Productivity growth has been surprisingly strong since the mid-1990s, producing rapid real income growth primarily for those in the upper half of the income distribution. And the large baby-boom generation has entered its peak earning years and appears to have strong preferences for large homes loaded with amenities." (FOMC 2005b: 11).

Consequently, Peach suggests, "home prices actually look somewhat low relative to median family income" (FOMC 2005b: 13).

Similarly, St. Louis Reserve Bank President William Poole only half-jokingly argues: "Just for the hell of it, I'd like to offer the hypothesis that property values are too low rather than too high" (FOMC 2005b: 57). House prices, in Poole's understanding, are a function of low real interest rates, which in turn reflect transformed fundamentals in the global economy. Poole concludes: "I offer those observations because, if we are in a world that is going to have much lower real rates of interest for some time to come, one would expect to see the price-to-rent ratio go up. Maybe this line in the chart has another 40 percent to go to get to equilibrium!" (FOMC 2005b: 58). Jeffrey Lacker, President of the Richmond Reserve Bank, concurs:

"It seems to me as if there are a lot of plausible stories one can tell about fundamentals that would explain or rationalize housing prices. Obviously, low interest rates have to top the list. Strong income growth among home owning populations would be on the list, as would land use restrictions, which were mentioned earlier, and the recent surge in spending on home improvement … So from that point of view, it's hard for me to see how it would be reasonable to place a great deal of certainty on the notion that housing is significantly overvalued, or that there's a bubble, or that it's going to collapse really soon." (FOMC 2005b: 62-63).

San Francisco Reserve Bank Senior Vice President John Williams was one of the few participants who unequivocally accepted the existence of a bubble. But even he conceded that "the magnitude of the current potential problem is much smaller than, and perhaps only half as large as, that of the stock market bubble [of the late 1990s]" (FOMC 2005b: 18).

Several participants did note the possibility that demand for securitized mortgage debt and the associated proliferation of novel mortgage products may be driving a bubble. Yet they remain skeptical of the idea. For instance, Janet Yellen, President of the San Francisco Reserve Bank, questions the notion that "creative financing" is producing a bubble:

"One view that I think is very prevalent is that the use of credit in the form of piggyback loans, interest-only mortgages, option ARMs [adjustable-rate mortgages], and so forth, involves financial innovations that are feeding a kind of unsustainable bubble. But an alternative perspective on that is that high house prices, in fact, are curtailing effective demand for housing at this point and that house appreciation probably is poised to slow. So the increasing use of creative financing could be a sign of the final gasps of house-price appreciation at the pace we've seen and an indication that a slowing is at hand." (FOMC 2005b: 36).

In sum, given the "real" supply and demand factors thought to be driving the housing market, most participants judge that evidence of a bubble is at best inconclusive and perhaps even non-existent. As Chicago Reserve Bank President Michael Moskow concludes, "I come away somewhat less concerned about the size and consequences of a housing bubble than I was before" (FOMC 2005b: 48).

Housing-Price "Correction"

Following this discussion of bubbles, housing markets stayed on the FOMC agenda, as indicated by the *Housing* topic, peaking in May 2007. By early 2006, Committee members are anticipating a "correction" in housing prices and an associated "cooling" in housing activity, but

This optimism was belied by incoming data. By August 2007, in the wake of renewed financial turmoil, the FOMC was forced to acknowledge that problems in the mortgage market had spread beyond subprime and that the CDO market was severely impaired. On September 18, 2007, a Committee member—Ben Bernanke himself—referred to the presence of a "financial crisis" for the first time (FOMC 2007c: 93).[20] In their presentations to the FOMC, staff also began to acknowledge the limitations of macroeconomic models for grappling with unfolding financial events. As staff economist David Stockton explained, also on September 18, "the financial transmission mechanisms in most of the workhorse macro models that we use for forecasting are still rudimentary. As a result, much of what has occurred doesn't even directly feed into our models" (FOMC 2007c: 20).

Despite these admissions, however, the FOMC adhered to its basic conceptual apparatus. For instance, participants continued to take heart from the "resiliency" of the underlying real economy. As Philadelphia Reserve Bank President Charles Plosser explained at the September 2007 meeting:

"The national economy looks more vulnerable to me than it did six weeks ago, but it would be a mistake—and I think Dave Stockton did an excellent job of reminding us—to count out the resiliency of the U.S. economy at this early stage. I think there can be a tendency in the midst of financial disruptions, uncertainty, and volatility to overestimate the amount of spillover that they will exert on the broader economy." (2007c: 47).

