

Drivers and Dynamics of Agenda Change at the World Bank

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Summary

Between 1987 and 1990, the World Bank increased both its environmental staff and spending by over 1000%. What drove this change, and why was it so dramatic? In this paper, I use quantitative text analysis to show that US interests play a large, significant role in shaping the Bank's agenda, with a 1 per cent increase in US attention leading to a 0.41 per cent increase in spending on a given topic. At the same time, leaders, media, shareholder agendas, and their interaction with US interests also impact spending choices and official rhetoric. I draw on punctuated equilibrium theory (Baumgartner and Jones, 1993) to explain change dynamics, demonstrating how the institutional design of the Bank makes it resistant to incremental pressures, with only the largest stimuli leading to reform. This study contributes novel data and methodology to analyze institutional agenda shifts and should galvanize reformers to press for radical, rather than incremental change.

Keywords: World Bank, policy change, agenda shifts, topic model, natural language processing, environmental reform, governance, punctuated equilibrium

1.0 Introduction

In May 1987, World Bank president Barber Conable made a shocking announcement to a gathering of civil society leaders:

The World Bank has been part of the [environmental] problem in the past...We are [now] creating a top-level Environment Department to help set the direction of Bank policy, planning and research work...These changes...will work to ensure that environmental awareness is integral to all the Bank's activities

(quoted in Wade, 1997, p. 617).

More surprising than Conable's rhetorical about-face was the institutional follow-up. Over the next three years, the Bank hired two hundred environmental specialists, increased environmental spending by over 1000 per cent and changed its entire project approval structure to integrate environmental assessment (Table 1). After four decades of essentially no environmental considerations, the Bank underwent radical change.

Table 1: Indicators of the World Bank's Environmental Agenda, 1975-1995

Indicator	1975	1980	1985	1990	1995
Staff	2	3	5	160	162
(with long term consultants)				(270)	(300)
Lending (US millions)	ns	ns	15	180	990
Reports- Environment	13	46	57	196	408
Reports- Poverty	16	57	16	95	210
Total Reports	635	968	1238	1593	1760

(From Wade, 1997, p. 612)

While the depth of these reforms remains contested (Rich, 1990), the scope and speed of this transition raises important questions about the drivers and dynamics of institutional change. Wade (1997) suggests that the confluence of pressure from Congress, NGO activism, and new leadership led to agenda change. While these factors certainly played a role in the agenda shift, they cannot explain the preceding years of stability. Before the 1987 reforms, there had been

over a decade of concerted environmental activism and repeated promises of reform from Bank executives. If a 'perfect storm' led to extreme changes, why would a 'medium storm' not spur incremental change? This paper suggests that institutional friction at the Bank creates a strong status quo bias in which only the strongest stimuli driven by key stakeholders can effect change. The paper proceeds as follows: following this introduction, section two places environmental reform into a broader theoretical and institutional framework of the Bank agenda. Section three describes the data and empirical approach used to test the argument. Section four develops a fixed effect OLS model of agenda change which is discussed in section five. Section six tests whether distributions of agenda shifts follow a punctuated dynamic and section seven concludes.

2.0 How Policy Change Happens

Though the results of Bank's environmental reforms have been widely examined (Gutner, 2005, Nielsen and Tierney, 2003, Gallagher and Kilby, 2019), descriptions of the reforms may not explain change across topic areas. I begin by examining environmental reforms as a case from which general drivers and dynamics of change can be identified and tested.

2.1 Greening the Bank

In the years after World War II, the Bank's agenda was dominated by financial and technical considerations. Reflecting on the first decades, a 1988 Bank report noted "environmental considerations have had little influence on the selection or design of projects" (p. 617). Throughout the sixties, environmental concerns entered the public consciousness. Coverage in the *New York Times* increased from 150 to 1,700 articles per year between 1960 and 1970. In 1972, the Club of Rome's *Limits to Growth* report brought environmental concerns to the international arena. Despite growing environmental activism, Bank president McNamara appointed a single environmental advisor whose primary role was satiating public protest.

Resistance crystalized in the 1980s in response to several particularly egregious projects. In 1981, the Bank approved funding for a highway in Polonoroestre, Brazil. The project would displace indigenous groups and open up the rainforest to developers. Despite the Bank's claims that the highway was inevitable and Bank participation limited detrimental impacts, even internal staff had reservations about the project (Wade, 1997, p. 618). Polonoroestre quickly became the poster project for environmental activists, with *Foreign Affairs* comparing the destruction to Hiroshima and Nagasaki (Guppy, 1984, p. 943). Three umbrella environmental organizations formed a coalition to protest the Bank's involvement. In 1983, the groups won a hearing in the US Congress. Testimonies from Brazilian civil society leaders were covered in the *New York Times* and on television, increasing the campaign's public image. Despite pressure from American legislators and the public, the Bank ignored demands for reform and made only minor changes to their policies.

In 1986, the tides finally shifted. The NGO movement found an unlikely ally in Republican Senator Robert Kasten— a Reaganite, foreign aid critic, and chair of the Senate Appropriations Subcommittee on Foreign Operations (Nielsen and Tierney, 2003). The Bank was due for a capital increase, and Kasten held the purse strings. Opposing Polonoroestre increased Kasten's popularity with his environmentally conscious electorate without threatening industry at home. He demanded environmental action from the Bank before authorizing any increase in funding. Along with Congress, Kasten's allies in the US Treasury also advocated reforms (Nielsen and Tierney, 2003).

Civic pressure also climaxed. In September 1986, the NGO coalition held an 'alternative annual meeting' protesting the Bank's event. Activist climbers scaled the Bank building and unfurled a banner reading: "World Bank destroys tropical rain forests". Later that year, Barber

Conable— a “longstanding environmental sympathizer” — replaced AW Clausen as president. Eleven months into his presidency, Conable made the announcement that radically changed the Bank’s environmental policy, leading to the spending and staff increases of the late 1980s (Wade, 1997).

In this account, there are multiple drivers of change. News coverage increased public awareness, a crisis focused attention, coordinated activism targeted key stakeholders, pressure from a funder aligned financial incentives, and a new leader championed the cause. Others might add the oil crisis and other time-specific events to the list (Gutner, 2005).

While this ‘perfect storm’ narrative is plausible, it fails to explain why the Bank would refuse to take any action during the first years of campaigns and then suddenly introduce a ten-fold increase in environmental spending. Wade (1997) notes “what is striking about the first years of the campaign is how little the Bank moved in response to all the pressure” (p. 667). If the pressures in 1987 were able to change spending by orders of magnitude, wouldn’t the media attention, NGO activism, and Congress hearings of 1983 have led to at least incremental change?

This discontinuous dynamic is not unique to environmental issues. Despite criticisms of ideological ossification (Broad, 2006, Moore, 2007), careful examination reveals several such dramatic shifts. In its first years, Bank staff were mostly engineers conducting large infrastructure projects such as dams, highways, and power plants. In 1964, Bank president Woods spearheaded a staffing change increased the number of economists on staff from 25 to 200, rapidly shifting attention to issues like trade and monetary policy (Stein, 2008). Structural adjustment was a similarly rapid response to global economic crisis. The number of conditions on Bank loans rose swiftly in the early 1980s in response to the crisis (World Bank, 2005). Cormier and Manger (2019) also find evidence of “paradigm shifts” in the contents of loan

conditionality. Explaining these shifts requires an understanding of the dynamics of policy stability and an understanding of the bank's institutional architecture.

2.2 Policy Change

Policy process literature has evolved from assumptions of rational agents with clear preferences to an appreciation of idiosyncrasies and influences on individuals and systems. Cohen, March, and Olsen (1972), suggest that problems, solutions, participants, and choices emerge independently, and preferences are varied and unknown. Consequently, there is no clear problem-solution mapping. This leads to a policy soup (Kingdon, 1984) from which entrepreneurs must leverage windows of alignment between problems and policies.

Ostrom (2005) further nuances policymakers' choices by pointing out the differences in institutional development. While some policy arenas might have near-perfect information, enforced property rights, and low friction, others are characterized by high information costs, bounded rationality, and expectations of mutuality. The World Bank is low-information high-context institution, which limits its policy choices.

2.2.2 Punctuated Equilibrium

"[In] any system with a status quo bias, policy changes will rarely be moderate: inertial forces for change are eliminated or kept to the smallest scale until and unless they are overpowered"

- Baumgartner, Jones and Mortenson, 2017, p. 57

Baumgartner and Jones (1993) develop a theory of policy change based on the observation that policies are typically highly stable, but occasionally undergo dramatic changes. They argue that this outcome is the natural consequence of any system with equilibrium-promoting institutions. Any change that can be resisted, will be. Consequently, all forces for change are minimized except the most extreme. They summarize their point with lobbyist Tom

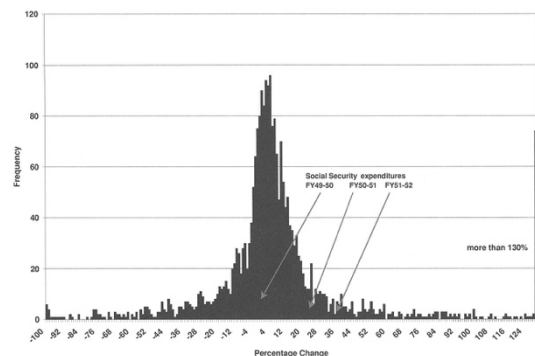
Korologos' dictum about American legislators: "The things Congress does best are nothing and overreacting" (p. 87).

