin (2013) explore the relations between investor sentiment and stock market returns in G7 countries. They

use various investor sentiment indicators such as investor survey, equity fund flow, closed-end equity fund discount and equity put–call ratio. They try to prove the significant impact of investor sentiment on value and growth stock returns as well as aggregate market returns. Their results show that investor sentiment negatively predicts the future returns, which supports previous research. High sentiment is followed by low future returns while low sentiment is followed by high future returns. They also find all the sentiment indicators used show relatively strong forecast power on returns of value stocks relative to returns of growth stocks. Furthermore, the impact of survey sentiment on future returns gradually declines beyond the one-month forecast horizon. Bathia and Bredin display evidences of price pressure on value stocks and the overall market since concurrent equity fund flow rises.

Yu and Yuan (2011) study the effect of investor sentiment on the risk-return tradeoff in the stock market. They find that there exists a positive relation between expected excess return and conditional variance during low-sentiment regimes, but insignificant relations during high-sentiment regimes. Their finding supports the noise trader theory that sentiment trading impairs an otherwise positive risk-return tradeoff. They also detect a much stronger relationship between returns and contemporaneous volatility innovations during low-sentiment regimes. Yu and Yuan propose a new mechanism for investor sentiment to impact stock prices while prior literature mostly concentrates on its direct impact and the co-movement of stock prices and investor sentiment. Yu and Yuan document a novel approach that investor sentiment first impacts the compensation for volatility and then in turn impacts stock prices. Chung et al. (2012) test whether there exists asymmetric forecast power of investor sentiment on the cross-section of stock returns over economic expansion and recession periods based on the NBER business cycles. The multivariate Markov-switching model is employed to capture the unobservable dynamics of the shifts in the economic states. Their results show that the forecast power of investor sentiment is most profound during expansion periods when investors' optimism rises. The investor sentiment predicts the returns of portfolio formed on size, book-to-market equity ratio, dividend yield, earnings-to-price ratio, age,



return volatility, asset tangibility, growth opportunities, and 11 widely documented anomalies only during economic expansion regimes. The predictive ability is insignificant during economic recession regimes. Garcia (2013) extracts two columns of financial news from the New York Times and uses the fraction of positive and negative words as a proxy for investor sentiment. Garcia indicates that the forecast power of news content on stock returns is concentrated during recession periods. The asymmetry in the forecast power is not due to the differences in reporting along the business cycle. Besides, news content shows stronger impact on Mondays and days after holidays since weekends and holidays give investors time to read the news. The impact persists into the afternoon of the trading day but has partial reversal over the following 4 trading days. Mclean and Zhao (2014) indicate that both investment and employment have low response to Tobin's  $q$  and high response to cash flow during recessions and low investor sentiment regimes. Share issuance has a more important role than debt issuance in bringing about these impacts. The results of alternative tests show that recessions and low sentiment rise the external finance costs, resulting in a decline in investment and employment.

Huang et al. (2014) eliminate a common noise component in sentiment indices and construct a new investor sentiment proxy. They demonstrate that the new investor sentiment index performs much better in predicting the aggregate stock market when compared to the existing sentiment indices. Besides, the novel investor sentiment proxy also predicts cross-sectional stock returns sorted by industry, size, value, and momentum. They analyze that the driving force of the forecast power may be related with investors' biased beliefs about future cash flows. Da et al. (2014) construct a Financial and Economic Attitudes Revealed by Search index to measure the investor sentiment. They prove the predictive ability of the new index on short-term return reversals, temporary increases in volatility, and mutual fund flows out of equity funds and into bond funds.

Yang and Zhou (2015) confirm the effect of investor trading behaviours and investor sentiment on excess returns beyond the Fama and French three factors, and they find

the effect of investor trading behaviours is more significant than that of investor sentiment. Furthermore, investor trading behaviour and investor sentiment both exhibit larger impact on the excess returns of small stocks than on large stocks. Their results provide support for the roles of investor trading behaviour and investor sentiment on the formation of excess returns and also demonstrate the term structure of investor sentiment impact and the term structure of investor trading behaviour impact. Liston (2016) studies how investor sentiment affects the returns of a portfolio which consists of sin stocks, including publicly traded companies in the alcohol, tobacco, and gaming industries. The finding indicates that both individual and institutional investor sentiment are priced factors in sin stock returns. And if the role of investor sentiment is controlled, the abnormal returns for sin stocks documented by previous researchers disappear. Moreover, investor sentiment significantly affects the conditional volatility of sin stocks.

Kräussl and Mirgorodskaya (2016) explore the effect of media pessimism on financial market returns and volatility in the long term. According to the underreaction and overreaction hypotheses proposed by Barberis et al. (1998), Kräussl and Mirgorodskaya suggest that media pessimism, which translates into investor sentiment, affects stock market performance after a lag of several months. They calculate the ratio of the number of newspaper articles containing predetermined negative words to the number of newspaper articles containing predetermined positive words in the headline and in the lead paragraph in order to construct a media pessimism index. Their results show that media pessimism has relations with negative stock market returns 14–17 months in advance and has relations with positive stock market returns 24–25 months in advance. Besides, media pessimism is associated with positive market volatilities 1–20 months in advance. They also detect Granger causality of media pessimism on market performances. The media pessimism index constructed by Kräussl and Mirgorodskaya exhibits additional predictive ability of the Baker and Wurgler (2006) investor sentiment index and the Chicago Board Options Exchange Market Volatility Index. Sun et al. (2016) study how high-frequency investor sentiment impacts stock market. Their

results indicate that lagged half-hour investor sentiment can predict intraday S&P 500 index returns. Although the intraday momentum effect only exists in the last half hour, the impact of sentiment persists in at least the last two hours of a trading day. They highlight the significant economic value of high-frequency investor sentiment from an investment perspective.

Antoniou et al. (2016) find that the stock market has an upward slope during pessimistic sentiment periods but a downward slope during optimistic sentiment periods. They analyze that optimistic sentiment periods attract unsophisticated and overconfident traders who are looking for risky opportunities and high beta stocks, while such traders stay away from the market during pessimistic sentiment periods. Therefore, high beta stocks become overpriced during optimistic sentiment periods, but traditional beta pricing prevails during pessimistic sentiment periods due to less noise trading behaviours. The results reveal that noise traders are more bullish about high beta stocks when sentiment is optimistic, whereas investors act more rationally when sentiment is pessimistic. Ding et al. (2018) propose a model with multiple risky assets as an extension of the noise trader risk model of De Long et al. (1990). The results indicate that market-wide sentiment leads to relatively higher contemporaneous returns and lower subsequent returns for stocks which are more prone to sentiment and hard to arbitrage. Their results support existing findings on the relations between sentiment and cross-sectional stock returns. They also decompose investor sentiment into long-run and short-run components and predict that there is a negative association between long-run sentiment and cross-sectional returns while there is a positive association between short-run sentiment and cross-sectional returns. The long-run sentiment component is negatively related with subsequent stock returns while the short-run sentiment component is positively related with contemporaneous stock returns.

Cookson and Niessner (2019) try to analyze the sources of investor disagreement by using investors' sentiment from a social media investing platform, combined with information on the users' investment approaches such as technical-based approaches and fundamental-based approaches. They study disagreement within and across

investment approaches to test how much of overall disagreement is driven by different information sets versus differential interpretation of information. They find that overall disagreement is evenly split between within-group disagreement and cross-group disagreement, but within-group disagreement has more tight relations with trading volume than cross-group disagreement does. Cookson and Niessner also suggest that although both sources of disagreement are meaningful, to investors, information differences matter more for trading than differences across market approaches do. Fan et al. (2020) propose a new proxy of firm-level uncertainty exposure around major political events. They construct a degree of disagreement among social media users who mention firms and politicians together for the purpose of studying the associations between the disagreement proxy and individual stock features. The results indicate that rise in disagreement among tweets which jointly mention firms and politicians leads to increase in stock price volatility and trading volume.

Qadan and Aharon (2019) examine the explanatory power of investor sentiment in the size premium. They use several investor sentiment indicators including stock market-based, survey-based and press-based indices. The empirical evidence indicates that lagged investor sentiment predicts the small stock premiums. Pandey and Sehgal (2019) construct the novel investor sentiment indices to assess the extent to which sentiment-based factor explain the well-documented equity market anomalies such as size, value, and price momentum for India. They confirm the explanatory power of the sentiment-based factor which proxies for the price over-reactions and prove that their novel sentiment index leads other sentiment indicators in prior research. They also argue that the asset pricing models, including the Fama French 5 factor model, are not fully capable to explain the small firm effect.

Li and Li (2021) conduct their research in Chinese stock market and use overnight and over-weekend returns as firm-specific investor sentiment to reflect retail investors' beliefs. They find that firm-specific investor sentiment persists in the short-run and has negative association with intraday returns and price impact. They also document a U-shaped relationship with trading activity, an inverse U-shaped relationship with long-

term performance and positive relationship with cross-sectional returns. Firm-specific investor sentiment proposed by Li and Li captures the characteristics of Chinese stock market which has short-selling constraints, and the market-level information of firm-specific investor sentiment has explanatory power in risk premiums from sentiment-driven mispricing. Wang et al. (2021) detect a negative association between investor sentiment and future stock returns at the global level by using the consumer confidence index to measure sentiment. Although the developed and emerging markets show negative pattern in common, a more instant effect of investor sentiment is observed in emerging markets, while a more enduring effect is observed in developed markets. There exists heterogeneity in the relation between investor sentiment and returns in individual stock markets. The heterogeneity may be due to the cross-market differences in culture and institution, along with intelligence and education, and the various degrees of market participation of individual investors.

### **2.2.2 Economic policy uncertainty**

Pastor and Veronesi (2012) explore the effect of shifts in government policies on stock prices. They propose a general equilibrium model in which government decisions have both economic and noneconomic motives. They find that stock prices decline when a policy change is announced. The fall in price would be large if uncertainty about government policy is large or if the policy change is after a short or shallow economic recession. Shifts in government policies rise the volatilities and correlations among stocks. Pastor and Veronesi also find positive risk premium related with policy decisions. Antonakakis et al. (2013) study the dynamic correlations among stock market returns, implied volatility and policy uncertainty. They find that the time-varying correlations is negative between policy uncertainty and stock market returns over time, except for the latest financial crisis. Besides, the rise in the volatility of the stock market and the policy uncertainty impairs the stock market returns. Moreover, dynamic correlations reveal heterogeneity in patterns of stock returns during recession periods in United States. It is suggested that the correlations are indeed time-varying and have

high sensitivity to oil demand shocks and U.S. recessions. Goodell and Vähämaa (2013) examine how political uncertainty affects the political process and implied stock market volatility during presidential election cycles in United States. The results indicate that stock market uncertainty, measured by the VIX volatility index, rises when the election probability of the eventual winner has positive change, and the positive relation between implied volatility and the probability of success of the eventual winner still exists even after controlling for shifts in overall election uncertainty. Goodell and Vähämaa argue that the presidential election process engenders market anxiety as investors form and revise their expectations regarding future macroeconomic policies. Ko and Lee (2015) test the link between policy uncertainty and stock prices in both a time and frequency domain. Their results reveal that the association is negative but switches over time exhibiting low to high frequency cycles. Moreover, the timing of frequency changes overlaps when there is co-movement between policy uncertainty in U.S. and policy uncertainty in other countries.

Baker et al. (2016) construct a novel proxy for economic policy uncertainty (EPU) based on newspaper coverage frequency. They explore the effect of EPU on firm-level stock price volatility, investment rates, and employment growth as well as aggregate investment, output, and employment. The U.S. EPU index reaches its peak around tight presidential elections, Gulf Wars I and II, the 9/11 attacks, the failure of Lehman Brothers, the 2011 debt ceiling dispute, and other prominent battles over fiscal and monetary policies. They find that at the firm level, policy uncertainty has relations with larger stock price volatility and decreases investment and employment in sectors which are highly sensitive to policy such as defense, health care, finance, and infrastructure construction. At the macro level, innovations in policy uncertainty foreshadow decrease in investment, output, and employment in the United States. The panel vector autoregressive setting shows similar results for 12 major economies. Their findings support theories that highlight negative economic impact of uncertainty shocks. Christou et al. (2017) test the impact of EPU on stock market returns for six countries including Australia, Canada, China, Japan, Korea and the United States. They confirm

the negative impact on stock market returns caused by increase in policy uncertainty levels. They take uncertainty spillovers into consideration, and find a significant negative relation between stock market returns and U.S. EPU shocks in all countries except in Australia. They analyze that investors may obtain favorable opportunities by investing in Australia after a rise in policy uncertainty levels in the U.S. economy. Tsai (2017) studies the effect of EPU in China, Japan, Europe, and the United States on the contagion risk of investments in the global stock market. They reveal that EPU in China has the most powerful effect and its contagion risk spreads to different regional markets, except for European market. The effect of EPU in the United States is less than that in China, and EPU in Japan solely impacts contagion risk in stock market in emerging countries. They analyze that the results may be due to the extremely high trade dependence among these countries. The economic policies of the trading partners are important factor in determining the stock market performances of international enterprise.