If their sectoral thinking led Committee members to minimize the economic risks posed by financial markets, their regional thinking led them to view these risks as geographically

[20] In retrospect, the FOMC would date the start of the financial crisis to August 2007, which marked a severe and sustained round of financial market turbulence associated with a collapse of confidence in the asset-backed commercial paper (ABCP) market.

dispersed. Plosser insisted on this fact as late as December 2007:

"based on such observations and the news that I hear from my District, I sense that the stresses in the economy vary significantly by region, and we must be mindful that the weaknesses on Wall Street are in those states that have exaggerated housing volatility and may not be representative of the rest of the economy." (FOMC 2007d: 56).

Once again, this optimism was premature. Conditions rapidly deteriorated in the winter of 2007-2008. By January 2008, Sandra Pianalto, President of the Cleveland Reserve Bank, was "detecting the first signals of a credit crunch" (FOMC 2008a: 76). By March, Mishkin could claim: "The reality is that we are in the worst financial crisis that we've experienced in the post-World War II era" (FOMC 2008b: 69). It was also in March 2008 that the staff's economic projections first forecasted a recession, albeit a mild one (FOMC 2008b: 14-16).

The FOMC's chief source of concern during the winter is the development of an "adverse feedback loop" whereby tightening credit conditions restrain economic activity, which further weakens financial markets and thus further tightens credit conditions (see FOMC 2008b: 69). At the same time, participants also begin to worry about the liquidity, and ultimately the solvency, of individual financial institutions. This concern is captured in the *Bank Liquidity* topic, which rises precipitously in the wake of the Bear Stearns collapse of March 2008.[21] As Federal Reserve Governor Kevin Warsh explains on March 18: "Over the past couple of weeks, not just in the episode with Bear Stearns, counterparty risk is becoming the dominant concern in markets. As has been pointed out around this table, it is increasingly difficult to separate liquidity issues from solvency issues." Warsh concludes: "Financial institutions, more broadly than financial markets,

[21] The *Bank Liquidity* topic is also associated with the short-term lending facilities established by the Federal Reserve in March 2008 to promote liquidity in the financial system: the Primary Dealer Credit Facility (PDCF) and the Term Securities Lending Facility (TSLF). Note that *pdcf* and *tslf* are both top words in this topic.

are having a hard time finding their way" (FOMC 2008b: 61).

From Financial Markets to Inflation Fears

By early 2008, then, the FOMC had managed to make the connection between housing and financial markets that they had missed at the start of the subprime deterioration. But just as external events forced these connections upon them, external events would turn their attention elsewhere. In the spring and summer of 2008, financial turmoil temporarily receded, at the same time as energy, food, and other commodity prices unexpectedly spiked. In consequence, beginning in April 2008 and continuing through the summer, many participants shifted focus away from financial markets to inflation. Inflation concerns are reflected in the *Bank Liquidity* topic itself, which includes such terms as *commodity*, *prices*, and *inflation* among its top words.

Dallas Reserve Bank President Richard Fisher spells out this shift in emphasis at the April 29-30 meeting:

"While there are many who have voiced concern with the adverse feedback loop that runs from the economy to tighter credit conditions and back to the economy, I am very troubled by a different adverse feedback loop—namely the inflation dynamic whereby restrictions in the fed funds rate lead to a weaker dollar and upward pressures on global commodity prices, which feed through to higher U.S. inflation."

Fisher concludes: "I believe the risk posed by inflation is more significant than the extension of further anemia in the economy" (FOMC 2008c: 54).

Some participants even begin to suggest parallels with the inflation environment of the 1970s. As Plosser warns in April 2008, "in the 1970s one of our mistakes was that we accommodated relative price shocks with very accommodative monetary policy, and in so doing helped convert a relative price shock into sustained inflation. I think we should be careful not to fall into that same trap" (FOMC 2008c: 107-108). To be sure, such claims are a source of conflict. Relative to the high levels of consensus that characterize the FOMC during much of our timeframe, the spring and summer of 2008 represent a period of contestation. Mishkin, for instance, chastises his colleagues for making inappropriate comparisons: "it's very important to emphasize that this is not the 1970s, and I really get disturbed when people point to that as a problem" (FOMC 2008c: 130).

Broadly speaking, the Board of Governors, along with the New York, Boston, and San Francisco Reserve Bank presidents, exhibit comparatively greater concern for financial markets and growth during this period, while most of the remaining presidents stress commodity prices and inflation. Of course, the former group exercises decision-making power although the latter is numerically stronger and thus dominates discussion, if not policy. Even official FOMC statements, however, maintain from April 2008 onward that inflation has reemerged as a risk roughly equaling the risks to growth. At least one member of the Board, Kevin Warsh, goes further. As Warsh insists on August 5, 2008, "my view is that inflation risks are very real, and that these risks are higher than growth risks" (FOMC 2008d: 84).