Unlike rational choice approaches, Jones and Baumgartner (2005) start from the assumptions that information is plentiful and attention is limited. Instead of responding incrementally to manageable stimuli, organizations must decide how to allocate their attention across an overwhelming range of informational inputs. Since the threshold to gain attention is high, responses are disjoint compared to increases in signal. This leads to organizations which are both highly stable and prone to dramatic change.

2.2.3 Stochastic Approaches

Building on Padgett (1980), Jones and Baumgartner (2005) test for punctuation by analyzing the distribution of changes in attention across multiple topics. If information processing is efficient and policymakers allocate finances proportionally to the scale of informational inputs, the distributions would approximate normal. In a punctuated model, there would be many near-zero changes and unexpectedly frequent number of large changes. This leads to a leptokurtic, fat-tailed distribution (Figure 1) in which the 'shoulders' of the normal distribution disappear. Jones and Baumgartner suggest that punctuations will increase in prominence through the policy process. Upstream processes (Congress hearings, news coverage) are more informationally efficient, while downstream outputs with more friction (legislation, budgets) exhibit a 'wilder' Paretian distribution with both more stability and more punctuation.

Figure 1: Paretian Policy Punctuations
(From Jones, Sulkin, Larsen, 2003)



2.3 World Bank

While numerous scholars have examined policy change in national governments, there has been less attention given to the patterns of policy processes in international organizations such as the World Bank. Understanding the institutional structure of the Bank— its leadership and governance— is crucial to explaining patterns of change.

2.3.1 Governance

The goal of stability is deeply embedded in the Bank's institutional design, making the equilibrium/punctuation dynamic more likely. Unlike the UN's one-flag one-vote policy, the Bank was designed with a hybrid system of basic and subscribed shares. This was a result of the tension between maintaining the postwar balance of power and achieving legitimacy in the eyes of developing countries. Kapur, Lewis, and Webb (1997) suggest that economically powerful countries would not have approved the same level of investment and delegation into the Bretton Woods system without an assurance of continued control.

The compromise established at the Bretton Woods conference was to give each member state 250 basic votes and then assign quota votes based on countries' position in the economy (Vestegard and Wade, 2013). In 1946, the US held 41.4% of shares, which has slowly declined to reach 15.9% in 2018. The second largest shareholder— Japan— has less than half as many votes, with 6.8% in 2018.

The Bank is governed by a board of directors, which has grown from 12 in 1944 to 25 in 2018. Six seats are appointed by each of the largest shareholders while the rest are elected by regional groupings. Directors must cast a single vote, even if their constituency is divided on a topic (Lyne, Nielsen, and Tierney, 2009). This further marginalizes smaller countries who struggle to form coalitions. Any changes to the Bank's Articles of Agreement requires an 85%

supermajority. This gives veto power not only to the US, but most combinations of four or more directors.

By convention, the US appoints the Bank president for a five-year term. Despite the powerful interests represented on the Board, the executive also exerts power. This is due to work by John McCloy, the Bank's second president, who, in 1947, "extracted an agreement from a reluctant Executive Board that henceforth it would be only a reactive body" (Kapur, Lewis, and Webb, 1997, p. 10). With no operational powers, the sole task of the board is approving projects. Lyne, Nielsen, and Tierney (2009) note that given the high costs of project planning and consultations, most are designed to appeal to the majority of members, making actual votes perfunctory.

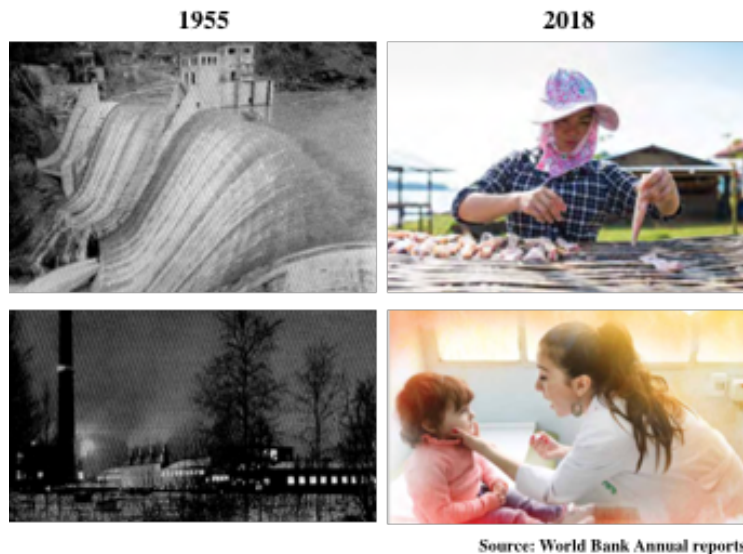
In the 1960s, postwar prosperity left the bank with more capital than credit-worthy customers. Countries like India and Pakistan desperately needed infrastructure loans but lacked an acceptable credit rating. In 1960, the International Development Association (IDA) was formed to provide grants and development finance at less-than-market rates. Like the IBRD, the IDA is governed by a system of subscriptions and voting shares. Unlike the IBRD, the IDA cannot finance its own operations indefinitely. It requires periodic replenishments from 'Part I' member countries, which includes most developed countries. IDA replenishment was one of the carrots used by Senator Kasten to force environmental reform on the bank in the 1980s.

2.4 World Bank Agenda

The structures of project approval, executive appointment, and replenishment requirements make the bank strongly resistant to change. Nonetheless, the Bank's agenda has changed dramatically since its inception. The change is evident in the images featured in the Bank's reports. The 1955 annual report features two Bank projects- a dam in Colombia and paper

mill in Finland. In 2018, the bank highlights sustainable livelihoods work in Laos and pandemic insurance instrument used to finance primary care in the Democratic Republic of Congo. There is a clear shift from large infrastructure to local and social priorities.

Figure 2: Images of Policy Change



How did this change occur? In its first years, Bank staff were mostly engineers, and projects on large infrastructure projects such as dams, highways, and power plants. In the first two decades, over 60 percent of loans went to infrastructure (Stein, 2008). As previously mentioned, in 1964 president Black quadrupled the number of economists on staff. Fueled by postwar progress and battling Soviet influence, the Bank championed growth through capital accumulation (Rostow, 1960).

When McNamara came to office in 1968, spending shifted from infrastructure to education, health, and other social priorities. McNamara's famous "Nairobi Speech" in 1973 highlighted the "40 percent of their populations who are neither contributing significantly to economic growth nor sharing equitably in economic progress" and called for increased investment in smallholder agriculture (McNamara, 1973). This was in line with the broader

move toward a “basic needs” approach to development (Stein, 2008). Kapur, Lewis, and Webb (1997) also note that McNamara worked hard to limit US influence in the bank (p. 5).

In 1982, Walter Clausen became president of the bank and appointed Anne Krueger as chief economist. Krueger’s work on state-failure ushered in the Bank’s neoliberal era. This change happened just as the world economy faced oil shocks, financial stagnation, and the decline of Soviet influence. The crisis came to a point in August 1982 when Mexico defaulted on its sovereign debt, with Argentina and Chile experiencing similar crises that year.

Just as in environmental reform, the ‘perfect storm’ of contextual and institutional factors led to rapid change at the Bank. Structural adjustment programs enforced strict conditionality on loans to limit the scope of government spending and spur market-based growth. Devaluation, austerity, liberalization, and privatization were suddenly the focus of the bank’s attention, with the number of conditions per loan tripling from 1982-87 (World Bank, 2005).

In the 1990s, the limitations of the ‘Washington Consensus’ began to show. Spurred by the leadership of president Wolfensohn, the Bank began to backpedal away from adjustment. It abandoned Structural adjustment for poverty reduction strategy papers and funded more health and education projects. The UN’s Millennium Development Goals helped shape this focus, with the Bank declaring: “simply put, these goals are our goals” (World Bank, 2019).

In the 21st century, the Bank’s focus has fragmented. Competition from larger finance organizations such as Chinese investment has led the bank to recast itself as a knowledge broker (Mehta, 2001). Attempts to move past the state-market divide has led to investment in “good governance”, especially in the wake of the 2008 financial crisis (Diara and Plane, 2014, Lateef, 2016). Most recently, the UN’s Sustainable Development Goals have brought climate action and social priorities to the agenda (World Bank, 2019). Though some contend that this “post-

