

# UPDATED REPLICATION: ECONOMIC VOTING, MEDIA AND PARTISANSHIP

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## 1. INTRODUCTION

The present paper is a replication and extension of an earlier paper on comparative economic voting by Soroka, Stecula and Wlezien (2015). Their analysis supports the proposition that media coverage and the public react to changes in or levels of economic activity, and the past, present, or future economy. According to their model, media coverage anticipates change in the future economy, and this both influences and is influenced by public evaluation. Specifically, they use Error Correction Models (ECMs) to first capture relative impact of short- versus long-term effects of economy on media content. For example, here short-run effect of media means to what extent current change over time period  $t - 1$  to  $t$  in economic indicators affects the current change in media content; long-term effect refers to the total effect that economic indices have on media coverage over time period  $t + 1$  to  $t + k$ . Then the authors also provide short term and long term effects of media coverage on public opinion, and the opposite relationship. In addition to highlighting the importance of media's effect, Soroka, Stecula and Wlezien (2015) focuses on both volume or tone of media coverage. First, consider work suggesting that, since gathering and processing information about the economy is costly, people do not continuously update their expectations but rather do so only occasionally and remain largely inattentive in between. Expectation updating occurs when there are high volumes of economic news, and economic news tends to be most frequent when the economy is bad. Second, the newspaper coverage is not impartial. They are privately owned and may tend to reflect the views of the owners. It follows that individuals' expectations may be a product of media tone.

However, methodologically, before using ECMs, Soroka, Stecula and Wlezien (2015) fails to consider the properties of these time series. Moreover, the authors fail to ensure that their equations are balanced. The order of integration needs to be consistent across all series in a model (Grant and Lebo, 2015). Thus, in this paper, I will start with non-stationary test and unit root test for the variables to check whether these time series exhibit an consistent I(d) process. Then I will test the co-integration among these variables to test whether an ECM is necessary for examining the long-run relationship. The main goal of this assignment is to see: 1) whether ECMs model is appropriate for these variables; 2) whether we can obtain same results about the relationship between media content and the economy, and

the relationship between media and public opinion, if ECMs models are necessary.

The current paper is composed of two parts. First, the paper starts with non-stationary test and unit root test and tries to replicate Soroka, Stecula and Wlezien' paper (SSW) to see whether we can obtain same results about the relationship between media content and the economy, and the relationship between media and public opinion. Second, the paper extends Soroka, Stecula and Wlezien' paper in examining the role of partisanship in the relationship between media and public evaluation. In the recent research in the field of communication, there is an ever pervasive belief in various forms of media bias. In the U.S., over the past two decades, the dominant belief regarding media bias is that that the mainstream news media favor liberal causes and political candidates (Nisbet, M. C., and Feldman, L., 2011). Yet researchers are unable to find definitive evidence for systematic partisan bias in coverage of elections (D'Alessio D. and Allen, 2000). In contrast, Niven (2001) finds that little evidence of partisan media bias in the U.S by comparing coverage when members of both parties have engaged in the same behavior. Thus, I consider partisan media bias is worthy to be examined in the extension. Furthermore, when we talk about the traditional class voting, we usually assume a close correspondence between the working class and Democratic party and between the upper class and Republican party. Moreover, in the field of partisan political economy, there is consistent difference in policies and priorities between Democratic and Republican administrations. Consequently, this significant partisan differences in macroeconomic, tax and transfer policies have produced significant partisan disparities in patterns of post-tax income growth among different social classes (Bartels, 2009). Hence, it is interesting to test whether social classes' opinion varies with presidential partisanship, and to analyze reasons behind this difference.

For these reasons, I extend Soroka, Stecula and Wlezien' paper in three ways. First, methodologically, before using ECMs, the paper fails to consider the properties of these time series. Moreover, the authors fail to ensure that their equations are balanced. The order of integration needs to be consistent across all series in a model (Grant and Lebo, 2015). Thus, in this part, I start with unit root test for the variables to check whether these time series exhibit an consistent  $I(1)$  process. Then I would test the cointegration among these variables to test whether an ECM is necessary for examining the long-run relationship. Second, if an ECM model is necessary, I add a categorical explanatory variable "political party identity of incumbent" across time. In the U.S. context, the political party of incumbent is either Democratic or Republican party. The use of two categories, enables us to analyze whether the economic performance are different among two incumbent parties. If the economic indices differ with political party identity of the incumbent, it enables us to further examine whether consumers' sentiment varies with real economic performance, or their sentiment is influenced by other factors. Moreover, this party identity enables to us to demonstrate whether the media responds differently in areas where the incumbent is a Republican or a Democrat. Third, I consider whether at the national level social class measured by personal income plays a role

in public sentiment since different social classes will be differently sensitive to economic indices, and also have varying preferences over political parties. If it is true that evaluation of different social class varies with the incumbent partisanship, we have to ask why it happens. For instance, is it income inequality or unemployment rate which are different for Democratic and Republican administrations that affects the opinion?