Thus a mere forty days before the failure of Lehman Brothers and ensuing stock market free fall, most participants maintain that the risks of financial collapse are no longer the Committee's major concern. Making standard reference to the economy's "resilience," Chicago Reserve Bank President Charles Evans summarizes a widely held viewpoint as of early August:

"One year on the economy has withstood the financial shock in a resilient fashion, especially given the add-on shock from oil. I don't know what more we could have hoped for from the vantage point of the fall of 2007" (FOMC 2008d: 107).

Indeed, the FOMC was hesitant to abandon this position even *after* Lehman Brothers filed for bankruptcy on September 15, 2008, the largest such filing in U.S. history. On the following day, at the regularly scheduled FOMC meeting, participants by and large downplayed the significance of the Lehman failure and the financial market turmoil it was causing. As Dennis Lockhart, President of the Atlanta Reserve Bank explained in his briefing, "my view on the national outlook for the economy has not changed materially since our August meeting" (FOMC 2008e: 29). In keeping with their macro-level indicators, Committee members sought to de-emphasize the implications of a single financial event for the real economy. Plosser explained the logic:

"While a lot of attention in the short run is being paid to financial markets' turmoil, our decision today must look beyond today's financial markets to the real economy and its prospects in the future. In this regard, things have not changed very much, at least not yet … I agree that recent financial turmoil may ultimately affect the outlook in a significant way, but that is far from obvious at this point." (FOMC 2008e: 38).

Richmond Reserve Bank President Lacker concurred: "Overall, I don't take what's happened in the last few days as changing much. It's not obvious to me what the implications are for the outlook for inflation and growth, at least at this point" (FOMC 2008e: 48).

Many participants simply reasserted the inflation narrative of previous months. Indeed, they expressed concerns that the visibility of short-term financial events would distract the FOMC from its commitment to long-term price stability. For instance, Thomas Hoenig, Kansas

City Reserve Bank President, implored the Committee “to look beyond the immediate crisis, which I recognize is serious. But as pointed out here, we also have an inflation issue” (FOMC 2008e: 31). Strikingly, the FOMC policy statement released on September 16, 2008 and presented at the beginning of this paper continued to suggest that the risks to growth and inflation were roughly equal.

Not all reactions to the Lehman bankruptcy were so sanguine. Boston Reserve Bank President Eric Rosengren insisted otherwise at the September 16 meeting: “The failure of a major investment bank, the forced merger of another, the largest thrift and insurer teetering, and the failure of Freddie and Fannie are likely to have a significant impact on the real economy” (FOMC 2008e: 30). Yet the extent of his alarm placed Rosengren in a distinct minority. Federal Reserve Governor Donald Kohn, himself one of the more growth-focused participants during the lead-up to September, better captured the Committee’s central tendency with his projection that “Activity is more likely to stagnate than to decline” (FOMC 2008e: 58).

Of course, all of this would change in a matter of days. By early October, the FOMC was coordinating a joint interest rate cut with the world’s major central banks. By the next regularly scheduled meeting, on October 28-29, Janet Yellen was arguing that “we are in the midst of a serious global meltdown” (FOMC 2008f: 68). Nonetheless, we can safely conclude that at no point prior to the last months of 2008 did the FOMC even remotely appreciate the depths or dangers of the financial crisis. Even after they came to grasp *that* housing and financial markets were intimately intertwined, they failed to recognize the *extent* of the risk that housing posed for financial markets and institutions. What is more, they failed to recognize the extent of the risk that financial markets and institutions posed for economic growth. In short, the FOMC continued to make sense of economic life in terms of two conceptually distinct and largely independent spaces: the “financial” and the “real” economies.

Conclusions

Our use of topic models coupled with a more conventional form of textual analysis demonstrates quite clearly the power of culture in shaping actors’ ability to make sense of the external world. The backgrounds of the participants, the words they use to frame their arguments, even their measurement instruments all affect their interpretation and construction of reality, as sociologists maintain (Bourdieu and Wacquant, 1992; Goffman, 1979; Callon, et al., 2007; Weick, 1995). The fact that the group of experts whose job it is to make sense of the direction of the economy were more or less blinded by their assumptions about how that reality works, is a sobering result.

