

**Navigating in turbulent times: Using social media discourse to examine small and family-owned business survival and government actions during the COVID-19 crisis**

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# **Navigating in turbulent times: Using social media discourse to examine small and family-owned business survival and government actions during the COVID-19 crisis**

## **Abstract**

During a crisis, small and family-owned businesses tend to experience more severe economic consequences than their larger counterparts and often lack financial resources needed to weather the challenges brought about by the crisis. To comprehend the distinct challenges and concerns of small and family-owned businesses during a major crisis, this research study focuses on the recent COVID-19 pandemic, which had a catastrophic effect on businesses and societies alike. To that effect, we address two research questions: 1) What aspects of small and family-owned businesses do social media users discuss during the COVID-19 pandemic? and 2) What is the impact of major government announcements and policies on these discussions? The initial part of the study uncovered the diverse topics that emerged in social media conversations concerning smaller and family-owned businesses during the pandemic, encompassing challenges faced by different demographic groups, discussions around vaccine mandates, entrepreneurial opportunities in the pandemic context, government support programs, and the survival challenges encountered by these small and family-owned businesses. The subsequent part of the study emphasized the importance of timely and responsive government interventions during times of crisis and especially highlights the significance of targeted measures to address the unique challenges faced by women entrepreneurs, black-owned businesses, and other marginalized groups and finally suggests that government responsiveness and accountability are crucial in navigating crises. These insights, obtained through topic modelling and AI-based applications, aid in constructing messages that genuinely resonate with the public, ensuring clear communication of policy intentions. The implications of our study transcend recent COVID-19 effects, as World Health Organization (WHO) cautions that there could be even worse health and socio-economic crises in the future, and we need to be better prepared to handle subsequent devastating effects.

**Keywords:** Coronavirus · COVID-19 · Topic Model · BERTopic · Clustering · Social Media

# **Navigating in turbulent times: Using social media discourse to examine small and family-owned business survival and government actions during the COVID-19 crisis**

## **1 Introduction**

During various crises, small and family-owned businesses often encounter significant challenges due to their inherent vulnerabilities such as inadequate planning, restricted cash flow, limited access to capital, lack of government assistance, and infrastructure deficiencies (Runyan, 2006). For example, evidence from the 2007-2009 recession reveals that small firms experienced unfair declines relative to larger firms, primarily because of sluggish sales and heightened economic uncertainty (Şahin et al., 2011). Focusing on natural disasters, a few studies have also shown that small businesses face disproportionately higher level of challenges amid crisis periods (see for example, Marshall et al (2015) on 2005 Hurricane Katrina; Wedawatta et al (2013) on 2019 Cockermonth flood; McNamara (2013) on 2012 flood in Fiji; Irvine and Anderson (2016) on 2001 foot and mouth disease in Scotland and England). Even in the context of manmade crises, such as the 2011 London riots, research by Doern (2014) revealed that affected businesses faced substantial financial losses, ranging from thousands to millions of pounds, alongside employee layoffs, reduced investments, and enduring personal and psychological costs. Thus, it becomes evident that small businesses are disproportionately impacted by various crises, necessitating tailored policy interventions to address their specific needs. To that effect, recent COVID-19 pandemic gives us an opportunity to get a deeper insight into the challenges faced by small and family-owned businesses during a widespread socio-economic crisis, and how policymakers can identify and implement targeted solutions to support small and family-owned businesses, thereby enhancing their resilience in the face of future adversities.

The COVID-19 pandemic has presented unprecedented challenges across various domains, primarily posing a significant threat to the lives of millions globally (Dutta et al., 2023). As of the end of September 2023, the pandemic had tragically claimed nearly seven million lives worldwide (Worldometers, 2023; Belitski et al., 2021), significantly impacting economies and individuals of countries (Fairlie & Fossen, 2021; McKibbin & Fernando, 2020; Hadjielias et al., 2022). Nations worldwide swiftly implemented a range of measures, including lockdowns, quarantines, curfews, and mobility restrictions, in a pressing effort to contain the virus (Brühlhart et al., 2020; Onyeaka et al., 2021).

The impact has been uneven, with self-employed individuals bearing a disproportionate burden on their income compared to salaried employees (Kritikos et al., 2020; Hadjielias et al., 2022) and certain employees, particularly those working for small businesses, faced layoffs as these businesses grappled with insufficient liquidity to maintain their workforce throughout the pandemic. Many of these businesses faced closures or opted for a temporary closure until they could recuperate from their financial setbacks (Kalogiannidis, 2020). The nature of their work, often reliant on in-person interactions and capital constraints, made it harder for them to sustain their livelihoods amidst social distancing and lockdowns. The distinct challenges encountered by smaller and family-owned businesses during the pandemic thus come to the fore. During the pandemic, certain family firms thrived (Miroshnychenko et al., 2023). For example, the Finnish family firm Finnboat streamlined its operations by digitizing and transitioning its procurement processes to an online platform (Leppäaho & Ritala, 2022). On the contrary, specific sectors like tourism and hospitality experienced economic hardships, amplifying the mental health challenges faced by business owners (Al-Mughairi et al., 2022).

Only a very few studies have examined the effect of COVID-19 pandemic on smaller and family-owned businesses. For instance, Alekseev et al (2023) conducted a survey in 2000 across small business owners, managers, and employees to analyze the repercussions of the COVID-19 pandemic on these enterprises. They find that young small business struggled to keep their business open during the pandemic, such firms had to lower the prices to address demand shock and did not receive adequate financial support. Using a sample of UK based small businesses over 2016-2019, Belghitar et al (2021) examined the impact of government policies on small businesses and their subsequent responses. They find that government funding was critical for the survival of most of the smaller businesses. In 2020, Stephens et al (2021) conducted a survey in on a very small sample (n= 113) to understand the impact of COVID-19 on female entrepreneurs. However, these inquiries predominantly analyzed the effects of policies and responses at a firm level during specific pandemic periods, without shedding light on the opinions of small business owners and the public throughout the pandemic period, and ‘prior to and after’ various policy announcements.

During COVID-19 pandemic, when most of the people were confined to their homes, social media (such as Twitter<sup>1</sup>, Facebook, Reddit) became a useful source to gauge their sentiment (Cho et al., 2023; González-Padilla & Tortolero-Blanco, 2020; Lips, 2021). The content produced by users on these platforms holds increasingly significant roles across diverse analytical applications (Mendon et al., 2021; Choudrie et al., 2021). These applications range from everyday tasks such as accessing daily news (Tandoc & Johnson, 2016) to the nuanced extraction of sentiments and viewpoints (Wedel et al., 2021; Wang et al., 2022). Notably, Twitter has emerged as a hub for microblogging, earning recognition for its capacity to swiftly disseminate real-time information, which includes ongoing events, evolving news stories, and the comprehensive assessment of

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<sup>1</sup> Twitter now has been rebranded as X.

public sentiment (Kaur et al., 2021; Greyling & Rossouw, 2022). Empirical inquiries have substantiated the viability of systematically parsing continuous streams of tweets to not only gauge public responses but also to derive profound insights into pivotal events, encompassing evaluations related to stock forecasting (Teti et al., 2019), trends in news and media consumption (Han et al., 2021), and the dynamics of elections (Grover et al., 2018). However, a discernible gap within the current academic landscape pertains to the largely unexplored terrain associated with the analysis of discourse within the realm of social media. This gap is particularly relevant to the context of small and family-owned businesses, and the intricate backdrop shaped by the onset of the COVID-19 pandemic.

To that effect, we ask the following research questions: 1) What issues pertaining to small and family-owned businesses do social media users discuss during the COVID-19 pandemic? The primary objective of this inquiry is to discern the emerging topics within discussions concerning small and family-owned business operations amid the COVID-19 pandemic on Twitter. To achieve this goal, we employ the BERTopic model, a state-of-the-art technique for topic modeling, to identify and categorize prevalent themes arising from the discourse. By delving into these topics, we aim to gain deeper insights into the twitter discussions concerns and dynamics that smaller and family-owned businesses are navigating during this unprecedented crisis. 2) What is the impact of major government announcements and policies on these discussions? Specifically, we seek how narratives are changing around a major government announcement aimed at supporting small businesses in the face of the pandemic. By analyzing the interaction between government announcements and the resultant Twitter discourse, we intend to discuss how these measures have influenced smaller and family-owned business discussions and whether they have contributed to the resilience and survival of smaller and family-owned businesses.

In summary, our research aims to uncover emerging topics within small and family-owned business discussions during COVID-19 on Twitter using the BERTopic model. This investigation is important and makes significant contributions at least for three reasons. First, this study contributes to the expanding body of knowledge concerning the issues and difficulties faced by small and family-owned businesses during crises, such as the recent conclusion of the COVID-19 pandemic. While smaller and family-owned businesses employ more than 60% of the US workforce and contribute approximately 60% of US GDP (FamilyBusiness, 2021, June 2), we often do not pay adequate and systematic attention to understand their challenges and incorporate their concerns in policy decisions. In this study, by focusing on social media user discussions on small and family-owned businesses, we aim to address this systematic bias against those firms. We would like to also highlight that implications of our study transcend recent COVID-19 effects. Although the World Health Organization (WHO) had officially ended the COVID-19 global health emergency in early 2023, WHO cautions that future health crises could be even worse. According to WHO, there is a growing concern surrounding the potential emergence of another severe pandemic, referred to as “Disease X” which could have devastating affects around the globe (WHO, 2023, May 22; Reuters, 2023, August 18). Therefore, relevance of our findings goes beyond the scope of recently concluded pandemic. Second, we examine the role and influence of government announcements and policies in shaping social media discussions and mitigating the challenges faced by small and family-owned businesses during this global crisis. Again, our study results are not only relevant to COVID-19 crisis, but policymakers and regulators can also benefit from our findings and be better prepared for any future large-scale crises that may have significant socio-economic effects. Third, our study contributes to the growing body of literature that focuses on social media analysis to aid business and policy decisions (Bhatt et al., 2022). Our study

highlights how social media platform is pivotal for smaller and family-owned businesses during emergencies, enabling these businesses to stay updated on available resources, communicate their challenges to government and others, and seek vital support from authorities. It achieves this by providing a methodological approach for effectively analyzing discussions on social media platforms and leveraging recent advancements in the field of Natural Language Processing (NLP). This study shows that topic modelling approach and AI-based summarization techniques offers pragmatic insights for governments and organizations seeking to communicate policy measures effectively and understanding the alignment between announcements and main topics of interest by social media users.

In the next section 2, we discuss the relevant literature on the potential challenges faced by smaller and family-owned businesses during the COVID-19 pandemic. This is followed by the methodology section 3, where we present our sample and the topic modeling technique that is most suitable for our analysis and rationale behind it. Section 4 presents the results. In section 5 we discuss the summary and implications of our study and finally section 6 concludes the study.

## **2 Literature Review**

In this section, firstly, under the theme of ‘small and family-owned business literature review’ (section 2.1), four interconnected streams of literature related to small and family-owned businesses are explored, establishing the theoretical foundation of our study. The initial segment explores the general challenges that small and family-owned businesses encountered, coupled with the psychological burdens borne by their proprietors. Subsequently, the second part delves into the specific impact on women-owned small businesses. The third part delves into the influence of

government interventions in assisting small and family-owned businesses. Finally, the fourth part examines the issue of adaptability in the face of a new working culture within small and family-owned businesses. Thereafter, we summarize the literature on the textual analysis of COVID-19 discussions on social media (section 2.2) and the usefulness of the ‘Twitter’ as the prime social media source (section 2.3).

## **2.1 Small and family-owned business literature review**

As a result of COVID-19, governments enforced lockdowns and specific restrictions were implemented. While major businesses successfully navigated through this challenging period, small businesses, in contrast, were forced to confront closures (Tang et al., 2021).

The repercussions of COVID-19 distinctly affected small businesses (Bruhn et al., 2023), resulting in an unprecedented surge in the demand for loans (Cowling et al., 2021). This is evident from a survey conducted by Bartik et al (2020) to understand the effect of COVID-19 on small businesses. According to this study, 43 percent of businesses underwent temporary closures. Additionally, a portion of the businesses chose to downsize their staff by 40 percent.

Also, during the COVID-19 period, Patel & Rietveld (2020) observed that self-employed individuals reported heightened psychological distress due to financial insecurity. Concurrently, Chhatwani et al (2022) suggested that depression may impede the beneficial influence of psychological resilience on a business's ability to persevere and thrive in the face of adversities. Hence, it may be evident that these mental obstacles can lead to detrimental impacts on the overall survival and operational efficiency of these businesses.

### ***2.1.1 Challenges confronting women-owned small businesses***

Prior to the pandemic, (Ackah et al., 2023) conducted a study in Ghana, which revealed that women-owned businesses faced a productivity gap in comparison to businesses owned by men. However, the introduction of the pandemic had significant effects on small businesses owned by women (Manolova et al., 2020). In the UK, Dy & Jayawarna (2020) highlighted how the pandemic disproportionately impacted self-employed women and women-owned businesses, particularly those from marginalized backgrounds. Furthermore, research conducted in Ireland Stephens et al (2021) revealed that certain female entrepreneurs demonstrated resilience by leveraging peer support. These studies collectively underline the significance of delving into the genuine challenges encountered by women-owned small businesses during the pandemic. Understanding these dynamics may be essential for addressing the specific challenges women-owned small and family businesses face during crises, providing a foundation for targeted social media and policy interventions.

### ***2.1.2 Government support: navigating pandemic challenges for small and family-owned businesses***

As the pandemic led to lockdowns and restrictions, certain financially fragile small businesses initially encountered demand shocks, prompting them to lower their prices. However, as time progressed, supply shocks took precedence over the earlier concerns about demand (Alekseev et al., 2023). Governments had to intervene to provide essential support and mitigate the economic impact through various policy measures such as stimulus packages, grants, and loan programs, governments aimed to provide financial relief, ensure business continuity, and protect jobs (Belghitar et al., 2021; Dörr et al., 2021). These interventions were crucial for enabling small

businesses to navigate the uncertainty and financial hardships brought about by the pandemic, ultimately contributing to the preservation of the economic fabric of communities (Dörr et al., 2021). This analysis suggests the need for a comprehensive understanding of how social media conversations may reflect and influence the resilience and recovery strategies of small and family-owned businesses during crises, which could enhance the relevance of targeted support and policy adjustments.

### ***2.1.3 Navigating adaptability challenges in small and family-owned businesses amidst change***

The rapid transition to remote work due to the pandemic posed adaptability challenges for businesses, impacting their work processes and social dynamics (Lal et al., 2021). Zhang et al (2021) and Wilton et al (2011) also highlighted that as a result of this disruption, hybrid or work-from-home (WFH) oriented workplaces emerged, necessitating organizational adaptations. In response, family businesses proactively addressed these challenges. They swiftly prioritized workforce safety, leveraging their existing digital infrastructure, and embarking on a steep learning curve. Notably, the pandemic-induced behavioral changes led these family businesses to embrace new collaborative opportunities and engage with new alliances (Soluk et al., 2021). Studying these adaptive measures and the resulting shifts in work culture within small and family-owned businesses may be crucial for understanding the long-term implications of the pandemic or any upcoming catastrophes on the business landscape and my help in informing future strategies for resilience and innovation.

## **2.2 Textual analysis of COVID-19 discussions on social media**

Platforms like Twitter and Facebook have been widely used as sources of information to study health-related issues (Pollack et al., 2023; Asghari et al., 2018; Mejova et al., 2018; Weeg et al., 2015). These user-generated posts have become a valuable data source and have caught the attention of many researchers (Lin et al., 2020; Wang et al., 2020; Yin et al., 2022; Xue et al., 2020).

The emergence of modern topic modeling and clustering techniques has paved the way for a more comprehensive exploration of social media's texts in various contexts. Roy et al (2019) directed their attention towards a distinctive aspect of online user behavior during the Ebola outbreak, focusing on the Twitter users' inclination to assign blame during the Ebola Outbreak. Employing a sequential Latent Dirichlet Allocation (LDA) model, they traced the evolution of localized blame dynamics, providing valuable insights into outbreak discussions. Bogdanowicz and Guan (2022) investigated the consequences of the COVID-19 pandemic on societal perceptions and behaviors. Their study aimed to discern the topics dominating discussions and uncover topic trends over time in response to significant events. Their utilization of an advanced Sequential LDA model facilitated the identification of twelve prominent topics within a Twitter dataset, underscoring the utility of topic modelling techniques in understanding of online social media discussions. Research has also extended into the sports domain. Lee et al (2022) delved into exploring COVID-19-related sports research trends, employing topic modeling and social network analysis to uncover latent topics within relevant literature. Their analysis shed light on the structure and trends of COVID-19-related sports research. Furthermore, Leung et al (2022) investigated the variations in the prevalence of the stressors across distinct stages of the pandemic. They employed

latent Dirichlet allocation (LDA) topic model on Reddit data collected over time frame of February 2020 – July 2021 to identify prevalent psychosocial stressors during the COVID-19 pandemic.

Sentiment analysis has been used to understand people's reactions during the COVID-19 pandemic by analyzing their social media posts. Li et al (2020) compared emotions and triggers in American and Chinese tweets on Twitter and Weibo, revealing differences in sentiments such as fear, sadness, and disgust, even though many were confident in controlling the pandemic. Zhou et al (2020) studied sentiment dynamics in New South Wales, Australia, by analyzing COVID-19 related tweets and observing changes over time based on local government areas. Yin et al (2020) analyzed around 13 million COVID-19 related tweets using a novel framework, finding a slightly higher proportion of positive tweets over a 2-week period. They also identified common concerns like staying home, case reports, and pandemic-related deaths. Çağatay et al (2022) utilized text mining techniques such as word clouds, clustering, and sentiment analysis to determine the periods and expressions of news usage in newspapers. Their study aimed to shed light on the utilization of news content during different periods of the pandemic, providing additional insights into the evolving media landscape. Lyu et al (2021) aimed to unravel public perceptions and emotions related to COVID-19 vaccines over an extended period. Their sentiment analysis spanned various social media discussions, generating 16 topics categorized into five broader themes.

### **2.3 Why Twitter?**

Twitter is a well-known social media platform where people express their thoughts about specific topics using short written messages called “tweets” (D’Andrea et al., 2019). A tweet also includes information about where the person is located, hashtags (keywords used to categorize content), and emoticons (symbols representing emotions), which all help to show how people are feeling

(Giachanou & Crestani, 2016). Additionally, government officials use Twitter to share information about events or important announcements with the general public (Golbeck et al., 2010). Researchers have found Twitter to be very useful for various types of studies. For example, it has been used to study things like opinion of flight services people use (Tiwari et al., 2019), the feelings people have about sports (Yu & Wang, 2015), what people think about politics (Khatua et al., 2020), the emotions of cancer patients (Crannell et al., 2016), and people's opinions about vaccines (D'Andrea et al., 2019).

Twitter provides researchers with a special collection of text that has advantages over traditional ways (such as surveys and interviews) of collecting information. One of these advantages is that Twitter data is updated in real-time, which means researchers can see what people are talking about right now and follow trends as they happen. This is particularly useful for studying topics that change over time, like how small and family-owned businesses are responding to the COVID-19 pandemic and how people's thoughts about this have changed over the course of the pandemic.

### **3 Methodology**

In our research, we utilized topic modelling to uncover prevalent themes within Twitter discussions concerning small and family-owned businesses during the COVID-19 pandemic. The methodology is illustrated in Figure 1. The data collection process involved gathering a dataset of 132,567 tweets, guided by specific keywords and hashtags associated with small and family-owned businesses. Prior to analysis, the collected tweets underwent text pre-processing to enhance topic exploration.

We employed BERTopic as our final topic model, a powerful topic modeling technique (Egger & Yu, 2022; Grootendorst, 2022; Tang et al., 2024; Williams et al., 2023; Ruocco et al., 2024) that leverages deep learning models to capture complex relationships within textual content. BERTopic allows us to extract meaningful clusters and uncover underlying themes in the tweets. By comparing the outcome of BERTopic to that of other traditional topic modeling algorithms like Latent Dirichlet Allocation (LDA) and Non-negative Matrix Factorization (NMF), we find that BERTopic performs better in capturing contextual connections between words, resulting in more accurate topic identification (Röder et al., 2015; Lau et al., 2016). The application of BERTopic's hierarchical structure and adaptability to diverse data types ensured a comprehensive analysis of the topics discussed in small and family-owned businesses during the pandemic. Initially, the implementation of BERTopic yielded 18 meaningful topics, as presented in the Appendix, Table A1.1. However, through the process of grouping and merging similar topics, the number of topics was reduced to 11 as shown in Table 5, which formed the basis for our subsequent analysis.

Additionally, we explored the effectiveness of BERTopic by analyzing its performance in handling outliers – tweets that did not align with predefined topics. Employing cosine similarity, we aimed to reduce these outliers and assign tweets to suitable thematic topics. This approach did not drastically increase the tweet count per topic, except one topic out of 11 topics, highlighting BERTopic's adaptability and effectiveness in identifying meaningful topics from Twitter conversations and leaving out the tweets which does not pertain to these topics.

In our exploration of shifting narratives concerning major government announcements, we adopted a structured framework to analyze the evolution of narratives related to major governmental announcements during COVID-19, in relation with topics identified by BERTopic. This multi-step process involved data collection, identification of key announcement dates,

temporal window selection, topic-centric filtering, and summarization using AI models as previous studies have already highlighted the use of AI based summarization techniques employed in various sectors such as health care and education (Ma et al., 2024; Rahman et al., 2023). Finally, by tracking narrative shifts around key government announcements within BERTopic-identified topics, we aimed to gain insights into the dynamic nature of discussions and how they responded to pivotal policy interventions.