## 2. THEORY

Economic voting models begin with the simple proposition that, all other factors being equal, incumbent political parties will fare better at the polls when the macroeconomy has been performing well. In particular, incumbents who have presided over economic prosperity are rewarded at the polls, while those who are deemed responsible for decline are punished. For example, voters prefer politicians under whose leadership the nation enjoys higher rates of economic growth (Lewis-Beck and Rice 1984, Lewis-Beck and Tien 1996), lower rates of inflation (Norpoth 1996), lower consumer prices (Arcelus and Meltzer 1975, Lepper 1974), or an otherwise stronger economy according to leading economic indicators (Wlezien and Erikson 1996). Kinder and Kiewiet (1979) further argue that voters may have pre-conceptions as to which party is better suited to handle national economic problems.

A systematic examination of this literature reveals, however, that economic voting is highly contingent on two critical moderating factors: voters themselves and the political context in which they make judgments. For instance, Powell and Whitten (1993) argues that national economic variables account for significant or substantial amount of the variation in the change in incumbent vote share, but only in systems with clear political responsibility (contextual variables: government ideology and clarity of opposition). Anderson (2007) also considers institutional limits to economic voting, namely, the effects of economic conditions on elections are contingent on the clarity of responsibility and the clarity of alternatives. He also argues that the effects of economic conditions on elections are contingent on biases in information sources, citizens' motivations and biases, and their cognitive abilities. Moreover, Landa and Duell (2015) considers the effects of shared and unshared social identities in voter-representative relationships. Specifically, voters will tend to demand more effort from out-group representatives, with the exception of the cognitively sophisticated, who will overcompensate for in-group favoritism by applying higher standards. Duch, Palmer and Anderson (2000) argue that voters' perceptions of the national economy are conditioned by local conditions, personal finances, political attitudes, and demographics. The literature on economic voting notes that voter's subjective evaluations of the overall state of the economy are correlated with vote choice.

An important contributing factor here is the role of the media in shaping voters' subjective evaluation about the economy (Duch and Stevenson 2011; Duch, Palmer and Anderson 2000; MacKuen, Erikson and Stimson 1992; Hetherington 1996), since information about economic situation mainly come from media sources.

DellaVigna and Kaplan (2007) address this question by looking at the entry of Fox News in cable markets and its impact on voting. They conclude that Fox News convinced 3 to 8 percent of its viewers to vote Republican. Therefore, The Fox News effect could be a temporary learning effect for rational voters, or a permanent effect for voters subject to non-rational persuasion. Also Gerber, Karlan and Bergan (2009) measures the effect of receiving free subscriptions to either a liberal or conservative leaning newspaper on voters' political knowledge and opinions in the U.S.. They find results that neither subscription had an impact on voters' political knowledge, but that both subscriptions caused voters to increase their support for the Democratic presidential candidate. Additionally, Hetherington (1996) finds that media consumption and attention to the presidential campaign through the mass media negatively shaped voters' retrospective economic assessments. And these assessments were significantly related to vote choice. This suggests an explanation for why George Bush lost reelection despite an economy that had rebounded from recession well in advance of election day.

In the current paper, I extend Soroka, Stecula and Wlezien's original analysis by considering whether voters are influenced by media, and whether media's effect is interacted with incumbent political party identity and voters' social class.

### 3. DATA AND ANALYSIS

I use Soroka, Stecula and Wlezien's replication data as the basic data for the current paper provided by American Journal of Political Science (AJPS) Data-verse. The data set is composed of 381 observations with 16 variables, which has fewer data points than the original data used in Soroka, Stecula and Wlezien's paper. For extension party, I collect the United States' incumbent political party data from 1980 to 2011. To be consistent with the public opinion data, I collect the social classes' sentiment from "Surveys of Consumers University of Michigan" database, the same data source Soroka, Stecula and Wlezien's paper used for public opinion. Combining all variables collected above, there are five bodies of data: macroeconomic measures, incumbent political party, media data, measurement of public opinion and measurement of public opinions grouped by three different social classes. All the variables are monthly data from January of 1980 to September of 2011. Table 1 presents all the variables for the statistical analysis. The "lagging<sup>1</sup>, coincident<sup>2</sup> and leading<sup>3</sup> (or re-estimated leading, revised leading)" are the index

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<sup>1</sup>Lagging indicators are indicators that usually change after the economy as a whole does. Typically the lag is a few quarters of a year. For instance, the unemployment rate is a lagging indicator: employment tends to increase two or three quarters after an upturn in the general economy

<sup>2</sup>Coincident indicators change at approximately the same time as the whole economy, thereby providing information about the current state of the economy. There are many coincident economic indicators, such as gross domestic product, industrial production, personal income and retail sales.

