

STOCK Act: a Decade in Review

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Abstract

The STOCK Act of 2012, which amended the Ethics in Government Act, attempted to address insider trading using Congressional knowledge by Congress members. As legislators have passed legislation to limit insider trading in the market, the same type of sanctions or punishments must be applied to lawmakers to achieve an efficient stock market and restore the public trust in the government. Past literature has explored the importance of market efficiency, the consequences of insider trading, and the abysmal Congressional transaction returns. This study investigated and compared the lag in transaction reporting across different groups of lawmakers. It retrieved all available transactions from a paid API, provided by FinnHub, combined with C-Span Congressional Chronicle data points, such as political affiliation, and political office. The study used the Lilliefors Test and Wilcoxon Rank Sum Test to determine data normality and compare the medians in different data groups i.e. genders, and political parties, respectively. The data groups' distributions were found to be not normal. The medians of reporting lag between data groups were found to be different. The study revealed that while most legislators have been compliant with the reporting requirements, some have not, which brought into question the effectiveness of the amendments.

Keywords: STOCK Act, Ethics in Government Act, Transaction Reporting Lag, Congressional Insider Trading

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STOCK Act: a Decade in Review

In the fast-paced world of finance, it is of utmost importance to uphold the integrity of trading practices, thereby ensuring a level playing field for all participants. There have been recent legislative actions, sought to address the issues of insider trading, ones that involves elected officials with access to non-public information in particular. The STOCK Act (Stop Trading on Congressional Knowledge Act) is the outcome of such legislative initiative. The STOCK Act was enacted to enhance transparency and enforce accountability to all elected officials, including those at the very top of the government.

This paper looks at the STOCK Act and its impact on insider trading activities among elected officials in Congress. By analyzing previous studies, historical context, and actual stock trading, including executives and their returns, this study seeks to assess the effectiveness of the Stock Act in achieving its intended objectives. In addition, the paper will examine examples and case studies that, attempting to provide insight into the real-world impact of the law. Thus, it is looking to determine whether the legislation has successfully eliminated insider trading by Congress officials.

As we navigate the complexities of policies, constitutional, and ethical considerations, the purpose of this review is to contribute to a better understanding of the role of the STOCK Act in promoting accountability and maintaining public trust in their elected officials. Despite these efforts, recent events have raised concerns about the possibility of insider trading among Congress members, rekindling interest in this area of study (Quiroz-Gutierrez, 2024).

Literature Review

To contextualize the discussion, it is important to understand the market returns and efficiency of capital markets. Sharpe (1964) introduced a model of equilibrium in capital markets under risk and uncertainty, providing a sound asset valuation theory. Sharpe's model of equilibrium in the capital market under risk and uncertainty provides a

foundational understanding of asset price determination. It provides a good starting point for asset pricing understanding. However, it mostly deals with general market ideas.

Fama (1970) expanded on this with the efficient market view, arguing that market prices fully reflect all available information. Later, Fama (1991) reviewed two decades of market performance research, discussing experiments and findings. Fama and French (1992) examined the determinants of average stock returns and found that firm size and book market preference explain cross-sectional variation. Fama and French (1993) examines the common risks of stock and bond returns and identifies factors that explain the differences between the two markets. Fama (1998) examined the evidence for long-term return anomaly, concluding that the anomaly literature does not substantially challenge the efficient market hypothesis. Fama's recent work (Fama & French, 2015) introduced a five-factor model of asset prices. It considered market exposure, size, cost, profitability and investment growth. Fama's documentation of market efficiency, risks, and understanding of asset pricing models are valuable for explaining overall market behavior. However, their direct application to the unique context of congressional bank trading may be limited, as these practices revolve around broader market. In further examining the relevance of capital market returns and efficiencies to congressional stock trading, it is crucial to acknowledge the limitations of existing models in capturing the intricacies of legislative decision-making.

While Sharpe's equilibrium model and Fama's efficient market hypothesis provide fundamental insights into asset price determination, their general applicability to the unique environment of congressional stock trading may be constrained. Expanding on Fama's five-factor asset pricing model, which considers exposures to market, size, value, profitability, and investment growth, it becomes apparent that the factors influencing asset pricing in the broader market may not mirror the complexities faced by legislators in their investment activities. The specific informational advantages, regulatory constraints, and ethical considerations inherent in congressional decision-making demand a tailored

analytical approach.

The work of Mossin (Mossin, 1966), remains a cornerstone in the literature on capital market equilibrium, providing a comprehensive and foundational framework of monetary policy that continues to frame discussions of investor behavior, risk assessment, and of market development. Moreover, Mossin's underpinning economic model is still relevant for understanding investor behavior and risk analysis. However, political dynamics lead to broader changes that go beyond the traditional capital market equilibrium model. Given the evolution of financial markets, these underlying principles must be constantly reassessed in legislative practice. As part of a broader body of literature on capital market performance and returns, Mosin's contribution highlights the importance of understanding the decision-making processes of individual investors in a dynamic and evolving economic environment. Although the paper contributes to the general literature, its direct application to the specific nuances of congressional banking transactions may be limited.

Sehun's analysis of insider trading data (Seyhun, 1986) showed that although insiders can predict future stock price movements and profits, non-insiders cannot predict the importance of information asymmetry. Seyhun's exploration of insider trading data sheds light on the significance of information asymmetry in stock markets. Nevertheless, the translation of these findings to the realm of congressional stock trading requires a nuanced examination of the sources and implications of insider knowledge within the political sphere. While relevant to the broader discussion on stock markets, its application to congressional stock trading requires careful consideration of the specific context and actors involved.

Carhart's work (Carhart, 1997) on mutual fund performance revealed that short-term persistence in returns can be explained by common factors in stock returns. Its relevance to congressional stock trading lies in the examination of common factors influencing stock returns, but the direct link needs to be established. Carhart's

identification of common factors in stock returns (Carhart, 1997) offers insights that may resonate with congressional stock trading. However, the direct relationship between these details and legislative decision-making requires careful analysis. Examining the persistence of short-term returns should motivate researchers to examine how temporal factors affect the stock trading behavior of legislators.

Barber's study of private equity investors (Barber, 2000) showed overconfidence in over-trading and underperformance. The study offers a conceptual dimension that may be relevant to the understanding of the work practices of members of Congress. Nevertheless, the specific motivations and manifestations of overconfidence in politics deserve in-depth investigation. Thus, its application to congressional savings trading requires a closer examination of the psychological factors affecting the influence of legislators' spending decisions.

Cohen's research (Cohen & Malloy, 2008) explored how social networks facilitate information transfer between mutual fund managers and corporate boards. It introduces a socio-political element to financial decision-making. Cohen's exploration of social networks in facilitating information transfer is insightful for general financial contexts. However, the direct link to congressional stock trading requires consideration of the specific networks and information channels within the political landscape. In other words, the application of these network dynamics to congressional stock trading requires an analysis of the unique channels through which information flows within the political domain.