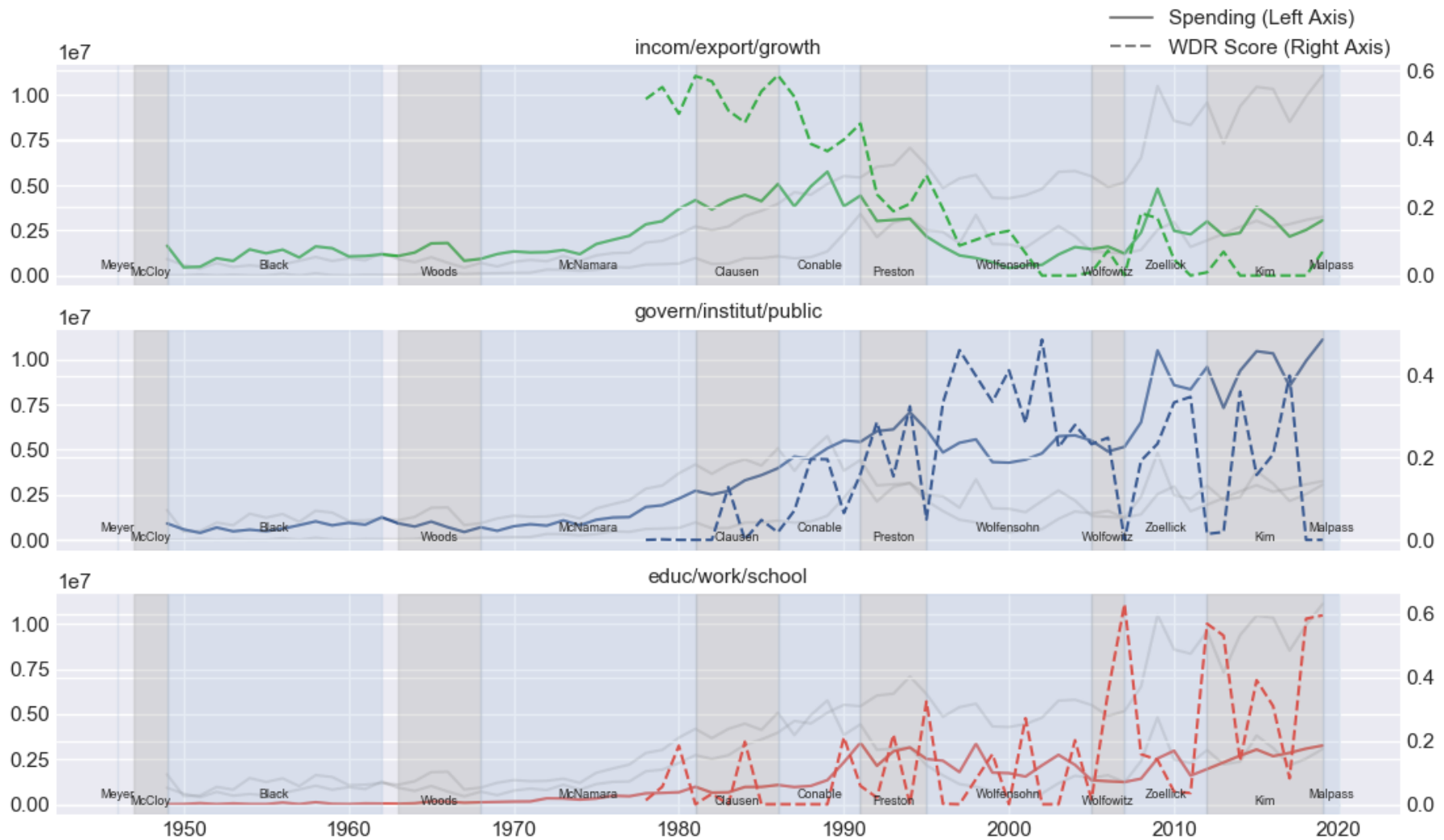
Washington consensus” is more of the same (Sandbrook, 2014), others note substantive changes in the Bank’s priorities (Cormier and Manger, 2019).

While the Bank's annual reports proclaim a clear shift from dirty factories to clean clinics, many contend that the Bank only pays lip service to the ideals of sustainability and human development (Moore, 2007).

2.7 World Bank Agenda

Examining World Bank rhetoric and spending over its 75-year history reveals clear paradigm shifts. Initial investment in infrastructure was supplanted by a neoliberal focus on governance and policy. Social and environmental issues gained currency in the 1990s, though governance remains the Bank’s main priority. This can be seen in Figure 3, which plots the attention given to three machine-coded topics in Bank spending and official reports. The first theme (income/export/growth) declines, while the second (govern/institute/public) increases. The third theme (educ/work/school), reflecting social priorities increases in the mid-1990s, but the shift is more pronounced in rhetoric than reality

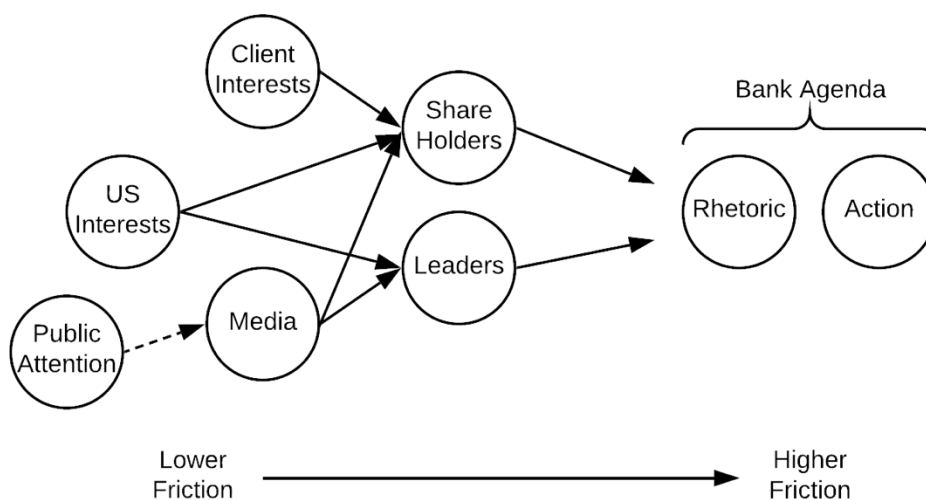
Figure 3: WDR Rhetoric and Bank Spending for Modelled Topics



There are competing possibilities as to the nature of the drivers of these agenda shifts. Some focus on US hegemony in the Bank, pointing out veto power, appointments, and the chokehold on IDA replenishment (Vestegaard and Wade, 2002). Other accounts attribute agenda shifts to the specific qualities of leaders themselves: McNamara and Wolfensohn championing social issues and Clausen and Zoellick pursuing free-market policies (Kapur, Lewis, and Webb, 1997). Others draw on international relations agency theory to suggest that the picture is incomplete without understanding the agendas of all members. Lyne, Nielsen, and Tierney (2009) find that neither US hegemony nor G7 interests can completely explain the Bank's social preferences. In their study, the preferences of the entire Bank membership are required to best model social spending. Finally, Wade's account of environmental reform (1997) suggests that popular pressure can play a role in shaping actor preferences.

Given the complex models of change introduced by public policy scholars, I expect that each of these factors will play some role in shaping the Bank's agenda. Figure 4 shows a simplified model of the drivers of Bank attention. Most of the studies of World Bank preferences explain agenda change for a single topic area such as environment (Gutner, 2003), social (Lyne,

Figure 4: Drivers of the World Bank Agenda



Nielsen, and Tierney, 2009), or governance (Diarra and Plane, 2014). However, there is little examination of the patterns of agenda change more broadly. Rather than describing how reform might occur in a specific issue area, my goal is to explain broader patterns of change.

I suggest that change at the World Bank will follow a punctuated, rather than incremental dynamic. Given information overflow and institutional friction, incremental pressure will lead to agenda punctuations. These may be triggered by attention grabbing events such as a new leader, popular protest, or changing priorities of Bank agents.

3.0 Approach

3.1 Rationale

To date, tracking changes in the World Bank agenda has usually involved close reading of relevant texts. These studies are often limited to a single topic area (Gutner, 2005) or time period (Pereira, 2016). This is partially due to the significant resources required to develop categorization systems and manually code documents (Geddes, 2003).

To effectively capture attention dynamics across time and topic, I use an unsupervised machine learning approach topic modeling. Natural language processing has been an emerging field in political science and is increasingly used to understand actor agendas (Benoit Laver, and Garry, 2003) Various methodologies have allowed temporal comparison of party agendas (Slapin & Proksch, 2008), analysis of documents in different languages (Lucas et al., 2015), and modeling of parliamentary priorities (Greene and Cross, 2017). In particular, I follow Greene and Cross' use of non-negative matrix factorization to draw out latent topics and trace their evolution over time.

Operationalizing my variables with digital text analysis is objective, scalable, and replicable (Bird, Klein, and Loper, 2009). It also allows me to analyze diverse document types

such as news articles, project descriptions, and UN addresses within the same methodological frame.

Using text analysis to understand development agendas is novel, but not without precedent. Alfini and Chambers (2007) compare most common bigrams to evaluate the changing language and attitudes of British development assistance. Sato (2018) compares the rhetoric of two World Development Reports, using counts of keywords to reveal shifting knowledge bases of the reports over time. Drawing on these approaches, I use unsupervised topic modeling to explore the changing agenda of the World Bank over the last 75 years. I describe the details of this process below.

3.2 Variables

3.2.1 World Development Reports

In the context of the politics of attention, the Bank's flagship reports function as both a summary of existing trends and a signal of perspective shifts. Scholars refer to the documents as both "paradigm maintenance" (Wade, 2002) and "markers of ideological shifts" (Moore, 2007).

Over the years, the reports have been the site of both control and contention over the bank agenda. In the 1980's, Kreuger "went over drafts of the [1983] report line by line", with references to human development disappearing from the reports during her tenure (Stein, 2008, p.149). Instead, the reports championed free market reforms (*Trade and Industrialization*, 1987) and condemned state intervention (*Financial Systems and Development*, 1989). The 1997 WDR (*The State in a Changing World*) was hailed as a marked departure from neoliberal dogma, though Moore (2007) contends that rather than a radical departure, the report is a "culmination of trends in the past decade or so within the Bank" (p. 231). In 1999, drafts of Ravi Kanbur's heterodox report were vetoed by US treasury, leading to Kanbur's resignation (Wade, 2002).

