**DORTMUND CENTER
FOR DATA-BASED
MEDIA ANALYSIS**

„Riders on the Storm"

The Uncertainty Perception Indicator (UPI) in Q1 2021

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Abstract

In this paper we update our Uncertainty Perception Indicator (UPI) with data from the first quarter of 2021. UPI values have declined in recent quarters. At first glance this might come as a surprise, with the third Corona wave having less of an impact than the first one, even though the former was several magnitudes bigger than the latter in Germany. This result underscores the difference between perception and actual impact: a shock hits the hardest when it first occurs because by then its nature is still unknown.

As shown in previous versions of the UPI, uncertainty has mainly been fed by the political sphere since the 2010s. Towards the end of our observation period, however, uncertainty from the international and European political spheres is declining, while German domestic politics is on the rise. The end of Angela Merkel's chancellorship marks the end of a long period of relative political stability. Without her in the race the outcome of German federal elections in September is hardly predictable. Whatever coalition may succeed, it is likely that any future government will engineer a shift in (economic) policy. The potential strength of this "election uncertainty effect" is evident in our data.

An update of our Fear Gauge shows profound shift in public discourse in Germany. With the pandemic in retreat for now, climate change and the question to what extent policies should follow science (whether on pandemics or global warming) are taking center stage in Germany.

Looking ahead, we expect UPI values to rise again as the federal elections loom and the economic and political consequences of the pandemic (e. g. higher debt levels) become apparent. Uncertainty shocks tend to come in waves. Given the severity of the Corona pandemic, a host of difficulties – ranging from unexpected inflation to debt crises to geostrategic tensions – are possibly in the making.

Keywords: Uncertainty, Narratives, Latent Dirichlet Allocation, Business Cycles, Covid-19, Text Mining, Computational Methods, Climate Change

## 1. After the storm, before the gale – Introduction

In the spring of 2020, as the Corona pandemic brought economic activity, and public life in general, to a halt across the globe, we returned to earlier work in which we had proposed the use of topic models for the measurement of economic uncertainty (Müller et al., 2018). What motivated us was the fact that uncertainty was visible virtually everywhere – except in many uncertainty indicators. The popular Economic Policy Uncertainty Index (EPU), introduced by Baker et al. (2016), didn't move initially though the economy had been hit by a monstrous exogenous shock. The reason was obvious: the EPU is based on a count of newspaper articles in which a predefined set of search words appears. This query is focused on certain areas of economic policy, e. g. monetary and fiscal policy and related institutions. Therefore, the EPU may be suitable to detect uncertainty stemming from the realm of traditional economic policy but not from truly exogenous developments. However, it was exactly these rather alien influences, we argued (Müller and Hornig, 2020), that were likely to become a recurrent ailment of humankind, due to the impact of climate change and increased population density in large parts of the world. We proposed a taxonomy that distinguishes between financial market uncertainty, economic policy uncertainty and truly exogenous uncertainty (i.e. the kind that originates neither in the market nor in the political system). An indicator, we postulated, should be able to capture all three kinds of uncertainty, *known unknowns* but also *unknown unknowns*.

We developed an approach that combines a more open query with a more sophisticated text mining method than the one used by the EPU. Topic models such as Latent Dirichlet Allocation (LDA) have the advantage of sorting large amounts of texts in an unsupervised fashion (Blei et al., 2003) which allows for individual text clusters ("topics") to be interpreted as frames (di Maggio et al., 2013). When an issue becomes more salient, or a completely new one appears, this should be detectable. Following this approach, we constructed the Uncertainty Perception Indicator (UPI). It is composed of a number of topics that have the propensity of isolating evolving economic uncertainty over time. The results promise to be valuable since the economic impact of a particular shock is likely to be different depending on the direction it is coming from. Financial market uncertainty may have longer lasting effects than natural disasters, say, a river flooding. Not all uncertainty shocks are created equal, thus indicators should be able to differentiate between them. This is what the UPI is designed to do.

Unfortunately, probabilistic topic models such as LDA are annoyingly unstable. With each run they yield slightly different results. This is not only a problem with respect to the reproducibility of scientific research but also a major hinderance to building reliable time-series from LDAs. As we showed in Müller et al. (2020a), a sequence of one-shot LDAs does not produce something akin of a consistent time-series, even when the newish *LDAPrototype* approach is applied which at least presents a solution to the reproducibility problem (Rieger et al., 2020a, b), and combining it with varying degrees of "zooming". In Müller et al. (2021b) we came up with a solution: if we held the LDA model's structure constant over periods of time, but allowed for gradual changes in the topics over time, a smooth transition towards reliable time-series becomes feasible. We call this method *RollingLDA* (see Müller et al., 2021b, for a detailed description). To be sure, at each observation point the stability of the model needs to be checked, for it is possible that disruptions in the structure of individual topics occur, rendering them hardly comparable over time. In this case, a recalculation of the entire model may be warranted.

In this research brief we present an update of the thus-constructed UPI. It now also includes newspaper articles from the first quarter of 2021. The composition of the corpus and the specifics of the *RollingLDA* model are identical to those used in the preceding paper (Müller et al., 2021b).

Figure 1: The Covid Shock peters out – UPI* for Germany
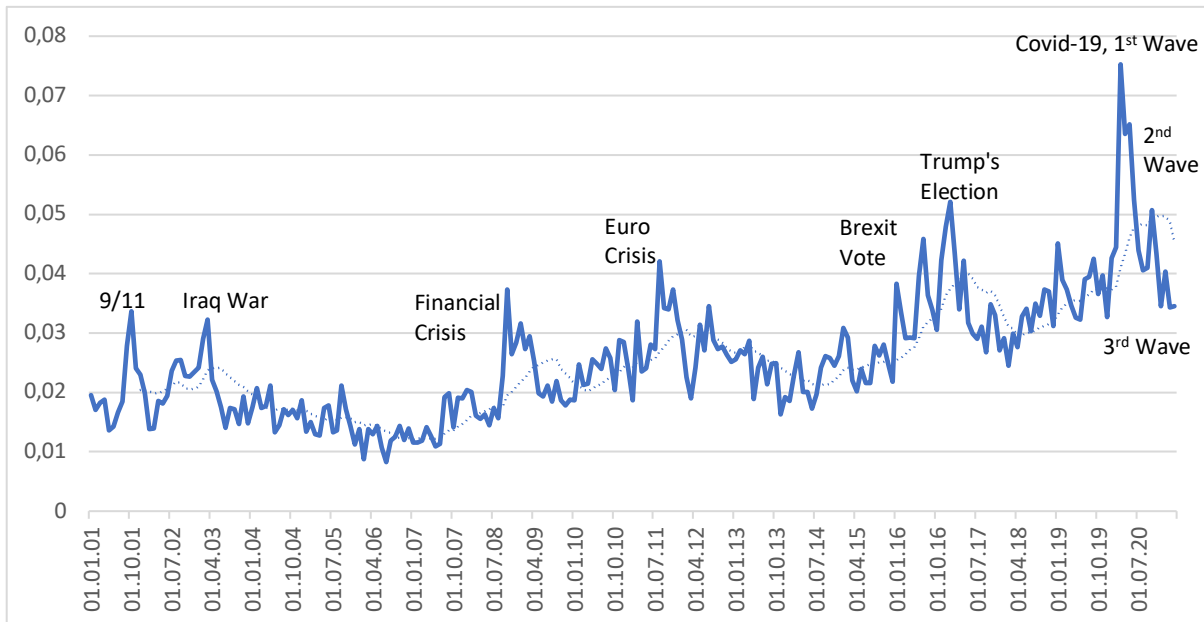
*Analysis corpus relative to entire corpus, monthly data and twelve-month backward-looking moving averages