<sup>3</sup>Leading indicators are indicators that usually, but not always, change before the economy as a whole changes. They are therefore useful as short-term predictors of the economy. For example, stock market returns are a leading indicator: the stock market usually begins to decline before

indicators series that respectively capture past, present and future economic circumstances distributed by the Conference Board. The “count, tone1 and tone3” variables indicate the volume and tone of media coverage that are from the *New York Times* and the *Washington Post*. The “count” variable is the news article count; the “tone1” variable is the mean monthly article tone derived using formula: (positive -negative)/wordcount  $\times$  100; and “tone3” variable is the mean monthly article tone derived using coefficient of imbalance<sup>4</sup>. And “recession” variable represents the count of this word in coverage. The “general negative” is the index composed of words: decline, recession, depression, and crisis. Finally, the last five variables are the index of consumer sentiment about economic performance. Specifically, consumers evaluate the economy by either retrospective or prospective approach. The “Lower.Third, Middle.Third, and Upper.Third” variables represent the index of consumer sentiment within income terciles. Figure 1 demonstrates that the evaluations by three social groups as well as public retrospective sentiment. Notice that the general trend of three social classes’ evaluations are almost same with public sentiment, though measured by different scales.

TABLE 1. Statistical Summary of the All Variables

Statistic	N	Mean	St. Dev.	Min	Max
Lagging	381	−0.007	1.551	−3.413	4.671
Coincident	381	−0.017	1.497	−4.711	3.893
Leading	381	−0.045	3.759	−14.284	7.051
Re-estimated Leading	381	−0.275	3.779	−14.135	7.283
Revised Leading	381	−0.305	4.112	−15.497	8.015
Unemployment Rate	381	6.367	1.667	3.800	10.800
Count (mean monthly count)	381	76.929	33.033	17	239
Tone1 (percentage)	381	0.220	0.338	−1.003	1.293
Tone3	381	0.002	0.002	−0.007	0.010
Recession (count)	381	95.176	93.739	0	522
General Negative	381	205.449	165.204	22	1,022
Retrospective Evaluation	381	−7.790	38.981	−94	59
Prospective Evaluation	381	9.320	12.801	−32	49
Lower.Third	381	77.514	11.540	45.200	104.400
Middle.Third	381	88.122	14.167	50.500	114.900
Upper.Third	381	94.781	14.908	54.300	126.100

Correlations between all measures are shown in Table 2. The count is most strongly and negatively related with the revised leading indicator (−0.68), rather than coincident and lagging indicators. The tone is only positively related with the revised leading indicator (0.189). Evidence shows that volume of media coverage

the economy as a whole declines and usually begins to improve before the general economy begins to recover from a slump.

<sup>4</sup>see Appendix A in Soroka, Stecula and Wlezien’s paper

FIGURE 1. Public Sentiment over Years

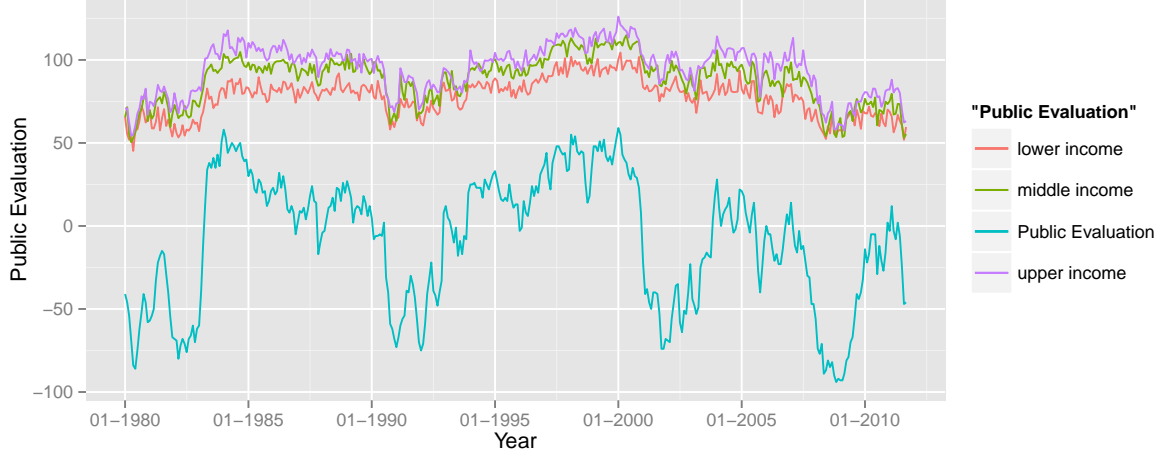


TABLE 2. Bivariate Correlations: Economic, Media, and Public Opinion Measures

	Lagging	Coincident	Revised Leading	Count	Tone1	Retrospective
Coincident	0.512					
Revised Leading	-0.075	0.664				
Count	-0.017	-0.419	-0.686			
Tone1	-0.356	-0.167	0.189	-0.220		
Retrospective	-0.256	0.191	0.621	-0.582	0.425	
Prospective	-0.507	-0.506	-0.266	0.166	0.376	0.265