Fung (2008) examined performance, risk, and capital flows in the hedge fund industry. While the paper contributes valuable insights to the hedge fund literature, its direct application to the unique context of congressional stock trading is limited. A dedicated analysis of factors influencing lawmakers' investment decisions, potential information advantages, and regulatory implications is necessary for a comprehensive understanding of the latter.

Seasholes' study (Seasholes, 2010) on individual investors and local bias challenged the notion that local stocks outperform, providing insights into transaction behaviors. While the paper offers insights into transaction behaviors, its application to congressional stock trading requires an understanding of the unique factors influencing lawmakers' investment choices.

Bartram (2016) examined the relationship between specific risk and market risk, especially during periods of high economic uncertainty. The paper provides valuable insights into market dynamics. However, their direct relevance to congressional securities trading requires an analysis of how these risks manifest themselves in politics.

The topic of insider trading is not a new topic by any means. Lakonishok (2001) argues in the 2001 paper that insider trading is frequently done. The conclusion was based on transaction data on various exchanges from 1975-1995. The author suggests that the insiders can out-perform contrarian investor, who goes against the market trend, in predicting the general direction of the market. Yet, this ability generally only apply to smaller firms. Additionally, purchases are more informative than sales.

In the 2003 study, Jeng (2003) concluded that purchasing transactions with insider information do have returns of over 6% per year, while selling transactions for not yield returns that is higher than that of the market. This coincides with the findings in Lakonishok (2001)'s paper. The study applied the performance-evaluation method on the trades. The method was chosen because the authors intended to calculate the estimated returns earned by insiders.

In summary, while the foundational work on capital market returns and efficiencies provides important information for understanding financial markets, their direct extension to parliamentary securities trading is required to have a particular lens that takes into account the distinctive aspect of legislative decision-making.

Turning to congressional stocks trading, the foundation provisions formed a more

nuanced analysis. Becker's model (Becker, 1983) examined competition between pressure groups for political influence. Ferejohn's model (Ferejohn, 1986) provided valuable insights into the broader political landscape by examining how voters formulate incentives for incumbents, with a focus on electoral competition. Baker's model of competition between pressure groups and Ferrejon's focus on electoral competition informed the understanding of political influence. While these examples do not explicitly address stock trading, they lay the foundation for understanding the motivations and incentives that can influence legislative decisions.

The initial research conducted by Ziobrowski in 2004 (Ziobrowski A., 2004) shed light on the advantages that Congress members had in stock investments, between 1993 and 1998. A later study by Ziobrowski in 2011 (Ziobrowski A., 2011) revealed that House members experienced returns from equity market investments. Performance differences could be observed based on factors like political party affiliation. Lenz's 2010 article (Lenz, 2010) examined the wealth accumulation trends of U.S. House members using data to that found in public surveys. Ziobrowski's investigation into banking activities and the resulting abnormal returns along with Lenz's analysis of wealth accumulation patterns were noteworthy.

Ward's theory (Ward, 1995) regarding the competition between pressure groups provides insights into how political influence operates. Additionally the research by Caselli and Morelli (Caselli, 2004) delves into the variations in the caliber of elected officials suggesting that individuals, with quality may excel in career pursuits. The theories posited by Ward and the study conducted by Caselli and Morelli shed light on the complexities of influence dynamics in the political environment. However, their direct application to congressional stock trading requires careful consideration of the specific factors at play.

Kroszner's study (Kroszner, 2005) regarding lawmakers establishing credibility and garnering donations provides insights into the effect of financial aspects in politics. Dal Bo,

Dal Bo, and Di Tella's model (Dal BÓ E., 2006) explores the influence of interest groups using both bribes and threats of punishment. Kroszner's research on legislators building reputations and Dal Bo et al.'s model on interest groups' influence using bribes and threats provide financial perspectives on political influence. While not directly addressing stock trading, these works shed light on the broader financial aspects of political decision-making.

Jerke (2010) delved into political intelligence trading, a growing practice where government officials supply information to hedge funds. Eggers (2013) analyzed the investment performance of members of Congress, finding little evidence of systematic profit from insider information. Eggers' later work (Eggers, 2014) explored how political connections manifest in congressional portfolios. Jerke's exploration of political intelligence trading and its intersection with hedge funds introduces a contemporary layer to the discussion of informational advantages. Eggers's analysis of the investment performance of members of Congress (Eggers, 2013), along with subsequent work (Eggers, 2014) on political connections in congressional portfolios, adds empirical depth to the understanding of legislative stock trading.

Tahoun's study (Tahoun, 2014) investigated the relationship between U.S. politicians' stock ownership and campaign contributions. Cherry's work (Cherry et al., 2018) studied Senators' stock trading activities before and after the STOCK Act, and finding evidence of abnormal returns before increased scrutiny contributed to the body of evidence on potential links between financial interests and legislative actions.

In the 2013 study, Fritz investigated the insider trading laws in detail (Fritz, 2013). The author started with when insider trading was governed by state laws, until the federal government codify insider trading law on the federal level. Fritz presented examples of dubious transactions of former Speaker of the House, such as, Speaker Dennis Hastert in 2005, Speaker Nancy Pelosi, Senator Harry Reid's advisers in 2008 etc. that ended up earning these officials huge profits. Fritz meticulously explored notable clauses of the

STOCK Act and evaluated them with real-life examples, occasionally with specific lawsuits. The author also examined other laws, aimed to prevent insider trading, such as, Sarbanes-Oxley Act, as well as, Congressional Ethics Rules on insider trading. He concluded that these laws are inadequate in preventing stock trading using congressional knowledge by Congress officials.

Karadas et al. (2021) argues that STOCK Act was, indeed, effective in preventing Congress members to trade upon non-public or Congressional macroeconomics knowledge. Past literature, examined by the authors suggest that there is evidence that the STOCK Act was successful in its purpose to put a stop to insider trading by Congress members. In addition, the authors scrutinized 101,191 transactions from 2004 to 2014, which were both before and after the enactment of STOCK Act, and concluded that the legislation negatively impacted the Congress members' ability to make informed trades with non-public information.

Belmont's recent analysis (Belmont et al., 2022) found no evidence of superior investment performance on average among House Members. It concluded that superior investment performance is absent on average among House Members, raising intriguing questions about the possibility of undiscovered insider trading that may not be captured by average results. However, it acknowledged potential insider trading that may not be captured by average results. These studies directly address various aspects of congressional stock trading, including political intelligence trading, investment performance, political connections, and abnormal returns. They are highly relevant to the research topic and provide essential empirical evidence.

The intersection where politics meets finance has always been a complicated interplay which calls for continuous investigation. Therefore, this research area's shows that it must still be closely, and potential abuses examined so as to maintain the fairness of financial markets and political arenas. Thus, as duly elected officials, it is imperative for

these individuals to uphold the integrity of their office and the people's trust.

