Erasmus School of Economics

Bachelor Thesis

International Bachelor Economics & Business

Have US Senators been using privileged political information to make abnormal returns on common stock trades during the beginning of the Biden administration?

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Final Version Date: August 1st, 2022

Abstract

This paper studies the returns on stock portfolios of US Senators by compiling data on their trades and evaluating the subsequent daily returns over a one-year time period representing the beginning of the Biden administration (Q2, 2021 until the end of Q1, 2022). Using performance evaluation methods such as CAPM, Fama French 3 Factor and 5 Factor with the addition of Momentum, it is determined that the stock portfolio of the overall US Senate shows significant positive abnormal returns under the 3 methods applied. American congressional trading legislation may be debated and reviewed before the end of the year and the findings of abnormal returns may support the need for renewed debate on this topic.

Key-words: US Senate Trading, Congressional Trading, Abnormal Returns

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1. Introduction

Decisions or announcements made by politicians around the world often have massive implications on profitability of certain companies or even entire industries and are thus of interest to those involved in financial markets. US Senators are among some of the most important figures when it comes to making decisions that can have serious financial effects for worldwide markets and global economies. Due to their position of power and high level government clearances, they may have consistent access to privileged information which would not be available for the public. This may allow Senators to be better able to predict the response of stock markets to the actions of the US government (current and upcoming) as well as important global events which may not have occurred yet. Schweizer (2011) stated that insider trading rules didn't apply to members of Congress and although it may not be illegal for them to conduct insider trading, it was definitely very unethical to engage in any form of it. Although US Senators are in such a powerful position; they, their staff and family members are currently still allowed to engage in trading of stocks and other financial instruments although subject to Congressional trading rules mandating public disclosure which were imposed in 2012.

2. Background & Relevance

In the US political system, legislation is first introduced and voted on in the House of Representatives. The House of Representatives consists of 435 voting and 6 non-voting members each with a 2 year elected-term similar to members of the Senate. If a simple majority is achieved in the vote on the legislation, then will it be considered by the US Senate. The Senate is made up of 100 Senators with 2 Senators coming from each state, and they would have to vote on any legislation that passed the House. If the legislation is passed by a simple majority, the President then gets to make the final decision to pass or veto the bill. In the case of a veto of the bill by the President, Senators have the power to challenge a veto making them some of the most powerful people in the US government.

According to (Karadas et. al, 2021) frustration was growing to new heights with Congress in 2011 after an episode of *60 minutes* exposed congressional trading in great detail and a book on the topic written by Peter Schweizer was published. Thereafter the Stop Trading on Congressional Knowledge (STOCK) act was signed into law by then President Barack Obama in April of 2012 (Karadas et. al, 2021) and its goal was to prevent potential insider trading and making financial gains related to non-public political knowledge. Blau et al. (2021) describe that even though this was the primary purpose, there were modifications made to the legislation the following year which relaxed the regulations on disclosure requirements for members of congress, their families and staff. Karadas et. al (2021) stated that initially there

was a requirement where the public would be able to search, sort and download the disclosure data from an electronic database however this was removed over national security concerns. Blau et al. (2021) acknowledged that these modifications quietly went ahead without much publicity and media coverage. Furthermore, Blau et al. (2021) stated that whilst many laws were in place to limit trading done by employees and executives of publicly traded companies, the STOCK Act was the first bill to place any restrictions on trading conducted by members of the House and Senate.

According to Levinthal (2022), 59 members of Congress violated the STOCK Act (including 7 Senators), and may face repercussions for this although fines are usually small or non-existent if waived. According to the U.S. Securities and Exchange Commission (2021), an investigation was started into North Carolina Senator Richard Burr and his brother-in-law for their early pandemic trades. Senator Burr was discovered to have sold more than $1.6 million of stock whilst potentially in possession of non-public information on the COVID-19 virus. This investigation has had no updates or releases since November of 2021, which is when the SEC obtained a court order to enforce a subpoena for his brother-in-law. It is important to point out that this SEC investigation was only launched after the Justice Department ended their own investigation without filing any charges against Senator Burr.

Current regulations on congressional stock trading might not be perceived as sufficient, as there is speculation regarding reforms on existing legislation and House Speaker Nancy Pelosi has stated an openness to debating new legislation on Capitol Hill (Walsh, 2022). American politicians may have to consider reforms of congressional or governmental stock trading laws this year and vote on potential legislation which could bring an end to congressional trading. The time of American politicians engaging in stock trading whilst in office may come to an end, but the question of whether they achieved abnormal returns or may have used privileged information remains.

Research Question:
"Have US Senators been using privileged political information to make abnormal returns on common stock trades during the beginning of the Biden administration?"

Sub Questions:
"Did Senators significantly outperform the stock market?"

"Were Senators able to use political information to make gains in the stock market stemming from the Russian invasion of Ukraine?"

3. Literature Review

Insider trading has long been a problem that governments have sought to tackle. The US government has had legislation against insider trading since the Securities Exchange Act of 1934 (Yulong & Sung, 1998) and laws have increased tremendously since. According to Yulong & Sun (1998), insiders are defined by the SEC as chairmen, directors, officers, principal shareholders (owning 10% or more of a company) etc. and they are expected to have access to the firm's private knowledge. Cline & Posylnaya (2019) state that although the SEC claims insider trading is widespread, it is very difficult to prove due to evidence being rare and investigations relying on circumstantial evidence. For the reasons listed above it is not possible to identify Senators as insiders and therefore the term insider trading will not be used to describe the stock activities of Senators throughout this paper.

In a paper by Jeng et al. (2003), the authors investigate the returns arising from insider trading. The database considered in this work originates from reports filed by corporate insiders with the SEC, contains 558,229 trades over the years 1975-1996 after the exclusion of option exercises, private trades and transactions by beneficial owners. Jeng et al. (2003) state that corporate insiders must file transactions of stock of their respective companies on a monthly basis with the SEC and this is made publicly available. The authors employ performance evaluation methods such as CAPM on value-weighted stocks to overcome the drawbacks of intensive trading criteria. Jeng et al. (2003) explain that in their compiled data, all insider purchases are placed into a purchase portfolio the day after their execution and held for 6 months and all insider sales are placed into a sale portfolio with those shares being held for 6 months as well. This 6-month period represents the minimum amount of time that an insider must hold stock before being allowed to claim any profits on the stock as per SEC regulations. Jeng et al. (2003) recognize that their work represents proxy returns as insider holdings do not disclose how or when stock is initially acquired, especially since insiders are net sellers of stock. Furthermore, it is mentioned that American regulators believe in a level playing field and abnormal returns to either sale or purchase portfolio would represent an unfair situation to outside investors who are at a disadvantage in terms of information (Jeng et al., 2003). The results of this work concluded that the purchase portfolio showed abnormal returns however the sale portfolio did not exhibit any abnormal returns under any of the performance evaluation methods that were used. Jeng et al. (2003) discovered that a value-weighted portfolio of insider stock purchases; where positions were held for 6 months, yielded abnormal returns between 52-68 basis points per month.

