Supplemental Appendix for

State-Linked Manipulated Media in the Time of Covid-19:

A Look at Iran

Benjamin E. Bagozzi, Karthik Balasubramanian, Rajni Goel, and Christopher Parker

2024

Topic Interpretations

This section provides expanded interpretations of our 20 estimated topics. To develop these interpretations, we first reviewed the top 20 FREX words for each topic that are presented in Figure 2 of the main paper. We then read the top 100+ tweets that our primary STM estimated as being most highly associated with each topic. While the primary focus was on reading each topic's most highly associated 100 tweets, we secondarily reviewed tweets that appeared below the top 100 threshold (i.e., those falling within the 200-500 most associated tweets for each topic) to ensure that our topic interpretations were not resting on any single set of very similar tweets. Together these highly associated topics and topwords allowed us to confidently develop the topic interpretations and labels presented below, to which we now turn.

Topic 1: Sanctions. Based upon the topwords and most highly associated documents for this topic, its primary focus appears to be on economic sanctions. In reviewing the most highly associated tweets for this topic, we find that the discussion of economic sanctions in this context encompasses not only Western sanctions directed at Iran, but also calls for sanctions on Western (e.g., European) countries and entities for their continued business with Iran. In this sense, Topic 1 appears to be more pro-sanction than anti-sanction, with its tweets often calling for consistency in enforcing economic sanctions against not only the Iranian government, but also other foreign countries and entities that continue to engage with the Iranian government. The topwords for this topic confirm this interpretation, with a focus on words relating to the key focal point of sanctions (e.g., 'iran,' 'iranian,' 'regime'), to other relevant parties whose compliance is relevant to sanctions against Iran (e.g., 'russia,' 'foreign,' 'european,' 'korea'), or to sanctions themselves (e.g., 'sanction,' 'financi,' 'punish').
Highest tweet (probability = 0.752):

> @VP No bank should dare to exchange currency in Iran, the most severe sanctions and sanctions for terrorism supporters should be imposed, the Iranian regime's acquisition of a nuclear weapon is very serious

Topic 2: Aggression. Relative to many other topics, Topic 2 is less thematically coherent. Much of the tweets that were found to be most strongly associated with this topic appear to be grouped together based upon their overall sentiment or stance, rather than on the basis of their target. More specifically, the common thread running through a majority of this topic's most highly associated tweets is one of aggression, with many of these tweets expressing strong emotions and using English language swear words. The topwords for this topic align with this interpretation, in that most are short expressions of demands, strong emotions, or requests, albeit without much focus on any single common issue area or entity. Examples in this case include topwords such as 'pleas,' 'let,' 'fuck,' 'listen,' and 'hear.'
Highest tweet (probability = 0.467):

> Fuck you James Woods, fuck you Scott Baio, fuck you Dean Cain, fuck you Jon Voight, fuck you James Caan, fuck you Stacey Dash, fuck you Robert Duvall, fuck you Chuck Woolery, fuck you Antonio Sab‡to Jr, fuck you Sarah Michelle Gellar, fuck you Bruce Willis & fuck you Gary Sinise.

Topic 3: Political Polarization. This topic appears to focus primarily on political content, especially as it relates to partisan politics and identities in the United States (U.S.). Many of the most highly associated tweeets in this case express anti-semetic, anti-Democrat, or pro-Trump messages, often alongside accusations that individual U.S. politicians or parties are corrupt or are lying. This overall interpretation of Topic 3 is also strongly reflected in the topwords for this particlar topic. For example, these topwords include references to U.S. politics (e.g., 'america,' 'obama') alongside pejorative terms such as 'lie,' 'corrupt,' 'fake,' 'traitor,' 'interfer,' 'fals,' and 'massacr.'
Highest tweet (probability = 0.768):

> Jewish billionaires and Twitter shamelessly support terrorist Biden and actually interfere inthe elections.Criminal Jewish billionaires and corrupt Democrats have carried out massive massacres in the US and want ruin Trump with false claims.This is a new genocide @SenateDems @GOP

Topic 4: Israel-Palestine. The focus of Topic 4 appears to rest squarely on the political and social issues surrounding the Israel-Palestine conflict. The most highly associated tweets for this particular topic primarily endeavor to cast Palestine in a positive light and/or to characterize Israel negatively in relation to its position on, or actions towards, Palestine. In this sense, we interpret this topic as primarily being pro-Palestine and anti-Israel. With respect to the former sub-theme, we can note topwords such as 'palestin,' 'palestinian,' 'palestinewillbefre,' 'freepalestin,' 'gaza,' and 'palestineresit.' With regards to the second sub-theme mentioned above (i.e., anti-Israel), we can likewise note topwords such as 'isra,' 'zionist,' 'occup,' 'occupi,' 'annex,' and 'jerusalem."