The purpose of the STOCK Act is to maintain the integrity of Congress in limiting insider trading. In pursuant to the Ethics in Government Act, which was amended by the STOCK Act in 2012, subjects members, family members, and certain staffers to Periodic Transaction Report Filing, where they are required to submit Periodic Transaction Reports (PTR) of any transaction of stock, bond, etc., exceeding \$1,000. Members are required to file the PTR within 30 days of receiving notice of the transaction. Late filings can happen, but no more than 45 days after the transactions. As the purpose of this paper is to assess the efficacy of the STOCK Act, it is imperative to analyze if the aforementioned rule, which is undoubtedly important in maintaining the integrity of Congress, has been effective and closely adhered to by the members. It can be hypothesized that there is no group difference in the reporting lag for the two dimensions of the dataset, gender and party.

Methods

This research will adopt a quantitative approach to investigate the efficacy of the STOCK Act in enforcing the aforementioned Ethics in Government Act. The study aims to calculate the reporting lag and compare them between different groups; such as, Republican and Democratic, male and female, etc. It will be crucial to examine data normality. In addition, the median between different legislator groups would need to be compared.

Participants

This study involves both present and former members of the U.S. House of Representatives and Senators as its subjects. It includes individuals who have publicly disclosed their financial dealings through available channels, either the reporting software or forms. However, it's important to note that not all officials may opt to reveal their stock trades, which could introduce a bias in the data. In addition, there may be missing data.

The sampling technique used is non-random, as it analyzes the entire current and

past official population rather than a randomly selected subset. This methodology enables a comprehensive examination of financial behaviors across Congress, providing insights into various trends and patterns over time.

With Congress members representing diverse backgrounds, political affiliations, and investment strategies, the participant pool offers a rich dataset for analysis. By including both current and former members, the study can explore longitudinal trends in stock trading behavior and wealth accumulation.

Nevertheless, it's crucial to recognize that financial disclosure data might not capture all aspects of officials' financial interests, as certain assets or transactions could be exempt from disclosure requirements. Additionally, variations in reporting practices or data accuracy among officials could introduce noise or biases into the analysis. For example, this study will only assess stock trading activities by Congress members. It will exclude other transactions such as real estate investments, as this information might not be publicly available.

Despite these potential limitations, scrutinizing the financial activities of elected officials yields valuable insights into the convergence of politics and finance. By leveraging publicly available data, this research aims to uncover patterns and trends in congressional stock trading and their implications for financial transparency and accountability.

Data

There are 97 unique legislators, who reported trades, retrieved from the transactions dataset and will be joined with the legislators' affiliation dataset to produce the dataset of which the analysis will be built upon. The dataset of which the analysis would be done on will consist of the following attributes; amountFrom, amountTo, filingDate, name (name of the legislator), position (senator or representative), symbol (stock's ticker), transactionType, gender, state, and party, as shown in table 3. The description of the final dataset is shown in table 4.

A total of 12,523 transactions were retrieved. The earliest and latest filing date retrieved were January 31st, 2014, and April 17th, 2024. respectively. The earliest and latest transaction date retrieved were February 7th, 2012, and April 12th, 2024, respectively. There were 995 unique securities being traded by Congress members. There are 10,829 male legislators, compared to 1,694 females (Appendix A Figure 1). From the final dataset, there are 9,854 trades made by members of the Republican party, and 2,669 from the Democratic counterpart, as shown in Figure 2. Table 7 suggests that legislators from the state of Georgia made the most transactions.

Congress's reporting lag descriptive statistics are displayed in table 8. The median of late filings is 31 days, while the mean is 167.79, with a standard deviation of 223.07, and an interquartile range of 361. The lag comparison between genders descriptive statistics are summarized in table 9. Male legislators' mean filing lag is 178.48, while that of female legislator is 95.81. The median in filing lag is 32 and 27 for male and female legislator, respectively. There is a large dispersion in the filing lag's interquartile range between male and female legislators, 390 to 37, respectively.

In table 10, the filing lag by party was explored. Democratic legislators have a significantly lower filing lag mean compare to the Republican counterpart (77.57 to 186.72). The same trend was true for median (23 to 34), standard deviation (142.08 to 232.16), and with a more dramatic difference in interquartile range (22 to 399).

The lag's descriptive statistics by state was also explored, as shown in table 11. The state of Tennessee has the highest median in filing lag at 498 days, followed by New Mexico and Arizona at 72 and 49 days, respectively. The interquartile range does not show the same trend as it appears slightly more chaotic with Tennessee interquartile range at 399, New Mexico's 49, and Arizona's 63 days. Means and standard deviations also have similar trends with the mean being 417.64, 72.00, 71.85, and standard deviation of 214.32, 69.30, 92.59, for Tennessee, New Mexico, and Arizona, respectively.

Data analytic plan

Congress members' affiliation (Republican or Democratic) retrieval

To perform the analysis, congress member's party affiliation is also needed to be retrieved. The information can be extracted from C-Span's Congressional Chronicle website C-Span (C-Span, n.d.), then combined to the trade dataset to produce the dataset that can be used for the analysis. This dataset attributes are legislators' names, position (senator or representative), gender, state, and party, as shown in table 1.

Retrieval of tickers

The first step of data ingestion would be downloading all available company tickers SEC-tickers (Securities & Commision, n.d.) from the U.S. Securities and Exchange Commission (SEC) by parsing and writing the tickers into a CSV file with a Python script. This would retrieve a set of tickers of publicly-traded companies on various U.S. exchanges.

Transaction data retrieval

The financial disclosure data were collected from a paid API, provided by Finnhub (FinnHub.io, n.d.). The arguments needed for downloading the congressional trades from the API are symbols (tickers), from date (first date of the time window for which the data is collected), to date (last date of the time window for which the data is collected).

The result of the API call would be a dictionary-type object, which contains data, an array of stock trades, and a second element called Symbol, or the traded security's tickers. The data item in the dictionary would contain a list with the following attributes; amountFrom (Transaction amount from), amountTo (Transaction amount to), assetName (Asset name), fillingDate (Filing date.), name (Name of the representative or senator), ownerType (Owner type), position (Position of the Congress member, senator or representative), symbol (Symbol or Ticker of the security being traded), transactionDate (Date of the transactions), transactionType (Transaction type of Sale or Purchase), as

shown in table 2.

The data collection process involved downloading all of the available financial disclosure records of all members. No direct interaction with participants occurred, and the data were collected without any experimental manipulation. The data collection process was solely based on the retrieval of existing public records. The downloaded data was compared to reports filed electronically by the senators or representatives. It was found that there is a slight discrepancy the filing and transaction dates retrieved from the API, which slightly deviated from the actual reported dates, but the transactions' amounts are accurate. There are also missing transactions, which can be investigated in later studies.

Data cleaning and variables transformation

Before conducting the analysis, the two dataset can be cleansed by going through a number of steps. In the legislator dataset, the index number attribute can be dropped. Position, gender, state, party attributes are factorized, with gender's labels to be updated to "Male" and "Female". The attribute `assetName` and `ownerType` are removed they do not provide insights to this analysis. The last step to clean this dataset is to enforce a unified date format on the `filingDate` and `transactionDate` attributes.