Ziobrowski et al. (2004) identified the possibility that US Senators may be using nonpublic information. They explain in their paper that politicians just like voters are expected to make

choices which tend to maximize their own personal benefits or minimize any costs. Before Lyndon B. Johnson became president, he had used his political influence as a congressman to obtain licenses for his radio and TV stations whilst blocking competitors from entering the Texas market where his media company operated. His influence as a politician allowed his starting investment of $17,500 to grow into a company potentially worth millions. Ziobrowski et al. (2004) constructed a portfolio using common stock trades of US Senators from 1993-1998 in their data set. Ziobrowski et al. (2004) constructed a data set with 6,052 stock transactions initially, but filtered out a total of 360 trades which did not fit into the category of US common stocks (not inclusive of trades related to IPOs) because they were preferred stock, foreign stocks or mutual funds to list a few examples. It is important to consider that these stock trades were found in Financial Disclosure Reports, which were only done annually in the time period considered (1993-1998) and therefore there was a significant time lag ranging from 5 months to 17 months before trades became publicly reported. Performance evaluation methods employed by Ziobrowski et al. (2004) such as CAPM or the Fama French 3 Factor Model helped them to conclude that a portfolio created to mimic stock purchases of Senators, outperformed the stock market by 85 basis points per month on a trade weighted basis. Ziobrowski et al. (2004) note that the trade weighted portfolio outperforms the equal weighted portfolio, suggesting an informational advantage as Senators heavily invested in the stocks that performed best. After stocks were sold by Senators, those stocks underperformed the market by 12 basis points per month on a trade weighted basis, however it is notable that the abnormal returns were not statistically significant. Ziobrowski et al. (2004) explained that in their work, stock buys of Senators were held and their sales were shorted, which gives way to the creation of the combined portfolio of both buys and sells. Ziobrowski et al. (2004) determined that after combining buy and sales transactions in a trade weighted hedged portfolio that Senators outperformed the market by 97 basis points a month. This shows us that the hedged combined portfolio and purchase portfolio of Senators outperform and show greater abnormal returns when compared to the purchase portfolio of corporate insiders in the previously discussed work by Jeng et al. (2003).

In a follow up paper by Ziobrowski et al. (2011), similar results were discovered, this time in the context of the US House of Representatives. More than 16,000 US common stock trades from 1985-2001 were compiled into the data set and were subsequently investigated for abnormal returns. The methodology and inclusion of only trades in US common stocks (not including IPO related trades) is consistent with that of previous work by Ziobrowski et al. (2004). Additionally, the findings of this paper on the House of Representatives were consistent with their previous work on the US Senate from 2004 however returns were smaller. The authors find that a stock portfolio mimicking stock purchases by members of the House

of Representatives was able to outperform the market by 55 points a month. Unlike Ziobrowski et al. (2004), this 2011 paper did not apply a hedged portfolio. Compared to the results from Ziobrowski et al. (2004), abnormal returns arising from a portfolio mimicking stock purchases of Senators is clearly higher than that of the House of Representatives by a margin of 30 basis points a month. When compared to the results of Jeng et al. (2003), the 55 basis points outperformance by members of the House of Representatives fits into the lower end of the range of corporate insiders where abnormal returns were between 52-68 basis points per month. Comparing these results tell us that whilst Senators displayed the highest abnormal returns, abnormal returns from the House of Representatives and Corporate Insiders were on a similar level, albeit lower than that of Senators.

Eggers & Hainmueller (2013) suggested previous congressional trading papers written by Ziobrowski et al. (2004) and Ziobrowski et al. (2011) created synthetic portfolios as nobody actually held the portfolio being analyzed or constructed. They describe this as an issue for congressional trading papers that needs to be kept in mind and that results stemming from these papers have limited real-world applicability. Eggers & Hainmueller (2013) stated that in their investigation of congressional stock trades (which included data from both the House and Senate) from 2004-2008, their findings showed an entirely different story where members of congress generally underperformed market indices during that period. Eggers & Hainmueller (2013) constructed a purchase portfolio by holding stocks bought by members of Congress for 255 trading days after the purchase date and a sell portfolio which held stocks sold for 255 days after the date of sale. They also applied a hedged portfolio which shorted sales and held purchases exactly like in Ziobrowski et al. (2004). According to the findings of Eggers & Hainmueller (2013) the average congressional portfolio was found to underperform a passive index fund by 2-3% per year before expenses. In addition to these findings Eggers & Hainmueller (2013) discovered that localized investments of members of Congress into companies that were headquartered in their state or district outperformed the market by roughly 3% annually. Furthermore, Eggers & Hainmueller (2013) state that if politicians were to use their political power to make profit as investors, they would be expected to be able to make well timed trades. The authors then include an example from the work of Schweizer (2011) where it was uncovered that Senator John Kerry was able to make major profits from making well-timed investments in the healthcare industry whilst being part of the Senate subcommittee in charge of regulating healthcare.

In a paper related to the topic of congressional trading; Stephan et al. (2021) investigate whether American politicians would get stock tips from brokerage firms and profit off these connections. It is important to note that regulations strongly prohibit brokerage houses from

modifications to current positions based on non-public knowledge that they may find. Stephan et. al (2021) explains that brokerage houses have strong incentives to remain on the good sides of certain politicians and that this practice complements their overall political strategies as these politicians could help influence regulatory outcomes to be favorable for them. Stephan et. al (2021) identify a connection between a brokerage firm and politician if the politician had received a campaign contribution from a Political Action Committee sponsored by brokerage houses during that year. The data considered includes stock trades of members of the House and Senate, compiled by the Center for Responsive Politics for the years 2004-2014 and data from disclosures directly from the Senate or House disclosures website for the years 2015-2018. Stephen et al. (2021) filtered out trades where they were unable to identify the brokerage house which executed the transaction creating a final sample of 33,060 trades. Putting together information from Political Action Committees and the sample of trades from 2004-2018, the authors find that out of 131 politicians, 60 have had at least 1 connected trade during a term in office. The findings of Stephen et al. (2021) indicate that the excess return in the 5-day window after the trade is around 30 basis points higher for connected trades when compared to non-connected trades. They also acknowledge that even though increased profitability disappears after the introduction of the STOCK Act, connected trades remain incrementally profitable just as before. During a point in which healthcare reforms were being considered on Capitol Hill, Stephen et al. (2021) uncovered that politicians connected to brokerage houses were more likely to trade in non-healthcare stocks compared to unconnected politicians and that their trades were also more profitable. The evidence suggests that brokerage houses received tips from politicians, thereafter advising them to steer clear of investing in the healthcare sector.

This topic of American congressional trading may have low relevance to European countries where literature on insider trading mainly discusses the corporate fields and without any ties to members of government. Stock trades by European politicians are not well-published and also not publicly available. In a paper by Bourveau et al. (2016), the authors investigate whether political connections affected individuals' tendency to engage in illegal activities on financial markets in the context of the 2007 French election which was won by Nicolas Sarkozy. Data on stock trades conducted by directors of French listed companies around the time of the election were analyzed to determine whether directors that were affiliated with Sarkozy experienced larger abnormal returns compared to those without. Bourveau et al. (2016) defined an affiliation to Sarkozy as being a documented businessman friend or having been included on a list of large campaign contributors. Board members and executives of French publicly traded companies are required to disclose transactions regarding stocks of companies where they are in managerial position or directorship to the website belonging to

the Autorité des Marchés Financiers. The results of the study showed that directors with links to Sarkozy may have made gains of roughly 30 million euros after the election and stock returns on purchases of Sarkozy affiliates are a meager 0.2 percentage points higher when compared to non-affiliated directors who sit on the same boards. Bourvrea et al. (2016) concluded that there was robust evidence that politically connected directors modified their behavior on financial markets post-election and that the results suggested that political connections may favor those involved in illicit activities on financial markets and help them profit financially.

4. Methodology

4.1 Data Creation

Unlike previous work by Ziobrowski et al. (2004), only Financial Disclosure Reports (FDRs) from the official Senate site will be used to compile a data set. One of their key sources of financial disclosure data was opensecrets.org, an organization which tracks and compiles financial information on US government officials, candidates and donors; however, their data on investments of Senators and other members of Congress end in 2018 with no planned or scheduled updates.

Financial information on US Senators (combined with that of their spouses) are readily available on the US Senate Financial Disclosures website. FDRs of Senators are only available from 2012 onwards and only for 6 years from the date a senator is no longer a member of Congress. Senators must post FDRs after financial activity above a certain threshold. In the case of stock trades this means for purchases or sales above a value of $1,001. They must do so within 30 days of the transaction date which can be extended by filing for a due date extension which gives them a further 15 days after the initial 30 days are up (Walsh, 2022). FDRs relevant to studying common stock trades are categorized under periodic transaction reports on the Senate disclosure site. These forms contain either a ticker (linking the Yahoo Finance page of that security) or the company name, the type of security traded, date of transaction, date of posting and transaction price range. The time period that will be investigated starts on the beginning of Q2, 2021 (April 1st, 2021) until the end of Q1, 2022 (March 31st, 2022) which represents the beginning of the Biden administration and their first year in the White House. For the purpose of this paper only transactions of US common stock listed on NASDAQ or NYSE and disclosed under the security type of stock on FDRs will be included in the data set. Yahoo Finance will be used for determining the prices of stocks that are being traded by Senators.