It is useful to return to our theoretical discussion. We have provided clear evidence to support the importance of culture and sense-making in decision making. We have shown how the background and training of actors attempting to interpret what is going on in some outside world profoundly limit the issues they examine and cause them to miss connections between things. Perhaps, our most important contribution to the study of culture and sense-making is methodological. Used in conjunction, topic modeling and a close reading of texts provide a powerful weapon with which to demonstrate the role of culture in shaping social perceptions and actions.

Our case study of the FOMC adds evidence that under the right circumstances, professional experts can have a wide degree of autonomy in analyzing policy situations and making decisions. The FOMC is clearly on one end of a spectrum whereby professional experts can exert their authority. It engages in arcane policy making in an avowedly apolitical fashion (Brint, 1990). In this way, it resembles agencies like the International Monetary Fund (Chwieroth, 2010) more than the large-scale political projects that brought neoliberal policies to some countries but not others (Fourcade-Gourinchas and Babb, 2004). That there was little or no pushback within the FOMC or in the broader financial community about how the FOMC was analyzing the economy up to the crisis shows how dominant and legitimate the macroeconomists at the FOMC were.

What is even more surprising is that in the wake of the failure of the Federal Reserve to foresee the crisis, there has been relatively little real push for change in the way that the Federal Reserve operates. Part of this is certainly due to the fact that the Federal Reserve quickly changed its position once it was clear that the crisis had started and acted effectively to prevent another Great Depression (Blinder, 2013). If anything, the Federal Reserve's power has expanded in the wake of the crisis due to the Dodd-Frank Act, and its use of macroeconomic tools to judge the state of the economy has not changed very much at all. This reflects two facts. First, there is no articulated alternative to macroeconomics as a basis for economic forecasting. Second, economists remain firmly in control of the main levers of the Federal Reserve suggesting that even if an alternative existed, it would be highly unlikely to gain adherents in the FOMC. This shows the remarkable resilience of a professional elite who clearly failed in their central mission, a resilience that is due to their control over the levers of power and their claim on arcane knowledge.

Our case study expands the purview of the literature on economists and their performativity in markets. The demonstration that economic policymakers create “market devices”—or more plainly, use economic tools—to engage in sense-making is a useful addition to the literature (Hirschman and Berman, 2014). Such devices help policymakers decide what to do by giving them tools to evaluate uncertain environments. They also provide them with justifications for action and help them manage the expectations of communities like the financial markets. The idea of a “market device” is a sub category of a broader notion that people borrow cultural tools all of the time to guide them in their interactions. So, for example, the use of network analysis, invented by anthropologists and sociologists in the 1960s and 1970s, has been taken over by corporations to create social networks in order to sell products. This is clearly a case of using cultural tools invented for one purpose and turning them into a marketing tool.

Our paper also provides an ironic twist to the problem of the performativity of economics. The performativity literature seeks to show how economists using economic models make markets in their own image. In our case, the economic training and the models they deployed to make sense of the economy matter precisely because they *inhibited* economists’ abilities to understand and act upon a set of markets whose objective workings were quite clearly independent of their sense perceptions. The mortgage market, the financial markets, and the connections between them were not a product of macroeconomic models. On the contrary, these models constantly led the FOMC to underestimate the size of the problem caused by the housing decline and to completely miss the connections between the housing bubble and a potential banking crisis. The result was a major failure of economic forecasting on the part of the major economic forecaster of the American state.

This makes us wonder what it would have taken to formulate a more accurate analysis of the economy. First, the people in the room would have had to have other forms of expertise. But in order for these people to be in the room, the whole structure of the Federal Reserve System would have to change. Whom the Federal Reserve recruits and promotes and what kinds of evidence would count as truth would have to be greatly altered. Even if such people were present, it is clear that the format of the discussion and the group processes in the room would have made it difficult for such a different perspective to have gotten a hearing. One could imagine that a dissenting voice would soon be isolated and treated as an outsider whose views were interesting but not to be taken seriously. Unless there was quite a bit more balance in the discussion in terms of the number of people with different views and expertise, it is difficult to see how the outcome would have changed.

Even then, one might ask whether such a diversity of viewpoints would have really made a difference. While participants with different points of view might have seen this particular crisis more clearly, they would be blind to other facets of reality (Zuckerman, 2010). Moreover, would a different point of view have prevailed or would it just have caused more confusion and conflict? Still, had there been more voices, the FOMC might have intervened earlier and with greater effect, thereby preventing the meltdown not just of the American economy, but the world economy as well.

