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### VALUABLE FOUNDATIONS OF SPECIES DIVISION OF NATIONAL SECURITY

In the most common definition, the national security policy is perceived as a system of protecting national interests and includes a complex of socio-economic, political, external, military, technical, legal and other operational and long-term activities, and also the appropriate action taken by the state, the citizens and their public associations.

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# THE EFFECT OF THE US PRESIDENT'S JOB APPROVAL RATING ON THE US STOCK MARKET

We analyze how US presidents job approval ratings affects the stock market of the country. Rasmussen daily presidential tracking poll is taken as a measurement for job approval rating and closing prices of Dow Jones Industrial Average (DJIA) is taken for the stock market. We analyzed the research question for Barack Obama and Donald Trump and the final results are different for the two. In case of Barack Obama we found that one day lagged job approval rating is predictive of changes in DJIA closing price which goes along with our hypothesis of positive relationship between the two variables. For Donald Trump we found a significant negative predictive power which as a matter of fact may not be too reliable coefficient partly because there is lack of observations for that president.

*Keywords:* Dow Jones Industrial Average (DJIA), Approval Index (AI), Donald Trump, Barack Obama, ARCH, GARCH

Historically it is found that stock prices rise by greater percentage during Democratic hold than Republican hold in the United States. In 20<sup>th</sup> century alone during Republican hold Dow Jones Industrials Index increased by an average of 30.5% while in Democratic hold by 32.5% (Stovall, 1992). Getting to the level of individual presidents, Franklin D. Roosevelt had the highest return, 200.2%, among all other democrats in his 1<sup>st</sup> term. In case of Republicans the highest return was during Calvin Collidge's term 148.9%.

A question arises: what causes such differences? Obviously, there is no single answer otherwise every stock trader would be a millionaire. The numerous reasons include economic freedom, political forces, business regulations and several hundreds of others. One reason that stands out and that has gained considerable research interest in the previous years is public mood. As later on will be presented in literature review, public mood can be used to predict movements in stock prices with high correctness.

However, analyzing public mood may be perceived as too general simply because someone's mood may not be related anyhow with the stock market. (e.g. due to bad exam results, university students post tweets with negative emotions). Hence, it would be much more correct if public mood was analyzed on something which is related to stock market or to economy. One figure who matches that requirement is the president who not only has strong relations/effect on the US economy but also there is enough information to analyze the public mood about him which we do not have in case of other figures/institutions which are related to US economy (e.g. FED).

Similar to the above case, public mood about president can be considered to be quite general and not to the point because it may not be logically related to the stock market. For instance, people may find the president to be attractive and thus have positive opinion about his look which possibly has little relation with stock market performance. Making the public opinion more concentrated to point and related to stock market we will concentrate on presidential job approval rating. Obviously, that indicator may also be perceived as general, however, it is much more related to the economic performance than generally populations opinion about thepresident. In this research we will concentrate on two presidents Barack Obama and Donald Trump.

We hypothesize that there should be a positive relation between presidential job approval index and the stock market. The intuitive chain of reasoning is that the better is the state of economy, the happier people are and as they assign some part of that good state of economy to the president, they should have positive opinion about the way president conducts his work. And for the reverse case when there is a bad economic situation the last person in the government to whom people express their dissatisfaction and demand his resignation is the president. Hence, in bad economic states public will have a negative mood about president.

Based on our research, we found that our hypothesis is confirmed for Barack Obama as there is a positive relation between his job approval rating and stock market. However, we did not reach expected results for Donald Trump, we found a significant negative coefficient.

The rest of the paper is organized as follows: Section 2 reviews the related literature, section 3 introduces the data that is used in the research. Sections 4 and 5 represent the main results of the research. The paper ends with Section 6, with concluding statements and directions for future research.

Literature review

Prediction of stock markets has always been one of the most attractive areas of study not only for financial analysts and economists but also for people from other backgrounds: physicians, mathematicians etc. Traditionally it was thought that stock markets follow Efficient Market Hypothesis (EMH) [1], [2]. Basically, it implied that it is not possible to "beat the market" because stock prices reflect all the possible information about the company under consideration.