*Note:* Bivariate correlations almost exactly match Table 1 in SSW with slight differences, because  $N$  in my replication data is 381 while  $N$  in SSW varies from 338 to 384.

increases and the tone worsens, when the economy goes down. Public sentiment also most strongly correlates with the leading economic indicators. It also shows that both public sentiment, retrospective and prospective, have strong correlation with media tone.

First of all, I begin with Dickey Fuller test to check the existence of unit root. The test regression is as following,

$$Y_t = \theta Y_{t-1} + \epsilon_t$$

Under the null hypothesis,  $\theta = 1$  against the alternative hypothesis  $\theta < 1$ . The results show that all economic indicators (lagging, coincident and leading indicator) have an  $I(1)$  process. The public retrospective series also follows  $I(1)$  process, while the prospective series is stationary. Among media coverage variables, only the “media count” variable has an  $I(1)$  process, while “media one” variable is stationary. In the sense, the media volume variable “media tone” and the “prospective

evaluation” variable are excluded for the consideration of ECM model.

Furthermore, I check three co-integration relationship: 1) co-integration between public retrospective sentiment and two economic indicators including lagging and coincident indicators; 2) co-integration between public evaluations (retrospective) and volume of media coverage; 3) co-integration between media volume and all three economic indicators. The results show: 1) There is no co-integration between public retrospective evaluations and both the lagging and coincident economic indicator. 2) there exists co-integration for the rest bivariate relationships. Based upon these results, it is clear that Soroka, Stecula and Wlezien (2015) have made error by using ECM among some variables. Specifically, first, the media volume and prospective sentiment variables should not be incorporated into an ECM with any other variables, because they do not exhibit the consistent  $I(1)$  process with other variables. Second, although both public retrospective sentiment and lagging and coincident indicator series are non-stationary and have same  $I(1)$  process, there is no co-integration between retrospective evaluation and the two economy series. That is to say, an ECM is not appropriate in these two cases.

With this in mind, we only consider the replication of the effects of the economy on media volume and the relationship between media and public opinions. I begin with a replication of the relationship between economic indicators and media coverage in SSW. The general ECM model can be shown as

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \beta_0 \Delta X_t + \beta_1 X_{t-1} + \epsilon_t$$

where current changes in  $Y$  are regressed on lagged levels of  $Y$ , current changes in  $X$ , and lagged levels of  $X$ .

Table 3 replicates responsiveness of media volume to lagging, coincident and leading indicators (Table 2 in SSW). I examine, same as Table 2 in SSW, the impact of lagging, coincident and leading indicators. The results are very close to SSW’s: change in “count” is significantly and negatively correlated with change in coincident and leading variables, with the coefficients of -14.497 and -5.996 respectively. In other words, current change in coincident and leading indicator predicts current change in total number of article: there are high volumes of economic news and articles when the economy goes down. But changes in media coverage are not at all related to changes in lagging variable. However, since ECM model does not apply to media tone, then we cannot conclude the result in SSW that change in “media tone” variable positively correlates with change in coincident and leading variables. Therefore, we can conclude that media volume are most strongly related to indicators of both the present and future.

Again, we can replicate ECMs of media volume and retrospective evaluation from the public. For instance, current changes in media can be modeled as a function of lagged media content, current changes and lagged levels of public opinion, and current changes and lagged levels of leading indicators. The coefficient for current changes in public opinion may not tell us the effects of opinion on media, because it

TABLE 3. Responsivenss of Media (volume) to Economy

	<i>Dependent variable:</i>		
	$\Delta$ in Count(t)		
	(1)	(2)	(3)
DV(t-1)	-0.199*** (0.032)	-0.242*** (0.035)	-0.348*** (0.039)
$\Delta$ in Lagging	-2.561 (3.288)		
Lagging(t-1)	1.329** (0.642)		
$\Delta$ in Coincident		-14.497*** (4.122)	
Coincident(t-1)		-1.215 (0.741)	
$\Delta$ in Leading			-5.996*** (1.548)
Leading(t-1)			-1.894*** (0.314)
Constant	15.466*** (2.651)	18.748*** (2.819)	26.336*** (3.082)
Observations	380	380	380
R <sup>2</sup>	0.109	0.127	0.200
Adjusted R <sup>2</sup>	0.102	0.120	0.194
Residual Std. Error (df = 376)	19.265	19.071	18.252
F Statistic (df = 3; 376)	15.346***	18.224***	31.396***

*Note:* When using ECMs to calculate  $\Delta Y$  and  $\Delta X$ , we lose one observation, thus  $N$  becomes 380. Count is the total number of articles; tone1 is the index measuring the difference between positive and negative word counts.