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Table 1: Voting Members of the Federal Open Market Committee, 2000-2008

Name	FOMC Position	Year(s)	Previous Sector	Career Central Banker?	Advanced Degree(s)	Dissertation Branch of Economics
Bernanke, Ben	Governor, Chairman	2002-2005, 2006-2008	Academic & Public	No	Economics PhD	Macroeconomics
Bies, Susan	Governor	2001-2007	Academic, Public & Private	No	Economics PhD	Macroeconomics
Broaddus, J. Alfred	Reserve Bank President	2000, 2003	Public	Yes	Economics PhD	Macroeconomics/ Microeconomics
Duke, Elizabeth	Governor	2008	Private	No	MBA	-----
Evans, Charles	Reserve Bank President	2007	Public	Yes	Economics PhD	Macroeconomics
Ferguson, Roger	Governor	2000-2006	Private	No	Economics PhD, JD	Industrial Organization
Fisher, Richard	Reserve Bank President	2005, 2008	Public + Private	No	MBA	-----
Geithner, Timothy	Vice Chairman	2003-2008	Public	No	Economics MA	-----
Gramlich, Edward	Governor	2000-2005	Academic + Public	No	Economics PhD	Macroeconomics
Greenspan,	Chairman	2000-	Public +	No	Economics PhD	Macroeconomics

Alan		2006	Private			
Guynn, Jack	Reserve Bank President	2000, 2003, 2006	Public	Yes	MBA	-----
Hoenig, Thomas	Reserve Bank President	2001, 2004, 2007	Public	Yes	Economics PhD	Macroeconomics
Jordan, Jerry	Reserve Bank President	2000, 2002	Public + Private	No	Economics PhD	Financial Economics
Kelley, Edward	Governor	2000-2001	Private	No	MBA	-----
Kohn, Donald	Governor	2002-2008	Public	Yes	Economics PhD	Macroeconomics
Kroszner, Randall	Governor	2006-2008	Academic	No	Economics PhD	Macroeconomics
Lacker, Jeffrey	Reserve Bank President	2006	Academic + Public	Yes	Economics PhD	Macroeconomics
Lockhart, Dennis	Reserve Bank President	2008	Private	No	Economics MA	-----
McDonough, William	Vice Chairman	2000-2003	Public + Private	No	Economics MA	-----
McTeer, Robert	Reserve Bank President	2002	Public	Yes	Economics PhD	Macroeconomics
Meyer, Laurence	Governor	2000-2001	Academic + Private	No	Economics PhD	Macroeconomics

Minehan, Cathy	Reserve Bank President	2001, 2004, 2007	Public	Yes	MBA	-----
Mishkin, Frederic	Governor	2006-2008	Academic	No	Economics PhD	Macroeconomics
Moskow, Michael	Reserve Bank President	2001, 2003, 2005, 2007	Academic, Public + Private	No	Business/Applied Economics PhD	-----
Olson, Mark	Governor	2001-2006	Public + Private	No	None	-----
Parry, Robert	Reserve Bank President	2000, 2003	Public + Private	No	Economics PhD	Macroeconomics
Pianalto, Sandra	Reserve Bank President	2004, 2006, 2008	Public	Yes	Economics MA, MBA	-----
Plosser, Charles	Reserve Bank President	2008	Academic	No	Economics PhD, MBA	Macroeconomics
Poole, William	Reserve Bank President	2001, 2004, 2007	Academic + Public	Yes	Economics PhD, MBA	Macroeconomics
Rosengren, Eric	Reserve Bank President	2007	Public	Yes	Economics PhD	Macroeconomics
Santomero, Anthony	Reserve Bank President	2002, 2005	Academic	No	Economics PhD	Macroeconomics/ Financial Economics
Stern, Gary	Reserve Bank President	2002, 2005, 2008	Public	Yes	Economics PhD	Macroeconomics

Warsh, Kevin	Governor	2006-2008	Public + Private	No	JD	-----
Yellen, Janet	Reserve Bank President	2006	Academic + Public	No	Economics PhD	Macroeconomics

Table 2: Words for selected topics. Hyperparameter values were alpha = 1/15 = 0.067 and eta = 0.2