Highest tweet (probability = 0.906):

> "12.Palestine belongs to the Arabs in the same sense that England belongs to the English or French. It is wrong and inhuman to impose the Jews on the Arabs. ñMahatma Gandhi- #Palestine Pray for Palestine #PalestineWillBeFree"

Topic 5: Commodity Prices. Topic 5 appears to focus on international investing and commodities. Upon investigating this topic's most highly associated tweets, we found that much of this topic's tweet-focus is on encouraging additional investments in silver as a commodity. This includes, e.g., tweets that claim that silver will see increased demand in the future for military, electronic, and technology purposes. Other highly associated tweets with Topic 5 make similar claims concerning both gold and silver. These interpretations are clearly reflected in Topic 5's topwords, which make reference to 'silver' and 'usd' alongside additional topwords that imply future predictions or expectations of increases or decreases in the demand or supply of various commodities (e.g., 'demand,' 'forecast,' 'shortage,' 'tech,' 'appl;) or that appear to focus on the implications of these changes for investments in that commodity (e.g., 'price,' 'high,' 'percent,' 'billion').

Highest tweet (probability = 0.958):

> @Tickeron Silver have critical role in high tech such as 5g mobile solar panel and electronics military high tech ... buy physical silver is the best investment at this years investment demand for silver is sky rocketing price of silver to 100 usd soon current price of silver is 17 usd

Topic 6: Election Lead-up. We interpret Topic 6 as primarily encompassing themes related to the lead-up to the 2020 U.S. Presidential Election. To this end, the most highly associated tweets for this topic focus on expressing fear over the outcome of this 2020 Election. Though some variation exists, many of these tweets more specifically express fear or concern over the Democratic party and/or Joe Biden winning this election, in terms of this potentially leading to the implementation of a host of (negatively characterized) left wing policies. As such, another interpretation of this topic could be as a one that indirectly expresses pro-Trump sentiments in the lead-up to this election. Both interpretations are evident in the topwords for this topic, where we can observe topwords related to the 2020 election itself (e.g., 'novemb,' 'boycott,' 'senat,' 'suprem'), to Donald Trump ('realdonaldtrump') and to varying levels of confidence in the 2020 election's outcome and/or consequences (e.g., 'forget,' 'certain,' 'sure,' 'forev,' 'sure').

Highest tweet (probability = 0.740):

> @realDonaldTrump If the oil boycott will fail and until April, Iran's oil exports will not reach zero, I will work with the Democrats to dismantle the tramp. Be sure to do this with our strength

Topic 7: Racial Tensions. This topic's associated tweets often express fears or anxieties over migration in the U.S. in relation to Joe Biden potentially winning the 2020 election. These concerns are expressed not only in relation to immigration from Latin America, but also in terms of immigration from Africa and Asia. Other highly associated tweets for Topic 7 call attention to the murder of George Floyd and other racial flashpoints in the U.S. This leads us to characterize this topic overall as relating to "Racial Tensions." The topwords for Topic 7 very closely align with this conclusoin. For example, the topwords for Topic 7 include words such as 'black,' 'african,' 'africa,' 'color,' 'gun,' 'beat,' and 'breath,' alongside other topwords that appear to focus more squarely on class and potetnially its intersection with race

(e.g., 'middl,' 'jobless,' 'poor,' 'environ').

