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Policy Shaping Politics: Monetary Policy Deliberations in Congressional Hearings

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I. INTRODUCTION

"I don't suppose that anyone would still argue that the central banking system should be independent of the Government of the country. The control which such a system exercises, over the volume and value of money is a right of Government and is exercised on behalf of Government, with powers delegated by the Government. But there is a distinction between independence from Government and independence from political influence in a narrower sense. The powers of the central banking system should not be a pawn of any group or faction or party, or even any particular administration, subject to political pressures and its own passing fiscal necessities." Allan Sproul, President of the New York Federal Reserve Bank letter to Robert R Bowie, September 1, 1948 (Meltzer 2004: 738)

"To me, public accountability is a moral corollary of central bank independence. In a democratic society, the central bank's freedom to act implies an obligation to explain itself to the public. Thus independence and accountability are symbiotic, not in conflict. . . . While central banks are not in the public relations business, public education ought to be part of their brief." Alan Blinder, former Vice-Chairman, Federal Reserve Board (Blinder 1998: 69)

"'There are people who think the Fed should be above democracy. . . . We can debate the most fundamental questions in human existence, but God forbid anybody in elected office should talk about whether or not we need a 25 basis-point increase from the Fed.'" Representative Barney Frank, Incoming Democratic Chairman of the House Financial Services Committee (January 2007) (Guha and Kirchgaessner 2007)

Independence and the accompanying obligations of transparency and accountability are typically regarded now as the cornerstones of the constitution of central banks. But if the above quotes, which are listed in chronological order and span nearly half a century, illustrate one thing, it is that there is sufficient scope for interpretation of the precise meaning of these principles to make them worthy of further study. In the recent context of a new Democratic majority in Congress, Congressman Frank's views reflect a frustration towards a perceived deference to the Federal Reserve by the outgoing Republican Congress, a deference which he believed was undermining the obligation of the Fed to account for its use of the powers delegated to it by Government, a responsibility which both Allan Sproul and Alan Blinder emphasised.

But it would be unwise to conclude from the observation of one individual that Congress had fallen asleep on the job, and thus that the Fed was given free rein. To put this observation into context we need to know much more about the history of oversight of monetary policy by Congress, and have a framework of analysis in which we can make more systematic judgments. In doing so, we can also reach wider conclusions on, for instance, the role of partisan politics in congressional oversight of the Fed.

In this paper, we examine the evolution of congressional oversight of the Fed since the mid-1970s, in order to understand how the Fed has treated Congress and vice versa. Our approach is unusual in that it measures statistically the deliberations of

Members of Congress in the House and Senate banking committees during the oversight hearings on monetary policy for five periods from the mid 1970s to the late 1990s. The reason for choosing this span of the history of US monetary policy is that it coincides with the Great Inflation of the 1970s, the radical action taken to cure that problem (initiated by the so-called Volcker Revolution of 1979), and the subsequent period of stability and low inflation. But it also covers a period in which monetary policy came to the forefront as the tool of macroeconomic stabilisation, and hence the role of Congressional oversight may well have changed too.

We start by putting these changes into the longer-run context of the history of the Federal Reserve. Section III then describes the background of the period from the mid-1970s to late 1990s. Section IV assesses the goals of Members of Congress in oversight hearings. Section V reviews the literature on committee deliberation. Section VI frames the key questions in our study and Section VII summarises the main results. Section VIII describes the data used and the methodology of full text analysis. Section IX describes the results in detail, while Section X concludes.

II. ANTECEDENTS

The Federal Reserve was founded as a part private, part public institution, "a peculiar hybrid" (Meltzer 2004: 725). The private ownership of the regional Federal Reserve banks by local member commercial banks was designed to act as a bulwark against central government influence. But it attracted concerns from agricultural and commercial interests that the Federal Reserve would act for the benefit of large banks against the interests of the public. This concern was reflected in a long-run stream of opposition to the Fed from congressional Democrats with notably agricultural district interests. This history helps to explain a number of important themes of Fed-Congress relations.

First, even though after the Second World War, public attitudes changed towards the role of the public sector (defined here to include the central bank) in economic management, we might still expect to see a deep-seated source of strain in relations between Members of Congress (notably Democrats) and the Fed.

Second, the Fed's independence was never absolute, and was never intended to be so. It was qualified by a desire from certain sections of Congress (again, more likely to be Democrats) to rein in that independence further, for instance by increasing transparency and accountability in ways that typically did not find favour with Fed officials.

And third, congressional concerns about the interests of the Fed (i.e. that it would lean towards large banks) spilled over into attitudes in Congress towards defining the monetary policy objective of the Fed.

In the early years of the Fed, stable growth of the economy was not part of its formal mandate, and most of the Fed's leadership "would have denied any responsibility for economic activity or employment." (Meltzer 2004: 9) Nor for that matter, did price stability feature in the Fed's mandate. In the 1920s, the economist Irving Fisher worked to get Congress to mandate price stability as the goal of the Federal Reserve, an unsuccessful initiative that was opposed by the Fed itself. The Fed's original

mandate was very much viewed as preventing financial crises and panics, and thereby smoothing the business cycle. In the language of modern central banking, the mandate placed the stability of the financial system at the forefront of the central bank's contribution to ensuring macroeconomic stability.

There was nothing very original in this view of the role of the Fed. It is a surprisingly modern view that, while monetary policy does not have long-run effects on employment, expenditure and output in the economy, there is a short run transmission from monetary policy to economic activity (first attributed to the late eighteenth/early nineteenth century economist Henry Thornton, but largely ignored until well into the twentieth century) which makes monetary policy the most potent tool of short-run economic stabilisation. A tradition which lacked a clear understanding of the transmission of monetary policy to economic activity and the price level (i.e. the effectiveness of monetary policy) would substantially compromise not only the clarity of the Fed's own objective and actions, but also the oversight of Congress. Understanding this tradition is likewise important in dispelling the notion that there was a clear foundation for the idea of a long or short-run trade-off between inflation and economic activity/unemployment.

Another important strand in the history of macroeconomic policy is the respective roles attributed to monetary and fiscal policy. The dominant post-war view was that, relative to fiscal policy, monetary policy was relatively unimportant for economic stabilisation. This was a view held not just in successive Administrations, but also in the Fed itself. This post World War II consensus had required a change of view on the role of fiscal policy, from where balanced budgets should be the peacetime norm, to one where government spending (and hence deficits) should substitute for cyclical weakness in private spending as the means to stabilise output. Within this framework, monetary policy should seek to control high inflation, but not in a way that meant high interest rates confounding the stabilisation goals of fiscal policy. Monetary policy was therefore at best shackled and subordinated. This was an approach that brought short-run stabilisation to the fore (via the operation of fiscal policy) but without any clear anchor (in terms of a policy objective such as a target for output growth or inflation) or set of rules. Thus the 1946 Employment Act emphasised employment and production as goals of the Fed, but without establishing a clear objective. In terms of relations between the Fed and Congress, the emphasis on the use of fiscal policy as a discretionary tool for economic stabilisation was important because Congress approved the budget. The Fed could thus find itself in conflict with Congress (and the Administration) where it was attempting to use the subordinate tool to counteract the inflationary effects of fiscal policy approved by Congress itself. The tendency in post-War policy-making was therefore for Fed chairmen to gravitate towards joining the formal co-ordination of economic policy through inter-agency co-ordination with the Administration. This arrangement lasted until the 1970s, when it broke under the weight of the pressure of inflation and a realisation that fiscal policy was too inflexible to perform the role of short-run stabilisation.

Our choice of period is therefore important because it begins (in the mid-1970s) at the point where the post-War consensus on economic policymaking is recognised to be seriously broken, and ends (late 1990s) with the establishment of the primacy of monetary policy as the tool of economic stabilisation. From the point of view of relations between the Fed and Congress it covers a shift from an approach in which

Congress had a formal role in approving the primary policy tool (the budget), to one where it was overseeing the agency responsible for the primary policy tool (the Fed).

This short summary of the antecedents of the period we cover has also emphasised that the modern convention that monetary policy is the primary tool of short-term economic stabilisation, and is thus aimed at delivering low inflation as the means to deliver stable growth, does not have long-established theoretical underpinnings.[1]

III. FROM THE 1970s TO THE 1990s

Figure 1 illustrates the familiar story of a period which began with the severe challenge of high inflation and weak economic growth (for which the term "stagflation" was coined) but progressed to a story of stable low inflation and stronger and more stable growth. It covers the tenure of four chairmen of the Fed, three of whom were undoubtedly "strong characters" – Burns, Volcker and Greenspan – while there was a brief (in 1978-9) period of weak leadership (Miller).

The nature of congressional oversight changed substantially in this period. The passage of the Humphrey-Hawkins Act in 1978 formalized biannual oversight hearings before the Senate and House banking committees.[2] The Act required Fed officials to explain how their monetary policy objectives would fit with the President's economic policy, in other words how monetary policy would fit with fiscal policy. This was a legacy of the post-War consensus on economic policy, and it fuelled a dispute between the Fed and (mainly) congressional Democrats, namely the push by the latter for greater transparency on the Fed's objectives, forecasts and operating procedures.

In the next section we examine the likely motives of Members of Congress in their oversight of the Fed. Before that, we highlight two important issues that are specific to congressional oversight of the Fed. First, since the history of monetary policy indicates that the theoretical underpinnings were weak and the role of monetary policy either subjugated to fiscal policy and/or little understood, it is hard to envisage that Members of Congress had much vision of what they sought to achieve through oversight. This would most likely have included little understanding of the distributional consequences (for interest groups within the economy) of monetary policy, since to understand that would require a much clearer exposition of the transmission mechanism form monetary policy decisions to activity and the price level. To the extent that an appreciation of distributional consequences existed, it appears to have been rooted in the older tradition of populist antipathy to the association of the Fed with the private interests of large banks.

Second, during the period that we study, it seems plausible that a change in the nature of congressional oversight may have resulted from the Fed's success in achieving stable low inflation. Thus, the form of oversight itself is conditional on (a) the success of the central bank in achieving its objective of low inflation, and on (b) whether there is a common acceptance among Members of Congress that low inflation is the best way to achieve sustainable growth throughout the economy, and thus stable low unemployment. We argue that the politics of oversight may be shaped both by the policy outcome itself (the Fed's success or failure) and by the degree of consensus surrounding the objective of policy, namely the benefits of low inflation.

Within this mix of policy success and congressional oversight there lies a paradox. The rise of the emphasis on legislative accountability as part of the package of having an independent central bank has come at a time when low inflation has been established for a longer period than at any time since the nineteenth century. In short, legislators have come to play a larger role at a time when, arguably, there is in substance less for them to do. Certainly, in an era of low inflation and stable growth of the sort seen since the mid 1980s, there is less need for them to signal their displeasure with the central bank. In the U.S. (and elsewhere), the 1990s were the key period in which the new era of stable growth and low inflation began to be accepted as a more enduring part of the economic landscape, and yet very little scholarly attention has been given to how congressional oversight adapted in the face of this change.

We seek to assess in an empirical framework the goals of members of the two congressional banking committees in order to gauge the extent to which these may have adapted to the changed role and objective of monetary policy, and to the modern era of low inflation. We introduce a new approach to gauging the motivations of Members of Congress—i.e., automated content analysis which enables us to evaluate statistically textual data from committee deliberations. Specifically, we compare the hearings from five periods of House and Senate oversight (1976-77, 1979, 1979-81, 1991-1993 and 1997-1999).

IV. THE GOALS OF BANKING COMMITTEE MEMBERS

What do senators and representatives strive to achieve as committee members? Generally, members of Congress are said to seek key political goals through committee activity, and among these, three are most important: (1) reelection, (2) good public policy, and (3) influence within Congress (Fenno 1973). The first goal—reelection—has received the greatest attention among academics, no doubt augmented by Mayhew's classic work (Mayhew 1974). In pursuing the primary goal of reelection (from which all other goals might follow), Mayhew argued that legislators would likely engage in *advertising*, or creating a name for themselves among constituents; *claiming credit* for favourable government action; and *taking positions*, or making value judgements on issues of political importance (Mayhew 1974; Mayhew 2000). All these activities are intended to curry favour with a legislator's home constituency—indeed, in pursuing the electoral goal, legislators effectively act as *delegates* to their constituencies. In contrast, legislators might seek to represent the national or wider public interest, and thereby perceive themselves as *trustees* who follow their own judgement in deciding "good" public policy, along the lines inspired by the 18th century statesman and philosopher, Edmund Burke (Hill 1929; Eulau 1962; Burke 1996; Uslaner 1999). And thirdly, Members of Congress may be more narrowly focused on furthering their congressional career through, for example, the pursuit of influence as committee chair.

In the House and Senate banking committees, all three goals may be relevant, but gauging their relative importance has been constrained by the data; that is, the most extensive data produced by committees—namely textual data in the form of hearings, testimony and deliberations—remain largely untouched by empirical researchers.[3] Rather, studies that have sought to gauge committee members' preferences usually

employ ideological measures from roll call data, using NOMINATE or ADA scores (Grier 1989; Grier 1991; Krehbiel 1991; Cox and McCubbins 1993; Londregan and Snyder 1994; Poole and Rosenthal 1997; Maltzman 1998; Young and Heitshusen 2003)), or measures of constituency characteristics (Shepsle 1978; Adler and Lapinski 1997; Adler 2000; Adler 2002). Positing that banking committees seek to influence Fed policy, some studies have observed a correlation between the liberal/conservative ranking of the chair of the Senate Banking Committee and the subsequent ease/tightening bias in monetary policy (Grier 1991; Chopin, Cole et al. 1996; Grier 1996)—which might reflect the veto power of the Senate over appointments to the Fed Board. However, other studies have disputed this correlation (Beck 1990).

Turning to the rank and file members, many scholars of legislative committees examine the extent to which legislators seek membership on committees with jurisdictions that provide district-specific benefits, and thus strive to distribute benefits to their constituents through committee activity. For some committees such as agriculture, these benefits are conspicuous and the distributional motivation is strong. For other committees such as banking, district specific benefits are less self-evident, although employing better constituency measures for legislators may well suggest a stronger electoral motive among these committee members than previously appreciated (Adler and Lapinski 1997; Adler 2002).

In yet a different light, scholars of monetary policy have repeatedly puzzled over the motivations for legislators who conduct oversight hearings on monetary policy (Woolley 1984; Beck 1990). Notably, monetary policy constitutes an unusual area of legislative oversight in that the standard means of legislative control of bureaucrats—the distribution of budgetary appropriations to fund the agency—is absent, as the Fed controls its own budget and thus many of the standard models (e.g., agency theory) are inappropriate.

As an unusual area of legislative oversight with little scope for electoral benefit, some authors suggest that legislators may seek to "shift-the-responsibility" for implementing tight monetary policy to the Fed in order to escape the inevitable electoral harm from groups and industries that might suffer from such a policy (Kane 1980; Fiorina 1982; Beck 1990). Moreover, because policymakers and scholars alike have come to embrace the consensus that low inflation benefits all, Members of Congress cannot expect to enjoy electoral benefits from their constituents from a low inflation outcome, or as Beck notes: "Those who gain from a decline in inflation are a more diffuse group and are not likely to be terribly thankful to their Members of Congress on election day. This is particularly true because no Member of Congress can claim credit for bringing down inflation" (Beck 1990: 135). Indeed, Beck concludes that Members of Congress remain largely inactive in monetary policy because they cannot claim credit for lowering interest rates. He further maintains that risk-averse legislators do not attempt to reform the Fed (e.g., by repealing the Fed's current control over its own budget or by exerting pressure on the Fed to engage in credit allocation) because of the uncertain electoral payoff (Beck 1990: 143). In this view, Congress gives the Fed a relatively free rein in making monetary policy. Whereas *in principle* Congress could reverse decisions of the Fed, remove Fed governors, or even dismantle the Fed, Members of Congress have never opted to do so.