Çolak et al. (2017) investigate the initial public offering (IPO) activity under political uncertainty around presidential elections in the United States. Fewer IPOs are found to originate from the status when a presidential election is on schedule. Moreover, the presidential elections exhibit stronger negative effect for firms with more concentrated businesses in their home states, with more dependence on government and state contracts, and with more difficulty in valuation. And this negative effect is associated with lower IPO offer prices during election periods.

Zhang (2018) explores the link between economic policy uncertainty and investor sentiment based on linear and non-linear Granger causality analysis. They reveal the apparent influence of economic policy uncertainty on investor sentiment, which can be explained by the real option theory and financial constraint theory. In the real option theory, firms and consumers regard investment choices as a series of options. The option value of delay is higher with more volatile economic policies. In the financial constraint theory, financial friction causes uncertainty, resulting in deterioration in financial constraint which decreases the efficiency of capital allocation. Phan et al.

(2018) argue that the predictive ability of EPU relies on both the country and the sectors examined, implying that EPU may exhibit larger impact on some countries and some sectors than others. They also study whether the predictive ability of EPU comes through either or both the cash flow channel and discount rate channel. Their results support the discount rate channel over the cash flow channel. Furthermore, they find evidences of asymmetry in the predictive ability of positive and negative EPU shocks on stock excess returns. Guo et al. (2018) apply the quantile regression models to study the dependence structure between EPU and stock market returns in G7 and BRIC countries. They find EPU decreases stock market returns except in France and the UK. And they observe asymmetric dependence with EPU in eight out of ten stock markets. However, they observe no dependence between EPU and the stock market in France and the UK. Hu et al. (2018) reveal the significant and negative explanatory power of shocks in U.S. EPU on returns of Chinese A-shares with a lag of one week. Besides, the market index which contains small and growth stocks has higher sensitivity to shocks in U.S. EPU than the market index which contains big and value stocks. Moreover, firms in manufacturing, information technology, and media industries in China respond more to shocks in U.S. EPU, while firms in agriculture and real estate industries are less sensitive to shocks in U.S. EPU. Furthermore, Chinese A-shares which experience large fall in reaction to shocks in U.S. EPU have higher returns, smaller market capitalization, weaker operating profitability, higher asset growth, and better past year's cumulative returns. They also show that investors in the Chinese A-shares market demand a premium to hold stocks that are sensitive to shocks in U.S. economic policy uncertainty. Das and Kumar (2018) extend the research by Ko and Lee (2015) and propose a new perspective to the relation between EPU and stock prices. They use multiple and partial wavelet coherence techniques and find that stock prices in developed markets are more sensitive to the combined effect of domestic policy uncertainty and U.S. EPU, while stock prices in emerging markets are more sensitive to domestic policy uncertainty. Among developed countries, Japan and European stock market are more sensitive to U.S. EPU when compared to domestic policy uncertainty.



Volatility spillover is an accurate proxy for the transmission of risk across sectors and is particularly informative during crisis periods. He et al. (2019) study the spillover effect and find that S&P 500 index volatility is a net recipient of spillovers from important EPU indices. The results show that Japanese EPU exhibits the strongest spillover effect on the U.S. stock markets, while EPU from the UK shows limited effect. They decompose the volatility into good and bad volatility, and the association between bad volatility and EPU is found to be stronger than that between good volatility and EPU. The dynamic spillover characteristics indicate that bad volatility has stronger reaction to shocks in EPU following the debt crisis and trade negotiations. Shen et al. (2021) discover the risk spreading channels by means of volatility spillovers within the Chinese sectors. They find that there are 17 sectors such as mechanical equipment, electrical equipment and utilities which function as risk transmitters, and 11 sectors such as national defense, bank and non-bank finance which function as risk takers. Under the extreme risk events like the global financial crisis, the Chinese interbank liquidity crisis, the Chinese stock market crash and the China–U.S. trade war, the connection significantly rises and the financial sectors serve as a buffer role in ensuring the security of the economic system. Their research documents the spillover effects within the Chinese sectors, and also uncovers the risk contagion patterns in the Chinese stock markets. Laborda and Olmo (2021) point out that among the seven economic sectors in the U.S., Banking and Insurance, Energy, Technology and Biotechnology are the main channels through which shocks propagate to the rest of the economy. Banking and Insurance is especially relevant during the global financial crisis from 2007 to 2009 while the Energy sector and Technology are especially relevant during the coronavirus crisis. Ordu-Akkaya (2018) tests whether migration policy uncertainty is an important factor that impacts company valuations and investor sentiment. The finding indicates that volatility transfers from migration index to stock markets in the UK and the U.S., but no similar results are found in France and Germany. Ordu-Akkaya also analyzes cross-market transmissions and observes that migration policy uncertainty of U.S. spills significant volatility to all European stock markets. The U.S. is found to have a central

role for investor sentiment and also for migration policies. Ordu-Akkaya confirms that the stock market has a strong linkage with migration policies. Dai and Peng (2022) reveal that among the four policy uncertainties, fiscal policy uncertainty and trade policy uncertainty make more contribution to the spillover effect, while monetary policy uncertainty and exchange rate policy uncertainty make less contribution to the spillover effect.

Shao et al. (2022) investigate the dynamic co-movement between local economic policy uncertainty and stock market returns. In China, economic policy uncertainty maintains an overwhelming position while the stock market leads EPU slightly in the UK. Besides, extreme volatility of the interlinkage between domestic stock markets and EPU is related to crash states like the global financial crisis, the 2015 stock market crash and the COVID-19 pandemic. They argue that there exists difference in the Chinese stock market and developed markets since the Chinese stock market is highly driven by policies, making policy-based prediction possible. It is suggested that Chinese stock investors and traders should focus more on domestic EPU because understanding market behaviours is crucial to them. Stock markets in the U.S. and the UK are more efficient in reflecting information and news excluding the extremely turbulent states such as the global financial crisis and the COVID-19 pandemic. They suggest regulators take steps to restore the financial markets and calm investor sentiment in such turbulent states and they also mention that it may take time for these measures to be effective.

### **2.2.3 Investor sentiment and political cycle**

Durr (1993) argues that changes in domestic policy sentiment along a liberal-conservative continuum may be regarded as reaction to varying economic expectations. Specifically, anticipation of a strong economy leads to more support for liberal domestic policies, while expectation of decreasing economic situations leads the mood of national policy to the right. Gentzkow and Shapiro (2010) develop a novel indicator of media slant measuring the similarity of a news outlet's language to that of a congressional Democrat or Republican. They find that readers prefer like-minded news.

Firms have strong reactions to consumer preferences, which stands for around 20 percent of the variation in measured slant in their sample. On the contrary, the identity of a newspaper's owner has limited explanatory power in the variation in measured slant. Perez-Liston et al. (2014) apply econometric techniques to test the effect of political climate on investor sentiment, stock market returns, and the covariance between investor sentiment and stock returns. The results reveal that stock market returns are higher under Democratic administration, which supports many prior research. However, they find higher investor sentiment and higher covariance between investor sentiment and stock returns during Democratic presidencies, which is inconsistent with previous studies. Their research appears to suggest that political climate not only impacts stock returns, but also affects investors' feeling about the market.

Adjei and Adjei (2017) explore the associations among political cycles, investor sentiment, and stock market returns. They discover two channels through which political cycles influence stock market returns. First, corporate fundamentals are directly impacted by fiscal and regulatory policies, which is reflected in stock prices. Second, there exists an indirect impact through the change in investor sentiment levels which in turn affects stock prices. Moreover, Adjei and Adjei test the relations between presidential elections cycles and investor sentiment. The results indicate that investor sentiment levels are lower and increase under Democratic administration, and are higher and decrease under Republican administration. Bonaparte et al. (2017) investigate investors' optimism on financial markets and reveal that investors' political affiliation and the current political climate significantly impact the macroeconomy. Individuals have higher optimism level and perceive markets with less risks and more undervaluation when their preferred party controls the White House. Consequently, investors allocate more money to risky assets and show a stronger preference for high market beta, small-cap, and value stocks, and a weaker preference for local stocks. They also find that the differences in investors' optimism and their portfolio choices across political parties cannot be explained by changes in economic conditions or varying

reactions to economic conditions by Democrat and Republican investors. Colón-De-Armas et al. (2017) observe that closed-end funds discounts significantly decline from two weeks prior to a U.S. presidential election to a week prior to the presidential election, and continue to exist until the week following the presidential election. This suggests a rise in investors' optimism during that time period, particularly when a Democratic president is in power. Besides, their results indicate that investors appear to be less interested in the power continuity. Investors become optimistic when there is a shift in the party in power, but become pessimistic when there is the entrenchment of power in the White House. The rise in investor optimism level surrounding the U.S. presidential elections is not observed in non-election years, which confirms the driving force of presidential elections for their results. Ebbes et al. (2017) compare the interaction between market returns, volatility and investor sentiment prior to and posterior to the Tunisian revolution. Their results reveal that under the regime of political stability, investor sentiment has insignificant effect on stock market returns and volatility. However, the Tunisian revolution brings about political instability. The significant bidirectional relations are detected between investor sentiment and stock market returns as well as investor sentiment and stock market volatility under the regime of political instability. Their results demonstrate that investors' behaviours compound the impact of political instability on Tunisian market.

Shaikh (2019) studies the behaviour of investor sentiment in terms of implied volatility index during the U.S. presidential election periods. The results reveal that investors' worries were diverted surrounding the presidential elections. The significant decline in the implied volatility level following the presidential elections turns out to be the calm before the storm. Investors have higher concern level prior to the election day. Specifically, the results indicate that the investors indeed concern the presidential election debates when choosing their portfolios. Based on the empirical estimates, the presidential elections in 2012 and 2016 exhibit a strong relationship with investor sentiment and stock market performances.

Since regime switching may cause new tendencies and behaviours of financial market,

Becker et al. (2021) try to model the effect of investor sentiment on stock market returns precedes and post Donald Trump's presidential election in 2016. They observe a structural break in the 2016 presidential election and the relation between investor sentiment and abnormal returns is found to be negative post the presidential election. Marinč et al. (2021) study the linguistic tone used in presidential candidates' tweets and find significant effect of that on stock market response. Trump's tweets which exhibit a positive linguistic tone about specific firms yields a daily cumulated abnormal return of 0.2 percent, while the positive linguistic tone from all Republican shows a cumulated abnormal return of 0.24 percent. Their results indicate that investors realize and react to the important information on the firm value conveyed through social media like twitter from an influential source.

Karadas et al. (2022) explore the associations between corporate managers' political ideology and corporate leverage policies conditional on investor sentiment. Their results reveal that Republican managers significantly decrease leverage under high investor sentiment regime. The impact of personal characteristics of managers persists on corporate policies, which is consistent with the behavioural consistency theory. Furthermore, they suggest that the internal and external stakeholders of a firm should consider the personality of managers in their decisions. If the company is highly indebted, a conservative manager should be taken into account in order to bring down the financial risk.

The government actively takes measures to restore the economy and support the financial market when the economic status faces huge downward risks during the post-epidemic periods. In such crisis, the government and the president play an important part and their influences strengthen. Su et al. (2022) confirm the significant impact of investor sentiment on the stock market performances and argue that investors can avoid the trust risk of the president by adjusting their asset portfolios. Besides, the duration of effects caused by the short-run shock will finally be restored over time. The approval ratings will impair the investor sentiment in the short run, but the market will digest this eventually.

### 3. Hypothesis development

We propose two hypotheses for the three-variable system. In Hypothesis 1, we assume that investor sentiment functions as a mediator between political cycles and stock market returns. In this three-variable system, the predictor (political cycle) is causally antecedent to the mediator (investor sentiment).

In Hypothesis 2, we assume that political cycles moderate the effect of investor sentiment on stock market returns. In this three-variable system, the moderator (political cycle) and the predictor (investor sentiment) are at the same level in regard to their role as causal variables antecedent to the outcome variable (stock market returns).

The difference between the two hypotheses is that, unlike the mediator-predictor relation, moderator variables always function as independent variables, while mediating events shift roles from effects to causes, depending on the focus of the analysis. The mediator hypothesis and the moderator hypothesis provide us a new perspective into the relations among these three variables.

#### *Hypothesis 1*

*Investor sentiment functions as a mediator between political cycles and stock market returns.*

Baron and Kenny (1986) clarify the meaning of mediation, and we introduce a path diagram as a model for depicting a causal chain.