Highest tweet (probability = 0.612):

> @ShesInTheBlack @lynnv378 Vote biden = millions and millions new migrant from asia africa such africa middle east and then = black african american latino poor american jobless

Topic 8: Gender & Politics. By and large, Topic 8's topwords and most higly associated tweets are oriented towards U.S. political issues, but without a clear partisan target. Some highly associated tweets appear to be anti-Trump, others anti-Biden, and still others pro-Biden. As such, this particular topic appears to be less coherent than many of the others reviewed above and below. At the same time, the topwords for Topic 8 suggest that another relevant dimension to this topic is issues seemingly related to women, gender, and sexuality (e.g., 'women,' 'rape,' 'rapest,' 'pedophil,' 'harris,' 'hot') alongside U.S. political references (e.g., 'voter,' 'hariss'). Hence, we have tentatively labeled this topic as "Gender & Politics" to encompass the overlapping themes identified here.

Highest tweet (probability = 0.913):

> "@thehill Things I never take for granted due to my past in socialist brazilís extreme poverty #436:
> 1. Havin a window so u dont get eaten by mosquitoes
> 2. Having potable water. Fresh water is amazing
> 3. The ability 2 take a hot shower (Thats a real fancy one)
> Dont bring socialism here"

Topic 9: Religion & Taxes. Topic 9 appears to combine two disparate themes. On the one hand, there are a fair number of pro-religion tweets or broader expressions of religious affinity within this topic's most highly associated tweets, especially as it relates to Christian and Muslim religions. Separately, there is also a very large number of highly associated tweets for this topic that seek to raise concerns over the prospect of Joe Biden raising taxes, including taxes on entrepreneurs. Accordingly, we include both themes within the label for this particular topic above. Notably, these two disparate themes are also clearly reflected in Topic 9's topwords. In the case of religion, we can see topwords such as 'god,' 'imam,' 'thepromisedsaviour,' 'prophet,' 'savior,' and 'muhammad.' Regarding taxes, we can likewise observe topwords such as 'rais,' 'tax,' and 'reduc.'

Highest tweet (probability = 0.772):

> The sinners, oppressors and the followers of them are afraid of the Reappearance of the Savior; But the righteous are in search of the Reappearance of the promised Savior #ThePromisedSaviour

Topic 10: Yemen. This topic again appears to combine two somewhat disparate themes. On the one hand, we find a large number of highly associated tweets reporting on Hillary Clinton's lead over Trump in the lead-up to the 2016 U.S. Presidential Election. On the other hand, additional highly associated tweets for Topic 10 instead focus on contemporary conflicts and humanitarian crises in Yemen. These latter tweets discuss, for example, the number of civilians killed or facing starvation as a result of Yemen's internal conflict and/or Saudi Arabia's role in this conflict. Discussion of Yemen in this respect appears to be more prominent in our assessments of this topic's associated tweets, leading us to label this topic as "Yemen" overall. That being said, the topwords for Topic 10 are consistent with the dual themes mentioned above. In the case of the first theme discussed, we can note that Topic 10 contains topwords such as 'poll,' 'clinton,' 'hillari,' and 'fox.' With respect to the second theme discussed above, we can observe topwords such as 'yemen,' 'war,' 'yemeni,' 'food,' 'yemencantwait', 'conflict,' 'danger', 'saudiarabia,' 'arabia', and 'humanitarian', among others.

Highest tweet (probability = 0.700):

> @CBSNews Tens of thousands of Yemenis, including civilians, are believed to have been killed in the conflict, which has led to the worldís worst humanitarian crisis as millions remain at risk of starvation. #YemenCantWait #Yemen #Yemeni #SaudiArabia

Topic 11: International Markets. Generally speaking, Topic 11's most strongly associated tweets endeavor to provide details or updates on various international financial markets or investments. That

being said, the focus here is less so on commodities such as silver (as was the case for Topic 5) than it is on themes related to foreign currency exchanges, currency speculation (especially in relation to the Euro), and crytocurrencies such as Bitcoin. Many of the associated top tweets seek to imply that Europe on the whole (or the Euro, or specific countries in Europe) is entering a period of financial crisis or decline, that Bitcoin is performing well investment-wise, or that Bitcoin is performing poorly investment-wise. In reviewing the topwords for Topic 11, we find a number of topwords related to currency exchanges and trading (e.g., 'euro,' 'forex,' 'market,' 'crash,' 'sell,' 'wait'), to crytocurrency (e.g., 'bitcoin,' 'cripto') or to other attributes of financial markets (e.g., 'nokia,' 'stock').
Highest tweet (probability = 0.929):