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

also captures the reciprocal effect of media on opinion. However, the lagged levels of opinion is more likely to showing the effects of opinion on media. Table 4 shows replication results for ECMs of media content. Here we have already seen that current changes of present economy predict current change in media coverage. Furthermore, current changes in both the “count” and “tone” variables significantly correlate with the lagged levels of retrospective evaluation with a coefficient of -0.105, 0.002 respectively. Clearly, same as the results in SSW, the lagged opinion may influence media content.

In addition, we also replicate ECMs of public opinion. Table 5 replicate the effects of media on economic sentiment, both retrospective and prospective (Table 7 in SSW). Results suggest that economic sentiment is strongly related to both the



TABLE 4. Responsiveness of Media Coverage to Economic Evaluation and the Economy (Replication of Table 6 in SSW)

	<i>Dependent variable:</i>	
	$\Delta$ in Count	$\Delta$ in Tone
	(1)	(2)
DV(t-1)	-0.385*** (0.041)	-0.686*** (0.048)
$\Delta$ in Leading	-4.105** (1.737)	0.097*** (0.026)
Leading(t-1)	-1.435*** (0.383)	0.002 (0.005)
$\Delta$ in Retros Evaluation	-0.275** (0.117)	0.007*** (0.002)
Retros(t-1)	-0.105*** (0.040)	0.002*** (0.001)
$\Delta$ in Prosp Evaluation	0.103 (0.165)	0.005* (0.002)
Prosp(t-1)	0.104 (0.108)	0.003* (0.002)
Constant	27.511*** (3.167)	0.134*** (0.023)
Observations	380	380
R <sup>2</sup>	0.223	0.386
F Statistic (df = 7; 372)	15.285***	33.466***

*Note:* When using ECMs to calculate  $\Delta Y$  and  $\Delta X$ , we lose one observation, thus  $N$  becomes 380.

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

actual economy and media coverage. Changes in leading economic indicators have a positive effect on current changes in both “retrospective evaluation” and “prospective evaluation” variables. Also, current changes and lagged media tone positively influence current changes in both “retrospective evaluation” and “prospective evaluation” variables.

In sum, all three replication tables verify the results presented in Soroka, Stecula and Wlezien’s paper. First, media content is more likely to reflect leading indicators than either coincident or lagging ones. Second, it is current changes in those prospective economic conditions matter most. So media content reflects the changes in the future economy. Third, media coverage matters for economic evaluations, almost entirely through tone. Fourth, media coverage is also influenced by the lagged levels of public opinion independent of economy, and importantly, it is

retrospective evaluations that matter most.

TABLE 5. Responsiveness of Economic Evaluation to Media  
(Replication of Table 7 in SSW)

	<i>Dependent variable:</i>			
	$\Delta$ in Retrospective Evaluation		$\Delta$ in Prospective Evaluation	
	(1)	(2)	(3)	(4)
DV(t-1)	-0.082*** (0.017)	-0.082*** (0.017)	-0.241*** (0.031)	-0.240*** (0.031)
$\Delta$ in Leading	3.836*** (0.843)	3.658*** (0.850)	1.214** (0.617)	1.233** (0.622)
Leading(t-1)	-0.089 (0.169)	-0.079 (0.169)	-0.316*** (0.118)	-0.316*** (0.118)
$\Delta$ in Count	-0.042* (0.025)	-0.050** (0.026)	-0.001 (0.018)	-0.0003 (0.018)
Count(t-1)	-0.037* (0.022)	-0.045** (0.022)	0.016 (0.015)	0.017 (0.015)
$\Delta$ in Tone1	8.977*** (1.670)	8.657*** (1.681)	4.882*** (1.200)	4.917*** (1.209)
Tone1(t-1)	9.670*** (1.890)	6.069** (3.065)	4.200*** (1.377)	4.658** (2.179)
Count $\times$ Tone (t-1)		0.073 (0.049)		-0.010 (0.036)
Constant	0.095 (1.735)	0.861 (1.807)	0.034 (1.249)	-0.073 (1.312)
Observations	380	380	380	380
R <sup>2</sup>	0.231	0.235	0.180	0.180
F Statistic	15.930*** (df = 7; 372)	14.262*** (df = 8; 371)	11.671*** (df = 7; 372)	10.196*** (df = 8; 371)

*Note:* When using ECMs to calculate  $\Delta Y$  and  $\Delta X$ , we lose one observation, thus  $N$  becomes 380.