As Figure 1 depicts, there are two causal paths feeding into stock market returns in this three-variable system: the direct effect of political cycle (*Path c*) and the effect of the mediator, investor sentiment (*Path b*). There is also a path from political cycle to investor sentiment (*Path a*).

Investor sentiment functions as a mediator when it meets the following conditions:

(I) Political cycle significantly accounts for variations in investor sentiment (*Path a*).

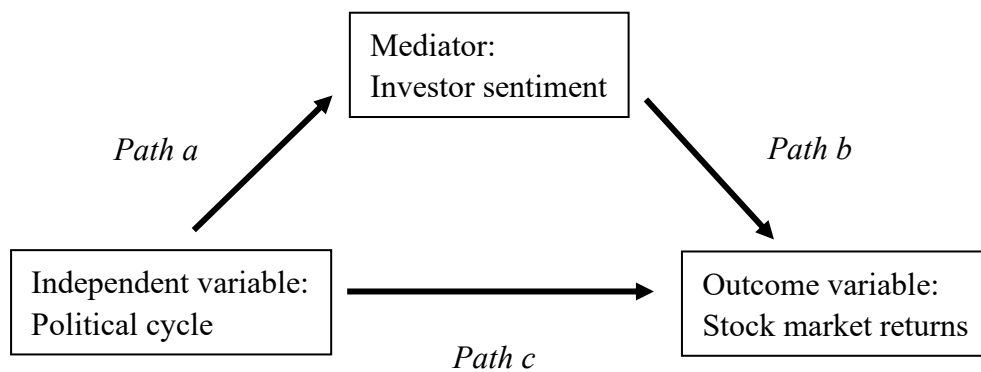
(II) Investor sentiment significantly accounts for variations in stock market returns (*Path b*).

(III) When *Paths a* and *b* are controlled, a previously significant relation between political cycle and stock market returns is no longer significant, with the strongest demonstration of mediation occurring when *Path c* is zero.

Then we claim investor sentiment is a single, dominant mediator. If investor sentiment significantly decreases *Path c* rather than reduces *Path c* to zero, this indicates that investor sentiment is an effective mediator, but not a single and dominant mediator.

**Figure 1 The basic chain involved in mediation**

Figure 1 plots the basic chain involved in the mediation model in Hypothesis 1. In the three-variable system, political cycle is the independent variable, stock market return is the outcome variable, and investor sentiment is the mediator. There are three paths, namely *Path a*, *Path b* and *Path c*. *Path a* is from the independent variable to the mediator, *Path b* is from the mediator to the outcome variable and *Path c* is from the independent variable to the outcome variable.



In the first condition, *Path a* assumes investor sentiment has a significant association with presidential political cycles.

Political cycles can significantly affect country's income distribution and prosperity. In democratic states, people vote for parties which best stand for their individual interests and beliefs. Nordhaus (1975) states that the key problem of macroeconomic policy faced by public authorities is the trade-off between unemployment and inflation. The so-called Phillips curve, proposed by Phillips (1958), hypothesizes that inflation and

unemployment have a stable and inverse relationship. In other words, price stability and full employment are incompatible goals and they cannot be achieved simultaneously. Different unemployment/inflation outcomes have important, class-linked effects on the distribution of national income.

Political authorities influence the rate of unemployment and inflation through the monetary and fiscal policy. The macroeconomic policy is a main focus of conflict between key political actors and interest groups. The major constituencies of political parties are distinguished primarily by class, income, and related socioeconomic characteristics. According to partisan theory proposed by Hibbs (1977), the lower income, blue-collar groups have different objective economic interests in comparison with the higher income, white-collar groups, and the two groups differ in the subjective preferences of the unemployment/inflation trade-off.

The different economic interests and subjective preferences are reflected in the contrasting positions toward various economic goals associated with left- and right-wing governments. The macroeconomic policies under left- and right-wing political parties are accordant with the objective economic interests as well as the subjective preferences of their class-defined core political constituencies. The Socialist and Labor parties which are labor-oriented and working-class-based typically give higher priority to full employment than to inflation, while Conservative parties which are business-oriented and upper middle-class-based generally attach greater significance to price stability than to unemployment. Thus, the left-wing parties have been characterized by comparatively low unemployment at the expense of high rates of inflation, whereas right-wing parties have been characterized by relatively low inflation and high unemployment.

In behavioural finance, investors, identified by De Long et al. (1990), are subject to sentiment. The public is influenced by the political rhetoric and the appearance of favoring macroeconomic policies under left- and right-wing political parties. The consensus and disagreement of the public opinion would likely be reflected in investors'



economic outlook as captured by investor sentiment during a president's tenure in office. Therefore, in *Path a*, investor sentiment is significantly related with presidential political cycles.

*Path c* assumes the stock market returns under Democratic administration significantly differ from the stock market returns under Republican administration. Stock prices reflect expectations about present and future earnings of firms, and also the applied discount rate. Herbst and Slinkman (1984) state that stock market reflects the likely trend of the economy, and the expectation of success or failure of government policies. To the electorate, the stock market provides both symbolic meaning about the course of the economy as well as a mirror of the consensus view. Since the public is influenced, its consensus opinion would likely be reflected in the stock market.

Alesina (1987) studies the macroeconomic policy in a two-party system and indicates that Democrats and Republicans have different view in the issues of economy like taxes, the safety net, and government spending. Most Republicans support lower income tax rates, a smaller safety net, and a low minimum wage which they believe would grow economy and hence boost the stock market, while Democrats pursue higher tax rates on the wealthier, a larger safety net and higher minimum wage to reduce income inequality. To stimulate the economy, Republicans believe private spending should be used rather than government spending. Statements such as “the Democrats are the party of labor, and the Republicans are the party of business” presumably reflect the relative attention paid to the various constituencies with respect to the economic policies of the two major parties. The well-known presidential puzzle, proposed by Santa-Clara and Valkanov (2003), is about the difference in stock market returns through the political cycle. They document the excess return in the stock market is higher during Democratic than Republican presidencies. The difference in returns cannot be explained by business-cycle variables related to expected returns, and is not concentrated around election dates. There is no difference in the riskiness of the stock market across presidencies that could justify a risk premium. The difference in returns through the political cycle is therefore a puzzle.

Santa-Clara and Valkanov (2003) speculate that the difference in returns may be due to different economic policies between Republicans and Democrats. These policies must impact the stock market directly and not just through their effect on the state of economy. The differences in policies between the parties were unexpected and kept surprising investors throughout the presidential mandates. There is no conclusive answer provided to this presidential puzzle but they conjecture that the investors perceive the party in the presidency to be a noisy signal of economic policy. So, in *Path c*, stock market returns are significantly related with presidential political cycles.

In Figure 1, political cycles affect the stock market both directly (*Path c*) and indirectly (*Path b*). The direct effect, according to Belo et al. (2013), is through the government spending channel. It is agreed by many economists that government spending influences the expected firm cash flows and the discounted rate of future cash flows. Belo et al. (2013) support expected cash flow effects that firms with high government exposure have higher expected profitability than firms with low government exposure during Democratic presidencies. The indirect effect, we hypothesize, is through investor sentiment. Investor sentiment may partially mediate the link between political cycles and stock returns. The government policies through the political cycles could transmit the effect to the economy as the stock market acts as the barometer of investors' expectations and faith in economic prospects (Bai, 2014; Baker et al., 2012). The political cycles may compound uncertainties in the market, increase investors' fear or faith and create optimistic or pessimistic sentiment on future returns.

Thus, we assume that investor sentiment is a mediator between political cycles and stock market returns. Political cycles indirectly affect stock returns through the channel of investor sentiment.

### *Hypothesis 2*

*Political cycles moderate the effect of investor sentiment on stock market returns.*

A moderator, according to Baron and Kenny (1986), is a qualitative variable like gender, race and class, or a quantitative variable like level of reward, that influences the

direction and strength, or any of them in the relation between the independent variable and the dependent variable.

For example, the relation between changing life events and severity of illness is found to be stronger in the events of death of a spouse than in the events of divorce (Stern et al.,1982). Thus, in a correlational analysis framework, the moderator effect is said to occur in this case since the magnitude of the correlation changes. If the relation between events and illness alters from positive to negative, which means life changes events have reduced the likelihood of illness, then the moderator effect is also said to occur.

In a variance analysis (ANOVA) framework, the moderator effect is regarded as an interaction between an independent or predictor variable and a factor that specifies the appropriate conditions for its operation. For example, Schneider et al. (1963) find that the specification of commitment, personal responsibility, and free choice is required as moderators for the ability of investigators to establish the effects of insufficient justification.

We use a path diagram in Figure 2 to show the correlational and experimental views of a moderator.

As Figure 2 depicts, there are three causal paths feeding into stock market returns in this three-variable system: the main effect of the predictor, investor sentiment (*Path d*), the main effect of the moderator, political cycle (*Path e*) and the interaction or product of the predictor and the moderator (*Path f*).

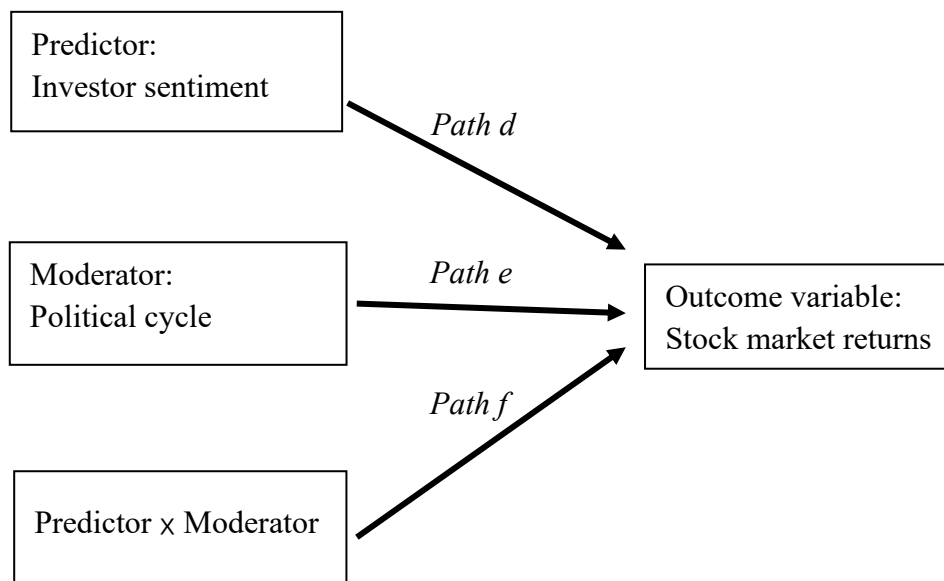
Then we have following conditions:

- (I) Investor sentiment significantly accounts for variations in stock market returns (*Path d*).
- (II) Political cycle significantly accounts for variations in stock market returns (*Path e*).
- (III) The interaction term of political cycle and investor sentiment significantly accounts for variations in stock market returns (*Path f*).

According to Baron and Kenny (1986), only if the third condition is met that the interaction term (*Path f*) is significant, the moderator hypothesis is supported. Then we claim political cycle is a moderator in the relation between investor sentiment and stock market returns. The first and second condition which indicate the main effect of investor sentiment and political cycle (*Path d* and *Path e*) may also be significant but they are not directly relevant conceptually to testing the moderator hypothesis. Besides, in order to provide a clearly interpretable interaction term, the moderator should be uncorrelated with the predictor and the outcome variable.

**Figure 2 The basic moderator model**

Figure 2 plots the basic moderator model in Hypothesis 2. In the moderator model, investor sentiment is the predictor, stock market return is the outcome variable, political cycle is the moderator, and there is also an interaction term of the predictor and the moderator. There are three paths, namely *Path d*, *Path e* and *Path f*. *Path d* is from the predictor to the outcome variable, *Path e* is from the moderator to the outcome variable, and *Path f* is from the interaction term of the predictor and the moderator to the outcome variable.



Within this framework, moderation implies that the causal relation between two variables changes as a function of the moderator variable. The analysis must measure and test the differential effect of the predictor on the outcome as a function of the moderator. The way to measure and test the differential effects depends on the level of the predictor and the moderator variable. We have following four cases.

- (I) Both predictor and moderator are categorical variables.
- (II) The predictor is a continuous variable and the moderator is a categorical variable.
- (III) The predictor is a categorical variable and the moderator is a continuous variable.
- (IV) Both variables are continuous variables.