It is important to point out that FDRs do not indicate how long the Senator had been holding the stock for or how that position was acquired and whether there are dividend payments. FDRs do not have to be done for the extended family of a Senator, which may be viewed as a loophole in the system. The amount of a trade is disclosed using a price range which means that there are no exact numbers given and instead a wide range. Additionally, there is no price given for the stock or exact time the trade was executed as only the day is given. This means that in previous literature related to congressional trading portfolios, price ranges are approximated using the midpoint of the trade range (up until a threshold) and the price of the stock will be taken as the adjusted closing price of the day in order to calculate the number of shares involved in trades so that returns can be calculated.

In the time period that will be investigated, the highest value trade was in the range of $1,000,001 - $5,000,000 and due to a very high midpoint of the range which is nearly 3 times $1,000,001, the assigned trade value for this bracket is set at $1,000,001. The table below shows us the price ranges in which Senators had transactions and the subsequent assigned trade values.

Tables 1: Prices Ranges and Assigned Trade Value

Price Ranges	Assigned Trade Value
$1,001-$15,000	$8000.50
$15,001-$50,000	$32,000.50
$50,001-$100,000	$75,000.50
$100,001-$250,000	$175,000.50
$250,001-$500,000	$375,000.50
$500,001-$1,000,000	$750,000.50
$1,000,001-$5,000,000	$1,000,001

Notes: The largest stock transactions made by Senators in the time period investigated were in the range of $1,000,000 - $5,000,000 and therefore this is the final range considered

The data on stock trades starts from the beginning of Q2, 2021 (April 1st, 2021) and stop at the end of Q1, 2022 (March 31st, 2022), which is a time period spanning 253 trading days. This represents the majority of the time the current administration under President Biden has been in office. The selected time period also represents a time where there have not been any Senate elections and therefore members have remained constant. Senate elections occur every 2 years and a different set of seats are up for election each time (Abramowitz & Segal, 1986).

Using the dollar values assigned to price ranges, the next step will be to compile stock portfolios of Senators (individually) by finding how many shares they were able to trade, on the stated transaction date using the adjusted closing price of that day. For stock buys, the assigned trade value is divided by the adjusted closing price to find the number of shares purchased and from there, it is possible to calculate how much value that number of shares has gained or lost until sale or the end of time period. For stock sales without any prior stock purchase or a prior stock purchase with a smaller assigned value than the sale, the amount (or difference in the case of a smaller prior stock purchase) is assumed as an asset from April 1st of 2021 until the date of sale. Assigned trade value is used to compute the number of shares that the Senator had sold and these number of shares are considered as a hold from April 1st onwards until the date of sale where gains or losses are realized.

After combing through all relevant FDRs and determining all US common stock trades conducted by Senators it will be possible to create 2 datasets. The 1st dataset will be used to show cumulative returns of Senators which considers current positions as well as previously held ones, and takes into account realized and unrealized profits or losses in respect to the size of the position. This dataset will be used to make figures comparing returns of Senators against those of the S&P 500. The 2nd dataset will be in the form of daily returns of current stock positions belonging to Senators. This dataset is created for the purpose of running regressions and applying performance evaluation methods to returns of Senators. Daily returns of Senator's current positions can be represented by the following equation (1):

$$(1)\ Daily\ Return_t = Value_{1,t}/(Total\ Value\ of\ Positions_{1-436,t}) * (Value_{1,t}/Value_{t-1} - 1)$$
$$..... + Value_{436,t}/(Total\ Value\ of\ Positions_{1-436,t}) * (Value_{436,t}/Value_{t-1} - 1)$$

Daily returns of Senators are the sum of weighted daily returns for individual current positions on day t. Weighting is done by considering the value of the position 1 in respect to the total value of all investments on that particular day which is shown by the first part of equation (1) $Value_{1,t}/(Total\ Value\ of\ Investments_{1-436,t})$. This is then multiplied by the daily returns of position 1 which is represented by $(Value_{1,t}/Value_{t-1} - 1)$. If a position is not open it will return a value of 0 and have no addition to the total value of current stock investments.

4.2 Performance Evaluation

In order to determine whether Senators are actually making abnormal returns on their stock trades, 3 performance evaluation methods will be utilized to answer that question. The first of which will be the CAPM model. Estimating returns using only 1 factor signifies the simplicity of the model and its true predictive power is questionable (Womack & Zhang, 2003). The risk-

free interest rate and market return is taken from Ken French data which is posted on his site (French, n.d.). The risk-free rate is at 0 during the entirety of the duration that this paper considers. This means that daily returns are equivalent to daily excess returns. The CAPM formula is shown below in equation (2).

$$(2)\ R_{st} - R_{ft} = \alpha_s + \beta_s(R_{mt} - R_{ft}) + \epsilon_{st}$$

R_{st} represents the yearly return on the Senate stock portfolio during year t. R_{ft} represents the risk-free rate during year t. R_{mt} represents the yearly return of the overall market. α_s, β_s are regression parameters whilst ϵ_{st} is the error term of the equation. α_s is the intercept which measures abnormal returns of the Senate stock portfolio. β_s measures volatility or systematic risk of the portfolio compared the market.

The 2nd performance evaluation method that will be considered in this paper is the Fama French 3 Factor model. The 3 Factor model is an expansion on the CAPM model and includes 2 additional variables (SMB and HML). The addition of independent variables to a regression model usually improves its predictive power (Womack & Zhang, 2003). The equation for the Fama French 3 Factor Model is shown in equation (3).

$$(3)\ R_{st} - R_{ft} = \alpha_s + \beta_s(R_{mt} - R_{ft}) + s_s SMB_t + h_s HML_t + \epsilon_{st}$$

α_s, β_s, s_s and h_s are regression parameters whilst ϵ_{st} is the error term of the equation. The SMB (Small Minus Big) factor represents the difference between a portfolio of small stocks by market capitalization and a portfolio of large stocks. It takes the average return of 9 portfolios of small stocks and subtracts from it the average return belonging to 9 portfolios of big stocks. The HML (High Minus Low) factor represents the difference between a portfolio of high book-to-market stocks and a portfolio of low book-to-market ones. This factor takes the average return for 2 value portfolios and subtract the average of 2 growth portfolios.

The 3rd and final performance evaluation method is the Fama French 5 Factor model with a slight alteration to include momentum as the 6th factor. Unlike the previously described models, the Fama French 5 Factor model has not been used in previous work on congressional trading due to the fact that most papers were published prior to the publication of the model. This model builds upon the 3 Factor model and adds 2 more factors (RMW and CMA) which helps it perform better compared to the original 3 Factor model (Fama & French, 2015). The momentum factor that is added onto the model is represented by Mo and this will

be the 6th factor. The equation for the Fama French 5 Factor Model plus momentum is given by equation (4).

(4) $R_{st} - R_{ft} = \alpha_s + \beta_s(R_{mt} - R_{ft}) + s_s SMB_t + h_s HML_t + r_s RMW_t + c_s CMA_t + m_s Mo_t + \epsilon_{st}$

α_s, β_s, s_s, h_s, r_s, c_s and m_s are regression parameters whilst ϵ_{st} is the error term of the equation. The CMA (Conservative Minus Aggressive) factor represents the average return of 2 conservative portfolios minus the average return of 2 aggressive investment portfolios. The RMW (Robust Minus Weak) factor represents the average return of 2 robust profitability stock portfolios minus the return of 2 weak profitability portfolios. The momentum factor (Mo) considers past momentum of stocks by subtracting the average return of 2 low prior returns portfolios from that of 2 high prior returns portfolios.