The overall prevalence of economic uncertainty in our newspaper corpus has markedly decreased in the first quarter. Interestingly, the second and the third wave of the Corona pandemic, that hit Germany in the final quarter of 2020 and in early 2021, respectively, resulted only in minor local maxima (fig. 1). This is all the more remarkable as the effective medical impact of the pandemic became more severe over time. While the first wave passed Germany rather mildly, peaking at some 6000 new Covid-19 cases a day in early April 2020, the second and the third waves were much more pronounced, with daily counts of up to 30 000 additional infections. The numbers of Corona-related deaths and hospitalizations peaked in early 2021 as well. Still, economic uncertainty, as measured by the UPI, declined after the first wave. This underlines the importance of perception over actual affectedness: the impact of uncertainty shocks seems to be the biggest when they first hit. It is the unknown that is most disturbing, not necessarily the severity. As individuals, companies, and public institutions adapt to altered circumstances, the arresting effects of uncertainty subside: from being meek victims of disaster they learn how to be "Riders on the Storm" (as the old Doors classic has it). While German media still reported intensively on the pandemic, they less often framed it as causing economic uncertainty, so that the UPI has dropped sharply. Meanwhile, other uncertainty-related issues have risen in salience, most notably domestic politics.

This short paper is organized as follows: the next section provides an overview of the results with a focus on what happened in the most recent past. Section 3 presents some conclusions, focusing on sources of uncertainty that may become more relevant in quarters to come. The appendix presents an overview of our topic model and a stability test.

2. What's new? – Results

Disaggregating the UPI into Uncertainty Factors shows a rise in political uncertainty over the second half of the 2010s. This increase precedes an associated rise of uncertainty in the real economy and, at times, in financial markets. At the end of the time horizon the two latter types of uncertainty abate somewhat as the post-Corona recovery starts to come into focus, while political uncertainty remains at elevated levels.

Figure 2: UPI by Uncertainty Factors, frequency over time*
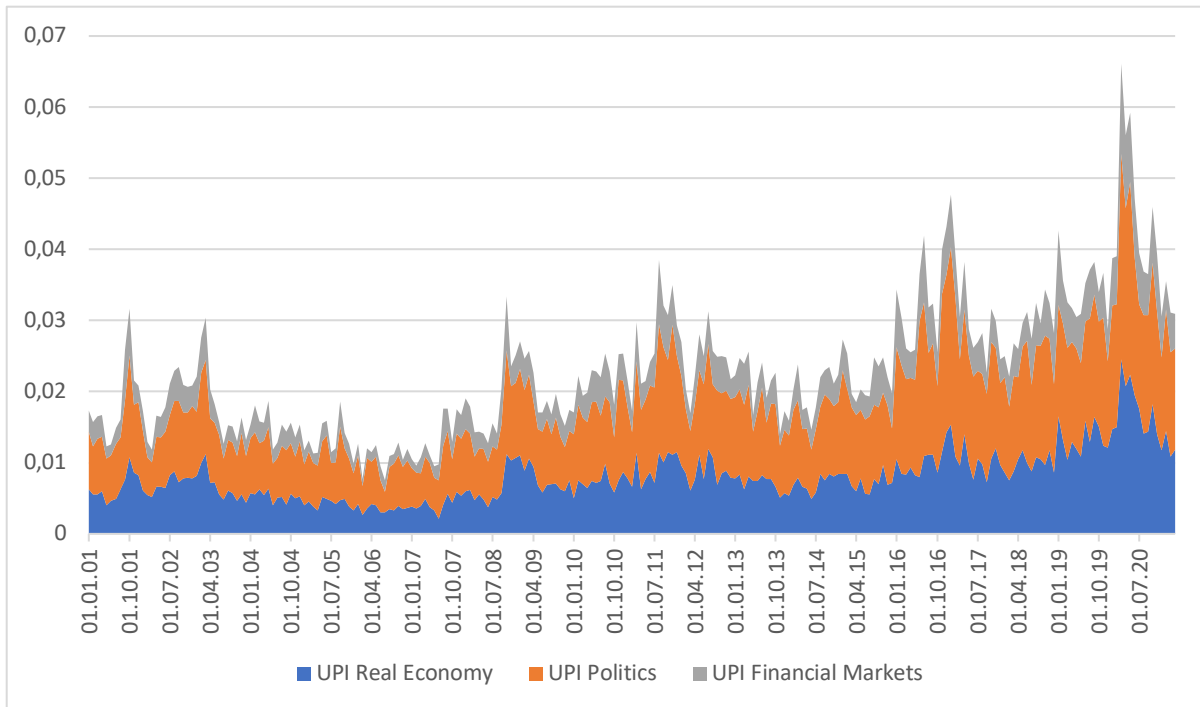
*Shares relative to corpus

UPI Politics
Over the past decade the rise of overall uncertainty was mainly driven by international and European topics (fig. 3). Europe's dismal decade is epitomized in the Euro Crisis peaking in 2011, and the Brexit referendum of 2016. Geopolitical strains materialized most pronouncedly in the election of Donald Trump to the US presidency in 2016 and the trade conflicts he launched.

