

Shifting Ideologies? Re-examining Media Bias.

Research Note*

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Abstract

This research note engages the current research on measuring media bias. I present a reanalysis of the results found in Groseclose and Milyo (2005) and show that the original parameter estimates of the ideological positions of media outlets are not stable over time. Using the same data but analyzed over different periods of time, I find a different conclusion than the previous article. I examine four-year rolling time periods and find that the data produce different parameter estimates in the early- to mid-1990s as compared to after 2000, with all analyzed outlets appearing more moderate or conservative in later time periods. My results indicate that the estimated positions are sensitive observations in the data and the time period of observation of the outlet.

The question of media bias can elicit strong and diverse opinions. While there seems to be no consensus if there is a liberal or conservative bias, the American Society of Newspaper Editors reports that 78% of the public believe there is a bias in news reporting (ASNE 1999). While crucial to understanding the “Fourth Estate,” there have been relatively few replicable large-n empirical studies of the ideology of media outlets. Much of the scholarly work uses content analysis to study this topic. There is certainly a large value added to these studies, but their replication costs make them less desirable. Nonetheless, understanding the political positions of media is key. If media outlets are a primary mechanism for voters to learn about policy options, then there is a serious concern that the information might be tainted by the ideological views of an outlet.

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Groseclose and Milyo (2005) (GM) provides an important and useful quantitative measure of an outlet's revealed ideology. This measure allows for a meaningful comparison between standard measures of the ideology of members of Congress, for instance the Americans for Democratic Action scores, and an outlet's revealed ideology. The GM analysis concludes that there is a strong liberal bias in news coverage, with the remarkable finding that 18 of the 20 major news outlets studied are to the left of the estimated median voter. Just as the topic of media bias can invoke strong opinions from the popular press, it also generates a debate in the academic literature, with the GM approach being substantially criticized. Nevertheless, there have been few other large-n empirical studies that attempt to give an objective measure of media bias. GM was the first article to provide a comparable link to the ideological positions of other political actors.

In this note, using the same data as GM analyzed in different periods of time, I find very different results than those in the original analysis. The estimated ideology of an outlet is sensitive to the inclusion of certain policy groups and time period of observation. I examine four-year rolling time periods and show that the data produce different parameter estimates in the early- to mid-1990s as compared to post-2000, with all outlets appearing more moderate or conservative in later time periods.

Much of the empirical work in the Communications literature relies on content analysis. While this research is certainly valuable, its cost and difficulty in replication renders it arguably less desirable. D'Alessio and Allen (2000) performs a meta analysis of 59 studies that use content analysis, finding little robust evidence of aggregate bias during Presidential Elections. Drawing similar conclusions, Jamieson (2000) reports that content analysis does not suggest a systematic liberal bias, but rather the press bias disadvantages the candidate behind in the polls. On the other hand, Kahn and Kenney (2002) examines newspaper coverage of more than 60 Senatorial campaigns across three election years and finds that information on news pages is slanted in favor of the candidate endorsed on the newspaper's editorial page.

Combining content analysis with advanced statistical analysis, Ho and Quinn (2007) leverages explicit position-taking in editorial pages. The authors collect and classify over 1500 editorials adopted by 25 major U.S. newspapers on 495 Supreme Court cases from 1994-2004, and then apply an item response theoretic approach to locate newspapers on a interpretable ideological scale. The article finds that 18 of the 25 papers studied are slightly to the left of the median Justice during

1994-2004. The article, however, does not find the same magnitude of bias in the media as reported in GM. In a similar automated content analysis approach, Gentzkow and Shapiro (2006) uses the partisan correlation of two- and three-word phrases to estimate ideological positions of media outlets. This research examines a larger set of often local news outlets, concluding that consumer preferences explain more of the variation across outlets than newspaper ownership.

The GM approach is different in that it leverages common citations of policy groups and think tanks. Specifically the procedure counts the number of times a news outlet cites a think tank, for example the Sierra Club, and then compares that with members of Congress who also cite the Sierra Club in their speeches on the floor of the House and Senate. To use the article’s simplified example, assume that there are only two think tanks and that the *Washington Post* cites the first twice as much as the second. The measure proposed by GM finds the ADA score of the member of Congress who exhibits the same 2:1 citation ratio during his speeches and assigns the *Washington Post* that ADA score. The data that I describe below and use in my reanalysis of the previous results was kindly obtained from Groseclose and Milyo. It represents the same dataset used in the original 2005 analysis.

The Data and Model

The unit of analysis in GM is a citation of a policy group or think tank by either a media outlet or a member of Congress.¹ The Congressional citations were coded using all citations listed in the *Congressional Record* that occurred between January 1, 1993, and December 31, 2002 (the 103rd through 107th Congress). An outlet’s citation was coded via Lexis-Nexis, over varying periods of observation.