5. Data

Table A1 shows which Senators are part of the dataset as well as other information such as state, political party, birth date and trades made. This information on Senators is found on the official US Senate government website. Out of 100 total Senators whose financial disclosure reports were combed through, only 21 of them made US common stock trades of companies listed on the NASDAQ or NYSE. This figure suggests that stock trading of US common stocks by members of the Senate is not very widespread or something that most Senators engage in. 12 of these 21 Senators were Republicans, 8 were from the Democratic Party and there was 1 Independent who caucuses/affiliates with the Democrats. The 1 Independent Senator is therefore included as part of the Democratic Party subsection of my data and is included as part of their results. 17 of the Senators are white males and the other 4 are white females. Out of the female Senators included in the dataset only 1 of them was a Democrat, the rest being Republicans. Other investments by Senators that were included on financial reports but not part of the data set included short sells (and trades related to covering these positions), options, commodities, stock trades of private companies, bonds, crypto, market indexes or ETFs, investment funds and other alternate indexes such as in the American real-estate market.

The subsections of my datasets will be Republican, Democrat, Female, Male and the 5 top Senators by trades made. The top 5 Senators by trades were Thomas Tuberville (158), Thomas Carper (72), Jerry Moran (35), Shelley Capito (28) and John Boozman (26). The number of trades they made total 319. Other subsections that were initially planned however rejected included age and ethnicity or race. The issue with age is that most Senators included in the dataset are born prior to 1955 with the exception of 3 Senators who were born within 10

years after 1955. A further 11 Senators were born in the years 1950-1955. This gives an indication that 18 out of the 21 Senators are above the pension age (they can be considered as eldery people) and makes it difficult to have a distinct subsection separation by age. Ethnicity was considered however it turned out that all of the 21 Senators are white. Currently, only 11 members of the Senate identify as non-white. A 2015 study on racial demographics of personal offices of Senators (in Washington DC) and Senate committee employees further highlights a lack of racial diversity on Capitol Hill as it was discovered that out of 296 employees, 276 of them were white (Jones, 2015).

Table 2 - Key Statistics on US Senate Trading Q2, 2021 - Q1, 2022

|	Q2, 2021	Q3, 2021	Q4, 2021	Q1, 2022	Q2, 2021 – Q1, 2022
Value of Largest Sell* (in USD)	175,000.50	175,000.50	1,000,001	375,000.50	1,000,001
Value of Largest Buy* (in USD)	175,000.50	175,000.50	175,000.50	375,000.50	375,000.50
Rep Buys	9	31	30	54	124
Dem Buys	14	6	9	25	54
Rep Sells	32	19	54	57	162
Dem Sells	35	11	18	27	91
Female Buys	7	2	3	4	16
Male Buys	16	35	36	75	162
Female Sells	4	7	5	14	30
Male Sells	63	23	67	70	223
Total Buys	23	37	39	79	178
Total Sales	67	30	72	84	253
Total Trades	90	67	111	163	431

Notes: Rep is short for Republicans, Dem is short for Democrats. Value of the largest buys or sells and Average buy or sell value considers the assigned trade value from Table 1

The table above shows us that Senators made 431 US common stock trades over the course of this time period in 258 different US common stocks. These 431 transactions consisted of 178 buys and 253 sales. Of these 431 trades, 158 (86 buys, 72 sales) belonged to Thomas Tuberville, a Republican Senator from Alabama and the most active stock trader (by number of trades) in the Senate. The table above shows that the most popular quarter for trading was

Q1 of 2022 where 79 stock purchases and 84 stock sales were executed. Female Senators that were part of the dataset made a total of 46 trades which is far less than the 385 trades made by their male counterparts. Out of 24 total females currently serving as Senators, 4 were included in the dataset leading to an average of 1.92 trades per Female Senator. Out of 76 total males currently serving as Senators, 17 were included in the dataset leading to an average of 5.07 trades per Male Senator. This shows that Male Senators on average made more than double the trades of Females and contributed the majority of stock trades during the beginning of the Biden administration.

In addition to the information given by the table above, the 3 most popular traded stocks were Apple with 13 trades by 6 Senators, Intel with 9 trades by 7 Senators and Microsoft which was traded 9 times by 5 Senators. The information on most traded stocks can be seen in Figure A1.

Figure 1: Cumulative Returns of US Senators (Total Senate, Democrat, Republican) vs S&P 500 from Q2, 2021 - Q1, 2022
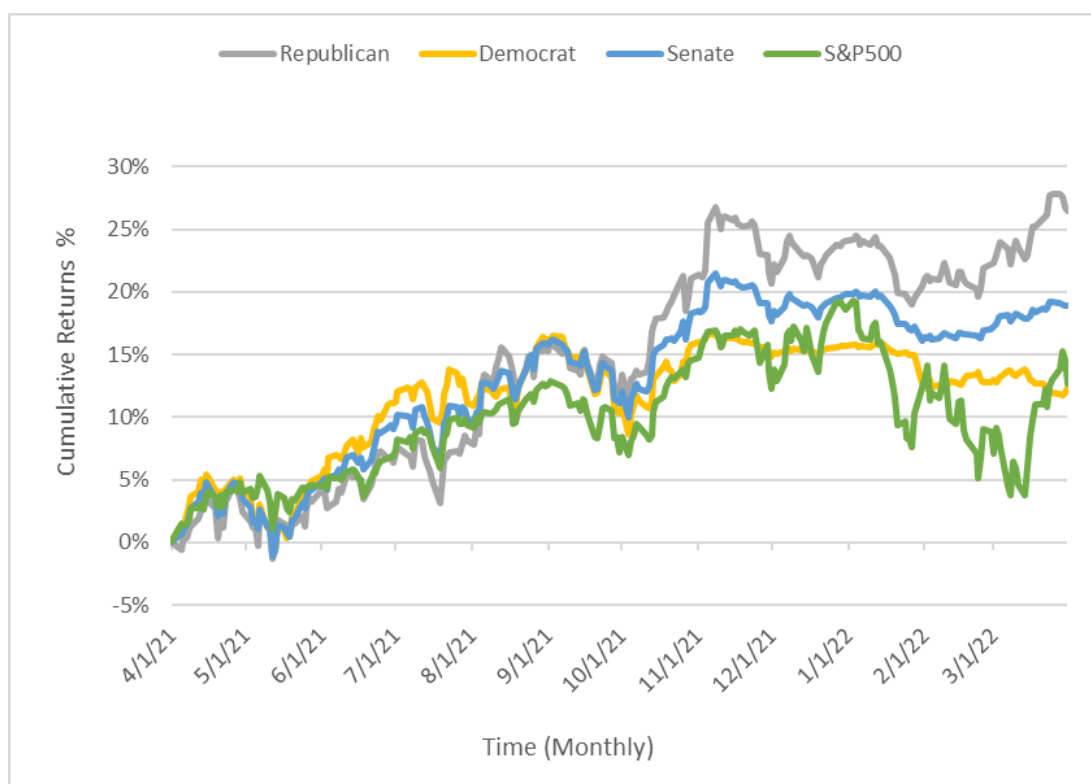
The graph above was made using cumulative stock returns of Senators over the course of the year that was investigated. The figure above exhibits returns of Democratic Senators, Republican Senators and the overall Senate compared to the S&P 500 from the start of Q2 2021 until the end of Q1 2022. Democrats end the year slightly underperforming the S&P 500

having outperformed it for the majority of the year. Republicans on the other hand start off slow, underperforming the S&P 500 before finally going up and outperforming all other groups by a fairly considerable margin. The overall Senate line includes Democrats and Republicans outperforms the S&P 500 for most of the year besides for a small section when Republicans were also being outperformed by the S&P 500. A 2nd figure showing returns of Female Senators, Male Senators, the overall Senate and S&P 500 is included in the Appendix (Figure A2). This figure shows a heavy underperformance of the S&P 500 by Female Senators as they end the year with a loss of 10% whilst Male Senators make gains of roughly 19.9% at the end of the same time period. Female Senators also have a small influence (due to lesser amounts of stock owned or traded) on the overall Senate. It appears that from Figure A2, the cumulative returns of the overall Senate mirror the returns of Male Senators fairly closely in comparison.