Given their importance as a signal of institutional agenda, the World Development Reports are a useful object of study as each has theme which captures the intellectual zeitgeist of the year. Pereira (2016) examines the themes of WDRs to trace the evolution of neoliberalism at the Bank. Lateef (2016) uses WDRs to mark the milestones in the Bank's approach to governance. Stein (2008) repeatedly cited WDRs as a signal of Bank attention revealing the changing tone toward institutional economics. As mentioned above, Wade (2002) uses the reports to expose the tension between conflicting policy priorities. David Moore's (2007) analysis of the 1997 WDR summarizes the multiple purposes of the documents. The WDRs are...

...marked with much media hoopla, but have no direct policy implications. As such, they can be judged as a combination of global propaganda, markers of ideological shifts and measurement within the multilayered international institution itself, and textbook-like primers for the implementers of World Bank and IMF policies around the world...in this context they can be judged as the World Bank's signals of public relations and intentions — of hegemonic construction and maintenance (p. 228).

World Development Reports were retrieved from the Bank's Open Knowledge Repository, which provides open access to all Bank documents. From 1998-2002, the World Bank released WDRs on a fiscal schedule (eg.1998-1999). Wade (2002) refers to the 1999-2000 report as the 2000 WDR. I follow this pattern, classifying reports by the latter year. This skips 1998, leaving 41 reports for analysis.

The reports were converted to text using the PDFMiner package for Python (Shinyama, 2014). They were then preprocessed to allow analysis. The raw text was converted into individual tokens with only lowercase letters. Next, punctuation, numbers, tokens of less than

three characters, and stopwords (the, and, that, etc) were removed. In order to capture the similarities between different forms of the same word, word endings were eliminated (Porter, 2001). For example, “educate”, “education”, and “educating” were all stemmed to “educ”, allowing the model to establish connections between different forms of the same word. I also filtered out words specific to the domain of analysis such as “world”, “bank”, and “development”. A full list of excluded words can be found in Appendix I. The reports were 250-300 pages each, averaging 213,525 tokens available for analysis.

The next step was to group the texts according to their main topics. With no previously annotated data or established lexicons in this domain, an unsupervised method was most appropriate. Due to the small number of documents ($n=41$), my interest was not classifying documents as much as exploring the structure of topics within each document. Hard clustering methods such as k-means were therefore not suitable. I used non-negative matrix factorization (NMF) to model the underlying structure of the topics in documents. NMF provided efficiency, coherent topics, and the ability to choose the number of topics (Greene and Cross, 2017).

I started by creating a matrix V with the dimensions $n*m$, where n represents each document and m represents each term in the vocabulary of the corpus. Each cell is filled with the product of a term’s frequency in the document and its uniqueness in the corpus (inverse document frequency). The resulting term frequency-inverse document frequency matrix (TFIDF) weighs terms on both their frequency and uniqueness in the corpus (Manning & Schütze, 1999). NMF generates topics by decomposing a matrix V into factors W and H where:

- V is matrix of the distribution of words across documents (in this case TFIDF)
- H is the distribution of latent variables across terms ($n*k$)
- W is the distribution of documents across latent variables ($k*m$)

If the data have an underlying structure, then the values of the latent variables will be able to accurately approximate the structure of the data. Because NMF constrains values to be positive, the values in each matrix reveal the degree to which each term or document inform the latent variable. Therefore, W shows the degree to which each document fits each topic, while H shows which features (words) are most informative about each topic (Greene and Cross, 2017). I use sklearn's NMF package to generate the matrices, which computes W and H by minimizing the distances between WH and V using the Frobenius norm (Predregosa, et al, 2011).

In an unsupervised model, determining the number of topics included is often a subjective process relying on individual judgement. In order to select an appropriate number of topics (k) for the model, I use the measure of topic coherence introduced by O'Callahan et al. (2015) and used by Greene and Cross (2017). O'Callahan's measure relies on a word2vec model (Mikolov et al., 2013), which positions a term as a vector with a complex vector space representing linguistic context. Coherence is measured by taking the mean of the cosine similarity of the vectors for the top ten features in each topic. This method requires a pretrained set of word embeddings, for which I use SpaCy's English set (Honnibal and Johnson, 2015). I measure coherence for NMF models up to 40 topics. Following O'Callahan et al., I take the average of the topic coherence scores to assess the model's coherence level for each value of k . Maximum coherence is achieved at $k=3$ and rises again between $k=16$ and $k=25$, which means that the model is most demonstrative of the underlying topics at these points. I analyze both a 3-topic model and a 16-topic model. The 3-topic model demonstrates larger themes in the Bank's discourse, while the 16-topic reveals nuances in the attention given toward more niche topics. Table 2 shows the most informative features for each topic for each model. In proceeding

sections, I present results for the simpler 3-topic model but include details on the 16-topic model in appendix II.

Figure 6: Coherence Levels and number of topics in model

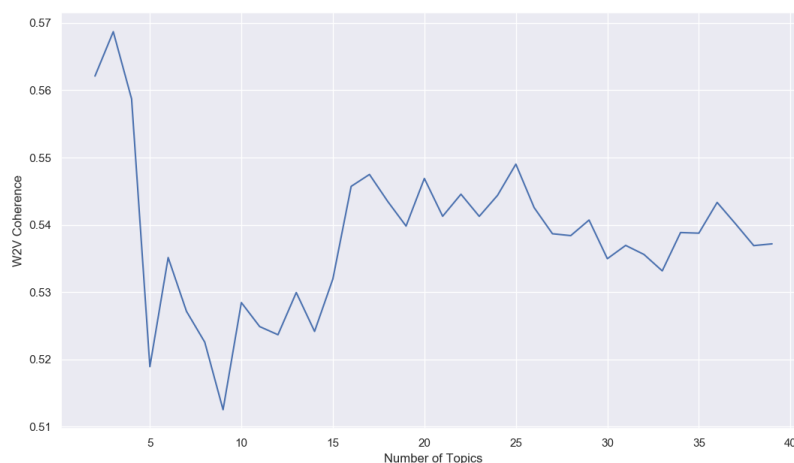


Table 2: Top Ten Features for Three Topic Model

Topic 0 (Governance): govern, institut, public, econom, state, polici, use, market, intern, servic
Topic 1 (Infrastructure): incom, export, growth, rate, industri, import, price, year, econom, trade
Topic 2 (Social):'educ, work, school, women, social, job, labor, health, econom, program

3.2.2 Spending

Analyzing both rhetoric and action requires a reliable and meaningful indicator for Bank action. Jones and Baumgartner (2005) use budget authority categories to trace policy change in the US. While many narratives of policy change mention changes staffing distributions or approval processes, project spending is the most commonly cited indicator of Bank priority (Kapur, Lewis, and Webb, 1997, Stein, 2008, Lyne, Nielsen, Tierney, 2009). At the World Bank, project-level disbursement provides a comprehensive, transparent, and representative source of data on spending priorities.

The World Bank Projects Explorer API provides a record of financial disbursements since 1947. The database records a total of 18,637 projects representing \$945,872,870,000 in loans and grants. The average project budget is approximately \$50 million. Each project includes a large amount of metadata, including title, location, date, abstract, keywords, budget, and topics. Some projects had insufficient data, leaving 13,033 projects for analysis.

Bank spending was compared across the same dimensions as WDR rhetoric. To do this, I used the abstract and keywords from each project as a new document. These documents averaged just 245 tokens each. While project abstracts may be accused of merely recycling popular jargon, project snippets are technical summaries representative of actual Bank activities. This can be seen by comparing sentences on the same topic from the two sources:

World Development Report 2002

“The priority for countries in promoting competition in product markets is trade liberalization—and removal of entry and exit barriers for firms.” (p. 149).

IBRD Project #066100, 2002

“The Second Institution Building Technical Assistance Project is intended to provide technical assistance to support the policy measures to be implemented under the Second Structural Adjustment Credit.

Projects’ texts were preprocessed using the same steps as the WDRs. They were then converted into a TFIDF matrix and transformed the model trained on the WDR data. This process essentially scores the projects according to the topics covered in the WDRs. These scores were multiplied by the budget to weigh for attention. Project budgets included both grant and loan components, but as I am more interested in relative agenda coverage, I do not distinguish

between the two. Figure 3 (above) shows the evolution of rhetoric and spending in the three-topic model.

3.2.3 Country Interests

The World Bank is composed of 189 shareholding members, each of which has a say in project approval. Leaders from each country— represented by the board— vote on projects proposed by the Bank’s executive. Lyne, Nielsen and Tierney (2009) use the preferences of each member, weighted by voting share, to explain the proportion of social spending. Lyne, Nielsen and Tierney’s approach is very rigorous but is limited to a single policy dimension. Topic modeling allows me to see change across a variety of relevant policy areas, which requires a proxy for national agenda amenable to multiple topic areas.

Activity in the UN General Assembly (UNGA) has been consistently been used to measure national agendas and IFI disbursements, most notably through Thacker’s (1999) use of voting records to measure US alignment. Baturo, Dasandi, and Mikhaylov (2017) assert that the speeches made in the General Assembly serve as effective representations of national agendas. The statements— made by each UN member every year— are an opportunity for leaders to express their position on various issues. Unlike voting records, General Assembly declarations have ‘no strings attached’. Statements are made by a country’s chief executive, who is most likely the one setting the agenda for that country’s participation in the Bank.

Baturo, Dasandi, and Mikhaylov collect 8,093 texts from 1970-2018 and use topic-modeling to derive actor agendas. I take their dataset and transform the speech texts in my topic model to obtain a model of country interests over time.