Figure 3: UPI Politics – European and International topics, key events*
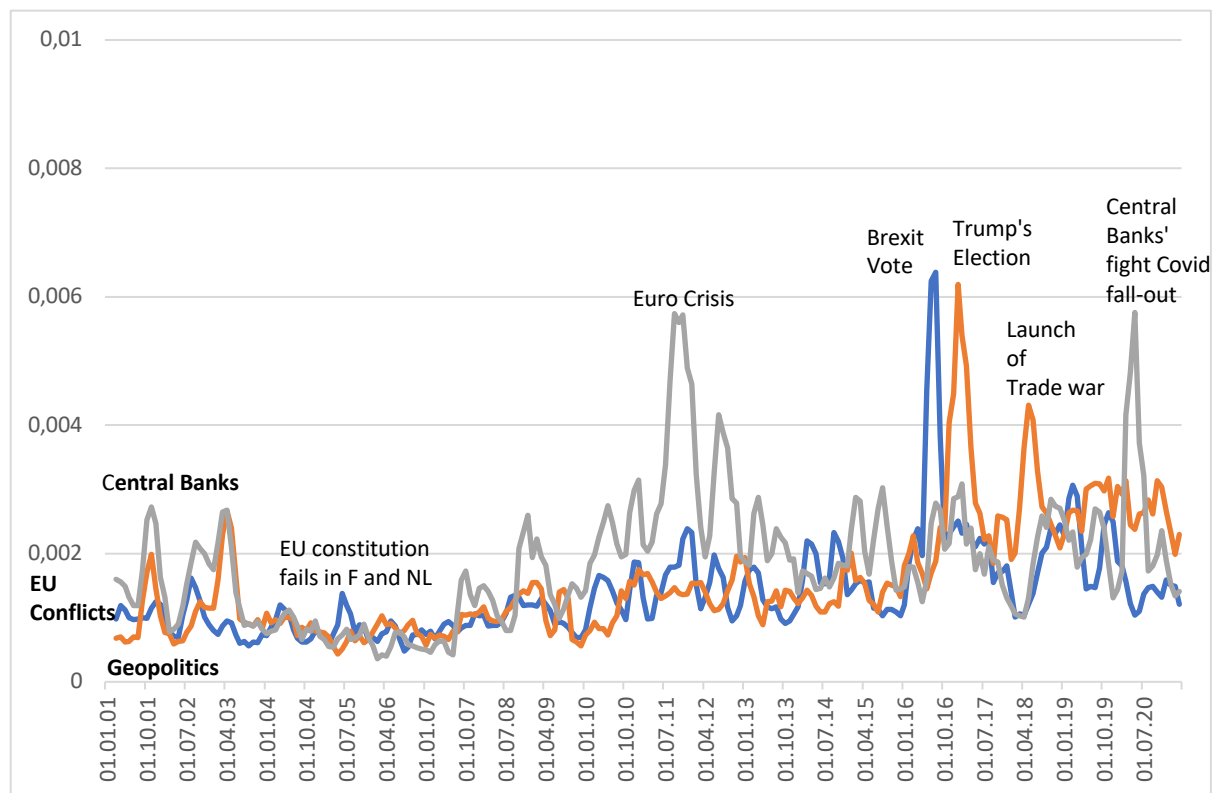
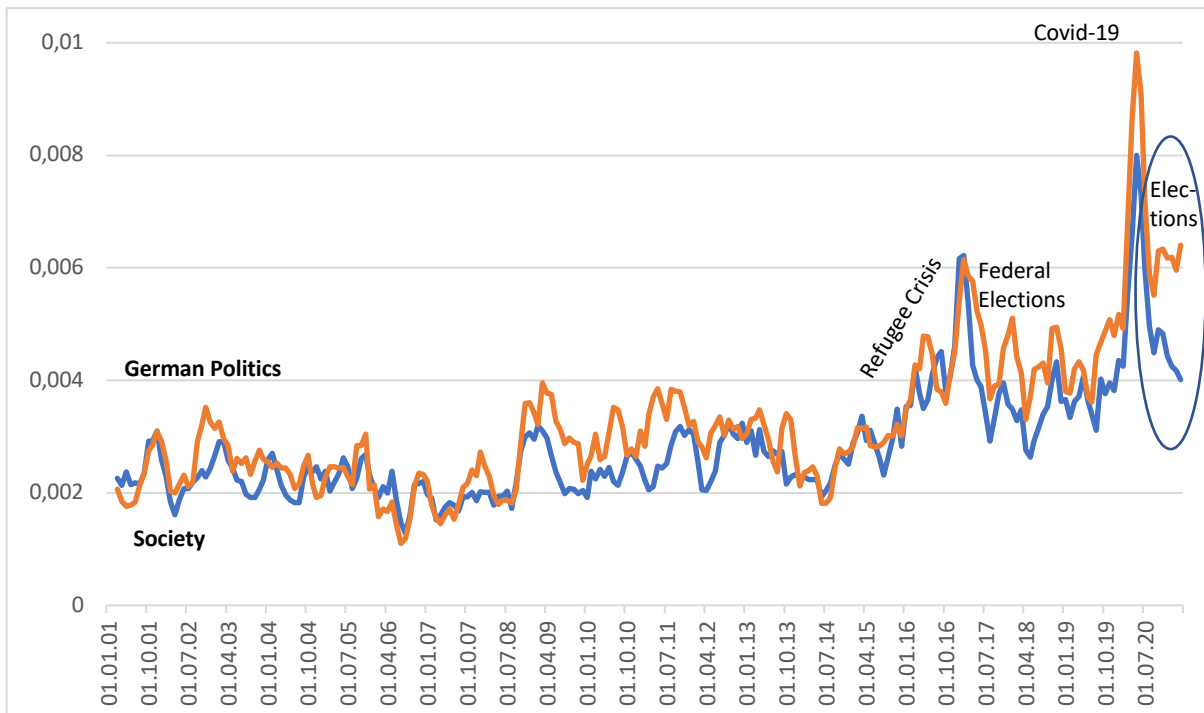*Shares relative to corpus; three-month backward-looking moving average

However, toward the end of the time horizon these factors have declined: the EU has entered into what looks like a new phase of tentative political integration, with the commonly financed 750 billion Euro Corona recovery fund as the most striking development. For the time being, the bitter disputes of the 2010s over a strategy against the debt crisis have been sorted out, a change in mood for which the common Covid experience has apparently been a catalyst. On the geopolitical level, the election of Joe Biden to become the 46th US president has ushered in the prospect of renewed transatlantic cooperation after the tumultuous Trump years. Differences with the US as well as tensions with China and Russia remain on the radar but do not seem acute to the German public presently.

Instead, in a remarkable shift *domestic politics* has become a major source of economic uncertainty in Germany. During the first decade of Angela Merkel's chancellorship domestic affairs were a toned-down, if not boring business. This changed during the refugee crisis of 2015/16, when harsh debates about national identity rippled through the nation and right-wing mass demonstrations stirred an alarmist political climate across the spectrum, an episode that culminated in the right-wing AfD party entering national parliament as the third-largest group after the 2017 federal elections. In 2020 it was the political reactions to the pandemic, particularly unprecedented public safety measures, that gave rise to uncertainty (fig. 4, orange line). At the same time, a wave of public discontent hit the nation when a small, but voiceful minority attracted public attention (blue line).

Over the past two decades covered by our analysis, public debates in Germany, as captured in the topic "Society", and political developments ("German Politics") moved largely in tandem. This has changed. In recent quarters a *decoupling* can be observed (highlighted in fig. 4). While civil society seems to have returned to a state of relative calm, there is considerable

commotion in the realms of domestic politics. The upcoming federal elections cast a cloud over the economy as the status quo of the past one and half decades, i.e. conservatives-led coalition governments under Angela Merkel's modest chancellorship, is coming to an end. All possible future options are untested – in terms of coalitions and candidates – and therefore induce considerable political uncertainty. Possible Christian democratic successors were among the most often cited figures in the topic "German Politics II" in recent quarters (see appendix, table 3).