In our hypothesis, investor sentiment, as a predictor, is a continuous variable and political cycle, as a moderator, is a dichotomy, which is indicated by case (II). We assume political cycle might moderate the effect of investor sentiment on the stock market. The level of the moderator, treated as different groups, may alter the effect of the predictor on the outcome variable. We have two political parties, which are Democratic party and Republican party. The different political party in power may change the effect of investor sentiment on the stock market returns. The source could be the different tendency in policies between the parties, which keeps surprising investors throughout the presidential mandates (Santa-Clara & Valkanov, 2003). The macroeconomic policy in a two-party system has been studied by many researchers, and Democrats and Republicans hold different view in some significant issues like taxes, the safety net, and government spending. Democrats aim to reduce income inequality, and support higher tax rates, a larger safety net and higher minimum wage while Republicans pursue lower income tax rates, a smaller safety net, and a lower minimum wage to boost the economy. The different policy tendency actually reflects the differences in objective economic interests and subjective preferences of the unemployment/inflation trade-off of interest groups behind the political parties (Nordhaus, 1975; Hibbs, 1977). Investors' fear or faith at the macroeconomic policy would be captured by investor sentiment during a president's tenure in office. Investors regard the political party in power as a noisy signal of the macroeconomic policy. And an interaction of noise intensity (predictor) and controllability (moderator) is found by Glass and Singer (1972) of the form that an adverse impact on performance occurred only when the onset of the noise was not signaled. So, we assume that an interaction of sentiment and political cycle impacts the stock market performances.

To measure the moderator effect, we must know a priori how the effect of the independent variable varies as a function of the moderator. The linear form of moderation is generally assumed. The effect of investor sentiment on stock market returns changes linearly with respect to the moderator, political cycle. For other cases like case (I), the analysis is a  $2 \times 2$  ANOVA, and moderation is indicated by an interaction. In case (III), the function could be quadratic. For example, the fear-arousing message may be more effective for low-IQ subjects, while the rational message may be more effective for high-IQ subjects. In case (IV), the analysis could be a step function and we need to dichotomize the moderator at the point where the step takes place. For example, there could be the case that the rational message becomes more effective than the fear-arousing message at some critical IQ level. The linear hypothesis can be tested by adding the product of the moderator and the predictor to the regression equation, as described by Cohen et al. (2015) and Cleary and Kessler (1982). The moderating effect is indicated by the significant effect of the interaction term of political cycle and investor sentiment while the two variables are controlled.

Therefore, we hypothesize that political cycles (controllability) moderate the effect of investor sentiment (noise intensity) on stock market returns (outcome) and this type of moderator effect can be measured by unstandardized regression coefficients (Duncan, 1975) for each political party in power and then the difference is tested between regression coefficients (Cohen et al., 2015).

## **4. Data**

### **4.1 Stock return proxies and sample period**

We use monthly return of S&P 500, which can be downloaded from Wharton Research Data Services (WRDS). The excess return is calculated by the return of the market index minus the risk-free rate. The monthly three-month T-Bill yield is used as the risk-free rate which can be obtained from the Federal Reserve Bank of St. Louis. Since

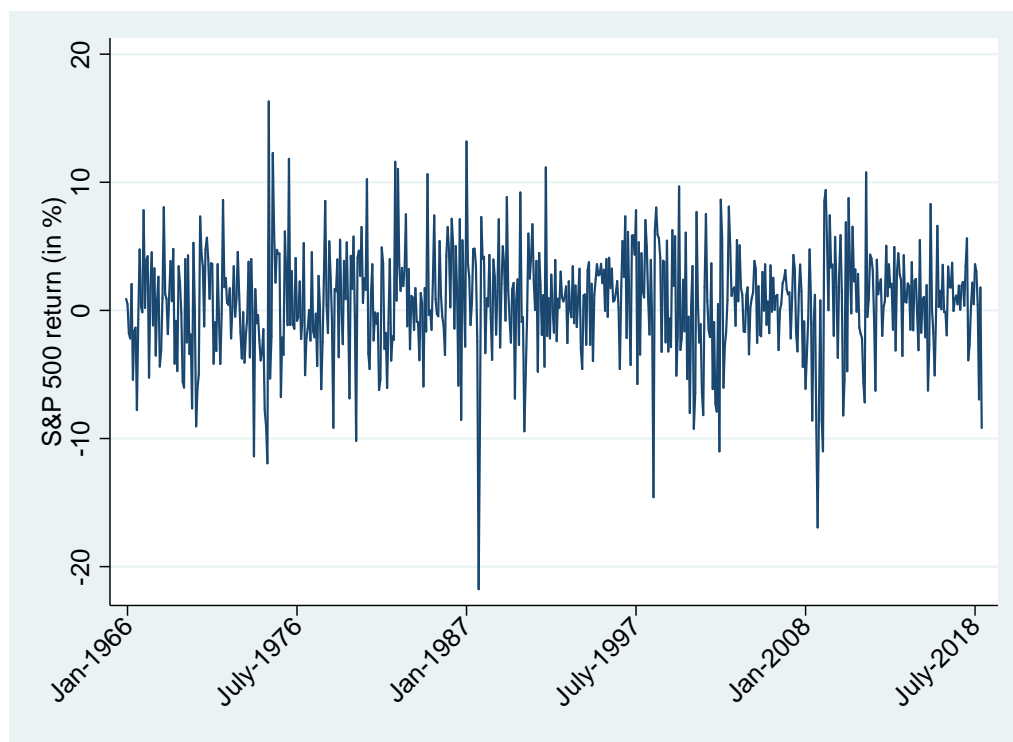
Baker and Wurgler (2006) only upload the sentiment index during 1965-2018 in their website, our sample period covers from December 1965 to December 2018, including 637 monthly observations.

Panel A and B in Figure 3 plot the monthly S&P 500 index return and excess return during the sample period respectively. We can find stock market returns have large fluctuations around the year 1974, 1987, 1997 and 2008.

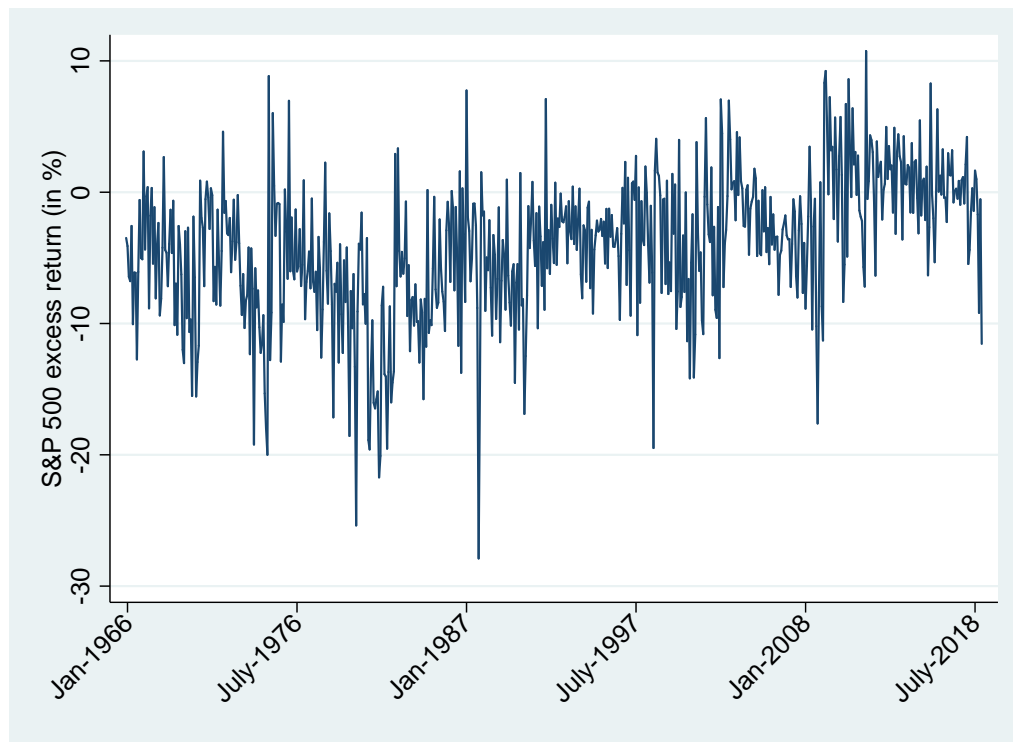
**Figure 3 The monthly S&P 500 index return: 1965/12-2018/12**

Figure 3 plots the monthly stock market return from December 1965 to December 2018. Panel A plots the monthly S&P 500 index return during the sample period. Panel B plots the monthly excess return of S&P 500 index during the sample period. The excess return is calculated by the return of the market index minus the risk-free rate. We use the monthly three-month T-Bill yield as the risk-free rate and the data can be obtained from the Federal Reserve Bank of St. Louis. The data of S&P 500 index can be obtained from Wharton Research Data Services (WRDS).

**Panel A S&P 500 return**



## Panel B S&P 500 excess return



## 4.2 Investor sentiment

We use four sentiment indicators in this paper, namely Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI), and the Economic Policy Uncertainty Index (EPU).

### 4.2.1 Baker and Wurgler's sentiment index (BW)

Baker and Wurgler (2006) construct the investor sentiment index based on five metrics: the value-weighted dividend premium calculated as the difference between the average market-to-book ratio of dividend payers and non-payers, the first-day returns on initial public offerings (IPOs), IPO volume, the closed-end fund discount, and the equity share in new issues. Originally, there is a sixth metric included, but the NYSE turnover ratio was dropped in the newest update. The data can be downloaded from Jeffrey Wurgler's website.



We use the orthogonalized BW index based on the first principal component of five standardized market-based sentiment proxies where each of the proxies has first been orthogonalized with respect to a set of macroeconomic indicators, which are growth in the industrial production index, growth in consumer durables, nondurables, services, employment and a dummy variable for NBER recessions. Baker and Wurgler (2006) construct the orthogonalized index to reduce the likelihood that these proxies are connected to systematic risk. They suggest that the orthogonalized index may be cleaner proxies for investor sentiment.

Panel A in Figure 4 plots the monthly orthogonalized BW sentiment index over the sample period. We can find that investor sentiment is high around the year 1970, 1984 and 2002, and especially low around 1976.

#### **4.2.2 The Conference Board Consumer Confidence Index (CCI)**

The consumer confidence index provides an indication of future development of households' consumption and saving, based upon answers regarding their expected financial situation, their sentiment about the general economic situation, unemployment and capability of savings. The Consumer Confidence Survey, conducted by the Conference Board, reflects prevailing business conditions and likely development for the months ahead. This monthly report details consumer attitudes, buying intentions, vacation plans, and consumer expectations for inflation, stock prices, and interest rates.

We can download the data from the website of the Conference Board. We use standardized CCI in this paper. Panel B in Figure 4 plots the index over the sample period. We can find that the consumer confidence is especially high during 1970-2000.

#### **4.2.3 The University of Michigan's Consumer Sentiment Index (MCSI)**

The Michigan Consumer Sentiment Index (MCSI) is a monthly survey of consumer confidence levels in the United States conducted by the University of Michigan. The survey is based on telephone interviews that gather information on consumer

expectations for the economy. Each month, the university conducts a minimum of 500 phone interviews across the continental United States. The survey asks 50 core questions and covers three areas: personal finances, business conditions, and buying conditions. The answers to these questions form the basis of the index.

We can download the data from the website of the Federal Reserve Bank of St. Louis. We use standardized MCSI in this paper. Panel C in Figure 4 plots the index over the sample period.

#### **4.2.4 Economic Policy Uncertainty Index (EPU)**

To measure policy-related economic uncertainty, Baker et al. (2016) construct an index from three types of underlying components. The first component is News Coverage index of search results from 10 large newspapers<sup>1</sup>. Monthly searches are performed of each paper for articles containing the term ‘uncertainty’ or ‘uncertain’, the terms ‘economic’, ‘economy’, ‘business’, ‘commerce’, ‘industry’, and ‘industrial’ as well as one or more of the following terms: ‘congress’, ‘legislation’, ‘white house’, ‘regulation’, ‘federal reserve’, ‘deficit’, ‘tariff’, or ‘war’.