However, later on new theories were introduced which relaxed the conclusions of EMH. Recent research in behavioral finance [3], [4] shows that emotions and human irrational decision making overall can play a role in predicting stock prices. But how those factors can be analyzed? [5] studies the relation between text sentiments and public polls. The results show a very high correlation between the considered variables. In particular, the sentiment ratio is 73.1%. [6] analyzes the reverse of the relationship we will analyze in our research. That is, how U.S. presidential approval ratings respond to changes in stock markets. They argue that the stock market is a good economic indicator responding to big shocks, government policies and economic trends. They conclude that stock market movements can be used to predict movements in job approval ratings.

Data Description

The data used in the research are Rasmussen Daily Presidential Tracking Poll and Dow Jones Industrial Average Index. The former data is collected by "Rasmussen Reports" company through automated telephone polling techniques, which implies that surveys are conducted through digitally recorded voice. This method insures that every participant hears exactly the same wording with the same intonation. Participants of the survey are selected from a pool of likely voters whose data is provided by census bureau. Surveys are done daily with 500 people and the final result is reported on the bases of three-day rolling average. Respondents are offered four choices for describing their approval: "strongly approve", "strongly disapprove", "somewhat approve" and "somewhat disapprove". In the final report, survey participants are grouped in these four categories and each number below the categories represents the share/percentage of people who answered that category. In addition, the Rasmussen company reports "Approval Index" which is equal to the difference between the percentages of "strongly approve" and "strongly disapprove" ratings. We will use "Approval Index" as a measure for presidential job approval rating. None of the other four variables were taken because of uncertainties in their interpretations the cause of which is that their sum does not total to 100 percent. It is worth to mention that after the row data is collected, it is processed by Rasmussen Reports on a weighting bases to make sure that final results are a good indicator of the overall population with its subgroups. Compared to other polling organizations job approval ratings, Rasmussens data has quite similar trends (Rasmussen, 2017). However, the data contains one possible limitation which is that the proportion of "strongly disapprove" is slightly higher compared to some other polls. That is usual for polls conducted with automated techniques. The data is drawn in Figure 1 and Figure 2.

Dow Jones Industrial Average (DJIA) index was taken as a measurement for stock prices. The index was chosen due to the diversity of industries that its member firms are part of. That makes the index an overall good indicator of stock market in United States. However, there are no companies from the industries of transportation and utilities. In addition, comparison was made between DJIA, S&P

500 and Russel 2000 during the research. It is found that the three indices are highly correlated (Appendix A). The data is drawn in Figure 3 and Figure 4.

Figure 1: Approval Index for Barack Obama Figure 2: Approval Index for Donald Trump



Figure 3: Dow Jones index during Obamas period



Some changes in data were done before passing to the main analysis. In particular, job approval ratings for Saturdays and Sundays were removed because DJIA does not give stock prices for those days. In addition, in the cases where dates of approval rating and index did not coincide for a very short period the observations were deleted if the date of approval rating was later than the date of index. That was done based on the logic that future rating does not affect present Dow Jones Industrial Average (DJIA) index.

Analysis for Barack Obama

We took the detrended DJIA which is stationary as implied Dickey-Fuller unit root test. Our data is described by ARCH, AR and MA models (Appendix B). Also, we took lagged approval indexes following the idea that it may take some time

before the information about change in approval index spreads around the stock market and affects the decisions made by traders. So, the final model is:

$$DJIA_{t} = \beta_{0} + \sum_{i=1}^{n} \beta_{1,i}AI_{t-i} + \sum_{i=1}^{m} \beta_{2,i}DJIA_{t-i} + \sum_{i=1}^{p} \beta_{3,i} \varepsilon_{t-i}$$
$$Var(\varepsilon_{t}) = \partial_{0} + \sum_{i=1}^{q} \partial_{1,i} \varepsilon_{t-i}^{2} + \sum_{i=1}^{p} \partial_{2,i} \sigma_{t-i}^{2}$$

DJIA – Detrneded Dow Jones Industrial Average

AI – Approval Index

To find the best model for detrended DJIA the above model is tested for different cases and the final outcome is represented by the outcome below. This model was chosen based on Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC).