We are thus left in a quandary as to the motivations of legislators who conduct oversight hearings on monetary policy. If they can glean no significant electoral benefit from bringing down inflation, are there other aspects to the hearings that might yield electoral gain? If Mayhew's credit claiming activity bears little fruit in the context of these high profile hearings, might committee members seek some other electoral benefit, such as name recognition or taking a position? Alternatively, is there evidence to suggest that their deliberations reflect the desire to enact good public policy—even one as simple as forcing the Fed to, as Blinder argues in the opening quote, "explain itself to the public"? Or perhaps members may wish to exhibit their commitment to addressing an important national policy, such as the levels of inflation and employment. And finally, is there any evidence to suggest a role for our third motivation—seeking influence in Congress? Might, for example, committee members (either as regular members or chair) give any indication that their membership on the banking committee might confer on them special influence within the House or Senate? In short, research provides mixed findings for the motivations of Members of Congress in the House and Senate banking committees. Active participation might reflect electoral, good public policy, or influence in the chamber objectives; or, a more passive stance might simply indicate an electoral motivation that is risk-averse and thus satisfied with shifting the responsibility for implementing unpopular policy to the Fed. Given the uncertainty surrounding these findings we seek a different means for gauging these motivations—the arguments and deliberations of members themselves in committee.

V. DELIBERATIONS IN COMMITTEES

While measures such as constituency composition may enable us to gain some handle on the motivations of committee members, we argue that a richer understanding might be had by examining more closely the ways in which members of Congress process information. That is, what sorts of arguments and rhetoric do they employ to challenge (or defend) the decisions of the Fed on monetary policy? And, to what extent do they come to accept the low inflation consensus – i.e. that low inflation is the best means to deliver sustainable economic growth and thus low unemployment? In short, how do members process information on monetary policy within the banking committee setting and if we are able to capture this process systematically, how might it inform our understanding of the goals of legislators' oversight of the Federal Reserve?

While our *systematic* approach to studying the verbatim transcripts of the committee hearings is new, Havrilesky (Havrilesky 1993) has attempted a form of content analysis on the congressional hearings records. His approach is quite simple, using a raw word count of references to the words "unemployment", "employment", "interest", "interest rates", "inflation", and "inflationary", measured separately between members of Congress and the Fed chairman of the day, from 1975 to 1992. Havrilesky assumes that mentioning inflation indicates a desire for tighter monetary policy, while mentioning unemployment or interest rates indicates a desire for easier monetary policy. He ignores references to other terms such as credit conditions, capital formation, and the budget deficit, on the grounds that they are not synonyms for the essential variables of monetary policy, and that they have appeared inconsistently throughout the period. While Havrilesky's findings are informative

about the possible correlation between hearings and Fed policy, his approach reveals little about the deliberations of Members of Congress in these hearings.[4]

In contrast, we use automated content analysis to capture the thematic structure of the committee deliberations as well as the tendencies of particular members to speak to specific arguments (and possibly to avoid other arguments). We assume that committee members seek to process information and arrive at judgements based on argued reasoning. We maintain that the deliberations of politicians should reflect their distinct sets of aims and objectives; and, building on this, we seek to measure empirically the link between their objectives and the arguments they employ in deliberation.[5]

A key goal in our analysis is to understand better the deliberative process that underpins legislators' thinking about monetary policy, and at the same time link these considerations to their underlying goals as elected officials. While deliberation is becoming a topical subject among political scientists (Page 1996; Elster 1998; Fishkin and Laslett 2003; Pettit 2003; Austen-Smith and Feddersen 2006), few have sought actually to understand the mechanics of deliberation within a policymaking setting. Indeed, as one author aptly notes, "(u)nwavering faith in deliberation is puzzling because scholars have not clarified how deliberation works" (Barabas 2004). Some recent studies of Congress have begun to study the role of deliberation, yet the empirical focus has been more on floor debates than committee hearings (Quirk 2005; Mucciaroni and Quirk 2006). In their deliberations on the floor and in committee Members of Congress seek to *persuade* their colleagues and external constituencies to support their policy position (Mucciaroni and Quirk 2006: 26-27).

VI. QUESTIONS

The empirical evidence on the role of congressional oversight vis-à-vis the Federal Reserve is thin, consistent with the lack of convenient source material for conventional econometric analysis provided by oversight hearings. There are no votes in the oversight hearings that could enable us to measure the positions and motivations of Members of Congress. Moreover, much of the literature in the field of Congress/Federal Reserve relations pre-dates the more recent period of sustained low inflation, and hence, successful monetary policy, and thereby does not provide a full picture. In this literature the authors tend to envisage congressional oversight of monetary policy as more static than dynamic—that is, fundamental shifts in the state of the economy and the success of monetary policy are not generally understood to shape the nature of congressional oversight itself. Inasmuch as a lengthy period of low inflation changed the expectations of economic actors, it is likely that the Fed's success in delivering on this outcome also shaped how Members of Congress perceived the Fed. We thus argue that the nature of congressional oversight is likely to be dependent on the state of the economy, and in particular, on the Fed's success in achieving its objectives of low inflation and stable growth (high employment) over the course of the 1990s. We maintain that with the emergence of the era of low inflation from the 1990s and the success of the Fed's conduct of the monetary policy regime, the oversight behaviour of the banking committees has changed.

One possible product of this success might be to diminish the importance of monetary policy on the congressional agenda (i.e. why play with success, and certainly don't

criticise it). Hence, the oversight hearings may provide little real value (Rohde 1995), and may be nothing more than a "show", a view that seems to be consistent with the opening quotation from Congressman Barney Frank. Yet to dismiss the value of the hearings is to ignore the change in the institutional relationship implied by a successful monetary policy.

Our use of textual analysis of congressional oversight hearings has therefore been directed at three basic questions:

1. What are Members of Congress seeking to achieve in oversight hearings?
2. Has their objective changed over time--in line with the changed role and importance of monetary policy, and the success of the Fed in tackling the Great Inflation of the 1970s?
3. Has there been a change in the coverage of fiscal policy in the oversight hearings, again to reflect the changed role and importance of monetary policy and the Fed's success against inflation?

VII. SUMMARY OF RESULTS

The results are described and assessed in more detail in Section IX, but in summary the key points are as follows:

A: Members of Congress generally showed little interest in the detail of monetary policy making. They were more inclined to challenge the Fed in the areas of governance, accountability and transparency.

B: The degree of challenge from Congress to the Fed appears to be negatively related to the success of the Fed in pursuing low inflation and stable economic growth. In a period in which poor economic performance was current or within recent memory (marked by a higher rate of inflation, weaker growth and a higher level of unemployment), there appears to have been more contention between Members of Congress and the Fed Chairman, but this was more focused on the governance of the Fed, in terms of its transparency and accountability to Congress. This challenge came more from Democrats than Republicans (consistent with the tradition of populist criticism of the Fed). Later, as the Fed's success became more apparent, commentary by Members of Congress on the Fed's performance became more positive and bipartisan.

C: By the late 1990s, the discourse of oversight hearings became more focused on the importance of delivering low inflation as the best way to ensure stable economic growth and low unemployment. This reflects the timeline of thinking on the role and objective of monetary policy.

D: Tentatively, we conclude that there was some change in the focus of the debate on fiscal policy. Up to the later 1990s, there was more debate around the policy mix (i.e. the combination of monetary and fiscal policy measures). By the late 1990s, with low inflation and stable economic growth more established, and with monetary policy accepted as the tool for short term stabilisation, there was a decline in the focus on fiscal policy and a change in that focus. Members of Congress were more inclined to seek to use the Fed's

reputation for success in monetary policy to support or attack the Administration's fiscal policy.

VIII. DATA AND METHODOLOGY

a. Data

The data consist of transcripts from hearings in House and Senate committees on the Fed's Monetary Policy report from the mid 1970s to the late 1990s. There are 19 House hearings[6] and 18 Senate hearings[7] grouped into ten text files (one file for each chamber in each of the five time periods).

Within the text files, each speech, question or interjection by a committee member or the Fed Chairman constitutes a "case"[8]. Each case is identified (or "tagged") with identifying characteristics, including the date of the meeting, and for Members of Congress (not Fed Chairmen) the speaker's name, party and whether they are the committee chair or a member.[9]

b. Methodology: Computer-Assisted Content Analysis

Automated content analysis of political texts has captured the attention and imagination of political scientists, with researchers seeking to measure empirically the policy positions from political party manifestos and legislative speeches (Gabel and Huber 2000; Laver and Garry 2000; Laver and Benoit 2002; Laver, Benoit et al. 2002; Albright 2007; Benoit and Mikhailov 2007; Slapin and Proksch 2007), the dynamics of political agenda-setting in Congress (Quinn, Monroe et al. 2006), political culture (Garson 2002), and to classify or extract meaning from political texts more generally (Godbout, Diermeier et al. 2007; Hillard, Purpura et al. 2007; Hopkins and King 2007; Monroe, Quinn et al. 2007).

A variety of packages are on offer for automated content analysis, each providing its own array of analytical tools and insights into textual data.[10] Some packages appear well-suited to analyze very large corpora encompassing multiple topics, but usually these require a pre-coded or pre-scaled reference document from which "fixed parameters" (Lowe 2007) may be derived and employed on other documents (or the larger population of documents) to scale, code and/or classify these documents (Laver, Benoit et al. 2002; Hopkins and King 2007). Other approaches employ machine-learning in order to mitigate the costs of human labelling, although they recognize that human intervention to monitor and guide the analysis cannot be avoided (Hillard, Purpura et al. 2007). Alceste, the approach used here and elsewhere in the social sciences,[11] does not require any pre-coding but is more limited in that it cannot analyze very large corpora[12] or corpora containing multiple discrete topics. Its chief advantage for political speeches is that it allows the researcher to analyze statistically and spatially the intersection of characteristics of the speakers with the tendency of those speakers to develop and focus on particular lines of argument. A more detailed description of the Alceste method is given in Appendix 1.

IX. RESULTS OF ANALYSIS OF HEARINGS

a. Identifying the Themes

Tables 1 and 2 provide summaries of the basic statistics from Alceste for the ten data files. The total word count for the congressional hearing text files ranges from 28,667 to 132,397. The second row indicates the number of unique words that were analyzed by the program.[13] The passive variables[14] (also referred to as tagged indicators) define characteristics of each speech or "case", and these include the speaker's name, party affiliation, and so on (as described above).[15]

[Tables 1 & 2 – About here]

The "Initial Context Unit", or ICU, is essentially the sampling unit—i.e., a pre-existing division of the text and is specified by the user. For simplicity, we refer to ICUs as cases, or the speeches of members. For the congressional hearings, the number of speeches or comments during each set of hearings ranges from 272 to 1215.

The "Elementary Context Unit", or ECU, is a "gauged sentence", which the program automatically constructs based upon word length and punctuation in the text.[16] Using the presence or absence of words in each ECU, the program calculates matrices on which to build the classification process. (Examples of ECUs representative of classes from Table 2 are given in Appendix II.) The program conducts two preliminary analyses, each using slightly different lengths for the contextual unit.[17] It then opts for the length that allows the greater proportion of ECUs to be successfully classified, relative to the total available. Tables 1 and 2 show that percentage classified for the hearings ranges from 65% to 91%.

The final two rows indicate the number of classes identified in each text file and the size of each class (as measured by the percentage of the total ECUs classified within each). The labels for each class (e.g., *Fiscal Policy, Inflation Outlook,* and so on) are not, however, automatically given by the program.

The output provides the researcher with a number of different tools for conceptualizing the content of classes. Of the many tools, two are particularly useful—characteristic words and characteristic ECUs.[18] The most characteristic function words for each class, along with their χ^2 statistical significance (with the minimum chi-squared value for selection automatically set by the program, with one degree of freedom[19]), provide an indication of the theme or frame of argument that unifies a class. The most characteristic words for each class are those with the highest χ^2 values. In Appendix II, we provide a sample of the characteristic *phrases* for each of the congressional hearing files from the 1990s. These characteristic phrases (or ECUs) indicate the characteristics words within each phrase that have been classified within that particular class.

The tables in Appendix II are only a very small sample of the characteristic phrases for each class within each set of hearings. We selected for illustration two of the top ECUs (by χ^2 value). Admittedly, politicians are not always as articulate or as focused as we (or they) might prefer, and so the first and second top ECUs for each class do not always adequately convey the overall content of the class (as judged by the remaining top 20 ECUs and the characteristic words (by χ^2 value)). For sake of consistency and transparency of the our methodology, we endeavoured to present the

first two ECUs in the ranking, unless in our view, these do not adequately reflect the content of the remaining 18 or 19 top ECUs or the list of characteristic words (that is, if a top ECU fails to reflect what we perceive as the overall content of the class, we have selected one that better serves this purpose). To allow the reader to judge each ECU, we include both the χ^2 value (with one df) and its rank in the ECU list for that class.

b. Tree Graphs and Tagged Indicators

Labelling the themes within the hearings is only the first step in our analysis. Next, we examine the relationships between the classes. Alceste provides two means to analyze the relationships between the class--tree graphs and correspondence analysis—but for reasons of space, we will focus only on the tree graphs.

[Figures 2 through 11 – about here]

i. Tree Graphs

Figures 2 through 11 are tree graphs of the thematic classes, schematized according to Alceste's descending hierarchical classification procedure (the percentage weight given to each class by the analysis is indicated in parentheses). These graphs illustrate the most closely related classes (those that join near the left of the graph) and the progressively less related classes (those that join further and further to the right, or the trunk of the tree).

ii. Tagged Indicators

The tree maps provide an initial cut into the organization of thematic classes by party. Tables 3 through 7 lend greater accuracy to this by identifying the level of statistical significance for each of the tags, by thematic class.

[Tables 3 – 10, about here]

In Tables 8 through 10, we have summarised the findings for the themes identified in the textual analysis. We have used common headings for the themes across the 23 year period that we assess. Thus we have ten common headings plus an "other" category (though the "other" category is only used for one set of hearings—the House in the last period). Combining themes from each period under common headings inevitably runs the risk of joining themes that have the same subject matter (e.g. fiscal policy) but very different slants on the issue. Nonetheless, common headings for the themes allow us to trace broad patterns over time within the discourse of oversight hearings. Table 8 provides for each thematic heading a timeline of the party and Fed Chairman tags that are significant at the 1% level or greater (using the indicators D and R for each party and F for the Fed Chairman). Table 8 also identifies those thematic headngs where both parties attract a significant tag (labelled D/R)—in these cases we conclude either that the theme attracts bipartisan support or that the parties disagree but in doing so each party tag acquires statistical significance.