Financial Markets	**Productivity**	**Housing**	**Employment**	**Bank Liquidity**	**Inflation**	**Weakness**
financial	productivity	housing	employment	april	prices	weakness
credit	growth	inflation	improvement	commodity	inflation	easing
banks	slowing	growth	productivity	pdcf	pace	sales
turmoil	nairu	core	growth	lehman	pass	stimulus
risk	labor	moderate	hiring	prices	increase	fiscal
institutions	acceleration	president	recovery	inflation	pause	inventory
cut	supply	thank	business	facility	energy	attacks
cdo	wage	section	job	system	tightening	spending
losses	tight	language	ten	tslf	core	cut
loans	tightening	residential	gap	options	costs	tech
market	inflation	alternative	disinflation	june	compensation	consumer
mortgage	treasury	bit	tax	headline	higher	investment
downside	demand	home	expansion	institutions	oil	november
deterioration	year	energy	output	repo	measures	economy
liquidity	prices	forecast	dollar	voluntary	neutral	sector
swap	tech	trend	pickup	primary	statement	recession
commercial	stock	comfortable	equipment	stress	contained	manufacturing
agencies	increase	data	july	stigma	language	recovery
auction	earnings	past	accommodative	dis	remove	argentina
october	trend	public	june	stearns	accommodative	september
capital	workers	poole	spending	dealers	data	industry
lending	rise	slightly	strong	reserve	china	travel
asset	euro	predominant	positive	party	path	auto
stress	higher	think	recommendation	solvency	move	weakening
insurance	unemployment	ceo	labor	exigent	rise	decline
modal	technology	prices	strength	sec	markup	basis
sheet	deepening	labor	data	march	graphs	economic
exposure	pressures	spillover	fiscal	oil	expectations	stock
crunch	oil	subprime	inventory	financial	pressures	downside
spreads	national	uncertainty	recent	merrill	solid	holiday

Table 2: Top words for selected topics (continued).

Energy	Housing Bubble	Minutes	Charts & Data	Policy Response	Portfolio	Objectives	Macroeconomics
Hurricane	bubble	minutes	Panel	Target	acf	objective	interest
Katrina	rent	Release	Model	Reserve	rps	Goal	rate
Gasoline	housing	statement	Us	Zero	study	numerical	gdp
Oil	land	committee	Line	Bound	ginnie	explicit	year
Gulf	mortgage	public	Chart	Program	securities	narrative	inflation
Energy	home	communication	Economy	Sheet	portfolio	inflation	unemploym
Gas	thank	draft	Black	Funds	treasury	mandate	one
August	overvalued	language	Rule	December	dissent	range	expectations
Rebuilding	ratio	think	Right	Federal	outright	target	point
Refinery	arms	formulaic	Middle	Rate	mae	stability	may
September	properties	vote	Red	Facility	government	communication	forecast
Storm	afford	expediting	Present	quantitative	asset	Dual	also
intervention	ofheo	members	Bottom	Deflation	lombard	congress	now
disruptions	percentile	announcement	depreciation	Quantity	gnmas	diversity	percent
Orleans	value	editing	simulations	Ceiling	collateral	Adopt	growth
Crude	ltv	nineteen	Dollar	Size	freddie	Public	economy
uncertainty	exhibit	discussion	Exhibit	Monetary	sovereign	achieve	term
Supply	hedge	meeting	Taylor	Banks	interim	horizon	policy
Damage	misalignme	decision	Show	Excess	discount	section	risk
Impact	loans	words	adjustment	Purchases	window	specific	like
Heating	shown	view	Foreign	Interest	issue	regime	well
Barrel	index	process	productivity	Treasury	system	Cpi	continue
reconstruction	miami	issue	Rate	Tools	disclose	definition	last
Winter	gse	backwards	Frb	Securities	operations	benefits	much
devastating	nonmarket	Give	Top	Guarantee	contingency	central	even
Filed	constant	Blackout	Ratio	communication	repo	transparency	can
Coast	lenders	Say	Profits	Regime	tally	committee	see
Effect	family	Use	Variables	Policy	authorized	Run	seems
Gallon	upper	Information	coefficients	Money	diversified	Think	real
Natural	misallocation	Agree	Exchange	nonstandard	auction	anchored	months

Abbreviations defined: cdo=credit debt obligation, frb=federal reserve board, arms=adjustable rate mortgages, pdcf=primary dealer credit facility, tslf=term security lending facility, dis=depository institutions, cf=credit facility, ofheo=office of housing enterprise oversight, rps=repos, cpi=consumer price index, gdp=gross domestic product, ltv=loan to value ratio, gse=government sponsored enterprises, acf=asset credit facility, ceo=collateralized equity obligation, nairu= non-accelerating inflation rate of unemployment