$$\begin{split} DJIA_t &= 415.8 + 1.76AI_{t-1} + 0.967 DJIA_{t-2} + 0.977 \varepsilon_{t-1} \\ & (102.7) \ (1.022) \ (0.00591) \ (0.00550) \end{split}$$

$$Var(\varepsilon_t) = 816 + 0.146\varepsilon_{t-i}^2 + 0.806\sigma_{t-1}^2$$
(124.3) (0.0150) (0.0186)

Interpretation of the coefficient of  $AI_{t-1}$  would be: holding everything else constant, 1 percent increase in  $AI_{t-1}$  will cause an increase in detrended DJIA by 1.76 dollars. In addition, detrended DJIA today has a significant effect on DJIA 2 days later on.

Results for Donald Trump

Unlike the case of Barack Obama, Donald Trumps data is not described by an ARCH model. Only in the case of AR, 13<sup>th</sup>, 14<sup>th</sup> and some other lags are significant. So, the final model is assumed to be given by

$$DJIA_t = \beta_0 + \sum_{i=1}^n \beta_i AI_{t-i} + \sum_{i=1}^n \theta_i DJIA_{t-i}$$

As in the case of Barack Obama the model was tested for different coefficients, however, we reached an unexpected result which is the negative coefficient. That contradicts to our initial hypothesis. Such result may be due to small number of observations for this analysis. Because Donald Trump has only been president for several months and stock markets are closed during weekends and national holidays we only had 59 observations. If we were to do this research a year later from now the possibility of having results similar to the case of Obama might be higher.

Conclusion and limitations of results

Different results are reached for the considered presidents. The final formulation of the results for President Barack Obama would be: presidential job approval index for Barack Obama today is significant at predicting Dow Jones Industrial Average rating tomorrow and there is positive relationship between that two variables. In case of Donald Trump we reached significant results, however, due to low number of observations those results may not be reliable so we will restrain us from making conclusions. One important limitation that our research did not consider is a causality test. It may be so that DJIA also affects AI following the logic that an improvement in stock market is correlated with improvement in overall economy and the better is the state of economy the better opinion will people have about the president and therefore president's job approval rating will be higher. In the case of decrease in stock market, similar logic will follow. In addition, several other tests were not done other effects such as EGARCH were not tested in our analysis.

Due to above mentioned important limitation, our data should be tested for vector auto regression (VAR) models in future research. In addition, our results should be checked for previous presidents. That will enable to reach generalizations in case of positive outcomes. Also, other tests could be done on our research which would further improve the results.

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Appendix A.

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. corr Russel SP500 DowJones
(obs=2062)
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	Russel	SPS00	DowJones
Russel	1.0000		
SP500	0.9855	1.0000	
DowJones	0.9889	0.9954	1.0000



Figure 4: Autocorrelation



### Table 1: *LM test for ARCH*

LM test for autoregressive conditional heteroskedasticity (ARCH)

lags(p)	ch12	df	Prob > chi
1	154.704	1	0.0000
2	261.915	2	0.0000
3	285.711	3	0.0000
4	314.445	4	0.0000
5	315.541	5	0.0000
6	323.785	6	0.0000
7	319.836	7	0.0000
8	323.404	8	0.0000
9	331.738	9	0.0000
10	331.973	10	0.0000
11	325.396	11	0.0000
12	311.968	12	0.0000
13	300.218	13	0.0000
14	313.910	14	0.0000
15	316.288	15	0.0000
16	304.184	16	0.0000
17	305.598	17	0.0000
18	304.820	18	0.0000
19	301.149	19	0.0000
20	296.425	20	0.0000
21	301.584	21	0.0000
22	306.779	22	0.0000
23	307.253	23	0.0000
24	309.475	24	0.0000
25	310.147	25	0.0000
26	310.516	26	0.0000
27	309.592	27	0.0000
28	316.877	28	0.0000
29	319.305	29	0.0000
30	321.020	30	0.0000