Table 9 provides a summary of the distribution of the importance of each thematic heading (in contrast to Tables 8 and 10, this covers all themes). The distribution is calculated as the percentage share of ECUs retained by the textual analysis that is

classified into each thematic heading. Finally, Table 10 presents the percentage distribution of thematic headings where there is a significant tag (at the 1% level or greater) for either party or the Fed Chairman. We then group those together by party and Chairman. This allows us to observe any trends over time in the extent to which a party or the Chairman contribute to the discussion. Also, we sum these weights together to observe the total weights for both parties and for both parties plus the Chairman. Finally, we include information on the party of the President and the majority party in both houses of Congress.

We observe four main findings from the textual analysis.

First, we look at the extent to which the two parties attract significant tags for the first four themes identified in Table 8, namely those most directly associated with monetary policy (inflation, the US economy and output, the labour market/unemployment, and the monetary aggregates used to track inflationary pressures). Of the 21 significant tags for these themes, 16 are uniquely associated with the Fed Chairman. Of the remaining five tags, three are associated with the Democrats, one with the Republicans, and one has significant tags for both the Democrats and the Fed Chairman. Of those five tags, three are in the first period, covering 1976/77. Looking by theme, three of the five tags are in the labour market/unemployment theme, while the Fed Chairman has no significant tags in that theme. From these results, we can see a concentration of party interest in the earliest period, when Arthur Burns was Chairman of the Fed, and a focus in this period on the labour market and unemployment situation. The money growth and aggregates theme perhaps most closely relates to the detailed entrails of monetary policymaking, and thus may be an area where the parties are least likely to attract significant tags. This is true except for the House in the first period. Table 3 indicates that the significant tag for Democrats is associated with the Democrat Chair of the House Banking Committee, Rep Henry Reuss of Wisconsin. Reuss was in the populist tradition of Democrats from agricultural states, and appears to have been prepared to tackle Burns on the detail of monetary policy. Likewise, Burns had a reputation for having a taste for battle with Congress, conditioned by the problems of the inflation of the 1970s. After Burns, the monetary policy themes are dominated by the Fed Chairman (though this is more consistently true of the two strong chairmen, Volcker and Greenspan, than the weak chairman, Miller)

It is not surprising to find that the labour market and unemployment theme attracts the largest number of significant party tags in this group of themes, though it is noteworthy that these tags are sporadic in their distribution rather than a constant presence. They appear in 1976-77 and only re-appear once, for the Senate in 1991-93, the latter indicating that Democratic senators were more concerned with unemployment and the downturn in the economic cycle.

Our first conclusion is that Members of Congress have demonstrated very limited interest in debating the more technical detail of monetary policy with successive Fed Chairman. The evidence such as it is indicates that this interest has declined over time (or more accurately, was at a peak in the first period that we cover).

Our second finding concerns the area in which Members of Congress are more likely to challenge the Fed Chairman, namely the structure and governance of the

arrangements for monetary policymaking, and in particular the transparency of the Fed and thus the quality of accountability to Congress. Themes eight and nine in Tables 8 and 9 ("Independence of the Fed – Relations between the Fed and Congress/the Administration" and "Appraising the Fed") are relevant to this issue. The pattern of significant tags (Table 8) and classes (Table 9) indicates a concentration of focus on structure and governance in the early part of the period, which gives way to bipartisan praising of Alan Greenspan in the last part of the period. This provides support for the view that the intensity of challenge from Congress is conditional on the success of the Fed in pursuing its objective with respect to monetary policy. The evidence also indicates that in the early period the Democrats were more likely to challenge the Fed than the Republicans, again consistent with the tradition of populist criticism of the Fed. The emergence of a bipartisan consensus towards praising the Fed Chairman could of course be consistent with Barney Frank's criticism that Congress had gone soft on the Fed. Finally, another indicator of the degree to which Members of Congress have tailored their behaviour in response to the conditions of the time is revealed by Table 10, where the percentage share of classes with a significant party tag falls to the lowest point in the last part of the period under review (1997-99). In an extension of this work we intend to add another three years covering the late Greenspan years (up to the end of 2005) to see if this result holds.

Our second conclusion is that the degree of challenge from Congress to the Fed appears to be negatively related to the success of the Fed in pursuing low inflation and stable economic growth. In a period in which poor economic performance was current or within recent memory (marked by a higher rate of inflation, weaker growth and a higher level of unemployment), there appears to have been more contention between Members of Congress and the Fed Chairman, but this was more focused on the governance of the Fed, in terms of its transparency and accountability to Congress. This challenge came more from Democrats than Republicans (consistent with the tradition of populist criticism of the Fed). Later, as the Fed's success became more apparent, commentary by Members of Congress on the Fed's performance became more positive and bipartisan.

The first two findings have supported the view that the Fed's success in achieving low inflation has shaped the nature of oversight, but we should also expect to see the debate on monetary policy evolve to match the evolution of thinking on the role and content of monetary policy. Specifically, we should expect to see a sharpening of the focus on inflation as the objective of monetary policy. Table 8 indicates that from around the time of the Volcker Revolution in 1979, the chairman of the Fed attracts a significant tag for the inflation theme. In contrast, Burns did not attract a significant tag for the inflation theme, while Miller did for the Senate but not the House (and for the Senate in 1979 Miller only made one appearance, the other was made by Henry Wallich, Vice Chairman of the Board of Governors of the Federal Reserve). Table 8 also indicates a decline over time in the presence of a significant tag for the money growth/money aggregates theme. This further supports the view that the debate on monetary policy became focused on the final objective of achieving and maintaining low inflation rather than the intermediate objective of money growth. This may not seem like a very radical conclusion, but it indicates that congressional hearings developed in line with the consensus of thinking on monetary policy.

Our fourth finding concerns the coverage of fiscal policy in the oversight hearings. Fiscal policy is covered by two themes in Tables 8 and 9, one covering fiscal policy itself (Theme 6) and the other the interaction between fiscal and monetary policy (Theme 7). There are seven significant tags which are evenly distributed across the 23 year period. All of these tags belong to the parties, four to the Republicans, one to the Democrats, and two in which both parties attract significant tags. Table 10 indicates that for the most part the Republicans were the minority party in both houses during this period, hence we detect a somewhat greater likelihood that the minority party would use the oversight hearing with the Fed Chairman to highlight fiscal policy issues. A good example of this tendency is seen in the 1991-93 period. This is likely to have reflected the contentious nature of fiscal policy in the 1992 presidential election (i.e., Bush's "read my lips" debacle), and the overall concern with the budget deficit.

These results indicate that fiscal policy was always an issue on which Members of Congress wanted to engage the Fed Chairman. We have indicated more than one possible explanation for this interest. First, the post-World War II consensus on economic policy gave prime position to fiscal policy over monetary policy as the tool of stabilisation, but this eroded with the inflation problem of the 1970s and a realisation that the room for manoeuvre in adjusting fiscal policy settings was too limited. But we may expect to see some confusion in the early part of the period we cover on the respective roles of fiscal and monetary policy. A second possible explanation for the interest in fiscal policy is that this is an area where by *taking positions* Members of Congress can attract more direct electoral benefit from their constituents (in contrast monetary policy does not have such visible distributional benefits and hence electoral advantage).

These two explanations would suggest more debate (and greater tension) around the mix between monetary and fiscal policy in the early part of the period than by the end in the later 1990s. We might further expect a change in the role of fiscal policy in the minds of members of Congress in the wake of a sustained period of successful monetary policy, with members recognizing the political benefits from attaching to the credibility and reputation of the Fed Chairman to support their personal/party position on fiscal policy. Judgment on these explanations requires a closer study of the highlighted ECUs – i.e study and interpretation of the characteristic sentences and phrases of each theme rather than reliance on statistical indicators – which is beyond the scope of this paper. However, a brief comparison of the coverage of fiscal policy in the early and late 1990s (the last two sub-periods) indicates a shift in the emphasis of comment by Members of Congress. In the early period, Republicans try to engage Alan Greenspan in a more partisan way to support their position on the overall fiscal stance (but it is important to bear in mind that this reflected an argument within the Republican party). In the later period, the discussion became more reflective and less partisan, on longer term fiscal issues such as Social Security funding, but still seeking to engage Greenspan's support. This indicates a shift from immediate concerns for the spiralling deficit to worries about future pressures on the budget—i.e., spending on Social Security. Thus, some of the shift in emphasis may be credited to the successful budget reduction efforts of the Clinton Administration. In both periods we can observe Members of Congress seeking to use hearings on monetary policy to engage the support of the Chairman of the Fed on issues of fiscal policy. There is, however, a noticeable difference between the two periods.

Tentatively, we conclude that there was some change in the focus of the debate on fiscal policy. Up to the later 1990s, there was more debate around the policy mix (i.e. the combination of monetary and fiscal policy measures). By the late 1990s, with low inflation and stable economic growth more established, and with monetary policy accepted as the tool for short term stabilisation, there was a decline in the focus on fiscal policy and a change in that focus. Members of Congress were more inclined to seek to use the Fed's reputation for success in monetary policy to support or attack the Administration's fiscal policy.

X. CONCLUSION

The empirical evidence on the role of congressional oversight vis-à-vis the Federal Reserve is thin. Much of the literature is dated, and this gap is made more important by the changes seen in the last 15 years or so in both the understanding of the role of the Federal Reserve in monetary policy (the recognition that delivering low inflation is the best way to secure sustainable economic growth and low unemployment), and the success of the Fed in achieving this objective.

We assert that a change in the nature of congressional oversight is likely to have resulted from the Fed's success in achieving stable low inflation. Thus, the form of oversight itself is conditional on (a) the success of the central bank in achieving its objective of low inflation, and on (b) whether there is a common acceptance among Members of Congress that low inflation is the best way to achieve sustainable growth throughout the economy, and thus stable low unemployment. We argue that the politics of oversight may be shaped both by the policy outcome itself (the Fed's success or failure) and by the degree of consensus surrounding the objective of policy, namely the benefits of low inflation.

The literature on congressional oversight provides mixed findings for the motivations of Members of Congress in the House and Senate banking committees. Active participation might reflect electoral, good public policy, or influence in the chamber objectives; or, a more passive stance might simply indicate an electoral motivation that is risk-averse and thus satisfied with shifting the responsibility for implementing unpopular policy to the Fed. Given the uncertainty surrounding these findings we seek a different means for gauging these motivations—the arguments and deliberations of members themselves in committee.

We examine the evolution of congressional oversight of the Fed since the mid-1970s, in order to understand how the Fed has treated Congress and vice versa. The reason for choosing this span of the history of US monetary policy is that it coincides with the Great Inflation of the 1970s, the radical action taken to cure that problem (initiated by the so-called Volcker Revolution of 1979), and the subsequent period of stability and low inflation. Our choice of period is important because it begins (in the mid-1970s) at the point where the post-World War II consensus on economic policymaking is recognised to be seriously broken, and ends (late 1990s) with the establishment of the primacy of monetary policy as the tool of economic stabilisation. From the point of view of relations between the Fed and Congress it covers a shift from an approach in which Congress had a formal role in approving the primary

policy tool (the budget), to one where it was overseeing the agency responsible for the primary policy tool (the Fed).

We pose three basic questions:

1 What are Members of Congress seeking to achieve in oversight hearings?
2 Has their objective changed over time--in line with the changed role and importance of monetary policy, and the success of the Fed in tackling the Great Inflation of the 1970s?
3 Has there been a change in the coverage of fiscal policy in the oversight hearings, again to reflect the changed role and importance of monetary policy and the Fed's success against inflation?

Our methodological approach is unusual in that by using textual analysis of the transcripts of oversight hearings we are able to apply an empirical tool to assess the arguments and deliberations of Members of Congress and successive chairmen of the Fed.

We have four main results.

Members of Congress generally showed little interest in the detail of monetary policy making. They were more inclined to challenge the Fed in the areas of governance, accountability and transparency. (As an extension to this paper, we intend to explore the representative sentences and words from each set of classes in order better to distinguish the electoral, public policy and career motivations of banking committee members.)

As the Fed became more successful in pursuing low inflation and stable economic growth, the contribution from Members of Congress became more positive towards the Fed and more bipartisan. In the earlier part of the period we cover, in which poor economic performance was current or within recent memory (marked by a higher rate of inflation, weaker growth and a higher level of unemployment), there was more contention between Members of Congress and the Fed Chairman, but this was more focused on the governance of the Fed, in terms of its transparency and accountability to Congress. This challenge came more from Democrats than Republicans (consistent with the tradition of populist criticism of the Fed).

By the late 1990s, the discourse of oversight hearings became more focused on the importance of delivering low inflation as the best way to ensure stable economic growth and low unemployment. This reflects the timeline of thinking on the role and objective of monetary policy.

Tentatively, we conclude that there was some change in the focus of the debate on fiscal policy. Up to the later 1990s, there was more debate around the policy mix (i.e. the combination of monetary and fiscal policy measures). By the late 1990s, with low inflation and stable economic growth more established, and with monetary policy accepted as the tool for short term stabilisation, there was a decline in the focus on fiscal policy and a change in that focus. Members of Congress were more inclined to seek to use the Fed's reputation for success in monetary policy to support or attack the Administration's fiscal policy.

There is therefore a paradox that as the principles of central bank behaviour have come to place more emphasis on accountability to the public via the legislature (as part of the constitution of an independent central bank), so the success of central banks like the Fed has meant that there is less for legislators to criticise (and wish to change). This does not invalidate the need for oversight as part of ensuring that the focus remains on the objective of low inflation and stable economic growth, and to provide a means to allow the central bank to explain its actions. It does however mean that the criticism levelled by Barney Frank needs to distinguish between the charge the Congress has gone soft in its basic role of ensuring that the Fed is accountable to the public through Congress, and the (invalid) view that Congress should return to the ways of doing things of thirty years ago.

APPENDIX 1: DETAILS OF ALCESTE METHODOLOGY

Alceste is textual analsyis software that identifies a speaker's association of ideas and main arguments—ideas and arguments which can then be correlated with characteristics of the speaker's (e.g., party affiliation, constituency characteristics and so on). The package relies upon co-occurrence analysis, which is the statistical analysis of frequent word pairs in a text corpus. Alceste was developed by Max Reinert (Reinert 1983; Reinert 1998; Reinert 2003) and has been applied in sociology, psychology, and political science (Noel-Jorand, Reinert et al. 1995; Lahlou 1996; Noel-Jorand, Reinert et al. 1997; Brugidou 1998; Guerin-Pace 1998; Bauer 2000; Brugidou 2003; Noel-Jorand, Reinert et al. 2004; Schonhardt-Bailey 2005; Schonhardt-Bailey 2006). It has been described as a "methodology" insofar as it "integrates a multitude of highly sophisticated statistical methods," (Kronberger and Wagner 2000: 306) and, "(t)aken together, the program realizes a complex *descending hierarchical classification* combining elements of different statistical methods like segmentation (Bertier and Bouroche 1975), hierarchical classification and dichotomization based on reciprocal averaging or correspondence analysis (Hayashi 1950; Benzecri 1981; Greenacre 1993) and the theory of dynamic clouds (Diday, Lemaire et al. 1982)" (Kronberger and Wagner 2000: 306). More simply, it may be described as a marriage of textual and statistical analysis (Popping 2004).