Unlike the UN, members do not have equal say in Bank affairs. In order to weigh shareholder preferences, I digitized the IBRD and IDA voting shares for 1947-2019 from the

Bank's Annual Financial statements. I multiply each country's UNGA score by their vote share and then create annual indices of shareholder interest.

$$ShareholderInterest_t = \sum(UNGA_{it} * \frac{Votes_{it}}{Votes_t})$$

3.2.4 US and Client Attention

Along with annual measures of aggregate preference, I use the UNGA dataset to determine the interests of both the loan client and the US across each topic area. This allows me to include US and client interests as a predictor of spending for each loan.

Lyne, Nielsen, and Tierney (2009) suggest that for donor countries, bilateral aid priorities can effectively proxy interests. I test this by aggregating summaries of American aid projects from AidData (1980-2013) and the International Aid Transparency Initiative (IATI, 2005-2018). These aid-based models of US preference closely correlate with both rhetoric and spending. However, the UNGA data provides a more consistent dataset which covers a longer period, so I retain it.

3.2.5 Media

Wade's (1997) account of environmental reform repeatedly mentions the media as an indicator of popular support for reform. Similarly, Jones and Baumgartner (2005) also use media attention as a driver of agenda priorities. Rather than suggesting that media plays a causal role in determining Bank agendas, I use the media attention as a signal of relative attention paid to a topic by the general public and NGO campaigns.

Both Wade (1997) and Baumgartner and Jones (1993) use the *New York Times* coverage as a measure of media attention. Though coverage is focused on the USA, the *Times* offers unparalleled archival access. Using the *New York Times* Public API, I collect the first paragraph from every article published between January 1945 and June 2019 (n=9.5 million). These texts

are transformed into the NMF model and grouped by month and year. This gives me an annual index of media attention paid to the topics generated by the topic model.

3.2.6 Leaders

Descriptions of agenda change at the Bank often focus on the role of the president in catalyzing change (Kapur, Lewis, and Webb, 1997, Stein, 2008). I create a dummy variable for each president to examine the impact of leadership on the attention given to each topic. In order to untangle the changes over time that are unrelated to leadership changes, I also add year fixed effects into the models.

3.2.7 Client Characteristics

Though most accounts of agenda change focus on the structure of the bank itself, the characteristics of lending countries may influence the types of projects pursued (Cormier, 2016). Along with the country agenda from the transformed UNGA dataset, I add country fixed effects and control for national GDP from the World Development Indicators.

4.0 Model

I use multiple regression to test how the priorities of shareholders, clients, leaders, and global attention each play a role in shaping the priorities of the bank. I first examine attention in both rhetoric and spending on an annual basis. I use the coefficients for each topic as dimensions in a panel regression such that:

$$Attention_t = \beta + \beta Media_t + \beta UNGA_t + \beta USInterest_t + \Omega President \\ + \Omega Year + \Omega Topic + \varepsilon$$

Where:

- *Attention* refers to the attention given to a topic during a particular year in either the *World Development Report* or as the mean of budget-weighted project attention.

- β_{Media} refers to attention in the *New York Times* for that year.
- β_{UNGA} refers to the interests of each country weighted by their voting share. I use preferences from the IBRD, though IDA-weighting achieves similar results.
- $\beta_{USInterest}$ refers to the attention given in the that year's UNGA by the US.
- Ω refer to dummy variables for the president, year, and topic area.

My theoretical expectations lead me to test some additional model specifications.

Because national interests may take time to impact Bank agendas, I lag dependent variable. I test one, three, and five-year lags, but report only on the three-year lag, as results were similar across specifications. The policy windows approach (Kingdon, 1984) suggests that the confluence of agent interests and contextual forces might galvanize change. Therefore, I create an interaction term using the product of US, UNGA, and media. This “window” variable captures any impact of the alignment of different actor interests.

Next, I examine the impacts of various dimensions of attention on individual projects.

The attention given to any topic in a World Bank project in country i during year t can be described as:

$$Attention_{it} = \beta + \beta_{Media}_t + \beta_{UNGA}_t + \beta_{USInterest}_t + \beta_{ClientInterest}_{it} \\ + \beta_{ClientGDP}_{it} + \Omega_{President} + \Omega_{Year} + \Omega_{Country} + \Omega_{Bank} + \varepsilon$$

Where:

- $Attention$ refers to the attention given to a topic in project, weighted by project amount.
- β_{Media} refers to attention in the *New York Times* for that project month.
- β_{UNGA} refers to the interests of each country weighted by their voting share in the bank through which the project was funded.
- $\beta_{USInterest}$ refers to the attention given in the that year's UNGA by the US.

- $\beta_{ClientInterest}$ refers to the attention given in the that year's UNGA by the client country.
- $\beta_{ClientGDP}$ refers to the client country's GDP.
- Ω refers to dummy variables for the president, year, lending country, and bank (IBRD or IDA).

Summary statistics for all variables are available in Appendix III.

Table 2: Determinants of Bank Spending (Annual)

	Standard				Three Year Lag				Interaction			
	r ² = .784				r ² = .774				r ² = .863			
	Coefficient	Std Error	p > t		Coefficient	Std Error	p > t		Coefficient	Std Error	p > t	
Constant	0.369	0.063	0.000	***	0.376	0.061	0.000	***	0.112	0.062	0.074	
NYT	33.838	14.781	0.024	*	19.423	14.330	0.179		50.900	12.075	0.000	***
UNGA*Votes	-39.921	6.547	0.000	***	-37.031	6.347	0.000	***	-8.393	6.807	0.221	
USA	4.803	1.671	0.005	**	4.942	1.620	0.003	**	11.011	1.588	0.000	***
Window									-1.10E+05	1.51E+04	0.000	***
Black	1.32E-12	3.44E-13	0.000	***	9.70E-13	3.34E-13	0.005	**	2.42E-06	3.33E-07	0.000	***
Woods	0.000	0.000	0.009	**	0.000	0.000	0.094		0.000	0.000	0.000	***
McNamara	0.091	0.043	0.038	*	0.058	0.042	0.173		-0.064	0.041	0.117	
Clausen	0.106	0.036	0.004	**	0.084	0.035	0.019	*	0.041	0.030	0.176	
Conable	0.130	0.032	0.000	***	0.104	0.031	0.001	***	0.081	0.026	0.003	**
Preston	0.003	0.033	0.922		0.043	0.032	0.180		0.007	0.026	0.793	
Wolfensohn	-0.122	0.034	0.000	***	-0.054	0.033	0.103		-0.104	0.027	0.000	***
Wolfowitz	-0.077	0.033	0.023	*	-0.016	0.032	0.623		-0.073	0.027	0.007	**
Zoellick	0.103	0.028	0.000	***	0.028	0.027	0.313		0.093	0.023	0.000	***
Kim	0.136	0.028	0.000	***	0.129	0.027	0.000	***	0.132	0.023	0.000	***
Topic0	0.566	0.070	0.000	***	0.530	0.068	0.000	***	0.351	0.064	0.000	***
Topic1	-0.099	0.038	0.011	*	-0.093	0.037	0.013	*	-0.005	0.033	0.875	
Topic2	-0.098	0.044	0.028	*	-0.061	0.042	0.155		-0.234	0.040	0.000	***
Year Effects	Y				Y				Y			
Observations	n=147				n=147				n=147			

*p ≤.05, **p≤.01, ***p≤.001

Table 3: Determinants of Bank Rhetoric (Annual)

	Standard			Three Year Lag			Interaction		
	r ² = .162			r ² = .206			r ² = .422		
	Coefficient	Std Error	p > t	Coefficient	Std Error	p > t	Coefficient	Std Error	p > t
Constant	-0.012	0.124	0.920	0.041	0.331	0.285	-0.444	0.128	0.001 ***
NYT	38.292	30.056	0.207	14.416	0.492	72.804	50.214	25.213	0.050 *
UNGA*Votes	-13.732	14.443	0.345	-10.721	-0.742	18.072	49.580	16.315	0.003 **
USA	8.603	3.233	0.010 **	8.124	2.558	14.455	15.866	2.981	0.000 ***
Window							-1.71E+05	2.97E+04	0.000 ***
McNamara	0.046	0.077	0.557	-0.027	-0.358	0.125	-0.208	0.078	0.009 **
Clausen	0.042	0.070	0.553	0.060	0.864	0.200	-0.109	0.064	0.092
Conable	0.030	0.058	0.602	0.049	0.854	0.165	-0.078	0.052	0.136
Preston	-0.017	0.058	0.770	0.031	0.551	0.144	0.004	0.049	0.928
Wolfensohn	-0.067	0.064	0.298	0.013	0.206	0.138	-0.009	0.055	0.874
Wolfowitz	0.012	0.057	0.838	-0.039	-0.710	0.071	0.029	0.047	0.546
Zoellick	-0.033	0.048	0.493	-0.018	-0.379	0.075	-0.046	0.040	0.260
Kim	-0.024	0.048	0.621	-0.029	-0.620	0.064	-0.028	0.040	0.488
Topic 0	-0.020	0.135	0.883	-0.003	-0.026	0.264	-0.442	0.135	0.002 **
Topic 1	0.172	0.073	0.021 *	0.156	2.178	0.299	0.336	0.067	0.000 ***
Topic 2	-0.164	0.095	0.088	-0.112	-1.205	0.073	-0.339	0.085	0.000 ***
Year Effects	Y			Y			Y		
Observations	n=120			n=117			n=120		

*p ≤.05, **p≤.01, ***p≤.001

Table 4: Determinants of Bank Project Spending (3 Topics, 1980-2018)