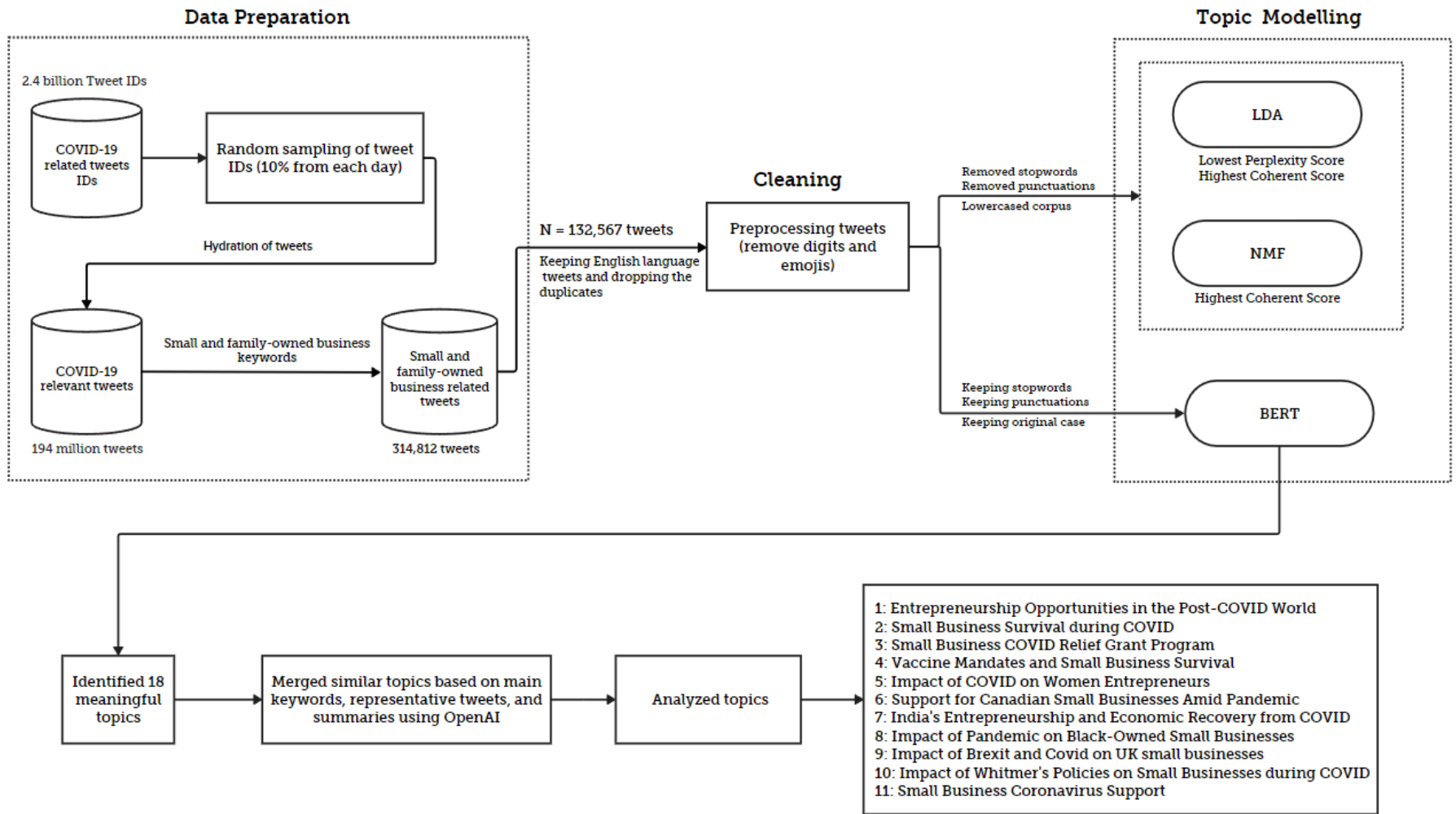


Fig. 1 Process Model

### 3.1 Data Description

A substantial dataset, encompassing a total of 2.4 billion tweet IDs, with a specific focus on the COVID-19 topic, was sourced from the Echen GitHub repository (Chen et al., 2020). This extensive dataset spans the period from January 2020 to December 2022. To ensure a representative sample that accurately reflects the entire dataset, a systematic random sampling methodology was employed. This approach involved selecting 10 percent of tweets from each day. After “hydration” – a process to retrieve complete tweet data using only the tweet IDs and the Twitter API – a final dataset of 194,207,066 tweet IDs were collected. This resulted in the successful construction of a comprehensive dataset, including complete tweets, author details, engagement metrics (such as likes, retweets, tweet count, and number of followers). Discussion of the metadata plots is presented in Section A1.1 of Appendix. Finally, the tweets were collected and securely stored in a database.

By selecting keywords as outlined in Table 1, we methodically extracted tweets related to small and family-owned businesses from the dataset. This filtration process culminated in a focused subset of 314,812 small and family-owned business tweets or 0.162% of the total of 194,207,066 tweets, forming the foundation for a comprehensive examination. After considering only English-language tweets and eliminating duplicates, a conclusive set of 132,909 tweets remained available for subsequent analysis during LDA and NMF. It is important to note that the tweet count here marginally differs from the number of tweets in the final BERTopic model, which consisted of 132,567 tweets, as illustrated in Figure 1. This difference in the number of tweets arises due to the merging of the data frame produced by the BERTopic model with the original

dataset (which contains 132,909 tweets), resulting in the loss of 342 tweets during the merging process for the BERTopic model.

**Table 1** The keywords employed for retrieving tweets related to small and family-owned businesses

Small and family-owned business keywords
family business, household enterprise, kinship company, domestic firm, entrepreneur, entrepreneurs, entrepreneurship, small business, mom-and-pop shop, mom and pop shop, microenterprise, sole proprietorship, family firm, ancestral business, hereditary enterprise, progenitor company, bloodline enterprise, familial company, household venture, family-owned operation, family owned operation, family owned business, blood relation corporation, family-run business, family run business

### 3.2 Text Pre-Processing

Prior to conducting the topic modeling analysis, the collected tweets underwent a series of preprocessing steps aimed at enhancing the quality of the data analysis for topic modeling and subsequent analysis (Egger & Yu, 2022). These preprocessing steps were carried out to ensure that the data was in an appropriate format for analysis and to facilitate the ability to effectively capture the underlying semantics and meanings within the text.

In the text processing process, LDA and NMF followed a separate text processing process compared to text processing for BERTopic. The first step in terms of text processing for LDA and NMF involved text enhancement, where a range of actions were taken to ready the text for analysis. This entailed systematically purging non-ASCII characters, symbols, numerals, and emojis (Dutta et al., 2023). Furthermore, we conducted the removal of stopwords, those frequently occurring

words like "and" and "the," etc., and applied lemmatization, a process that reduces words to their core or root form (Dutta et al. 2023). In the following phase, we proceeded to create bigrams (pairs of two successive repeating words) and trigrams (sequences of three consecutive repeating words) within the corpus. Finally, the concluding stage entailed implementing TF-IDF (Term Frequency-Inverse Document Frequency), a technique utilized to assess the importance of words within a document collection (Curiskis et al., 2020).

The initial step involved in terms of text processing for BERTopic text cleaning; wherein various actions were taken to refine the text for analysis. Non-ASCII characters, symbols, digits, and emojis were systematically removed from the text (Dutta et al., 2023). This was done to establish a consistent and uniform textual basis, thereby enabling transformer models to interpret the textual content more accurately (Devlin et al., 2018; Reimers et al., 2019; Medvecki et al., 2024). Importantly, the original casing of words was preserved, as this decision was made to maintain the inherent grammatical structures and nuances present in the text (Reimers et al. 2019; Medvecki et al 2024). Moreover, the conventional approach of converting all tokens to lowercase was intentionally omitted. This decision was made to preserve crucial information associated with the capitalization of words and retain as much textual information as possible.

Moreover, unlike some preprocessing strategies that involve the removal of stopwords (commonly occurring words like "and," "the," etc.) and the application of lemmatization (reducing words to their base or root form), we opted to retain stopwords and not perform lemmatization (Sarica & Luo, 2021; Dutta et al., 2023). The rationale behind this approach was to ensure that the textual content remained as close to its original form as possible, minimizing the loss of contextual richness and unique nuances embedded within the language. By not eliminating stopwords and preserving the words in their original forms, the analysis could potentially capture the specific

ways in which these words contributed to the overall content and meaning of the tweets (Sarica & Luo, 2021; Mikolov et al., 2013; Devlin et al., 2018).

In summary, the preprocessing steps undertaken before the BERTopic modeling analysis encompassed the removal of non-essential elements while preserving the natural structure of the text. This approach aimed to empower subsequent analyses, particularly those involving transformer models, as these models are capable of a comprehensive and accurate understanding of the semantic context present in the tweets (Vaswani et al., 2017; Devlin et al., 2018; Reimers & Gurevych, 2019; Reimers & Gurevych, 2020).

### **3.3 Latent Dirichlet Allocation (LDA)**

Introduced by Blei et al (2003), LDA is a probabilistic topic modeling technique that offers an intuitive approach to understanding the underlying themes within a corpus of text. It operates on the assumption that documents are composed of mixtures of topics, and the words within these documents are generated from these topics (Blei et al., 2003). This generative process allows LDA to identify topics by analyzing word co-occurrence patterns across documents (Blei et al., 2003).

One of the notable advantages of LDA is its interpretability (Suri & Roy, 2017; Del Gobbo et al., 2020; Uthirapathy & Sandanam, 2023). The topics generated by LDA are represented as probability distributions over words, making it relatively straightforward for humans to grasp and label these topics (Blei et al., 2003). However, LDA has its limitations, particularly when it comes to capturing the contextual relationships between words (Egger & Yu, 2022). It treats words as independent entities and overlooks the intricate semantic connections between them. Consequently, in cases where context plays a pivotal role, such as in analyzing nuanced text or highly specialized domains, LDA's topic assignments may lack precision (Egger & Yu, 2022).

Moreover, the sparsity and high dimensionality of textual data can pose challenges for LDA, as a result the algorithm may struggle to effectively capture subtle and intricate relationships between words in large and complex datasets.

### ***3.3.1 LDA Analysis***

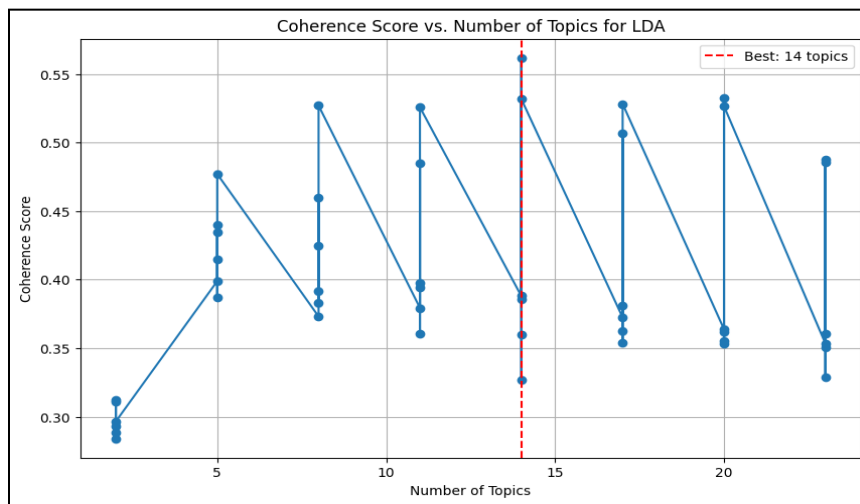
The following sections are as follows. First section discusses the evaluation criteria for LDA topic modelling (Section 3.3.2) and then we discuss LDA topic modelling in terms of highest coherence as evaluation criteria (Section 3.3.3) and finally we discuss LDA topic modelling in terms of lowest perplexity as evaluation criteria (Section 3.3.4).

### ***3.3.2 LDA Evaluation***

LDA was performed using a grid search function, systematically exploring different numbers of topics, and adjusting hyperparameters such as “alpha” (associated with the document-topic distribution) and “eta” (linked to the topic-word distribution). To evaluate the ideal number of topics coherence and perplexity were selected as the evaluation criteria. Perplexity uses the model’s ability to predict the topics of the document by matching the probability of words in the document against the top words present in generated topics and lower perplexity depicts enhanced model performance, thus helping in selecting the optimal number of topics (Blei & Lafferty, 2007; Zhao et al., 2015). Similarly, coherence tests whether the words in a certain topic are logical, helping in finding the ideal number of topics (Blair et al., 2019). High coherence establishes that words in the topic form a strong connection and create meaningful sense, thereby creating a good topic (Blair et al., 2019).

### 3.3.3 LDA topic modelling in terms of highest coherence

In terms of coherence, the best number of topics for LDA was 14 (Refer to Figure 2). In Table 2, we present a comprehensive representation of 14 LDA topics, assessed in terms of highest coherence. Additionally, the table includes the prominent terms associated with each topic, as well as the respective count of tweets attributed to them. In Figure 3, we present word cloud visualizations of LDA topics, in terms of highest coherence scores.



**Fig. 2** Coherence score vs number of topics graph for LDA

**Table 2** Top key words and number of tweets using LDA in terms of highest coherence

Topic label	Top terms	Number of tweets
1	“business”, “small”, “pandemic”, “covid”, “grant”, “help”, “support”, “program”, “owner”, “new”	24737
2	“tory”, “theyve”, “dr”, “sir”, “vendor”, “workplace”, “waste”, “bos”, “disability”, “village”	120
3	“turned”, “shes”, “quality”, “highlight”, “bringing”, “planned”, “chief”, “proven”, “reduced”, “core”	137
4	“supported”, “india”, “amazing”, “learned”, “learning”, “speak”, “lesson”, “platform”, “moving”, “reading”	134

5	“pre”, “red”, “dealing”, “sell”, “wonder”, “boom”, “explain”, “sold”, “app”, “rock”	226
6	“business”, “small”, “covid”, “pandemic”, “people”, “lockdown”, “many”, “owner”, “home”, “get”	62940
7	“crime”, “employment”, “pushing”, “girl”, “gate”, “mile”, “sister”, “wild”, “capitalist”, “battling”	128
8	“entrepreneur”, “pandemic”, “covid”, “entrepreneurship”, “woman”, “post”, “new”, “entrepreneurial”, “year”, “world”	23423
9	“raised”, “thriving”, “court”, “committee”, “adviser”, “presidential”, “concepcion”, “joey”, “paper”, “grew”	128
10	“recovering”, “mother”, “surviving”, “centre”, “valley”, “brother”, “dog”, “threatened”, “spike”, “advocating”	161
11	“destroyed”, “regulation”, “investing”, “busy”, “prior”, “body”, “status”, “de”, “previous”, “club”	70
12	“business”, “small”, “covid”, “pandemic”, “loan”, “relief”, “million”, “tax”, “billion”, “american”	20268
13	“built”, “road”, “present”, “degree”, “wing”, “nature”, “instagram”, “jeff”, “master”, “differently”	188
14	“suffered”, “side”, “transfer”, “secret”, “scam”, “client”, “hiring”, “mamadeb”, “capitalism”, “grab”	249



**Fig. 3** LDA topic word cloud in terms of highest coherence



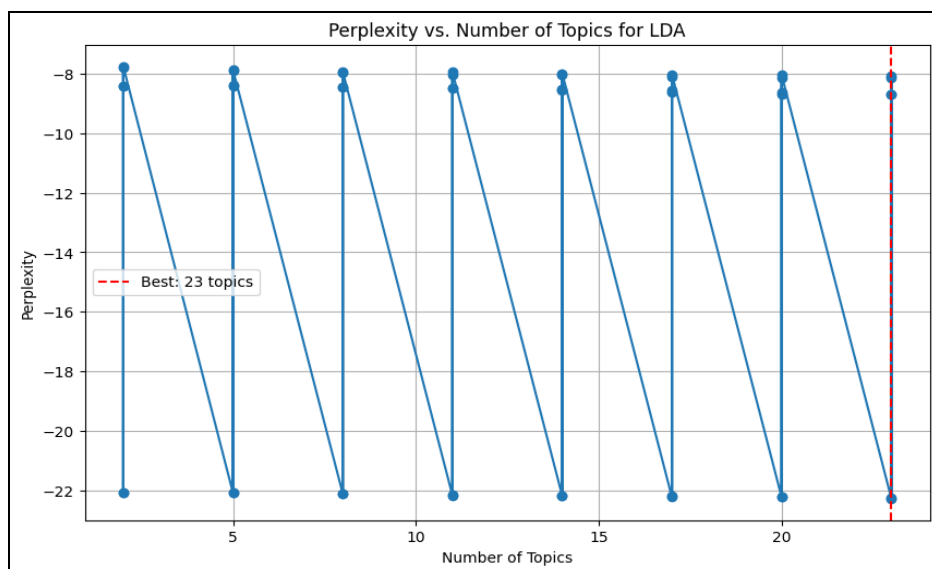
**Fig. 3** LDA topic word cloud in terms of highest coherence (Continued)



**Fig. 3** LDA topic word cloud in terms of highest coherence (Continued)

### 3.3.4 LDA topic modelling in terms of lowest perplexity

In terms of lowest perplexity, the best number of topics for LDA was 23 (Refer to Figure 4). In Table 3, we present a comprehensive representation of 23 LDA topics, assessed in terms of lowest perplexity. Additionally, the table includes the prominent terms associated with each topic, as well as the respective count of tweets attributed to them. In Figure 5, we present word cloud visualizations of LDA topics, in terms of lowest perplexity scores.



**Fig. 4** Perplexity vs number of topics graph for LDA

**Table 3** Top key words and number of tweets using LDA in terms of lowest perplexity

Topic label	Top terms	Number of tweets
1	“mask”, “online”, “digital”, “course”, “joe”, “post”, “book”, “hand”, “absolutely”, “lead”	1198
2	“business”, “small”, “covid”, “people”, “dont”, “lockdown”, “think”, “want”, “would”, “get”	21924
3	“business”, “small”, “covid”, “open”, “school”, “lockdown”, “big”, “closed”, “forced”, “child”	8453
4	“small”, “business”, “covid”, “relief”, “billion”, “bill”, “act”, “republican”, “american”, “family”	7141
5	“entrepreneur”, “pandemic”, “uk”, “grow”, “entrepreneurship”, “start”, “become”, “covid”, “innovation”, “talk”	2591
6	“social”, “florida”, “entrepreneur”, “pandemic”, “future”, “control”, “rise”, “hope”, “kill”, “covid”	2113
7	“business”, “small”, “million”, “pandemic”, “trump”, “growth”, “administration”, “destroy”, “covid”, “u”	2945
8	“business”, “home”, “small”, “stay”, “people”, “life”, “work”, “im”, “make”, “kid”	8927
9	“business”, “small”, “fund”, “covid”, “pandemic”, “loan”, “recover”, “wage”, “credit”, “county”	3375
10	“business”, “small”, “pandemic”, “support”, “help”, “destroyed”, “hit”, “local”, “owner”, “covid”	13972
11	“business”, “small”, “pandemic”, “covid”, “job”, “year”, “lost”, “many”, “due”, “since”	9068
12	“health”, “covid”, “vaccine”, “entrepreneur”, “young”, “public”, “education”, “meant”, “pandemic”, “gov”	1851
13	“entrepreneur”, “pandemic”, “entrepreneurship”, “covid”, “new”, “challenge”, “opportunity”, “entrepreneurial”, “global”, “world”	5576
14	“business”, “pandemic”, “small”, “tax”, “new”, “year”, “increase”, “survive”, “covid”, “story”	3508

15	“business”, “small”, “took”, “covid”, “pandemic”, “left”, “spending”, “get”, “high”, “owner”	2971
16	“restriction”, “lockdown”, “govt”, “covid”, “sector”, “business”, “test”, “small”, “kept”, “shortage”	2341
17	“business”, “small”, “covid”, “program”, “grant”, “mandate”, “loan”, “relief”, “help”, “apply”	12799
18	“business”, “small”, “woman”, “recovery”, “pandemic”, “covid”, “economic”, “impact”, “support”, “entrepreneur”	7503
19	“didnt”, “got”, “money”, “business”, “small”, “class”, “ppp”, “people”, “middle”, “loan”	1599
20	“business”, “helped”, “small”, “street”, “force”, “pandemic”, “rep”, “covid”, “nation”, “continues”	1332
21	“business”, “small”, “covid”, “loan”, “pay”, “check”, “money”, “corporation”, “federal”, “bank”	4593
22	“started”, “really”, “long”, “debt”, “pandemic”, “mom”, “living”, “party”, “business”, “thought”	1062
23	“business”, “pandemic”, “small”, “u”, “covid”, “supply”, “join”, “free”, “chain”, “event”	6067

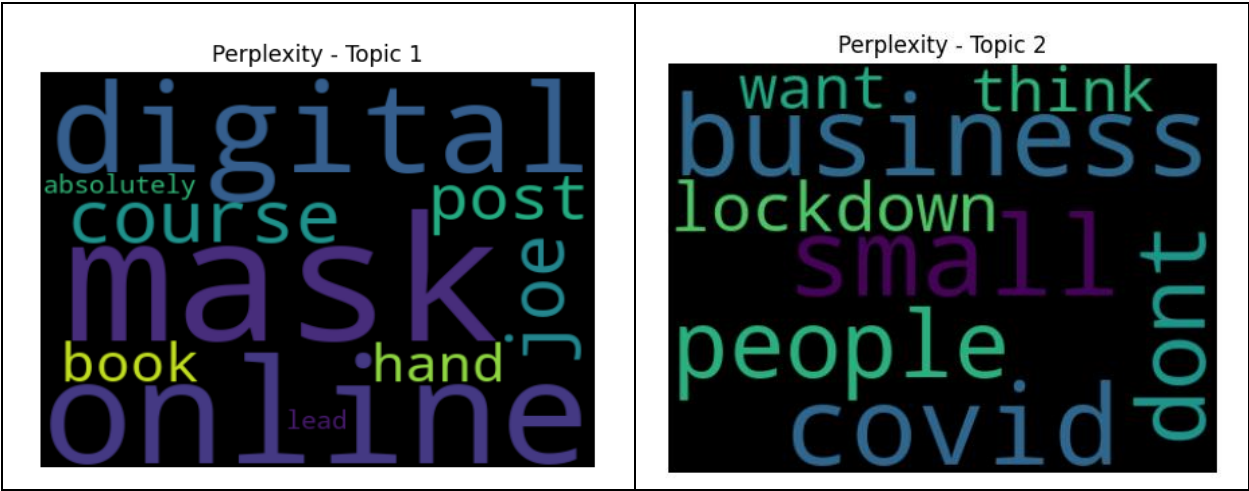


Fig. 5 LDA topic word clouds in terms of lowest perplexity



Fig. 5 LDA topic word clouds in terms of lowest perplexity (Continued)



Fig. 5 LDA topic word clouds in terms of lowest perplexity (Continued)



Fig. 5 LDA topic word clouds in terms of lowest perplexity (Continued)



**Fig. 5** LDA topic word clouds in terms of lowest perplexity (Continued)

### 3.4 Non-negative Matrix Factorization (NMF)

Introduced by Lee et al (2001), NMF is a topic modeling technique that represents documents as combinations of non-negative factors to uncover the underlying topics. Unlike LDA, NMF evaluates the degree to which each document aligns with individual topics, as opposed to assuming that a document encompasses multiple topics (Egger & Yu, 2022).

NMF has the advantage of producing non-negative topic-word and document-topic matrices, which are more interpretable than the probability distributions generated by LDA and is computationally efficient and faster than LDA (Chen et al., 2020). However, similar to LDA, NMF

also struggles with capturing contextual relationships between words (Egger & Yu, 2022). It treats words as isolated entities and doesn't consider the intricate interplay of meaning and context (Lee et al., 2001). Consequently, NMF's ability to assign topics accurately can be compromised in cases where understanding the contextual nuances of language is crucial (Egger & Yu, 2022). Moreover, this algorithm may deliver incoherent topics.

In conclusion, LDA and NMF are valuable tools in the realm of topic modeling, each with its own set of strengths and limitations. While they excel in uncovering latent topics within textual data and offer interpretability, they may fall short when it comes to capturing the rich contextual relationships between words (Egger & Yu, 2022; Röder et al., 2015; Lau et al., 2016; Sánchez-Franco & Rey-Moreno, 2021).

### ***3.4.1 NMF Analysis***

The following sections are as follows. The first section discusses the evaluation criteria for selecting the best number of topics (Section 3.4.2) and then we discuss NMF topic modelling in terms of highest coherence (Section 3.4.3).