Figure 4: UPI Politics – a decoupling of domestic topics

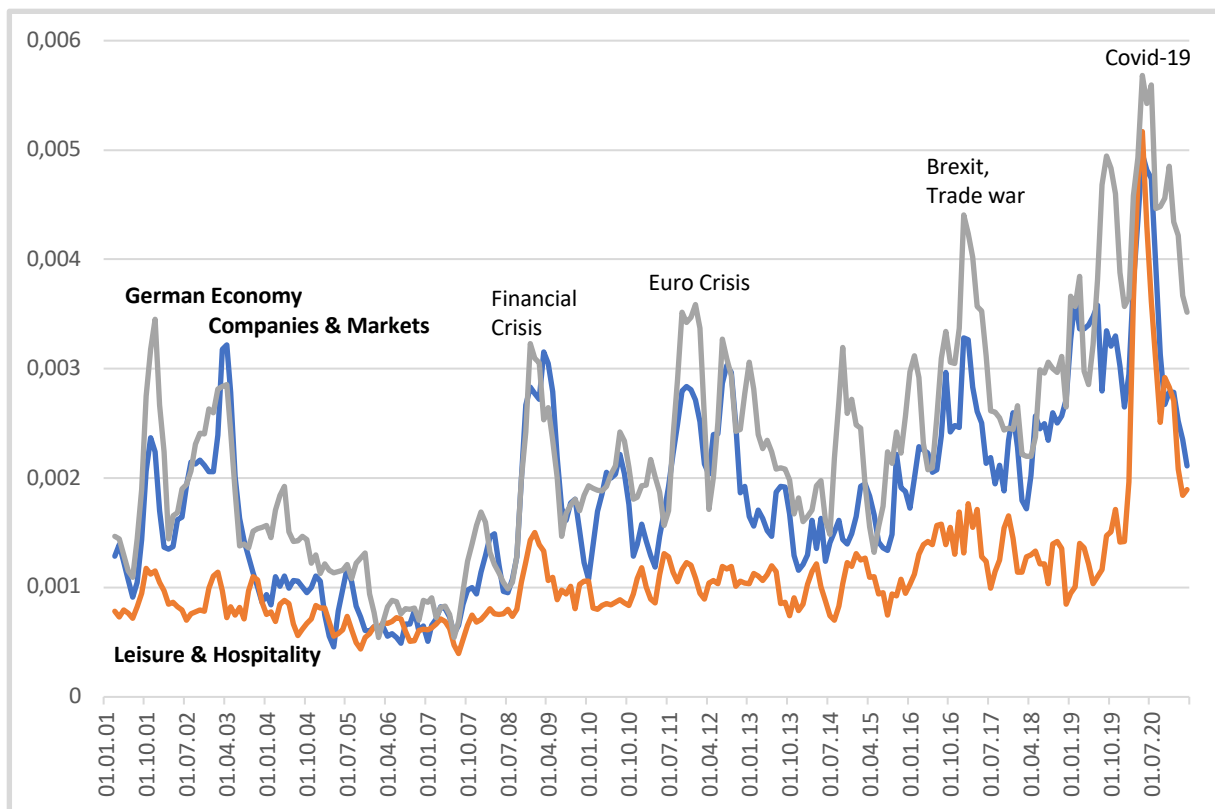*Shares relative to corpus; three-month backward-looking moving average*

UPI Real Economy

Turning to the real economy, it is hardly surprising that *cyclical topics* have declined markedly towards the end of the horizon. The business cycle hit a trough in the second quarter of 2020. Since then, a recovery has been under way, even though recurrent waves of infections have caused delays (fig. 5).

*Figure 5: UPI Real Economy – Business Cycle-sensitive Topics**

*Shares relative to corpus; three-month backward-looking moving average

Like the cyclical topics, structural ones have declined as well in recent quarters. Since the mid-2010s the topic „Corporate Culture" was on a secular rise, driven by the challenges posed by digitalization and (foreign) digital giants such as Google, Apple and Amazon, the final peak being triggered by the Corona pandemic. For the time being, the topic has declined markedly. "Energy & Climate Change Mitigation" used to be driven by the Fridays for Future movement and a general sense of urgency concerning global warming, declined in Q4 2020, but made a comeback in Q1 2021 (fig. 6, highlighted).

Figure 6: UPI Real Economy – Structural Topics
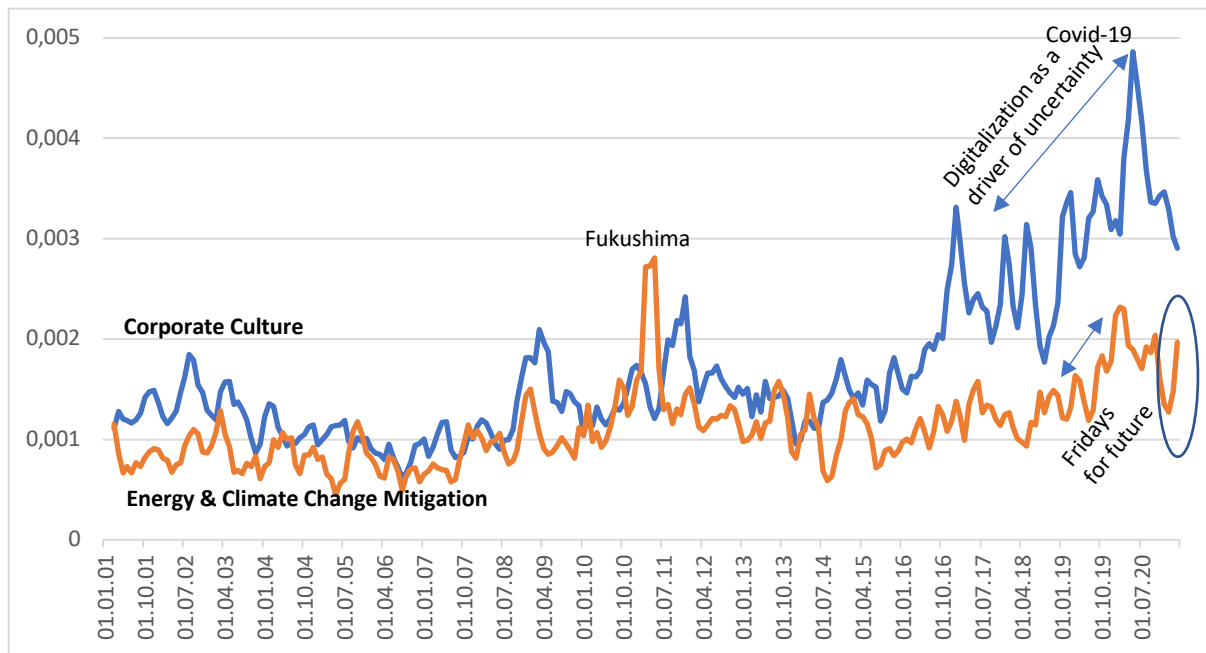
*Shares relative to corpus; three-month backward-looking moving average

Corona in the UPI
In Q1 2021, when a third wave of infections prompted a prolonged lockdown, the pandemic was still far from over. And it has remained a major issue in all the topics of our model since Q1 2020 (see fig. 8 in the appendix).