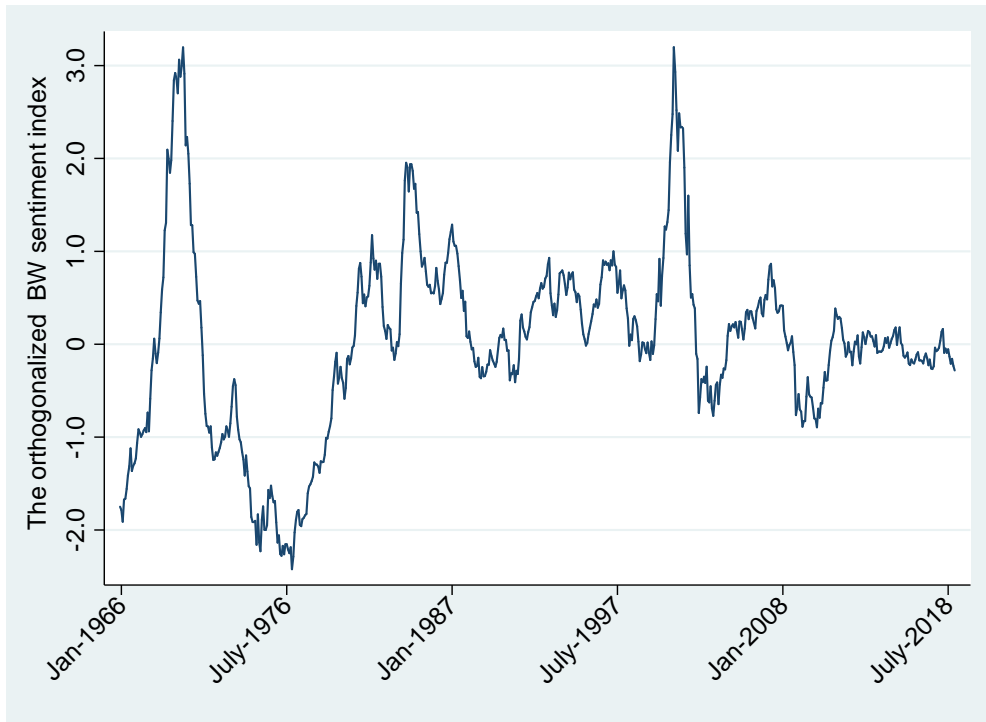
#### **Figure 4 The monthly investor sentiment index: 1965/12-2018/12**

Figure 4 plots the monthly investor sentiment index from December 1965 to December 2018. Panel A plots the monthly orthogonalized Baker and Wurgler’s (2006) investor sentiment index (BW) during the sample period. Panel B plots the monthly standardized Conference Board Consumer Confidence Index (CCI) during the sample period. Panel C plots the monthly standardized University of Michigan’s Consumer Sentiment Index (MCSI) during the sample period. Panel D plots the monthly standardized Economic Policy Uncertainty Index (EPU) during the sample period. The orthogonalized BW index can be downloaded from Jeffrey Wurgler’s website. The CCI can be downloaded from the website of the Conference Board. The MCSI and EPU index can be retrieved from the Federal Reserve Bank of St. Louis.

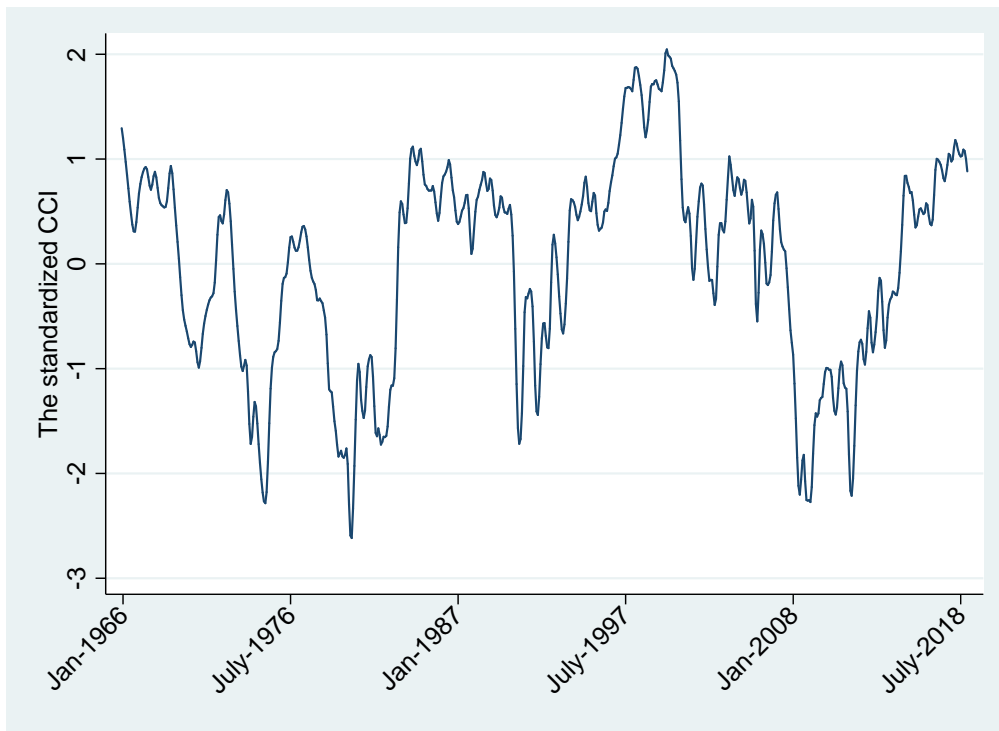
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<sup>1</sup> Two overlapping sets of newspapers are used in this series. The first spans 1900 - 1985 and is comprised of the Wall Street Journal, the New York Times, the Washington Post, the Chicago Tribune, the LA Times, and the Boston Globe. Since 1985, the previously mentioned newspapers are used along with USA Today, the Miami Herald, the Dallas Morning Tribune, and the San Francisco Chronicle.

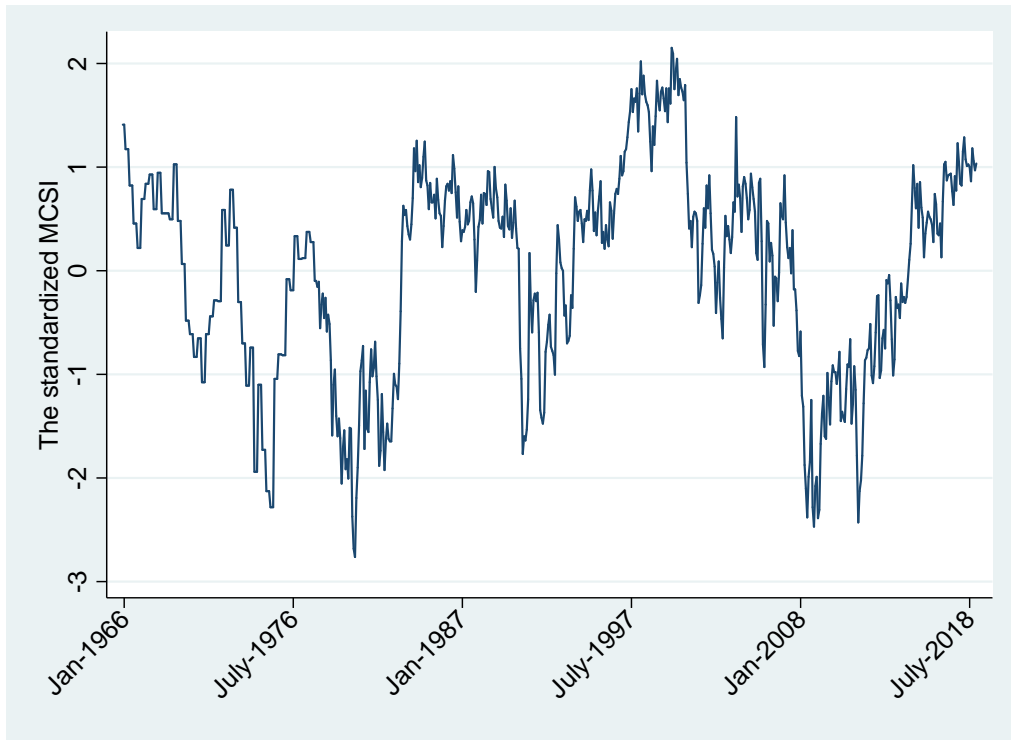
**Panel A The orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW)**



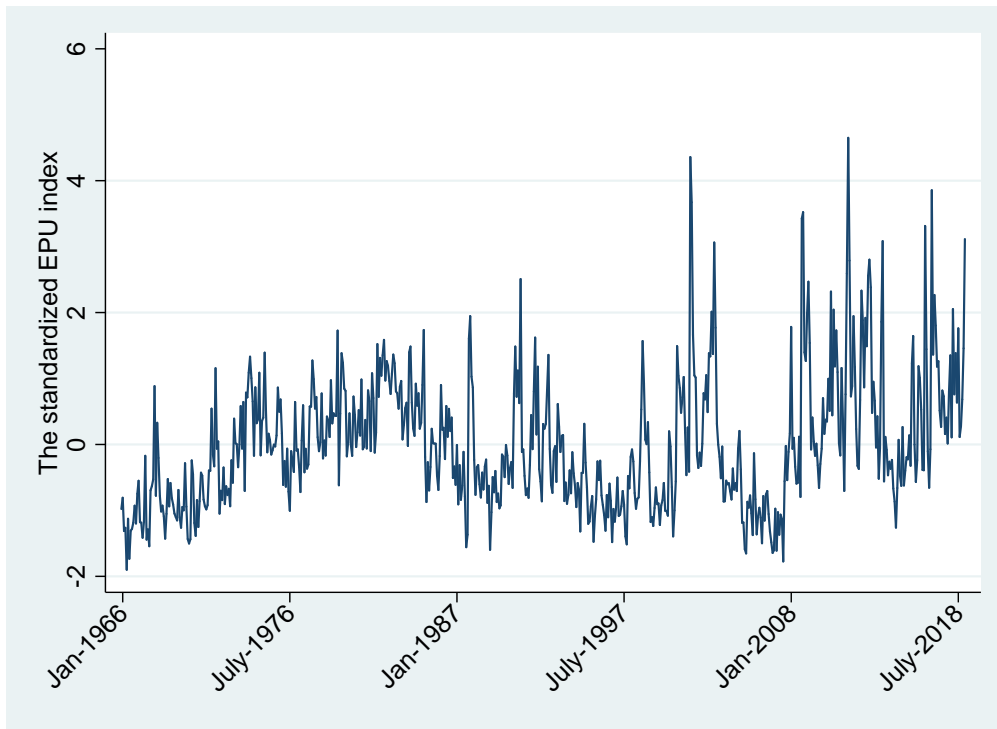
**Panel B The Standardized Conference Board Consumer Confidence Index (CCI)**



**Panel C The Standardized University of Michigan's Consumer Sentiment Index (MCSI)**



**Panel D The Standardized Economic Policy Uncertainty Index (EPU)**



The second component of index draws on reports by the Congressional Budget Office (CBO) that compile lists of temporary federal tax code provisions. The third component of policy-related uncertainty index draws on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters.

The data can be downloaded from the Federal Reserve Bank of St. Louis. We use standardized EPU in this paper. Panel D in Figure 4 plots the index over the sample period. We can find EPU become more volatile in recent years.

The key differences among these sentiment indicators lie in their construction methods and different aspects of investor sentiment they measure. BW index captures the market-based sentiment based upon the first principal component of five proxies. For example, the market turnover, or more generally, liquidity, reveals the underlying differences of opinion, which are in turn related to valuation levels when short selling is difficult (Scheinkman & Xiong, 2003). Another example is the proxy related with the closed-end funds. It is argued that if closed-end funds are disproportionately held by retail investors, the average discount on closed-end equity funds rises when retail investors are bearish (Zweig, 1973; Lee et al., 1991; Neal & Wheatley, 1998).

But CCI and MCSI are survey-based indicators, which reflect sentiment about the general economic situation. CCI indicates future development of households' consumption and saving. The index takes the details like consumer attitudes, buying intentions, vacation plans, and consumer expectations for inflation, stock prices, and interest rates into consideration while MCSI covers three areas: personal finances, business conditions, and buying conditions. They both measure consumer expectations about the current and future economy but the details they design to know about the consumers are different. EPU index measures the uncertainty level related with economic policies by the government and public authorities and the results are based on the search from newspapers in the United States, which is a huge difference between EPU index and other three indicators we used.

In summary, these sentiment proxies measure different aspects of investor sentiment.

Since our research purpose is to study the mechanism in the three-variable system including political cycle, investor sentiment and stock market, we use four indicators concerning investor behaviours, consumer expectations, policy-related economic uncertainty to avoid losing information captured by different sentiment proxies and also to further study which kind of sentiment could channelize the effect of political cycle.

### **4.3 Macroeconomic conditions**

We use log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ) between yields of BAA- and AAA-rated bonds, term spread ( $TS_t$ ) between the yield to maturity of a 10-year Treasury note and a three-month Treasury bill, and relative rate ( $RR_t$ ) calculated as the deviation of the three-month Treasury bill rate from its one-year moving average to reflect business cycles. These business conditioning proxies are suggested by Campbell (1987), Fama (1990), Fama and French (1988, 1989), Keim and Stambaugh (1986), Schwert (1990), Santa-Clara and Valkanov (2003), Perez-Liston et al. (2014) and Adjei and Adjei (2017) in their studies about the relations between political cycle and stock market. The data are obtained from the Federal Reserve Bank of St. Louis.

