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Committing to Fiscal Policy: The Influence of the U.S. President on Consumer Confidence and Output

Philipp Adämmer[†] and T. Philipp Dybowski[†]

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[†] Department of Economics, University of Münster, Germany

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Philipp Adämmer[a], T. Philipp Dybowski[b,*]

[a] *Chair of Monetary Economics, University of Münster, Germany*
[b] *Institute of International Economics, University of Münster, Germany*

Abstract

This paper examines whether the U.S. president's fiscal commitment raises confidence and ultimately output. We analyze 80,545 U.S. presidential speeches by using a probabilistic topic model to construct a continuous measure on the president's commitment to fiscal policy. Impulse responses from a SVAR model confirm that a stronger commitment temporarily boosts consumer confidence which then stimulates output.

Keywords: topic model, fiscal policy, SVAR, confidence

JEL: C32, C82, D72, D83, E62

*Corresponding author

Email addresses: philipp.adaemmer@wiwi.uni-muenster.de (Philipp Adämmer), philipp.dybowski@wiwi.uni-muenster.de (T. Philipp Dybowski)

1. Introduction

At least since the seminal thoughts of John Maynard Keynes, economists have examined the ways in which sentiment and confidence ("animal spirits") influence the real economy (Ludvigson, 2004). It is widely believed today that consumer confidence is a crucial transmission channel for policy shocks (Bachmann and Sims, 2012). Hence, verifying such a transmission channel and determining the impact factors on confidence is an important subject for economic research.

Findings from political science imply that politics – in particular the U.S. president – has influence on consumer's confidence (e.g., Cohen and Hamman, 2003; De Boef and Kellstedt, 2004). This impact stems from the formal and informal powers granted to the president. For example, presidents can strategically influence the content, timing and publication of news to promote their political agenda. One announcement often suffices to attract and redirect attention by the media and the public (e.g., Zeidenstein, 1984; Miles, 2014). Eshbaugh-Soha (2013) show that the president's press conferences are frequently cited by the media which consequently directs public opinion. The president also steers the political agenda of the congress with respect to macroeconomic topics (Rutledge and Larsen Price, 2014).

Based on this strand of literature we hypothesize that the president can raise consumer confidence by signaling a commitment to fiscal policy issues. Such a commitment increases beliefs in fiscal sustainability and hence raises confidence (e.g., Barsky and Sims, 2011). Increased confidence in turn stimulates output. To reveal the president's fiscal policy commitment, we apply the Latent Dirichlet Allocation (LDA) algorithm to the Public Papers of the Presidents. To the best of our knowledge, this is the first attempt using LDA to combine the literature of (political) impact factors on confidence and the transmission channel of confidence to output.

2. Data and Methodology

2.1. Data

We analyze 80,545 presidential speeches between 1960 and 2015 collected from *The American Presidency Project* (Woolley and Peters, 2015). Quarterly data on tax revenues and GDP are taken from the BEA's NIPA tables. Quarterly data on the Consumer Confidence Index is obtained from Thomson Reuters Datastream. Macroeconomic variables are in logarithms of real per capita terms.

2.2. Topic Models

Probabilistic topic models are algorithms that can discover topics within a large corpus of documents without the need of classifying information (Blei, 2012). To identify topics within the presidential speeches, we use the LDA algorithm proposed by Blei et al. (2003). LDA is a hierarchical Bayesian model that assumes documents to exhibit multiple topics, where documents

are distributions over topics and topics distributions over words.[1] We follow Dybowski and Dybowski (2016) to reveal the 100 most prevalent topics by performing 5000 iterations on our corpus.[2]

LDA analyzes all documents by grouping related words of the corpus together to form coherent topics. Within these topics words are ordered according to their probability of occurrence. Table 1 depicts four revealed topics from the presidential speeches. For illustration, we only show the 20 most probable words of topics 42, 9, 52 and 94. Descriptive titles have to be inferred by the researcher since the algorithm only assigns consecutive numbers to topics. Based on visual inspection, we label topic 42 as *fiscal commitment* since words like *budget*, *tax*, *spending* and *deficit* are given the highest probability of occurrence. We label the other three topics *environment*, *foreign affairs* and *U.S. armed forces* according to the ordering of words.