Citations were counted if the legislator or journalist referenced one of 200 think tanks in his or her speech or article.² If a legislator or journalist only noted an action the think tank had taken (e.g., initiated a boycott), only cited a think tank to criticize it, or gave an ideological label to the think tank, the citation was *not* included in the analysis. Similarly, citations by the media

¹As the data are constructed, the unit of analysis could actually be a sentence in the citation. Thus allowing for “in depth” citations versus passing references. As GM points out, performing an analysis on the number of sentences in the citation introduces serial correlation in the data. It also produces odd rankings of most cited think tanks. Therefore, I, like GM, use the citation as the observation.

²The list of these 200 think tanks comes from www.wheretodoresearch.com.

outlets do not include editorials, letters to the editor, book reviews, or general opinion pieces. The intention is to use citations where the think tank is portrayed as a disinterested expert.

GM presents an analysis that, for computational reasons, collapses the top 200 think tanks into fifty for the estimation procedure. The top forty-four think tanks were actual research institutions. The remaining six, however, were constructed by ranking the remaining think tanks according to the average ADA score by legislators who cited them. Following this ranking, five cut points were defined in the original analysis such that smaller think tanks falling in a region would be scored as belonging to the appropriate “mega think tank.”

For reasons I describe in the next section, the analysis presented in this note does not pool the data over the entire time period. Congressional data are critical to estimate the model for the GM method but are thin in any one or two years. Without any Congressional data the media parameter estimates are not identified, and with only a small amount of data, the parameter estimates are noisy and unstable. Hence I choose to pool both Congressional and media data into four-year rolling windows to balance between data necessary to produce stable estimates and to observe variability over the entire time period.

In my analysis, I estimate the ideological position of each outlet independently of the other outlets. In the periods I analyze, a given outlet often cites less than fifty policy groups. Hence, I use thirty actual think tanks and ten mega think tanks. Neither the original results nor the results presented here are sensitive to the small changes in the specification of the number of these mega think tanks.³

Legislator ideology is measured using *adjusted* scores from Americans for Democratic Action (ADA). These adjusted ADA scores account for inflation in the scale and to make the scores comparable over time. Previous scholars have shown that this measure correlates highly with other measures (Burden, Caldeira, and Groseclose 2000; Groseclose, Levitt, and Snyder 1999) of ideology.⁴

³When pooling over the entire time period, rather than using four-year windows, and using thirty think tanks with ten mega think tanks the resulting estimates of the media outlets ideological locations are essentially the same as those estimates presented in GM. These alternative specifications are available upon request.

⁴I find substantively similar estimates to the Groseclose and Milyo (2005) analysis using Poole and Rosenthal’s CommonSpace measure as well as the American Conservative Union’s (ACU) measure of ideology. Estimated ideological positions of the media outlets using both scores are available upon request. While the estimates are on different scales, each measure provides the same revealed ideology of the outlets when performing the pooled GM analysis. As expected the ACU and ADA scores are mirror images of one another.

Structural Model

In this section I review the structural model estimated in Groseclose and Milyo (2005). This model might look very similar to a multinomial logit but it is not. The crucial difference is that there is an additional object that must be estimated in this model, the outlet’s ideological position.

For a congressional member i , let x_i be the observed ideological score. Define i ’s utility from citing think tank j as $u_{ij} = a_j + b_j x_i + \epsilon_{ij}$ where a_j is the “valence” of think tank j and b_j is the ideology of j . The intercept term, a_j , accounts for certain think tanks being cited more than others for nonideological reasons, which include things such as reputation or quality of research.

If the error term, ϵ_{ij} , is distributed Weibull, then the probability that i selects j is

$$P_i(j) = \frac{\exp(a_j + b_j x_i)}{\sum_{k=1}^J \exp(a_k + b_k x_i)}.$$

Similarly, define c_m as the *estimated* score of the outlet m . As above, let the utility outlet m receives by citing j be $u_{mj} = a_j + b_j c_m + \epsilon_{mj}$. Again, if ϵ_{mj} is distributed Weibull, then the probability that m cites j is

$$P_m(j) = \frac{\exp(a_j + b_j c_m)}{\sum_{k=1}^J \exp(a_k + b_k c_m)}.$$

Note that this model estimates the set of c_m parameters, whereas they are fixed in a multinomial logit. Using nonlinear maximization on the corresponding likelihood function, one may estimate each a_j , b_j , and c_m . For the model to be identified, one must arbitrarily choose a think tank, j , and fix a value of a_j and b_j to zero. To be consistent with Groseclose and Milyo (2005), I set the a_j and b_j to zero for the Heritage Foundation.⁵ Later in the paper I examine the robustness of the results to this identifying assumption.