The Fear Gauge
In Müller et al. (2021b) we constructed a "Fear Gauge" which measures the salience of the word "Angst" and synonyms. In Q4 2020 we observed that fear was abating. In Q1 2021, though, it again rose markedly. The main contributor was the topic "Society" (fig. 8). We attribute this rise to the still-raging pandemic. An intense debate about the late and slow start of the vaccination campaign, that was coordinated at the EU level, contributed too (as the orange segments in fig. 7 indicate).

Figure 7: Fear Gauge – Salience of "Angst" in UPI topics*
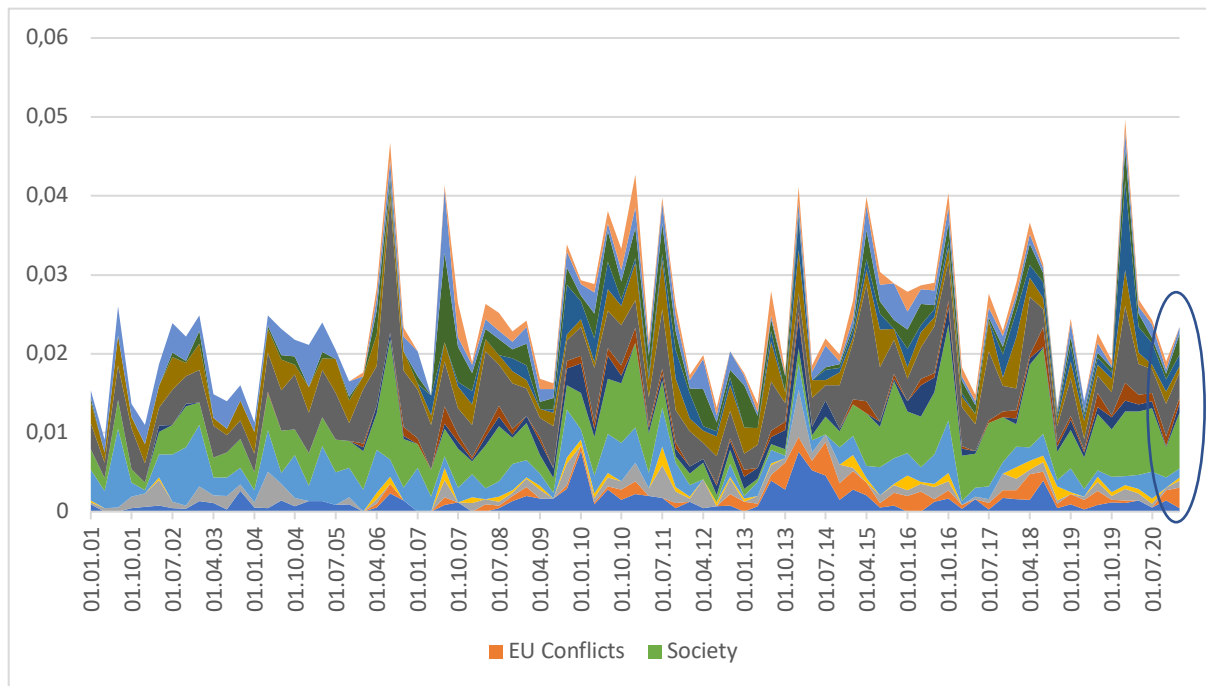
*Shares of articles in UPI topics comprising the word "angst" and synonyms

What is driving the topic "Society"? Table 1 provides a snapshot of the past five quarters. Having calculated the top words (i.e. the most characteristic ones) of each topic on a quarter-to-quarter basis, certain shifts in public priorities become visible. One striking example is *Climate Change* ("Klimawandel"). The term did not appear on the top word lists[1] until 2020 Q1. During the height of the Covid-induced uncertainty shock in Q2 and Q3 it disappeared again, only to reappear in Q4 and Q1 2021, possibly to stay. This rise is in line with our findings concerning the "ECCM" topic (fig. 6). Another example is the word *Science* ("Wissenschaft") which appears 46 times among the 50 top words since 2001, but disappears after 2015. In recent quarters, though, Science has made a comeback and hit the top ranks as debates about Corona-induced restrictions and the anti-vaccination/pandemic denial movement have become more animated.

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[1] In the topic's top 50 words there is only mention of "Klima" in Q1 2005 (rank 30).

Table 1: Top Words by Quarter of Topic "Society"

2020-Q1	2020-Q2	2020-Q3	2020-Q4	2021-Q1
menschen	menschen	menschen	menschen	Menschen
gesellschaft	gesellschaft	gesellschaft	gesellschaft	Gesellschaft
welt	leben	bildung	wissenschaft	Wissenschaft
leben	demokratie	bevoelkerung	Freiheit	Pandemie
denken	soziale	leben	Politik	Bevoelkerung
politik	welt	soziale	politische	Leben
soziale	krise	freiheit	Buerger	Politik
globalisierung	politik	politik	Krise	Soziale
freiheit	denken	covid	Welt	Koopmans
macht	angst	politischen	pandemie	Wissen
politische	bevoelkerung	sozialen	Denken	Welt
klimawandel	politische	globalisierung	Leben	Klimawandel
europa	freiheit	welt	Soziale	Angst
tun	buerger	generation	Zukunft	Tun
buerger	politischen	pandemie	Tun	Entscheidungen
demokratie	gibt	demokratie	Herr	Denken
sozialen	solidaritaet	buch	Heute	Corona
buch	macht	tun	klimawandel	Leute
staat	virus	zukunft	Kultur	Risiken
oekonomischen	gerade	krise	Erleben	Covid

3. What's next? – Conclusions

The Q1 2021 update of the UPI shows a rapid retreat of perceived economic uncertainty. This is a remarkable result, at a time when a severe third wave of the pandemic was still on the rise and public discontent over Corona-fighting restrictions became more and more voiceful. What's next? Drawing from recent experience we suggest the following:

Watch out for the next spike!
As noted in Müller et al. (2021b), past outbreaks of uncertainty tended to come in waves. A major event is typically being followed by subsequent ones. The two geopolitical shocks of the early 2000s (the terror attacks of 9/11 and the Iraq war) were causally intertwined. The financial crisis of 2008 triggered the Euro crisis. The populist shocks of 2016 (the Brexit referendum and the election of Donald Trump) were related to each other in so far as they were the most prominent manifestations of a up to that point simmering populist turn in Western democracies. Major uncertainty shocks seem to be culminations of underlying tensions in the political economy. Once laid bare, these tensions tend to unload in a series of additional eruptions.