> @ScotlandNT @dundeeunitedfc Euro is oldman eus money look at italy and Spain and Greece euro it isn't safe haven see brexit europe union end soon europe dont have oil gas mine army and young people europe dont have good furure#trump #gold #stock market #china forex signal eurusd #euro

Topic 12: Encouragements. This topic appears to have some similarities to Topics 5 and 11, but with less coherence overall. On the one hand, many of the most highly associated tweets with Topic 12 focus on investments that span themes encompassed within both Topic 5 and Topic 11. For example, a selected reading of the most highly associated tweets for Topic 12 suggests that this topic's tweets include themes related to the price of Bitcoin crashing or to silver being a good investment. Relative to the tweets contained under Topics 5 and 11, many of Topic 12's tweets seem to more aggressively suggest that readers should buy or "dump" holdings in either Silver or bitcoin. At the same time, there are also disparate tweets within this topic's most highly associated tweets that deal with non-investment themes such as sunsets. The topwords for this topic are reflective of the low level of coherence outlined above. For example, we find that a majority of the topwords in this case lack specificity to any one single theme, such as 'can,' 'now,' 'come,' 'expect,' 'step,' 'easily,' and 'tonight.'
Highest tweet (probability = 0.537):

> @Network88241507 Bears will entry soon. Its time to destoy s2f bitcoin model and dump this fck ponzi to 1-2k. https://t.co/7qAelPhDot

Topic 13: Economic Anxiety. Topic 13's most highly associated tweets focus primarily on expressions of concern over employment, unemployment, tax increases, working class individuals, and income levels within the domestic U.S. context. Some, but not all, of these tweets appear to focus on the role of politics in this context. However, in these cases, there does not appear to be a specific political target or partisan angle, in the sense that some of these highly associated tweets link their aforementioned economic anxieties to Democrat policies and others to Donald Trump's policies. In the latter case, references to corruption and non-economic themes such as white supremacy are also present. The topwords in this instance are less telling than in the case of other topics, though they do somewhat reinforce the above interpretations via their inclusion of topwords such as (e.g.) 'incom,' 'white,' 'respect,' and 'proud.'
Highest tweet (probability = 0.345)

> @KelliBruer This increase indirectly affects the income and unemployment of those who have less than 400 incomes and reduces their income and unemployment. Read more

Topic 14: Negativity. Similar to Topic 2, the most highly associated tweets for this topic are fairly disparate in their themes or targets, but share similarities in the levels of negativity that these tweets express towards their varied targets and/or themes of interest. For example, many of the most highly associated tweets in Topic 14 are decidedly anti-Trump in the levels of negativity expressed towards Donald Trump, whereas others instead express similar negative stances towards Burma's Aung San Suu Kyi. To an extent, these high levels of negative stance and/or sentiment are also evidenced in the topwords associated with Topic 14, such as 'hate,' 'enough,' 'idiot,' and 'upset.'
Highest tweet (probability = 0.434):

> is being the president of Myanmar not enough for you Aung San Suu Kyi???? #ShameOnAungSanSuuKyi https://t.co/IqBgr87403

Topic 15: Political Violence. The most strongly associated tweets for Topic 15 appear to primarily relate to discussions of policy violence and/or police brutality against protesters, both in the U.S. and other countries (e.g., the United Kingdom). There are also some highly associated tweets that instead focus on protest violence (as opposed to violence against protesters) in similar contexts. Separately, an additional subset of highly associated tweets provide details on, or coverage of, the conflict in Syria, typically with a pro-Syria orientation. Altogether, we accordingly characterize this topic as encompassing various forms of "Political Violence." The topwords for Topic 15 are highly consistent with the interpretations outlined above. With regards to protests and police violence, we can observe topwords such as 'protest,' 'polic,' 'blacklivesmatt,' 'racism,' 'portland,' 'georg,' 'short,' 'portlandprotest,' and 'demonstr.' And with regards to broader conflicts in Syria and elsewhere, we can likewise observe topwords such as 'syria,' 'syrian,' 'iraqprotest,' 'iraqi,' 'violenc,' 'base,' and 'troop'.
Highest tweet (probability = 0.780):