Results

In this section, I present a reanalysis of the Groseclose and Milyo (2005) data and model. The original analysis pooled both media and Congressional data over the entire period, 1990 to 2004. Given that a sufficient amount of data are needed to estimate the positions of media outlets, it

⁵The choice of fixing the Heritage Foundation’s valence and ideology does have an important substantive interpretation. This identification solution implies that there is no absolute measure of a think tank’s ideology, but only a relative position.

is reasonable that the original analysis pooled the data over the entire period of time. However, this assumes that the data-generating process is stable over this period. While there might be stability over some issue domains, policy agendas do change. If the media is an echos of current debates in Congress, using Congressional data and media data from different time periods could be problematic.⁶

The periods of observation of media outlets and Congressional citations overlap, but the periods might be substantially different, as indicated by Figure 1. This figure presents a breakdown of the number of total citations per year and by outlet over that outlet’s period of observation. Some outlets were only sampled over four to five months whereas others were sampled over several years.⁷ This figure highlights the fact that even if the periods of observation overlap, the distribution of the observations could also be substantially different. For instance, *CBS Evening News* and *ABC World Tonight* have similar observation windows, but the majority of the *CBS* data was collected between 1990 and 1994, whereas *ABC* had more observations between 1999 and 2003.

[Figure 1 about here.]

Figure 1 also gives an indication how thin the data are per year. Unfortunately, this understates a problem with the data. It only indicates the total number of citations in the data per year, by outlet. Figure 2 presents the citation patterns of the over 150 think tanks and policy groups in the data from 1990 through 2004, aggregated by Congress or all media outlets. Think tanks are sorted according to the total number of citations by members of Congress. The most frequently cited policy group by members of Congress is the National Taxpayers Union. The most commonly cited think tank in the data aggregating across all media outlets is the Brookings Institute.⁸ While there is some variation in the number of policy groups being cited by Congress and the media, it is overshadowed by the variation over time.

⁶The following hypothetical scenario points out a potential problem. Suppose we have data from Congress at an earlier time period, t_1 , where the majority of the debates were about policy p_1 but a few liberal members were often talking about policy p_2 , and each policy had distinct policy experts or think tanks that were being cited. Also suppose that we only have media data from a later time period, t_n , but over those n periods policy p_2 became a larger issue in Congress and is being discussed more. In this scenario, if we only have data from Congress at t_1 and data from media outlets at t_n , the media outlets will look more liberal than Congress even if the outlets are just reporting floor debates because the only liberal members of Congress were discussing policy p_2 in the early time period.

⁷GM states that the sampling time frame in order to obtain at least 300 observations per outlet.

⁸The National Taxpayers Union is the 40th most-cited policy group by all media outlets and the Brookings Institute ranks 8th when ordered by Congressional citations.

[Figure 2 about here.]

These citation patterns reemphasize the concern and potential problems with pooling data over the entire period of observation. Rather than pooling all data from 1990 until 2004 as in the GM analysis, I disaggregate the data into four-year rolling time periods. Four-year periods were chosen as they provide a good tradeoff between variance within the period of observation and need for a sufficient amount of data to reasonably estimate an outlet’s position. Congressional data are critical for the GM method. Without observations from Congress, the model is not identified. These data are crucial for the approach to produce stable results.

Since the data do not contain Congressional citations in every year, I only examine four-year periods where there are Congressional observations. In particular I only examine periods starting with 1993 and continuing up to and including the 2000 through 2003 period.⁹ The only observations used to estimate the location of an individual outlet occur in that four-year window. For example, *NPR*’s ideological position would be estimated in the 1993-1996 period using only *NPR* and Congressional citation data only from January 1993 through December 1996.¹⁰ It is not possible to do the same type of analysis for outlets with samples that span only a few months. In the four-year periods I analyze, a given outlet often cites less than fifty policy groups. As previously discussed, each outlet was estimated separately using a total of forty think tanks, with ten of those being the previously discussed amalgamated mega think tanks.¹¹

Figure 3 presents the results of estimating the GM measure of an outlet’s ideology over four-year rolling time periods. Each panel of the figure highlights a significant shift across all outlets studied. Recall that the estimated measure is an ADA score, with higher meaning more liberal. As the figure indicates, this reanalysis indicates that outlets reveal a liberal position in the earlier time periods but appear substantially more moderate or conservative in later time periods.

[Figure 3 about here.]

Table 1 presents the full analysis for the twelve outlets which had enough observations at

⁹There are only seven Congressional citations in 2003, but there are over 2100 in the entire 2000-2003 period.

¹⁰Estimating the location of an individual outlet, rather than jointly estimating all 20, produces the same estimated location as found in GM when using the full 1990-2004 pooled data. All parameter estimates of the various outlets presented here were estimated independently of other outlets.

¹¹Pooling over the entire time period, as in the original GM analysis, and using thirty think tanks with ten mega think tanks produces similar results to those of the original GM analysis.

different points in time to perform the rolling four-year analysis. Every outlet demonstrates a decrease in the parameter estimate in later time periods. *NPR*, the outlet which has the largest number of observations and which overlaps completely with the Congressional observation period, indicates the largest observed change in estimated ADA score. In the early- to mid-1990s, my results show that *NPR* demonstrated a significantly liberal position, with an estimate of over 70 on the ADA scale. Estimating *NPR*'s position post-2000, however, indicates a right of center position. While the results indicate a significant change in ideology across all outlets, the results also indicate that the ordinal ranking of the outlets appears consistent. For example, *Fox's Special Report with Brit Hume* is always more conservative than *NPR* over every 4-year period.