Speculating about the near future, an obvious threat are *new waves of Covid-19 infections*. With new variants being detected and spreading, further shocks from this direction cannot be ruled out. Furthermore, we'd suspect that *inflation* surprises may be in the making. Central banks are prone to miscalculations concerning underlying price dynamics that build up during

the post-Covid recovery to the effect that inflation expectations could become unanchored. Rising market interest rates, in turn, may lead to *debt crisis* in countries with high levels of foreign-currency denominated liabilities, e.g. Turkey. In Q1 2021 uncertainty surrounding central banks was quite low (fig. 3), but this may change. At the time of writing, business reporting is rife with warnings of inflation. Financial markets indicate that central banks still control the monetary narrative, but they are being challenged.

In the sphere of geopolitics, demoralized citizens of poorly managed emerging and transition countries may voice their opposition to *incompetent governments*. In poor developing countries, an as yet largely untamed pandemic may contribute to the *destabilization* of societies, potentially prompting additional *migration*. *Souring international relations* may also prove to be part of the fall-out from the Corona crisis. All these global developments would have repercussions in an open country such as Germany.

In the immediate future, domestic politics are bound to take centerstage in Germany.
According to our data, German politics have been a moderating factor over much of the past two decades. This can no longer be taken for granted, as the arrival of populist polarization in Germany in recent years already indicated (fig. 6). At the time of writing, candidates are on the verge of hitting the campaign trail as the federal elections in September loom. Afterwards, the country will be led by a new coalition government headed by a new chancellor, as Angela Merkel is stepping down. Given the increased fragmentation of the political landscape, several hitherto un-tested combinations of parties could form the next government which could differ substantially from its predecessors, especially in terms of economic policy. From a hard-leftish stance on redistribution to a moderately business-friendly government many outcomes are possible. This is exactly the type of situation that creates *economic policy uncertainty.*

The domestic political agenda will partly be shaped by the pandemic.
The collective experience of the Covid-19 crisis is likely to influence voters' preferences, although it is not quite clear in which ways. While it can be argued that the Corona crisis has been proof that a large welfare state and draconian government intervention are beneficial, it has also unveiled troublesome administrative inefficiencies and slowness. Either way, the next government will likely put an *institutional overhaul* high its agenda. The second obvious issue is *Global Warming*. As the rising salience of the terms Climate Change and Science in our model indicates (table 1), the experience of the shutdowns during the pandemic may feed into an equally uncompromising approach to fighting climate change, even if it comes at high social costs. Uncertainty concerning the path to climate neutrality may be a major driver to overall uncertainty in years to come.

4. References

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring Economic Policy Uncertainty. *The Quarterly Journal of Economics*, *131*(4), 1593–1636. https://doi.org/10.1093/qje/qjw024

Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent Dirichlet Allocation. *Jourrnal of Machine Learning Research*, *3*, 993–1022.

DiMaggio, P., Nag, M., & Blei, D. (2013). Exploiting affinities between topic modeling and the sociological perspective on culture: Application to newspaper coverage of U.S. government arts funding. *Poetics*, *41*(6), 570–606. https://doi.org/10.1016/j.poetic.2013.08.004

Müller, H., & Hornig, N. (2020). Expecting the Unexpected: A new Uncertainty Perception Indicator (UPI) – concept and first results. *DoCMA Working Papers*. https://doi.org/10.17877/DE290R-21089

Müller, H., Hornig, N., & Rieger, J. (2021a). "For the times they are a-changin'". *DoCMA Working Papers*. https://doi.org/10.17877/DE290R-21878

Müller, H., Rieger, J., & Hornig, N. (2021b). "We're rolling." *DoCMA Working Papers*. https://doi.org/10.17877/DE290R-21974

Müller, H., von Nordheim, G., Boczek, K., Koppers, L., & Rahnenführer, J. (2018). Der Wert der Worte – Wie digitale Methoden helfen, Kommunikations- und Wirtschaftswissenschaft zu verknüpfen. *Publizistik*, *63*(4), 557–582. https://doi.org/10.1007/s11616-018-0461-x

Rieger, J., Jentsch, C., & Rahnenführer, J. (2020a). Assessing the Uncertainty of the Text Generating Process Using Topic Models. In I. Koprinska, M. Kamp, A. Appice, C. Loglisci, L. Antonie, A. Zimmermann, R. Guidotti, Ö. Özgöbek, R. P. Ribeiro, R. Gavaldà, J. Gama, L. Adilova, Y. Krishnamurthy, P. M. Ferreira, D. Malerba, I. Medeiros, M. Ceci, G. Manco, E. Masciari, … J. A. Gulla (Eds.), *ECML PKDD 2020 Workshops* (pp. 385–396). Springer International Publishing. https://doi.org/10.1007/978-3-030-65965-3_26

Rieger, J., Koppers, L., Jentsch, C., & Rahnenführer, J. (2020b). Improving Reliability of Latent

Dirichlet Allocation by Assessing Its Stability Using Clustering Techniques on Replicated Runs.

ArXiv:2003.04980 [Cs, Stat]. http://arxiv.org/abs/2003.04980

5. Appendix

Table 2: Overview of Topics and Labels (RollingLDA, prototyped, Q1-2021, K=14)

Topic No.	Label	Share in analysis corpus (per cent)	Content	Part of Uncertainty Factor…
1	Corporate Culture	6.6	Trust, Technology, Entrepreneurship, Digitalization, Knowledge, Workplace, Career	UPI Real Economy
2	EU Conflicts	5.4	Brexit, Greece debt, democratic values, Russia, Turkey etc.	UPI Politics
3	Energy & Climate Change Mitigation	4.8	Energy market developments, transition to sustainables etc., Fukushima disaster (2011) as focal event	UPI Real Economy
4	Companies & Markets	7.3	Developments at quoted international corporates	UPI Real Economy
5	Geopolitics	6	Geopolitical tensions	UPI Politics
6	Society	11.3	Debates on Capitalism, Globalization, Democracy, Populism, Immigration, national identity	UPI Politics
7	Financial Markets I	6.1	Trouble concerning financial institutions (banks, insurance…), retail investor aspects	UPI Financial Markets
8	German Politics I	7	Structural Reforms, Labor Markets, Welfare State	UPI Politics
9	Miscellaneous	10.1	Diverse	–
10	Financial Markets II	9.4	Retail Investor perspective	UPI Financial Markets
11	Leisure & Hospitality	4.4	Entertainment, arts, sports, travel, Corona-related peak	UPI Real Economy
12	Central banks	7.3	ECB, Fed etc. actions against crises	UPI Politics
13	German Economy	8.9	Business cycle developments, forecasts, surveys	UPI Real Economy
14	German Politics II	5.8	Parties and governments	UPI Politics

We combine 7 and 10, 8 and 14, due to their thematic proximity.