The reason why other economic variables are not used as control variables in the equation, like unemployment and inflation, is because political cycle actually reflects the objective economic interests and the subjective preferences of the trade-off between unemployment and inflation of the interest groups, which is the key problem of macroeconomic policies faced by public authorities, stated by Nordhaus (1975).

The famous Phillips curve by Phillips (1958) hypothesizes a stable and inverse relationship between inflation and unemployment. Price stability and full employment are not compatible goals which can be achieved simultaneously. Political authorities influence the rate of unemployment and inflation through the monetary and fiscal policy. The voters support political parties that best stand for their individual interests and beliefs. The major constituencies of political parties are distinguished primarily by class, income, and related socioeconomic characteristics. The partisan theory proposed by Hibbs (1977) indicates that for the lower income, blue-collar groups, the objective

economic interests and the subjective preferences of the unemployment/inflation trade-off are different in comparison with the higher income, white-collar groups. The differences are reflected in the contrasting positions toward various economic goals associated with left-and right-wing governments. The Socialist and Labor parties which are labor-oriented and working-class-based typically give higher priority to full employment than to inflation, while The Conservative parties which are business-oriented and upper middle-class-based generally attach greater significance to price stability than to unemployment.

Our paper tries to test the effect of political cycle on the stock market and the role of investor sentiment in the three-variable system. No matter in the mediator or moderator hypothesis we propose, political cycle is the independent variable which reflects the objective economic interests and the subjective preferences of the unemployment/inflation trade-off of the different interest groups. Therefore, we do not control the economic variables like unemployment and inflation, and instead we use the macro conditions like log dividend-price ratio, default spread, term spread, and relative rate which are often used while studying the links between political cycle and stock market (Campbell, 1987; Fama, 1990; Fama & French, 1988; Fama & French, 1989; Keim & Stambaugh, 1986; Schwert, 1990; Santa-Clara & Valkanov, 2003; Perez-Liston et al., 2014; Adjei & Adjei, 2017).

#### **4.4 Summary statistics**

Table 1 summarizes the descriptive statistics for the variables. S&P 500 return has a mean of 0.61% and excess return has a mean of -4.13%. The average sentiment level measured by the orthogonalized Baker and Wurgler Index (BW) is positive during the whole sample period for U.S. market, with a mean of 0.0157 and standard deviation of 0.9878. The standardized EPU has a maximum level of 4.6504. There is total 637 monthly observations, with 277 months under Democratic administration and 360 months under Republican administration.

The mean of the S&P 500 return is 0.94% under Democratic administration and 0.36%

under Republican administration. The mean return is higher under Democratic administration, and the difference in the returns between two parties is significant, which can be confirmed by the test statistics. The mean of the excess return is -2.86% under Democratic administration and -5.10% under Republican administration. The average excess return is significantly higher under Democratic administration.

The mean of the BW sentiment index is -0.1289 during Democratic presidencies and 0.1270 during Republican presidencies. The mean of the BW sentiment index is significantly higher during Republican presidencies. But the mean of CCI and MCSI is significantly higher during Democratic presidencies. Although the mean of the standardized EPU index is -0.0520 and 0.0400 during Democratic and Republican presidencies respectively, there is no significant difference in the EPU index across two parties. The preliminary test lay a foundation for our empirical estimation in the next section.

**Table 1 Summary statistics for stock return and investor sentiment index**

This table reports the summary statistics for the index return and excess return of S&P 500 index and investor sentiment proxies including the orthogonalized Baker and Wurgler’s (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan’s Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU) from December 1965 to December 2018. The full sample period has 637 monthly observations, with 277 monthly observations during Democratic presidencies and 360 monthly observations during Republican presidencies. We report the summary statistics during the whole sample period, during Democratic presidencies and during Republican presidencies respectively. We also provide mean-comparison test results for the stock market return and investor sentiment index during Democratic presidencies versus Republican presidencies.

Variable	Mean	Median	Min	Max	Standard deviation
<i>Full sample period: 1965/12-2018/12, 637 monthly observations</i>					
S&P 500 return (%)	0.6138	0.8745	-21.7630	16.3047	4.2919
Excess return (%)	-4.1287	-3.5884	-27.8930	10.7523	5.4931
BW sentiment index	0.0157	0.0279	-2.4220	3.1974	0.9878
CCI	0	0.2991	-2.6162	2.0465	1



MCSI	0	0.2685	-2.7629	2.1509	1
EPU	0	-0.1530	-1.8992	4.6504	1
<hr/>					
<i>Democratic presidencies, 277 monthly observations</i>					
<hr/>					
S&P 500 return (%)	0.9409	1.1061	-14.5797	10.7723	3.9898
Excess return (%)	-2.8606	-2.5691	-25.3795	10.7523	5.2025
BW	-0.1289	-0.0224	-2.0257	2.2532	0.7747
CCI	0.0920	0.3717	-2.6162	2.0465	1.1217
MCSI	0.0905	0.3011	-2.7629	2.1509	1.1130
EPU	-0.0520	-0.2359	-1.8992	4.6504	1.0421
<hr/>					
<i>Republican presidencies, 360 monthly observations</i>					
<hr/>					
S&P 500 return (%)	0.3620	0.5973	-21.7630	16.3047	4.4999
Excess return (%)	-5.1044	-4.5106	-27.8930	8.8447	5.5183
BW	0.1270	0.1350	-2.4220	3.1974	1.1130
CCI	-0.0708	0.1980	-2.2840	1.1816	0.8903
MCSI	-0.0697	0.2278	-2.4696	1.4827	0.8989
EPU	0.0400	-0.0819	-1.7736	4.3573	0.9659
<hr/>					
<i>T test for mean-comparison (Democrat vs Republican)</i>					
<hr/>					
	t-statistics		p-value		
<hr/>					
S&P 500 return	-1.6900		0.0915		
Excess return	-5.2150		0		
BW	3.2651		0.0012		
CCI	-2.0411		0.0417		
MCSI	-2.0093		0.0449		
EPU	1.1515		0.2500		
<hr/>					

## 5. Methodology

### 5.1 Political cycle and investor sentiment

In order to test Hypothesis 1, we should first examine whether *Path a* and *Path c* in

Figure 1 are significant according to Baron and Kenny (1986). In Figure 1, *Path a* assumes that investor sentiment is significantly related with political cycle. To test this relation, we use the dummy variable  $Democrat_t$  which equals one if month  $t$  is during Democratic presidencies and zero otherwise. Model 1 takes the following form:

$$S_t = \alpha_0 + \alpha_1 Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \varepsilon_t \quad (1)$$

$S_t$  is the sentiment index in month  $t$ , which represents one of the following four sentiment related variables, namely the orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU).

We control the macro variables, namely log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ) between yields of BAA- and AAA-rated bonds, term spread ( $TS_t$ ) between the yield to maturity of a 10-year Treasury note and a three-month Treasury bill, and relative rate ( $RR_t$ ) calculated as the deviation of the three-month Treasury bill rate from its one-year moving average. The monthly data are obtained from the Federal Reserve Bank of St. Louis.

$\varepsilon_t$  is a random variable and represents the error term. We assume that the error term is normally distributed with a zero mean and a constant variance. The error term is not correlated with each other or with independent variables.

If the coefficient  $\alpha_1$  is significant, this indicates that investor sentiment is associated with political cycle, which confirms *Path a* in Figure 1.

## 5.2 Political cycle and stock market

In Figure 1, *Path c* assumes that stock market return is affected by political cycle. To test this relation, we use the dummy variable  $Democrat_t$  which equals one if month  $t$  is during Democratic presidencies and zero otherwise. And we also control for the

macro conditions like log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ), term spread ( $TS_t$ ), and relative rate ( $RR_t$ ) in month  $t$ . Model 2 takes the following form:

$$R_t - R_{ft} = \beta_0 + \beta_1 Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \vartheta_t \quad (2)$$

where  $R_t$  is the return on the market index in month  $t$  and  $R_{ft}$  is the risk-free rate in month  $t$ . We assume that the error term  $\vartheta_t$  is normally distributed with a zero mean and a constant variance. The error term is not correlated with each other or with independent variables.

If the coefficient  $\beta_1$  is significant, this indicates that the stock market return during Democratic presidencies significantly differs from that during Republican presidencies, which confirms *Path c* in Figure 1.

### 5.3 Investor sentiment as a mediator

In Hypothesis 1, we assume that investor sentiment serves as a mediator between stock market returns and political cycles. In order to test this hypothesis, we include investor sentiment ( $S_t$ ) and the dummy variable  $Democrat_t$ . And we also control for the macro conditions like log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ), term spread ( $TS_t$ ), and relative rate ( $RR_t$ ). Model 3 takes the following form:

$$R_t - R_{ft} = \gamma_0 + \gamma_1 S_t + \gamma_2 Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \omega_t \quad (3)$$

where  $R_t$  is the monthly return on the market index in month  $t$  and  $R_{ft}$  is the risk-free rate in month  $t$ .  $S_t$  is the sentiment index in month  $t$ , which represents one of the following four sentiment related variables, namely the orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU).  $Democrat_t$  is a dummy variable which equals one in month  $t$  if the president is a Democrat and zero otherwise.

We assume that the error term  $\omega_t$  is normally distributed with a zero mean and a constant variance. The error term is not correlated with each other or with independent variables.

#### 5.4 Direct and indirect effect

According to the nature of mediation clarified by Baron and Kenny (1986), if  $\alpha_1$  in front of  $Democrat_t$  in equation (1) and  $\beta_1$  in front of  $Democrat_t$  in equation (2) both show significance, but  $\gamma_1$  is significant and  $\gamma_2$  is insignificant in equation (3), then we could claim that investor sentiment is a dominant mediator between political cycle and stock market returns, which confirms Hypothesis 1. The fluctuations in investors' beliefs caused by political cycle transmit to the stock market by the channel of cumulated panic and uncertainties.

The coefficient  $\beta_1$  in front of  $Democrat_t$  in equation (2) represents the direct effect of political cycle on stock market returns (*Path c* in Figure 1). The indirect effect of political cycle on stock market returns is defined as the product of *Path a* in Figure 1 from political cycle to investor sentiment and *Path b* in Figure 1 from investor sentiment to stock market returns. The former is reflected in the coefficient  $\alpha_1$  in equation (1), and the latter is reflected in the coefficient  $\gamma_1$  in equation (3).

#### 5.5 Sobel test

A more realistic goal may be that investor sentiment as a mediator significantly decreases *Path c* in Figure 1 rather than eliminates the relation between stock market returns and political cycles altogether. From a theoretical perspective, a significant reduction demonstrates that investor sentiment as a given mediator is indeed potent.

Sobel (1982) provides a specialized  $t$  test to determine the statistical significance of the indirect effect via the mediator. In Figure 1, we calculate the path from the independent variable (political cycle) to the mediator (investor sentiment), and obtain the coefficient  $\alpha_1$  and its standard error  $S_{\alpha}$ . Then we calculate the path from the mediator (investor

sentiment) to the dependent variable (stock market returns), and obtain the coefficient  $\gamma_1$  and its standard error  $S_\gamma$ .

The indirect effect via the mediator (investor sentiment) is the product of  $\alpha_1$  and  $\gamma_1$ , or  $\alpha_1\gamma_1$ . The exact formula, given multivariate normality for the standard error of the indirect effect or  $\alpha_1\gamma_1$ , is as follows:

$$S_{\alpha\gamma} = \sqrt{\gamma_1^2 s_a^2 + \alpha_1^2 s_\gamma^2 + s_a^2 s_\gamma^2}$$

We calculate the  $t$ -statistics and compare to its null sampling distribution.

$$t = \alpha_1\gamma_1/S_{\alpha\gamma}$$

## 5.6 The moderator effect of political cycle

To test Hypothesis 2, we include investor sentiment, political cycle and the interaction term of the two variables in model 4. We examine whether political cycle moderates the effect of investor sentiment on the stock market. Model 4 takes the following form:

$$\begin{aligned} R_t - R_{ft} = & \mu_0 + \mu_1 S_t + \mu_2 Democrat_t + \mu_3 S_t \times Democrat_t + c_1 DY_t + c_2 DS_t \\ & + c_3 TS_t + c_4 RR_t + \tau_t \end{aligned} \tag{4}$$

where  $R_t$  and  $R_{ft}$  represent the return on the market index and the risk-free rate in month  $t$  respectively.  $S_t$  is the sentiment index in month  $t$ , which represents one of the following four sentiment related variables, namely the orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU).  $Democrat_t$  is a dummy variable which equals one when month  $t$  is under Democratic presidencies and zero otherwise. The coefficients  $c_1$  to  $c_4$  measure the impact of macroeconomic conditions: log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ), term spread ( $TS_t$ ) and relative rate ( $RR_t$ ). We assume that the error term  $\tau_t$  is normally distributed with a zero mean and

a constant variance. The error term is not correlated with each other or with independent variables.