The difference between the original published results and the apparent shift in ideology across all outlets is puzzling, but it is not clear the change can be attributed to a change in the actual ideology expressed by the outlets. The rank-order of the outlets is consistent over the different periods and the shift is approximately uniform over all outlets. Given this, a likely candidate would be a shift in the intercept, or more specifically the a_j valence term, of the identifying think tank, the Heritage Foundation.

Many ideal point models are sensitive to assumptions necessary to identify the model. In other words, every estimated score is *relative* to some fixed endpoint. If that end point moves, one might observe movement in the estimated scores. To examine the sensitivity of the reanalysis to the identifying assumption of the Heritage Foundation, alternative policy groups were used to anchor the scale.

Figure 4 presents the estimated ADA score of *CBS Evening News* using alternative think tanks to identify the model. The top panel of the figure indicates the estimated ideological score using *CBS* and Congressional citation data only from 1993 through 1996, the earliest four-year period in the reanalysis. The bottom panel presents the same analysis for the 2000 through 2003 period. Varying the identifying policy group has a minor influence on the estimated ADA score. For *CBS Evening News*, the estimated score does not vary more than 2.5 points. The significant change in the estimated ADA score between the first and last four-year period remains for several different identifying policy groups. Therefore changes in the ideology of *CBS Evening News* from the early- to mid-1990s to post-2000 does not seem to be an artifact of the choice of the original identifying policy group.

[Figure 4 about here.]

The GM finding of a strong liberal bias seems suspect in light of my reanalysis. The findings presented here indicate liberal media outlets during the early 1990s, but conservative media outlets by the beginning of the next decade. The exact time of the start of the shift is hard to specify given that the data are pooled over four-year time periods. Ideally the model would be estimated yearly, but this is not possible given the structure of the model and amount of citation data from Congress and an outlet in any given year. So while pooling over a four-year period is preferable to aggregating over the entire period, it might make the shift appear more gradual due to averaging. The conservative shift, however, appears to be occurring during the mid to late 1990s.

In order to better understand the instability of the results and peculiarity of the data, I performed a variety of robustness checks. To see if the results were sensitive to the inclusion of any given source, I performed a set of complete pooled analyses, i.e., the same as GM, each time excluding a different think tank or policy group. The exclusion of any given source had a minimal effect, with one notable exception.¹² Performing a pooled analysis without using citations of the National Taxpayers Union (NTU), the most frequently cited policy group by members of Congress, resulted in an average drop in nearly nine points on the ADA scale. In other words, excluding citations of the NTU from both members of Congress and media outlets results in all media outlets appearing substantially more conservative. These results may be found in Table 2. If the analysis is performed only excluding NTU observations from 1995, on average the outlets' estimated locations are over three points lower on the ADA scale. NTU is the most frequently cited policy group by members of Congress, with 566 observations. While this might seem like a substantial loss of data, this policy group represents less than 6% of the Congressional citation data and is the 43rd most cited policy group by all media outlets. The estimated ideological positions of the various media outlets found in Groseclose and Milyo (2005) are sensitive to the inclusion of observations from the NTU.

Figure 2, discussed previously, highlights the substantially different distribution of observations between media outlets and Congress. Congressional citations of NTU are most frequent in the

¹²Different analyses were performed excluding Rand, Citizens Against Government Waste, and the Brookings Institute. These were chosen because of the frequency in the data. Brookings is the most commonly cited think tank by any media outlet. Excluding Brookings from the analysis had no effect on the estimated ADA of the outlets, with an average decrease in 0.2 points. These results are available upon request.

early to mid 1990s and peaking in 1995. The rolling four-year analysis I have conducted is therefore picking up fewer NTU observations in later periods. The shifting ideology of the various media outlets presented above could be partially driven by fewer NTU observations. However, the change in estimated ADA scores of the various outlets using the four-year rolling analysis is greater than the effect of excluding NTU. This indicates that the sensitivity of the results to the inclusion of NTU speaks to serious concerns with the method, but does not fully explain the difference between citation patterns in early and late four-year periods.

Given this observation, there could be several additional reasons for the apparent shift in ideology of the news outlets. The first explanation is market driven. In the mid- to late-1990s, Fox entered the news market. This in and of itself is not sufficient to drive other profit maximizing news outlets to the right. However, if the entry of Fox changed the distribution of underlying television news audience, then this could be the case. More precisely, if conservative talk radio listeners were not watching these outlets before Fox and the entry of Fox provided them an outlet to watch, then the underlying audience distribution would shift.

A second explanation involves the change in power in the 104th Congress. The apparent shift in the estimated ideology appears substantially after the Republicans took control in 1995. Since the method depends on citations of think tanks and these policy experts might require some time to generate reports to cite, a lag seem plausible. On the other hand, the earliest pooled time period includes the years 1993 through 1996, and over half of the observations in the earliest time period are from the 104th Congress. A strong shift is not observed, however, until the 1996-1999 or 1997-2000 time periods, but the earlier time periods should still be picking up a change in the Republican agenda.