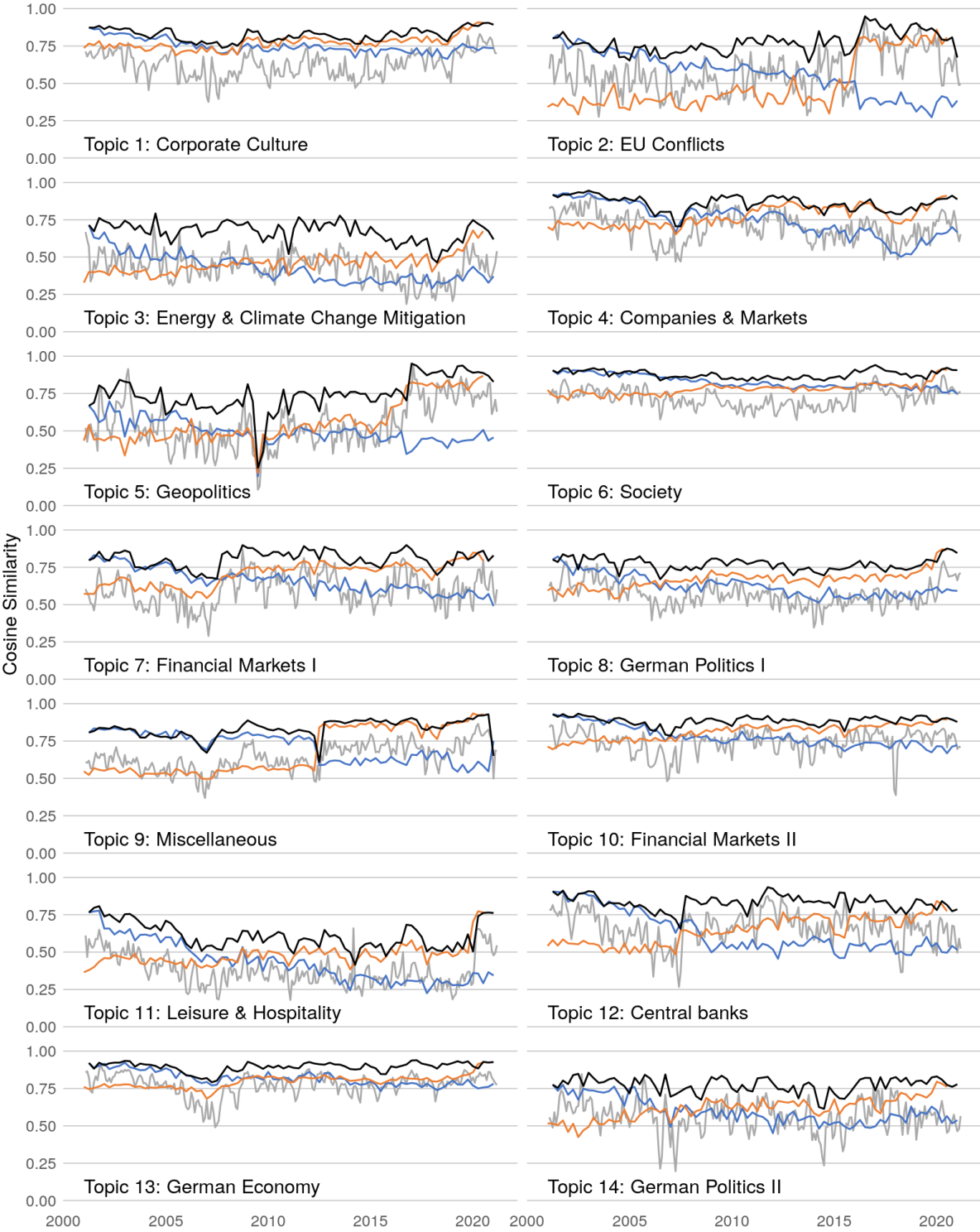*Figure 8: Salience of the Pandemic in UPI Topics, Jan 2020 to March 2021*
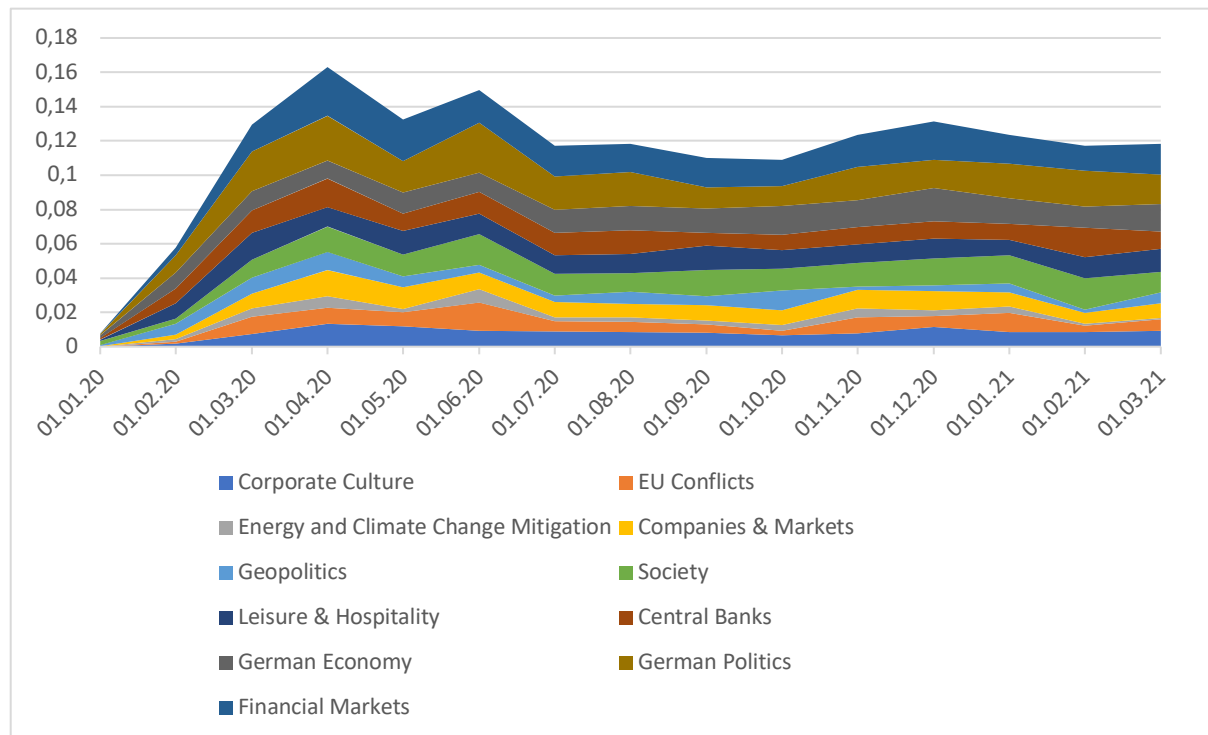
*Shares of articles containing "Corona" or "Covid"

Testing the Model's Stability

Since the *RollingLDA* method allows topics to change over time, testing for self-similarity is warranted to ensure that no structural breaks in the underlying data render the LDA model obsolete. Figure 9 shows the similarity of the topics' word distributions over time using cosine similarity. The quarter-to-quarter similarities are shown in black, the month-to-month similarities in gray. In addition, the quarter-to-quarter similarity of the respective topic at the first time point (2001 Q1) to all following quarters is shown in blue, as well as the corresponding similarities of the last quarter (2020 Q4) to all preceding quarters in orange.