> @washingtonpost #US forces dominate border areas with #Syria, and it is through these borders that elements of ISIS terrorist group enter Iraq. #Iraq #IraqProtests #iraqirevolution

Topic 16: Covid-19. The most highly associated tweets for this topic focus on the Covid-19 pandemic, especially in relate to the rates of Covid-19 increasing, spreading, or leading to increased deaths. The geographic focus of these tweets is often on locations in the U.S., locations in Asia (e.g., Singapore or Hong Kong), or global. That being said, some highly associated tweets do not contain a geographic reference point at all. Similarly, a small number of highly associated tweets also imply declines or stabilization in Covid-19 cases or discuss lockdowns and other control measures being used to address Covid-19. Looking across all of the highly associated tweets for Topic 16, we can also note a number of additional moderately associated tweets that focus on distinct themes such as gold prices. Nevertheless, we label this topic as "Covid-19" based upon Covid-19-focused tweets being the overriding theme of this topic's most associated tweets. Turning to the topwords for this topic, we find that they likewise focus on Covid-19, with examples being 'coronavirus,' 'corona,' 'virus,' 'health,' 'mask,' 'humanrightsviol,' 'pandem,' 'test,' 'outbreak,' and 'medic.'
Highest tweet (probability = 0.671):

> Singapore reports record 386 new Covid-19 cases and 9th death #COVID19 #coronavirus https://t.co/3Sw8oVloYK

Topic 17: Temporal Context. We characterize Topic 17 as focusing on the temporal context or temporal reference points of tweets concerning a wide variety of topics. In this sense, Topic 17's most highly associated tweets lack a common overarching theme. Some relate to U.S. politics, some discuss investing and commodity prices, some focus on international conflicts, and others make more general observations about daily experiences and outlooks. As alluded to above, the common theme running through these tweets appears to be engagement with time as a reference point for the observations included within each tweet. For example, many of these highly associated tweets start by referencing or discussing a theme or person of interest's qualities in the past, before turning to discussing that theme or person in today's or the future's context. Others make more general references to past, present, and future, such as "Don't let yesterday take up too much of today." Hence, a majority of the most highly associated tweets for this topic can be seen as aligning with efforts to put a given subject into "Temporal context." This is also evidence in the topwords for this topic, which include topwords such as 'rememb,' 'today,' 'trend,' 'start,' 'go,' and 'soonyou.'
Highest tweet (probability = 0.687):

> "@SkilbeckIryna @BorisJohnson After 20 years of screaming about the obvious manipulation of the Silver Price it looks like the DOJ & CFTC just MIGHT stop "Allowing" it!!
> > Soon...you will fondly remember the sub-$1,000oz. SILVER Days!!
> > https://t.co/MAcg15gBg6"

Topic 18: Anti-Democrat. The vast majority of highly associated tweets for Topic 18 focus on spreading negative information about Joe Biden and/or Kamala Harris. In some cases, these highly associated

tweets endeavor to cast doubt in Joe Biden's leadership abilities. Others attempt to liken Joe Biden and/or Kamala Harris to Hugo Chavez and socialism. These characterizations are closely mirrored in the topwords for Topic 18. In particular, we can first observe many topwords in relation to Democratic politicians such as 'joe,' 'harri,' 'berni,' 'biden,' 'sander,' and 'joebiden;' or the Democratic party itself ('dem'). We can then also observe other topwords that seek to cast these Democratic actors in a negative light, including 'hugo,' 'chavez,' 'rich,' and 'hunter.'

Highest tweet (probability = 0.928):

> @mischieforever @InfoBabe31 @mtclifford84 @VoterCenter @JoeBiden @Kamala-Harris Vote for hugo biden and in real hugo harris . Biden say anything hugo chavez say in 1998 .chavez win a fair election in 1998 and reach power by democracy . Taking money from the rich and distributing it among the poor.Biden does not share wealth, he shares poverty

Topic 19: Election Aftermath. This topic's most highly associated tweets primarily amplify concerns over the 2020 U.S. Presidential Election's immediate aftermath. A large share of these tweets characterize the post-2020 election period as one of political turmoil, implying that various financial markets in the U.S. and more generally are suffering as a result of election turmoil. Other highly associated tweets instead or additional discuss Donald Trump's refusal to admit electoral defeat, ask about Donald Trump's potential for cancelling of the election, or express related pro-Trump sentiments. The topwords for this topic confirm these characterizations, especially in relation to topwords such as 'admit,' 'defeat,' 'turmoil,' 'plummet', 'trumppenc,' 'polit,' and 'patriot.'