There are two preconditions for good results with Alceste: (1) the textual data must be consistent within the whole (e.g., themes and conditions of production are both consistent); and (2) the text must be large enough for the statistical output to be relevant (with a minimum of 10,000 words). The software is particularly adept at analyzing naturally occurring (or non-reactive) textual data. Congressional hearings on monetary policy fit these preconditions precisely: the thematic content and basic structure are consistent, the total word count for each hearing is well over the minimum (see Tables 1 and 2), and the textual data are non-reactive.

Alceste determines word distribution patterns within a text, with the objective being to obtain a primary statistical classification of simple statements (or "contextual units")[20] in order to reveal the most characteristic words, which in turn can be distinguished as word classes that represent different forms of discourse concerning the topic of the text. Through its dictionary, Alceste prepares the text by reducing different forms of the same word (in the form of plurals, suffixes, etc.) to the root form and transforms irregular verbs to the indicative, thereby producing a matrix of reduced forms. It also subdivides the corpus into "function words" (articles, prepositions, conjunctions, pronouns, and auxiliary verbs) and "content words" (nouns, verbs, adjectives, and adverbs). The content words are understood to carry the meaning of the discourse and the final analysis is based on these. (Content words are sometimes referred to as the "meaningful words".) The program creates a data matrix (an "indicator matrix") which allows an analysis of statistical similarities and dissimilarities of words in order to identify repetitive language patterns. This matrix relates relevant words in columns and contextual units in rows, so that if a given word is present, a *1* is entered in the cell; otherwise, the entry is *0*. Then, using descending hierarchical classification analysis, the program identifies word classes. (The term "class" is used for descending hierarchical classification analysis while the term "cluster" is used for the more traditional ascending cluster analysis (Kronberger and Wagner 2000: 308).) The first class comprises the total set of contextual units in the

initial indicator matrix. The program then attempts to partition that class into two further classes that contain different vocabulary and ideally do not contain any overlapping words. The methods used for this are optimal scaling and the adoption of a maximum chi-squared criterion for cutting the ordered set of words. Alceste compares the distribution of words in each of the two new classes with the average distribution of words. Different forms of discourse that use different vocabulary will result in an observed word distribution that deviates systematically from one where the words are independent of each other. The procedure searches for maximally separate patterns of co-occurrence between the word classes. The chi-squared criterion is thus used as a measure of the relationship that exists between words, rather than as a test.

Following an iterative process, the descending hierarchical classification method decomposes the classes until a predetermined number of iterations fails to result in further divisions. With each step, the descending hierarchical classification uses the first factor of the factorial analysis of correspondences; its top-down design thus allows it to eliminate class "artefacts" (Reinert 2006). The result is a hierarchy of classes, which may be schematized as a tree diagram.

The classification follows a specified procedure using chi-squared, and may be illustrated using Kronberger and Wagner's example of the decomposition of an original matrix into two classes (Kronberger and Wagner 2000: 309).

	Specific vocabulary of class 2		Overlapping vocabulary		Specific vocabulary of class 3		
	food	*fruit*	*say*	*word j*	*Cure*	*cancer*	
Class 2	45	12	20	k_{2j}	0	0	K_2
Class 3	0	0	21	k_{3j}	33	20	K_3
	45	12	41	k_j	33	20	K

Classes 2 and 3 are optimally separate in that they have as little overlap in words as possible. "The numbers in the table (k_{2j}, k_{3j}) indicate the frequency of contextual units for each class containing a specific word *j*. In our example, class 2 consists of statements containing words like 'food' and 'fruit', while words like 'cancer' and 'cure' are typical for class 3. Of course, it will rarely be possible to separate statements such that words occurring in one class do not appear in the other. There will always be some overlapping vocabulary, like the word 'say' in the example" (Kronberger and Wagner 2000: 309).

The chi-squared procedure then establishes "out of all possible procedures" two classes that maximize the following criterion:

$$\chi^2 = k_2 k_3 \sum_{j \in J} \left[\left(\frac{k_{2j}}{k_2} - \frac{k_{3j}}{k_3} \right)^2 \div k_j \right], \text{ where}$$

$$k_{2j} = \sum_{i \in I_2} k_{ij}; k_2 = \sum_{i \in I_1} k_{2j}; k_j = k_{2j} + k_{3j}$$

APPENDIX II: EXAMPLES OF ECUS FROM 1990s HEARINGS

[Insert Tables A1 to A4, about here]

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[1] As an (important) example, Meltzer notes that he found no mention of the distinction between nominal and real interest rates in Federal Reserve minutes until late into the inflation period of the 1960s and 1970s. In contrast the Fed used an absolute standard of nominal rates to judge whether monetary policy was tight or loose.

[2] This was enacted by the Full Employment and Balanced Growth Act of 1978 (P.L. 95-523).

[3] Researchers are, however, increasingly employing automated content analysis software to analyze floor debates Quinn, K. M., B. L. Monroe, et al. (2006). An Automated Method of Topic-Coding Legislative Speech Over Time with Application to the 105th-108th U.S. Senate, Harvard University, University of Michigan, Michigan State University, University of Georgia.. Moreover, the

Congressional Hearings Data Set (http://www.policyagendas.org/) provides tabulated and coded information on hearings from 1947-2004, but it does not include verbatim transcripts, which are essential for textual analysis.

[4] Havrilesky's results suggest that Fed chairmen do not telegraph Fed policy intentions in their dialogue with Congress. But he does achieve statistical significance for a model whereby the concerns of senators help to explain the change in the Fed funds rate in the month after the hearing. A second finding from this work is that there has been little correlation between Senate and House state-of-the-economy concerns over time. Havrilesky suggests that this difference—whereby senators but not representatives are found to have a significant impact on the Fed funds rate one month ahead—reflects the veto power of the Senate over appointments to the Fed Board. This is consistent with Grier's finding that the liberal/conservative bias of the chairman of the House Banking Committee has no influence on the ease/tightness bias of monetary policy, in contrast to the chairman of the Senate Banking Committee.

[5] Borrowing from Quirk, deliberation may be defined as "the intellectual process of identifying alternatives, gathering and evaluating information, weighing considerations, and making judgments about the merits of public policies" Quirk, P. J. (2005). Deliberation and Decision Making. The Legislative Branch. P. J. Quirk and S. A. Binder. Oxford and New York, Oxford University Press**:** 314-348..

[6] The House hearings covered were in: February 1976, July 1976, February 1977, July 1977, February 1979, July 1979, November 1979, February 1980, July 1980, February1981, July 1981, July 1991, February 1992, July 1992, February 1993, July 1997, February 1998, July 1998, and February1999.

[7] The Senate hearings covered were in: May 1976, November 1976, May 1977, November 1977, February 1979, July 1979, February 1980, July 1980, February1981, July 1981, February 1991, February 1992, July 1992, February 1993, July 1997, February 1998, July 1998, and February1999. No Senate hearing was held in July 1991, so the February 1991 hearing was used instead.

[8] At the time of the July 1979 Senate hearing there was no Chairman of the Federal Reserve – Miller had resigned and Volcker had not been appointed. Governor Henry Wallich, the Vice Chairman of the Federal Reserve Board appeared. The July 1979 House hearing occurred before Miller's departure from the Fed.

[9] We do not use ideology scores since our methodology is not well-suited for interval data. We could collapse the ideology scores into quintiles, but given the overlap between party and ideology, it seemed more sensible to simply use party affiliation alone.

[10] For a recent showcase of these approaches in political science, see http://www.purpuras.net/apsagroup/.

[11] Examples of its application in the social sciences include: Noel-Jorand, M. C., M. Reinert, et al. (1995). "Discourse analysis and psychological adaptation to high altitude hypoxia." Stress Medicine **11**: 27-39, Lahlou, L. (1996). "A method to extract social representations from linguistic corpora." Japanese Journal of Experimental Social Psychology **36**: 278-291, Noel-Jorand, M. C., M. Reinert, et al. (1997). "A New Approach to Discourse Analysis in Psychiatry, applied to Schizophrenic Patient Speech." Schizophrenia Research **25**: 183-198, Allum, N. C. (1998). A Social Representations Approach to the Comparison of Three Textual Corpora Using Alceste. London, London School of Economics and Political Science, MSc Dissertation, Brugidou, M. (1998). ""Epitaphes, l'image de Francois Mitterrand à travers l'analyse d'une question ouverte posée à sa mort (Epitaphs, Francois Mitterrand's Image: An Analysis of an Open Question Asked on His Death)." Revue Française de Science Politique **48**(1): 97-120, Brugidou, M. (2003). "Argumentation and Values: An Analysis of Ordinary Political Competence Via An Open-Ended Question." International Journal of Public Opinion Research **15**(4): 413-430, Noel-Jorand, M. C., M. Reinert, et al. (2004). "Schizophrenia: The Quest for a Minimum Sense of Identity to Ward Off Delusional Psychosis." The Canadian Journal of Psychiatry **49**(6): 394-398, Schonhardt-Bailey, C. (2005). "Measuring Ideas More Effectively: An Analysis of Bush and Kerry's National Security Speeches." PS: Political Science and Politics **38**(3): 701-711, Schonhardt-Bailey, C. (2006). From the Corn Laws to Free Trade: Interests, Ideas and Institutions in Historical Perspective. Cambridge, MA, MIT Press, Schonhardt-Bailey, C. (2008). "The Congressional Debate on Partial-Birth Abortion: Constitutional Gravitas and Moral Passion." British Journal of Political Science **forthcoming**.

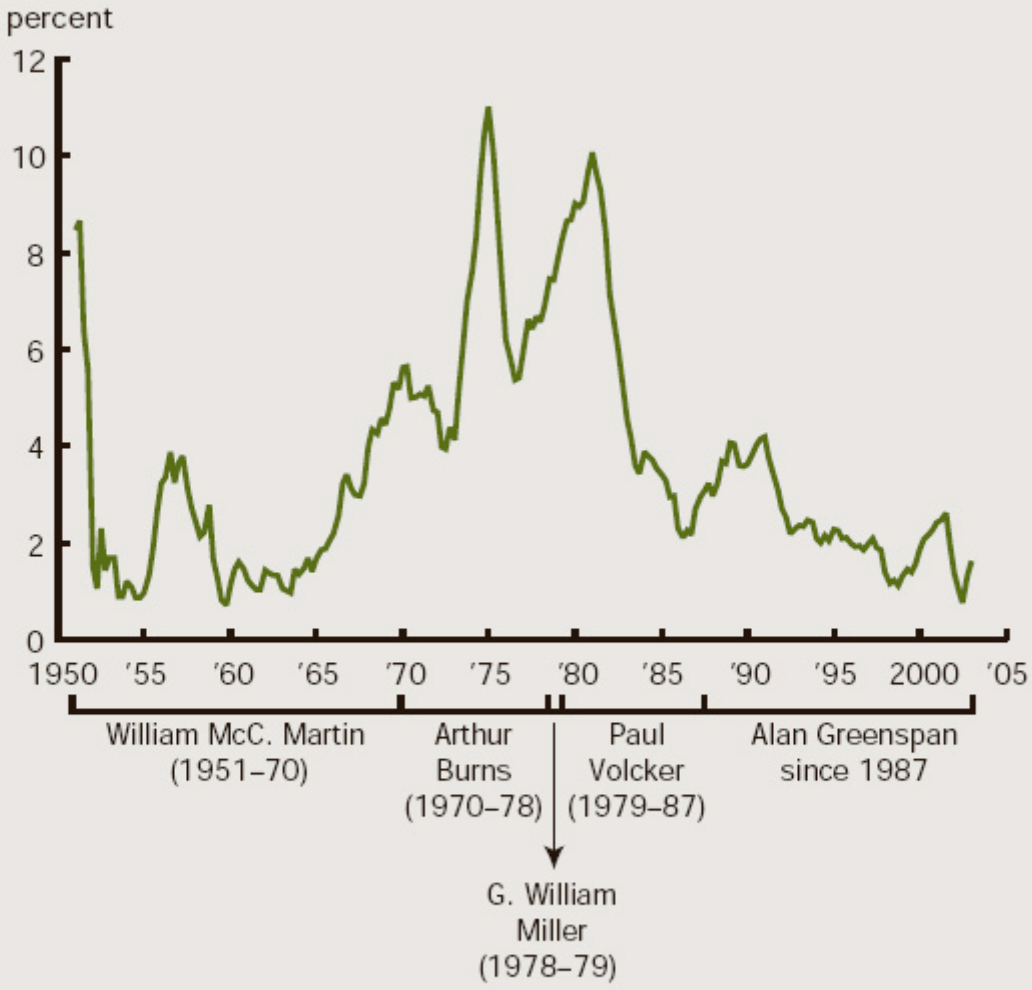
[12] Although subsequent versions may allow a larger corpus, Alceste 4.7 requires that the corpus not exceed 15 mb.

[13] Plurals and conjugation endings are reduced to a single form and nonce words are eliminated from the analysis. The leaves a smaller word count which is analyzed by the program.

[14] These are deemed "passive" as they do not contribute to either the calculation of the word classes or the factors in the correspondence analysis.
[15] These variables include a number of constituency characteristics, but space does not allow the presentation and discussion of these results. In future research, we intend to explore these data further.
[16] Popping notes that the ECU is akin to the "recording unit" used in other programs, where it is usually defined by the researcher Popping, R. (2004). email correspondence with author..
[17] A contextual unit is equivalent to one or more successive ECU(s). The two calculations are done with two different parameters for the selected number of words per contextual unit in order to check the reliability of the classes and the stability of the results.Reinert, M. (1998). ALCESTE users' manuel (English version). Toulouse, Image.
[18] The standard report lists the top 20 ECUs for each class, ranked by chi square association. However, a separate file is produced that lists all the ECUs for each class, where the default cut-off for selection is zero.
[19] This minimum value for word selection within Alceste varies from 2.13 to 20, with smaller text files tending toward the lower threshold and larger ones toward the high threshold. The basic rule of thumb with Alceste is (as with any statistical analysis)—the more data, the easier it is to attain statistical significance (hence larger text files have to attain a higher threshold to be statistically significant).
[20] For Alceste, "statements" are defined as "contextual units." The program automatically determines contextual units with reference to punctuation and the length of the statement up to a maximum of 250 characters.