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Turning our attention to extension part, I begin with preliminary analysis of the relationship between economic indicators and incumbent political party. I use a simple linear regression, where the three economic indicators as dependent variables are regressed on the partisanship of the president. In Table 6, we notice that the estimates of the average economic indicators (lagging, coincident and leading) increase for Democratic party are all negative: -0.241, -0.156 and -0.5. Republican party, on average, gets 0.507, 0.338, 0.440 percent greater more than Democratic party. Accordingly, the estimate of the average unemployment rate increase for Democratic party is positive, with a value of 6.936. But the “effect” of having

Republican party on unemployment rate is 1.289 percent less than Democratic. Therefore, during periods from 1980 to 2011 when there was a Republican president in office, economic indicators were more positive, and unemployment rate was less.

TABLE 6. Economy to Incumbent Political Party

	<i>Dependent variable:</i>			
	Coincident	Lagging	Leading	Unemployment Rate
	(1)	(2)	(3)	(4)
Republican Party	0.507*** (0.152)	0.338** (0.159)	0.440 (0.424)	-1.289*** (0.159)
Constant	-0.241** (0.101)	-0.156 (0.106)	-0.500* (0.282)	6.936*** (0.106)
Observations	381	381	381	381
R <sup>2</sup>	0.028	0.012	0.003	0.148
F Statistic (df = 1; 379)	11.066***	4.503**	1.077	65.714***

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Secondly, let us take a look at the responsiveness of media to the economy given the incumbent political party. Similarly, I use multiple linear regression model to test the relationship. I consider media “tone” and the count of word “recession” as dependent variables respectively to economic indicators, presidential party identity and their interaction term. I keep the lagging and coincident economic indicators rather than the leading index, since it highly correlates with the coincident indicator at  $r = 0.732$ . In addition, to avoid collinearity, I include only one economic indicator each time in each model. In Table 7, we can see that “tone” is negatively related with both the lagging and coincident index. It is mostly because that media tends to critics over the economy even the economy is not bad. The interesting part is the interaction term, which means the effect of economic indicators on media tone depends on the incumbent partisanship. To be more specific, in model (1), Democratic party has a baseline level of 0.299 percent when lagging effect equals 0, while Republican party only has 0.131 percent. Moreover, regarding the effect of economic performance on “tone”, Republican party has 0.074 percent less than democratic party. Recall that “tone” variable is measured based on the difference of count between positive and negative words. Therefore, media tone is more likely to be positive for Democratic party rather than Republican. Similar effect can be observed in model (2). In model (3) and (4), the count of “recession” is negatively related with the economic indicators, in particularly, significantly related with the coincident. It means that media content is more likely to report

the current economy, instead of the past. In addition, the baseline effect of Democratic and Republican party on “recession” variable are 85.216 and 78.901 percent in model (3) and (4) respectively. More interestingly, Republican party, on average, gets 18.796 and 31.893 percent more recession count than Democratic, when other are held constant. Moreover, in model (4) one unit increase in the coincident index, the recession count for Democratic party declines by 26.9 percent. In contrast, the Republican only gets 12.049 percent less. Therefore, we can conclude that media content not only reflect the current economic status, but also the significant presidential partisan bias.

TABLE 7. Responsiveness of Media to the Economy and Partisanship

	<i>Dependent variable:</i>			
	Tone1		Recession	
	(1)	(2)	(3)	(4)
Lagging	−0.040*** (0.013)		−1.079 (4.006)	
Coincident		−0.009 (0.015)		−26.900*** (4.226)
Republican	−0.168*** (0.031)	−0.180*** (0.034)	18.796** (9.480)	31.893*** (9.217)
Interaction: Rep×Lag/Coin	−0.074*** (0.020)	−0.039* (0.022)	20.781*** (6.146)	14.851** (6.130)
Constant	0.299*** (0.021)	0.303*** (0.022)	85.216*** (6.288)	78.901*** (6.117)
Observations	381	381	381	381
R <sup>2</sup>	0.216	0.104	0.059	0.125
F Statistic (df = 3; 377)	34.663***	14.562***	7.832***	17.952***

Note:

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

To further test the relationship between media content, partisanship and economy, I use the ECMs model to control for the lagged levels of variables. Table 8 show ECMs in which current changes in media tone are regressed no its own lagged levels, both current changes and lagged levels of economic indicator and presidential partisanship. In each case, we examine, separately, the impact of lagging, coincident and leading indicators. Results demonstrate that media coverage is also systematically related to both coincident and leading variables. Moreover, media tone is also strongly related to incumbent’s partisanship. For example, in each model, Democratic incumbent holds much higher baseline effect (0.171, 0.165 and 0.186) on media than Republican incumbent. In particular, the disparity between two political parties is strongest in the leading case. Recall that media is substantially future-oriented, hence it is reasonable that media bias is mainly responsive to future economy. Therefore, I argue that there is definitive evidence for

systematic partisan bias in media coverage.