Highest tweet (probability = 0.537):

> @InoueKuniko @SpeakerPelosi US election political turmoil causes stock market plummet as Trump neither admits defeat nor Biden then we have sevilwar #sp500 #xauusd #gold #biden #TrumpPence2020 #stimulus

Topic 20: Mass Dissemination. Topic 20 lacks a coherent theme based upon our review of its most highly associated tweets. In most cases, these highly associated tweets contain very little actual textual content, instead including (i) very large numbers of twitter handles, (ii) retweets of existing tweets containing large numbers of twitter handles, and/or (iii) similar broad outreach efforts. Hence, while themes can at times be recognized within Topic 20's highly associated tweets (such as themes related to justice, human rights, or anti-Trump sentiment), the majority of this topic's tweets appear to simply be efforts to gain followers or attention across a large cross-section of existing twitter accounts. The topwords in this instance are accordingly fairly general and lacking in coherence, with topwords such as 'right,' 'girl,' 'cri,' 'nice,' 'may,' 'eye,' 'photo,' 'soldier,' and 'sad.'
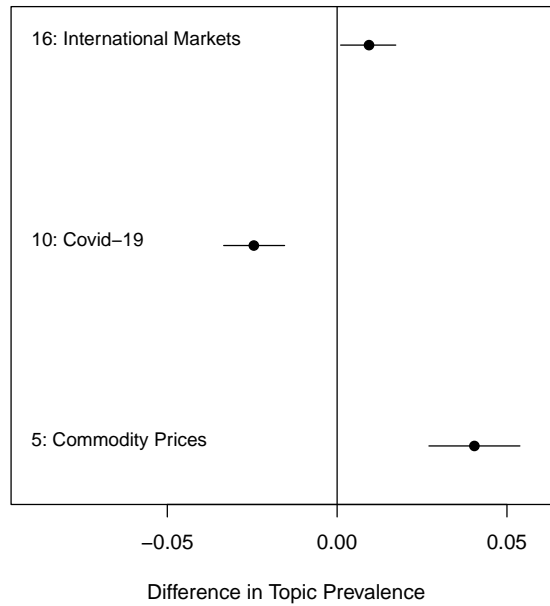
Highest tweet (probability = 0.509):

> RT @NewJeffCT: @sdr_medco @veryblueinTexas @Endgame2021 @bamableu @BCOOL333 @Msdesignerlady @4a_of @MsButterflyyy @vegix @LopezLovinLife @SÖ
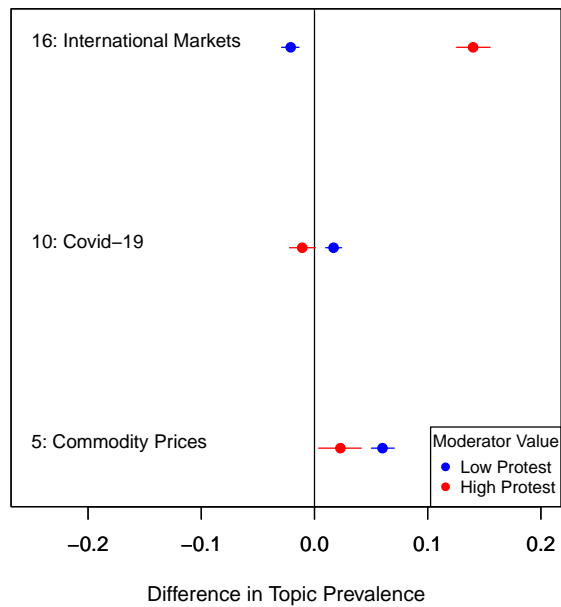
Auxiliary Analyses
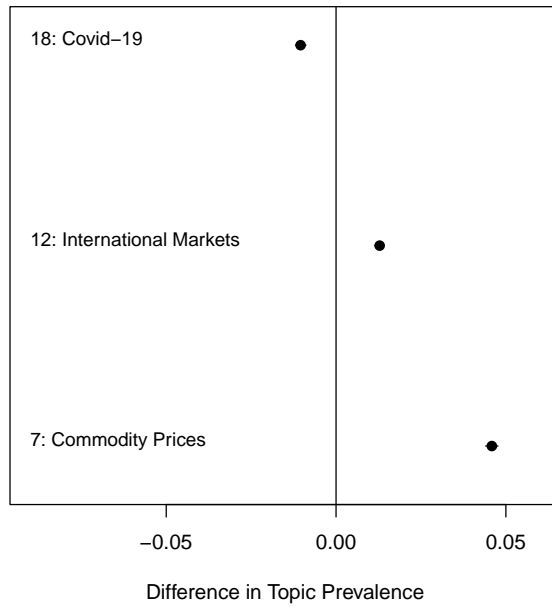
Figure A.1. *Estimated Effect of Change in ln Iran Covid19 Cases on Topics of Interest for Specification Including Only ln Iran Covid19 Cases.*