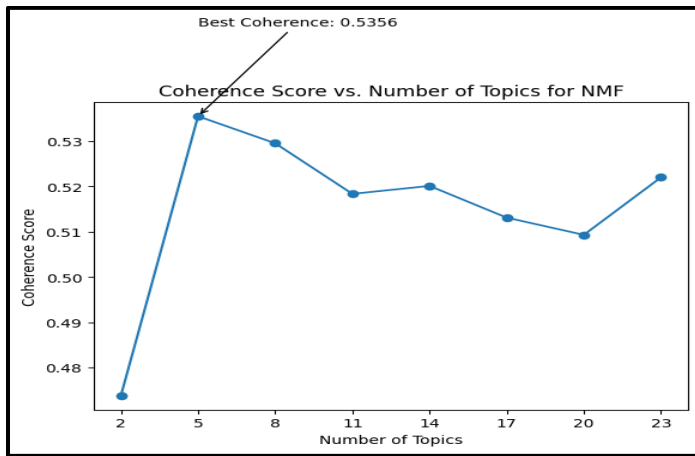
### ***3.4.2 NMF Evaluation***

NMF was utilized through a systematic grid search, methodically exploring a variable number of topics. To determine the correct number of topics, coherence was favored. Coherence assesses whether the words in a certain topic are logical, aiding in finding the optimal number of topics (Blair et al., 2019). High coherence depicts that words in the topic form a strong connection and create logical sense, composing a good topic (Blair et al., 2019). Perplexity, on the other hand, attempts to match the probability of words in the document against the top words present in

generated topics (Blei & Lafferty, 2007; Zhao et al., 2015) and hence was not employed in NMF since probabilities in NMF are absent.

### 3.4.3 NMF topic modelling in terms of highest coherence

NMF revealed that 5 topics exhibited the highest coherence (Refer to Figure 6). In Table 4, we provide an overview of 5 NMF topics, including their prominent terms and the respective counts of associated tweets. Lastly, we present the visual representation of topics in terms of word clouds (Figure 7).



**Fig. 6** Coherence score vs number of topics graph for NMF

**Table 4** Top key words and number of tweets using NMF in terms of highest coherence

Topic label	Top terms	Number of tweets
1	business, small, lockdown, people, owner, pandemic, many, get, dont, government	46384
2	grant, program, apply, business, relief, small, loan, application, fund, coronavirus	13728
3	entrepreneur, pandemic, woman, new, post, entrepreneurship, opportunity, challenge, read, world	28333
4	covid, relief, business, small, bill, crisis, impact, fund, family, american	26032
5	support, help, business, small, need, please, local, please_sharethank_vote_matter, community, safe	18432



Fig. 7 NMF topic word cloud in terms of highest coherence

### 3.5 BERTopic

BERTopic, a topic modeling approach which leverages advanced language models like BERT to comprehend words in context (Egger & Yu, 2022; Tang et al., 2024; Williams et al., 2023; Ruocco et al., 2024). This characteristic enables BERTopic to capture complex relationships between words, resulting in more accurate topic identification within text data. BERTopic has demonstrated superior performance compared to traditional methods in tasks involving document grouping and topic labeling (Röder et al., 2015; Lau et al., 2016; Egger & Yu, 2022).

An advantageous feature of BERTopic is its hierarchical topic creation, which organizes topics into sub-topics, providing a more detailed and organized representation of diverse themes in the data (Grootendors, 2022). Given BERT's comprehensive pre-training on extensive data, BERTopic can leverage this knowledge to understand new topics without requiring an extensive amount of new data (Grootendors, 2022). While traditional topic models (i.e., LDA and NMF) struggle with short and noisy texts, BERTopic excels in effectively handling such cases (Egger & Yu, 2022). Numerous studies have concluded that BERTopic outperforms LDA and NMF in terms of coherence and topic separation (Egger & Yu, 2022; Röder et al., 2015; Lau et al., 2016; Sánchez-Franco & Rey-Moreno, 2021). This implies that the topics generated by BERTopic are more comprehensible and logical compared to the other models. Furthermore, BERTopic has a high degree of flexibility, adapting well to various data types, documents of varying lengths, and even different languages (Devlin et al., 2018; Wang et al., 2018). This adaptability empowers BERTopic as a potent tool for topic modeling, particularly when dealing with diverse and short text datasets.

The BERTopic approach entails three stages: document embedding (i.e., turning documents into numerical representations), document clustering, and document c-TF-IDF. The initial step involves transforming the corpus documents into word embeddings, a process that maps words

into numerical vector spaces while considering semantic nuances and context (Mikolov et al., 2013). In the second step, prior to clustering, embeddings undergo dimensionality reduction, which offers benefits such as eliminating redundant features, reducing computation and training time, and aiding data visualization. The final step involves looking at the importance of words in each group (or cluster), which then helps to distinguish the different topics. This is done using a technique called class-based TF-IDF (or c-TF-IDF). This method measures how important a word is to a whole group/cluster of documents, rather than just one. It helps to create a better picture of what each topic is about (Grootendorst, 2022).

The aim of the class-based TF-IDF is to provide the same class vector to all documents within a single class. This regularization reduces the influence of frequently occurring words within a class. The frequency of each word is extracted for each class and divided by the total number of words. This approach models the significance of words in clusters rather than individual documents, facilitating the creation of topic-word distributions for each document cluster (Grootendorst, 2022).

Furthermore, in contrast to BERTopic, both LDA and NMF consider the entirety of the document corpus when attributing topics. This presents a significant limitation since not all documents within the corpus inherently align with coherent topics; some may serve as outliers, as shown in our implementation of BERTopic within this study. The utilization of LDA and NMF for topic assignment entails a global perspective, implying that each document is considered in isolation when determining its association with specific topics. However, this approach may not adequately account for the diversity and nuances of topics within the dataset. Consequently, documents that deviate from the prevalent themes or exhibit unique characteristics may be incorrectly allocated to topics, leading to less accurate topic assignments. This limitation was

notably observed in our study when employing BERTopic which did a great job identifying outliers to give much more coherent topics. This is because BERTopic's utilization of contextual embeddings offers a more nuanced approach to topic modeling by considering the contextual relationships between words and documents (Grootendorst, 2022; Devlin et al., 2018; Reimers & Gurevych, 2019). This enables it to capture subtle topic distinctions and improve the accuracy of topic assignments, especially in cases where documents may deviate from the norm or exhibit hybrid characteristics.

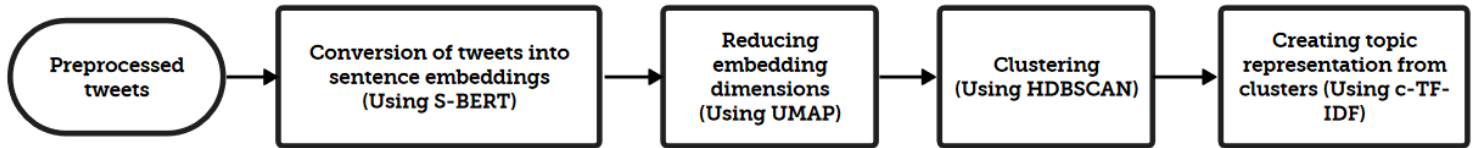
In summary, while LDA and NMF have the disadvantage of treating all documents uniformly when assigning topics, potentially resulting in less precise topic allocations, BERTopic's utilization of contextual embeddings provides a more sophisticated means of discerning topics and is better suited for handling outlier documents and intricate topic structures within the corpus which was similarly observed during the analysis and resulted in being the final topic model.

The following sections are as follows. The first section discusses the BERTopic model implementation (Section 3.5.1) followed by analyzing the effectiveness of BERTopic Model (Section 3.5.2).

### ***3.5.1 BERTopic model Implementation***

The BERTopic model implementation involves a series of steps that transform textual data into a format suitable for further processing (refer to Figure 8). This process initiates with the conversion of textual documents into sentence embeddings. In our case, we utilize Sentence-BERT (SBERT) to transform the preprocessed tweets into numerical representation of dimension 384. SBERT is a specialized model designed to provide single embeddings for sentences which focuses on semantic similarity, a crucial aspect of our analysis (Reimers & Gurevych, 2019).

To effectively perform clustering, we recognize the necessity of dimensionality reduction. Many clustering algorithms, including HDBSCAN, are sensitive to the curse of dimensionality, where high-dimensional data points become equidistant which in turn results in poor clustering (Allaoui et al., 2020; Campello et al., 2013). Hence, we employed the Uniform Manifold Approximation and Projection (UMAP) technique to reduce the dimensions of the sentence embeddings. UMAP serves as a dimensionality reduction tool similar to PCA and t-SNE, preserving the essential structural properties of the data (McInnes & Healy, 2018; Allaoui et al., 2020).



**Fig. 8** BERTopic Implementation Stages

Following dimensionality reduction, we used the reduced embedding vectors for clustering. We used HDBSCAN, a density-based algorithm (Campello et al., 2013). Unlike distance-based algorithms like k-means, HDBSCAN considers the reachability of points to form clusters (Campello et al., 2013). Points that are distant from most others are identified as outliers, aiding in the creation of meaningful clusters. While implementing HDBSCAN we specified cluster to be at least 1000 tweets.

The training phase of BERTopic model encompassed a combination of above steps which serves as pipeline models. This involved utilizing the generated sentence embeddings of tweets, UMAP model, and HDBSCAN model. The training process yielded the generation of topics, size of topics and representation of every topic (i.e., top terms of every topic).

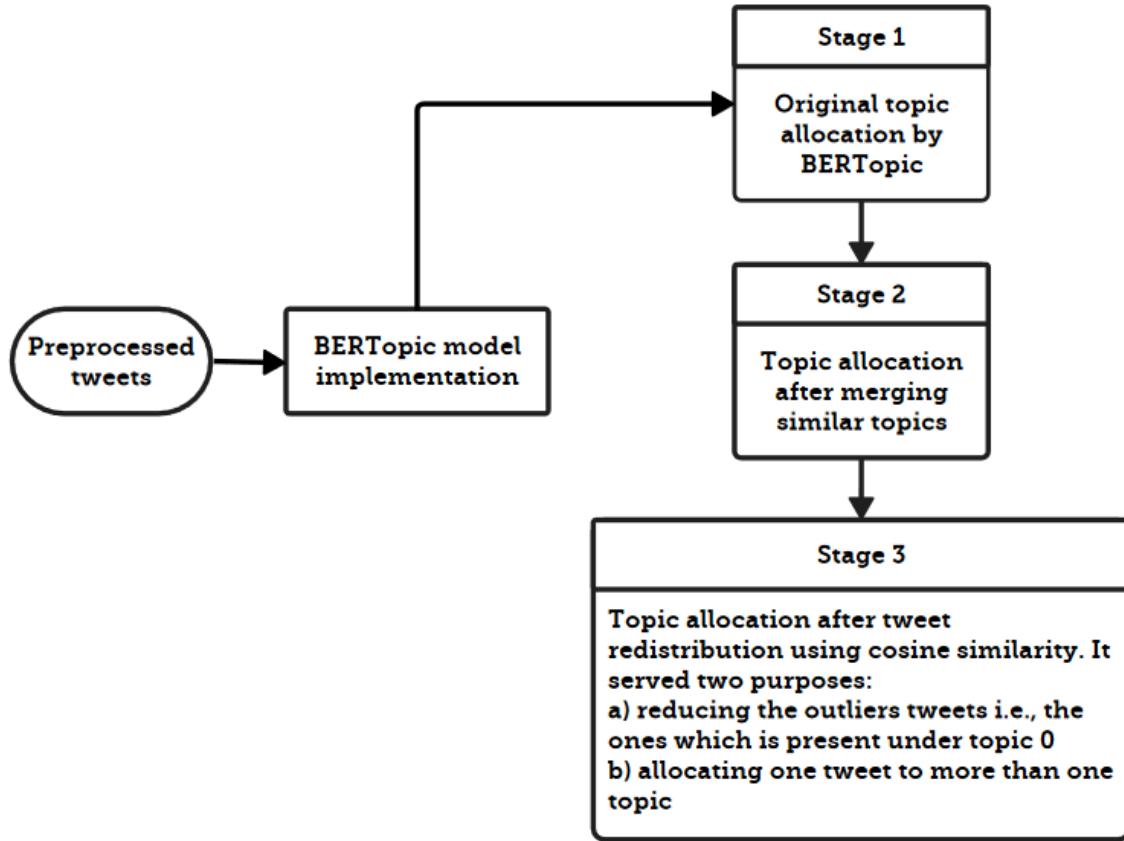
To enhance topic comprehension, we used topic representation and 5 representative tweets from each topic and tailored topic labels using OpenAI API. This allowed us to generate informative topic descriptions (Refer to Appendix, Table A1.1).

Further, we proceeded to generate summaries for the identified topics by leveraging the Open AI API. In this step, tweets of each topic were utilized to generate summaries using the API, thereby providing deeper insights into the essence of each topic. Moreover, by analyzing these summaries in conjunction with the representative documents of each topic, we recognized patterns of similarity among topics. This allowed us to logically group topics that shared common underlying themes. Taking this grouping a step further, we merged the grouped topics, and subsequently revised and updated the associated topic labels (refer to Table 5). This consolidation and refinement of topics served multiple advantages. Firstly, it facilitated a more coherent and structured representation of the narrative landscape by reducing redundancy and enhancing the interpretability of the resulting topics. Secondly, this process enabled the identification of overarching themes that encompassed multiple related topics, providing a broader perspective on the prevalent discussions within the dataset.

Upon finalizing the merged and updated topic labels (i.e., stage 2 topic allocation), we adopted this topic information as our reference point for the next section. Refer to Fig. 9 for more information on the topic allocation stages. Next section will discuss about our progression in extending the scope to assign multiple topic labels to a single tweet and discuss the effectiveness of BERTopic model.

**Table 5** Topics after merging similar topics (Stage 2)

Topic label	Topic name	Top terms (Stage 2)	Tweet count
1	Entrepreneurship Opportunities in the Post-COVID World	entrepreneur, pandemic, covid, entrepreneurship, new, entrepreneurial, post, time, young, world, year, support, social, people	11103
2	Small Business Survival during COVID	covid, pandemic, lockdown, people, owner, help, support, many, government, get, need, one, time, big	22105
3	Small Business COVID Relief Grant Program	covid, grant, relief, loan, pandemic, program, help, apply, ppp, fund, application, support, million, bill	12032
4	Vaccine Mandates and Small Business Survival	mask, vaccine, covid, people, wear, get, mandate, pandemic, lockdown, entrepreneur, owner, need, one, vaccinated	4283
5	Impact of COVID on Women Entrepreneurs	woman, entrepreneur, pandemic, covid, female, entrepreneurship, support, new, impact, challenge, help, economic, read, recovery	2634
6	Support for Canadian Small Businesses Amid Pandemic	covid, pandemic, canadian, canada, ontario, support, lockdown, government, help, owner, people, need, many, entrepreneur	2235
7	India's Entrepreneurship and Economic Recovery from COVID	india, covid, entrepreneur, pandemic, indian, lockdown, people, help, time, govt, due, economy, pm, sir	1498
8	Impact of Pandemic on Black-Owned Small Businesses	black, pandemic, owned, covid, entrepreneur, owner, community, hit, help, latino, minority, support, white, woman	1499
9	Impact of Brexit and Covid on UK small businesses	covid, uk, pandemic, support, brexit, government, tory, entrepreneur, help, people, many, owner, economy, million	1249
10	Impact of Whitmer's Policies on Small Businesses during COVID	covid, pandemic, people, owner, family, lockdown, relief, support, help, home, money, get, job, would	1109
11	Small Business Coronavirus Support	coronavirus, pandemic, owner, help, need, support, new, crisis, impact, survive, relief, many, corona, company	1089



**Fig. 9** Topic allocation stages

### ***3.5.2 Analyzing BERTopic Model Effectiveness***

In the domain of Natural Language Processing (NLP), the BERTopic model has gained popularity due to its remarkable ability to capture and uncover complex relationships present in textual content (Grootendorst, 2022). We explored its effectiveness to identify prevalent themes within Twitter conversations surrounding small and family-owned businesses.

BERTopic operates by clustering similar tweets into cohesive themes, providing a coherent structure to a very diverse and vast collection of textual content of social media. This model uses BERT-based contextual embeddings, which allows BERTopic to understand the text better and have an in-depth understanding of the nuanced semantic connections among words and phrases,

which gives it an edge in identifying thematic patterns (Devlin et al., 2018; Reimers & Gurevych, 2019). However, the initial application of BERTopic revealed that a substantial portion of tweets remained classified as outliers (refer to Table A1.1 in Appendix), thereby questioning the model's capacity to effectively understand the entire conversational spectrum. In stage 1, BERTopic uncovered a total of 18 meaningful topics and one outlier topic which has tweets which does not fit to the 18 meaningful topics (refer to Table A1.1 in Appendix). These 18 meaningful topics cover a substantial portion of the tweets — 60,836 out of a grand total of 132,567. However, there remained a vast collection of 71,731 tweets that BERTopic classified as outliers — tweets that didn't fit the themes of the predefined topics. Similarly, the number of outliers will not change in stage 2 since we are only merging similar topics other than outlier topic (refer to Table 5).

To reduce these outliers, we employed an approach involving cosine similarity. By calculating the average cosine similarity of a tweet with others tweets in a specific topic, we assessed its affinity with that topic. If this average similarity surpassed the 50% threshold, we added the corresponding topic label to the tweet. In addition to handling outliers, this method also lets tweets be part of more than one topic, depending on how much they were similar with a specific topic. For example, consider tweet\_100. Assuming, according to the BERTopic this tweet was initially assigned to topic\_7. However, upon calculating the average similarity between tweet\_100 and the tweets within topic\_1 exceeded 50%, we took the step of modifying the label of tweet\_100. Specifically, we changed its label to consider both topic\_7 and topic\_1. By implementing this approach, our intention was twofold: firstly, to ensure that outlier tweets found their suitable thematic topic, and secondly, to enable a tweet to be associated with multiple topics, guided by the underlying cosine similarities between them. The idea behind the second intention is that there is a possibility that one tweet might be discussing multiple topics. This additional layer

of topic assignment was aimed to provide a more nuanced and comprehensive understanding of the content within the tweets. Please refer to Table 7 to see the difference between the stage 2 topic allocation and top terms of the topics. This technique is employed to determine if these outliers could be more appropriately accommodated within the themes identified by the BERTopic. Yet, despite this approach, the increase in tweet numbers per topic was very low, in comparison to Stage 2 (refer to table 6) – this stage 2 did not involve outlier reduction as it only merged the similar topics except outlier topic.

**Table 6** Final tweet allocation table (Stage 3)

Topic label	Topic name	Top terms (Stage 3)	Tweet count
1	Entrepreneurship Opportunities in the Post-COVID World	entrepreneur, pandemic, covid, entrepreneurship, new, entrepreneurial, post, time, young, world, year, support, social, people	11103
2	Small Business Survival during COVID (Frustration)	covid, pandemic, lockdown, people, owner, help, support, many, government, get, need, one, time, big	22129
3	Small Business COVID Relief Grant Program	covid, grant, relief, loan, pandemic, program, help, apply, ppp, fund, application, support, million, bill	12032
4	Vaccine Mandates and Small Business Survival	mask, vaccine, covid, people, wear, get, mandate, pandemic, lockdown, entrepreneur, owner, need, one, vaccinated	4283
5	Impact of COVID on Women Entrepreneurs	woman, entrepreneur, pandemic, covid, female, entrepreneurship, support, new, impact, challenge, help, economic, read, recovery	2640
6	Support for Canadian Small Businesses Amid Pandemic	covid, pandemic, canadian, canada, ontario, support, lockdown, government, help, owner, people, need, many, entrepreneur	2235
7	India's Entrepreneurship and Economic Recovery from COVID	india, covid, entrepreneur, pandemic, indian, lockdown, people, help, time, govt, due, economy, pm, sir	1498
8	Impact of Pandemic on Black-Owned Small Businesses	black, pandemic, owned, covid, entrepreneur, owner, community, hit, help, latino, minority, support, white, woman	1520

9	Impact of Brexit and Covid on UK small businesses	covid, uk, pandemic, support, brexit, government, tory, entrepreneur, help, people, many, owner, economy, million	1249
10	Impact of Whitmer's Policies on Small Businesses during COVID	covid, pandemic, people, owner, family, lockdown, relief, support, help, home, money, get, job, would	1109
11	Small Business Coronavirus Support	covid, pandemic, coronavirus, help, owner, support, many, need, new, relief, survive, way, entrepreneur, impact	5933

After looking into the variation in tweet counts between Stage 3 (with outlier reduction) and Stage 2 (without outlier reduction), it is evident that the cosine similarity approach did not give a substantial improvement in the tweet count per topic (refer to Table 7). However, it is important to note that a substantial increase of 4844 in the tweet count was observed for Topic 11, signifying the potential effectiveness of the introduced approach for certain topics. For subsequent analysis in this study, we have considered stage 3 topic allocation data.

**Table 7** Difference in tweet count between Stage 3 and Stage 2

Topic label	Tweet count difference (Stage 3 – Stage 2)
1	0
2	24
3	0
4	0
5	6
6	0
7	0
8	21
9	0
10	0
11	4844

This discussion highlights that although adding cosine similarity to BERTopic didn't consistently result in a notable increase in the number of tweets per topic, it did show potential in one case, which is Topic 11. Furthermore, this underscores the effectiveness of BERTopic in identifying meaningful and coherent topics. Having said that, it is important to note that a bigger chunk of text (such as blog posts) can exhibit a multifaceted conversation which might not exclusively belong to one topic (Medvecki et al., 2024). Which is why the cosine similarity technique can prove beneficial depending on the nature and length of the text. On platforms like Twitter, where text length tends to be shorter (with an average of 32 words per tweet in our dataset), which reduces the scope of a tweet to be discussing two separate topics or themes. This is a contributing factor to BERTopic's robust performance with Twitter text. Even with our modified approach of assigning tweets to multiple topics and utilizing cosine similarity to reduce outliers, there isn't a substantial increase in the number of tweets per topic. This underscores BERTopic's adaptability and effectiveness in the context of Twitter conversations. Further exploration and fine-tuning of such approaches hold potential for unveiling more comprehensive insights into the dynamic landscape of Twitter discussions on small and family-owned businesses.

## **4 Results**

The following sections are as follows. Prevalent topics in twitter discussions around small and family-owned business (Section 4.1) followed by Change in narratives around major announcements by governments (Section 4.2).

### **4.1 Prevalent topics in twitter discussions around small and family-owned business**

After merging similar topics (stage 2) and handling outliers (stage 3), we looked at these topics closely to understand the main themes social media users were discussing about smaller and

family-owned businesses on Twitter. An insightful overview of the topics is presented in Table 8.1. As shown in Table 8.1, a wide range of issues are covered through our BERT topic modeling approach. We have used OpenAI API to assign contextual title to each topic theme – based on the overall theme of the tweets covered under each topic. The aggregated topics are: 1) Entrepreneurship Opportunities in the Post-COVID World; 2) Small Business Survival during COVID (Frustration); 3) Small Business COVID Relief Grant Program; 4) Vaccine Mandates and Small Business Survival; 5) Impact of COVID on Women Entrepreneurs; 6) Support for Canadian Small Businesses Amid Pandemic; 7) India’s Entrepreneurship and Economic Recovery from COVID; 8) Impact of Pandemic on Black-Owned Small Businesses; 9) Impact of Brexit and Covid on UK small businesses; 10) Impact of Whitmer’s Policies on Small Businesses during COVID; 11) Small Business Coronavirus Support. Corresponding word clouds figures (Figure 10-20) are referenced in Table 8.1. Sample tweets corresponding to each topic are presented in Appendix, Table A1.2.