Table 1: Selected topics, revealed by LDA

Fiscal commitment [*topic 42*]		**Environment** [*topic 9*]		**Foreign affairs** [*topic 52*]		**U.S. armed forces** [*topic 94*]	
prob.	words	prob.	words	prob.	words	prob.	words
.064	budget	.042	environmental	.159	foreign	.052	military
.050	tax	.041	water	.154	policy	.038	forces
.043	spending	.028	environment	.114	special	.028	armed
.040	billion	.028	protection	.100	ambassador	.027	army
.031	cut	.027	land	.083	political	.024	war
.030	deficit	.024	natural	.044	republic	.022	veterans
.027	taxes	.020	resources	.033	parties	.019	service
.026	cuts	.020	interior	.029	delegation	.016	commander
.022	pay	.017	lands	.028	mission	.016	uniform
.020	income	.015	conservation	.021	president	.015	women
.019	fiscal	.015	national	.019	embassy	.015	vietnam
.017	economy	.015	park	.018	northern	.014	navy
.016	congress	.013	river	.018	ireland	.013	force
.015	economic	.013	preserve	.014	firm	.013	serving
.015	plan	.012	protect	.013	united	.013	chief
.015	reduction	.012	quality	.010	brown	.011	duty
.014	increase	.011	pollution	.009	honorable	.011	corps
.013	proposed	.011	areas	.009	irish	.011	honor
.013	federal	.010	clean	.006	reconciliation	.011	sacrifice
.013	balanced	.010	forest	.005	states	.010	soldiers

The table presents four selected topics from the 100 topics discovered by LDA. For each topic we show the 20 most probable words. Topic labels are assigned from visual inspection of the words contained in each topic.

Having identified topic 42 as the fiscal commitment topic, we follow Griffiths and Steyvers (2004) and Dybowski and Dybowski (2016) to construct a monthly time series. Each observation is the highest monthly probability for topic 42 and corresponds to one presidential speech.[3] Figure 1 depicts the respective plot, in which grey-shaded areas mark U.S. tax reforms as documented in Yang (2007). An inspection of speeches that cause the probability spikes in Figure 1 confirms our topic interpretation (see titles of selected speeches). Numerous spikes occur during documented tax reforms, underlining the tax policy aspect of the president's fiscal commitment. Probability spikes outside the shaded areas can be pinned to fiscal policy issues such as the budget or the deficit/surplus.

[1] Blei et al. (2003) and Griffiths and Steyvers (2004) explain in detail the statistics behind this algorithm.
[2] We use the Matlab Topic Modeling Toolbox by Griffiths and Steyvers (2004).
[3] We also follow Dybowski and Dybowski (2016) to construct quarterly data for our empirical analysis.

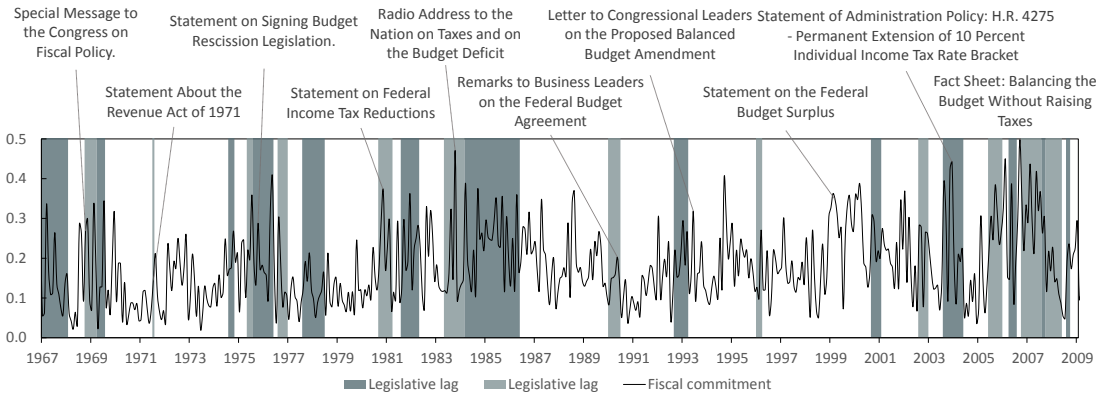

Figure 1: Monthly time series of the probability of containing topic 42. The shaded areas mark the legislative lags of U.S. tax reforms as documented in Yang (2007). Different shadings only serve to differentiate between tax reforms.

2.3. SVAR model

We apply the fiscal commitment variable within a structural VAR framework. Estimation of the reduced form VAR(p) with $p = 4$ lags is standard (Lütkepohl, 2005). The reduced form errors (u_t) are linked to the structural innovations (ε_t) according to $u_t = \mathcal{B}\varepsilon_t$:

$$\begin{aligned} u_t^T &= a_C u_t^C + a_Y u_t^Y + a_F u_t^F + \varepsilon_t^T \\ u_t^C &= b_T u_t^T + b_Y u_t^Y + b_F u_t^F + \varepsilon_t^C \\ u_t^Y &= c_T u_t^T + c_C u_t^C + c_F u_t^F + \varepsilon_t^Y \\ u_t^F &= d_T u_t^T + d_C u_t^C + d_Y u_t^Y + \varepsilon_t^F. \end{aligned} \tag{1}$$

T, C, Y and F denote tax revenues, consumer confidence, GDP and fiscal policy commitment, respectively. We identify our SVAR model under considerations of Blanchard and Perotti (2002) and Bachmann and Sims (2012). Specifically, we order confidence after taxes and use the output elasticity of tax revenues estimated by Pereira and Lopes (2014) for the contemporaneous effect a_Y.

