In recent years, researchers have been exploring the potential of using Google Trends data as a source of real-time information, as they might provide insight and improve predictive power of various variables in diverse fields such as finance, marketing and economics among others. This literature overview revolves around key studies whose main focus was the use of Google Trends data as a tool to predict inflation or other macro-level indicator. We review the employed methodologies, challenges faced, and the implications of these findings for future research.

The growing interest in the use of GT can be attributed to several factors.

1 Real time data: The data is available in real-time. Thus, it can function as a source source of up-to-date insights into consumer behavior, market sentiment, and other factors that influence economic indicators. The real-time nature of the data can be particularly helpful and valuable in dynamic and rapidly changing economic environments or during time periods when traditional sources of data may be lagging behind or outdated.

2 High frequency: GT provides high-frequency data, therefore short-term fluctuations and trends can be captured more accurately. This granularity can might help to improve accuracy and responsiveness of forecasting models.

3 Broad coverage: GT covers any topic for which search-related terms are searched with non-negligible intensity. As a result, variables for which traditional data are non-existent or hard to collect and quantify, GT can serve as an accesible alternative.

4 Behavioral insights: GT offers a unique perspective on consumer behaviour, reflecting collective concerns and interest of internet users. Although internet users cannot be considered as accurate and representative sample of whole population, GT might provide insight into sentiment, preferences and expectations, which are influenced and possibly can influence economic outcomes among others.

5 Cost effectiveness: GT is publicly available and free of charge. That makes it accessible and cost-effective source of information for researchers, policy-makers businesses and overal anyone with access to internet connection.

6 Easy integration: GT can complement already existing traditional economic indicators and other data sources in order to create more comprehensive and robust forecasting models. This complementation can help diminish limitations of each dataset in order to enhance overal predictive power.

7 Leading indicator potential: For some economic variables, GT can serve as a leading indicator, which allows for earlier detection of changes in trends or market conditions, since it can provide a representation of consumer expectations which consequently affect the real outcome. This might allow researchers and policy-makers to react more quickly, flexibly and effectively to emerging economic developments.

However, while the are significant advantages of GT, there are also challenges and limitations regarding the use of GT. We have already mentioned issues regarding representativeness of real population. Naturally, this is followed by concerns about reliability. In addition, GT can be susceptible to spurious correlations. Thus, careful consideration of conditions along with choice of appropriate methodological approach is necessary in order to ensure GT is applied effectively and without bias in terms of forecasting purposes.

Pejpry:

Ettredge et al. (2005) emerged as early pioneers in the successful application of web search data for economic forecasting. Their research focused on the prediction of unemployment rates utilizing web-based search data. The findings from their study indicate that web search data possesses the potential for effective application in forecasting other pertinent macroeconomic indicators.

In addition, various other scientific disciplines have capitalized on the use of web search data. Polgreen et al. (2008) investigated the association between search queries related to influenza and actual instances of the illness. Their models demonstrated success in predicting increases in positive influenza cultures and rises in pneumonia and influenza-related mortality several weeks in advance. Subsequently, Ginsberg et al. (2009) further substantiated the efficacy of web searches as a tool for early detection in the field of epidemiology. This line of inquiry has been supported and expanded upon by several researchers, including but not limited to Brownstein et al. (2009), Pelat et al. (2009), and Wilson (2009).

Polgreen et al. 2008

<https://academic.oup.com/cid/article/47/11/1443/282247>

Ginsberg et al. 2009

<https://www.nature.com/articles/nature07634>

Corley

<https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=bab035bbc719ecdb3ffcb2a14b97f1390939a744>

Brownstein

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2917042/>

Pelat

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2815981/>

Wilson

<https://www.cmaj.ca/content/180/8/829.short>

Lets return back to economic related topics. Askitas and Zimmerman (2010) and D’amuri and Marcucci (2010) examined the relation of web search to evolution of unemployment rate in Germany and USA respectively. Baker and Fradkin (2011) estimated inversely proportional relationship between unemployment benefits and intensity of job search.

Vosen & Schmidt (2011) showed that a nowcasting model using Google Trends data outperformed traditional time-series models in predicting consumer price inflation.

Askitas and Zimmermann (2009) investigate the use of GT for predicting unemployment rates in Germany, France, and the United States. The authors employ Granger causality tests and vector autoregressive (VAR) models to analyze the relationship between search volume data and unemployment rates. This study serves as an example of how to employ advanced econometric techniques, such as VAR models, when using Google Trends data for forecasting purposes.

Guzmán (2011) was the first one to delve into utilization of GT in order to forecast specifically inflation. The results suggest a statistically significant and positive relationship between search volume data for inflation related terms and inflation expectations. This implies that search data can complement traditional data sources, offering real-time insights and improved predictive accuracy.

Choi and Varian (2012) used engine search data to forecast values of economic indicators such as consumer confidence, unemployment claims, travel destination planning and automobile sales. Authors employ various time-series models including autoregressive models and state-space models.

Choi & Varian

<https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=4d91786f9f88e0ec8dd5a25ca7c08f4d8e693b53>

Aksitas and zimmerman

<https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1465341>

askitas zimmerman 2009

<https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=4d91786f9f88e0ec8dd5a25ca7c08f4d8e693b53>

d amuri and marcucci

<https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1594132>

Guzmán

<https://sci-hub.se/10.3233/JEM-2011-0342>

Baker and fradkin

<https://core.ac.uk/reader/6400010>

Baker Fradkin 2017

<https://sci-hub.se/https://doi.org/10.1162/REST_a_00674>

Vosen and Schmidt

<https://onlinelibrary.wiley.com/doi/full/10.1002/for.1213?casa_token=wDqoyslfLtQAAAAA%3A_Br_ThERGB4wNuDXBZebA-tpq9GOIqJic4_9PjvQNswbugKz7aOH8DopCiYqOFklEmlXdGJUY9eedYmsPA>

Preis et al. (2013) utilize GT in such way that they find patterns which can be interpreted as „early warning signs“. Results of their research align with the idea that significant declines in the financial market are preceded by periods of investor anxiety, as manifested in GT. We believe that this idea can be applied to inflation, as expectations about rising inflation can be conveyed in GT and may precede individual–related actions purposely lessening short-term impacts inflation for the individual, while they may spiral inflation upwards even further.

Challenges and Limitations:

Despite the promising results of these studies, there are several challenges and limitations associated with using Google Trends data for inflation prediction. The reliability and representativeness of Google Trends data can be affected by changes in search algorithms, data sampling methods, and user behavior (Lazer et al., 2014).

Lazer 2014

<https://sci-hub.se/10.1126/science.1248506>