	Governance			Infrastructure			Social		
	r ² =0.317			r ² =0.230			r ² =0.067		
	Coefficient	Std Error	p > t	Coefficient	Std Error	p > t	Coefficient	Std Error	p > t
Constant	0.054	0.045	0.227	0.100	0.005	0.000 ***	0.027	0.006	0.000 ***
News	1.648	1.097	0.133	0.010	0.004	0.019 *	0.012	0.009	0.194
UNGA	0.036	0.030	0.234	0.005	0.003	0.146	-0.004	0.002	0.127
US Pref	0.007	0.002	0.001 ***	0.006	0.004	0.169	0.020	0.007	0.002 **
Client Pref	-0.616	0.180	0.001 ***	0.375	0.216	0.083	0.064	0.145	0.659
Client GDP	-1.03E-14	1.77E-15	0.000 ***	-2.57E-14	1.70E-15	0.000 ***	-4.70E-15	1.58E-15	0.003 **
IDA Dummy	-0.130	0.005	0.000 ***	-0.078	0.005	0.000 ***	-0.002	0.004	0.697
McNamara	0.084	0.050	0.091	-0.002	0.037	0.960	0.040	0.034	0.243
Clausen	0.078	0.044	0.077	0.015	0.030	0.634	0.040	0.028	0.160
Conable	0.056	0.039	0.149	0.015	0.023	0.523	0.025	0.021	0.240
Preston	0.049	0.037	0.183	0.025	0.019	0.179	0.038	0.017	0.031 *
Wolfensohn	0.061	0.035	0.080	0.000	0.018	0.990	-0.003	0.017	0.865
Wolfowitz	0.060	0.036	0.097	-0.001	0.020	0.948	-0.010	0.019	0.589
Zoellick	0.059	0.039	0.134	0.013	0.023	0.579	-0.033	0.022	0.126
Kim	0.046	0.040	0.241	0.035	0.028	0.215	-0.063	0.026	0.014 *
Year Effects	Y			Y			Y		
Country Effects	Y			Y			Y		
Observations	n=11116			n=10897			n=10705		

*p ≤.05, **p≤.01, ***p≤.001

5.0 Results

5.1.1 Annual Spending

Table 2 shows the impact of various actor agendas on World Bank spending. Media attention and US interests both increase attention given to different topics. These effects are large, with one standard deviation increase in US attention leading to 28 percent of a standard deviation increase in spending, or 1 percent increase leading to 0.4 per cent increase in spending. Interestingly, shareholder agendas, as reflected by UN speeches, negatively correlate with spending. This could be due to UN speeches on governance from major stakeholders, which the projects model (Table 4) shows to be inversely linked to governance spending. Nonetheless, this does reinforce the argument that the Bank struggles to meaningfully integrate the voices of developing countries.

The impact of Bank presidents is clearly linked to spending priorities. The panel setup makes it difficult to interpret the coefficients, as they describe attention across all topics. However, even with fixed effects for years, the impact of each president is significant, affirming that Bank executives do shape the priorities of the bank. Topic dummies are also significant, suggesting different dynamics across topics.

Introducing a three-year lag has little impact on the direction or significance of most variables. However, the impact of media is no longer significant, perhaps due to shorter timelines of news attention. The interaction term has a very small but significant impact on spending, greatly increases the fit of the model, and increases the impact of media and US priorities. It also reduces the impact of shareholder agendas (UNGA), suggesting the influence of shareholders is conditioned on US agendas. Overall, the interaction affirms the impact of a ‘policy window’ when US, media, and shareholder agendas are aligned.

5.1.2 Annual Rhetoric

The relationship between actor agendas and Bank rhetoric (Table 3) is less clear as rhetoric is noisier than spending patterns. In the initial model, only US interests are significant, with a 1 percent increase in US attention leading to 0.71 percent increase in rhetoric. While a lag slightly increases the fit, it reduces the significance of the variables. Including the ‘policy window’ interaction term more than doubles the fit and increases the significance of the other key explanatory variables. Though the interaction term itself is slightly negative and near zero, it reveals the importance of other actors’ agendas in shaping Bank rhetoric. The significance of US interest also reinforces Wade’s (2002) anecdote about the US Treasury’s veto of Kanbur’s 1999 WDR.

5.1.3 Projects

Table 4 provides an overview of the predictions for individual projects. With so much variation in project topics, the fit of these models is very low and there are fewer significant coefficients. The interests of shareholders as a group is never significant and news attention is only weakly correlated to infrastructure funding. However, US interests remain significant for both governance and social spending, reinforcing the claim that US holds a hegemony on the Bank’s agenda. Nonetheless, the impacts are smaller, so that for social spending, a 1 per cent increase in US attention leads to only 0.01 per cent increase in spending. Client preferences are negatively correlated to governance loans. Given the history of structural adjustment, it is unsurprising that governance projects would be completed even against the interests of clients as they are expressed in the UN general assembly. Client GDP is significant and negative in all three topics. The impact is largest for the ‘social’ topic, affirming that social projects are more likely in countries with lower GDP.

As expected, the IDA dummy is negative for governance and infrastructure, priorities which are more likely to be addressed by the IBRD. Unexpectedly, there is no observed difference in social emphasis between the two banks.

With fixed effects for years, leader effects are not meaningful. However, when year are effects removed, almost every president has a large and robust impact on priorities. Introducing an interaction term has no impact on this model.

6.0 Distribution of changes in attention

While the linear model reinforces the influence of leader, US, shareholder, and media attention in determining Bank attention, it cannot fully explain the dynamics of change. I complement linear regression with the stochastic analysis developed by Padgett (1980) and used by Jones and Baumgartner (2005) to test for punctuation. If policies respond proportionally to changes in inputs, then the changes in rhetoric and spending will follow a normal distribution. Instead, Baumgartner and Jones (1993) find that policy changes, regardless of the precipitating factors, follow a leptokurtic distribution with many near-zero changes and a higher than expected frequency of large changes. This dynamic is more pronounced further down the policy process.

At the World Bank, variation is more likely in a document like the WDR than in the actual spending choices. High kurtosis is expected from both change distributions but punctuations or Paretian ‘fat tails’ will be more distinct in project spending. The difference in ability to respond to new information reveals why there might be a gap between rhetoric and spending at the bank.

To test this, I examine the annual changes in attention given to all topics. While Jones and Baumgartner (2005) use percent change over year, some of my topic-years have no spending commitments or WDR attention, making percent change calculations impossible. Instead, I take

the annual change and divide it by the average change for that topic area. I first plot the distribution, which shows the frequencies of different sizes of change. The center of the distribution shows near-zero changes, while the tails show larger increases and decreases in attention.

In order to categorize each distribution, I follow Jones and Baumgartner (2005) by plotting the midpoints of each bin of the frequency distribution. I use change magnitude to compare both tails on the same plot. I test whether these data are best approximated by a normal, exponential (semi-log), and Paretian (log-log) distributions. Straighter lines mean that the data conform to the respective distribution, and the slope reflects the magnitude of changes. Shallower slopes reflect larger punctuations (midpoints further out). Kurtosis is extreme in the 16 topic model due to the high number of niche topics (Appendix II), but dynamic is still clear in the more conservative 3 topic model, seen in figures 6 and 7:

Figure 6: World Bank Rhetoric Changes
(All Topics, 1979-2018)

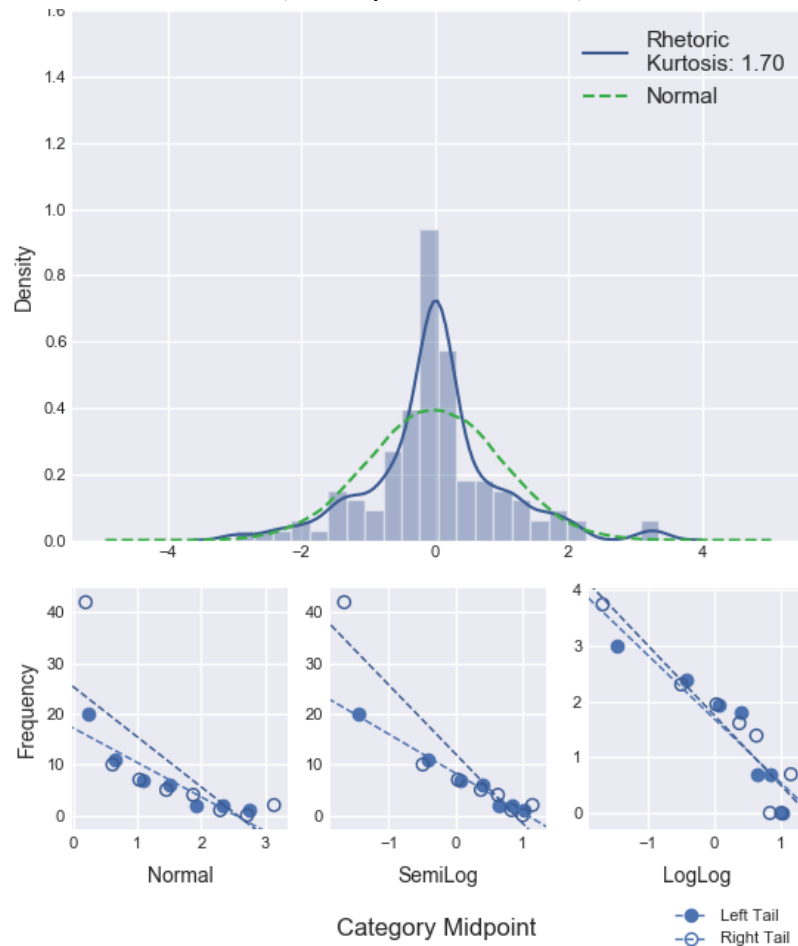


Figure 7: World Bank Spending Changes
(All Topics, 1961-2018)