It is obvious that the topic "Corporate Culture" remains very stable over the entire observation period. In addition to the high similarity from quarter to quarter (between 0.75 and 0.9), a high similarity of 0.75 between the word distribution in Q1 2001 and the word distribution in Q1 2021 can be observed, i.e., there is only a slight gradual change in the topic. Topic 2 "EU Conflicts" forms the counterpart. The quarterly similarities show a rather consistent vocabulary until mid-2016 with already medium gradual change. Then, in mid-2016, a strong short-term change in the vocabulary can be observed. Subsequently, the vocabulary is much more homogeneous until the end of 2020, i.e. the topic is more stable than before. By the current boundary (Q1 2021), the quarterly similarity then decreases again to the level of before. This break can be explained by the strong focus of the topic on Brexit during this period.

Figure 9: Topic Self-Similarity over time – Cosine Similarity

Topic 1: Corporate Culture

Topic 2: EU Conflicts

Topic 3: Energy & Climate Change Mitigation

Topic 4: Companies & Markets

Topic 5: Geopolitics

Topic 6: Society

Topic 7: Financial Markets I

Topic 8: German Politics I

Topic 9: Miscellaneous

Topic 10: Financial Markets II

Topic 11: Leisure & Hospitality

Topic 12: Central banks

Topic 13: German Economy

Topic 14: German Politics II

Cosine Similarity

As an example of a topic that is subject to permanent change in the specific topic setting, Topic 3 "Energy & Climate Change Mitigation" shows the expected patterns. Driven by individual events, the topic changes comparatively strongly on a quarterly basis, but the mutation of the topic from 2001 to the present is even more evident in the similarity of word distributions from Q1 2001 to Q1 2021. A striking pattern, however, is the declining quarterly stability of the topic from mid-2014 to mid-2018. This pattern suggests that coverage of energy and climate change related to uncertainty changed significantly from quarter to quarter. Between the second and third quarters of 2018, the vocabulary in this topic underwent a strong change due to the reporting around Greta Thunberg and subsequently stabilized increasingly until the beginning of 2020.

The impact of the corona pandemic on vocabulary can be observed most strongly in topic 11 "Leisure and Hospitality". In the first quarter of 2020, the vocabulary changed drastically. In contrast, since Q2 2020, it is very stable at a quarterly cosine similarity of around 0.75.

All 14 topics show sufficient topic stability to be able to describe them as appropriately interpretable. All interpretable topics show no abnormalities at the current quarter. Only the topic "Miscellaneous" shows a clear break, which can be explained by a small change in the data quality.

German Politics Topics, Top Words Quarter-by-Quarter
As noted in sec. 2, domestic politics has become a major driver of economic uncertainty. Tables 2a and b display the 30 Top Words of the two topics.

Table 3: Changing Top 30 Words in Topic "German Politics II", Quarters 2020 Q1 – 2021 Q1

2020-Q1	2020-Q2	2020-Q3	2020-Q4	2021-Q1
spd	merkel	soeder	merkel	merkel
merkel	fdp	spd	kanzlerin	cdu
cdu	spd	merkel	spd	kanzlerin
laschet	soeder	scholz	soeder	laschet
gruenen	cdu	partei	cdu	merz
partei	partei	cdu	bundestag	spd
fdp	kanzlerin	gruenen	giffey	dreyer
afd	angela	laschet	ministerpraesident	partei
soeder	laschet	union	ministerpraesidenten	angela
kanzlerin	lindner	ministerpraesident	laschet	union
merz	gruenen	csu	partei	soeder
ministerpraesident	ministerpraesidenten	bayern	angela	roettgen
koalition	union	bundestag	union	ministerpraesident
angela	macron	spahn	dulger	ministerpraesidenten
bayern	kaczynski	angela	berlin	gruenen
krampkarrenbauer	liberalen	fdp	koalition	malu
kanzleramt	ministerpraesident	kanzlerin	csu	armin
union	scholz	merz	afd	fdp
spahn	bundeskanzlerin	umfragen	haub	habeck
thueringen	afd	waehler	bayern	bundestag
gruene	armin	linken	gruenen	kanzleramt
berlin	polen	koalition	markus	bundeskanzlerin
ministerpraesidenten	umfragen	startbahn	armin	koalition
demokratie	merkels	macron	fdp	merkels
lindner	koalition	bundestagswahl	pandemiebekaempfung	csu
abgeordneten	csu	wahl	merz	kretschmann
csu	kemmerich	bund	waehler	fehler
linken	bayern	badenwuerttemberg	sozialdemokraten	stimmen
merkels	markus	parlament	kanzleramt	osterruhe
landtag	berlin	armin	gruene	friedrich

Table 4: Changing Top 30 Words in Topic "German Politics I", Quarters 2020 Q1 – 2021 Q1

2020-Q1	2020-Q2	2020-Q3	2020-Q4	2021-Q1
altmaier	bund	gesetz	duerfen	bundesregierung
gesetz	schulen	bund	euro	bund
arbeitgeber	betriebe	altmaier	dihk	unternehmen
beschaeftigten	duerfen	arbeitgeber	altmaier	betriebe
dsgvo	kurzarbeit	beschaeftigten	massnahmen	arbeitnehmer
bund	gesetz	unternehmen	gesetz	schulen
unternehmen	altmaier	heil	bund	beschaeftigten
arbeitnehmer	euro	euro	arbeitgeber	hilfen
euro	spd	arbeitnehmer	betriebe	homeoffice
kommunen	oeffnen	ueberbrueckungshilfen	unternehmen	schnelltests
berlin	staat	erhalten	beschaeftigten	tests
massnahmen	massnahmen	laender	regelung	spahn
menschenrechte	unternehmen	regelung	oeffentlichen	gesetz
pruefen	verwalter	kurzarbeit	betroffenen	heil
regeln	beschaeftigte	betriebe	regeln	betroffenen
kommission	kommunen	dsgvo	verlaengerung	ig
entwurf	regelungen	betroffenen	kammern	verordnung
deutschland	beschaeftigten	sprecher	gesetzlichen	altmaier
behoerden	regelung	entwurf	ministerium	mitarbeiter
rente	laender	beschaeftigte	faellen	oeffnen
regelung	unterstuetzung	gesetzlichen	laender	massnahmen
homeoffice	beschlossen	behoerden	ueberbrueckungshilfen	metall
heil	vorgaben	staatliche	homeoffice	inzidenz
verfahren	arbeitgeber	heisst	hilfen	beschaeftigte
vorschriften	kurzarbeitergeld	regeln	urteil	zusaetzliche
heisst	gesetzlichen	selbststaendige	bahn	lockerungen
duerfen	regeln	vertraege	pruefen	kritisiert
beschlossen	betroffenen	muesse	arbeitnehmer	hauptgeschaeftsfuehrer
regelungen	bundeslaender	darf	antrag	heisst