TABLE 8. Responsiveness of Media (Tone) to Economy and Presidential Partisanship

	<i>Dependent variable:</i>		
	$\Delta$ in Tone1(t)		
	(1)	(2)	(3)
DV(t-1)	-0.595*** (0.048)	-0.587*** (0.047)	-0.640*** (0.048)
$\Delta$ in Lagging	-0.066 (0.045)		
Lagging(t-1)	-0.043*** (0.010)		
$\Delta$ in Coincident		0.226*** (0.059)	
Coincident(t-1)		-0.027*** (0.010)	
$\Delta$ in Leading			0.157*** (0.025)
Leading(t-1)			0.007** (0.004)
Republican	-0.097*** (0.030)	-0.087*** (0.030)	-0.103*** (0.030)
Constant	0.171*** (0.024)	0.165*** (0.024)	0.186*** (0.024)
Observations	380	380	380
R <sup>2</sup>	0.293	0.300	0.330
F Statistic (df = 4; 375)	38.898***	40.113***	46.273***

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Recall that public opinion in Soroka, Stecula and Wlezien' paper is measured by two variables "retrospective and prospective evaluation", which both treat public as a whole group. Instead, in the extension, I consider different social groups measured by personal income plays a role in public sentiment since different social classes will be differently sensitive to economic indicators, and also have varying preferences over political parties. Above, we have already tested the relationships between media and public evaluations in the replication part. The results suggest that both actual economy and media coverage predicts the public opinion, and opinion leads coverage as well. Almost surely, all social groups are influenced by media. Furthermore, we have confirmed the partisan media bias. Consequently, it is highly possible that all social group's sentiment also has a partisan bias. Therefore, we cannot generally test whether each social group itself per se holds positive

sentiment to a particular party, and negative to another. We can only take seriously the comparison of the social class opinions.

I regress the public opinion of different social class on coincident indicator and presidential partisanship. As presented in Table 9, the evaluation from each class is regressed to partisanship, coincident variable and their interaction. First, in all models, social group's evaluation is strongly positive with coincident indicator. Moreover, the effect of the current economy on upper class (4.936) is higher than the effects of other two groups (4.541 and 3.667). Thus, regardless of media effect, the upper group is more likely to give higher evaluation than the other two groups. And the lower-income group tends to be more critical over current economy<sup>5</sup>. Second, in all three models, the effect of Democratic party on the public opinion are significantly positive, and has baseline of 95.516, 89.976 and 79.092 in three models respectively. However, Republican has a baseline approximately 2.2 percent less than Democratic in all three cases. Notice that only in upper class case the estimate of "Republican" is not significant. In particular, in case of middle class, Republican has 2.595 percent less than Democratic. We may infer that in this case, upper class evaluation is indifference between the two parties, while middle class is more likely to support Democratic party compared to other two groups. In fact, this conjecture make sense. When we talk about the traditional class voting, we usually assume a close correspondence between the working class and Democratic party and between the upper class and Republican party.

TABLE 9. Public Opinion by Social Class to the Economy and Partisanship

	<i>Dependent variable:</i>		
	Upper Class	Middle Class	Lower Class
	(1)	(2)	(3)
Republican	-2.243 (1.462)	-2.595* (1.394)	-2.124* (1.130)
Coincident	4.936*** (0.671)	4.541*** (0.639)	3.667*** (0.518)
Interaction: Rep $\times$ Coin	-5.617*** (0.973)	-5.301*** (0.927)	-4.923*** (0.752)
Constant	96.516*** (0.971)	89.967*** (0.925)	79.092*** (0.750)
Observations	381	381	381
R <sup>2</sup>	0.129	0.124	0.132
F Statistic (df = 3; 377)	18.621***	17.773***	19.139***

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

<sup>5</sup>This results can be also verified by two sample t-test between any pair of three groups

Is there evidence to understand why there is different political preference among social groups? To begin with, Table 10 shows tests of the ECMs of three social groups. For instance, current changes in each social class opinion can be modeled as a function of lagged opinion, current changes and lagged levels of unemployment rate, and the incumbent partisanship. Here, current changes of unemployment is not relevant to upper class evaluation at all. The middle class evaluation can be predicted only by the lagged levels of unemployment. In particular, the low-income group is most sensitive to both current changes and lagged levels of unemployment. Clearly, lower income class is more vulnerable to unemployment than are higher-income group, because even after unemployment compensation, lower-income works have the most to lose from unemployment. Moreover, in this case, upper class is indifferent between two political parties. But, in both middle class and lower-income case, Democratic party has 1.190 and 1.562 percent more of baseline effects than Republican party. That is, we infer that middle- and lower-income groups tend to favor Democratic party rather than Republican, partly because of unemployment consideration.