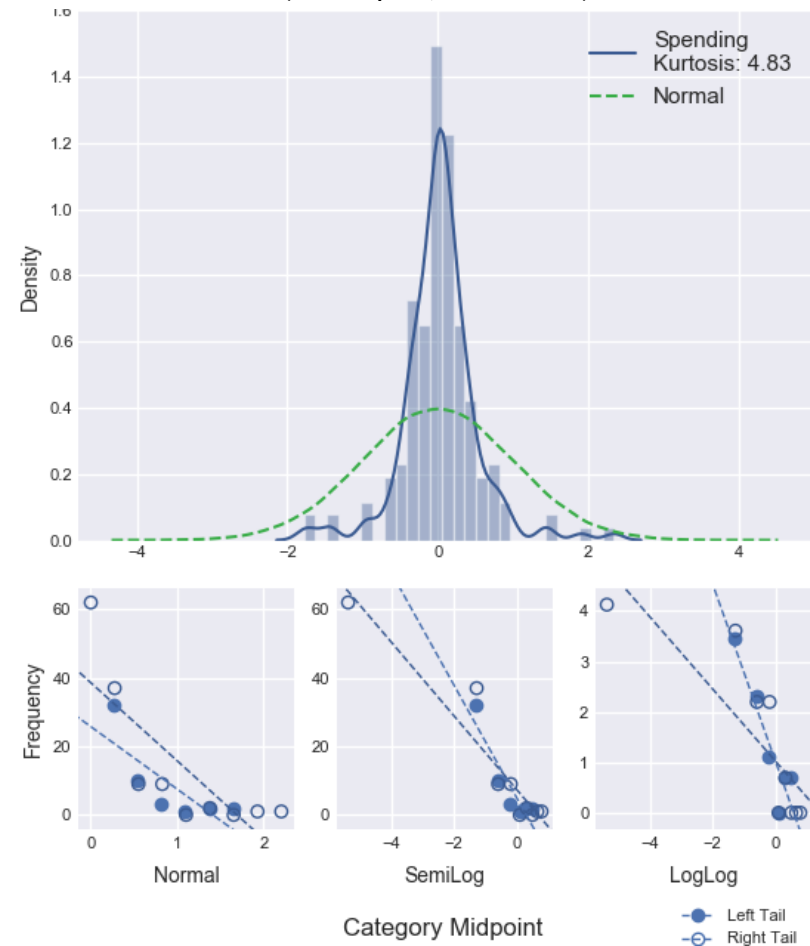


Figure 6 shows the distribution of changes in the rhetoric of the World Development Report. The tall centre of the distribution reflects the large number of near-zero annual changes in attention. The bulge in the right tail reflects a surprisingly frequent number of large increases in attention given to a topic in the WDRs. The plots at the bottom compare the data to three expected distributions. The normal distribution (left) is clearly concave, while the Paretian distribution (right) is convex. The data are closest to expectation in the exponential distribution (centre), where the points best approximate a straight line. The exponential distribution reflects punctuations, but not to the same degree as the Paretian, suggesting that rhetorical shifts are punctuated, but not to the same degree as spending shifts.

The distribution of spending changes (Figure 7) reveals an even more pronounced distribution. The kurtosis is more than in double the rhetorical distribution, with pronounced bulges in both tails. This reflects a very ‘wild’ distribution, with a large number of minor changes but unexpectedly high frequency of major changes. The plots for normal and exponential distributions are clearly concave, and the data fit closely to the Paretian distribution. The slope of the right tail is also shallower, reflecting the larger magnitude of positive punctuations. This shows increases in attention to have bigger jumps than decreases.

The difference between the kurtosis of the distributions reflects the location of the two processes in the institutional problem-solving process. Jones and Baumgartner (2005) argue that institutional friction increases throughout the policy process. Early stage processes such as Congress hearings are therefore less punctuated than budget disbursements. This is true at the Bank, where rhetoric is much less punctuated than project spending. The reports of the early 1990s reflect this flexibility, covering topics such as poverty (1990), environment (1992), and health (1993) even during the peak of structural adjustment. While Ravi Kanbur’s report was

ultimately vetoed, his appointment shows the Bank's ability to engage more diverse views in early stages of the policy process.

Institutional friction increases by the project stage, where agents have more at stake and there are more veto players. Consequently, there is a much higher threshold for change, leading to more punctuations. The gap between rhetoric and reality reflects the strong bias toward the status quo established by hegemonic influence from the bank's largest shareholder.

Examining the tails shows some of these punctuations. For example, there is a large increase in "governance" related funding in 2008. Though the increase in governance spending corresponds to Zoellick's appointment, it is likely that these loans were a response to the 2008 financial crisis. This increase in attention subsides in 2009 (See figure 3 above).

7.0 Conclusion

The World Bank has long been the object campaigns for reform. Some critique the bank for merely paying lip service to lofty goals while others despair at the prospect of radical change. This study explains both the rhetoric-spending gap and the possibility of transformative change even in a highly complex institution. This does not assume that change will always be in the direction desired by reformers— structural adjustment was just as much of a punctuation as environmental reform.

The model suggests that US interests significantly shape the Bank's agenda. However, the influence of all stakeholders and general media are also connected to the Bank's spending priorities. The analysis suggests that 'policy entrepreneurs' such as well-placed leaders can make change happen.

Methodologically, this study demonstrates the utility of topic modeling as an approach to understanding corpora of official documents and the possibilities for testing the drivers of

institutional agendas. It also reinforces the use of stochastic approaches to explain the dynamics of complex systems.

There are numerous ways to expand on this research on both methodological and theoretical grounds. The model could be optimized by testing different configurations of the relevant parameters and increasing the fit of the model. In order to obtain more robust results, further research might expand its scope to include more of the Bank's documents. The Bank's Open Knowledge Repository (OKR) has a protocol for harvesting its more than 27,000 documents published after 2012.

The relationship between rhetoric and spending links to larger questions in the field related to ownership, voice, participation, and accountability. In development studies, future research might draw on the methods in this paper to examine the link between citizens' concerns and government budgets or national priorities and NGO projects. More concrete results might be achieved by testing more specific hypotheses around keywords linked to certain policy agendas (Alfini and Chambers, 2007). A more detailed examination of the role of civil society in policy punctuation could also draw on the data and methods of this study.

Though institutional architecture often seems rigid, this study reveals how that rigidity enables— rather than precludes— transformative change.

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Declaration of Interest

No conflicts of interest.

Replication Data

All data used in this project is publicly available. Derived datasets are available from the author upon request.

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Appendix I

Excluded Words

world", "bank", "countri", "human", "develop", "development", "countries", "qxd", "rms",
 "cid", "page", "percent", "wdr", "also", "ofthe"