FIGURE 1

Inflation in the U.S. economy



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Fig. 2: House Monetary Policy Hearings 1976-77: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

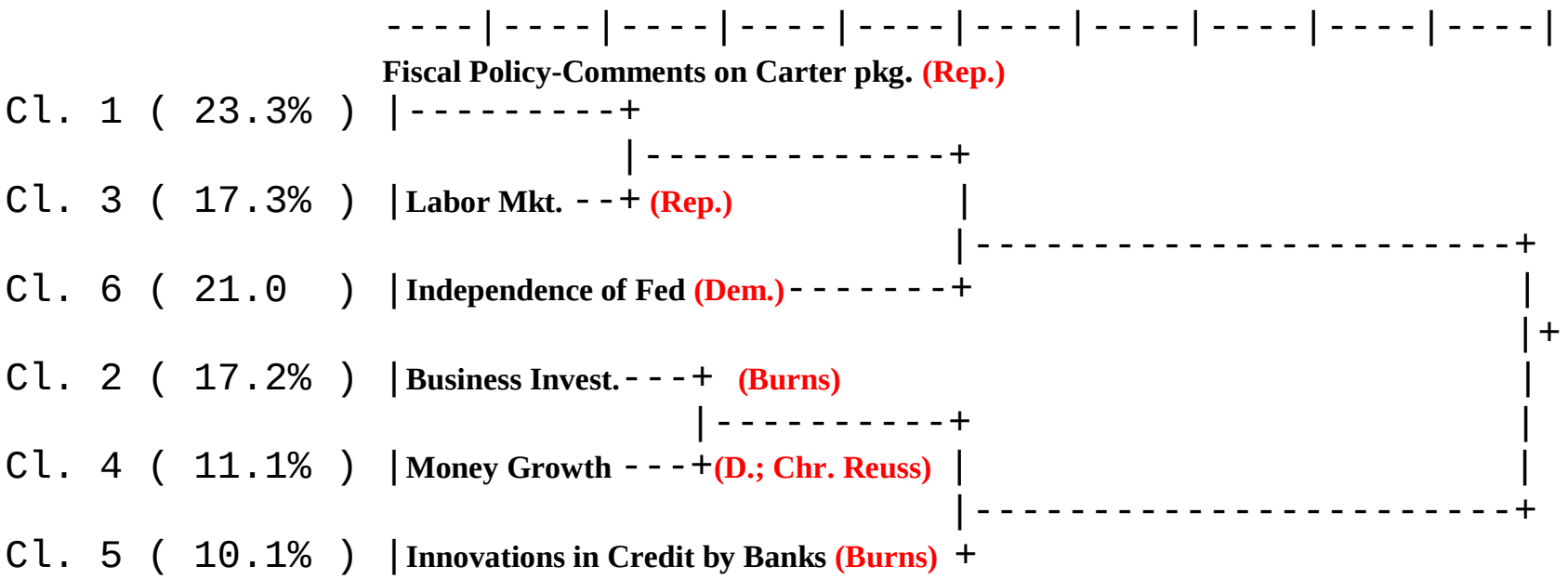


Fig. 3: Senate Monetary Policy Hearings 1976-77: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

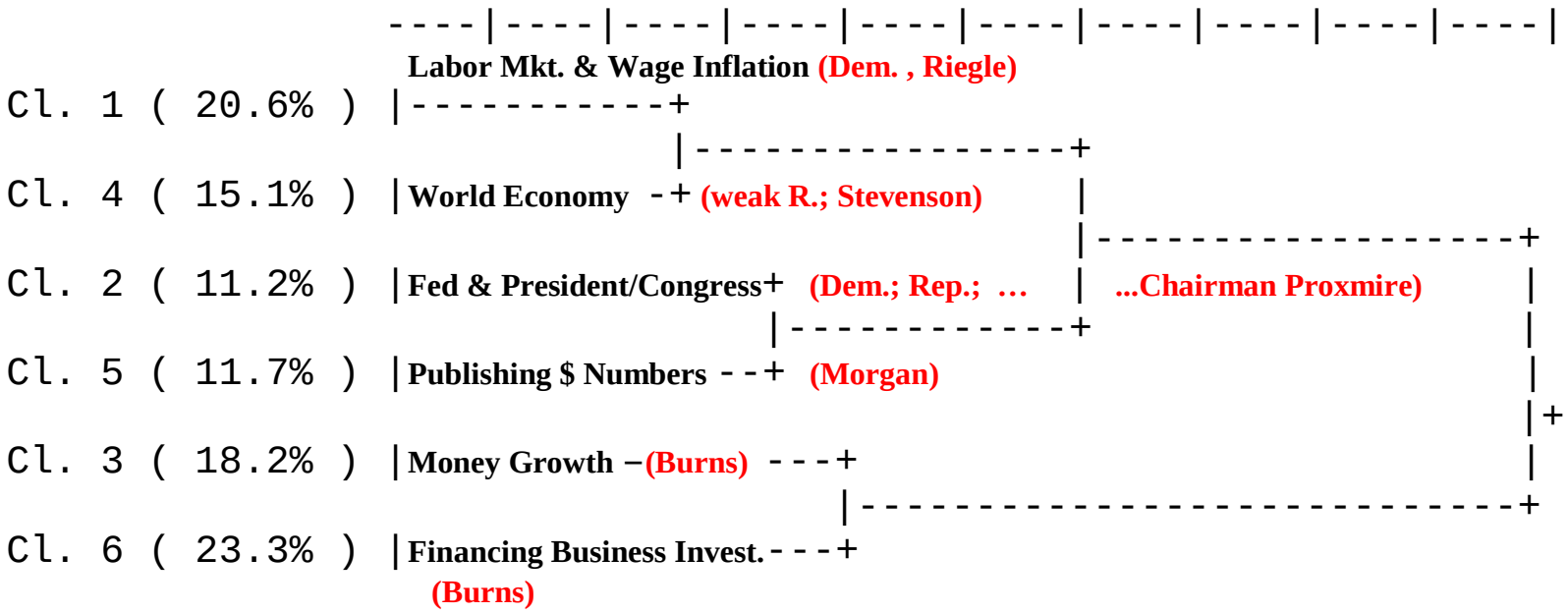


Fig. 4: House Monetary Policy Hearings 1979: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

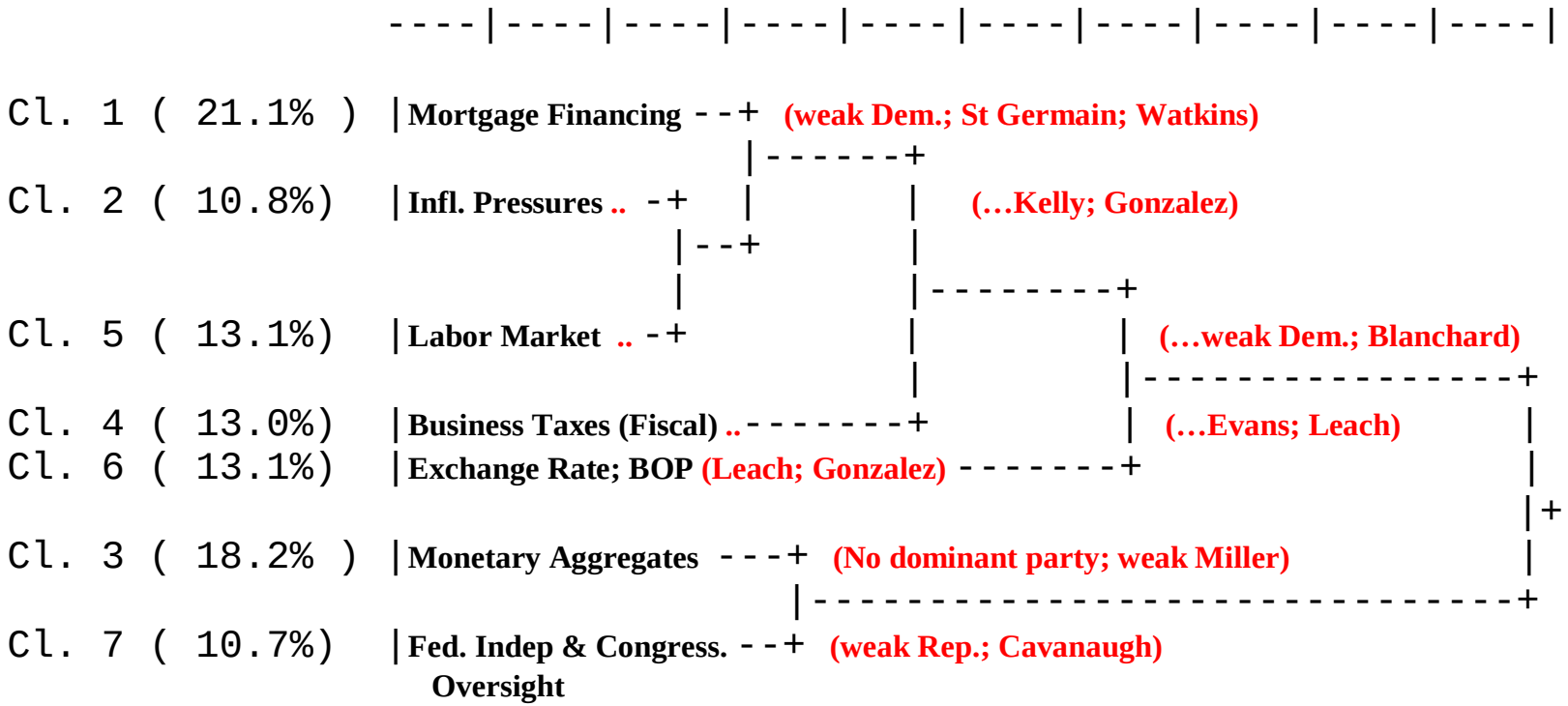


Fig. 5: Senate Monetary Policy Hearings 1979: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

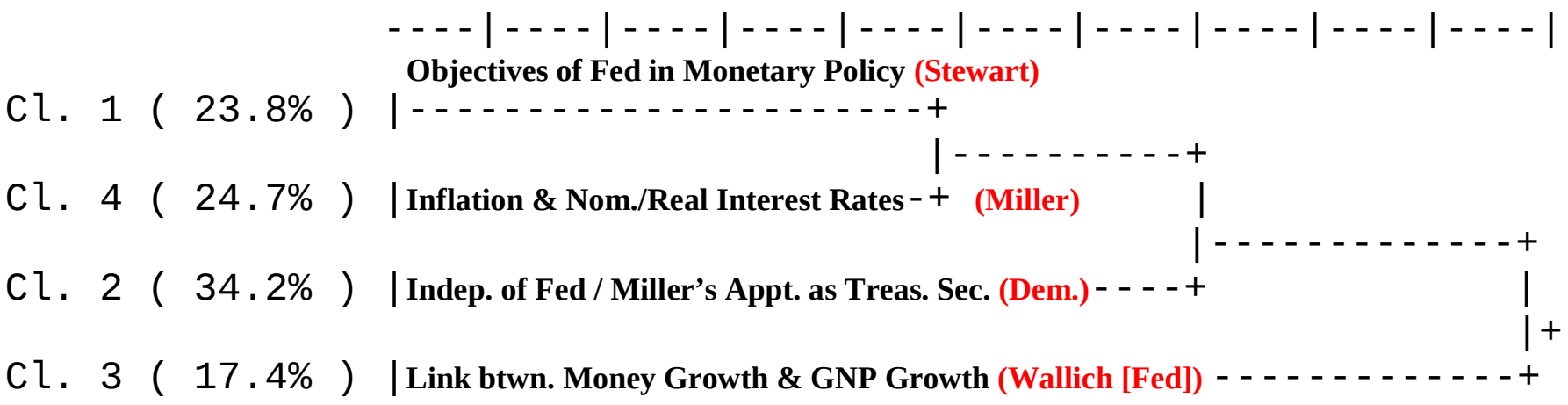


Fig. 6: House Monetary Policy Hearings 1979-81: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

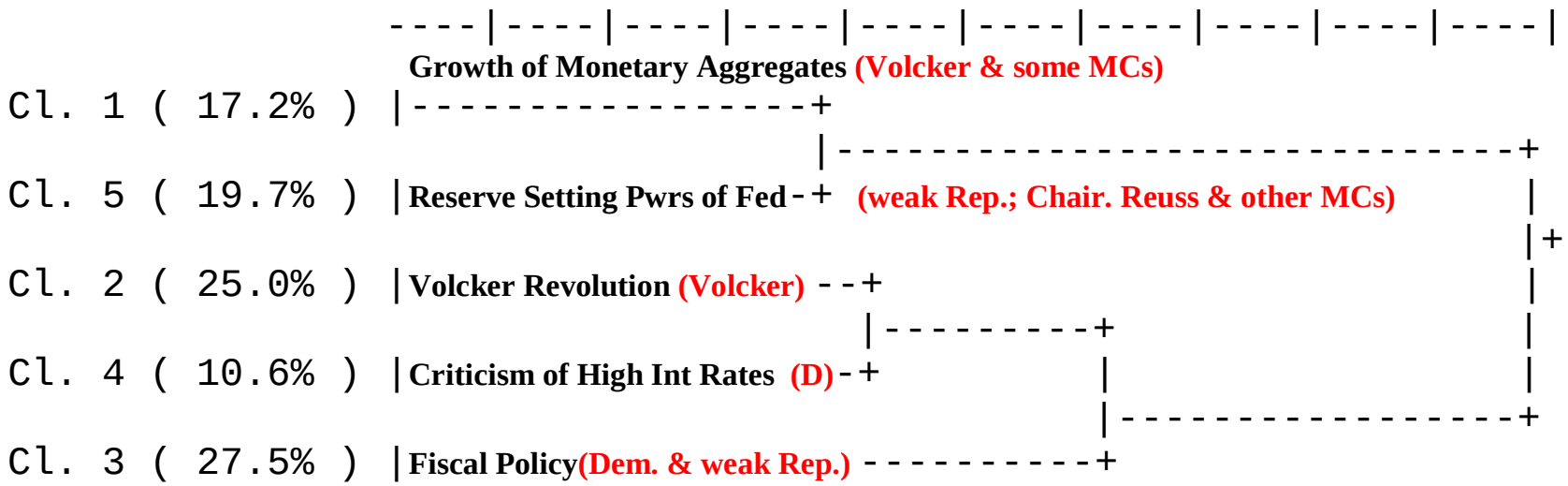


Fig. 7: Senate Monetary Policy Hearings 1980-81: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party in 1980; Republicans Majority in 1981)

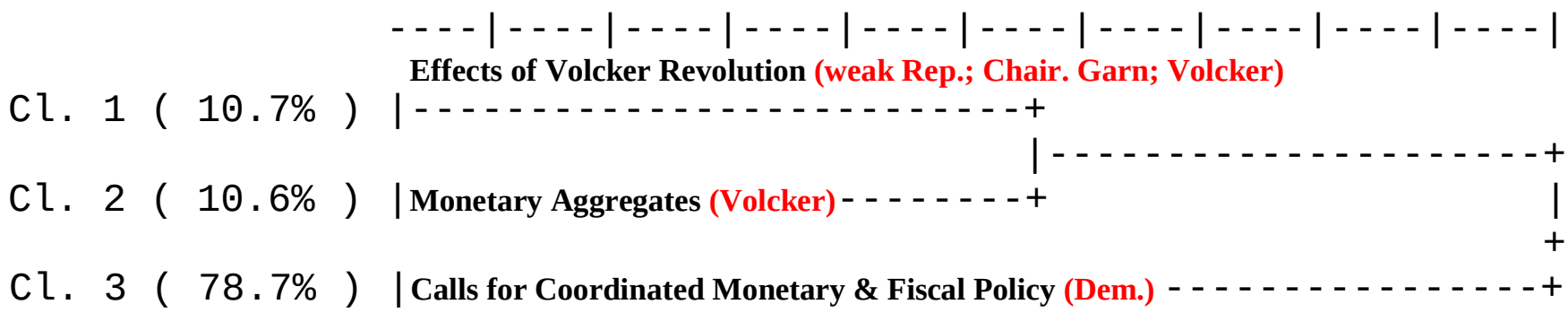


Fig. 8: House Monetary Policy Hearings 1991-93: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