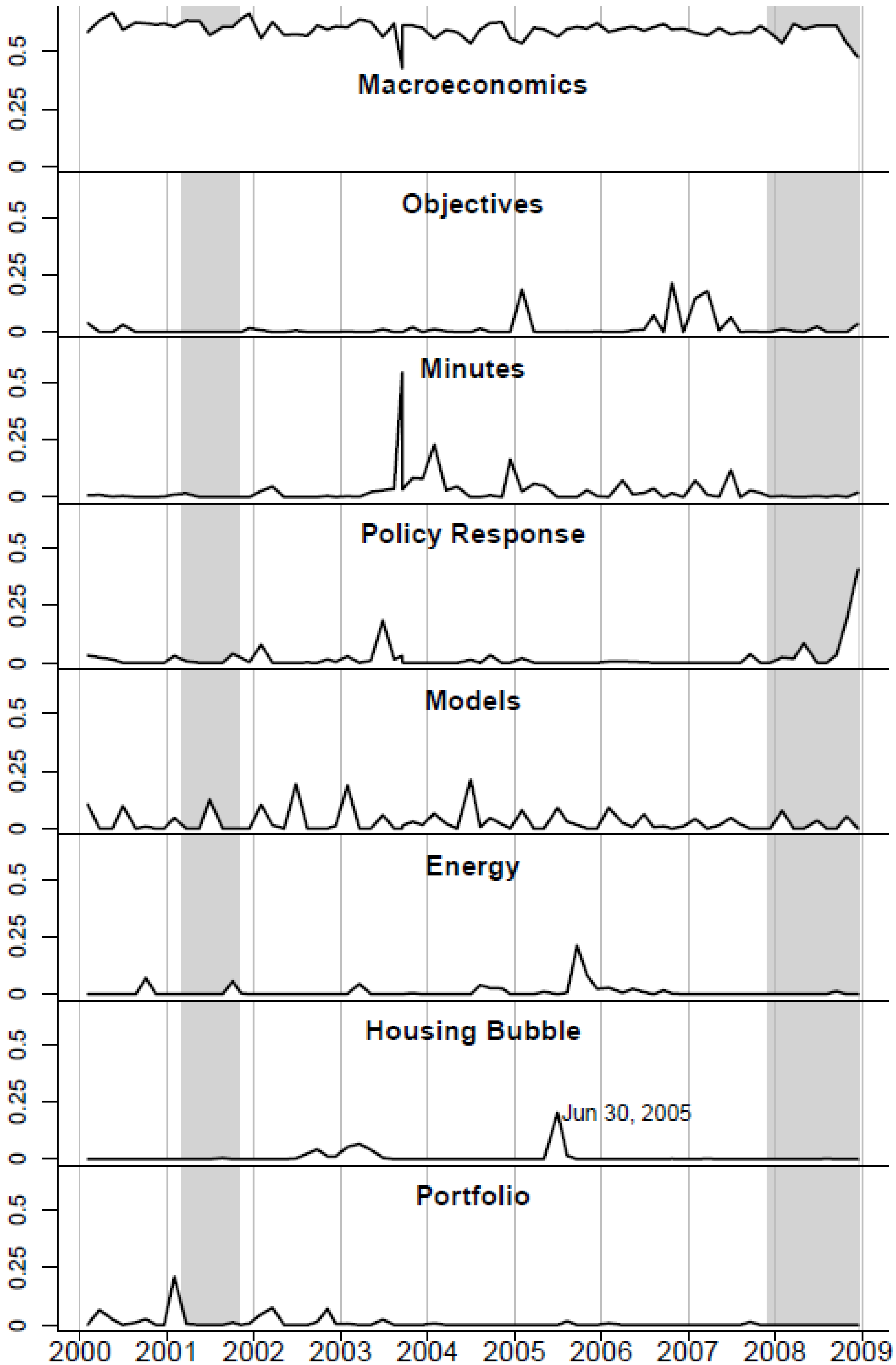

Figure 1: Topic Proportions over time. . The height of each line represents the proportion of words in a given transcript assigned to that topic. Grey bars indicate periods of recession.