Outcome measure

The transaction report filing lag will be the main measure of this analysis. Mean, median, interquartile range, and standard deviation in different groups; such as, gender, party, state will be assessed. These measures can provide comparisons of legislator groups' general tendencies in PTR filings.

Statistical tests

To determine whether a difference in transactions filing date exists between different groups, Lilliefors (Kolmogorov-Smirnov) tests will be conducted for each comparison to assess the lag data normality between compared groups. The test is used to determined the

data normality. Thus, Wilcoxon Rank Sum Tests will be conducted for each comparison to compare the distributions of the different groups by comparing the medians between two populations. These nonparametric tests were chosen due to the expected non-normality nature of the underlying data. These tests can potentially assist in answering the main hypothesis of the study.

Results

Assumptions check

First look of the data suggests that the data is not normal (Figure 1 and Figure 2). Base on the assumption check of normality, a non-parametric test is selected. In Test 1, a Lilliefors (Kolmogorov-Smirnov) test was conducted for male legislators' reporting lag. The result suggest the data is not normal (p-value $< .001$). Likewise, Test 2 suggests the same is true for female legislators' reporting lag (p-value $< .001$). The Lilliefors test was also conducted for Democratic legislators' reporting lag (Test 3) with a p-value < 0.001 . Test 4 assesses the normality of Republican legislators' reporting lag data, which is also shown to be not normal (p-value $< .001$). The results, again, suggest the data is not normal (p-value $< .001$). As such, the data normality assumption was not met. Due to the nature of the underlying data, this was expected.

Statistical test results

Based on the assumption check of normality, a non-parametric test was selected. In Test 5, the Wilcoxon Rank Sum Test was conducted to compare the median of reporting lag between male and female legislators, which suggests there is, indeed, a difference in the median of transactions reporting lag with $W = 8954484$, p-value $< .001$. In addition, as previously mentioned, Test 1 of male legislator's reporting lag and Test 2 of female legislator's reporting lag show that both data groups are not normal. The abnormality in the distribution of lag data by male and female legislators is demonstrated in Figure 3 density plot.

Similarly, the Wilconxon Rank Sum Test was conducted again to compare the median of reporting lag between Democratic and Republican legislators (Test 6). The test confirms that there is a difference in the median of transaction reporting lag with $W = 6384764$, $p\text{-value} < .001$. Again, Test 3 and Test 4 both suggest that the data is not normally distributed. Figure 4 shows the abnormality of data distribution by the Democratic and Republican parties' reporting lag.

Other observations

Through the analyses, interesting observations were made; such as, the disparity in the transaction counts between Male and Female legislators (Figure 1), Democratic and Republican legislators (Figure 2). Both density plots in reporting lag for the Male and Female comparison (Figure 3), and the Democratic and Republican (Figure 4), show extreme skewness in all four dimensions.

Table 8 shows a reasonable median of 31 days in overall reporting lag, very much in line of the Ethics in Government Act's rule for transaction reporting. However, the mean of reporting lag for the entire dataset is 167.79 days, which clearly violates the law. The interquartile range for overall reporting lag is 361 days, which is almost a calendar year.

The comparison between reporting lag of the male group and that of the female group was also explored (Table 9). The female transaction reporting lag's median of 27 days is within the 30-45 days requirement. Male transaction reporting lag median is slightly higher at 32 days. Both are still compliant to the reporting requirements. However, similar to the overall statistics of Table 8, the means shows latency in reporting by both male and female legislators, 178.48 days and 95.81 days, respectively. The same is true for standard deviation with male legislator's reporting lag at 230.09 days and 149.57 days for female legislators. On the other hand, female legislator has a somewhat acceptable interquartile range of 37 days, while that of the male counterpart is 390 days.

Additionally, on average, Republican legislator file the transactions much later than

their Democratic colleagues, 186.72 days versus 77.57 days, respectively (Table 10). The same is true for standard deviation with Republican reporting lag at 232.16 days, and Democratic at 142.08 days. The Republican reporting lag interquartile range is 399 days, while that of the Democratic party is 22 days, which is within the transaction reporting period requirement. Both parties median are compliant to the STOCK Act with 34 days for Republican and 23 days for Democratic.

Table 11 shows a tendency of transaction reporting latency by states, ranked by the latency median. First on the list is Tennessee, with an average lag in transaction reporting of 417.64 days, a median of 498 days, a similar interquartile range of 399 days, and a standard deviation of 214.32 days. New Mexico is second on the list with both transaction reporting lag's mean and median at 72 days. The state of Wyoming ranks 4th with a median and average lag of 42, which are compliant to the rule. While having compliant transaction reporting lag medians of 36, 35, 34, 32, and 32, respectively, PA, WV, VA, LA, MO, all have non-compliant averages, standard deviation and interquartile range in transaction reporting lag. The same trend was, again, observed with AK, KS, RI, GA, and DE.

The top 5 legislator ranked by transaction reporting lag were identified in Table 12. The focus is on legislators who made more than 50 trades. Robert Corker, Jr., the former Republican senator from Tennessee, is ranked first with 2504 transactions, a median of 498 days, an average of 420.68 days. a standard deviation of 212.26 days, and an interquartile range of 399 days. Former Republican senator from Mississippi Thad Cochran is second with 487 transactions, a median of 37 days, an average of 131.47 days, a standard deviation of 178.7 days, and an interquartile range of 126.5 days. Former Republican senator from Pennsylvania Patrick J Toomey is third with 189 transactions, a median of 36 days, an average of 186.92 days, a standard deviation of 247.54 days, and an interquartile range of 285 days. Republican senator from West Virginia Shelly M Capito is fourth with 532 transactions, a median of 36 days, an average of 123.79 days, a standard deviation of

168.57 days, and an interquartile range of 36 days. Republican senator from Kansas Jerry Moran is fifth with 144 transactions, a median of 34 days, an average of 115.7 days, a standard deviation of 128.63 days, and an interquartile range of 134 days. While most politicians' transaction reporting lag median is compliant, with the exception of senator Corker, only senator Capito has a compliant interquartile range. All five senators' transaction reporting lag averages, standard deviations, and interquartile range, with the exception of senator Capito, are well over the required reporting deadlines of 30-45 days.

Discussion

Summary of results

Having completed the Wilcoxon Rank Sum Tests on the transaction reporting lag between male and female legislators (Test 5), and Democratic and Republican legislators (Test 6), with both yielded a p-value $< .001$, the null hypothesis, which hypothesized no group difference in the reporting lag for gender and party, is rejected. As such, the alternate hypothesis, which states that there are group differences in the reporting lag for gender and party, is adopted.

While there were past literature that examined congressional stock trades, the reporting compliance aspect has not been investigated thoroughly. As such, this study has delve the Ethics in Government Act reporting compliance aspect of the STOCK Act, which requires legislators to report transactions within 30-45 days. The study has explored reporting lag in several directions; such as, gender, political party, individuals etc.