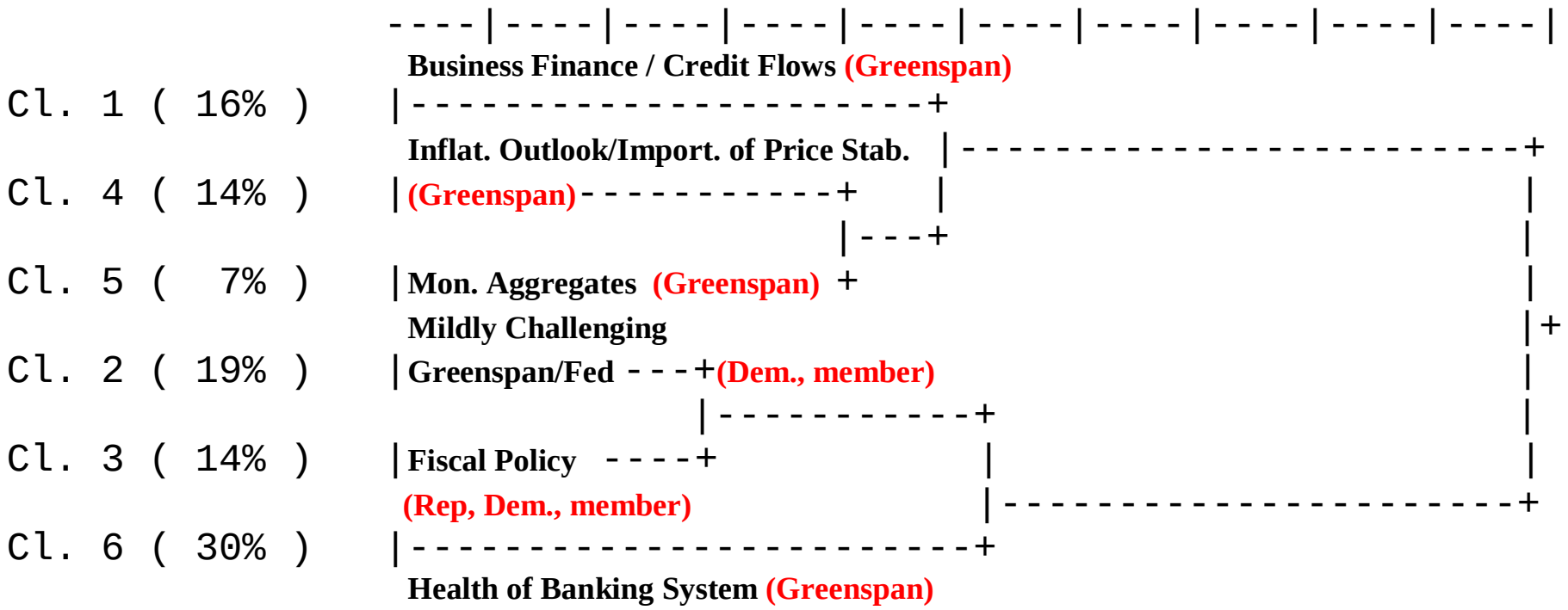


Fig. 9: Senate Monetary Policy Hearings 1991-93: Tree Diagram of Classes and Significant Tags for Each Class (Democrats as Majority Party)

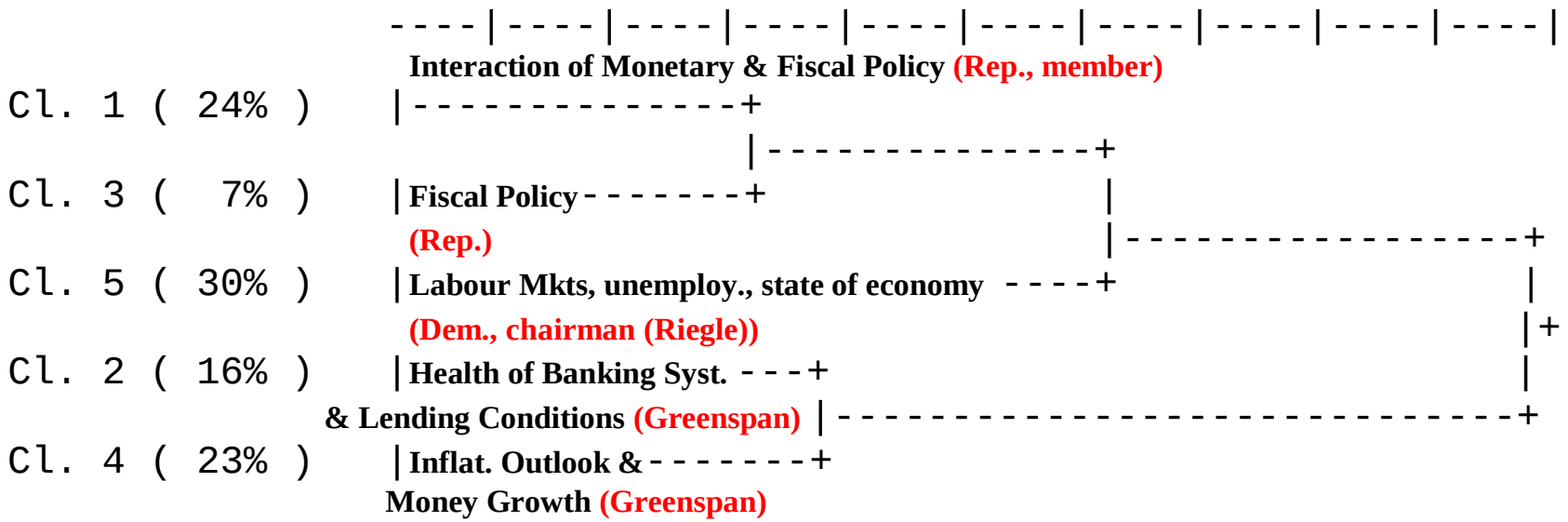


Fig. 10: House Monetary Policy Hearings 1997-99: Tree Diagram of Classes and Significant Tags for Each Class (Republicans as Majority Party)

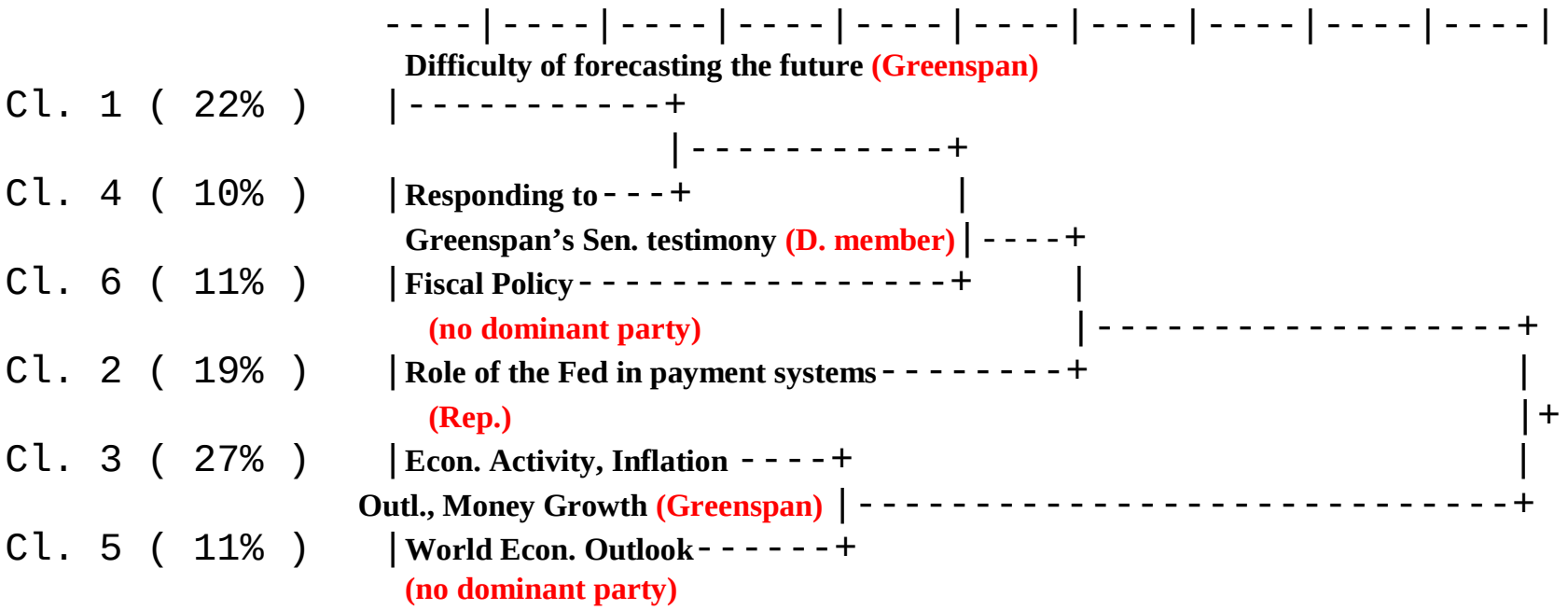


Fig. 11: Senate Monetary Policy Hearings 1997-99: Tree Diagram of Classes and Significant Tags for Each Class (Republicans as Majority Party)

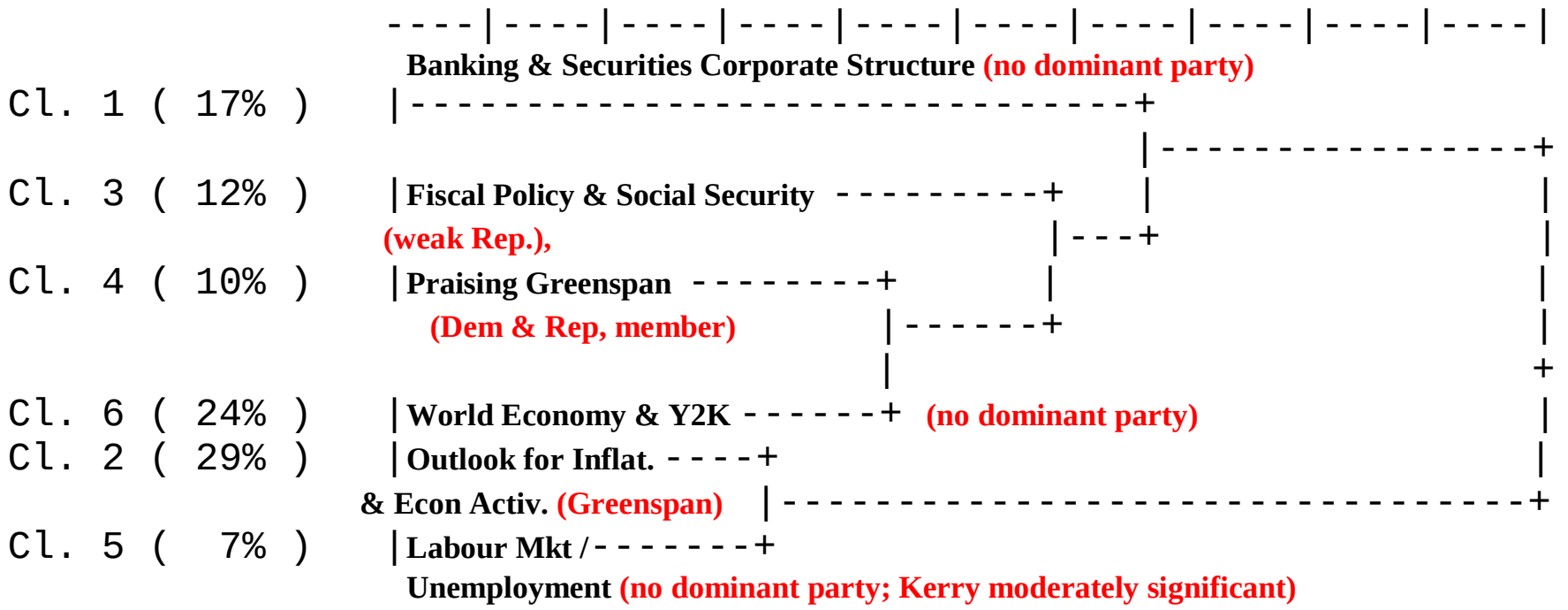


Table 1: Alceste Analysis: Basic Statistics for House and Senate Hearings on Monetary Policy (1976-1981)

	House Hearings, 1976-1977	**Senate Hearings, 1976-1977**	**House Hearings, 1979**	**Senate Hearings, 1979**
Total Word Count	86,429	65,186	35,288	28,667
Unique Words Analyzed	38,174	28,443	14,587	11,879
Passive Variables (Tagged Indicators)	74	49	55	27
I.C.U.s (= number of speeches / comments)	670	606	272	297
Classified E.C.U.s	1943 (= 77% of the retained E.C.U.)	1362 (= 70% of the retained E.C.U.)	664 (= 66% of the retained E.C.U.)	576 (= 65% of the retained E.C.U.)
Lexical Classes	6	6	7	4
Distribution of Classes (%) and Thematic Content	1 (23.3) *Fiscal Policy-Commentary on Carter pkg* 2 (17.2) *Business Investment & Capacity Utilization* 3 (17.3) *Labor Market – Criticism of Govt Intervention* 4 (11.1) *Money Growth & Aggregates* 5 (10.1) *Innovations in Money & Credit Behavior by Banks* 6 (21.0) *Independence & Structure of the Federal Reserve*	1 (20.6) *Labor Market & Wage Inflation* 2 (11.2) *Relations btwn Fed & President; btwn Fed & Congress* 3 (18.2) *Money Growth & Monetary Ranges* 4 (15.1) *Impact of World Economy & Oil Prices on US Economy & Inflation* 5 (11.7) *The Merits of Publishing Weekly Money Numbers* 6 (23.3) *Business Investment and Its Financing*	1 (21.1) *Mortgage Financing; Housing; Small Banks* 2 (10.8) *Inflation Pressures & Oil Prices* 3 (18.2) *Growth in the Monetary Aggregates* 4 (13.0) *Payroll & Business Taxes (Fiscal)* 5 (13.1) *Labor Market Policies (esp. for low paid)* 6 (13.1 *Exchange Rate; BOP & Foreign Currencies Borrowing by US* 7 (10.7) *Role of Fed in Monetary Policy (Indep. & Congressional Oversight)*	1 (23.8) *Objectives of Fed in Monetary Policy (& interaction w/ exchange rate & fiscal policy)* 2 (34.2) *Indep. Of Fed; Miller's appt. as Treasury Sec.* 3 (17.4) *Link btwn. Money/Credit Growth & GNP Growth* 4 (24.7) *Inflation and Nominal & Real Interest Rates*

Table 1: Alceste Analysis: Basic Statistics for House and Senate Hearings on Monetary Policy (cont.)