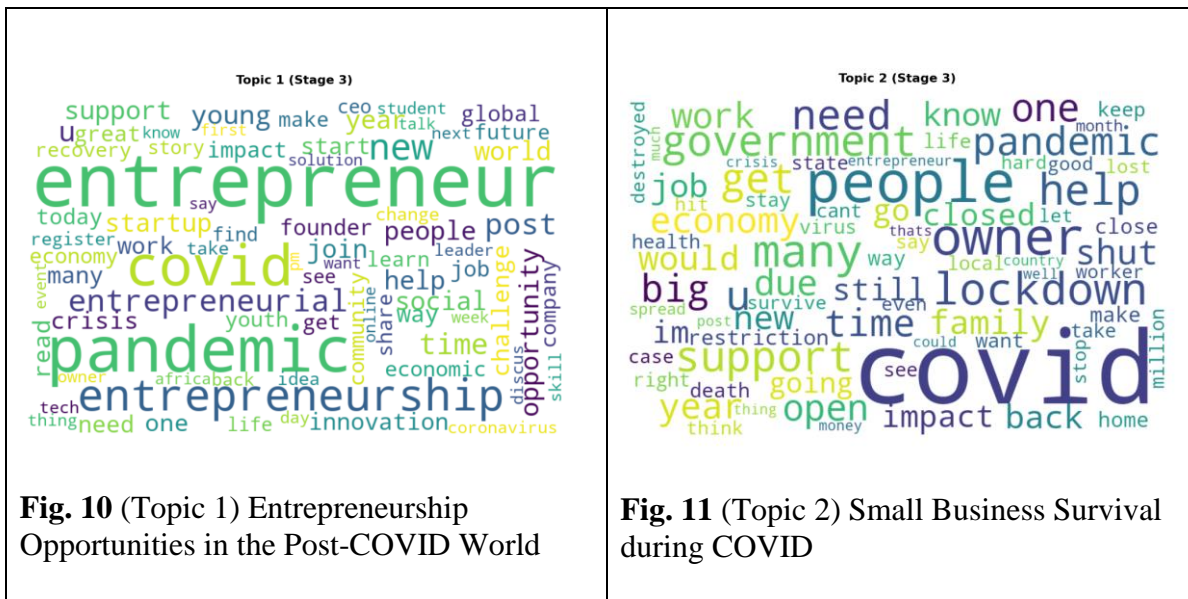
To enhance our comprehension of these topics, we again harnessed the capabilities of the OpenAI API to create individualized summaries for each topic. The key points of each topic area presented in Table 8.2.

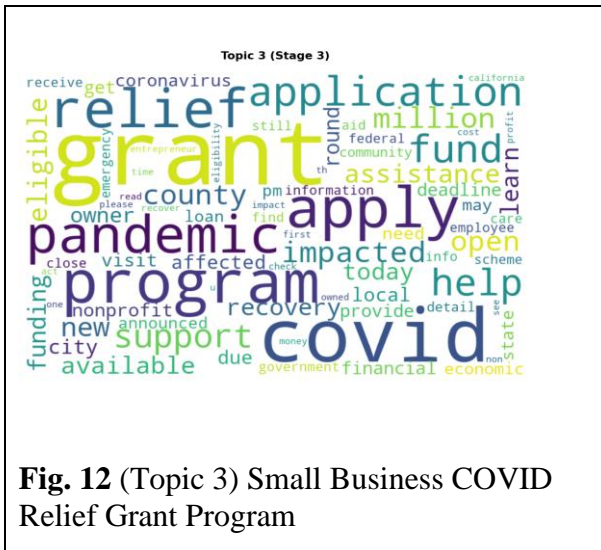
**Table 8.1** Topic description

Topic	Description	Top keywords figure (Stage 3 Word Clouds)
Entrepreneurship Opportunities in the Post-COVID World (Topic 1)	The COVID-19 pandemic has spurred a surge in new entrepreneurs, with many successfully adjusting to evolving market conditions. Despite the challenges, it has created opportunities for innovation and community-focused entrepreneurship, highlighting resilience and adaptability in various industries.	Figure 10

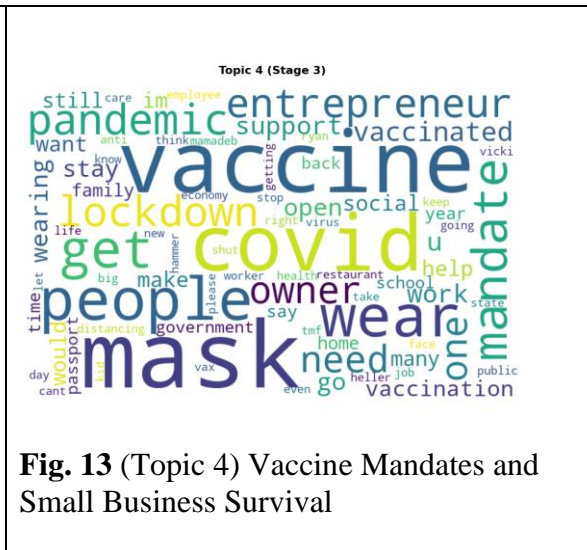
<p>Small Business Survival during COVID (Topic 2)</p>	<p>The COVID-19 pandemic has significantly impacted small businesses, leading to challenges such as blocked accounts and limited access to assistance. The discussions highlight the pressing need for increased financial support amid ongoing restrictions. The closure of small businesses, inconsistent lockdown effects, and government mismanagement compounded the challenges faced by these enterprises.</p>	<p>Figure 11</p>
<p>Small Business COVID Relief Grant Program (Topic 3)</p>	<p>The tweets highlight various small business grants and relief programs available in response to the COVID-19 pandemic, discussing application deadlines and launch details. The tweets underscore the significance of relief programs and grants during the pandemic, providing essential financial assistance to impacted small businesses.</p>	<p>Figure 12</p>
<p>Vaccine Mandates and Small Business Survival (Topic 4)</p>	<p>The tweets provide diverse perspectives on the impact of COVID-19 restrictions, including mask mandates and vaccine-related concerns on small businesses. Discussions range from vaccine distribution to government actions, revealing varying opinions about pandemic management and its effects on businesses.</p>	<p>Figure 13</p>
<p>Impact of COVID on Women Entrepreneurs (Topic 5)</p>	<p>The tweets shed light on the challenges faced by female entrepreneurs during the global COVID-19 pandemic, highlighting their resilience and the need for support. Despite facing unique hurdles, women-led businesses have shown adaptability and determination.</p>	<p>Figure 14</p>
<p>Support for Canadian Small Businesses Amid Pandemic (Topic 6)</p>	<p>The tweets reflect a diverse range of opinions regarding the Canadian government's support for small businesses during the pandemic. The need for immediate financial assistance and recovery plans is emphasized to ensure the survival and revival of small businesses, which are crucial for Canada's economic recovery.</p>	<p>Figure 15</p>
<p>India's Entrepreneurship and Economic Recovery from COVID (Topic 7)</p>	<p>The tweets shed light on the impact of the COVID-19 pandemic on small businesses and entrepreneurship in India. Highlighting the challenges faced by businesses, the government's relief measures, and the efforts of entrepreneurs and investors to support the nation's recovery, Indian entrepreneurs have demonstrated resilience and innovation, resulting in new business registrations during the pandemic.</p>	<p>Figure 16</p>
<p>Impact of Pandemic on Black-Owned Small Businesses (Topic 8)</p>	<p>The tweets highlight the significant impact of the COVID-19 pandemic on Black-owned small businesses, underscoring the challenges faced by these businesses and the lack of government support. Efforts to support Black-owned businesses exist, but there is a need for more equitable solutions to address disparities.</p>	<p>Figure 17</p>

<p>Impact of Brexit and Covid on UK small businesses (Topic 9)</p>	<p>The tweets address concerns regarding the adverse effects of the pandemic and Brexit on small businesses in the UK. The overall focus is on recognizing the significance of small businesses for the economy and advocating for enhanced support and protection.</p>	<p>Figure 18</p>
<p>Impact of Whitmer's Policies on Small Businesses during COVID (Topic 10)</p>	<p>The tweets highlight concerns regarding the negative impact of the COVID-19 pandemic and government policies on small businesses. Criticisms are directed at politicians for their inadequate response to the challenges faced by small businesses and their perceived prioritization of larger corporations, as well as accusations of fund mismanagement and hypocrisy.</p>	<p>Figure 19</p>
<p>Small Business Coronavirus Support (Topic 11)</p>	<p>The tweets delve into the impact of the COVID-19 pandemic on small businesses, underscoring the significance of these enterprises in the US economy. Despite the challenges posed by the crisis, the tweets highlight the potential for small businesses to persevere with community support and adaptation.</p>	<p>Figure 20</p>

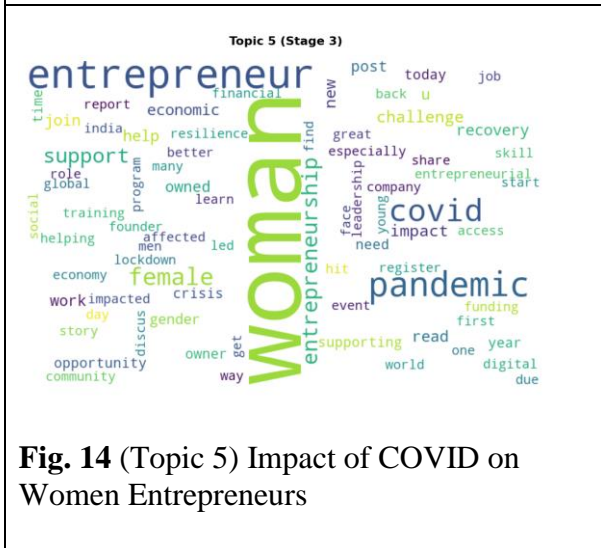




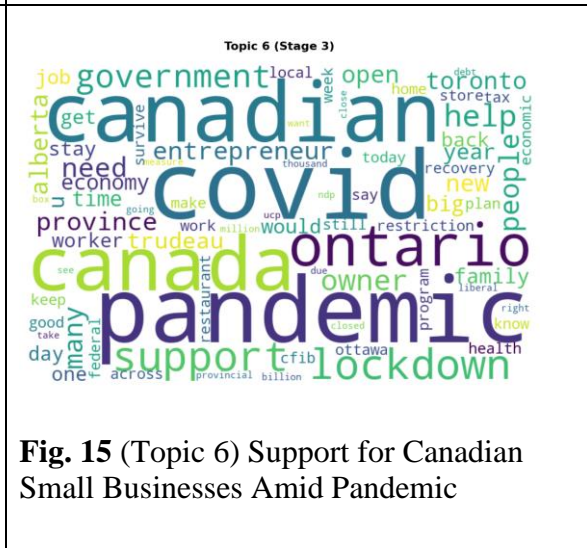
**Fig. 12** (Topic 3) Small Business COVID Relief Grant Program



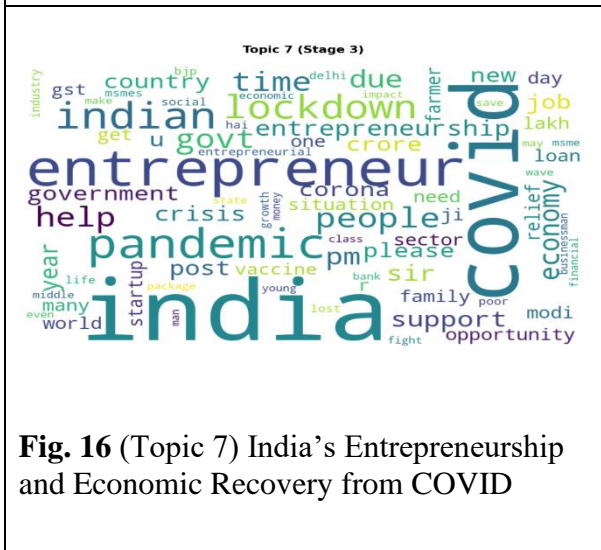
**Fig. 13** (Topic 4) Vaccine Mandates and Small Business Survival



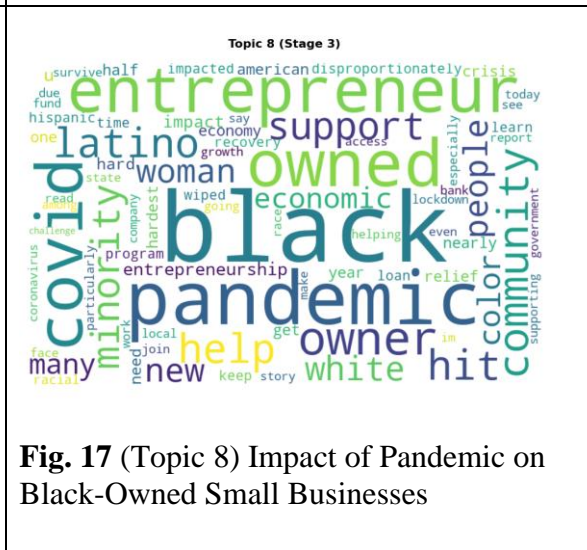
**Fig. 14** (Topic 5) Impact of COVID on Women Entrepreneurs



**Fig. 15** (Topic 6) Support for Canadian Small Businesses Amid Pandemic



**Fig. 16** (Topic 7) India's Entrepreneurship and Economic Recovery from COVID



**Fig. 17** (Topic 8) Impact of Pandemic on Black-Owned Small Businesses



**Table 8.2** Key points

Topic 1: Entrepreneurship Opportunities in the Post-COVID World	Topic 2: Small Business Survival during COVID	Topic 3: Small Business COVID Relief Grant Program	Topic 4: Vaccine Mandates and Small Business Survival
<p>1.Pandemic-driven entrepreneurship: The pandemic has spurred a rise in new entrepreneurs, with individuals adapting to changing market demands and thriving.</p> <p>2.Challenges and opportunities: COVID-19 has posed challenges for businesses, but it has also created room for innovation and entrepreneurship that benefits communities.</p> <p>3.Survival-driven startups: Many individuals have turned to entrepreneurship out of necessity, starting businesses due to job loss or furloughs during the pandemic.</p> <p>4.Industry impact and adaptation: The pandemic has affected industries like education, art, small businesses, and tourism. Entrepreneurs are finding ways to adapt and collaborate.</p> <p>5.Resilience and innovation: Entrepreneurs are actively pivoting their business models, seeking resources, and displaying resilience to navigate the pandemic's effects and foster post-COVID recovery.</p>	<p>1.Small business challenges: COVID-19's impact includes blocked accounts and restricted assistance for small businesses.</p> <p>2.Demand for increased support: Discussions emphasizes the necessity for enhanced financial aid during ongoing restrictions.</p> <p>3.Unequal treatment and frustration: Frustration stems from larger corporations benefiting while small businesses adhering to public health measures go unrecognized.</p> <p>4.Varied lockdown outcomes: The effects of lockdowns and restrictions are inconsistent, with some sectors continuing while others, like schools and small businesses, suffer.</p>	<p>1.California Small Business COVID Relief Grant: The tweets focus on the grant program's launch and application deadlines.</p> <p>2.Importance of relief programs: The tweets emphasize the role of grants in supporting small businesses during the pandemic.</p> <p>3.Financial assistance for recovery: The grants aim to aid small businesses facing challenges due to the pandemic's economic consequences.</p> <p>4.Providing essential support: The tweets provide valuable information and resources for small business owners seeking financial assistance.</p>	<p>1.COVID-19 Restrictions and Income Impact: The tweets highlight frustrations over restrictions, such as mask mandates and curfews, negatively affecting small businesses' income generation.</p> <p>2.Pharmaceutical Company Contributions: Some tweets suggest using taxes paid for vaccine development to support struggling businesses, emphasizing the need for financial assistance.</p> <p>3.Government Actions and Reversals: Criticisms arise over inconsistent government actions, like imposing strict vaccination mandates only to reverse them later, leading to confusion and disruptions.</p> <p>4.International Pandemic Variations: Differences in pandemic management among countries are noted, including fully vaccinated individuals facing lockdowns and the availability of rapid tests.</p> <p>5.Vaccine Mandates and Business Impact: The tweets discuss concerns about vaccine mandates, especially those imposed by President Biden, potentially leading to fines, employee terminations, and frustrations over business and individual freedoms.</p>

**Table 8.2** Key points (Continued)

Topic 5: Impact of COVID on Women Entrepreneurs	Topic 6: Support for Canadian Small Businesses Amid Pandemic	Topic 7: India's Entrepreneurship and Economic Recovery from COVID	Topic 8: Impact of Pandemic on Black-Owned Small Businesses
<p>1.Impact of Pandemic on Female Entrepreneurs: The tweets underline the significant impact of the pandemic on female entrepreneurs, accentuating both challenges and opportunities.</p> <p>2.Support for Women Entrepreneurs: There's a call for equal pay and digital marketing mentoring programs to empower and uplift women in business.</p> <p>3.Resilience and Success: Women-owned enterprises have demonstrated resilience and thrived during the pandemic, showcasing inspiring journeys.</p> <p>4.Care Infrastructure and Empowerment: The pandemic has highlighted the need for women's economic empowerment and the significance of care infrastructure.</p> <p>5.Challenges and Optimism: Despite facing job loss, childcare issues, and limited capital access, women entrepreneurs remain hopeful and determined about their future.</p>	<p>1.Criticism of Government Support: The Canadian government's response to the pandemic's impact on small businesses has drawn criticism for lacking adequate support compared to other countries.</p> <p>2.Importance of Small Businesses: Small businesses are integral to Canada's economy, but they have suffered due to the pandemic's adverse effects.</p> <p>3.Frustration with Lockdown Measures: Tweets express frustration with government-imposed lockdown measures and call for an end to restrictions on small businesses.</p> <p>4.Critique of Ontario's Actions: The Ontario government's handling of the pandemic and its consequences for small businesses have been criticized.</p> <p>5.Call for Support and Recovery Plans: The tweets emphasize the urgency of providing financial assistance and implementing recovery plans to ensure small businesses' survival and contribute to Canada's economic recovery.</p>	<p>1.Entrepreneurial Resilience: Small businesses in India have shown adaptability and innovation to navigate the challenges posed by the COVID-19 pandemic.</p> <p>2.Government Support: The Indian government has introduced schemes and initiatives to provide financial assistance to small business owners affected by the pandemic's impact.</p> <p>3.Threat to Businesses: Concerns about the potential closure of numerous small businesses, which could have significant economic and livelihood implications.</p> <p>4.Entrepreneurial Mobilization: Entrepreneurs and investors in India are collaborating to combat COVID-19 and contribute to the country's recovery efforts.</p> <p>5.Government Relief Measures: The government's relief measures, such as stimulus packages and financial assistance, aim to support entrepreneurship, uplift farmers and the poor, and enhance the health infrastructure to address the pandemic's challenges.</p>	<p>1.Disproportionate Impact: Black and minority-owned small businesses have been heavily affected by the pandemic, with expected closures and limited access to support.</p> <p>2.Lack of Government Help: Many Black entrepreneurs have not received assistance from the federal government's relief programs designed for small businesses.</p> <p>3.Racial Inequalities Exposed: The pandemic has highlighted and worsened existing racial disparities in business ownership and access to essential resources.</p> <p>4.Support Initiatives: Efforts like the Black Business Relief Fund and the Black Business Association aim to provide support and visibility to Black-owned small businesses.</p> <p>5.Latino Entrepreneurs Affected: Latino entrepreneurs have also faced significant challenges due to pandemic-related lockdowns and lack of government support, resulting in financial crises.</p>

**Table 8.2** Key points (Continued)

Topic 9: Impact of Brexit and Covid on UK small businesses	Topic 10: Impact of Whitmer's Policies on Small Businesses during COVID	Topic 11: Small Business Coronavirus Support
<p>1.Pandemic and Brexit Impact: The tweets highlight worries about the combined negative impact of the COVID-19 pandemic and Brexit on small businesses in the UK.</p> <p>2.Labour Party Critique: Criticism is aimed at the Labour Party for its handling of economic growth and inadequate support for small businesses.</p> <p>3.Government Support Advocacy: Many tweets call for increased government assistance and appropriate measures to aid small businesses' recovery from pandemic and Brexit challenges.</p> <p>4.SNP Criticism: The SNP in Scotland faces criticism for its handling of the pandemic and the resulting effects on small businesses.</p> <p>5.Small Business Significance: There's a strong emphasis on the essential role of small businesses in the economy, underlining the need for improved support and safeguards</p>	<p>1.Pandemic and Government Impact: The tweets express worries about the adverse consequences of the pandemic and government policies on small businesses.</p> <p>2.Politician Critique: Some tweets criticize politicians for not effectively addressing small businesses' challenges and appearing to favor big corporations.</p> <p>3.Support and Relief Call: There's a collective call for support packages and relief grants to assist small businesses in recovering from the pandemic's impact.</p> <p>4.Politicians' Involvement: Mention is made of politicians who have either supported small businesses during the pandemic or are highlighted for their roles in addressing related issues.</p> <p>5.Accusations and Effects: The tweets also raise accusations of fund mismanagement and hypocrisy by certain politicians, underscoring the negative implications on small businesses.</p>	<p>1.Importance of Small Businesses: The tweets emphasize the crucial role played by small businesses, which contribute significantly to the US economy's GDP.</p> <p>2.Survival and Community Support: While small businesses face pandemic-related difficulties, community support and adaptation are touted as means for their survival and future growth.</p> <p>3.Government Support and Assistance: The need for government intervention, such as PPP loans and rent forgiveness, is highlighted to aid small businesses' resilience during the crisis.</p> <p>4.Adaptation and Innovation: Many small businesses are reported to have undergone reinvention in order to adapt to the pandemic's challenges and secure their survival.</p> <p>5.Hemp Industry and COVID-19: There's a discussion on the potential role of hemp in combating the coronavirus, suggesting support for small family-owned businesses in the hemp industry.</p>

## 4.2 Change in narratives around major announcements by governments.

The methodology employed for extracting and analyzing narratives around major government announcements for the topics identified by BERTopic (Stage 3 topic allocation) is a multi-step process designed to systematically capture and comprehend the evolving discourse. Here is an in-depth overview of the methodology:

1. **Data Collection and Organization:** Initially, a collection of tweets related to each BERTopic-identified topic (Stage 3 topic allocation) is gathered. These tweets are systematically organized and stored for subsequent analysis.
2. **Identification of Key Dates and Announcements:** Major government announcements that are likely to have an impact on the discussions are identified. Each announcement is associated with a specific date and a brief description outlining the essence of the announcement (refer to Table 9). These announcements serve as focal points for analysis.

**Table 9** Key announcements

Announcement	Date	Description
Announcement 1: Fed launched the Paycheck Protection Program Liquidity Facility (PPPLF)	9th April 2020	To help small businesses, the Fed launched the Paycheck Protection Program Liquidity Facility (PPPLF) on April 9, 2020, in concert with the CARES Act. This program lent money to banks so they could, in turn, lend money to small businesses through the Paycheck Protection Program (PPP) (Board of Governors of the Federal Reserve System, 2020, April 9).
Announcement 2: SBA increased the maximum loan amount from \$150,000 to \$500,000	24th March 2021	SBA (Small Business Administration) increased the maximum loan amount from \$150,000 to \$500,000 (U.S. Small Business Administration, 2021, March 24).