In terms of gender, several observations were made. Table 5 shows that male legislators have made significantly more transactions (10,829 transactions) compared to that of female legislators (1,694 transactions). The reporting lag data for both male and female legislators were confirmed to be not normal applying the Lilliefors tests to both groups, with both p-values $< .001$ (Test 1 and Test 2). The analyses conducted in the study were able to highlight the group differences in reporting lag averages, median,

interquartile range between genders (Table 9). While both male and female legislators' reporting lag median (32 and 27 days, respectively) are compliant with the Ethics in Government Act, their averages (178.48 and 95.81 days), and standard deviations (230.09 and 149.57 days), are non-compliant. It is also observed that male legislators have a much higher interquartile range in reporting lag of 390 days, compared to that of female legislators, which is a compliant 37 days.

The disparity in the number of transactions made by male versus female legislators is interesting. It may be due to the fact that there are more male representation in Congress, compared to that of females. This may be due for a change in the future with more social justice and equality movements, aiming at a more balanced representation of gender in Congress. In addition, while the medians of reporting lag by male and female legislators are compliant to the Ethics in Government Act, the reporting averages, and standard deviations are horrendous, with months of transaction reporting latency. Additionally, male legislators' reporting lag interquartile range is 390 days, which is approximately 1 year and 25 days after the transaction date, a clear violation. All these comparisons show that while most legislators adhere to the rules that they, themselves, wrote and voted for, there are a few that dissent from the norm.

In terms of party, several observations were also made. Table 6 shows that Republican legislators have made significantly more transactions (10,829 transactions) compared to that of Democratic legislators (2,669 transactions). The reporting lag data for both Republican and Democratic legislators were confirmed to be not normal applying the Lilliefors tests to both groups, with both p-values $< .001$ (Test 3 and Test 4). The analyses conducted in the study were able to highlight the group differences in reporting lag averages, median, interquartile range between parties (Table 10). While both Republican and Democratic legislators' reporting lag median (34 and 23 days, respectively) are compliant with the Ethics in Government Act, their averages (186.72 and 77.57 days), and standard deviations (232.16 and 142.08 days), are non-compliant. It is also observed that

Republican legislators have a much higher interquartile range in reporting lag of 399 days, compared to that of Democratic legislators, which is a compliant 22 days.

The disparity in transactions reporting lag between Republican and Democratic legislators is intriguing, as the G.O.P. has been campaigning on the point of being the “law and order” party. In addition, while the medians of reporting lag by Republican and Democratic legislators are compliant to the Ethics in Government Act, the reporting averages, and standard deviations are non-compliant, again, with months of transaction reporting latency. Additionally, Republican legislators’ reporting lag interquartile range is 399 days, which is approximately 1 year and 34 days after the transaction date, another clear violation. Similar to the genders’ reporting lag analysis, all these comparisons show that while most legislators adhere to the rules, there are a few that are or were violating the law.

The study also highlighted 25 states with the highest reporting lag by median (Table 11), with a fair share of both Democratic and Republican-represented states in the mix, with Tennessee being first with 498 days. Other notable states are New Mexico, Arizona, Wyoming, Mississippi, Pennsylvania, etc., with the median transaction reporting lag of 72, 49, 42, 37, 36 days, respectively. While having compliant medians in transaction reporting lag, Mississippi, Pennsylvania, West Virginia, Virginia, and Louisiana have non-compliant averages. Furthermore, the analyses also revealed that the top 5 legislators with the highest transaction reporting lag happens to be from the Republican party (Table 12). For example, Figure 5 shows senator Robert Corker’s PTR form for transactions made on November 6th, 2013, but the reporting date, or filing date was not until March 21st, 2014. This means that the transactions were reporting 135 days, or 4 months and 15 days excluding the filing date, after the transaction date, makes this a clear violation of the Ethics in Government Act, and the STOCK Act. That somewhat explains the disparity in reporting lag that was observed when comparing that of Republican legislators and Democratic legislators.

Limitations

The dataset retrieved from FinnHub was rather small with only 12,523 transactions. The total number of transactions is rather small. It is suspected that not all reported trades were available and provided by FinnHub. With the majority of the past filings were filed by hand, and are not computer-readable using OCR (Optical Character Recognition), it is proven to be difficult to retrieve all transaction reports. As a result, the study might be missing a lot of data.

Future directions

The study can be extended by retrieving more data, either from accessing and hand-record the transactions, or finding another data source that provide the missing data. That would facilitate more robust analyses in the matter, with bias minimized as much as possible. Thus, having more data would also ensure more accurate analyses and results.

Implications

The analyses revealed that while most legislators are compliant to the Ethics in Government Act's periodic reporting requirements, there have been legislator that have not. It begs the question of the effectiveness of Congress in enforcing the laws that it implemented, policing itself. There is a late filing fee of \$200 who files more than 30 days after the due date imposed by the House of Representative. In addition, the late-filing violations in the House are investigated by an independent agency named the Office of Congressional Ethics (DeChalus, n.d.). There is no equivalent office operating as oversight in the Senate. As such, the question remains how effective a law is when it is not enforceable, especially at the upper chamber of Congress. There is also little transparency with no public records of the STOCK Act violators. While there have been efforts in banning stock trading in Congress altogether with proposals in the past, none have been able to make it to the Senate floor for voting, despite public support of such bipartisan bill

(Lane, 2023). Ultimately, it is imperative that lawmakers get this right to restore the people's faith in the government.

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Appendix

Test 1. Male's Reporting Lag Lilliefors Data Normality Test

```
##
##  Lilliefors (Kolmogorov-Smirnov) normality test
##
## data:  t1$lag[t1$gender == "Male"]
## D = 0.32754, p-value < 0.000000000000000022
```

Test 2. Female's Reporting Lag Lilliefors Data Normality Test

```
##
##  Lilliefors (Kolmogorov-Smirnov) normality test
##
## data:  t1$lag[t1$gender == "Female"]
## D = 0.37575, p-value < 0.000000000000000022
```

Test 3. Democratic Legislators' Reporting Lag Lilliefors Data Normality Test

```
##
##  Lilliefors (Kolmogorov-Smirnov) normality test
##
## data:  t2$lag[t2$party == "Democratic"]
## D = 0.41597, p-value < 0.000000000000000022
```

Test 4. Republican Legislators' Reporting Lag Lilliefors Data Normality Test

```
##
##  Lilliefors (Kolmogorov-Smirnov) normality test
```

```
##  
## data:  t2$lag[t2$party == "Republican"]  
## D = 0.31358, p-value < 0.000000000000000022
```

Test 5. Lag by Gender Wilcoxon Rank Sum and Signed Rank Tests

```
##  
## Wilcoxon rank sum test with continuity correction  
##  
## data:  lag by gender  
## W = 8954484, p-value < 0.000000000000000022  
## alternative hypothesis: true location shift is not equal to 0
```