The current data, unfortunately, cannot disentangle these possible explanations. Simply put, more data over consistent periods of observation are needed. The data are sensitive to the inclusion of observations of the National Taxpayers Union. Without doubt, Congressional data are crucial for the GM measure, but NTU only accounts for 6% of the Congressional data. This policy group is more frequently cited in the Congressional data than the media data, which indicates a sensitivity of the measure to which Congressional data are used to estimate the model. Moreover, the analysis presented here also indicates that it may be inappropriate in this measure of media bias to pool data over different periods of time.

Conclusion

In this note using the same data but disaggregated, I find a very different conclusion than the Groseclose and Milyo (2005) analysis, which pools both media and Congressional data from 1990 to 2004. Given that a sufficient amount of data are needed to estimate the positions of media outlets, it is reasonable that the original analysis uses the data over the entire period. Nonetheless, this assumes that the data-generating process is stable over fourteen years of observation. I examine four-year rolling time periods and find that the data produce different parameter estimates in the early- to mid-1990s as compared to after 2000, with all analyzed outlets appearing more moderate or conservative in later time periods.

The findings presented in this note indicate a sensitivity of the parameter estimates found in the original article to the inclusion of certain policy groups and the time period of observation. In particular, excluding one source, the National Taxpayers Union, from the analysis results in an average nine-point drop in the parameter estimates of media outlets. Excluding observations from the National Taxpayers Union in 1995 alone produces a three-point drop in the estimates. These changes point to the sensitivity of the GM media bias measure to relatively small changes in which data are used in the analysis. This instability speaks to serious concerns with the method. It does not fully explain why the method produces results that indicate liberal media outlets during the early 1990s and conservative media outlets several years later.

There is a vast amount of academic attention devoted to understanding the public response to news media. This literature contains a considerable amount of evidence pointing to a complicated, yet potentially very broad, influence of the news media. Understanding the ideological positions of mass media and being able to make substantive comparisons between different outlets is crucial to understanding the “Fourth Estate.” Groseclose and Milyo (2005) has provided an important large-n empirical study which attempts to give an objective measure of media bias. This previous research has provided a valuable contribution as the first article to provide a comparable link to the ideological positions of other political actors. The results presented in this note, however, indicate a need for a fair amount of skepticism in the parameter estimates presented in Groseclose and Milyo (2005).

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Period	ABC	ABC	ABC	CBS	Fox	NBC	NBC	Today	NewsHour	Newsweek	NPR	NY Times	US News
1993-1996	56.78 (3.52)		69.40 (3.16)							54.37 (4.65)	69.66 (1.74)		
1994-1997	62.15 (3.03)		66.38 (3.34)			71.31 (4.99)				63.25 (3.50)	73.19 (1.62)		62.19 (3.94)
1995-1998	59.51 (2.83)		65.52 (3.42)			70.38 (3.22)				65.65 (2.79)	74.93 (1.59)		65.96 (3.01)
1996-1999	51.70 (2.88)		65.00 (3.74)		40.25 (3.69)	63.78 (2.68)		66.54 (3.69)		66.17 (2.75)	67.92 (1.77)		65.98 (2.51)
1997-2000	53.43 (2.59)	56.27 (3.65)	62.95 (3.51)		30.85 (2.61)	54.88 (2.24)		57.09 (3.08)	53.27 (3.94)	59.48 (2.66)	59.67 (1.90)		55.52 (2.36)
1998-2001	48.59 (2.39)	54.38 (3.58)	61.28 (3.21)	53.56 (4.76)	29.71 (2.16)	46.57 (2.17)		48.40 (2.77)	43.42 (2.84)	57.33 (2.45)	52.53 (1.84)	58.90 (2.03)	50.80 (2.22)
1999-2002	47.31 (2.33)	49.02 (3.97)	54.83 (3.14)	50.08 (4.25)	25.83 (1.90)	41.86 (2.12)		47.80 (2.93)	35.93 (2.31)	47.06 (2.33)	45.75 (1.80)	56.87 (1.60)	42.88 (2.21)
2000-2003	40.69 (2.29)	43.96 (4.57)	51.71 (3.18)	46.88 (4.01)	21.58 (1.73)	38.04 (2.27)		45.56 (3.20)	31.32 (2.00)	43.55 (2.33)	40.95 (1.73)	51.78 (1.56)	37.87 (2.32)

Table 1: Estimated ADA scores of media outlets with standard errors in parentheses below the estimate. Each outlet's position is estimated independently of other outlets. Only citation data from Congress or a specific outlet used during the four-year period. All outlets show significant decreases in their estimated ADA score in later time periods.