HO: no ARCH effects vs. H1: ARCH(p) disturbance

### ՎԻԳԵՆ ՍԻՄՈՆՅԱՆ

Զեղծարարության տվյալների մասնագետ "Արմենիան քարդ" ՓԲԸ

## ԱՄՆ ՆԱԽԱԳԱՀԻ ԱՇԽԱՏԱՆՔԱՅԻՆ ՑՈՒՑԱՆԻՇԻ ԱԶԴԵՑՈՒԹՅՈՒՆ ԱՄՆ ԱՐԺԵԹՂԹԵՐԻ ՇՈՒԿԱՅԻ ՎՐԱ

Մենք ուսումնասիրում ենք թե ինչպես է ԱՄՆ նախագահի աշխատանքի ցուցանիշը ազդում երկրի ֆոնդային շուկայի վրա։ Ռասմուսենի նախագահական վերահսկողության հարցման արդյունքները վերցվել են որպես նախագահի աշխատանքի հաստատման ցուցանիշ և Dow Jones Industrial Index (DJIA) ինդեքսի փակման գինը վերցվել է որպես ֆոնդային շուկայի ցուցանիշ։ Մենք ուսումնասիրել ենք թեման Բարակ Օբամայի և Դոնալդ Թրամպի համար և վերջնական արդյունքները տարբեր են երկուսի համար։ Բարակ Օբամայի դեպքում ստացել ենք, որ նախորդ օրվա աշխատանքի հաստատման ցուցանիշը կանխատեսում է ինդեքսը, որը հաստատում է մեր հիպոթեզը՝ դրական կորելացիա քննարկվող փոփոխականների միջն։ Դոնալդ Թրամպի համար ստացանք նշանակալի բացասական կանխատեսող ուժ ինչը։ Ը ստ էության, այս արդյունքը չի կարող չափազանց հուսալի գործակից լինել, քանի որ այդ նախագահի համար քիչ են դիտարկումներ։

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## ВЛИЯНИЕ РЕЙТИНГА ОДОБРЕНИЯ ПРЕЗИДЕНТОМ США НА ФОНДОВОМ РЫНКЕ США

Анализируется, как рейтинги одобрения президентов США влияют на фондовый рынок страны. Расмуссенский ежедневный опрос по отслеживанию президентских выборов принимается за измерение рейтинга одобрения президентов, а цены закрытия Dow Jones Industrial Average (DJIA) принимаются за фондовый рынок. Мы проанализировали исследовательский вопрос для Барака Обамы и Дональда Трампа, и окончательные результаты для них разные. В случае Барака Обамы мы обнаружили, что рейтинг предыдущего дня прогнозирует изменения цены закрытия DJIA, что согласуется с нашей гипотезой о положительной взаимосвязи между двумя переменными. Для Дональда Трампа мы обнаружили значительную отрицательную прогностическую силу, которая, по сути, не может быть слишком надежным результатом, частично из-за отсутствия наблюдений для этого президента.

### ԱՐԹՈՒՐ ԲՈՒԴՈՒՐՅԱՆ

Երևանի Պետական համալսարանի Իրավագիտության ֆակուլտետի մագիստրոս

# ՀԱՅԱՍՏԱՆԻ ՀԱՆՐԱՊԵՏՈՒԹՅԱՆ ՄԱՄՆԱԿՅՈՒԹՅՈՒՆԸ ՊԵՏՈՒԹՅՈՒՆՆԵՐԻ ԵՎ ԱՅԼ ՊԵՏՈՒԹՅՈՒՆՆԵՐԻ ՔԱՂԱՔԱՑԻՆԵՐԻ ՄԻՉԵՎ ՆԵՐԴՈՒՄԱՅԻՆ ՎԵՃԵՐԻ ԼՈՒԾՄԱՆ ՄԱՍԻՆ ԿՈՆՎԵՆՅԻԱՅԻՆ

Հայաստանի Հանրապետությունը 1992թ. վավերացրել է «Պետությունների և այլ պետությունների քաղաքացիների միջև ներդրումային վեճերի լուծման մասին» կոնվենցիան, 1994թ. ընդունվել է «Օտարերկրյա ներդրումների մասին» ՀՀ օրենքը և այժմ էլ քննարկման փուլում է գտնվում Օրենքի փոփոխության նախագիծը։ Այս ամենը թույլ է տալիս դրական գնահատել Հայաստանի Հանրա-