Test 6. Lag by Political Party's Wilcoxon Rank Sum and Signed Rank Tests

```
##  
## Wilcoxon rank sum test with continuity correction  
##  
## data:  lag by party  
## W = 6384764, p-value < 0.000000000000000022  
## alternative hypothesis: true location shift is not equal to 0
```

Table 1*Legislators Dataset Structure*

Column Name	Data Type
name	character
position	integer
gender	integer
state	integer
party	integer

Table 2*Transactions Dataset Structure*

Column Name	Data Type
amountFrom	double
amountTo	integer
filingDate	double
name	character
position	character
symbol	character
transactionDate	double
transactionType	character

Table 3*Final Dataset Structure*

Column Name	Data Type
amountFrom	double
amountTo	integer
filingDate	double
name	character
position	character
symbol	character
transactionDate	double
transactionType	character
gender	integer
state	integer
party	integer

Table 4*Dataset Overview*

variable	classe	first_values
amountFrom	double	1001, 1001, 1001, 1001, 1001, 1001
amountTo	integer	15000, 15000, 15000, 15000, 15000, 15000
filingDate	double	2015-07-14, 2015-12-11, 2015-07-14, 2014-06-10, 2014-06-10, 2015-07-14
name	character	Robert P Corker, Jr., Robert P Corker, Jr., Robert P Corker, Jr., Robert P Corker, Jr., Robert P Corker, Jr., Robert P Corker, Jr.
position	character	senator, senator, senator, senator, senator, senator
symbol	character	A, A, A, A, A, A
transactionDate	double	2014-01-08, 2014-01-08, 2014-01-08, 2014-01-08, 2014-02-14, 2014-02-14
transactionType	character	Purchase, Purchase, Purchase, Purchase, Sale (Full), Sale (Full)
gender	integer	Male, Male, Male, Male, Male, Male
state	integer	TN, TN, TN, TN, TN, TN
party	integer	Republican, Republican, Republican, Republican, Republican, Republican
lag	double	552, 702, 552, 153, 116, 515

Table 5*Trades Count by Gender*

Gender	Count
Male	10829
Female	1694

Table 6*Trades Count by Political Party*

Party	Count
Republican	9854
Democratic	2669

Table 7*Top 25 Trade Counts by State*

State	Count
GA	2759
TN	2533
AL	980
RI	902
DE	597
KS	576
WV	533
MS	491
ME	465
OK	347
OR	263
NJ	228
PA	196
LA	190
NC	175
ND	171
TX	160
AK	154
WA	153
UT	105
CO	93
NV	71
IL	62
MI	58
FL	44

Table 8

Overall Lag Descriptive Statistic

Overall Lag Descriptive Statistics			
Mean	Median	SD	IQR
167.79	31	223.07	361

Table 9*Lag by Gender*

Gender	Lag			
	Mean	Median	SD	IQR
Male	178.48	32	230.09	390
Female	95.81	27	149.57	37

Table 10*Lag by Party*

Party	Lag			
	Mean	Median	SD	IQR
Republican	186.72	34	232.16	399
Democratic	77.57	23	142.08	22

Table 11*Top 25 Lag (Median) by State*

State	Lag			
	Mean	Median	SD	IQR
TN	417.64	498.0	214.32	399.00
NM	72.00	72.0	69.30	49.00
AZ	71.85	49.0	92.59	63.00
WY	42.00	42.0	14.14	10.00
MS	131.96	37.0	178.61	133.25
PA	187.28	36.0	246.94	285.00
WV	123.61	35.0	168.47	36.00
VA	172.29	34.0	252.15	220.00
LA	144.46	32.0	218.16	221.00
MO	89.00	32.0	107.69	130.00
AL	40.69	31.5	36.80	15.00
CO	64.18	30.0	105.52	22.00
FL	30.00	30.0	0.00	0.00
IL	34.35	30.0	23.98	15.00
NJ	30.18	30.0	0.40	0.00
AK	59.95	29.0	86.43	4.00
NE	28.71	29.0	0.71	0.00
AR	24.11	27.0	5.21	8.00
KS	67.48	26.0	109.74	18.00
OK	28.72	26.0	49.19	15.00
RI	97.95	26.0	168.31	24.00
OR	28.24	25.0	36.54	18.00
GA	132.47	24.0	212.99	69.00
MD	20.40	24.0	5.80	9.00
DE	104.49	23.0	157.37	164.00

Table 12*Top 5 Legislator Lag (Median) with 50 or More Trades*

Name	Party	Trade Count	Lag			
			Mean	Median	SD	IQR
Robert P Corker, Jr.	Republican	2504	420.68	498	212.26	399.0
Thad Cochran	Republican	487	131.47	37	178.70	126.5
Patrick J Toomey	Republican	189	186.92	36	247.54	285.0
Shelley M Capito	Republican	532	123.79	36	168.57	36.0
Jerry Moran,	Republican	144	115.70	34	128.63	134.0