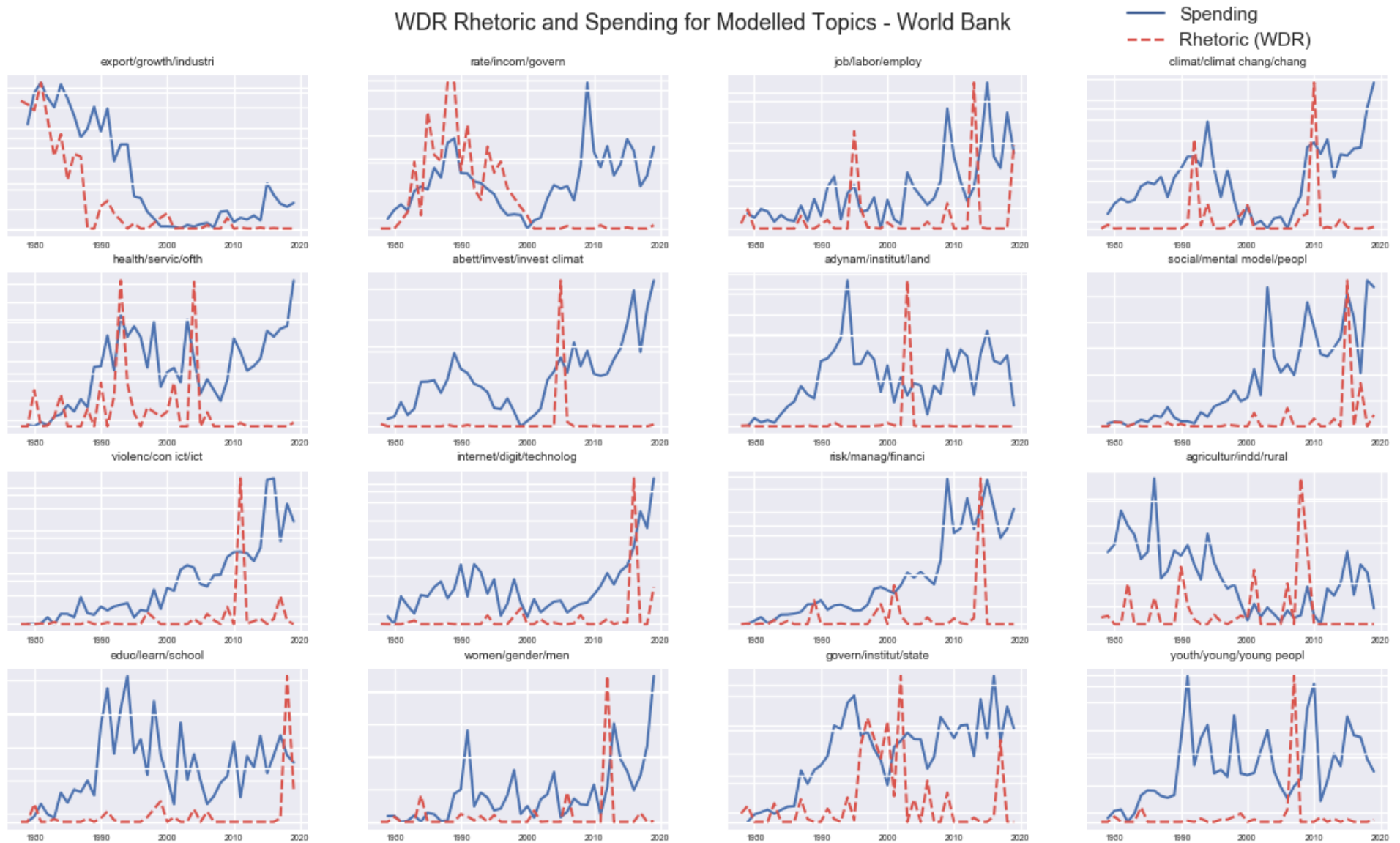
Appendix II: Data for 16-Topic Model

Table II.1: Top Ten Features for 16 Topic Model

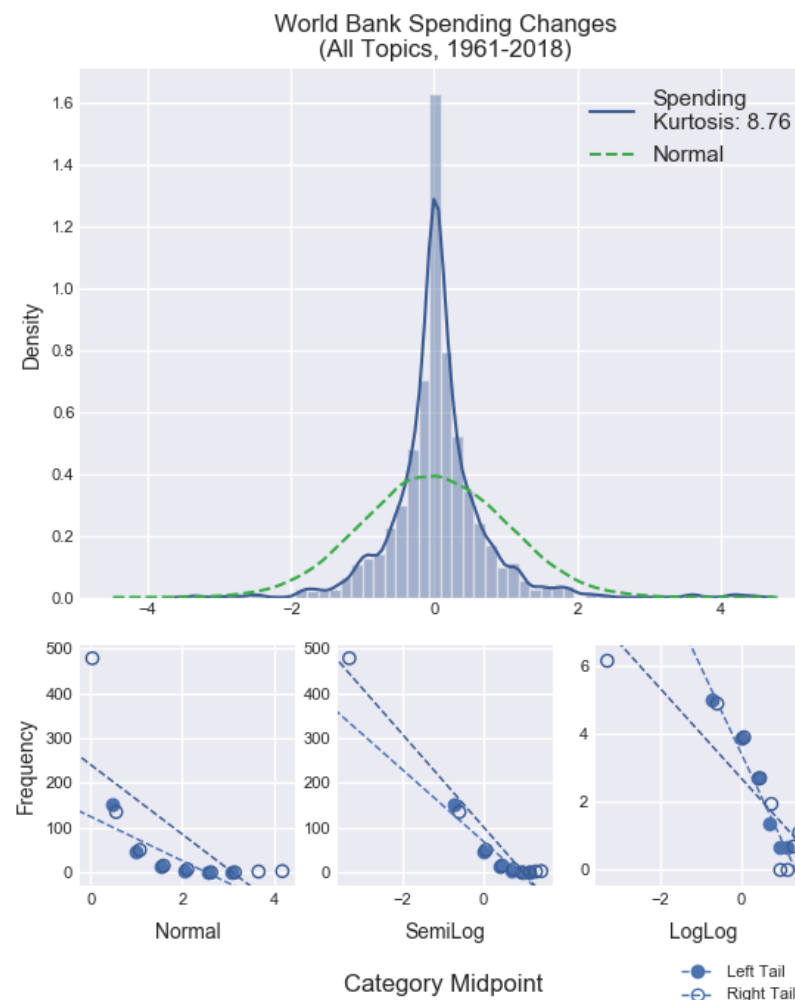
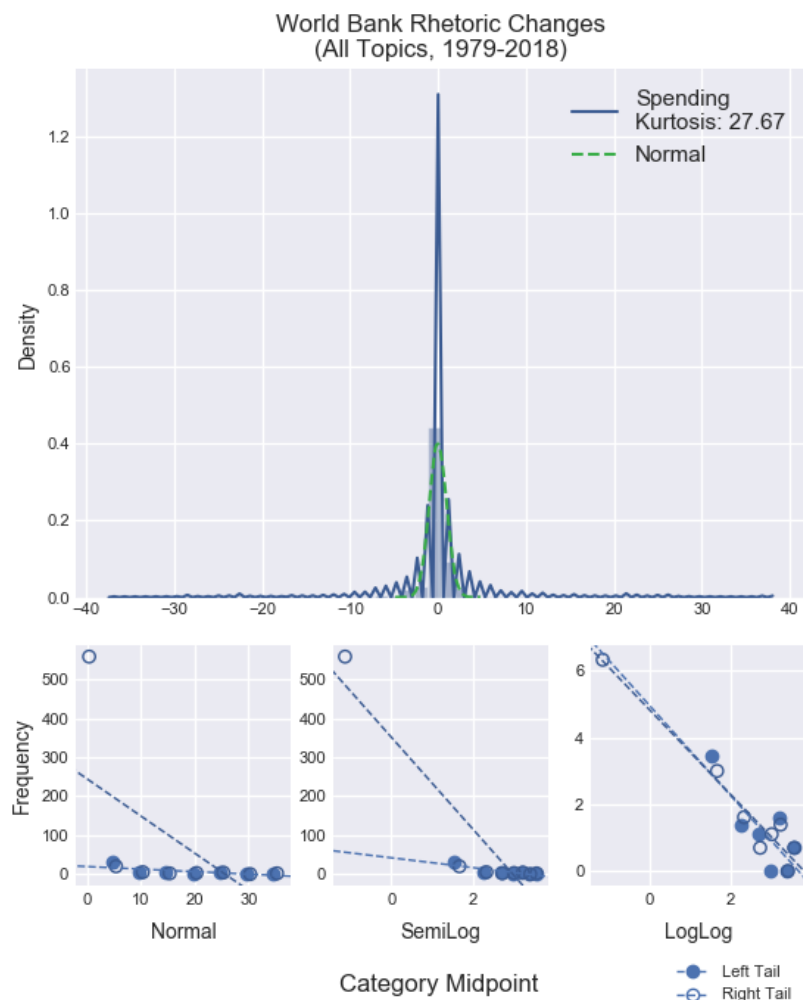
Topic 0: rate, incom, govern, economi, debt, public, invest, year, price, market
Topic 1: export, growth, industri, incom, import, oil, rate, price, increas, product
Topic 2: job, labor, employ, worker, work, beat, social, wage, product, econom
Topic 3: climat, climat chang, chang, emiss, carbon, water, energi, cost, use, environment
Topic 4: health, servic, ofth, poor, public, incom, provid, cost, per, govern
Topic 5: abett, invest, invest climat, govern, inga, climat, polici, abett abett, econom, improv
Topic 6: adynam, institut, land, intern, environment, urban, themi, use, asset, govern
Topic 7: social, mental model, peopl, chang, polici, behavior, econom, effect, make, decis
Topic 8: violenc, con ict, ict, area, con, intern, institut, seeth, secur, nation
Topic 9: internet, digit, technolog, digit technolog, use, servic, data, ict, inform, http
Topic 10: risk, manag, financi, risk manag, polici, peopl, insur, system, communiti, econom
Topic 11: agricultur, indd, rural, poverti, poor, market, incom, growth, econom, area
Topic 12: educ, learn, school, teacher, student, system, skill, program, work, econom
Topic 13: women, gender, men, econom, work, femal, differ, educ, incom, polici
Topic 14: govern, institut, state, market, econom, public, privat, reform, inform, mayb
Topic 14: youth, young, young peopl, peopl, school, educ, program, work, age, health
Topic 15: rate, incom, govern, economi, debt, public, invest, year, price, market

Figure II.1: Rhetoric and Spending, 16 topic model

WDR Rhetoric and Spending for Modelled Topics - World Bank



Figures II.2 and II.3: Change Distributions for 16 Topic Model



Appendix III: Summary Statistics for OLS Models

Model 1: Spending

	Mean	Standard Deviation
Spending	0.2471	0.2182
NYT	0.0048	0.0023
UNGA	0.0135	0.0082
USA	0.0205	0.0146
Window	2.22E-06	2.14E-06

Model 2: Rhetoric

	Mean	Standard Deviation
Rhetoric	0.1854	0.1888
NYT	0.0053	0.0024
UNGA	0.0125	0.0076
USA	0.0210	0.0152
Window	2.00E-06	2.00E-06

Model 3: Projects

	Mean	Standard Deviation
Spend_0	0.104	0.156
UNGA0	0.022	0.005
news0	0.006	0.001
USApref0	0.032	0.007
clientpref0	0.032	0.010
Spend_1	0.091	0.163
UNGA1	0.005	0.003
news1	0.002	0.001
USApref1	0.004	0.006
clientpref1	0.007	0.008
Spend_2	0.051	0.133
UNGA2	0.014	0.003
news2	0.007	0.002
USApref2	0.027	0.014
clientpref2	0.019	0.010
clientgdp	277735500000	1165924000000