Announcement 3: SBA increased the COVID EIDL maximum loan amount from \$500,000 to \$2 million	9th September 2021	SBA (Small Business Administration) increased the COVID EIDL maximum loan amount from \$500,000 to \$2 million (U.S. Small Business Administration, 2021, September 9)
Announcement 4: Emergency Rent Subsidy program announced	9th October 2020	The Canada Emergency Rent Subsidy Program (CERS). This program consists of two components: the base rent subsidy, accessible to organizations facing ongoing revenue decline, and the Lockdown Support, which offers supplementary assistance to entities forced to shut down or considerably curtail operations due to public health orders (Department of Finance Canada, 2020, September 10).
Announcement 5: Chancellor Sunak announced a £4.6bn fresh financial support package for struggling UK companies	5th January 2021	Chancellor Sunak unveiled a new financial assistance initiative amounting to £4.6 billion, aimed at providing vital support to struggling companies in the UK. This comprehensive package comprises two key components which aims to provide significant financial relief to a wide range of businesses across various sectors, addressing the challenges posed by the ongoing economic disruptions (The Guardian, 2021, January 5).

3. **Temporal Window Selection:** A temporal window of 10 days is chosen around each major announcement date. This window encompasses ten days before and ten days after the announcement date, ensuring that the discussions leading up to and following the announcement are captured.
4. **Topic-Centric Filtering:** For each BERTopic-identified topic (Stage 3 topic allocation), tweets within the chosen temporal window are filtered. These tweets are further categorized based on their topic label, facilitating a focused analysis for each topic.
5. **Summarization Using AI Model:** The tweets within the temporal window are subjected to summarization using OpenAI's text completion model. This process involves generating concise and informative summaries that encapsulate the core themes of the discussions.

This provides a holistic view of the narratives prior and after each major government announcement for the relevant topics. This allowed us to gain insights into the discussions over time in response to key announcements. The major government announcements, represented by

the identified dates (refer to Table 9), hold specific significance in shaping the conversations. Each announcement description offers context regarding the nature of the policy, intervention, or development being addressed. This comprehensive methodology ensures that the discourse around major government announcements is systematically captured, enabling a nuanced analysis of the evolving narrative landscape for each BERTopic-identified topic (Stage 3 topic allocation). Following section is discussion of changing discourse of twitter conversations around major announcements:

***Announcement 1: Fed launched the Paycheck Protection Program Liquidity Facility (PPPLF)***

The narratives captured across diverse topics before and after the announcement of Paycheck Protection Program Liquidity Facility (PPPLF) offer a comprehensive view of the evolving landscape of small businesses' challenges, responses, and recovery efforts during the pandemic. These narratives illuminate the nuanced shifts in discussions and the role of the announcement in shaping the discourse around small business support. A summary of the change in narrative can be found in Table 10.

**Entrepreneurship Opportunities in the Post-COVID World (Topic 1):** The announcement of the Paycheck Protection Program Liquidity Facility (PPPLF) acted as a catalyst in emphasizing the significance of entrepreneurship in post-pandemic recovery. It sparked discussions on practical strategies for navigating uncertainties, promoting innovation, and strengthening business resilience. The evolving narrative shifted from survival strategies to forward-looking innovations, underlining the role of inclusive entrepreneurship and community support.

**Small Business Survival during COVID (Frustration) (Topic 2):** The announcement of the PPPLF influenced a narrative transition from emphasizing the economic toll on small businesses to advocating for equitable support. Discussions spotlighted the importance of online resources,

training programs, and comprehensive assistance mechanisms. The announcement stimulated nuanced conversations about the effectiveness of relief measures and equitable distribution of support.

**Small Business COVID Relief Grant Program (Relief) (Topic 3):** The PPPLF announcement amplified discussions on relief measures and the complexities faced by small businesses in securing assistance. Conversations shifted from general support to scrutinizing allocation and fund distribution. The announcement underscored the urgency of small business support and prompted critical assessments of the relief infrastructure, revealing challenges and gaps in assistance distribution.

**Impact of COVID on Women Entrepreneurs (Topic 5):** The PPPLF announcement intensified conversations about the challenges faced by women entrepreneurs, emphasizing the need for responsive aid. The narrative evolved from acknowledging resilience to discussing concrete support programs and technological solutions. The announcement acted as a focal point for conversations about equitable recovery, gender disparities, and innovative initiatives.

**Impact of Pandemic on Black-Owned Small Businesses (Topic 8):** The PPPLF announcement intensified discussions about challenges faced by black-owned businesses, prompting a shift from resilience to actionable solutions. It led to discussions on targeted support measures, data transparency, and empowerment initiatives. The announcement highlighted the need to address disparities, discriminatory practices, and access to relief for black-owned businesses.

**Small Business Coronavirus Support (Topic 11):** The announcement of the PPPLF reshaped the narrative from challenges to solutions. Discussions shifted towards evaluating relief efforts' effectiveness and exploring alternative measures. The transformation reflected an increased

emphasis on finding viable strategies and assistance avenues for small business survival during the ongoing pandemic.

**Table 10** Announcement 1 summary

Announcement 1: Fed launched the Paycheck Protection Program Liquidity Facility (PPPLF)		
Topic	Pre-announcement theme/focus	Post-announcement theme/focus
Entrepreneurship Opportunities in the Post-COVID World (Topic 1)	Discussions mainly revolved around survival strategies amid pandemic uncertainties.	Announcement shifted the narrative towards fostering innovation, business resilience, inclusive entrepreneurship, and community support for post-pandemic recovery.
Small Business Survival during COVID (Frustration) (Topic 2)	Discussions focused on economic toll on small businesses.	Discussions emphasized online resources, training programs, and comprehensive assistance, while evaluating relief measures' effectiveness and impartial distribution.
Small Business COVID Relief Grant Program (Relief) (Topic 3)	Discussions centered on small businesses' challenges in securing relief in terms of general support.	Discussion shifted to critical evaluation of fund distribution, highlighting small business support urgency, and exposing gaps in the assistance infrastructure.
Impact of COVID on Women Entrepreneurs (Topic 5)	Before the PPPLF announcement, conversations acknowledged women entrepreneurs' resilience and the necessity for tailored aid.	The conversation shifted towards concrete support programs and technological solutions, becoming a focal point for equitable recovery, gender imbalances, and innovation strategies.
Impact of Pandemic on Black-Owned Small Businesses (Topic 8)	Prior, conversations acknowledged the resilience of black-owned businesses.	The discussion shifted to actionable measures, including targeted support, data transparency, and empowerment initiatives, illuminating the imperative to tackle disparities, discrimination, and relief access.
Small Business Coronavirus Support (Topic 11)	Prior, the focus was on challenges.	Shifted discussions towards solutions in terms of evaluating relief measures' effectiveness and seeking alternative avenues, reflecting an enhanced emphasis on identifying viable strategies for small business survival during the ongoing pandemic

***Announcement 2: SBA (Small Business Administration) increased the maximum loan amount from \$150,000 to \$500,000***

The discussions across topics prior to and following the announcement of increased loan amounts for COVID Economic Injury Disaster Loans (EIDL) provide a comprehensive perspective on the changing landscape of conversations and the influence of this announcement on shaping the discourse regarding support for small businesses. A summary of these narrative shifts is provided in Table 11.

**Entrepreneurship Opportunities in the Post-COVID World (Topic 1):** The discussions before the announcement highlighted the transformative impact of the pandemic on entrepreneurship, emphasizing adaptability, innovation, and creative problem-solving. The announcement played a role in amplifying this narrative by providing tangible support through increased loan amounts. This shift underscores the importance of government-backed initiatives in fostering an environment conducive to entrepreneurial growth and resilience. The evolving narrative signifies the potential for entrepreneurial adaptability amid the crisis.

**Small Business Survival during COVID (Frustration) (Topic 2):** The narratives before the announcement underscored the dire economic situation faced by small businesses, emphasizing closures, layoffs, and evolving customer preferences. The announcement introduced a concrete measure to address their financial struggles, reinforcing discussions on the significance of government intervention in shaping recovery trajectories. The evolving narrative highlights the urgent need for coordinated efforts to preserve these economic entities' resilience.

**Small Business COVID Relief Grant Program (Relief) (Topic 3):** Before the announcement, the discussions centered around relief programs aimed at supporting small businesses during the pandemic. The announcement of increased loan amounts reinforced the ongoing discourse on government-backed support, offering a solution to the financial challenges faced by small

businesses. This shift underscores the collaborative efforts between governments, organizations, and communities to ensure the survival and recovery of small businesses.

**Impact of COVID on Women Entrepreneurs (Topic 5):** The narratives before the announcement highlighted the disproportionate impact of the pandemic on women entrepreneurs. The announcement reinforced the ongoing concern for these challenges by providing a tangible solution through increased loan amounts. The evolving narrative reflects the importance of supporting and empowering women-led businesses during these challenging times.

**Impact of Pandemic on Black-Owned Small Businesses (Topic 8):** The narratives before the announcement underscored the disproportionate impact of the pandemic on black-owned small businesses. The announcement amplified discussions on the challenges faced by these businesses, aligning with ongoing efforts to support minority entrepreneurs. The evolving narrative emphasizes the importance of government intervention in addressing racial disparities in business and promoting inclusive economic recovery.

**Small Business Coronavirus Support (Topic 11):** The discussions before and after the announcement highlighted the profound impact of the pandemic on small businesses. The announcement of increased loan amounts for COVID EIDL loans aligned with ongoing efforts to provide aid and support to struggling businesses. The evolving narrative reflects the multifaceted nature of the issue, from economic struggles to relief measures and potential recovery.

**Table 11** Announcement 2 summary

Announcement 2: SBA increased the maximum loan amount from \$150,000 to \$500,000		
Topic	Pre-announcement theme/focus	Post-announcement theme/focus
Entrepreneurship Opportunities in the Post-COVID World (Topic 1)	Prior discussions emphasized pandemic's transformative effect on entrepreneurship, highlighting adaptability, innovation, and creative solutions.	The announcement amplified this narrative by offering concrete support via larger loans, underlining the role of government-backed initiatives in fostering entrepreneurial growth and resilience, signifying potential for adaptability amid crises.
Small Business Survival during COVID (Frustration) (Topic 2)	Prior narratives highlighted small businesses' dire economic situation, focusing on closures, layoffs, and changing customer preferences.	The announcement introduced a tangible step to address their financial struggles, reinforcing discussions on government's role in shaping recovery, underlining the pressing need for coordinated efforts to maintain these economic entities' resilience.
Small Business COVID Relief Grant Program (Relief) (Topic 3)	Prior discussions focused on pandemic relief programs for small businesses.	The increased loan amounts announcement reinforced the ongoing discourse on government-supported aid, providing a solution to financial challenges, highlighting collaborative efforts for small business survival and recovery.
Impact of COVID on Women Entrepreneurs (Topic 5)	Prior narratives emphasized the pandemic's disproportionate impact on women entrepreneurs.	The announcement reinforced ongoing concern by offering a concrete solution with increased loan amounts, highlighting the evolving narrative of supporting and empowering women-led businesses amid challenges.
Impact of Pandemic on Black-Owned Small Businesses (Topic 8)	Prior narratives highlighted the pandemic's disproportionate effect on black-owned small businesses.	The announcement heightened discussions on these businesses' challenges, aligning with ongoing support for minority entrepreneurs and emphasizing government intervention in addressing racial disparities for inclusive economic recovery.
Small Business Coronavirus Support (Topic 11)	pre-announcement discussions emphasized the pandemic's significant effect on small businesses.	post-announcement discussions emphasized relief measures and potential recovery.

***Announcement 3: SBA (Small Business Administration) increased the COVID EIDL maximum loan amount from \$500,000 to \$2 million.***

The narratives surrounding various topics before and after the announcement of the increased COVID Economic Injury Disaster Loans (EIDL) maximum loan amount from \$500,000 to \$2 million provide valuable perspectives into the multifaceted responses and evolving discussions on

social media platforms. This government policy response announcement has successfully redirected the center of discussions, sparking new debates across a wide range of issues. A summary of the change in narrative can be found in Table 12.

**Entrepreneurship Opportunities in the Post-COVID World (Topic 1):** Before the announcement, conversations centered on the transformative potential of entrepreneurship in the aftermath of the pandemic. The narrative encapsulated the innovation spurred by the crisis, the importance of government support, and the emergence of novel opportunities, particularly in digital, AI, and green technology. However, after the announcement, the narrative shifted towards pragmatic discussions about the direct impact of the pandemic on entrepreneurs and their businesses. These discussions spotlighted the adaptive strategies employed by entrepreneurs, emphasizing their resilience and the significance of government support, which gained concrete form with the increased loan amount for COVID EIDL. This narrative evolution reflects the shift from broad speculations about post-COVID opportunities to real-time challenges and how government interventions can play a pivotal role in shaping entrepreneurial resilience.

**Small Business Survival during COVID (Frustration) (Topic 2):** Prior to the announcement, Twitter conversations were characterized by the dire struggles of small businesses navigating the pandemic's upheavals. Frustration stemming from inconsistent regulations, unequal relief distribution, and inadequate aid systems was palpable. Post-announcement, the discourse continued to stress the immense hurdles faced by small businesses, shedding light on closures, support deficiencies, and mental health ramifications. The announcement of increased loan amounts provided a glimmer of hope and became a focus point, offering potential relief. This transition highlights the changing focus from expressions of frustration and challenges to the

anticipation of tangible support and recovery pathways, all fueled by the government's policy adjustments.

**Small Business COVID Relief Grant Program (Relief) (Topic 3):** Before the announcement, discussions centered on the available relief grant programs for pandemic-affected small businesses. Queries about eligibility, application processes, and funding were prevalent. After the announcement, the narrative remained fixated on the formidable pandemic challenges while adding the financial support package to the conversation. The spotlight on grant programs and the subsequent inclusion of increased loan amounts within the discourse illustrate the evolution from a mere inventory of relief options to a comprehensive understanding of the government's commitment to assisting businesses through multiple avenues.

**Impact of COVID on Women Entrepreneurs (Topic 5):** The pre-announcement discussions emphasized the pandemic's disproportionate impact on women entrepreneurs globally. The narrative underscored the urgent need for tailored support and resources. Post-announcement, this theme persisted, highlighting the resilience of women entrepreneurs while accentuating the unequal access to financial aid. The announcement of the increased loan amount provided a potential avenue for greater support. This narrative evolution reaffirms the enduring challenges faced by women entrepreneurs and the government's role in ameliorating the gendered impacts of the crisis.

**Impact of Pandemic on Black-Owned Small Businesses (Topic 8):** Prior to the announcement, the discourse highlighted the amplified struggles of Black-owned businesses during the pandemic, coupled with instances of innovation and resilience. Post-announcement, the focus remained on the disproportionate impact on these businesses, underlining the need for solutions to level the playing field. The announcement's integration added a layer of potential support, aligning with the

broader discussions of equitable recovery. This narrative evolution underscores the government’s role in addressing systemic disparities and fostering a more inclusive entrepreneurial landscape.

**Small Business Coronavirus Support (Topic 11):** Before the announcement, the challenges stemming from the pandemic were discussed, spotlighting the resilience of small business owners. After the announcement, the narrative transitioned to encapsulate the pandemic’s broad economic ramifications. The announcement’s indirect linkage to financial relief for struggling businesses complements the ongoing discussions about the pandemic’s broader implications. This shift emphasizes the interplay between individual business resilience and the government’s macroeconomic interventions.

**Table 12** Announcement 3 summary

Announcement 3: SBA increased the COVID EIDL maximum loan amount from \$500,000 to \$2 million		
Topic	Pre-announcement theme/focus	Post-announcement theme/focus
Entrepreneurship Opportunities in the Post-COVID World (Topic 1)	Initial discussions centered on post-pandemic entrepreneurship's transformative potential, highlighting innovation, government support, and emerging opportunities.	The narrative shifted to real-time challenges and the crucial government role in shaping entrepreneurial resilience.
Small Business Survival during COVID (Frustration) (Topic 2)	Pre-announcement focused on expressions of frustration and challenges	Post announcement discussion shifted towards anticipation of tangible support and recovery pathways, all fueled by the government's policy adjustments.
Small Business COVID Relief Grant Program (Relief) (Topic 3)	Prior discussions focused on pandemic-affected small businesses and their available relief grant programs, with prevalent inquiries regarding eligibility, application procedures, and funding.	The narrative shifted to a comprehensive understanding of the government's commitment to assisting businesses through various avenues.
Impact of COVID on Women Entrepreneurs (Topic 5)	Prior discussions emphasized the global pandemic's disproportionate impact on women entrepreneurs globally, stressing the need for tailored resources and support.	Post-announcement, the theme persisted, highlighting the resilience of women entrepreneurs while accentuating the unequal access to financial aid. The announcement of the increased loan amount provided a potential avenue for greater support.

Impact of Pandemic on Black-Owned Small Businesses (Topic 8)	Preceding the announcement, discussions emphasized the pandemic's heightened challenges for Black-owned businesses, along with instances of innovation and resilience.	Post-announcement, the focus remained on the disproportionate impact on these businesses, underlining the need for solutions to level the playing field.
Small Business Coronavirus Support (Topic 11)	Prior discussions focused on pandemic-related challenges, highlighting small business owners' resilience.	The narrative transitioned to encapsulate the pandemic's broad economic ramifications

***Announcement 4: Emergency Rent Subsidy program announced (Canada)***

The narratives captured across different topics before and after the announcement of the Emergency Rent Subsidy program in Canada provide an understanding of the challenges, responses, and expectations surrounding the support for Canadian small businesses during the COVID-19 pandemic. A summary of the change in narrative can be found in Table 13.

**Support for Canadian Small Businesses Amid Pandemic (Topic 6):** Before the announcement of the Emergency Rent Subsidy program, discussions highlighted the dire challenges faced by Canadian small businesses due to the pandemic. The narrative underscored the necessity of government support to aid in recovery efforts and emphasized the economic impact of the pandemic, particularly in provinces like Ontario. There was a strong call for accountability from federal and provincial governments to address the hardships experienced by businesses, families, and workers. The discourse also included criticism directed towards specific individuals and parties for their management of the situation. After the announcement, the narrative continued to emphasize the struggles of Canadian small businesses while examining the responses of various political parties and organizations. The discussions showcased the initiatives introduced by the Liberal government to provide assistance to different sectors, as well as criticisms directed towards the actions of the Conservative UCP government in reallocating subsidies. The NDP's response

was also mentioned, highlighting the varied approaches of different parties in addressing the challenges faced by small businesses.

The announcement of the Emergency Rent Subsidy program played a pivotal role in shaping the narrative by introducing a concrete and direct government intervention to support struggling small businesses. While the provided text did not extensively delve into the details of the announcement, it likely initiated discussions about the potential impact of this program on businesses’ financial stability and overall recovery. The program added a new dimension to the ongoing discourse, potentially addressing a critical concern faced by small businesses during the pandemic.

**Table 13** Announcement 4 summary

Announcement 4: Emergency Rent Subsidy program announced		
Topic	Pre-announcement theme/focus	Post-announcement theme/focus
Support for Canadian Small Businesses Amid Pandemic (Topic 6)	The narrative highlighted the dire challenges faced by Canadian small businesses due to the pandemic	The narrative continued to emphasize the struggles of Canadian small businesses while examining the responses of various political parties and organizations.

***Announcement 5: Chancellor Sunak announced a £4.6bn fresh financial support package for struggling UK companies (UK)***

The narratives spanning different topics before and after the announcement of the £4.6 billion financial support package for struggling UK companies provide valuable perspectives on the hardships experienced by small businesses due to the combined impacts of Brexit and the COVID-19 pandemic, as well as the government’s response to address these challenges. A summary of the change in narrative can be found in Table 14.

**Impact of Brexit and Covid on UK Small Businesses (Topic 9):** Before the announcement of the financial support package, discussions on Twitter revolved around the compounded challenges that UK small businesses were grappling with due to the simultaneous effects of Brexit and the pandemic. The narrative emphasized the perceived lack of adequate planning and preparation to effectively manage these crises. Small businesses' struggles, the pressing need for financial assistance, vaccination efforts, and critiques of government responsiveness were central themes. Criticisms were directed towards perceived delays in addressing these issues and providing substantial support to small businesses and freelancers. Additionally, internal party matters and lobbying efforts by the Labour party were part of the discourse.

After the announcement, the narrative persisted in highlighting the difficulties faced by UK small businesses, with the government's response, particularly the newly announced financial support package, coming to the forefront. Discussions continued to raise concerns about the sufficiency of the support, with some expressing skepticism about potential biases in support distribution. The regional efforts of parties like the Scottish National Party and Welsh governments were noted for their initiatives to aid small businesses. The vulnerability of smaller firms to the combined impacts of COVID-19 and Brexit was underscored, leading to ethical debates about the allocation of financial support between businesses and individuals. The announcement of the financial support package played a critical role in shaping the narrative's evolution by introducing a tangible policy action to address the challenges faced by UK small businesses. While the provided text did not explicitly present reactions to the announcement, it can be inferred that the package sparked discussions about its potential effectiveness and impact in alleviating the challenges experienced by businesses.

**Table 14** Announcement 5 summary

Announcement 5: Chancellor Sunak announced a £4.6bn fresh financial support package for struggling UK companies		
Topic	Pre-announcement theme/focus	Post-announcement theme/focus
Impact of Brexit and Covid on UK Small Businesses (Topic 9)	The narrative emphasized the perceived lack of adequate planning and preparation to effectively manage the crises related to Brexit and the pandemic	The narrative persisted in highlighting the difficulties faced by UK small businesses, with the government's response, particularly the newly announced financial support package, coming to the forefront.

## 5 Research Summary

This study centered around two main research questions: -

1. What aspects of small and family-owned businesses do social media users discuss during the COVID-19 pandemic?
2. What is the impact of major government announcements and policies on these discussions?

The findings of the research questions are summarized in this section. Section 5.1 summarizes the findings related to the first research question, while Section 5.2 summarizes the findings for the second research question. Section 5.3 discusses the overall comments. Theoretical implications are explored in Section 5.4, and Section 5.5 delves into the implications for policymaking and practical applications.

### 5.1 Summary of Key Findings 1

The first research question facilitated the exploration of various topics discussed by social media users in the context of smaller and family-owned businesses during COVID-19 period. It is

interesting to note that topics are not just confined to operational and financial challenges faced by the small and family business owners, rather a wide range of topics are captured through our topic modeling analysis. For instances, social media users engaged in major discussions involving: the issues faced by the women and black entrepreneurs, vaccine mandate, entrepreneurial opportunities during pandemic in addition to various government support programs and business survival challenges.