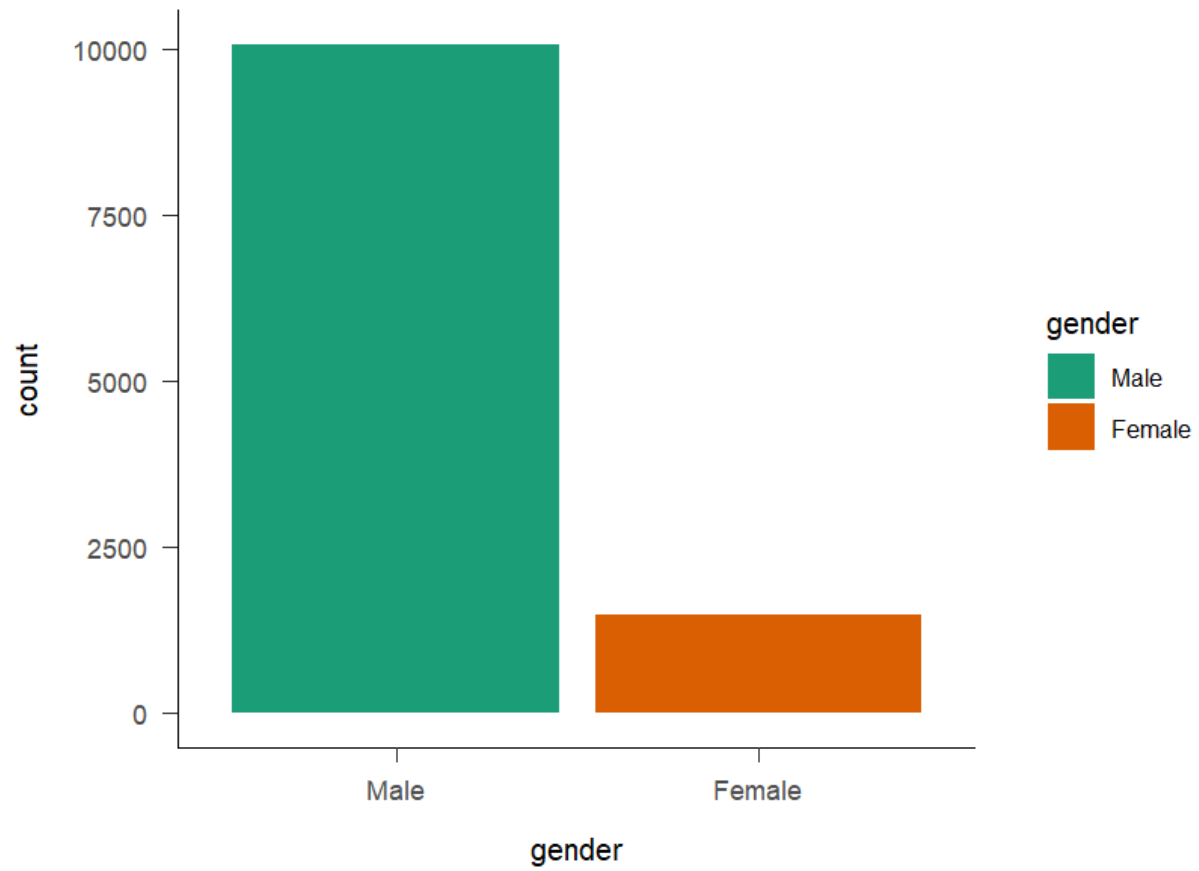


Figure 1

Trades Count by Gender

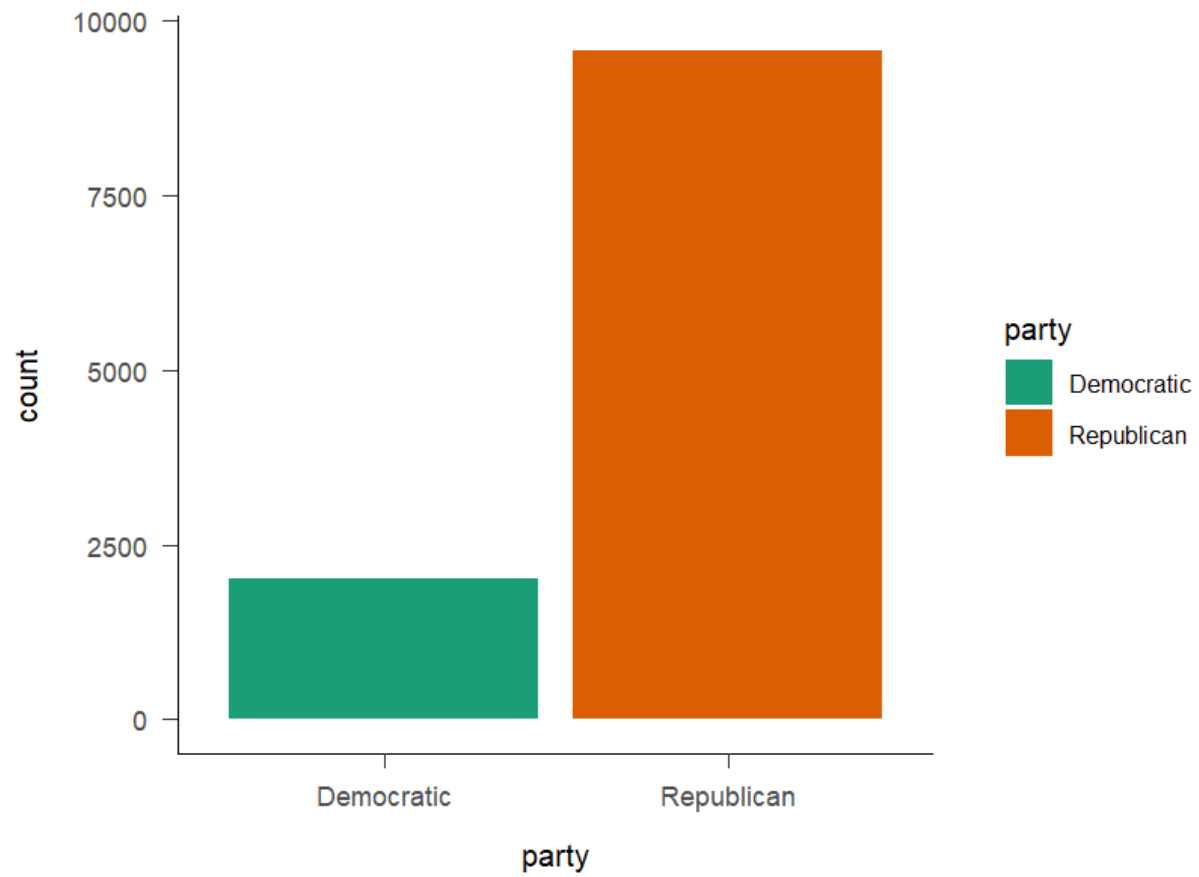
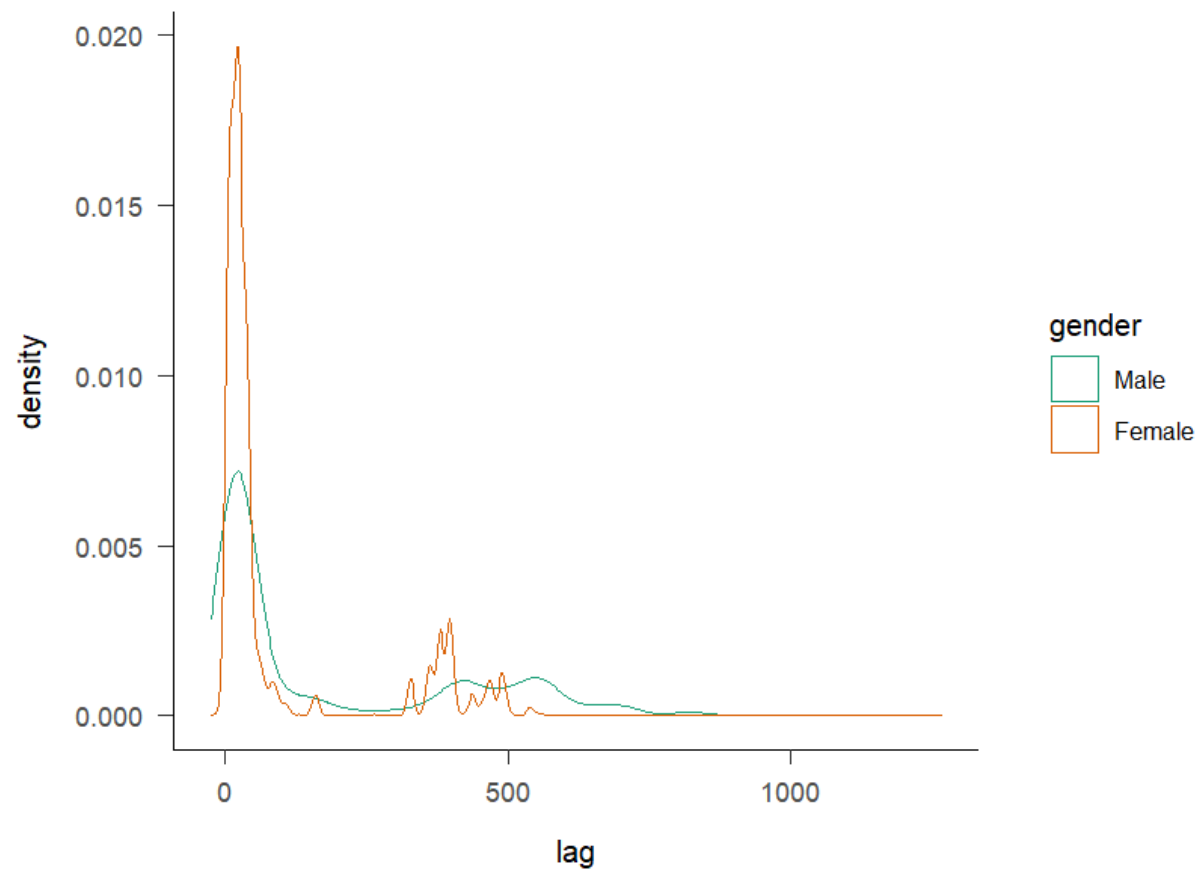
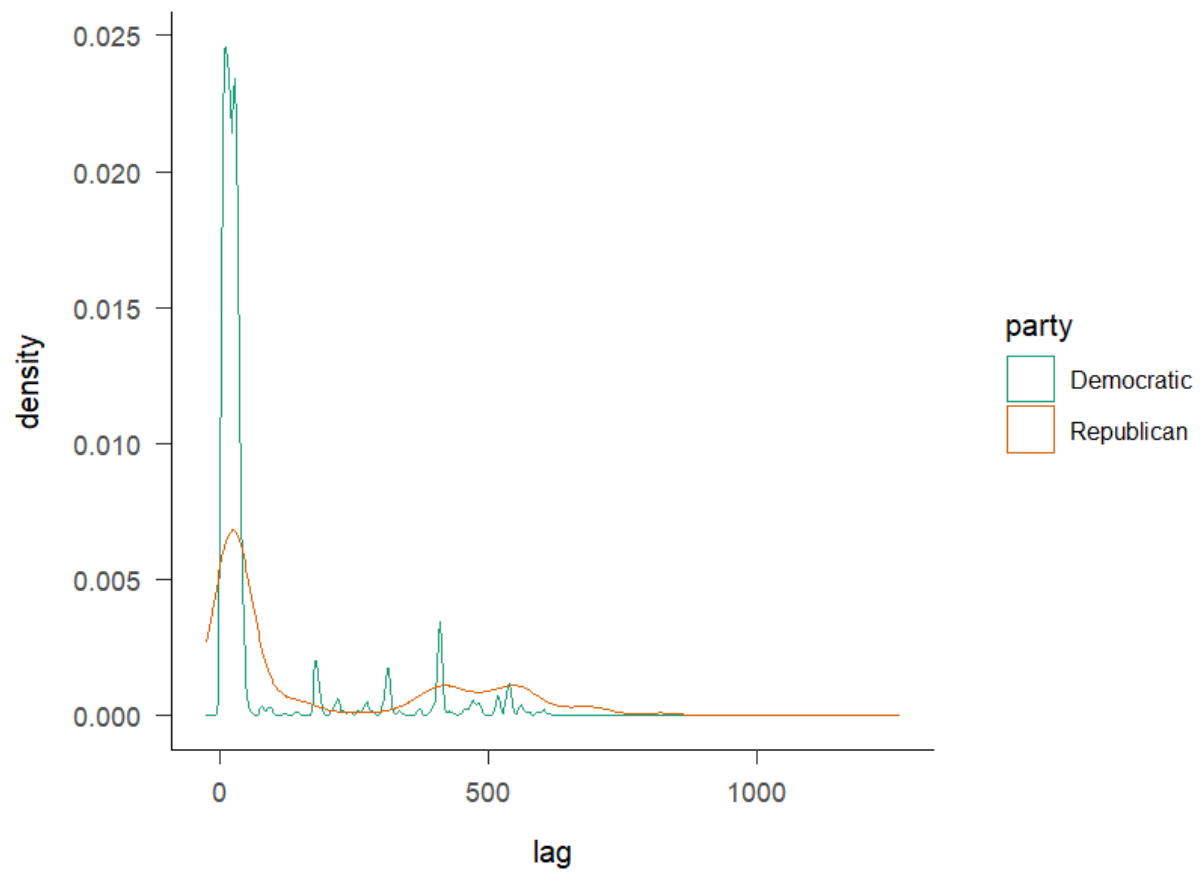