6. Results

Under the first performance evaluation method used (CAPM), the following results are derived from running a regression of daily returns of Senators (overall and subsections) from Q2, 2021 until the end of Q1, 2022.

Table 3: CAPM Model on Daily US Senate Stock Portfolio Returns

	Senate (1)	Republican (2)	Democrat (3)	Male (4)	Female (5)	Frequent Traders (6)
α_s	0.142*** (0.002)	0.127** (0.016)	0.070** (0.036)	0.148*** (0.002)	-0.149* (0.073)	0.110*** (0.041)
β_s	0.856*** (0.000)	0.732*** (0.000)	0.911*** (0.000)	0.852*** (0.000)	0.845*** (0.000)	0.780*** (0.000)
Observations	251	251	251	251	251	251

Notes: Subsection Democrats includes an Independent Senator who affiliates/caucuses with them. Subsection Frequent Traders are the top 5 Senators by number of trades. Here: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

Under the CAPM model, we can see that positive and significant abnormal returns (represented by α_s) are exhibited for the daily stock returns of the overall Senate, Republican Senators, Democrat and Male. Firstly, the overall Senate outperforms the market by 14.2% which is significant at a confidence level of 1%. For the data subsection of Female Senators there is a negative α_s of -14.9% which is significant at a level of 10%. This indicates a negative underperformance by Female Senators compared to the market over the time period investigated. For Male Senators there is a significant positive abnormal return of 14.8% at a

level of 1% meaning that Male Senators are significantly outperforming the market and have done far better on the stock market compared to their Female counterparts. The Male Senators are the subsection with the highest abnormal returns. Democratic Senators have similar results exhibiting significant positive abnormal returns of 7% at a 5% significance level. On the other hand, Republican Senators make more abnormal returns than members from their rival party with an α_s of 12.7% which is significant at a level of 5%.

Now, taking a look at the computed Betas (given by β_s), it is clear to see that they are all significant at a 1% confidence level. The overall Senate has β_s of 0.856, whilst the rest are in a range of 0.732 (Republican) to 0.911 (Democrat). These Betas which are positive yet under the value of 1 signify that the portfolios belonging to subsections of the data as well as the complete Senate data, are less volatile than the market. This also means that while the portfolios investigated move in the same direction as the market (most of the time) their Betas indicate how their excess returns move less than the market. The Democrats have a Beta which is closest to the market volatility of 1 whilst the Republicans are the farthest away and exhibit the least amount of volatility.

Under the second performance evaluation method used (Fama French 3 Factor), the following results are derived from running a regression of daily returns of Senators (overall and subsections) from Q2, 2021 until the end of Q1, 2022.

Table 4: Fama French 3 Factor Model on Daily US Senate Stock Portfolio Returns

	Senate (1)	Republican (2)	Democrat (3)	Male (4)	Female (5)	Frequent Traders (6)
α_s	0.153***	0.135***	0.075**	0.159***	-0.129	0.109***
	(0.001)	(0.0097)	(0.023)	(0.001)	(0.108)	(0.041)
β_s	0.816***	0.708***	0.881***	0.813***	0.789***	0.795***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
s_s	0.161**	0.212***	-0.021	0.148**	0.498***	0.164**
	(0.020)	(0.006)	(0.672)	(0.036)	(0.000)	0.037)
h_s	0.001	0.072	-0.084***	-0.003	0.172**	0.140***
	(0.980)	(0.132)	(0.006)	(0.938)	(0.021)	(0.004)
Observations	251	251	251	251	251	251

Notes: Subsection Democrats includes an Independent Senator who affiliates/caucuses with them. Subsection Frequent Traders are the top 5 Senators by number of trades. Here: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

After the application of the Fama French 3 Factor model, similar results are gathered compared to that of CAPM. The overall Senate makes an abnormal return of 15.3% which is greater than under the CAPM model and significant at a 1% level. The most distinct difference between CAPM and Fama French 3 Factor, is that the negative abnormal returns achieved by the subsection of Female Senators decreases from -14.9% to -12.9% and is now insignificant as its p-value is greater than 0.1 or 10%. Another key point to notice is that the overall Senate, Democrat, Republicans and Male Senators have considerable increases to their abnormal returns under this model by margins of at least 0.5% compared to CAPM and their Alphas (α_s) remain significant.

The results for the computed Betas (β_s), have not changed drastically. The Beta of the overall Senate has slightly decreased from the CAPM model and now reports a value of 0.816. All of the computed Betas are significant at a 1% level. The smallest Betas are now Republican with a diminished value of 0.708 and the largest remains Democrats albeit it now with a lower value of 0.881 compared to 0.911 under CAPM. This may suggest that the portfolio returns of Democrats and Republicans behave much differently to each other.

Onto the additional 2 factors (s_s, h_s), it is not significant in the results arising from the overall Senate and only significant under some data subsections. The regression parameters s_s and h_s which are the coefficients for SMB and HML respectively, both appear significant under data subsections Female and Frequent Traders. For the subsection Female Senators, s_s has a value of 0.498 (significant at 1%) and h_s has a value 0.172 (significant at 5%) whilst for Frequent Traders s_s takes a value of 0.164 (significant at 5%) and h_s has a value 0.140 (significant at 1%). This shows that for these particular subsections and their respective portfolio returns, there is a positive significant exposure to the 2 added factors in Fama French 3 Factor. Now taking a look at the regression results of Democratic Senators, there is a small negative insignificant coefficient of s_s however for h_s, it is small negative whilst significant at a 1% level. This shows a small yet negative exposure to the HML factor for the portfolio returns of Democrats. For Male, Republicans and the overall Senate, there are insignificant p-values for h_s however for the coefficient s_s, positive significant p-values are obtained indicating that the portfolio returns belonging to these groups are positively exposed to the SMB factor.

Under the third performance evaluation method used (Fama French 5 Factor plus Momentum), the following results are derived from running a regression of daily returns of Senators (overall and subsections) from Q2, 2021 until the end of Q1, 2022.

Table 5: Fama French 5 Factor Model on Daily US Senate Stock Portfolio Returns

	Senate (1)	Republican (2)	Democrat (3)	Male (4)	Female (5)	Frequent Traders (6)
α_s	0.143*** (0.002)	0.125** (0.017)	0.076** (0.022)	0.149*** (0.002)	-0.125 (0.122)	0.092* (0.083)
β_s	0.832*** (0.000)	0.750*** (0.000)	0.873*** (0.000)	0.832*** (0.000)	0.735*** (0.000)	0.843*** (0.000)
s_s	0.115 (0.172)	0.241** (0.011)	-0.094 (0.113)	0.106 (0.215)	0.400*** (0.006)	0.247*** 0.0098)
h_s	-0.082 (0.231)	0.006 (0.935)	-0.084* (0.064)	-0.086 (0.218)	0.155 (0.187)	0.015 (0.841)
r_s	-0.082 (0.309)	-0.015 (0.869)	-0.105* (0.066)	-0.078 (0.341)	-0.045 (0.745)	0.087 (0.339)
c_s	0.252* (0.076)	0.277* (0.06)	0.017 (0.858)	0.260* (0.076)	-0.162 (0.476	0.363** (0.016)
m_s	0.021 (0.717)	-0.104 (0.118)	0.053 (0.210)	0.013 (0.831)	0.240** (0.019)	-0.088 (0.186)
Observations	251	251	251	251	251	251

Notes: Subsection Democrats includes an Independent Senator who affiliates/caucuses with them. Subsection Frequent Traders are the top 5 Senators by number of trades. This version of the 5 Factor Model is an alternative one inclusive of Momentum. Here: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

After the application of the Fama French 5 Factor Model with the addition of Momentum, abnormal returns made by all portfolios excluding that of Females are significant. The overall Senate makes abnormal returns of 14.3% which is significant at a level of 1% which is similar to previous results determined by the other models introduced. It is also possible to determine that the subsection of Male Senators achieve the highest returns under each model, with an abnormal return of 14.9% under the 5 Factor Model. The α_s belonging to the Senate, Republicans, Democrats, Male and Frequent Traders exhibit decreases when compared to the results from Fama French 3 Factor yet remain significant.