## **5.2 Summary of Key Findings 2**

The second part of the research explored the narratives surrounding various topics before and after the government announcements. The narratives reveal dynamic shifts in discussions, emphasizing the evolving challenges faced by different sectors and the role of government interventions in shaping responses. The major findings of the second research question are summarized as follows:

The announcement of the Paycheck Protection Program Liquidity Facility (PPPLF) (Announcement 1) marked a transition from speculative discussions about post-pandemic entrepreneurship to practical strategies for navigating uncertainties, fostering innovation, and enhancing business resilience. The narratives shifted from survival tactics to forward-looking innovation, underlining the roles of inclusive entrepreneurship and community support. The announcement triggered a narrative shift from emphasizing the economic toll on small businesses to advocating for equitable support in the realm of small business survival during COVID-19. Conversations centered on online resources, training programs, and comprehensive assistance mechanisms. The announcement stimulated nuanced discussions about relief measures' effectiveness and the equitable distribution of support.

The second announcement of the increased loan amounts for COVID EIDL loans (Announcement 2) amplified conversations around the pandemic's transformative impact on entrepreneurship. Prior discussions had already highlighted the adaptability, innovation, and creative solutions that small businesses adopted in response to economic challenges, such as closures, layoffs, and shifting customer preferences. Specific attention was given to pandemic relief programs and the disproportionate effects on women and black-owned small businesses, emphasizing the significant overall impact on the small business sector. The announcement reinforced these themes by providing concrete support through larger loans, showcasing the critical role of government-backed initiatives in fostering entrepreneurial growth and resilience. This move addressed financial struggles, underscoring the necessity of coordinated efforts to sustain small businesses. The increased loan amounts not only offered a solution to financial challenges but also reinforced support for women-led businesses and highlighted government intervention in addressing racial disparities. Consequently, post-announcement discussions emphasized relief measures and the potential for recovery, aligning with ongoing efforts to support and empower small businesses amid the ongoing crisis..

Conversations surrounding the third announcement (Announcement 3) initially delved into the transformative potential of post-pandemic entrepreneurship, emphasizing innovation, government support, and emerging opportunities. This pre-announcement phase, however, witnessed a shift towards expressions of frustration and challenges faced by pandemic-affected small businesses, focusing on relief grant programs, eligibility criteria, application procedures, and funding availability. As the announcement neared, the focus intensified on the pandemic's disproportionate impact on women entrepreneurs globally, highlighting the urgent need for tailored resources and support, while also turning attention towards the challenges faced by Black-

owned businesses, showcasing instances of innovation and resilience amidst heightened difficulties. Post-announcement, discussions focused on real-time challenges and government support for entrepreneurial resilience, anticipating tangible pathways. The narrative continued to emphasize the resilience of women entrepreneurs, but also highlighted the stark reminder of the unequal access to financial aid. The announcement of increased loan amounts offered a glimmer of hope for greater support. Despite these positive steps, discussions persisted on the unequal impact of the pandemic, particularly on small businesses, emphasizing the pressing need for solutions to level the economic playing field. Overall, the narrative post-announcement broadened to encapsulate the pandemic's profound economic ramifications, highlighting the ongoing need for comprehensive support and recovery strategies..

In Canada, the Emergency Rent Subsidy program announcement (Announcement 4) played a pivotal role in shaping the narrative. Although the provided text did not provide extensive details about the announcement, it likely initiated discussions regarding its potential impact on businesses' financial stability and overall recovery. This program introduced a new dimension to ongoing discourse, potentially addressing a critical concern faced by small businesses during the pandemic.

Similarly, in the UK (Announcement 5), discussions transitioned from compounded challenges due to Brexit and the pandemic to debates on the efficacy of a financial support package. Although the provided text did not explicitly present reactions to the announcement, it likely sparked discussions about its potential effectiveness and impact in alleviating challenges experienced by businesses.

### **5.3 Overall comments**

The initial part of the study effectively uncovers the diversity of topics that emerged in social media conversations concerning smaller and family-owned businesses during the pandemic, showcasing the wide spectrum of concerns and interests expressed by the small and family-owned business owners. The analysis reveals a broad range of subjects, extending beyond operational and financial concerns. Notably, these topics encompassed challenges faced by different demographic groups, discussions around vaccine mandates, entrepreneurial opportunities in the pandemic context, government support programs, and the survival challenges encountered by these small businesses. The topics show the complexity of social media conversations during the crisis, highlighting the multifaceted nature of discussions pertaining to small and family-owned businesses.

Practically, the findings of this study of changing narratives around major announcements emphasize the importance of timely and responsive government interventions during times of crisis. The role of government support in addressing economic challenges and fostering resilience is evident. The narratives underscore the need for comprehensive solutions that encompass financial aid, regulatory clarity, and access to resources. Moreover, the findings highlight the significance of targeted measures to address the unique challenges faced by women entrepreneurs, black-owned businesses, and other marginalized groups. This study suggests that government responsiveness and accountability are crucial in navigating crises. Transparent and equitable distribution of aid emerged as important factors. Additionally, ethical considerations of supporting businesses versus individuals surfaced as complex societal debates. The findings stress the need for adaptive policy adjustments that consider the real-time challenges faced by businesses and communities. Overall, these findings highlight the power of government actions in shaping

discourse, influencing public sentiment, and steering conversations towards practical solutions, with far-reaching implications for policy, practice, and research.

#### **5.4 Theoretical Implications**

The advancement of information technology has led to digital means of knowledge sharing and interaction, primarily through online social media platforms like Twitter (Panahi et al., 2015). This transformation has accelerated the dissemination and real-time updating of knowledge (Panahi et al., 2016). As posited by Papadopoulos et al (2013) and Chang and Chuang (2011), social media serves as a collaborative online environment where individuals actively exchange information and knowledge (Chu et al., 2015). Previous studies have highlighted the significance of sharing emotions on Twitter and similar platforms, noting that this type of social sharing acts as a form of interpersonal interaction that assists individuals in managing their emotions (Hidalgo et al., 2017; Bachura et al., 2022).

Emotions arise from an individual's interaction with their environment and involve complex, coordinated responses (Scherer, 2005). When someone experiences an emotionally significant event, they quickly express their emotions to those around them, initiating a process known as Social Sharing of Emotion (SSE) (Rimé, 2009; Luminet et al., 2000). SSE is inherently a social activity, requiring at least two people: (1) the person experiencing the emotion, who feels compelled to share it, and (2) the recipient of this emotional expression. Research has shown that SSE occurs across all types of emotions, genders, ages, cultures, and educational levels, although there are slight variations among these groups (Rimé et al., 1998).

According to the Social Sharing of Emotion (SSE) theoretical framework, individuals seamlessly interact with a number of individuals about the circumstances of an emotion-eliciting

event, as well as their own sentiments and emotional reactions (Rimé, 2009). People frequently express their sentiments on social media, which researchers utilize to analyze public opinion amid emergencies. Research indicates that negative emotions such as fear, anger, sadness, and insecurity are common in these situations (Steinert, 2021). Sharing emotions online does not necessarily mean these feelings are inauthentic or unrepresentative of true feelings. While some individuals might misrepresent their emotions online, there is no evidence to suggest that this is widespread (Steinert, 2021). During the COVID-19 pandemic, many people felt that their valued aspects of life were under threat, leading to a prevalence of negative emotions (Steinert, 2021).

Inspired by the SSE framework, we uncovered the themes of Twitter discussions related to small and family-businesses during COVID-19 and analyzed to understand how announcement declarations are received by relevant Twitter users. Specifically, we aimed to determine if government announcements can alleviate people's concerns, given that sharing emotions has been shown to be beneficial when the SSE framework is met with appropriate feedback (Rimé, 2009; Hidalgo et al., 2015). This empirical study contributes to the extension of SSE framework in specific contexts, including crisis situations, small businesses, and entrepreneurship, thereby enhancing our understanding of the utility of social networks as platforms for emotional expression, which has become increasingly prevalent in contemporary times.

## **5.5 Policymaking and Practical Implications**

From a policymaking perspective, the findings of this study carry essential implications, offering valuable insights into the dynamics of social media discussions during times of crisis. Firstly, it is evident from the findings of the study that policymakers should consider the importance of tailoring their support programs to accommodate the unique challenges and opportunities faced by

different demographics, such as female and black entrepreneurs. This approach can ensure that assistance is effective and relevant to the specific circumstances of these small and family-owned businesses. Equity and inclusivity emerge as critical themes in the study's findings. Policymakers should strive to ensure that relief measures are designed with fairness in mind, addressing gender disparities and promoting access to support for marginalized small and family-owned businesses. Making policies that are transparent, inclusive, and accessible to all can have a significant impact on the effectiveness of these measures.

The practical implications of this research are closely tied to the methodology's relevance in real-world contexts. The study highlights the real-time nature of social media as a source of information. Policymakers should recognize the potential of social media platforms for providing immediate insights into the evolving concerns and sentiments of small and family-owned businesses during crises. With the conclusion of the COVID-19 pandemic and the recent alert from the World Health Organization (WHO) regarding the potential emergence of a new pandemic, this study offers a methodological framework for policymakers to harness the wealth of information available on social media. The methodology proposed in this study leverages recent Natural Language Processing (NLP) techniques, making it a valuable tool for making well-informed and timely policy decisions. The incorporation of BERTopic and AI-based summarization techniques offers pragmatic insights for governments and organizations seeking to communicate policy measures effectively. By understanding the alignment between announcements and existing topics, these insights aid in constructing messages that genuinely resonate with the public, ensuring clear communication of policy intentions. The study's reliance on a robust Twitter dataset and advanced analytical methods provides invaluable insights for shaping practical engagement strategies. Armed with this information, organizations can initiate and guide discussions surrounding major

announcements, ensuring that these messages gain traction and resonate with diverse audiences in meaningful ways. Additionally, the methodology's capability to identify critical discussion points equips policymakers with practical tools to swiftly pinpoint issues demanding immediate attention and action.

Moreover, the study uncovers a notable transition in the narrative of social media discussions following government announcements underscoring the influential role of government interventions in shaping discourse, influencing public perceptions, and fostering economic recovery. The observed narrative shifts resulting from announcements of increased loan amounts demonstrate their power to shift discussions from challenges to actionable solutions. Policymakers are encouraged to recognize the potential of policy adjustments to instill hope, spark discussions about recovery, and motivate stakeholders to navigate crises with resilience.

## **6 Conclusion**

Using advanced topic modelling we have explored the major themes/topics of discussion around small and family-owned business during COVID-19 and twitter discussions narratives triggered by major government announcements. Our study followed a comprehensive methodology, including the data collection process, using cutting edge topic modelling techniques (BERTopic model), and AI-driven summarization, to extract insights that hold profound implications across theoretical, practical, and policymaking domains. Our exploration of the data collection process highlighted the richness of discussions taking place on the Twitter platform regarding small and family-owned businesses. Leveraging the capabilities of BERTopic, we distilled these diverse conversations into coherent themes. This technique facilitated an understanding of prevailing topics and discourse patterns and paved the way for deeper investigation. The selection of BERTopic as our topic model was guided by its ability to handle context and semantics effectively.

The research findings highlight the dynamic nature of discussions on social media platforms in response to major government announcements. These announcements acted as catalysts for narrative shifts, triggering changes in tone, focus, and emphasis across various topics. The role of government interventions in shaping conversations is evident, as each announcement introduced a new perspective and dimension to ongoing discourse. The findings emphasize the importance of policy responses in shaping public perceptions, expectations, and discussions. The announcements prompted users to engage in deeper analyses, ask questions, express concerns, and share insights related to specific policy measures. This indicates the power of government actions in driving conversations on social media, influencing public opinion, and directing attention to critical issues. Furthermore, the research findings demonstrate the utility of the methodology employed, which systematically captured and analyzed the evolution of narratives around major announcements. By organizing and summarizing Twitter conversations within temporal windows, the study was able to showcase the nuanced changes in discourse, providing a comprehensive view of how different topics were discussed before and after key policy interventions. Overall, the research contributes to our understanding of how major government announcements can shape public discourse, influence perceptions, and steer discussions on social media platforms. It underscores the need for governments to strategically communicate their policies and interventions, as these announcements can have far-reaching effects on public opinions and conversations.

Our study has a few limitations that could be addressed in future research. Firstly, in our investigation, we opted for a temporal window to examine the evolving narratives related to significant government announcements. However, a specific challenge arises from our choice of strictly considering the 10 days leading up to the announcement date. It is important to note that

there tends to be a sense of anticipation preceding almost every announcement. During this anticipation phase, Twitter discussions may not accurately reflect the genuine state of affairs prior to the announcement. This anticipation effect could potentially introduce bias in our findings. To address this limitation and enhance future studies, researchers could consider a modification in the methodology. One possible approach is to extend the analysis window to encompass both an anticipation window preceding the announcement and the time period immediately following the announcement. By incorporating this dual-window approach - anticipation, announcement, and post-announcement periods - researchers could potentially obtain more comprehensive and accurate insights into the evolving discourse surrounding major announcements. This adjusted approach would help mitigate the influence of anticipatory discussions and offer a more nuanced understanding of the public discourse dynamics associated with significant governmental announcements.

Second, future studies can explore metadata information from Twitter to analyze and rank different types of users on the platform. They can also investigate statistics related to user behavior and demographics across various topics.

The third limitation pertains to the platform utilized in our study. We employed Twitter to understand the impacts of COVID-19 on small and family-owned businesses, and the dataset under our study spans from 2020 to the end of 2022, however Twitter was acquired by Elon Musk on 27<sup>th</sup> October 2022 (The New York Times, 2022, October 27) which presents some challenges for future Twitter users and researchers. (a) there has been a noticeable reduction in activity among the "Twitter's most active users" and approximately 25% decrease in the monthly average tweets of "top users" (CNBC, 2023, May 19). (b) the blue check mark which previously was assigned to authentic verified users on Twitter now has become a paid feature leading to any user on twitter to

acquire the blue check mark which becomes difficult for users and researchers to differentiate information from real and false accounts. This could give rise to dissemination of misinformation (The New York Times, 2023, March 31). Finally, the termination of academic access to the Twitter API, coupled with the introduction of new paid plans in early 2023, has created significant challenges for numerous researchers (CNN, 2023, April 5; CNN, 2023, February 9). Moving forward, the limitations imposed by this shift could impede researchers' ability to access data pertaining to public opinion, thereby hindering the timely provision of crucial insights to policymakers.

Fourth, Twitter is just one of many social media platforms. In the future, other social media platforms like Reddit (Ruan & Lv, 2022), Facebook (Smith & Graham, 2017), and Telegram (Vergani et al., 2022) could be utilized to explore similar research questions. Further, while quantitative analysis through topic modeling is valuable, incorporating qualitative insights through interviews or case studies could enrich the understanding of the challenges and strategies of small and family-owned businesses. Integrating qualitative methods, like interviews with business owners and experts, could provide depth to the findings and validate or challenge the results from the topic modeling approach. Future studies may explore such methodologies to address similar research questions.

Fifth, as per the research scope of this study, we focused on the small and family-owned business exclusively. We did not explicitly compare our findings using tweets related to large firms. Future studies may perform some comparative analysis and show how discussion topics differ between 'large' and 'small and family-owned firms'.

Finally, our study focused on the impact of COVID-19 on small and family-owned businesses using social media; however, there are numerous other significant crises that may entail

different discussion topics, which could be studied in the future. These include events such as the recession of 2007-2009 (Şahin et al., 2011), Hurricane Katrina in 2005 (Marshall et al., 2015), and the Cockermouth flood in 2019 (Wedawatta et al., 2013). Unlike a major pandemic such as COVID-19, short-term crises may require different types of interventions from governments or policymakers compared to prolonged crises. Despite this limitation, we argue that the findings of our study remain relevant for future crises in two significant ways. (a) the implications of our study extend beyond the immediate effects of COVID-19. The World Health Organization (WHO) warns that even more severe health and socio-economic crises may occur in the future (WHO, 2023, May 22; Reuters, 2023, August 18), necessitating better preparedness for handling subsequent devastating effects. (b) as discussed in the introduction, small businesses face considerable challenges in any crisis. These businesses often struggle due to inherent vulnerabilities such as inadequate planning, restricted cash flow, limited access to capital, lack of government assistance, and infrastructure deficiencies (Runyan, 2006). Therefore, while our study's generalizability may be constrained to major, enduring disasters, its insights are still applicable to future health and socio-economic crises, offering valuable lessons for improving crisis preparedness and response strategies.

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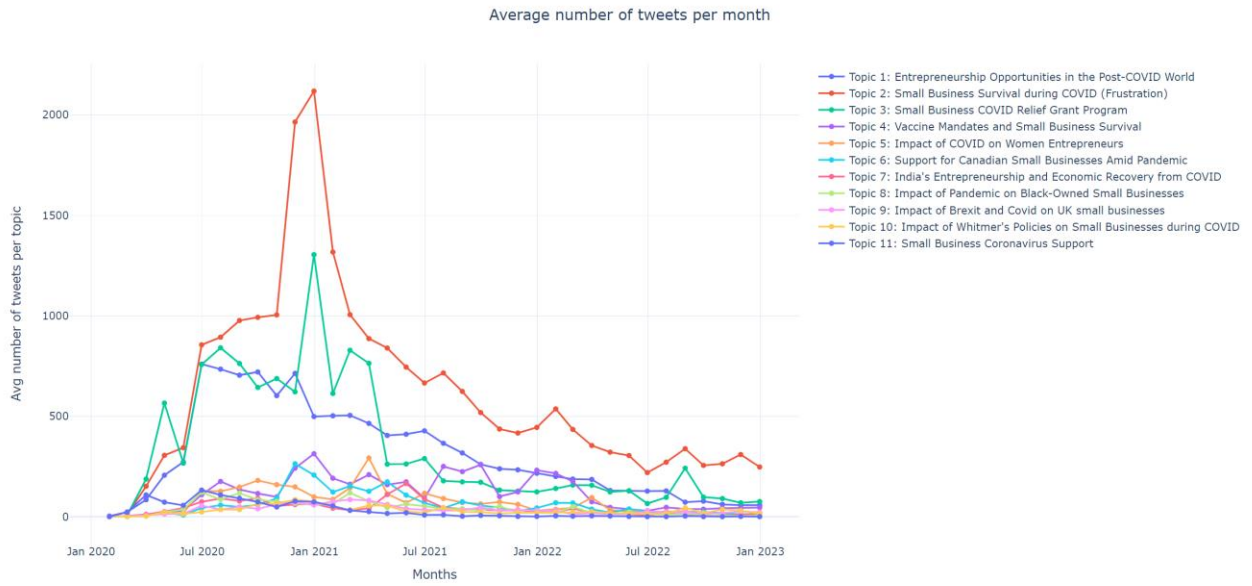
## **Appendix**

This appendix begins with a discussion of the Metadata plots in section A1.1, followed by Table A1.1, which displays the initial topics allocated by BERTopic, and Table A1.2, which presents representative sample tweets for each topic, illustrating the "before and after" effects of various announcements.

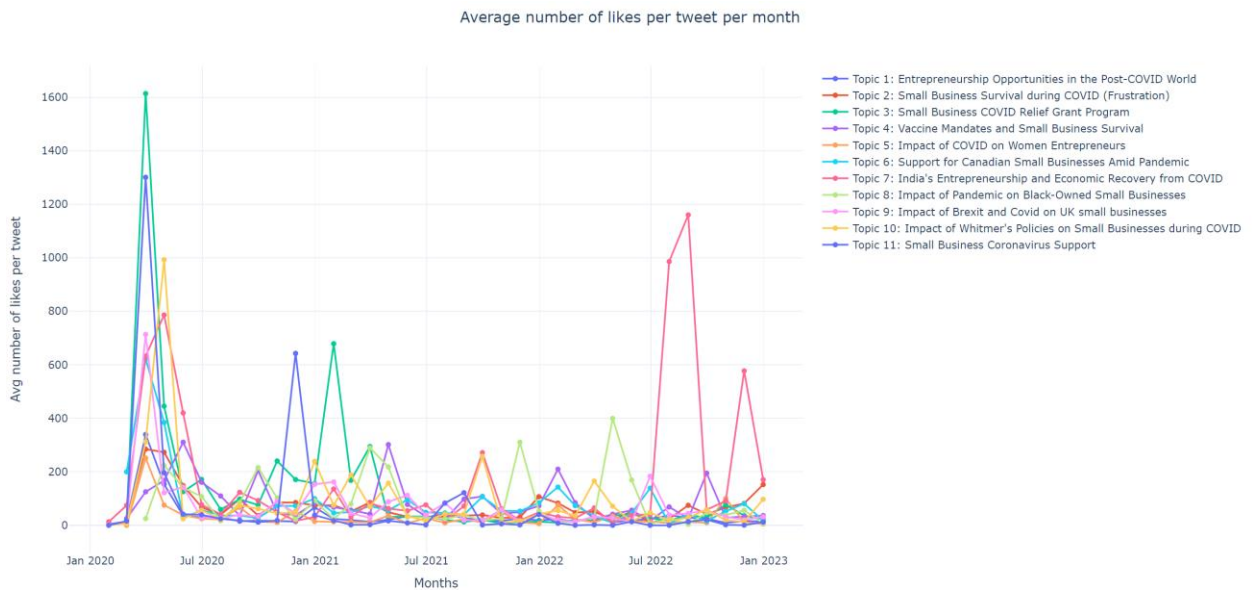
### **A1.1 Metadata plots discussion**

As mentioned in the section 3.1, in order to have a better insight on the individual topic importance we used the metadata of the tweets such the number of retweets, likes, followers and tweets per topic (Wang & Yang, 2020; Del Gobbo et al., 2020). Using this meta data, we plotted four graphs which helped us in understanding the general topic importance. These plots are useful for understanding the reach and popularity of each topic discussed in tweets. Retweets indicate how widely a tweet is shared, showing the topic's resonance and spread. 'Likes' reflect positive reception, highlighting which topics engage the audience most. The follower count of tweeting accounts suggests potential reach, with more followers indicating a broader potential audience. Lastly, the number of tweets per topic reveals its prevalence and importance. Together, these metrics provide a comprehensive picture of engagement, reach, and overall significance of each topic on Twitter.