Media Outlet	Published	Pooled	Pooled
	GM Results	Without NTU	Without 1995 NTU
ABC Good Morning America	56.1	47.7	52.6
ABC World News Tonight	61.0	52.7	57.9
CBS Early Show	66.6	57.0	63.2
CBS Evening News	73.7	64.1	70.0
CNN NewsNight with Aaron Brown	56.0	45.9	52.1
Drudge Report	60.4	50.6	56.5
LA Times	39.7	61.3	66.8
NBC Nightly News	70.0	54.5	58.4
NBC Today Show	61.6	54.3	60.3
New York Times	64.0	65.1	70.6
Newshour	73.7	45.4	51.8
Newsweek	55.8	56.7	62.8
NPR Morning Edition	66.3	57.2	63.0
Special Report with Brit Hume	66.3	32.6	36.6
Time Magazine	65.4	57.1	62.3
U.S. News and World Report	65.8	55.9	62.0
USA Today	63.4	53.2	59.3
Wall Street Journal	85.1	76.4	81.9
Washington Post	66.6	57.2	62.9
Washington Times	35.4	28.4	32.4
Average	62.6	53.7	59.2

Table 2: ADA estimates of media outlets using data from 1990 through 2004. The first column presents the Groseclose and Milyo (2005) published results from a pooled analysis including forty-four actual think tanks and six mega think tanks. The second column presents the exact same analysis but excluding all observations from the National Taxpayers Union (NTU). The third column presents the same analysis using all observations except those from the NTU in 1995. The National Taxpayers Union is the most frequently cited policy group by members of Congress in the data and accounts for nearly six percent of the total Congressional citation data. Excluding NTU observations yields estimates of media outlets that are on average nearly nine points more conservative on the ADA scale than the original Groseclose and Milyo (2005) results. Using all observations except citations of NTU in 1995 yields estimates on average over three points lower on the ADA scale.

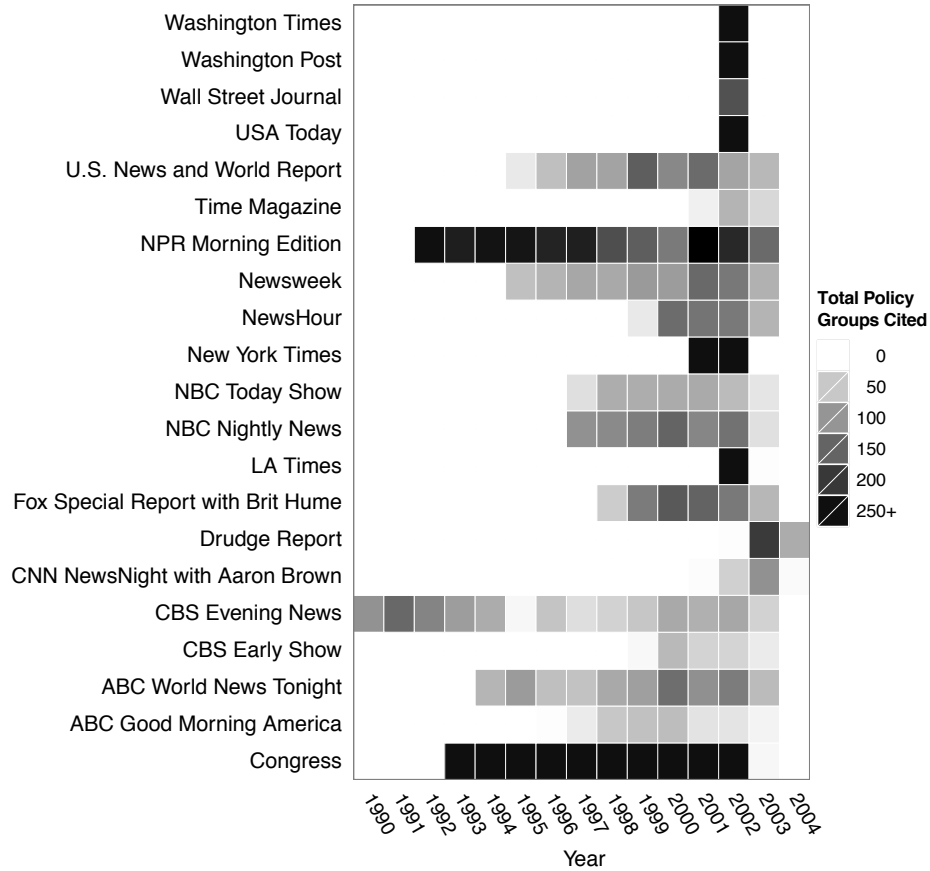


Figure 1: Total number of policy groups cited per year by outlet or Congress in the Groseclose and Milyo (2005) data. Some media observations are only during a few months of one year, while data from other media outlets span the entire time period. The sample of citations from the media outlets is skewed relative to citations from members of Congress. Even if the periods of observation of media outlets overlap, the majority of the observations come from different points in time. For instance, *CBS Evening News* and *ABC World Tonight* have similar observation windows, but the majority of the data for each outlet are collected over different time periods, 1990-1994 and 1999-2003 respectively.