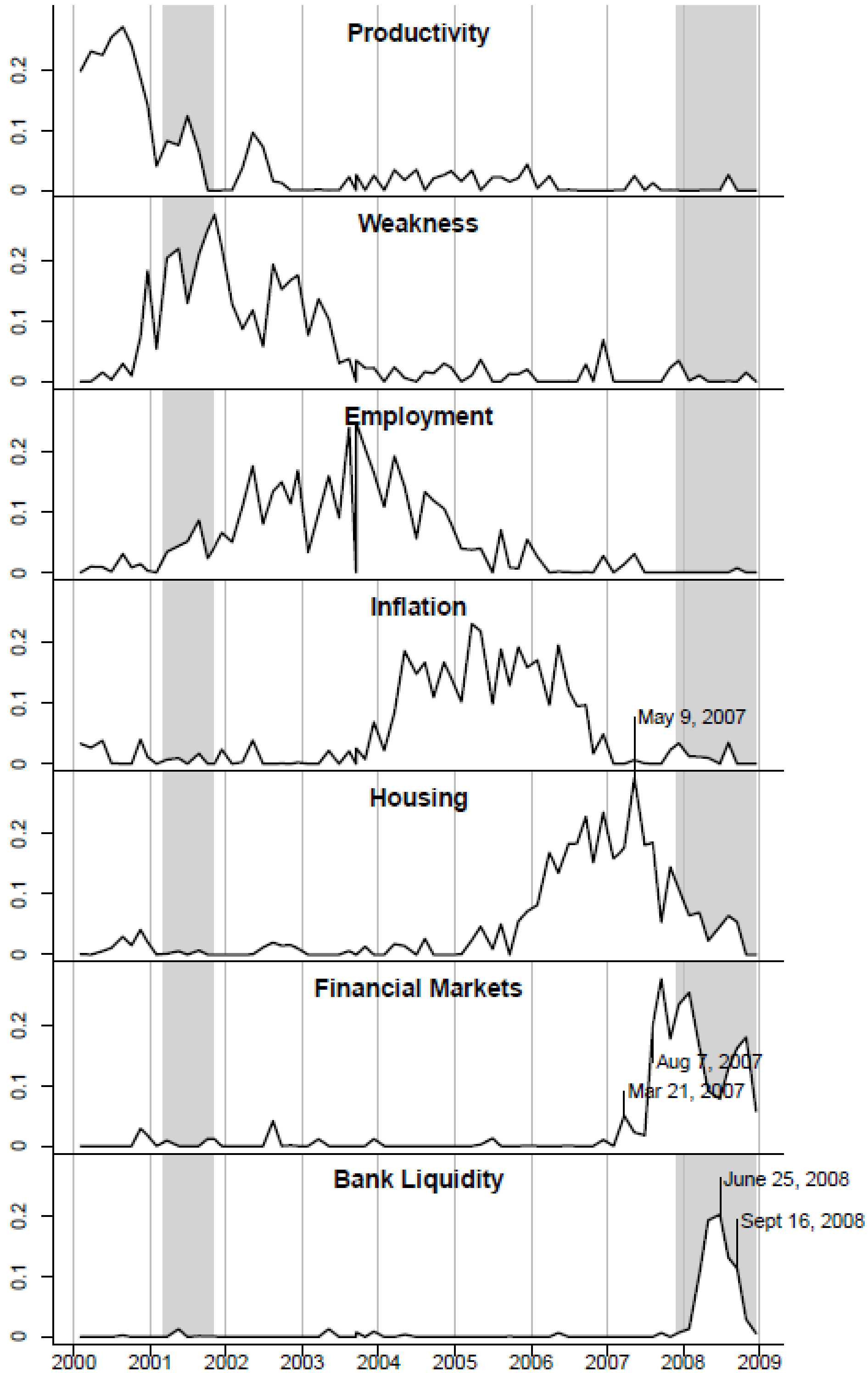

Figure 2: Topic proportions over time. The height of each line represents the proportion of words in a given transcript assigned to that topic. Grey bars indicate periods of recession.

Appendix A

In order to assess whether or not topics appear constantly, randomly, or as waves, we use an autocorrelation analysis. High autocorrelations (close to 1) indicate that consecutive observations have similar values, relative to the variation in other observations. Autocorrelation values close to zero indicate that consecutive observations are no more related than nonconsecutive observations. This means that both constant proportioned topics and separate spiked topics should have autocorrelations close to zero (Lafferty and Blei, 2005).

Figure 1 shows the autocorrelations for each topic ordered from top to bottom by the number of appearances. To determine whether values are high or low, bootstrapped confidence intervals were generated by re-computing autocorrelations for random temporal re-orderings of documents. The *Macroeconomics* topic has a correlation close to zero and highest appearance frequency, confirming that it has a largely constant proportion. As expected, the insignificant autocorrelations of the other four topics related to the purpose of the FOMC (*Portfolio*, *Objectives*) and meeting related business (*Minutes*, *Models*) show that they tend to be discussed intermittently. Eight topics (*Inflation*, *Weakness*, *Employment*, *Housing*, *Productivity*, *Financial Markets*, *Bank Liquidity*, *Policy Response*) have extremely high correlations, consistent with our characterization of them as topics that vary temporally. In the case of *Policy Response*, this takes the form of adding new facilities to deal with economic developments. The lower autocorrelations of the remaining two development topics, *Energy* and *Housing Bubble*, combined with their relative infrequency suggests they are highly transient topics. In the case of the *Housing Bubble* topic, almost all of the references refer to a single meeting of the FOMC (see figure 1). Similarly, the *Energy topic is about* the short-lived consequences of Hurricane Katrina on the economy.