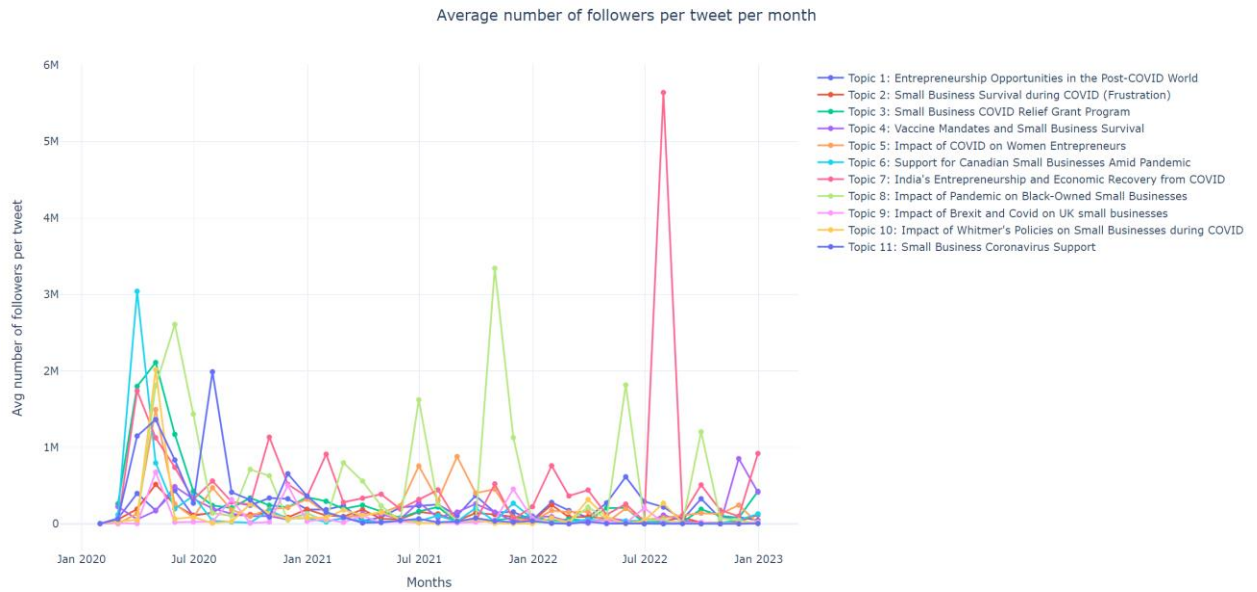
The four graphs are as follows:



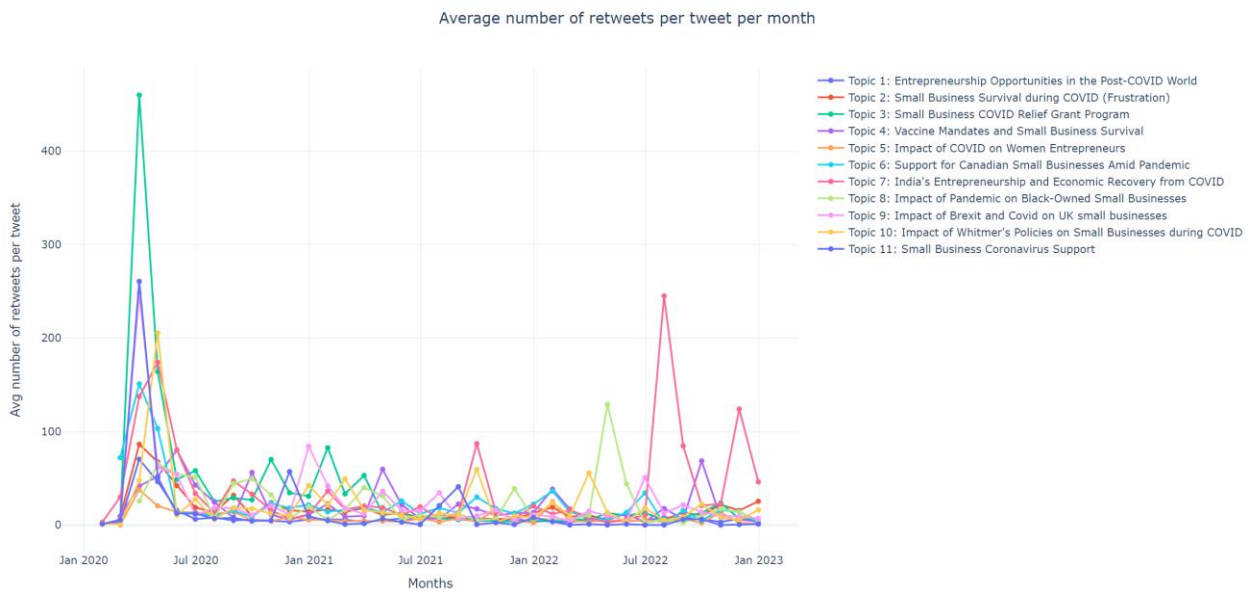
**Fig A1.1** Number of tweets for each topic monthly



**Fig A1.2** Average number of likes per tweet per topic monthly



**Fig A1.3** Average number of followers per tweet per topic monthly



**Fig A1.4** Average number of retweets per tweet per topic monthly

As it can be observed from figures Fig A1.1, Fig A1.2, Fig A1.3, and Fig A1.4, between 2020 and 2022, number of tweets trend demonstrated significant fluctuations across various topics. In 2020, Topics 1, 2, and 3 experienced a surge in tweet activity, each exceeding 500 tweets per month. However, this initial burst of activity gradually saw a decline by the end of 2022, indicating a decline in user engagement for these topics. Conversely, topics other than topics 1, 2, and 3 maintained a steady rate of fewer than 400 tweets per month throughout this period.

The first half of 2020 marked a period of peak engagement on Twitter, particularly for Topic 3, which recorded the highest average number of likes per month (n=1,613) and retweets per month (n=459). In contrast, Topic 8 had the lowest engagement, with an average of only 25 likes and 25 retweets per tweet per month, indicating minimal interaction.

In 2021, there was a noticeable shift in engagement trends across all topics on Twitter. The average number of likes per topic dropped to below 800 per month, suggesting a general decline in user interaction compared to the previous year. Despite this overall decrease, Topic 8 stood out by showing spikes and maintaining close to 2 million followers per tweet. This indicates that while the average number of likes for Topic 8 was low, there was sustained interest in the topic, as evidenced by its large follower base. This trend implies that followers might have remained interested in the content without actively interacting with it, reflecting a more passive form of engagement.

In terms of the average number of retweets per tweet per month, Topic 11 peaked twice in 2020 (n=260 and n=57) and once in August 2021 (n=41). In contrast, Topic 4 consistently garnered more traction over time, with the highest average number of retweets in 2020 (n=80). A similar trend was observed in terms of the average number of likes per tweet per month for Topics 4 and 11. In terms of the average number of followers, Topic 5 garnered interest and was the center of

discussion through the months of June (n=750) and August (n=880). In contrast, Topics 6, 9, and 10, along with Topic 5, peaked during the first quarter of 2020 (n>500) but gradually declined towards 2022, with the exception of Topic 5.

In summary, between 2020 and 2022, Twitter trends showed significant fluctuations. Topics 1, 2, and 3 surged in 2020 but saw a gradual decrease in terms of number of tweets since the beginning of year 2021. Peak engagement was in early 2020, especially for Topic 3, which had the highest likes and retweets and another surge in engagement for this topic was observed in the beginning of the year 2021. Despite relatively low number of likes per tweet, Topic 8 maintained nearly 2 million followers per tweet during the peaks, indicating passive interest. Topic 11 peaked in retweets in 2020 and August 2021, while Topic 4 saw regular spikes in terms of number of likes. Topic 5 peaked in mid-2020 but declined by 2022, except for a brief resurgence.

**Table A1.1** Initial topic allocation by BERTopic (Stage 1)

Topic label	Count	Topic name (OpenAI API)	Representation
0	71731	Outlier Topic	['small', 'businesses', 'small businesses', 'business', 'small business', 'covid', 'pandemic', 'help', 'support', 'people', 'relief', 'lockdown', 'new', 'owners', 'need', 'business owners', 'home', 'stay', 'like', 'money', 'family', 'entrepreneurs', 'just', 'time', 'local', 'work', 'coronavirus', 'government', 'trump', 'economy']
1	11103	Entrepreneurship Opportunities in the Post-COVID World	['entrepreneurs', 'entrepreneurship', 'pandemic', 'entrepreneur', 'covid', 'entrepreneurial', 'new', 'post', 'young', 'business', 'social', 'world', 'join', 'innovation', 'read', 'crisis', 'start', 'global', 'time', 'youth', 'opportunities', 'post covid', 'challenges', 'startups', 'great', 'people', 'year', 'post pandemic', 'support', 'young entrepreneurs']
2	9109	Small Business Survival during COVID	['covid', 'small', 'businesses', 'small businesses', 'business', 'small business', 'people', 'owners', 'business owners', 'government', 'just', 'big', 'lockdowns', 'like', 'shut', 'support', 'help', 'covid small', 'open', 'did', 'need', 'economy', 'businesses covid', 'restrictions', 'closed', 'work', 'close', 'going', 'time', 'know']
3	6200	Supporting Small Businesses during the Pandemic	['pandemic', 'small', 'businesses', 'small businesses', 'business', 'small business', 'people', 'pandemic small', 'owners', 'business owners', 'help', 'survive', 'support', 'government', 'like', 'businesses pandemic', 'economy', 'just', 'big', 'make', 'new', 'need', 'struggling', 'hard', 'hit', 'did', 'survive pandemic', 'going', 'local', 'time']
4	5753	Small Business COVID Relief Grant Program	['grant', 'grants', 'apply', 'small', 'program', 'business', 'businesses', 'small business', 'covid', 'grant program', 'applications', 'relief', 'small businesses', 'fund', 'county', 'impacted', 'eligible', 'help', 'assistance', 'available', 'million', 'application', 'funding', 'pandemic', 'relief grant', 'learn', 'business grant', 'recovery', 'impacted covid', 'open']
5	4283	Vaccine Mandates and Small Business Survival	['vaccine', 'mask', 'masks', 'wear', 'small', 'wear mask', 'businesses', 'small businesses', 'covid', 'business', 'small business', 'people', 'vaccines', 'vaccinated', 'covid vaccine', 'wearing', 'mandates', 'mandate', 'vaccination', 'just', 'distancing', 'dont', 'social', 'vicki', 'mamadeb', 'ryan', 'anti', 'social distancing', 'open', 'heller']
6	3584	Supporting Small Businesses during Lockdowns	['lockdown', 'small', 'businesses', 'small businesses', 'business', 'small business', 'people', 'lockdowns', 'lock', 'government', 'lockdown small', 'just', 'open', 'owners', 'big', 'support', 'business owners', 'like', 'going', 'businesses lockdown', 'work', 'need', 'time', 'survive', 'think', 'dont', 'close', 'want', 'help', 'shut']

7	2777	COVID Relief for Small Businesses and American Families	['relief', 'covid relief', 'small businesses', 'senate', 'small', 'covid', 'businesses', 'families', 'package', 'help', 'american', 'americans', 'pass', 'aid', 'congress', 'need', 'schools', 'unemployment', 'workers', 'republicans', 'families small', 'house', 'democrats', 'passed', 'voted', 'checks', 'relief package', 'people', 'bipartisan', 'small business']
8	2634	Impact of COVID on Women Entrepreneurs	['women', 'women entrepreneurs', 'entrepreneurs', 'female', 'pandemic', 'female entrepreneurs', 'entrepreneurship', 'covid', 'womens', 'gender', 'support', 'business', 'challenges', 'woman', 'support women', 'women entrepreneurship', 'entrepreneur', 'join', 'read', 'owned', 'women owned', 'recovery', 'economic', 'impact', 'businesses', 'led', 'new', 'post', 'pandemic women', 'women led']
9	2235	Support for Canadian Small Businesses Amid Pandemic	['canada', 'ontario', 'small', 'businesses', 'canadian', 'small businesses', 'canadians', 'business', 'small business', 'pandemic', 'covid', 'trudeau', 'lockdown', 'alberta', 'toronto', 'support', 'province', 'government', 'cfib', 'help', 'ottawa', 'ndp', 'people', 'open', 'need', 'ucp', 'owners', 'provincial', 'canadian small', 'business owners']
10	1958	Impact of COVID on Small Businesses	['small', 'businesses', 'small businesses', 'business', 'covid', 'small business', 'hes', 'pandemic', 'people', 'did', 'democrats', 'trump', 'money', 'like', 'just', 'does', 'help', 'economy', 'owners', 'millions', 'business owners', 'million', 'jobs', 'guy', 'big', 'family', 'got', 'shut', 'think', 'going']
11	1763	Small Business Loans During Covid	['loans', 'loan', 'small', 'businesses', 'business', 'small business', 'small businesses', 'coronavirus', 'business loans', 'covid', 'banks', 'pandemic', 'loans small', 'program', 'scheme', 'relief', 'billion', 'business loan', 'help', 'lending', 'received', 'government', 'bank', 'loan program', 'relief loans', 'lenders', 'administration', 'loan scheme', 'bounce', 'money']
12	1739	PPP Loans and Small Business Relief during COVID	['ppp', 'ppp loans', 'loans', 'small', 'businesses', 'ppp loan', 'loan', 'small businesses', 'program', 'business', 'small business', 'protection', 'paycheck protection', 'paycheck', 'protection program', 'money', 'pandemic', 'program ppp', 'covid', 'received', 'ppe', 'relief', 'trump', 'help', 'got', 'meant', 'employees', 'million', 'ppp small', 'apply']
13	1498	India's Entrepreneurship and Economic Recovery from COVID	['india', 'indian', 'entrepreneurs', 'covid', 'small', 'govt', 'indias', 'modi', 'lockdown', 'sir', 'entrepreneur', 'business', 'pandemic', 'ji', 'businesses', 'small businesses', 'hai', 'pm', 'rs', 'corona', 'lakh', 'crore', 'people', 'bjp', 'small business', 'farmers', 'economy', 'delhi', 'gst', 'help']
14	1499	Impact of Pandemic on Black-Owned Small Businesses	['black', 'owned', 'black owned', 'owned small', 'businesses', 'pandemic', 'entrepreneurs', 'black entrepreneurs', 'latino', 'small', 'owned businesses', 'business', 'small businesses', 'minority', 'covid', 'hit', 'black small', 'black business', 'color', 'white', 'owners', 'business owners', 'communities', 'half black', 'small business', 'black women', 'pandemic black', 'black businesses', 'minority owned', 'help']

15	1254	Supporting Local Small Businesses	['small', 'businesses', 'small businesses', 'business', 'small business', 'support', 'support small', 'help', 'need', 'local', 'owners', 'business owners', 'help small', 'great', 'supporting', 'local small', 'people', 'businesses small', 'know', 'owner', 'support local', 'business owner', 'survey', 'way', 'community', 'supporting small', 'work', 'important', 'businesses need', 'time']
16	1249	Impact of Brexit and Covid on UK small businesses	['uk', 'brexit', 'small', 'businesses', 'small businesses', 'covid', 'support', 'tory', 'business', 'scotland', 'eu', 'small business', 'nhs', 'pandemic', 'tories', 'government', 'snp', 'britain', 'scottish', 'wales', 'economy', 'help', 'people', 'money', 'welsh', 'london', 'boris', 'entrepreneurs', 'party', 'british']
17	1109	Impact of Whitmer's Policies on Small Businesses during COVID	['small', 'business', 'small business', 'businesses', 'small businesses', 'covid', 'shes', 'whitmer', 'pandemic', 'people', 'like', 'did', 'just', 'relief', 'money', 'owners', 'michigan', 'voted', 'nursing', 'kamala', 'business owners', 'help', 'woman', 'family', 'state', 'going', 'harris', 'nursing homes', 'lockdown', 'owner']
18	1089	Small Business Coronavirus Support	['coronavirus', 'small', 'businesses', 'small businesses', 'business', 'coronavirus pandemic', 'small business', 'coronavirus crisis', 'businesses coronavirus', 'owners', 'business owners', 'crisis', 'pandemic', 'help', 'business coronavirus', 'coronavirus small', 'survive coronavirus', 'impact', 'survive', 'corona', 'coronavirus relief', 'new', 'corona virus', 'support', 'virus', 'coronavirus coronavirus', 'impact coronavirus', 'need', 'relief', 'coronavirus outbreak']

**Table A1.2** Sample tweets for each topic with respect to the announcement

Announcement 1: Fed launched the Paycheck Protection Program Liquidity Facility (PPPLF)		
Topic	Tweets before	Tweets after
<p>Entrepreneurship Opportunities in the Post-COVID World <b>(Topic 1)</b></p>	<p>Entrepreneurs are not alone in this. Call upon networks, friends, family, and businesses. We are in this together and we can only come out of it together. - @SteveBawa3, Fruits &amp; Veggies Global #AfricanFoodSystem #Covid19 #TechandInnovationinAg</p> <p>#UHBauer students, if you're looking for (free!) entertainment while you're home, @texas_fame is hosting a series of online conversations about saving small businesses. Next up, 4/9, 12-1, with featured speaker @mcuban: <a href="https://eventbrite.com/e/saving-small-business-during-covid-19-a-conversation-with-mark-cuban-tickets-101657833316">https://eventbrite.com/e/saving-small-business-during-covid-19-a-conversation-with-mark-cuban-tickets-101657833316</a> #UHBauer students, if you're looking for (free!) entertainment while you're home, @texas_fame is hosting a series of online conversations about saving small businesses. Next up, 4/9, 12-1, with featured speaker @mcuban:</p> <p>This is a MUST attend event by any entrepreneur, especially #businesswomen. ALL member financial institutions are joining forces to help you navigate the supports available for you... #InItTogether</p> <p>At #Solution17 for #SDGs, we're committed to tackling the #COVID19Pandemic with the rest of the world We're engaging our community to come up with creative solutions to the outbreak, whilst working to minimize the effect #COVID19 via massive wealth creation &amp; entrepreneurship</p>	<p>NEW INTERVIEW! The pandemic is creating opportunities for YOU to increase your freedom, increase your cash flow and increase your ROI!</p> <p>Building a movement, boosting civic engagement, or telling a new story in response to #COVID19? Apply to @newmediaventures expanded Open Call! They're eager to hear from entrepreneurs and activists from vulnerable communities affected by the crisis.</p> <p>What will COVID do to the Entrepreneurial Society? It cannot be good... Fear and nationalism may prove as devastating as the virus itself. We will need European entrepreneurship more than ever to build more sustainable and resilient economies.</p> <p>Another amazing Cleveland health innovation for #COVID19 from one of the region's premier entrepreneurs @DanTMooreCo. Working with @ClevelandClinic @UHHospitals. @MAGNETOhio @OHIOMFG @BioECorp</p>

<p>Small Business Survival during COVID (Frustration) (Topic 2)</p>	<p>Many have lost their jobs, their benefits, or are having trouble supporting their small business in the wake of the coronavirus pandemic. We've put together a list of resources to help you get back on your feet.</p> <p>We are seeing a complete shutdown of production across the board in almost every sector. There are simply no safe, reliable ways to assemble cast and crew and protect them from potential #COVID19 exposure. We are having to rethink our business like many other small businesses.</p> <p>@AjitPawarSpeaks @PawarSpeaks please lift lockdown for small agro companies. If lockdown will be extended after 14 april, small businesses will not survive. You may lockdown at district levels. we have to cut staff or we have to close companies. thats it.</p>	<p>Mailchimp has also instituted several programs aimed at helping businesses weather the pandemic, including dedicating up to \$10 million to give free services to small businesses in need of financial relief.</p> <p>How has your business adapted to the changing times in order to stay afloat during the pandemic? Share your story with us in the comments, just like the following small business owners are sharing their stories with you in the following article.</p> <p>Whether you're looking for product best practices or financial resources, you can stay up to date on how to keep operations running during this difficult time on our COVID-19 Small Business Resource Center: <a href="http://ow.ly/ZnhM50z0n9Z">http://ow.ly/ZnhM50z0n9Z</a></p> <p>Are you a small business owner? Check out our COVID-19 resource page for info that could help you through the pandemic.</p> <p>Small businesses wanting #COVID19 resources in one place... Good news! The @USTreasury developed a one-stop page for small businesses, nonprofits, Veterans organizations, Tribal businesses, self-employed individuals and independent contractors.</p>
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<p>Small Business COVID Relief Grant Program (Relief) <b>(Topic 3)</b></p>	<p>Help is on the way for small businesses across the country, thanks to the #CARESAct. Read more about the bill @realDonaldTrump signed last week from @IvankaTrump and how together, we will defeat #coronavirus. #InItTogether</p> <p>Lots of new programs to help with COVID-19: Housing assistance grants, Small Business Fund webinar, Federal CAREs Act, CPS/City Colleges remote learning, food assistance, mortgage forbearance, UChicago neighborhood assistance, face shields Go Fund Me <a href="https://conta.cc/3bEx4a8">https://conta.cc/3bEx4a8</a></p> <p>Join a free information session today at noon - How to Navigate the Government COVID-19 Support Programs for Small Businesses in the nTri-County Region.  <a href="http://zoom.us/webinar/register/WN_JsIYHaUARY2O9dCOjnPf8Q">http://zoom.us/webinar/register/WN_JsIYHaUARY2O9dCOjnPf8Q</a>  #smallbusiness #finance #wagesubsidy #COVID19  @TheOCI @Bruce_Power</p>	<p>The U.S. Chamber of Commerce Foundation has developed a Save Small Business Fund that will make grants available to businesses employing 3-20 workers. Must be located In economically vulnerable area and harmed by COVID-19.  <a href="https://savesmallbusiness.com">https://savesmallbusiness.com</a></p> <p>fema: RT @WhiteHouse: American banks, large and small, have agreed to pledge \$1.6 billion to help small businesses and Main Street Americans hurt by the Coronavirus.</p> <p>Not a time for games. People are counting on Congress to do its job. Any actions taken need to go straight to the people and small businesses. No distractions. No picking winners and losers. #GetToWork</p> <p>Major restaurant chain operators Potbelly and Ruth's Hospitality Group were among the first to get government-backed loans intended to keep small businesses afloat, fueling concerns that big corporations will siphon away rapidly dwindling funds</p>
<p>Impact of COVID Women Entrepreneurs <b>(Topic 5)</b></p>	<p>The needs of #childcare providers on the front lines of this #COVID19 crisis largely women-owned small businesses, already operating on razor-thin margins are formidable. #FundChildCare #2020Budget</p> <p>#Womenledbusinesses may prove a source of resilience &amp; strength amid the global economic crisis: #genderlensinvesting #womenentrepreneurs @ForbesWomen @nerdette</p> <p>@SenWarren on @LateNightSeth breaking down simply why #StimulusBill #COVID19 slushfund oversight critical for Americans and small businesses who really need aid; putting trap gender bias</p>	<p>Women's businesses are more likely to experience hardship. They need specific programs to help them</p> <p>Covid19 fallout worse for women than men, Bailout package for women entrepreneurs demanded</p>