If the interaction term of political cycle and investor sentiment in equation (4) is significant, then we confirm *Path f* in Figure 2. However, the moderator variable should be uncorrelated with the predictor and the dependent variable, according to Baron and Kenny (1986), to provide a clear interaction term. So, only if the coefficient  $\alpha_1$  in equation (1) and the coefficient  $\beta_1$  in equation (2) are insignificant, and the coefficient  $\mu_3$  in equation (4) is significant, we can claim that political cycle is a moderator in the relation between investor sentiment and stock market returns.

## 6. Empirical results

### 6.1 Political cycle and investor sentiment

Table 2 reports the estimation results for model 1. We find that investor sentiment measured by BW, CCI and MCSI is negatively impacted by Democratic presidents in power, at 1% significance level. This is consistent with Perez-Liston et al. (2014) who suggest that political variables influence the way investors feel about the market. However, the association between EPU and presidential cycles is not statistically significant. This suggests that investor's concern about uncertainty of economic policy does not change significantly when the president switches from a Democrat to a Republican.

Our results confirm *Path a* in Figure 1. Political cycles predict investor sentiment, but only significant for BW, CCI and MCSI, not for EPU.

#### Table 2 Political cycle and investor sentiment

This table reports the estimation results for model 1 over the sample period from December 1965 to December 2018. It takes the following form:

$$S_t = \alpha_0 + \alpha_1 Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \varepsilon_t \quad (1)$$

$S_t$  is the sentiment index in month  $t$ , which represents one of the following four sentiment related variables, namely the orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU).

The dummy variable  $Democrat_t$  equals one if month  $t$  is during Democratic presidencies and zero otherwise. We control the macro conditions in month  $t$ , namely log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ) between yields of BAA- and AAA-rated bonds, term spread ( $TS_t$ ) between the yield to maturity of a 10-year Treasury note and a three-month Treasury bill, and relative rate ( $RR_t$ ) as the deviation of the three-month Treasury bill rate from its one-year moving average.  $\varepsilon_t$  represents the error term.

	(1)	(2)	(3)	(4)
	<i>BW</i>	<i>CCI</i>	<i>MCSI</i>	<i>EPU</i>
<i>Political cycle</i>				
<i>Democrat<sub>t</sub></i>	-0.3371*** (0.0793)	-0.1930*** (0.0679)	-0.2066*** (0.0676)	0.1109 (0.0781)
<i>Control variables</i>				
<i>DY<sub>t</sub></i>	-1.5898*** (0.2396)	-1.7371*** (0.2051)	-1.6639*** (0.2042)	-0.2397 (0.2360)
<i>DS<sub>t</sub></i>	0.0332 (0.1044)	-0.9061*** (0.0894)	-0.9329*** (0.0890)	0.8799*** (0.1028)
<i>TS<sub>t</sub></i>	-0.0702** (0.0353)	0.0577* (0.0302)	0.0484 (0.0301)	0.0887** (0.0348)
<i>RR<sub>t</sub></i>	-0.0809 (0.0496)	0.0743* (0.0425)	0.0936** (0.0423)	0.0453 (0.0489)
$\alpha_0$	0.9226*** (0.1414)	1.6973*** (0.1211)	1.7151*** (0.1205)	-1.0159*** (0.1393)

$R^2$	0.0981	0.3550	0.3609	0.1465
Adjusted $R^2$	0.0910	0.3499	0.3558	0.1397
$F$ -statistic	13.7324***	69.4534***	71.2694***	21.6616***

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 6.2 Political cycle and stock market

The first column in Table 3 reports the estimation results for model 2. We find the excess return is positively correlated with political cycles, at 1% significance level. Democratic presidency has positive explanatory power on the stock market returns. This contradicts to Jones and Banning (2008) who argue that neither election results nor the election cycle appears to offer much help in predicting stock market returns. Besides, our results suggest that the excess return during Democratic presidencies is significantly higher than that during Republican presidencies. This supports previous researchers like Niederhoffer et al. (1970), Huang (1985), Johnson et al. (1999), Hensel and Ziemba (1995), Santa-Clara and Valkanov (2003).

Therefore, the highly significant coefficient confirms *Path c* in Figure 1.

### Table 3 Political cycle, investor sentiment and stock market

The first column in Table 3 reports the estimation results for model 2 over the sample period from December 1965 to December 2018. It takes the following form:

$$R_t - R_{ft} = \beta_0 + \beta_1 Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \vartheta_t \quad (2)$$

where  $R_t$  is the monthly return on the market index in month  $t$  and  $R_{ft}$  is the risk-free rate in month  $t$ . The dummy variable  $Democrat_t$  equals one if month  $t$  is during Democratic presidencies and zero otherwise. We control the macro conditions in month  $t$ , namely log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ) between yields of BAA- and AAA-rated bonds, term spread ( $TS_t$ ) between the yield to maturity of a 10-year Treasury note and a three-month Treasury bill, and relative rate ( $RR_t$ ) as the deviation of the three-month Treasury bill rate from its one-year moving average.  $\vartheta_t$  represents the error term.

The column 2-5 in Table 3 reports the estimation results for model 3 over the sample period from December 1965 to December 2018. It takes the following form:

$$R_t - R_{ft} = \gamma_0 + \gamma_1 S_t + \gamma_2 Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \omega_t$$



(3)

where  $R_t$  is the monthly return on the market index in month  $t$  and  $R_{ft}$  is the risk-free rate in month  $t$ .  $S_t$  is the sentiment index in month  $t$ , which represents one of the following four sentiment related variables, namely the orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU).  $\omega_t$  represents the error term.

	(1)	(2)	(3)	(4)	(5)
	<i>Return</i>	<i>Return</i>	<i>Return</i>	<i>Return</i>	<i>Return</i>
<i>Political cycle</i>					
<i>Democrat<sub>t</sub></i>	2.0540*** (0.3876)	1.7185*** (0.3852)	1.9819*** (0.3895)	1.9540*** (0.3894)	2.0846*** (0.3879)
<i>Investor sentiment</i>					
<i>BW<sub>t</sub></i>		-0.9953*** (0.1906)			
<i>CCI<sub>t</sub></i>			-0.3735 (0.2269)		
<i>MCSI<sub>t</sub></i>				-0.4841** (0.2277)	
<i>EPU<sub>t</sub></i>					-0.2758 (0.1974)
<i>Control variables</i>					
<i>DY<sub>t</sub></i>	-10.9035*** (1.1709)	-12.4858*** (1.1867)	-11.5524*** (1.2340)	-11.7090*** (1.2276)	-10.9696*** (1.1710)

$DS_t$	-0.1009 (0.5103)	-0.0679 (0.5000)	-0.4394 (0.5495)	-0.5526 (0.5514)	0.1417 (0.5387)
$TS_t$	1.1386*** (0.1725)	1.0687*** (0.1696)	1.1602*** (0.1728)	1.1621*** (0.1724)	1.1631*** (0.1733)
$RR_t$	-0.8225*** (0.2425)	-0.9030*** (0.2381)	-0.7947*** (0.2427)	-0.7772*** (0.2427)	-0.8099*** (0.2425)
$\alpha_0$	-2.0600*** (0.6910)	-1.1417 (0.6995)	-1.4260* (0.7903)	-1.2296 (0.7920)	-2.3401*** (0.7190)
$R^2$	0.3035	0.3324	0.3065	0.3085	0.3056
Adjusted $R^2$	0.2980	0.3260	0.2999	0.3019	0.2990
$F$ -statistic	54.9902***	52.2769***	46.4009***	46.8347***	46.2195***

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 6.3 The mediation effect of investor sentiment

The column 2-5 in Table 3 reports the estimation results for model 3. We find that, of four sentiment proxies, the excess return is significantly negatively associated with BW and MCSI. And compared to model 2, the positive predictive power of political cycles is still significant but the magnitude becomes lower after we include investor sentiment in the estimation model. Combined with the previous results, BW and MCSI may function as a mediator between political cycles and stock markets according to Baron and Kenny (1986)'s clarification of the meaning of mediation.

Then we perform Sobel-Goodman Mediation Tests by Sobel (1982) to determine the statistical significance of the indirect effect via the mediator. Table 4 reports the test results. The test statistic in Panel A is highly significant, which confirms the mediation effect via BW. According to the calculation, the direct effect of political cycles on the excess return is 1.7185, and the indirect effect through BW on the excess return is

0.3355. The total effect of political cycles on stock market returns is the direct effect plus the indirect effect, which is 2.0540. So, 16.34% of the total effect is mediated via BW. And the direct effect of political cycle is still the majority, which accounts for almost 85% of the total effect.

**Table 4 Sobel-Goodman Mediation Tests**

This table provides the results for Sobel-Goodman Mediation tests. Panel A, B, C and D present the test results for the orthogonalized Baker and Wurgler’s (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan’s Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU) respectively.

Sobel (1982) provides a specialized *t* test to determine the statistical significance of the indirect effect via the mediator. In Figure 1, we calculate the path from the independent variable (political cycle) to the mediator (investor sentiment), and obtain the coefficient  $\alpha_1$  and its standard error  $S_a$ . Then we calculate the path from the mediator (investor sentiment) to the dependent variable (stock market returns), and obtain the coefficient  $\gamma_1$  and its standard error  $S_\gamma$ .

The indirect effect via the mediator (investor sentiment) is the product of  $\alpha_1$  and  $\gamma_1$ , or  $\alpha_1\gamma_1$ . The exact formula, given multivariate normality for the standard error of the indirect effect or  $\alpha_1\gamma_1$ , is as follows:

$$S_{a\gamma} = \sqrt{\gamma_1^2 s_a^2 + \alpha_1^2 s_\gamma^2 + s_a^2 s_\gamma^2}$$

We calculate the *t*-statistics and compare to its null sampling distribution.

$$t = \alpha_1\gamma_1/S_{a\gamma}$$

The direct effect is the path from the independent variable (political cycle) to the dependent variable (stock market returns). The total effect is the direct effect plus the indirect effect.

**Panel A Test for BW as a mediator**

	Coefficient	Standard Error	Z value	P> Z
Sobel	0.3355	0.1018	3.296	0.0010
Goodman-1 (Aroian)	0.3355	0.1029	3.261	0.0011
Goodman-2	0.3355	0.1007	3.333	0.0009
a coefficient	-0.3371	0.0793	-4.2504	0.00002
b coefficient	-0.9953	0.1906	-5.2217	1.8e-07

Indirect effect	0.3355	0.1018	3.2964	0.0010
Direct effect	1.7185	0.3852	4.4617	8.1e-06
Total effect	2.0540	0.3876	5.2995	1.2e-07
Proportion of total effect that is mediated:			0.1634	
Ratio of indirect to direct effect			0.1953	
Ratio of total to direct effect			1.1953	

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**Panel B Test for CCI as a mediator**

	Coefficient	Standard Error	Z value	P> Z
Sobel	0.0721	0.0506	1.424	0.1543
Goodman-1 (Aroian)	0.0721	0.0529	1.363	0.1730
Goodman-2	0.0721	0.0482	1.495	0.1348
a coefficient	-0.1930	0.0679	-2.8418	0.0045
b coefficient	-0.3735	0.2269	-1.6461	0.0997
Indirect effect	0.0721	0.0506	1.4244	0.1543
Direct effect	1.9819	0.3895	5.0880	3.6e-07
Total effect	2.0540	0.3876	5.2995	1.2e-07
Proportion of total effect that is mediated:			0.0351	
Ratio of indirect to direct effect			0.0364	
Ratio of total to direct effect			1.0364	

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**Panel C Test for MCSI as a mediator**

	Coefficient	Standard Error	Z value	P> Z
Sobel	0.1000	0.0573	1.746	0.0809
Goodman-1 (Aroian)	0.1000	0.0593	1.686	0.0918

Goodman-2	0.1000	0.0552	1.812	0.0699
a coefficient	-0.2066	0.0676	-3.0571	0.0022
b coefficient	-0.4841	0.2277	-2.1266	0.0335
Indirect effect	0.1000	0.0573	1.7458	0.0809
Direct effect	1.9540	0.3894	5.0184	5.2e-07
Total effect	2.0540	0.3876	5.2995	1.2e-07
Proportion of total effect that is mediated:			0.0487	
Ratio of indirect to direct effect			0.0512	
Ratio of total to direct effect			1.0512	

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**Panel D Test for EPU as a mediator**

	Coefficient	Standard Error	Z value	P> Z
Sobel	-0.0306	0.0307	-0.996	0.3193
Goodman-1 (Aroian)	-0.0306	0.0344	-0.890	0.3735
Goodman-2	-0.0306	0.0266	-1.151	0.2495
a coefficient	0.1109	0.0781	1.4199	0.1556
b coefficient	-0.2758	0.1974	-1.3970	0.1624
Indirect effect	-0.0306	0.0307	-0.9958	0.3193
Direct effect	2.0846	0.3879	5.3739	7.7e-08
Total effect	2.0540	0.3876	5.2995	1.2e-07
Proportion of total effect that is mediated:			-0.0149	
Ratio of indirect to direct effect			-0.0147	
Ratio of total to direct effect			0.9853	

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The test statistic in Panel B rejects the hypothesis that CCI serves as a mediator between political cycles and stock markets. Although *Path a* and *c* are significant for CCI, the indirect effect is insignificant.