	House Hearings, 1979-1981	**Senate Hearings, 1980-81***
Total Word Count	132,397	94,643
Unique Words Analyzed	54,508	38,609
Passive Variables (Tagged Indicators)	92	40
I.C.U.s (= number of speeches / comments)	1215	965
Classified E.C.U.s	2964 (= 75 of the retained E.C.U.)	2610 (= 91% of the retained E.C.U.)
Lexical Classes	5	3
Distribution of Classes (%) and Thematic Content	1 (17.2) *Growth of Monetary Aggregates* 2 (25.0) *Volcker Revolution* 3 (27.5) *Fiscal Policy* 4 (10.6) *Criticism of High Int. Rates; Calls for Rate Cuts* 5 (19.7) *Reserve Setting Powers of Fed; Bank Liquidity*	1 (10.7) *Effects of Volcker Revolution (Tighter lending Conditions; Reduced Money Demand)* 2 (10.6) *Monetary Aggregates* 3 (78.7) *Calls for President/Congress/Fed to work together (Coordinated Monetary & Fiscal Policy to address Inflation)*

*** The Senate did not hold its usual November Hearing in 1979.**

Table 2: Alceste Analysis: Basic Statistics for House and Senate Hearings on Monetary Policy, 1990s

	House Hearings, 1991-1993	**Senate Hearings, 1991-1993**	**House Hearings, 1997-1999**	**Senate Hearings, 1997-1999**
Total Word Count	72,161	125,112	106,855	79,844
Unique Words Analyzed	31,892	53,984	44,561	37,804
Passive Variables (Tagged Indicators)	60	66	76	59
I.C.U.s (= number of speeches / comments)	510	819	669	398
Classified E.C.U.s	1556 (= 76% of the retained E.C.U.)	2842 (= 79% of the retained E.C.U.)	2002 (= 69% of the retained E.C.U.)	1751 (= 82% of the retained E.C.U.)
Lexical Classes	6	5	6	6
Distribution of Classes (%) and Thematic Content	1 (15.9) *Business Finance & Credit Flows* 2 (9.2) *Mildly Challenging Greenspan* 3 (13.5) *Fiscal Policy* 4 (13.8) *Inflation Outlook / Importance of Price Stability* 5 (7.1) *Monetary Aggregates* 6 (30.5) *Health of the Banking System*	1 (23.7) *Interaction of Monetary and Fiscal Policy* 2 (16.4) *Health of Banking System & Lending Conditions* 3 (6.8) *Fiscal Policy* 4 (23.4) *Inflation Outlook & Money Growth* 5 (29.8) *Labour Markets, Unemployment, State of the Economy*	1 (22.1) *Difficulty forecasting the future (uncertainty)* 2 (19.2) *Financial System (Role of Fed in Payment Systems)* 3 (26.8) *Economic Activity, Inflation Outlook, Money Growth* 4 (10.3) *Responding to Greenspan's Senate testimony (resisting rate increases)* 5 (11.1) *World Economic Outlook* 6 (10.5) *Fiscal Policy*	1 (17.4) *Banking & Securities Corporate Structure (Bank Regulation)* 2 (29.5) *Outlook for Inflation & Econ. Activity* 3 (12.3) *Fiscal Policy & Social Security* 4 (10.2) *Praising Greenspan* 5 (6.9) *Labour Market & Unemployment* 6 (23.7) *World Economy & Y2K*

Table 3: Thematic Classes for 1976-1977 Congressional Hearings, With Statistically Significant Tags for Party Affiliation and Fed Chairman

Classes for House Hearings, 1976-77	**Democratic Tag (with χ^2 value)**	**Republican Tag (with χ^2 value)**	**Burns Tag (with χ^2 value)**	**Other Tags (with χ^2 value)**
Fiscal Policy-Commentary on Carter pkg	* (4.0)	*** (37.5)		
Business Investment & Capacity Utilization			*** (149.1)	
Labor Market – Criticism of Govt Intervention		** (9.9)		
Money Growth & Aggregates	*** (20.4)			*** Chairman Reuss-D (129.6)
Innovations in Money & Credit Behavior by Banks			*** (29.0)	
Independence & Structure of the Federal Reserve	*** (56.1)			
Classes for Senate Hearings, 1976-77				
Labor Market & Wage Inflation	*** (92.9)	* (4.4)		*** Riegle-D (176.6)
Relations btwn Fed & President; btwn Fed & Congress	*** (40.3)	*** (12.3)		
Money Growth & Monetary Ranges			*** (28.0)	
Impact of World Economy & Oil Prices on US Economy & Inflation		* (4.0)		*** Stevenson-D (25.6)
The Merits of Publishing Weekly Money Numbers				*** Morgan-D (22.7) * Sparkman-D (4.1)
Business Investment and Its Financing			*** (74.6)	

Statistical Significance (df = 1)	χ^2 value
N.S.	< 2.71
10 %	< 3.84
5 % (*)	< 6.63
1 % (**)	< 10.80
< 1 % (***)	≥ 10.80

Table 4: Thematic Classes for 1979 Congressional Hearings, With Statistically Significant Tags for Party Affiliation and Fed Chairman

Classes for House Hearings, 1979	**Democratic Tag (with χ^2 value)**	**Republican Tag (with χ^2 value)**	**Miller/Wallich Tag (with χ^2 value)**	**Other Tags (with χ^2 value)**
Mortgage Financing; Housing; Small Banks	(2.9)			*** St Germain-D (38.) *** Watkins-D (14.2) *** Paul-R (10.8)
Inflation Pressures & Oil Prices				*** Kelly-R (15.7) ** Gonzalez-D (7.5)
Growth in the Monetary Aggregates			(3.7) [Miller]	
Payroll & Business Taxes (Fiscal)				*** Evans-R (11.3) ** Leach-R (8.9)
Labor Market Policies (esp. for low paid)	(3.5)			*** Blanchard-D (40.2)
Exchange Rate; BOP & Foreign Currencies Borrowing by US				*** Leach-R (39.8) * Gonzalez-D (5.5)
Role of Fed in Monetary Policy (Independence & Congressional Oversight)		(2.2)		*** Cavanaugh-D (23.5)
Classes for Senate Hearings, 1979				
Objectives of Fed in Monetary Policy (& interaction w/ exchange rate & fiscal policy)				*** Stewart-D (18.2)
Independence of Fed; Miller's appointment as Treasury Secretary	*** (22.6)			
Link between Money/Credit Growth & GNP Growth			*** (60.0) [Wallich]	
Inflation and Nominal & Real Interest Rates			** (9.3) [Miller]	

Tags given for individual members only for those classes in which neither party affiliation nor Fed Chairman is a dominant tag, or where one individual's tag is unusually significant. Levels of statistical significance are the same as for Table 3.

Table 5: Thematic Classes for 1979-81 Congressional Hearings, With Statistically Significant Tags for Party Affiliation and Fed Chairman

Classes for House Hearings, 1979-81	**Democratic Tag (with χ^2 value)**	**Republican Tag (with χ^2 value)**	**Volcker Tag (with χ^2 value)**	**Other Tags (with χ^2 value)**
Growth of Monetary Aggregates			*** (20.5)	*** Stanton-R (20.1) *** Hansen-R (16.1)
Volcker Revolution			*** (109.4)	
Fiscal Policy	*** (21.3)	** (7.9)		
Criticism of High Int. Rates; Calls for Rate Cuts	*** (80.3)			*** Watkins-D (279.7)
Reserve Setting Powers of Fed; Bank Liquidity		** (8.8)		*** Chairman Reuss-D (125.9) *** McCollum-R (42.3) *** Wortley-R (26.9)
Classes for Senate Hearings, 1980-81				
Effects of Volcker Revolution (Tighter lending Conditions; Reduced Money Demand)		* (4.3)	*** (11.2)	** Chairman Garn-R (10.5)
Monetary Aggregates			*** (39.1)	
Calls for President/Congress/Fed to work together (Coordinated Monetary & Fiscal Policy to address Inflation)	*** (71.2)			*** Riegle-D (60.6)

Tags given for individual members only for those classes in which neither party affiliation nor Fed Chairman is a dominant tag, or where one individual's tag is unusually significant. Levels of statistical significance are the same as for Table 3.

Table 6: Thematic Classes for 1991-1993 Congressional Hearings, With Statistically Significant Tags for Party Affiliation and Greenspan

Classes for House Hearings, 1991-1993	**Democratic Tag (with χ^2 value)**	**Republican Tag (with χ^2 value)**	**Greenspan Tag (with χ^2 value)**
Business Finance & Credit Flows			*** (118.8)
Mildly Challenging Greenspan	*** (225.4)	*** (19.5)	
Fiscal Policy	*** (36.6)	*** (122.9)	
Inflation Outlook / Importance of Price Stability			*** (31.2)
Monetary Aggregates			*** (41.8)
Health of the Banking System			*** (48.0)
Classes for Senate Hearings, 1991-1993			
Role of Fed vis-à-vis Congress	* (6.3)	*** (33.3)	
Health of Banking System			*** (126.7)
Fiscal Policy		*** (190.6)	
Inflation Outlook & Money Growth			*** (522.1)
Labour Markets, Unemployment, State of Economy	*** (498.2)		

Statistical Significance (df = 1)	χ^2 value
N.S.	< 2.71
10 %	< 3.84
5 % (*)	< 6.63
1 % (**)	< 10.80
< 1 % (***)	≥ 10.80

Table 7: Thematic Classes for 1997-99 Congressional Hearings, With Statistically Significant Tags for Party Affiliation and Greenspan

Classes for House Hearings, 1997-1999	**Democratic Tag (with χ^2 value)**	**Republican Tag (with χ^2 value)**	**Independent Tag (Bernie Sanders) (with χ^2 value)**	**Greenspan Tag (with χ^2 value)**	**Other Tags (with χ^2 value)**
Difficulty forecasting the future (uncertainty)				*** (16.4)	
Financial System	* (4.5)	*** (77.9)	** (8.1)		
Economic Activity, Inflation Outlook				*** (182.1)	
Responding to Greenspan's Senate testimony	*** (202.6)		*** (18.2)		
World Economic Outlook				** (7.1)	*** Hinchley-D (22.9) *** Lucas-R (20.1) *** Vento-D (15.4)
Fiscal Policy		(3.3)			*** Bentsen-D (35.8) *** Cook-R (17.1) *** Kanjorski-D (45.4) *** McCollum-R (45.4) *** Royce-R (27.6)
Classes for Senate Hearings, 1997-1999					
Banking & Securities Corp. Structure				* (4.6)	*** D'Amato-R (12.3) *** Reed-D (16.5)
Outlook for Inflation & Econ. Activity				*** (127.6)	
Fiscal Policy & Social Security		*** (13.3)			*** Allard-R (53.3) *** Bayh-D (35.2) *** Crapo-R (13.0) *** Grams-R (31.9) *** Moseley-Braun-D (32.5)
Praising Greenspan	*** (115.8)	*** (115.6)			
Labour Market & Unemployment					*** Kerry-D (30.6) *** Moseley-Braun-D (10.0)
World Economy & Y2K					** Bennett-R (14.8) * Dodd-D (6.2) * Schumer-D (6.2)

Tags given for individual members only for those classes in which neither party affiliation nor Greenspan are dominant tags. Levels of statistical significance are the same as for Table 3.

Table 8: Summary of Major Themes and Significant* Party and Federal Reserve Chairman Tags (1976-1999)

Major Themes in Congressional Hearings, Summarized	**1976-1977 (Burns)**		**1979 (Miller)**		**1979-1981 (Volcker)**		**1991-1993 (Greenspan)**		**1997-1999 (Greenspan)**	
	House	*Senate*	*House*	*Senate*	*House*	*Senate*	*House*	*Senate*	*House*	*Senate*
1. Inflation (U.S.)				**F**	**F/D**	**F**	**F**	**F**	**F**	**F**
2. U.S. Economy-Output	**F**	**F**					**F**		**F**	**F**
3. Labor Market / Unemployment	**R**	**D**						**D**		
4. Money Growth / Aggregates	**D**	**F**		**F**	**F**	**F**	**F**			
5. Financial System / Banks	**F**				**R**		**F**	**F**	**R**	
6. Fiscal Policy	**R**				**D/R**		**D/R**	**R**		**R**
7. Interaction of Monetary & Fiscal Policy						**D**		**R**		
8. Independence of the Fed – Relations between Fed/Congress/Administration	**D**	**D/R**		**D**						
9. Appraising the Fed Challenging the Fed Praising the Fed							**D/R**			**D/R**
10. World Economy (Impact on U.S.)									**F**	

* Tags for which χ^2 value is greater than 10.8 with 1 df (significance of at least 1%)—excluding the one Independent Tag for Bernie Sanders. D=Democrat; R=Republican; and F=Federal Reserve Chairman.
Classes in red (classes 1, 2, 3 and 4) are linked in terms of word and sentence overlap, as are classes in blue (8 and 9).

Table 9: Distribution of Major Themes Within Each Set of Congressional Hearings* (1976-1999)

Major Themes in Congressional Hearings, Summarized	1976-1977 (Burns)		1979 (Miller)		1979-1981 (Volcker)		1991-1993 (Greenspan)		1997-1999 (Greenspan)	
	House	*Senate*	*House*	*Senate*	*House*	*Senate*	*House*	*Senate*	*House*	*Senate*
1. Inflation (U.S.)			**11**	**25**	**25**	**11**	**14**	**23**	**27**[@]	**29**[@]
2. U.S. Economy-Output	**17**	**24**					**16**			**7**
3. Labor Market / Unemployment	**17**	**21**	**13**					**30**		
4. Money Growth / Aggregates	**11**	**30**	**18**	**17**	**17**	**11**	**7**			
5. Financial System / Banks	**10**		**21**		**19**		**30**	**16**		**17**
6. Fiscal Policy	**23**		**13**	**24*** **	**28**		**14**	**7**	**11**	**12**
7. Interaction of Monetary & Fiscal Policy						**78**		**24**		
8. Independence of the Fed – Relations between Fed/Congress/Administration	**21**	**11**	**11**	**34**						
9. Appraising the Fed Chairman Challenging Greenspan Praising Greenspan					**11**		**19**			 **10**
10. World Economy (Impact on U.S.)		**15**	**13**						**11**	**24**
11. Other									**51**[+]	
TOTAL (= 100 except for rounding)	**99**	**101**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**99**

* Defined as the share of retained ECUs that are classified into each theme (links with rows 5 and 7 of Tables 1 and 2).
[@] Covers money, economic activity, and inflation.
[***] [Interpretation required here]
[+] Greenspan on the difficulty of forecasting the future and responding to Greenspan's Senate testimony; role of the Fed in payments systems.
Classes in red (classes 1, 2, 3 and 4) are linked in terms of word and sentence overlap, as are classes in blue (8 and 9).

Table 10: Share of Classified ECUs by Party and Fed Chairman (where party or Fed Chairman is statistically significant) * (1976-1999)

Major Themes in Congressional Hearings, Summarized	**1976-1977 (Burns)**		**1979 (Miller)**		**1979-1981 (Volcker)**		**1991-1993 (Greenspan)**		**1997-1999 (Greenspan)**	
	House	*Senate*	*House*	*Senate*	*House*	*Senate*	*House*	*Senate*	*House*	*Senate*
Share of themes for which **Democrats** dominate discussion	**32**	**21**		**34**	**11**	**78**		**30**		
Share of themes for which **Republicans** dominate discussion	**40**				**20**			**31**		**12**
Share of themes for which **Democrats and Republicans** are both significant in the discussion		**11**			**28**		**33**			**10**
Share of themes for which the **Fed Chairman** dominates discussion	**27**	**42**		**42**	**42**	**22**	**67**	**39**	**38**	**36**
TOTAL of Democrats, Republicans and Federal Reserve Chairman (all of the above)	**100**	**74**	**0**	**76**	**100**	**100**	**100**	**100**	**38**	**58**
TOTAL of Democrats, Republicans, Democrats/Republicans combined—but not the Federal Reserve Chairman	**72**	**32**	**0**	**34**	**59**	**78**	**33**	**61**	**0**	**22**
President's Political Party	**Democrat**		**Democrat**		**Dem. … Rep.**		**Rep. … Dem.**		**Democrat**	
Majority Party in Congress	**Dem.**	**Dem.**	**Dem.**	**Dem.**	**Dem.**	**Dem.1980 Rep.1981**	**Dem.**	**Dem.**	**Rep.**	**Rep.**

* Party / Fed Chairman tags for which χ^2 value is greater than 10.8 with 1 df (significance of at least 1%)—excluding the one Independent Tag for Bernie Sanders. Hence, themes for which neither party nor fed chairman tags are significant are not included (e.g., where the discussion is spread fairly evenly across party lines), and thus columns do not necessarily sum to 100.