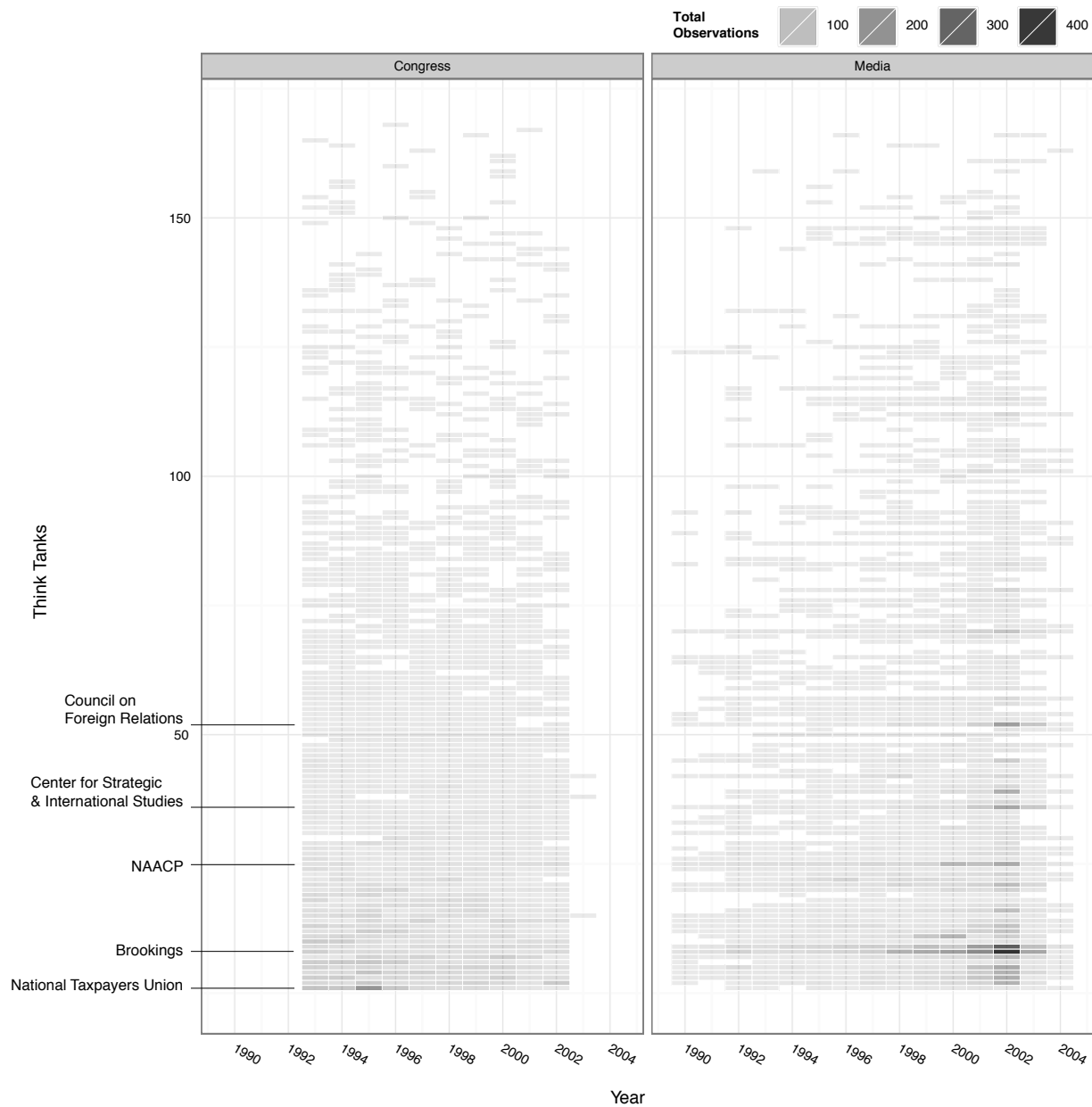


Figure 2: Citations of the nearly 170 think tanks and policy groups over time and ranked by total number of Congressional citations. The left panel indicates those citations by members of Congress. The right panel indicates citations aggregated over all media outlets studied. Shading of the cells indicates the frequency of citation of that policy group. There were more outlets studied in the late 1990s and early 2000s, causing an increase in the total frequency of policy group citations. There are a relatively constant number of Congressional citations of some policy groups. The National Taxpayers Union is the most commonly cited policy group by members of Congress, but has decreased in frequency from the mid 1990s until the early 2000s. The Brookings Institute is the most frequently cited policy group by media outlets, aggregating across all years and outlets.