The test statistic in Panel C is highly significant, which confirms the mediation effect of MCSI. The direct effect of political cycles on the excess return is 1.9540, and the indirect effect through MCSI on the excess return is 0.1. The total effect is the direct effect plus the indirect effect, which is 2.0540. So, 4.87% of the total effect is mediated via MCSI. And the direct effect of political cycle is the majority, which accounts for almost 95% of the total effect of political cycles on stock markets.

The test statistic in Panel D rejects the hypothesis that EPU serves as a mediator between political cycles and stock markets. In model 1, we already find that EPU is not affected by political cycles, which is inconsistent with the conditions of mediation as stated by Baron and Kenny (1986).

In summary, only BW and MCSI could function as a potent mediator and significantly reduce the direct effect of political cycles on stock market returns. And the proportion of the indirect effect via BW is larger than that via MCSI.

#### **6.4 The moderation effect of political cycle**

Table 5 presents the results for equation (4) in which we incorporate investor sentiment, political cycles and the interaction term of these two variables. We can find that political cycles show significantly positive explanatory power regardless of sentiment indicators we choose, which is consistent with our prior results. BW and EPU are significantly negatively related to stock market returns, at 1% level, while CCI is positively related, at 10% level. MCSI becomes insignificant when the interaction term is added to the equation. If we look at the moderator effect, the interaction term is significant except the case when BW is used. This may suggest that the effect of BW does not change significantly when the president switches from a Republican to a Democrat, but the

effects of other sentiment indicators vary across different parties. The effects of CCI and MCSI are positive under Republican presidencies, but turn out to be negative under Democratic presidencies. The effect of EPU is negative under Republican presidencies, but turns out to be positive under Democratic presidencies.

It seems that we meet the three conditions in Figure 2 that investor sentiment significantly accounts for variations in stock market returns (*Path d*), political cycle significantly accounts for variations in stock market returns (*Path e*) and the interaction term of political cycle and investor sentiment significantly accounts for variations in stock market returns (*Path f*), so political cycle may moderate the effect of investor sentiment on stock markets. This suggests that political cycle, as a moderator, shifts the direction and magnitude, or any of them in the relation between investor sentiment and stock markets. But Baron and Kenny (1986) also state that the first and second condition which indicate the main effect of investor sentiment and political cycle (*Path d* and *Path e*) are not directly relevant conceptually to testing the moderator hypothesis. And most importantly, in order to provide a clearly interpretable interaction term, the moderator should be uncorrelated with the predictor and the outcome variable.

Previous results in Table 2 indicate that of four sentiment indicators, which is also the predictor in Figure 2, BW, CCI, MCSI all show significant relations with political cycle (moderator), and the first column in Table 3 indicates that political cycle (moderator) is significantly related with stock market returns (outcome variable). This violates the condition clarified by Baron and Kenny (1986) that the moderator should be uncorrelated with the predictor and the outcome variable, so the moderator hypothesis of political cycle is rejected although the interaction term of political cycle and investor sentiment is significant.

Therefore, based on the estimation results, in the three-variable system of political cycles, investor sentiment and stock markets, we only support the mediator hypothesis. Investor sentiment proxies like BW and MCSI, are proved to function as a mediator to channelize the effect of political cycles on stock markets as Figure 1 shows. Political

cycles not only directly affect stock markets, but also indirectly affect stock markets through investor sentiment. Besides, we also reject the moderator hypothesis of political cycle because of its significant relations with our predictor and outcome variable in Figure 2 so that it cannot provide a clearly interpretable interaction term. We find in the three-variable system, political cycle and investor sentiment are not at the same level in regard to their role as causal variables antecedent to the outcome variable. The mediating events shift roles from effects to causes. In fact, political cycle is causally antecedent to investor sentiment measured by BW and MCSI in the system. Moreover, our choice of sentiment indicators also matters when exploring the mechanism in the system since the procedure of testing a mediator or moderator is strict. Among the sentiment indicators we choose, BW and MCSI are proved to be a mediator, but it should be noticed that sentiment proxies like CCI and EPU are not consistent with any situations in Hypothesis 1 or 2.

**Table 5 The moderation effect of political cycle**

This table reports the estimation results for model 4 over the sample period from December 1965 to December 2018. It takes the following form:

$$R_t - R_{ft} = \mu_0 + \mu_1 S_t + \mu_2 Democrat_t + \mu_3 S_t \times Democrat_t + c_1 DY_t + c_2 DS_t + c_3 TS_t + c_4 RR_t + \tau_t \tag{4}$$

where  $R_t$  is the monthly return on the market index in month  $t$  and  $R_{ft}$  is the risk-free rate in month  $t$ .  $S_t$  is the sentiment index in month  $t$ , which represents one of the following four sentiment related variables, namely the orthogonalized Baker and Wurgler's (2006) investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU). The dummy variable  $Democrat_t$  equals one if month  $t$  is during Democratic presidencies and zero otherwise. We control the macro conditions in month  $t$ , namely log dividend-price ratio ( $DY_t$ ), default spread ( $DS_t$ ) between yields of BAA- and AAA-rated bonds, term spread ( $TS_t$ ) between the yield to maturity of a 10-year Treasury note and a three-month Treasury bill, and relative rate ( $RR_t$ ) as the deviation of the three-month Treasury bill rate from its one-year moving average.  $\tau_t$  represents the error term.



	(1)	(2)	(3)	(4)
	<i>Return</i>	<i>Return</i>	<i>Return</i>	<i>Return</i>
<i>Political cycle</i>				
<i>Democrat<sub>t</sub></i>	1.6926*** (0.3881)	2.0451*** (0.3842)	2.0247*** (0.3848)	2.1192*** (0.3837)
<i>Investor sentiment</i>				
<i>BW<sub>t</sub></i>	-0.9391*** (0.2155)			
<i>CCI<sub>t</sub></i>		0.6001* (0.3134)		
<i>MCSI<sub>t</sub></i>			0.4200 (0.3122)	
<i>EPU<sub>t</sub></i>				-0.9397*** (0.2588)
<i>The moderator effect</i>				
<i>Democrat<sub>t</sub>BW<sub>t</sub></i>	-0.2413 (0.4314)			
<i>Democrat<sub>t</sub>CCI<sub>t</sub></i>		-1.7386*** (0.3921)		
<i>Democrat<sub>t</sub>MCSI<sub>t</sub></i>			-1.6276*** (0.3902)	

$Democrat_t EPU_t$				1.4336 <sup>***</sup> (0.3669)
<i>Control variables</i>				
$DY_t$	-12.6921 <sup>***</sup> (1.2433)	-11.5944 <sup>***</sup> (1.2162)	-11.7445 <sup>***</sup> (1.2120)	-10.6886 <sup>***</sup> (1.1602)
$DS_t$	-0.0477 (0.5016)	-0.5341 (0.5420)	-0.6274 (0.5447)	-0.0585 (0.5352)
$TS_t$	1.0681 <sup>***</sup> (0.1697)	0.8931 <sup>***</sup> (0.1806)	0.9289 <sup>***</sup> (0.1792)	1.1340 <sup>***</sup> (0.1715)
$RR_t$	-0.9022 <sup>***</sup> (0.2382)	-1.1705 <sup>***</sup> (0.2538)	-1.1372 <sup>***</sup> (0.2547)	-0.9609 <sup>***</sup> (0.2428)
$\alpha_0$	-1.0763 (0.7096)	-0.8439 (0.7898)	-0.7340 (0.7909)	-2.1879 <sup>***</sup> (0.7121)
Adjusted $R^2$	0.3253	0.3200	0.3196	0.3146
<i>F-statistic</i>	44.8046 <sup>***</sup>	43.7602 <sup>***</sup>	43.6746 <sup>***</sup>	42.6945 <sup>***</sup>

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 7. Conclusion

In this paper, we study the relationship among political cycles, stock markets and investor sentiment. Most paper in this field concentrate on the bilateral relationship between political cycles and stock markets like Siokis and Kapopoulos (2007), Santa-Clara and Valkanov (2003), Leblang and Mukherjee (2005), Belo et al. (2013) and

Kumar et al. (2015), the impact of investor sentiment on stock markets like Tetlock (2007), Garcia (2013), Kräussl and Mirgorodskaya (2016), Cookson and Niessner (2019), and the relation between investor sentiment and political cycles such as Adjei and Adjei (2017), Perez-Liston et al. (2014) and Bonaparte et al. (2017). However, the literature leaves a blank in the mechanism in a three-variable system including political cycles, investor sentiment and stock markets, and we try to fill the gap.

We propose two hypotheses regarding this three-variable system. The first one is that investor sentiment functions as a mediator between political cycles and stock market returns. The second one is that political cycles moderate the effect of investor sentiment on stock market returns. The difference between the two hypotheses lies in the role of investor sentiment and political cycles, for example, whether they are at the same level antecedent to the outcome variable. We use the monthly excess return of S&P 500, the orthogonalized Baker and Wurgler's investor sentiment index (BW), the Conference Board Consumer Confidence Index (CCI), the University of Michigan's Consumer Sentiment Index (MCSI) and the Economic Policy Uncertainty Index (EPU). We use a dummy variable to indicate which party is in power. We also control for the macro conditions like log dividend-price ratio, default spread, term spread and relative rate. The sample period starts from December 1965 to December 2018, including 637 monthly observations, with 277 months during Democratic presidencies and 360 months during Republican presidencies.

In Hypothesis 1, to meet the condition of mediation clarified by Baron and Kenny (1986), we need to start by testing the relation between political cycles and investor sentiment, as well as the relation between political cycles and stock market returns. We find BW, CCI and MCSI are significantly related to political cycles. When a Democrat is elected, investor sentiment is negatively impacted. EPU index which measures the uncertainty of economic policy does not change significantly whether the Democratic party is in power or not. Then we study the relation between political cycles and stock market returns, and find the excess return is positively associated with political cycles. Democratic presidency has positive explanatory power on stock market returns.

Next, we test whether investor sentiment functions as a mediator between political cycles and stock markets. Our results show that only BW and MCSI show significant mediation effect and reduce the direct effect of political cycles on stock markets. And BW shows larger proportion of indirect effect to total effect as compared to MCSI. Besides, although investor sentiment serves as a mediator, the direct effect still accounts for the majority of the total effect of political cycles on stock markets.

In Hypothesis 2, to provide a clear interaction term, political cycles need to be uncorrelated with investor sentiment and stock markets, clarified by Baron and Kenny (1986). Although the highly significant interaction term of political cycles and investor sentiment reveals that the moderation effect of political cycles may exist in the three-variable system, which suggests that political cycles may moderate the effect of investor sentiment on stock markets, and political cycles could shift the direction and magnitude or any of them in the relation between investor sentiment and stock markets, the moderator hypothesis is rejected by us following the strict testing procedure. But we should notice that investor sentiment indeed shows different effect across the two political parties. For example, the effect of EPU on stock market returns is negative under Republican presidencies but positive under Democratic presidencies. The effects of CCI and MCSI are positive under Republican presidencies, but turn out to be negative under Democratic presidencies. And the effect of BW does not significantly change when the president switches from a Republican to a Democrat.

In summary, only mediator hypothesis is proved in the three-variable system of political cycles, investor sentiment and stock markets, and the exact path depends on which sentiment indicator is used. Of four proxies we choose, BW and MCSI could function as a mediator and channelize the impact of political cycles on stock markets. The moderator hypothesis does not apply to the three-variable system. Our examination of two mechanisms in the three-variable system provides a new social psychological perspective into the relations among political cycles, investor sentiment and stock markets.

Since Baron and Kenny (1986) carefully elaborate many ways in which mediators and moderators differ, we are aware of the importance of not using the terms mediator and moderator interchangeably and follow the strict testing procedure to examine whether the mediation and moderation effect exist in the system. We believe the moderator-mediator distinction can be used to study not only a wide range of phenomena including control and stress, attitudes, and personality traits in social psychological research, but also some questions in economics and finance, especially the ones related with investor sentiment. In the future studies, we could make the most effective use of a broader causal system that includes both mediators and moderators.

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