The remaining identification is achieved by a recursive scheme with two exceptions: Due to a recognition lag in the presidents awareness of the Consumer Confidence Index, we postulate that the president's commitment to fiscal policy is not immediately influenced by changes in consumer's confidence. In contrast, president's statements regarding fiscal policy have an immediate effect on consumer's confidence. We thus set $d_C = 0$ and estimate b_F within the VAR. To avoid problems associated with correlation of variables, we follow Blanchard and Perotti (2002) by estimating the coefficients of the output (u_t^Y) and the fiscal commitment (u_t^F) equation via 2SLS. We include a constant and dummies for NBER recessions and the financial crisis as exogenous variables.

Due to the availability of the Consumer Confidence Index and the estimated output elasticity of tax revenues by Pereira and Lopes (2014) our sample stretches from 1967:II to 2009:II.

3. Results

Figure 2 shows impulse response functions of our SVAR model. Impulse responses represent unit shocks of the respective variables. The shaded areas correspond to one standard deviation confidence intervals.

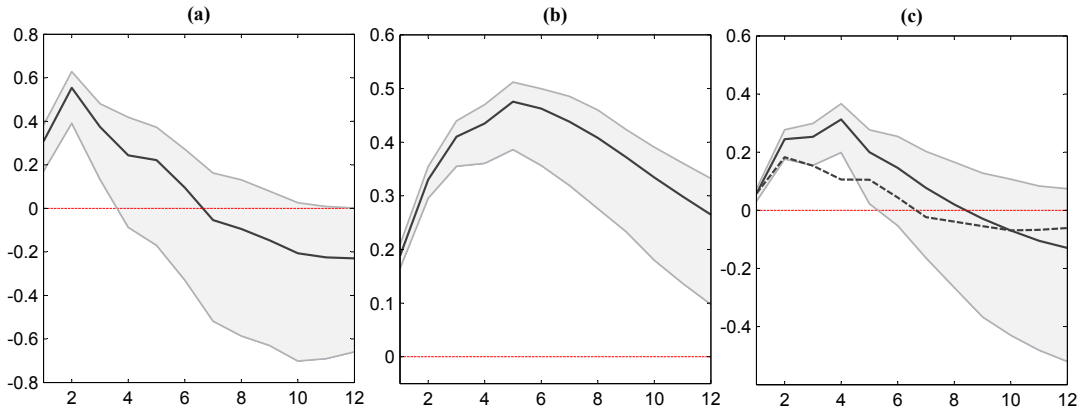

Figure 2: Estimated responses of (a) confidence to fiscal commitment, (b) GDP to confidence and (c) GDP to fiscal commitment. The dashed line is the isolated confidence channel of fiscal commitment to output. The shaded areas correspond to one-standard deviation bands, computed by Monte Carlo simulations with 500 replications.

From left to right, Figure 2 depicts the transmission channel of the president's fiscal commitment via confidence on economic activity. Panel (a) shows the response of consumer confidence to a positive fiscal commitment shock. It is visible that a stronger fiscal commitment by the president boosts consumer confidence during the first four quarters. The peak effect is reached around 2 quarters after which it declines and quickly fades out. Panel (b) shows that output rises in response to a positive confidence shock. The impact reaches its maximum around 5 quarters.[4] Panel (c) shows the *direct* effect of output to an increased fiscal commitment shock (solid line). This effect is positive and significant during the first six quarters, before it gradually fades out. In addition, panel (c) depicts the *indirect* effect of fiscal commitment to output via the "confidence channel" (dashed line). Following Bachmann and Sims (2012), this channel is given by $\partial Y/\partial F = \partial Y/\partial C \times \partial C/\partial F$, which is equivalent to $c_C \times b_F$ for the immediate effect. The dynamic confidence channel is revealed by multiplying the corresponding impulse responses over the forecast horizon $h = 1, \ldots, 12$. This *indirect* channel exhibits a positive effect on out-

[4]Our identification is further supported by the negative response of output to a tax revenue shock. To conserve space, this is not shown but available upon request.

put and underlines that confidence is important for the transmission of the president's fiscal commitment into economic activity.

In sum, all findings support our hypotheses: The president raises confidence by committing to fiscal policy. Increased confidence then raises output.

4. Conclusion

Consumer Confidence is an important source for politicians and economists to obtain insight into the state of the economy. In addition, it is considered an important transmission channel of policy shocks. We use a probabilistic topic model to obtain a continuous time series that contains information about the president's commitment to fiscal policy issues. We use this variable within a SVAR model and show that an increase of the president's commitment to fiscal policy raises consumer confidence which then stimulates output. The impact of political and presidential announcements on confidence is an important subject to be further investigated. The methods and results in this letter serve as a starting point.

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