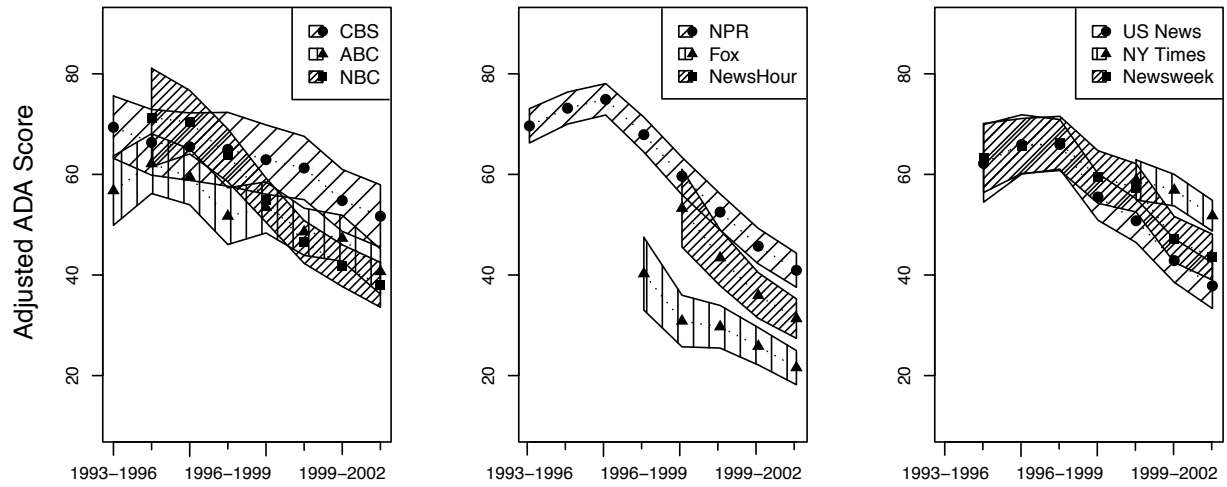


Figure 3: Estimated ADA score of media outlets using data over rolling four-year time periods. Periods begin 1993 and end using data in 2003. Each outlet is estimated independently of the other media outlets and uses the Congressional citation data during the same four year time period. Bands around the point estimates represent 95% confidence intervals. Estimates for all outlets during the early 2000s are more conservative, or lower on the ADA scale, compared to previous time periods.

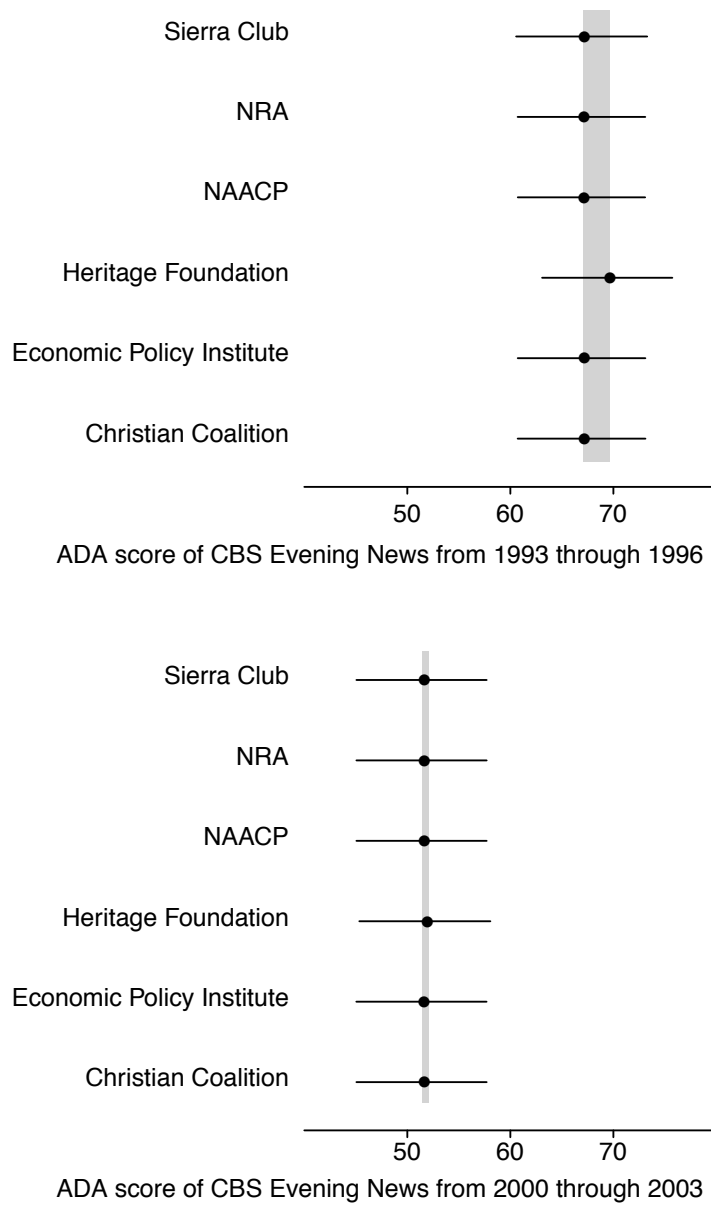


Figure 4: Estimates of the ADA score of *CBS Evening News* by varying the identifying think tank. The Heritage Foundation is used to identify the model for the main results presented in Table 1. The top panel indicates the estimated ideological score using CBS and Congressional citation data only from 1993 through 1996, the earliest four-year period in the reanalysis. The bottom panel indicates the estimated ideological score data from only 2000 through 2003, the latest four-year period in the reanalysis. While varying the identifying policy group does influence the estimated ADA score, the estimated score does not vary more than 2.5 points. Changes in the ideology of CBS from the early to mid 1990s to the early 2000s cannot be attributed to changes in the original identifying policy group.