The results for the computed Betas (β_s), have not changed drastically when compared to the 3 Factor Model, however the smallest and largest Beta have moved closer together. This may suggest that with the addition of more factors, the returns of Republican and Democrat portfolios are behaving on more of a similar level. The Beta belonging to Republicans moved up to 0.750 whilst the Beta of Democrats moved down to 0.873. The Beta of the overall Senate is 0.832. All of the computed Betas are significant at a level of 1%.

Under this model, there are 5 additional factors which have to be considered (s_s, h_s, r_s, c_s, m_s). Under the results of the overall Senate and Males, the only Factor which is significant is CMA which is represented by coefficient c_s (significant at a 10% confidence level). The c_s for these groups range from 0.252 for the overall Senate to 0.260 for Males. These close values may indicate underlying similarities in the positive exposure of these particular groups to the newly introduced CMA factor. Examining the results found for Republicans and Frequent Traders, s_s and c_s are the only significant factors. For Republicans the coefficient s_s for the SMB factor returns a positive value of 0.241 which is significant at 5% and for the coefficient c_s of the CMA a value of 0.277 is found which is significant at 10%. For Frequent Traders the coefficient for the SMB factor returns a positive value of 0.247 which is significant at 1% and for the coefficient of the CMA a value of 0.363 is found which is significant at 5%. This displays a positive exposure to the SMB and CMA factors for Republicans. Comparatively, the portfolio belonging to Democratic Senators indicates significant negative exposure (at a 10% level) to HML with h_s having a value of -0.084 and RMW with r_s having a value of -0.105. Females were the only subsection where there was any significant exposure to the Momentum factor. For m_s there was a positive value of 0.240 which is significant at 5%, and s_s has a value of 0.400 which is significant at 1%.

7. Discussion

The results arising from applying different performance evaluation methods, suggest that Senators are making significant abnormal returns. It is important to consider for the purpose of validity and robustness that results found in this paper on the Senate display significant positive abnormal returns at a 1% significance level, under each of the 3 performance evaluation methods that were applied.

The results found in this paper are in line with previous work by Ziobrowski et al. (2004) on the US Senate due to the discovery of significant abnormal returns in my results. However, the stock portfolio of the overall Senate from the beginning of Q2, 2021 until the end of Q1, 2022 yields higher abnormal returns than that of Senators in Ziobrowski et al. (2004) which considered the years 1993-1998. Under a combined trade weighted hedged portfolio it was discovered that Senators outperformed the market by 97 basis points a month or nearly 0.97% (Ziobrowski et al., 2004) and this result was found by applying the Fama French 3 Factor model. These results were achieved by holding the buys and shorting the sales of Senators which may not be the most realistic representation of actual returns. The results of my paper indicate that over the course of Q2, 2021 - Q1, 2022, Senators outperform the market by 15.3% (under the Fama French 3 Factor model), which is equivalent to 127.5 basis points per month. In comparison to work on corporate insiders by Jeng et al. (2003), their outperformance

of the market of between 52-68 basis points per month is beaten by Senators during the start of the Biden administration and also by the returns stemming from the combined trade weighted hedged portfolio from Ziobrowski et al. (2004). Jeng et al. (2003) achieved their results by placing insider purchases in a purchase portfolio for 6 months and placing insider sales in a sale portfolio also held for 6 months and considered SEC data over the years 1975-1996. Taking into consideration past works that were discussed and the results of this paper, there is clear evidence that Senators are making returns higher than that stemming from stock portfolios belonging to corporate insiders.

Separation of the dataset by gender generates the highest positive abnormal returns (out of the sections investigated) for Males and also the lowest most negative abnormal returns for Females. Male Senators who are on average more active investors than Females, display higher levels of abnormal returns when compared to the overall Senate at 60 basis points or 0.6% under each and every model applied. On the other hand, the overall Senate outperforms both the subsections of Democrats and Republicans under every performance evaluation model applied. As previously stated, the highest Beta obtained under each and every model was that belonging to Democrats, whilst the smallest Beta obtained belonged to Republicans. This may suggest that the behavior of portfolio returns for these 2 separated groups are very different and that a combined portfolio would then outperform the returns stemming from Republicans or Democrats. These differences can be further highlighted with the addition of factors and their exposure to these factors. Under Fama French 3 Factor, it was determined that there was significant positive exposure to the SMB factor for Republicans, whilst Democrats displayed a negative significant exposure to the HML factor. Under the 5 Factor model (plus momentum), Republicans show positive significant exposure to SMB and CMA while Democrats show significant negative exposure to HML and RMW. The final subsection considered was Frequent Traders, which were the top 5 Senators by number of trades over the year considered. Frequent Traders contributed 319 out of 431 total Senate trades and their portfolio exhibited significant positive abnormal returns, however these figures fell below that of the overall Senate, Republicans and Male Senators under each model applied. This may suggest that those who trade the most may not be the most experienced or smartest investors at the end of the day.

In order to make a link between Senators and use of privileged non-public political information, it is important to consider recent world events. The Russian invasion of Ukraine on the 24th of February, 2022 meant that many stocks of companies in the defense industry soared during late February or early March. If Senators knew ahead of time when the invasion was going to happen and the position of the US on the matter (with billions of dollars' worth of American

weapons having been sent to Ukraine since the invasion), the expectation revolving this situation is that they would have been able to make well-timed trades on the stock market of defense industry stocks.

Taking a look at Table A2, showing trades in the defense industry stocks by Senators, there are 5 Senators who traded defense stock over the time period considered with a total of 14 trades. The stocks listed were determined as defense industry stocks through the use of the SIPRI report on the top 100 defense industry companies in 2020. The amount of 14 trades in defense industry stock is a low number considering that there were 431 total trades made. In comparison to this figure, Apple (AAPL) stock alone was traded 13 times. A possible explanation behind the low number of trades is that Senators may be holding their current stock positions of defense industry companies and not actively trading them over the course of the time period investigated. Additionally, Honeywell (HON) and General Electric (GE) which were included in Table A2, were not included in the Figure A3 due to the fact that the SIPRI report by Marksteiner et al. (2021), stated that arms sales only accounted for 18% of the total revenue of HON and 6% of the total revenue of GE. In comparison, the rest of the companies traded by Senators in Table A2 have at least 55% of their revenue coming from arms sales or military services, which shows that HON and GE may not be very reliant on their military contracts and their stock prices might not move like other defense companies where majority of revenue is from military contracts.

When viewing Figure A3, there are 9 sales whilst only 2 buys. Sales are represented by black triangles markers and buys are shown as red circles. Boeing stock was bought by Republican Senator Bill Hagerty of Tennessee at a high price in June of 2021 (represented by the first red circle) and since then, the price of the stock has been on a downward trend. The purchase of Northrop Grumman (NOC) on March 30th by Thomas Tuberville cannot lead to any conclusions as this was the 2nd to last day of the time period investigated. Examining the sales made of defense industry stock, there is a cluster of 5 sales of Lockheed Martin (LMT), L3Harris (LHX) and Raytheon (RTX) in mid-January of 2022 by Senators Thomas Carper and Thomas Tuberville. This shows that Thomas Tuberville and Thomas Carper sold their stock positions in defense companies before prices moved quickly upwards in late February and early March. It is important to note that Thomas Carper is part of the US Senate Committee on Homeland Security whilst Thomas Tuberville is part of the US Senate Committee on Armed Services. Being part of these particular committees would suggest having an understanding of the defense industry and potential worldwide security threats or military activities. Other stock sales that occurred in 2021 were made far too early to be considered in the context of this situation. There is a notable trade to mention which is the sale of L3Harris (LHX) by

Senator Shelley Capito on February 24th, 2022 which is the day that Russia invaded Ukraine. The adjusted closing price of LHX had already risen on that day to $226.41 from $214.34 the previous day, however LHX would soon hit a peak of $268.30 on the 7th of March. This shows that even though Senator Shelley Capito sold the stock at a decently high value, this was still nowhere near the peak as the price of LHX stayed well above $226.41 until the end of March (end of the time period investigated). The findings indicate that Senators were not able to make well-timed trades, as there was a trend of selling defense stocks early and before any considerable jumps in price stemming from the invasion. There is no suggestion that any of the mentioned Senators traded defense industry stocks using privileged political information under the context of the invasion of Ukraine.