Table A1: House Hearings on Monetary Policy, 1991-1993: Examples of Most Typical ECUs in each Class

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
1 Business Finance & Credit Flows		69 (1)	#large #firms, #especially those with good #credit ratings, have preferred #bond #markets over #banks as a place to #borrow. meanwhile, #households, feeling the #strain of #debt #service #burdens, have rechannelled #cash #flows away from #retail #deposits to the #repayment of #consumer #debt at #banks and other #lenders. (Greenspan)
1		50 (2)	#together, these #supply and #demand factors have #accelerated a long/ standing #process of rechannelling #credit #flows #outside #depository #institutions. with #reduced needs to #fund #asset growth, #banks and #thrifts have #bid less vigorously for #deposits, as can be #observed in the very low #returns on such #instruments. (Greenspan)
2 Mildly Challenging Greenspan		37 (5)	regardless of the economic consequences that that might #bring after #november. so my first #series of #questions is related #to that. I am not #going #to #ask you how you are #going #to #respond #to whatever pressure may or may not be #brought, obviously. I can just #say that I #hope you will #resist those #kinds of pressures as you and other #fed #chairman have done in the past. (Rep. Schumer, D-NY)
2		36 (8)	oh, #mr. #chairman. as much as I like you, I must respectfully #disagree. there is no #empirical #evidence #to back #up that #statement. #absolutely none. (Rep. Roth, R-WI)
3 Fiscal Policy		54 (1)	we have a #spending problem, #nothing else. but look at what will happen #under this #plan: according to an #analysis #presented by the #american #enterprise institute, in #fiscal year 1994 the #clinton #plan will #raise 36 #billion #dollars in new #taxes while #cutting just 3. (Rep. Ridge, R-PA)
3		49 (4)	and we are not quite so good at it on this #side of the #table. #share with us how #taxes #impact on the economy, but also how #cuts #impact on the economy. (Rep. Fingerhut, D-OH)

Table A1: House Hearings on Monetary Policy, 1991-1993: Examples of Most Typical ECUs in each Class, continued

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
4 Inflation Outlook & Importance of Price Stability		54 (1)	even as the #anticipated strengthening of #economic #activity occurs, #monetary #policy will #continue to #promote #ongoing #progress #toward the #longer #run objective of #price #stability, which should #lay the #foundation for #sustained #economic #expansion. (Greenspan)
4		44 (2)	that will be #necessary to #achieve a decent #economic #recovery and will not #endanger reasonable, responsible #progress #toward #price #stability #over the next few years. the #trick will be to engineer this #modest #monetary #expansion with discretion and not overdo it and keep the #longer #term #trend of m2 growth on a #path #consistent with #price #stability and #economic growth and its #potential. (Rep. Neal, Committee Chair, D-NC)
5 Monetary Aggregates		100 (1)	#interpreting this #slow #growth was one of the major challenges faced by the federal reserve #last #year. you may #recall that in #establishing the #ranges in #february and reviewing them in #july, the committee took #note of the substantial #uncertainties #regarding the #relationships between #income and #money in 1992. (Greenspan)
5		89 (2)	an #aggregate whose #relationship with #nominal #gdp has been less distorted in the #last few #years than that of the monetary #aggregates. significant #uncertainties #regarding the #appropriate #ranges of monetary #growth remain. (Greenspan)
6 Health of the Banking System		54 (1)	there are #lots of #problems in the construction of #securitization of #small #business #loans, which I #suspect appropriate legislative #vehicles can possibly #eliminate. I do not know enough about some of the #detailed #legal #aspects at this #particular #stage, but I am #aware that we did facilitate the #secondary markets in mortgages by #certain #legal #changes which inhibited the form in which these #securities could be #issued. (Greenspan)
6		36 (4)	all we could do, very #specifically, was #endeavor to #try to #find #means to #ease #specific #problems for #specific banks, but whenever we are #dealing with a #regional #problem, (Greenspan)

Table A2: Senate Hearings on Monetary Policy, 1991-1993: Examples of Most Typical ECUs in each Class

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
1 Interaction of Monetary and Fiscal Policy		42 (1)	I #hope so. I #think it would be #useful to be #able to do that but I_m awaiting the #views of the president, the administration, and the bipartisan #leadership of the #congress with #respect to what #type of assignment they would like us to #pursue. (Greenspan)
1		29 (9)	my #question to you, how do you see your role in terms of bringing #together all these disparate #impacts on our #monetary and #fiscal #policy with #regard to the role that the #fed will #play? (Sen. Mosley-Braun, D)
2 Health of the Banking System		58 (1)	an #adequate #capital cushion is critical to maintaining the #safety and #soundness of #individual #banks and protecting the #deposit #insurance #fund from excessive #losses. A #significant #commitment of #capital from owner shareholders also #ensures that these #individuals will have #strong #incentives to oversee and #control the #risk taking #activities of #bank managers. (Greenspan)
2		58 (2)	to the #extent lower #funding #costs are passed on to #borrowers, they will #bolster the #demand for #loans. to the #extent they are #absorbed in #bank #profit #margins, these #lenders should be #encouraged to #extend more #credit. (Greenspan)
3 Fiscal Policy		83 (1)	the #total level of #revenues is 313 #billion #dollars of #new #taxes over a 5 year period. #defense is #cut by 187 #billion #dollars. #defense and #new #taxes #add up to 102 percent of #deficit #reduction. it is going to be #virtually impossible to #cut #defense any further at the end of this 5 year period and, in fact, at the end of 3 years, you_re going to have made the #big #defense #cuts. (Sen. Gramm, R-TX)
3		79 (2)	would we #help the economy if we #reformed #entitlements and dramatically reduced the federal #budget #deficit? I think the #answer is yes. what I think you can do here today is to #give us your views as to which of the two #paths america should take. one is to #raise #taxes and #raise #spending in #order to get america moving at a #faster pace. (Sen. Gramm, R- TX)

Table A2: Senate Hearings on Monetary Policy, 1991-1993: Examples of Most Typical ECUs in each Class, continued

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
4 Inflation Outlook & Money Growth		37 (1)	excluding volatile food and #energy #prices, #inflation #last #year was the #lowest in two #decades. although the #january #consumer #price #index was surprisingly #high, #judging from survey evidence and the #behavior of #long #term #interest #rates, #inflation #expectations #appear to be #gradually #diminishing, (Greenspan)
4		34 (2)	to #support these #favorable #outcomes for #economic #activity and #inflation, the #committee reaffirmed the #ranges for #m2, #m3, and #debt that it had selected on a tentative #basis #last #july that is, 2 1/ 2 to 6 1/ 2 #percent for #m2, 1 to 5 #percent for #m3, (Greenspan)
5 Labour Markets, Unemployment, State of Economy		40 (1)	in other #words, when you #started downwards. we #hit a point #down here about this is 12, 14 #months after the #peak. and then you #started back #up in these #previous #recessions, the #average, and so, at 22 #months #out here, they had more than #recovered the #jobs that had been #lost. (Sen. Sarbanes, D-MD)
5		37 (3)	I just #see too much slippage in the economy. I #see too many #job #eliminations. an #awful #lot of #people right now highly qualified, with #advanced #degrees in engineering and other #fields, #people coming #out of #college with #advanced #degrees, #can_t #find #work even though they look all over the #place. (Sen. Riegle, Committee Chairman, D-MI)

Table A3: House Hearings on Monetary Policy, 1997-1999: Examples of Most Typical ECUs in each Class

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
1 Difficulty forecasting the future (Uncertainty)		34 (1)	I #wish we #knew more about a-lot-of these #things. they #continuously change and we #continuously get proxies for what we #think #real money is and #find #out that this is not a #useful proxy. (Greenspan)
1		29 (3)	now, I do not #know yet, and I do not #think anyone has any #way of #really figuring #out #exactly how this is all #going to evolve. (Greenspan)
2 Financial System (Role of Fed in Payment Systems)		59 (1)	as #retail #electronic #payment #systems #evolve, non #banks may become significantly more #involved in #payment #system #operations than they are today. how would this development affect the #federal #reserve_s #role as the #central #bank for #settlement of inter #bank #payments? (Rep. Leach, Committee Chairman, R-IA)
2		45 (3)	most people would be surprised to learn that only 1600 of the 25, 000 #federal #reserve #employees are working in #monetary #policy. the rest are #involved in unrelated #services, such as the #transportation of #paper #checks. (Rep. Maloney, D)
3 Economic Activity, Inflation Outlook, Money Growth		41 (1)	#assuming #historically #typical #velocity #behavior. #last #year, these monetary #aggregates far overshot the #upper bounds of their #annual #ranges. while #nominal #gdp #growth did #exceed the #rate #likely #consistent with #sustained #price #stability, the #rapid #growth of #m2 and #m3 also #reflected outsized declines in their #velocities, that is, the #ratio of #nominal #gdp to money. (Greenspan)
3		38 (2)	and our #factories were #working more intensively too: industrial #production #increased 5 3/ 4 #percent #last #year, #exceeding #robust #additions to #capacity. those #gains were #shared #widely. the #hourly #wage and #salary structure #rose about 4 #percent, #fueling #impressive #increases in personal #incomes. (Greenspan)

Table A3: House Hearings on Monetary Policy, 1997-1999: Examples of Most Typical ECUs in each Class, continued

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
4 Responding to Greenspan's Senate testimony (resisting rate increases)		62 (3)	we/ see this #today in #mr. passell_s #article on the #front #page of the new #york/ #times. basically what we are told is there may well be too much/ employment in this #country. (Rep. Frank, D-MA)
4		52 (6)	as I said, some of the #press #interpreted your #comments #yesterday and then your #comments #today they #seem to #sound like there is a #bias toward #raising interest rates. (Rep. Maloney, D)
5 World Economic Outlook		48 (1)	the #situation in #japan, however, remains a #significant concern. I am #confident that #officials in the other g7 #countries are prepared to #take the necessary measures to guard against a #sharp #economic #downturn that could #develop into #world #depression. (Greenspan)
5		45 (2)	the forces of #asian #restraint could well be #providing another, more direct #offset to inflationary impulses arising #domestically in the #united #states. in the wake of #weakness in #asian #economies and of lagged #effects of the #appreciation of the dollar more generally, the dollar prices of our non #oil #imports are likely to decline further in the #months #ahead. (Greenspan)
6 Fiscal Policy		51 (1)	and #republicans would increase a little bit #military #spending. but isn_t it #true that, macroeconomically, the notion of #putting 60 percent aside for #social #security is the equivalent of #reducing the #deficit, and then expanding ira_s is the equivalent of a #tax #cut? (Rep. Leach, Committee Chairman, R-IA)
6		51 (2)	so that the #question really gets #down to, in a period such as we are now in, #reducing the #debt because we need increased #savings. I shouldn_t #argue that that would not become #private #savings. it might if you basically #cut #taxes. I am not #sure about that. (Greenspan)

Table A4: Senate Hearings on Monetary Policy, 1997-1999: Examples of Most Typical ECUs in each Class

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
1 Banking & Securities Corporate Structure (Bank Regulation)		76 (1)	in #addition, the #holding #company #structure best #protects #insured #depository #institutions and the #federal #safety #net from the #volatility of #merchant #banking #activities, prevents the #spread of the #federal #safety #net, and its #related #subsidy, (Greenspan)
1		69 (2)	the #board #believes #merchant #banking #activities should be #permitted through the #holding #company #structure, which #provides a more #effective shield against the #dangers of #mixing #banking and #commerce. (Greenspan)
2 Outlook for Inflation & Econ. Activity		46 (1)	for one, the #combination of continued #low inflation and stable to #rising/ domestic #profit #margins #implies quite #subdued growth in #total #consolidated unit/ #business #costs. with #labor #costs constituting more than two #thirds of those #costs and/ #labor #compensation per #hour #accelerating, #productivity must be #growing #faster, and/ that step #up must be #roughly in #line with the #increase in #compensation growth. (Greenspan)
2		40 (2)	the #economic #outlook these #recent #domestic and international #developments provide the backdrop for umited #states #economic #prospects. our #economy_s #performance should #remain #solid this #year, though #likely with a #slower #pace of #economic #expansion and a slightly #higher #rate of #overall #inflation than #last #year. (Greenspan)
3 Fiscal Policy & Social Security		37 (1)	the #current #projections of the #social #security #administration indicate #there_s a gap which would have #to be closed, either on the #revenue #side or on the #benefit #side. (Greenspan)
3		36 (2)	what, if anything, is the downside or danger #to #using the #surplus #to increase federal #government #spending rather than #to #pay #down the #debt, #save #social #security, or provide #tax #cuts? (Sen. Crapo, R-ID)

Table A4: Senate Hearings on Monetary Policy, 1997-1999: Examples of Most Typical ECUs in each Class, continued

Class		***Chi square association*** *(rank)*	***Selection of E.C.U.s representative of each class*** *(where # designates words that have been tagged with that class and all capitalization is omitted by the analysis)*
4 Praising Greenspan		67 (2)	#thank you, #chairman #greenspan, for being here and I #thank you for the service you_ve rendered to the #country. I #think your #policies have #absolutely #proven to have been correct, although there has been #criticism of them. (Sen. Faircloth, R-NC)
4		55 (3)	I also #want to add my #commendation to #chairman #greenspan for his steadfastness and understanding and the #important #role that he #plays in assuring people that the economy will #stay on an even keel, that there is a rock at the #fed. (Sen. Schumer, D)
5 Labour Market & Unemployment		81 (3)	thus, there would #seem to be emerging #constraints on #potential #labor #input. even before we #reach the #ultimate #limit of #sustainable #labor #supply growth, the economy_s ability to #expand #employment at the recent rate should rapidly #diminish. (Greenspan)
5		76 (4)	I was also struck by your #prepared testimony where you say that _there would #seem to be emerging #constraints on #potential #labor #input. even before we #reach the #ultimate #limit of #sustainable #labor #supply growth, the economy_s ability to #expand #employment at the recent rate should rapidly #diminish. (Sen. Kerry, D-MA)
6 World Economy & Y2K		37 (2)	#senator, you are quite #correct in #saying that this is a unique event and that we have no precedential capabilities of #evaluating it. I_m one of the culprits who #created this #problem. I used to write those programs back in the 1960_s and 1970_s, and was proud of the #fact that I was #able to #squeeze a few #elements of space #out of my program by not having to put a 19 before the year. (Greenspan)
6		37 (3)	I #know there are a number of people who have/ #raised the #issue that the #conversion to the #euro should be #delayed until the #y2k #problem has been #taken/ care of. (Sen. Bennett, R-UT)