Figure 2

Trades Count by Political Party

**Figure 3**

Lag by Gender

**Figure 4**

Lag by Political Party

This Report Should Be Filed With:
 Secretary of the Senate
 Office of Public Records
 Hart Building, Suite 232
 Washington, DC 20510

**PERIODIC DISCLOSURE
 OF FINANCIAL
 TRANSACTIONS**

RECEIVED
 SECRETARY OF THE SENATE
 PUBLIC RECORDS
 14 MAR 21 (File Date)

Reporting Individual's Name: ☐ Amendment: ☐ Senate Office / Agency in Which Employed: ☐ Page Number: 2
 Bob Corker Senator Bob Corker

Report any purchase, sale, or exchange by you, your spouse, or dependent child within 30 days of receiving written notification of such transaction. Report any stocks, bonds, commodity futures, and other securities when the amount of the transaction exceeded \$1,000. Include transactions that resulted in a loss. Do not report a transaction involving an excepted investment fund, any real property, or a transaction between you, your spouse, or dependent child. Please clarify which two assets are involved in any reportable exchange. In no event may this disclosure be filed more than 45 days after such transaction.

Identification of Assets		Transaction Type (x)			Transaction Date (Mo., Day, Yr.)	Amount of Transaction (x)									
Purchase	Sale	Exchange		\$1,001 - \$15,000		\$15,001 - \$50,000	\$50,001 - \$100,000	\$100,001 - \$250,000	\$250,001 - \$500,000	\$500,001 - \$1,000,000	Over \$1,000,000***	\$1,000,001 - \$5,000,000	\$5,000,001 - \$25,000,000	\$25,000,001 - \$50,000,000	Over \$50,000,000
Example: (S) Spouse	IBM Corp. (stock) NYSE	X		2 / 1 / 1X		X			E	X	A	M	P	L	E
(DC) Dependent Child	(DC) Microsoft (stock) NASDAQ/OTC		X	2 / 27 / 1X			X	E	X	A	M	P	L	E	
(J) Joint															
1	CBL (Stock)	X		11/6/2013						X					
2	CBL (Stock)	X		11/6/2013						X					
3															
4															
5															
6															
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20															

Figure 5

Robert Corker's Periodic Transactions Report on March 21st, 2014