8. Conclusion

The results gathered from this investigation into US common stock trading by US Senators suggests that the members of the Senate who engage in stock trading make significant positive abnormal returns. Comparing the results of this paper to previous results of Senators prior to the STOCK Act of 2012 indicates that even though legislation is now in place, abnormal returns still exist. When compared to the work of Ziobrowski et al. (2004) and Ziobrowski et al. (2011), returns of Senators are currently higher than in 1993-1998 and also beating the portfolios of members of the House of Representatives from 1985-2001 & 2011. At a glance it may be perceived that the STOCK Act might not be accomplishing its goals due to the increased returns Senators currently exhibit, however it is difficult to determine whether Senators are just well-informed traders or using privileged non-public political information.

Whilst the methodology has been carefully followed in order to create data and therefore also results, a few limitations exist. All papers on the topic of congressional trading have limitations and consider many assumptions due to how the data is gathered as well as how the system of financial disclosures work for members of congress. As previously stated, Financial Disclosure Reports (FDRs) do not state the exact price at which stock was bought or sold, trades are stated in ranges and there were no timelines given for how long the position was open or how it may have been acquired. FDRs are not required for the extended family of a Senator which provides a loophole or point of contention. However, if any evidence is found that extended family members are making trades using knowledge of a Senator, an investigation will most certainly be launched. A final possible limitation of the data is the possibility of human error or forgetfulness for when Senators fill and report their financial information or activity. Levinthal (2022) discovered that 7 Senators violated the STOCK Act including Thomas Tuberville, Dianne Feinstein and Thomas Carper, with most of them posting stock trades they made months late. This could mean that not all trades that actually occurred

are accounted for by FDRs and therefore will not be included in the data created. This current system of FDRs provides decent information but can also be interpreted and seen as having a lack of transparency. The limitations above indicate the possibility that data or results found may not be very precise compared to the scenario where exact numbers are given and more detailed FDRs are provided.

The topic of congressional trading will stay a relevant topic on Capitol Hill and members of congress may have to debate or vote on new legislation before the end of 2022. This paper considered the time frame representing the start of the Biden administration, however a more large-scale investigation spanning a larger time frame perhaps to even before the STOCK Act of 2012 would drastically increase the size of data and number of observations. This may paint a picture of congressional trading during the past decade which has not been covered in previous literature. This paper as well as past ones on the topic of congressional trading only consider US common stocks whilst there are many other assets disclosed on FDRs such as ETFs, Crypto and Bonds which may give a better understanding of returns achieved or the nature of investments by US Senators if accounted for. Whilst it may be possible to suggest that Senators have knowledge and power over sectors or individual companies in the stock market and hence papers in these areas may be more relevant, Senators have been involved in regulating cryptocurrency which may suggest otherwise.

To conclude, it is important to note that only 21 out of the 100 total Senators made trades of US common stock (258 different stocks were traded) listed on NASDAQ or NYSE from Q2, 2021 until the end of Q1, 2022. Furthermore, there is no conclusive evidence which points to Senators using privileged political information to make trades of defense companies in the context of the Russian invasion of Ukraine. Out of the 14 trades made in the defense industry by 5 Senators none of them can be determined as being well-timed trades. An increase in transparency by means of more exact figures (such as execution price, trade value) and increased details on disclosure reports would paint a more accurate picture of returns arising from congressional trading. These changes would certainly help future literature, make it possible for less assumptions to be made whilst investigating this topic and make results more realistic and precise. If these changes would be implemented, it would open up an opportunity to investigate returns on options contracts which is a popular form of security trading in disclosure reports. Whilst it may be concluded that stock trading by US Senators is not very widespread or common over the beginning of the Biden administration, the significant positive abnormal returns achieved (by the overall Senate) over this time period and lack of transparency regarding disclosures, suggest that it is important that Capitol Hill reviews and debates new legislation regarding congressional trading.

9. References

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10. Appendix

Table A1: Dataset Senators and Information

	State	Party	Birth Date	Gender	# of Trades
Thomas Tuberville	Alabama	Republican	9/18/54	Male	158
Daniel Sullivan	Alaska	Republican	11/13/64	Male	1
John Boozman	Arkansas	Republican	12/10/50	Male	26
Dianne Feinstein	California	Democrat	6/22/33	Female	2
John Hickenlooper	Colorado	Democrat	2/7/52	Male	19
Richard Blumenthal	Connecticut	Democrat	2/13/46	Male	21
Thomas Carper	Delaware	Democrat	1/23/47	Male	72
Jerry Moran	Kansas	Republican	5/29/54	Male	35
Mitch McConnell	Kentucky	Republican	2/20/42	Male	4
Susan Collins	Maine	Republican	12/7/52	Female	11
Angus King	Maine	Independent	3/31/44	Male	2
Gary Peters	Michigan	Democrat	1/12/58	Male	9
Roy Blunt	Missouri	Republican	1/10/50	Male	2
Richard Burr	North Carolina	Republican	11/30/55	Male	5
Ron Wyden	Oregon	Democrat	5/3/49	Male	11
Patrick Toomey	Pennsylvania	Republican	11/17/61	Male	1
Sheldon Whitehouse	Rhode Island	Democrat	10/20/55	Male	6
Bill Hagerty	Tennessee	Republican	8/14/55	Male	15
Mark Warner	Virginia	Democrat	12/15/54	Male	2
Shelley Capito	West Virginia	Republican	11/26/53	Female	28
Cynthia Lummis	Wyoming	Republican	9/10/54	Female	1