	<p>issue in elections to rest: Let's elect a woman president to break the ceiling already!!!</p> <p>Sara Blakely, the CEO and founder of the shapewear brand Spanx, announced today that she is giving \$5 million to support female-run small businesses during the coronavirus pandemic <a href="http://on.forbes.com/60121xNhm">http://on.forbes.com/60121xNhm</a></p>	<p>2/ Just as thousands of women owned small businesses completed their paperwork to apply for small biz Covid support what they heard: nada.</p> <p>Women Entrepreneurs, do you have technology-driven solutions to fight Corona? MyGov in partnership with @unwomenindia invites you to take the #COVID19ShriShaktiChallenge &amp; join India's fight against Corona. Participate to win prizes totaling Rs. 22.5 Lakhs: <a href="https://innovate.mygov.in/shrishakti/">https://innovate.mygov.in/shrishakti/</a></p>
<p>Impact of Pandemic on Black-Owned Small Businesses (Topic 8)</p>	<p>Despite the economic downturn, Black entrepreneurs across the country are working to find new ways to adapt in the era of social distancing.</p> <p>What happens to Black entrepreneurs &amp; gig workers during the Coronavirus pandemic? Our new podcast @DearCulturePod features @tressiemcphd breaking down why people with or without W2s matter too. @QueenSqueakz also calls out Trump's attacks on @Yamiche. <a href="https://spoti.fi/2JG4GrW">https://spoti.fi/2JG4GrW</a></p> <p>Black Businesses and Entrepreneurs must stop being greedy spectators. Their voice and helping hand is missing during this Covid-19 challenge</p>	<p>Twitter friends: Please help keep a Black womans small business afloat with just two clicks! @nailyeah can win up to \$1K to support her business during the lockdown. Vote for her here</p> <p>.@KamalaHarris The only thing keeping eligible small businesses - including minority-owned small businesses - from falling through the cracks is a lack of money to provide the loans. So please stop the tweets and pass funding for the #PaycheckProtectionProgram !!!</p> <p>Minority-owned businesses have long faced discriminatory banking practices. It's an outrage that this is still happening in a pandemic. Im pushing for more data on small business loans to ensure people of</p>

		color aren't being shut out.
Small Business Coronavirus Support (Topic 11)	<p>In the midst of a global coronavirus pandemic, many small businesses are under extreme pressure, forced to adopt new daily practices to keep ...</p> <p>Many small businesses in the U.S. were vulnerable even before the coronavirus crisis hit, a New York Fed report shows</p> <p>Small business owner in Pasadena forced to move out of home, plans to live in van after store closes amid coronavirus pandemic</p>	<p>Seven ways small businesses can avoid bankruptcy amid the coronavirus outbreak #investinyou (In partnership with @acorns.)</p> <p>Sen. Dick Durbin on the coronavirus rescue plan for airlines, small businesses</p> <p>“RT Forbes: There are now several new temporary relief options aimed at helping small businesses push through the current economic headwinds caused by the coronavirus. Here’s what you need to know if you’re a small business owner looking for help: <a href="http://on.forbes.com/60151LYmf">http://on.forbes.com/60151LYmf</a></p> <p>Coronavirus is having an affect on us all, especially a lot of small businesses like mine. Here's a super simple way you can help: Please follow us @colessalon Thank you all.</p>

Announcement 2: SBA increased the maximum loan amount from \$150,000 to \$500,000		
Topic	Tweets before	Tweets after
<p>Entrepreneurship Opportunities in the Post-COVID World <b>(Topic 1)</b></p>	<p>Are you an entrepreneur looking to scale your business? Our EEP programme starting March 22, 2021 is designed to equip owner-managers with the essential knowledge and critical tools needed to profitably run and scale their businesses during and beyond the current pandemic.</p> <p>Dr. Paul Hopkinson @hopkinson67, Associate Head of Edinburgh Business School at #HWUDubai and Academic Lead for Heriot-Watt Online, shares valuable insights on the importance of entrepreneurship and why the time is right for start-ups to flourish. Read:</p> <p>Hear from local small business owners how they have coped during the pandemic. Chester County Library to Host Virtual Entrepreneurship Panel on Pandemic Survival Strategies</p> <p>My latest blog on the impact of COVID19 on start-ups and a start-up accelerator #covid #startup #startups #accelerator #Entrepreneurship #Entrepreneur #innovation @CityREDI @WM_REDI</p>	<p>I think the pandemic happening is a great opportunity to launch entrepreneurs because of free financial opportunities and quick grants for security and no time caps on stuff and etc.</p> <p>Mad respect for entrepreneurs that ended up on the wrong side of COVID, had their co's almost destroyed over night &amp; have been working incredibly hard over the past year to get them back on track. Easy to forget in these bubbly times w/ valuations at ATH for most of the market.</p> <p>New: Social entrepreneur Bayile Adeoti explains how Covid has affected Dechomai, her social enterprise which helps empower ethnically diverse women, and why strategic partnerships are more important now than ever</p>
<p>Small Business Survival during COVID (Frustration) <b>(Topic 2)</b></p>	<p>@ohio_data @GovMikeDeWine's COVID data is b.s. He has wrecked Ohios economy, small businesses jobs over his baseless mandates. Ohio needs to be fully open w/o restrictions or mask mandates. DeWine needs to resign. THAT is where we are.</p> <p>The government doesnt want COVID-19 to go away. Thats one of the reasons they are letting illegals in without checking them.</p>	<p>Small suppliers have buckled under the weight of lockdowns. It is crucial that Government support genuinely reaches them &amp; as fast as possible to prevent further small business casualties. Read our Chairman Mike Cherry's opinion piece in @MediaplanetUK.</p> <p>@DominicRaab What about the human rights of the millions of small businesses deliberately ignored by The Treasury and your government in this pandemic?? Provided with no support left to wither and die. #theforgotten</p>

	<p>They want complete control so they can continue to destroy our economy and wipe small businesses out!</p> <p>Small businesses across Pennsylvania, particularly those in the hospitality industry, have suffered immensely due to the #COVID19 pandemic and the subsequent unilateral mitigation efforts.1/</p> <p>This pandemic killed so many small businesses and made it so easy for gentrification to sink its teeth in and make its way into communities we thought were gonna be okay. Its actually alarming.</p>	<p>@CTVMontreal hundreds of small businesses will bust because of COVID. They employed thousands of people who lost everything. Yet taxpayers' money is about to be spent to save the business of a millionaire who's going to rake in taxpayers' money ...</p> <p>“The government does not have a plan to revive the economy without placing the burden of preventing COVID-19 spread to the workers and small businesses.” #DutertePalpak #FreeMassTestingNow Read full statement: <a href="https://facebook.com/agham.org/posts/1717136951804135">https://facebook.com/agham.org/posts/1717136951804135</a></p>
<p>Small Business COVID Relief Grant Program (Relief) <b>(Topic 3)</b></p>	<p>California will be taking applications for more than \$2 billion in state-funded grants for small businesses and nonprofits that have been impacted by Covid-19 economic hardships.</p> <p>Good news for small businesses: Our latest COVID package has new funding for anyone worried about hitting their bottom line. Click here for the latest updates on loans and grants for small businesses</p> <p>FOUND/LA Small Business Recovery Fund is a grant program to help protect small businesses across Los Angeles County. Application window opens TODAY and closes March 21, 2021. Apply here: <a href="https://t.co/wRuCVPFvfP">https://t.co/wRuCVPFvfP</a></p> <p>It's the last week to apply for this grant that aims to help U.S. small businesses severely impacted by the pandemic stabilize and thrive by providing better access to affordable capital in the form of</p>	<p>@POTUS My family's small business may have a chance at surviving this pandemic, thanks to @POTUS. We just got approved for a small business PPP loan. I want to cry! This year has been hell but thanks to a president who actually cares, I can finally see the light!</p> <p>The #AmericanRescuePlan is a lifeline for Virginia families and small businesses in need, and will help us put this pandemic behind us. I spoke to @FitzFox5DC last weekend about the funding for schools, vaccines, stimulus checks, and protecting and restoring jobs here in #VA10.</p> <p>To ensure that small businesses have access to the capital they need to see them through the current challenges resulting from COVID-19, @WD_Canada will provide eligible businesses with interest-free repayable funding of up to \$1M. Learn more and apply: <a href="https://wd-deo.gc.ca/eng/20061.asp">https://wd-deo.gc.ca/eng/20061.asp</a></p>

	non-repayable grants of up to \$20,000.	
Impact of COVID on Women Entrepreneurs (Topic 5)	<p>Join us Wednesday, March 17 10am EST for a discussion on the unprecedented challenges faced by women employees and entrepreneurs, and the impact of government responses to the COVID-19 crisis from a gender perspective. Register here: [...]</p> <p>Women Entrepreneurs Face Work-Life Challenges During Pandemic #womeninbusiness</p> <p>Closing gender gaps in entrepreneurship would help reduce poverty, create jobs, and spur growth and innovation.</p> <p>We know that women and minorities in small businesses have been disproportionately impacted by the pandemic. But look at how important small businesses are to our overall economy and represent the lion's share of opportunities. Turn this engine on now.</p> <p>We need to address structural inequalities &amp; put marginalised people, including women entrepreneurs, at the heart of global economic recovery from Covid-19. The C7 is calling on the UK as #G7UK leader to promote 4 actions. Read the @bondngo report: <a href="https://bit.ly/3kVx9vW">https://bit.ly/3kVx9vW</a></p>	<p>.@LaurierWEC has received \$290,000 in funding from the federal government's Women Entrepreneurship Strategy's Ecosystem Fund. The funding is part of \$4.8million designed to support women entrepreneurs in Ontario as they adapt and grow during the #pandemic. <a href="http://bit.ly/wecWLUf">http://bit.ly/wecWLUf</a></p> <p>As we continue to celebrate #WomensHistoryMonth, Filipino women business owners share how @usaid_manila has supported their small businesses and social enterprises amid the COVID-19 pandemic.</p> <p>The pandemic has only highlighted these disparities b/w male and female entrepreneurs, creating a 'shecession'. By supporting the right entrepreneurial programs, we can help women entrepreneurs recover.</p>
Impact of Pandemic on Black-Owned Small Businesses (Topic 8)	<p>@NPR @nberpubs @RobertFairlie6 find Black-owned businesses experienced the largest losses in early 2020, closing at nearly 2x the rate of White-owned businesses. While no group was immune, Black entrepreneurs have had to get creative and collaborative in order to survive.</p> <p>@Jennife20311813 @MsAvaArmstrong So many</p>	<p>Partnerships have been critical to supporting entrepreneurs of color throughout this pandemic. These partnerships will be essential in the additional work that must be done in the coming months to continue to increase the number of minority-owned small businesses across MA.</p> <p>CM @RashiKesarwani says redlining and racism is NOT in the past, and talks about the Great Recession, subprime loans, minority and women small business owners struggling during COVID-19. "For West Berkeley, the</p>

	<p>black owned small businesses in NYC could use funding .. hit hard by NY COVID lockdowns + BLM/Antifa riots, using same script as Sharpton used to enrich himself .. not one of them supported opportunity zones ..</p> <p>Since the pandemic started, ~41% of all U.S. Black-owned biz have closed their doors for good.  @Phil_Gaskin @dhall3  @Sherrell_Dorsey  @TheAmaraReport @HUPrez17  lay out the State of Black Eship and how we can create stronger entrepreneurial ecosystems for Black entrepreneurs. #SXSW</p> <p>Across the country, Black- and Brown-owned small businesses have been devastated by the pandemic. Today, I stopped by Smith Flooring, a Black-owned union shop in Pennsylvania, to discuss how the American Rescue Plan will help them and countless other small business owners.</p> <p>The pandemic accelerated job automation and Black and Latino workers are most likely to be replaced</p>	<p>status quo is hard,” in response to “change being hard.” #berkmtg</p> <p>“We have a lot of work ahead, but together we are going to get our economy on track and hang an open sign on tens of thousands of Latino small businesses once again,” he added</p>
<p>Small Business Coronavirus Support (Topic 11)</p>	<p>During the coronavirus pandemic, many people lost their jobs. Local businesses also suffered a huge blow. These small businesses are a super essential since most of them are based on short supply chains.  #zerowaste #climatechange #globalwarming</p> <p>Kwasi Kwarteng, the Business Secretary, is facing warnings that his plan to make company directors personally liable for the accuracy of accounts risks stifling entrepreneurship and undermining the Covid recovery.  <a href="http://ow.ly/lm6a50E1ZXY">http://ow.ly/lm6a50E1ZXY</a></p>	<p>The Arkansas District Office of the U.S. Small Business Administration provides free webinars on coronavirus relief options and various other topics.</p> <p>Small businesses, concert venues and airports will all get coronavirus relief. One expert broke down how the aid will help Anne Arundel</p> <p>Preparing Small Businesses for Tax Season During the Coronavirus</p> <p>After a year of epic job losses, waves of coronavirus infections, and small business closures, numerous trends are brightening the outlook.</p>

	<p>Has The Coronavirus Severely Impacted Your Business's Revenue And Profits?          Small Business Breakthroughs Magazine Is Hosting A Local No-Cost Business Development Workshop To Show Local Business Owners How To Increase Their 2020 Revenue By MORE  <a href="https://theprofitcoaches.com/virtual-business-development-webinar/">https://theprofitcoaches.com/virtual-business-development-webinar/</a></p>	
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<p><b>Announcement 3:</b> SBA increased the COVID EIDL maximum loan amount from \$500,000 to \$2 million</p>		
Topic	Tweets before	Tweets after
<p>Entrepreneurship Opportunities in the Post-COVID World  <b>(Topic 1)</b></p>	<p>New business creation is a booster shot for the #US #job market - An unexpected bright spot of the #pandemic has been a surge in risk-taking by #entrepreneurs, igniting a record stretch of business creation over the past 18 months.</p> <p>Innovation is key in solving healthcare challenges. Applications are open for the MIT Sandbox Long Covid &amp; Lyme Entrepreneurship Program, and we're looking for innovators in MIT's community to contribute to the search for solutions. Details and apply: <a href="http://ow.ly/GSed50FUxhs">http://ow.ly/GSed50FUxhs</a></p> <p>How the Covid-19 Crisis Has Driven Manufacturing-Related Change            Understanding what looks different is crucial to evolving and growing through those changes.            @Entrepreneur #manufacturing #fastenernews #workforce #fasteners #supplychain</p>	<p>Small businesses and start-ups have a drive unlike others. Only 40% of businesses survived the pandemic and some even thrived. What lessons can small CPA firms learn from startups?            #AAMKT #Startups #CPAFirm</p> <p>While the U.S. economy continues to suffer the consequences of the Covid-19 pandemic and escalating climate disasters, American entrepreneurship remains as resilient as ever #Next1000</p>

<p>Small Business Survival during COVID (Frustration) <b>(Topic 2)</b></p>	<p>Quick question.... A lot of small businesses are going broke with these lock downs (understandable) Q: Why? Because their bills don't stop. Which are mainly rent &amp; bank loans Q: Why can't the Govt use its powers to 'stop' all loans; rent during a full lock down? Just asking.</p> <p>@Justinthejock @Microlambert @MetPoliceEvents Exactly. They were all holed up in their opulent second homes during the pandemic and then they come out and sabotage the efforts of small business owners and minimum wage employees trying to get to work. Not a good look</p> <p>With families stuck at home, COVID brought the rise of third-party delivery services. Are they worth the expense for small businesses despite the demand? Read more..</p> <p>so very many in the deepest distress over job losses, the failure of small businesses built up over the years, their children out of school for over a year, and stressed to breaking point from the imposed claustrophobia of the pandemic... <a href="https://t.co/y9KiUpgXh7">https://t.co/y9KiUpgXh7</a></p> <p>The lack of a safety net for low-income Indians and small businesses, has been brutally exposed as they have struggled to operate online, Covid health emergencies have pushed many into debt and banks have cut back on higher-risk, unsecured lending. <a href="https://t.co/pFKXqDeIco">https://t.co/pFKXqDeIco</a></p>	<p>DEADLINE: Temporary measures brought in to support businesses from insolvency during the pandemic will be phased out from Oct 1 and new targeted measures to support small business and commercial tenants are being introduced. More: <a href="https://t.co/FfDoatDo01">https://t.co/FfDoatDo01</a> #COVID19 @dorset_gateway</p> <p>Totally absent is what small businesses are saying about the Federal Govts support &amp; leadership for small businesses &amp; their employees. Being told to go to the TGA website for advice is not reasonable. COSBOA briefing with Labors Pandemic Jobs and Industry taskforce #auspol</p> <p>But we've shown that it is possible to organize a small business. It is possible to unionize in the craft chocolate industry. It is possible to unionize across cafe, warehouse, and factory teams. It is possible to unionize in 2021, in San Francisco, in the middle of a pandemic.</p>
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<p>Small Business COVID Relief Grant Program (Relief) <b>(Topic 3)</b></p>	<p>The legislative majority is MIA but could easily help workers and small businesses with child care, paid sick leave and direct relief using their stash of American Rescue Plan billions.</p> <p>#ICYMI: @NassauExecutive is offering \$10k grants to small businesses impacted by the pandemic and there are still funds available. Visit <a href="https://t.co/P0nf29fDPs">https://t.co/P0nf29fDPs</a> to learn more.</p> <p>Global Coalition Launched \$80 Million Relief Fund to Protect Energy Access in Vulnerable Communities from COVID-19 Fallout #solar #energy #relief #smartaid #techforgood #technology #remote #launch #tech4good #entrepreneur</p> <p>The city of Vandalia, which offers grants because small businesses continue to feel the impact of COVID-19</p> <p>Applications for the Victorian Government's Small Business COVID Hardship Fund close on 10 September. Businesses that have experienced a reduction in revenue of 70% may eligible for grants of \$20,000. Further information here: <a href="https://t.co/FI7EolyNRb">https://t.co/FI7EolyNRb</a></p>	<p>SMALL BUSINESS SUPPORT Don't miss out on ROUND 9, the last round of California's Small Business COVID-19 Relief Grant Program open from Thursday, September through Thursday, September 30. For more information visit <a href="https://t.co/3BOeDldPwZ">https://t.co/3BOeDldPwZ</a></p> <p>Small businesses who are struggling amid the coronavirus pandemic are eligible for up to \$10,000 in federal grant money through the county.</p> <p>RELIEF GRANTS: California is offering grants between \$5K-\$25K to eligible small businesses and nonprofits for COVID-19 expenses. Apply now!</p> <p>The Camden County Board of Commissioners announces the Camden County RECOVERS Small Business Grant Program. This second Grant Opportunity is being made available for Small Businesses that have been affected by the COVID-19 Pandemic. visit <a href="https://t.co/xNnPLjCdmg">https://t.co/xNnPLjCdmg</a></p> <p>Collin County TX has \$200M in COVID relief funds. But instead of using it on small businesses, healthcare, etc, our County Judge; Commissioners Court want to build a parking lot and expand the jail. Meeting is 9/13. @NBCDFW @wfaa @dallasnews @startelegram @CBS11 @FOX4</p>
<p>Impact of COVID on Women Entrepreneurs <b>(Topic 5)</b></p>	<p>Women in the workforce have suffered major setbacks in 3 key areas during the pandemic: Sectors of the economy that employ a larger share of women have been hardest-hit The disproportionate burden of unpaid work Less support for women entrepreneurs</p> <p>The Pandemic Created An Economic Disaster For Women; These Female Entrepreneurs Are Helping Other Women Bounce Back</p>	<p>From young entrepreneurs to durable long-time businesses, there has been an impressive level of survival for Hispanic women in business during the pandemic.</p> <p>The COVID-19 pandemic has changed a lot of ways that the world does business. And a new report on women entrepreneurs and stress underscores the need for more support as we move out of the pandemic.</p>

<p>Impact of Pandemic on Black-Owned Small Businesses <b>(Topic 8)</b></p>	<p>The pandemic sparked a start-up boom in the U.S., particularly in Black communities. There was an untapped potential in these high-income Black communities to become #entrepreneurs, says @MITSloan professor and economist @ssstern_mit. @nytimes</p> <p>Due to the COVID pandemic, black-owned businesses declined more than 40%, significantly more than any other ethnic group. Black-owned companies also had more trouble getting access to government relief. This hurdle is on top of all the other obstacles Black entrepreneurs face.</p> <p>Businesses owned by women and entrepreneurs of color are disproportionately impacted by COVID-19 but often deprioritized in relief efforts. We're proud to have structured millions of dollars in loans for underfunded #smallbiz owners.</p>	<p>COVID-19 has caused closure of almost twice as many Black-owned businesses than white-owned. Our weekly Mastermind Mondays are a time to find solutions. They are a time for networking, accountability &amp; growth. Register for tomorrow 9/13 #Entrepreneur</p> <p>Why are by-law officers in #HamOnt storming a small, Black-, immigrant-family-owned business following all the covid guidelines?</p> <p>Apparently you can be an anti-vax protester at a hospital &amp; never be fined, but Black family businesses? This is what anti-Black racism looks like.</p>
<p>Small Business Coronavirus Support <b>(Topic 11)</b></p>	<p>As the country continues to fight the coronavirus, small business owners are fighting to stay afloat.</p> <p>The Salims operate a news stand in the CBS Broadcast Center in Manhattan, and have spent tens of thousands of dollars to keep going throughout the pandemic.</p>	<p>@GOPLLeader the Republicans ignoring the Coronavirus is threatening our small businesses. Google the states with the highest covid-19 infection rates. I rest my case. you're going to find that the overwhelming majority are states ran by Republican governors.</p> <p>The coronavirus pandemic has been brutal for business owners, especially small business owners. However, this one small business is not just surviving, but thriving through this pandemic. What's the owner's secret?</p>

**Announcement 4:** Emergency Rent Subsidy program announced

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<p>Support for Canadian Small Businesses Amid Pandemic <b>(Topic 6)</b></p>	<p>It's been 127 days since @Alberta_UCP took a taxpayer subsidy meant for small businesses and non-profits during the pandemic. How many days until they admit how much of your money they took?</p> <p>For too many Canadians, the dignity of work has taken a blow with the impacts of the pandemic on their small businesses.</p> <p>Canada needs to build back stronger by setting them up for recovery and success post-COVID-19.</p> <p>They don't care if my business shuts down: Port Hope, Ontario small business owner speaks to @tamaraugo about town council's destructive #COVID19 rules</p>	<p>If the NDP cared about maximizing Covid response there wouldn't be an election.</p> <p>If they cared about getting help to families in need there wouldn't be an election.</p> <p>If they cared about small business there wouldn't be an election.</p> <p>The NDP cares about the NDP. #BCelxn2020</p> <p>Across the country, Canadians are doing their part to slow the spread of COVID-19 - and for families, small businesses, and workers facing financial challenges caused by public health measures, the Liberal government will continue to have your back.</p> <p>Dr Etches and Ottawa Public Health, I beg you, please incorporate as small business owners so the Mayor will listen to you.</p> <p>The CFIB estimated in June, before Canadian COVID-19 infections began rising again, that small businesses will incur \$117 billion in debt that could take more than a year to pay off.</p>

<p><b>Announcement 5:</b> Chancellor Sunak announced a £4.6bn fresh financial support package for struggling UK companies'</p>		
Topic	Tweets before	Tweets after
<p>Impact of Brexit and Covid on UK Small Businesses <b>(Topic 9)</b></p>	<p>@SLR_Mod_Shop Iâ€™m notice if this is more to do with the new coronavirus strain than Brexit, but if it is the latter, why the gov has left everything so late to figure this out is ridiculous and further hurting hurting small business at what is the hardest time weâ€™ve ever experienced ðŸ˜©</p> <p>The Prime Minister is addressing the nation tonight. He should set out a clear plan to vaccinate 2 million people per week, fix sick pay and give support to those who need to isolate, and ensure a package of support for the excluded and small businesses affected by lockdown</p> <p>With further necessary #Covid restrictions, it is even more vital we see further financial support for small businesses and freelancers, especially retail, hospitality and seasonal businesses. @ExcludedUK @ForgottenLtd @FSB_Scotland</p>	<p>Small businesses can now apply for the Strategic Framework Grant- paid every 4wks during #lockdown - however long. Its around £2k for each premise (we have 2). If we were in England we'd be getting a 1 off payment of 4K without this future certainty @scotgov choices.</p> <p>“UK firms fear twin force of Covid plus Brexit will force them under. More than 250,000 small businesses expect to fail in 2021 as state support dwindles”</p> <p>When you get simultaneously punched in the stomach, and kicked in the head, it hurts MORE.</p> <p>Always remember: “Covid plus Brexit” was avoidable. Govt rejected option to extend Brexit talks on 12 June 2020</p> <p>The very real impact that Covid is having on the small business sector in the UK... many remain without any support from @RishiSunak since the outset of the crisis...</p>