TABLE 10. Public Opinion by Social Class to Unemployment Rate and Partisanship

	<i>Dependent variable: opinion</i>		
	$\Delta$ in Upper(t)	$\Delta$ in Middle(t)	$\Delta$ in Lower(t)
	(1)	(2)	(3)
DV(t-1)	-0.091*** (0.026)	-0.116*** (0.029)	-0.200*** (0.034)
$\Delta$ in Unemployment	-2.470 (1.735)	-1.688 (1.773)	-3.152* (1.636)
Unemployment(t-1)	-0.290 (0.232)	-0.503** (0.250)	-0.877*** (0.247)
Republican	-0.845 (0.622)	-1.190* (0.654)	-1.562** (0.632)
Constant	10.821*** (3.724)	13.907*** (3.987)	21.756*** (4.116)
Observations	380	380	380
R <sup>2</sup>	0.039	0.047	0.085
F Statistic (df = 4; 375)	3.792***	4.618***	8.732***

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

To further illustrate the explanation of choices on political parties, I consider income inequality as another explanation. Specifically, I anticipate the working poor experiencing significantly more income growth under Democratic presidents than under Republican presidents. Therefore, my focus is on partisan patterns of

income growth rate for different social groups. I employ the U.S. Census Bureau's historical income data by families to examine year-to-year changes in real pre-tax income for families at different levels of income distribution groups from 1947 to 2014<sup>6</sup>. The annual data set is composed of 6 variables with 68 observations from 1947 to 2014,: upper limit of real pre-tax income for families at the 20th, 40th, 60th, 80th percentile of the income distribution, the lower limit of real pre-tax income for families at the 95th percentile, and presidential party identity<sup>7</sup>. Based on the data, I calculated the annual real pre-tax income growth rate for families at the 20th, 40th, 60th, 80th and 95th percentile of the income distribution<sup>8</sup>. Table 11 shows results of the average annual pre-tax income growth (unit: percentage) for families at various levels of income distribution during Democratic and Republican administrations. Notice that the average rate of real income growth under either Democratic or Republican party, is higher for affluent families than for those lower in the income distribution. More importantly, the pattern in partisan difference column demonstrates that income growth rate under Democratic party maintains more balanced among different income groups than under Republican party. Especially, Republican administrations are associated with more unequal income growth among the 20th percentile, 80th and 95th percentile groups than Democratic. It may be tempting to conclude that Democrats and Republicans have different priorities over macroeconomic policies, which have had significant consequences for the shape of the income distribution. Consequently, it is also reasonable to infer that public evaluation has been affected by distinct party platforms and political ideology. In other words, we can argue that income inequality may explain why lower- and middle income groups are more likely to support Democratic party instead of Republicans.

TABLE 11. Real Income Growth Rate by Income Level and Presidential Partisanship, 1947 - 2014

Income Families	Democratic Presidents	Republican Presidents	Partisan Difference
20th percentile	1.850	0.437	1.413
40th percentile	1.555	0.968	0.587
60th percentile	1.815	1.118	0.697
80th percentile	1.826	1.392	0.434
95th percentile	1.904	1.575	0.329

*Note:* Average annual real pre-tax income growth (percentage) for families at various points in the income distribution.

<sup>6</sup>: Similar tests have been done in Bartels (2009)

<sup>7</sup>: The unit of all real pre-tax income is U.S. dollar in 2014

<sup>8</sup>: By doing so, we lose 1 observation, and have 67 observation in the data set



#### 4. CONCLUSION

Preceding sections have explored the nature of relationship between economy, news coverage, partisanship and public sentiment. The analyses point to some interesting important results. First, the replication shows that media content is more likely to reflect leading indicators than either coincident or lagging ones. Namely, media content reflects the changes in the future economy. Second, media coverage matters for economic evaluations, almost entirely through tone. And media coverage is also influenced by the lagged levels of public opinion independent of economy, and importantly, it is retrospective evaluations that matter most. Third, the extension parts demonstrate that media coverage has a strong partisan bias, particular is biased toward Democratic party. Fourth, public sentiment by social groups involves partisan preference as well as media effect. That is, the middle- and lower-income groups tends to support Democratic party, partly because unemployment policy is one of priority of Democratic policies, partly because income inequality remains lower under Democratic administrations than Republicans.

The fact that economic indicators are better under Republican administrations need not mean that household income growth rate under Republican governance should be higher than Democrats. Despite this, future work might explore carefully the puzzle why Democratic administrations have lower economy indicators but high household income growth rate than Republican.

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