Figure A1: Most Popular Stocks by Number of Trades (Buys + Sales)
by the US Senators Q2, 2021 - Q1, 2022 (4 or more trades)
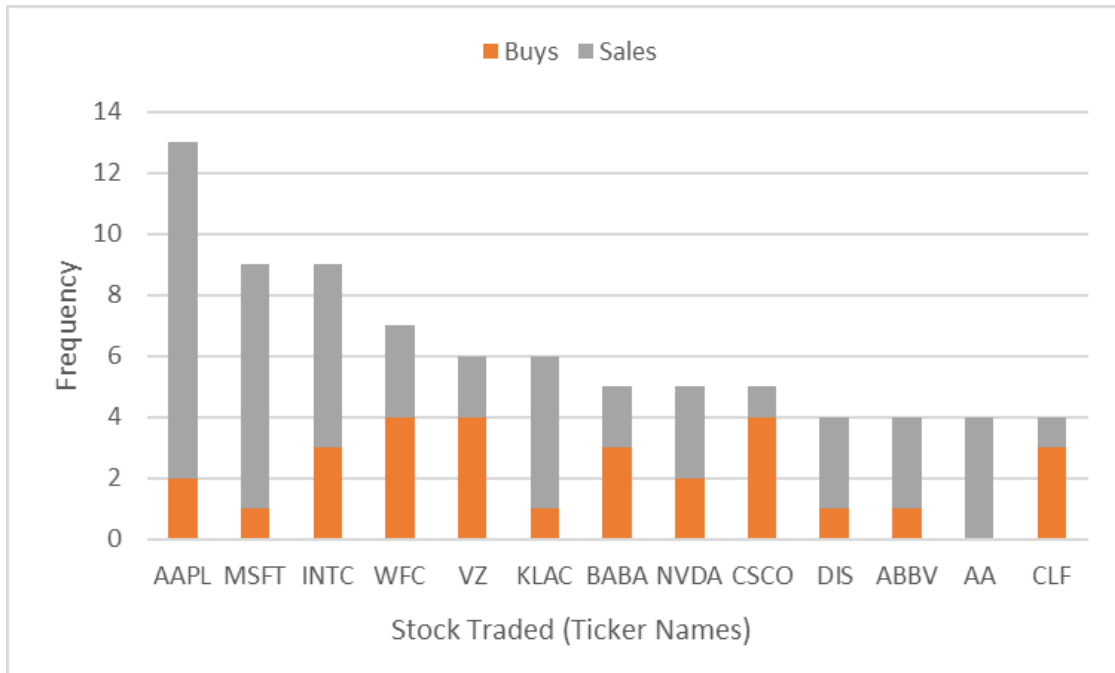
Figure A2: Cumulative Returns of US Senators (Total Senate, Male, Female)
vs S&P 500 from Q2, 2021 - Q1, 2022
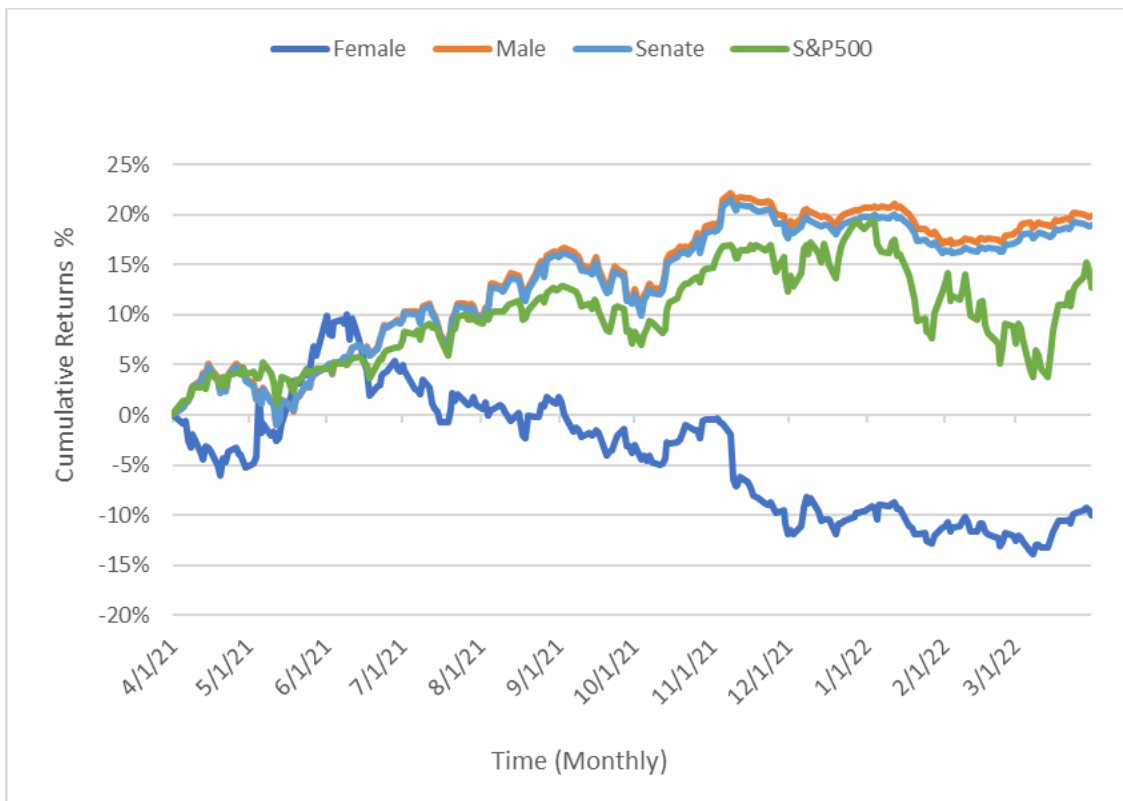
Table A2: Trades in the Defense Industry by US Senators (Q2, 2021 - Q1, 2022)

	BA	GE	GD	HON	LHX	LMT	NOC	RTX	Total Trades By Senator
Thomas Tuberville	0	1	1	1	0	1	1	1	6
Thomas Carper	0	0	0	0	2	1	0	1	4
Shelley Capito	0	0	0	0	1	0	0	0	1
Bill Hagerty	1	0	0	0	0	0	0	0	1
John Boozman	0	0	1	1	0	0	0	0	2
Totals By Stock	1	1	2	2	3	2	1	2	14

Figure A3: Cumulative Returns of Defense Industry Stock Traded By US Senators from Q2, 2021 - Q1, 2022 with Markers Representing Buys and Sales
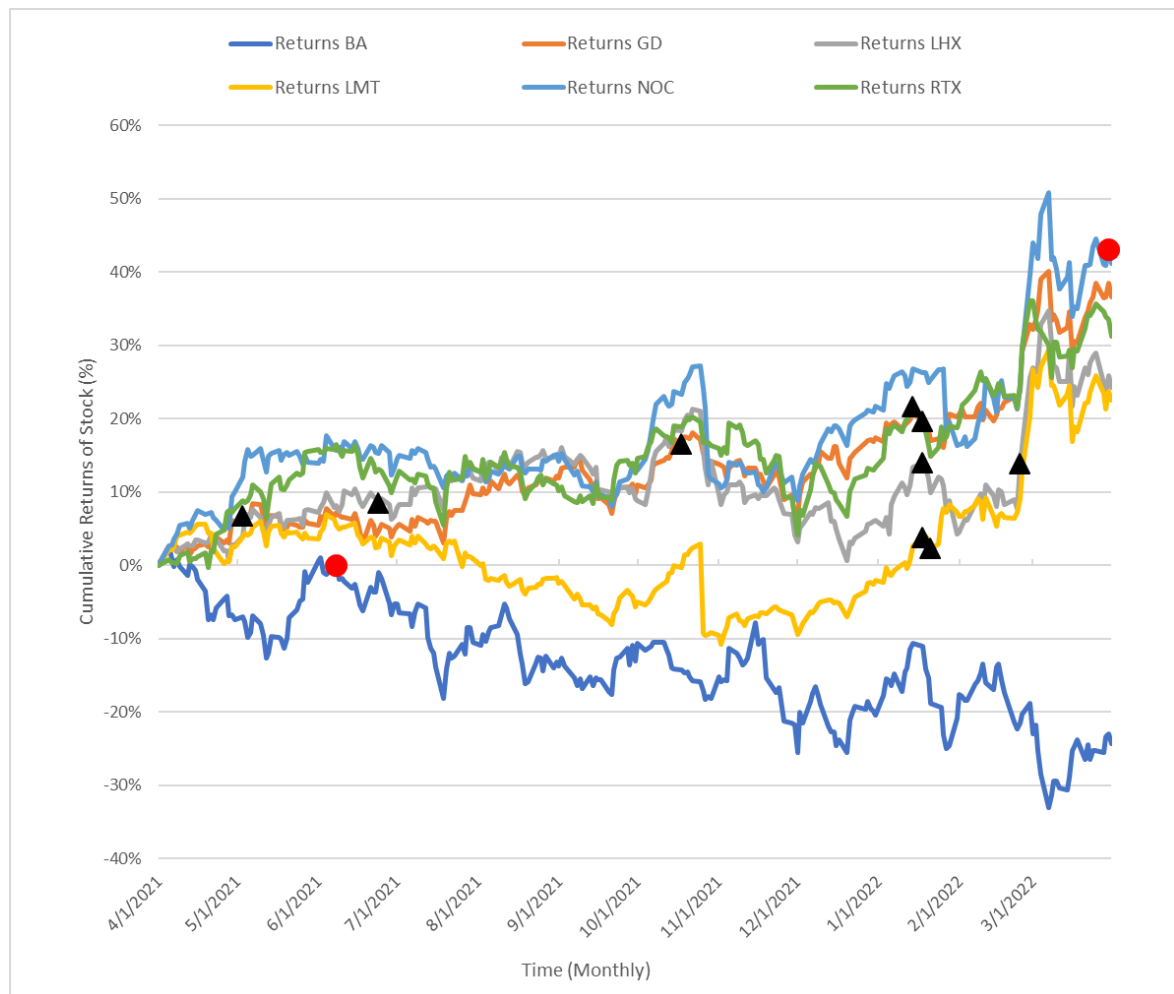
Notes: Red circle markers represent buys of the particular stock they are tied to and black triangle markers represent sales.