Figure A.2. *Estimated Effect of Change in ln Iran Covid19 Cases on Topics of Interest for Specification Controlling for All Lasso-stage Covaraites.*

Figure A.3. *Estimated Effect of Change in ln Iran Covid19 Cases on Topics of Interest for ln Iran Covid19 Cases × ln Iranian Protest Events.*

Table A.1. *VIF Results for Poisson Specifications*

	Lasso Specification		Final Specification	
	VIF	1/VIF	VIF	1/VIF
Ln VOO	2.52e+06	0.000000		
Ln VTI	1.98e+06	0.000001		
Ln Gold	61505.64	0.000016		
Ln Platinum	38887.79	0.000026		
Ln Soy Price	18292.62	0.000055		
Ln Corn Price	11605.93	000086	1775.46	0.000563
Ln Barley Price	9748.80	0.000103		
Ln Oil Price 2	6664.51	0.000150	494.77	0.002021
Ln Silver	4316.89	0.000232	1141.10	0.000876
Ln Oil Price 1	2941.75	0.000340		
Ln Cotton Price	2009.97	0.000498		
Ln Rice Price	1584.46	0.000631		
Month Counter	1523.08	0.000657	46.76	0.021384
Ln Ether	1093.40	0.000915	192.23	0.005202
Ln Sugar Price	1090.98	0.000917	553.99	0.001805
Ln Gas Price 1	859.08	0.001164		
Ln Bitcoin	525.00	0.001905		
Ln US Covid Cases	464.81	0.002151		
Ln Global Events	407.73	0.002453	377.36	0.002650
Ln GB Covid Cases	217.23	0.004603		
Ln Russia Covid Cases	124.19	0.008052	82.16	0.012172
Ln Saudi Arabia Covid Cases	95.87	0.010431	79.47	0.012583
Ln Iran Covid Cases	77.44	0.012913	32.31	0.030953
Ln Iranian Events	69.28	0.014434	65.63	0.015237
Ln Israel Covid Cases	56.42	0.017723	43.16	0.023169
Ln Global Covid Cases	54.62	0.018307		
Ln Lebanon	51.02	0.019598	47.09	0.021235
Temperature	33.77	0.029616	18.12	0.055196
Ln Palestine	31.16	0.032090	24.68	0.040521
Ln Jordan Covid Cases	28.28	0.035366	20.99	0.047645
Ln Syria Covid Cases	17.20	0.058137	15.75	0.063486
Ln Gas Price 2	5.86	0.170664	4.76	0.210229
Ln Yemen Covid Cases	5.80	0.172498	4.52	0.221042
US Election	4.31	0.232029		
Israel Election	1.96	0.510110		
Iran Election	1.93	0.517208	1.21	0.82434
Ln Iranian Repression Events	1.88	0.532565	1.86	0.536356
Ln Iranian Protest Events	1.17	0.854665	1.14	0.877519
Ln Precipitation	1.15	0.871352		
Mean VIF	119773.55		228.39	