The stock exchange of influencers: predicting fanbase variation with a financial approach

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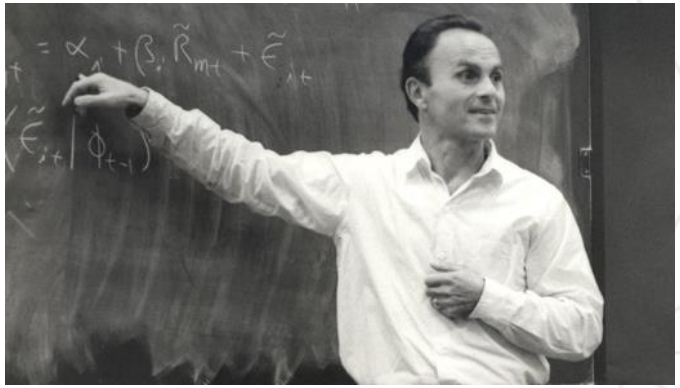
The Efficient Market Hypothesis

- The EMH is a cornerstone yet debated **hypothesis** about **financial economics** proposed in 1970 by Eugene Fama



- (i) Current prices of stocks incorporate all available **information** and **expectations**

- (ii) Current prices of stocks are the best approximation of their **intrinsic value**

Instagram and Influencers

- **Instagram** is used by **1.3 billion users** worldwide (Digital 2021 Global Stats hot Report)

- A limited portion of social profiles emerges and reaches a large base of followers: the **influencers**

- **Goals of influencers**
  - **Increase** their **fanbase** engaging users through the content they offer
  - **Monetize** their social presence, **through** helping brands in **marketing**

The Stock Exchange of Influencers

- **Parallel** between the ecosystem of OSNs and the stock exchange market.
- **Influencers**: **stocks** with a market value (fanbase cardinality)
- **Followers**: **buyers** (the act of buying is start following)
- **Our aim is to check whether influencers are efficient**

Target of our analysis

- **Our aim is to check whether influencers are efficient**

- **Efficiency** of influencers' **follower growth rate** in relationship with **Google Trends SVI**

  - **Instagram** is just one of the possible OSN to be studied
  - **Google Trends** is just one of the many possible external sources of information
  - **Many influencers' characteristics** can be taken into account
  - The **fanbase nowcasting** for **decision support** and **advertising optimization** is just one of the possible application

Data Collection: Crowdtangle

- A tool from Facebook help follow, analyze, and report what's happening across social media
  - Facebook
  - **Instagram**
  - Twitter (partially)

- It is possible to consult trends and download CSV reports about
  - Total Interactions
  - Post Count
  - **Follower Growth**

Data Collection: Google Trends

- Google Trends is a website by Google that analyzes the popularity op search queries in Google Search ss various regions and languages

- It is possible to download CSV reports

- The index, Google Trends SVI (Search Volume Index) is min-max normalized in the time interval selected
  - Values are between 0 and 100

Google Trends and Finance

- From the end of 2000's Google Trends have started been included in **financial applications**

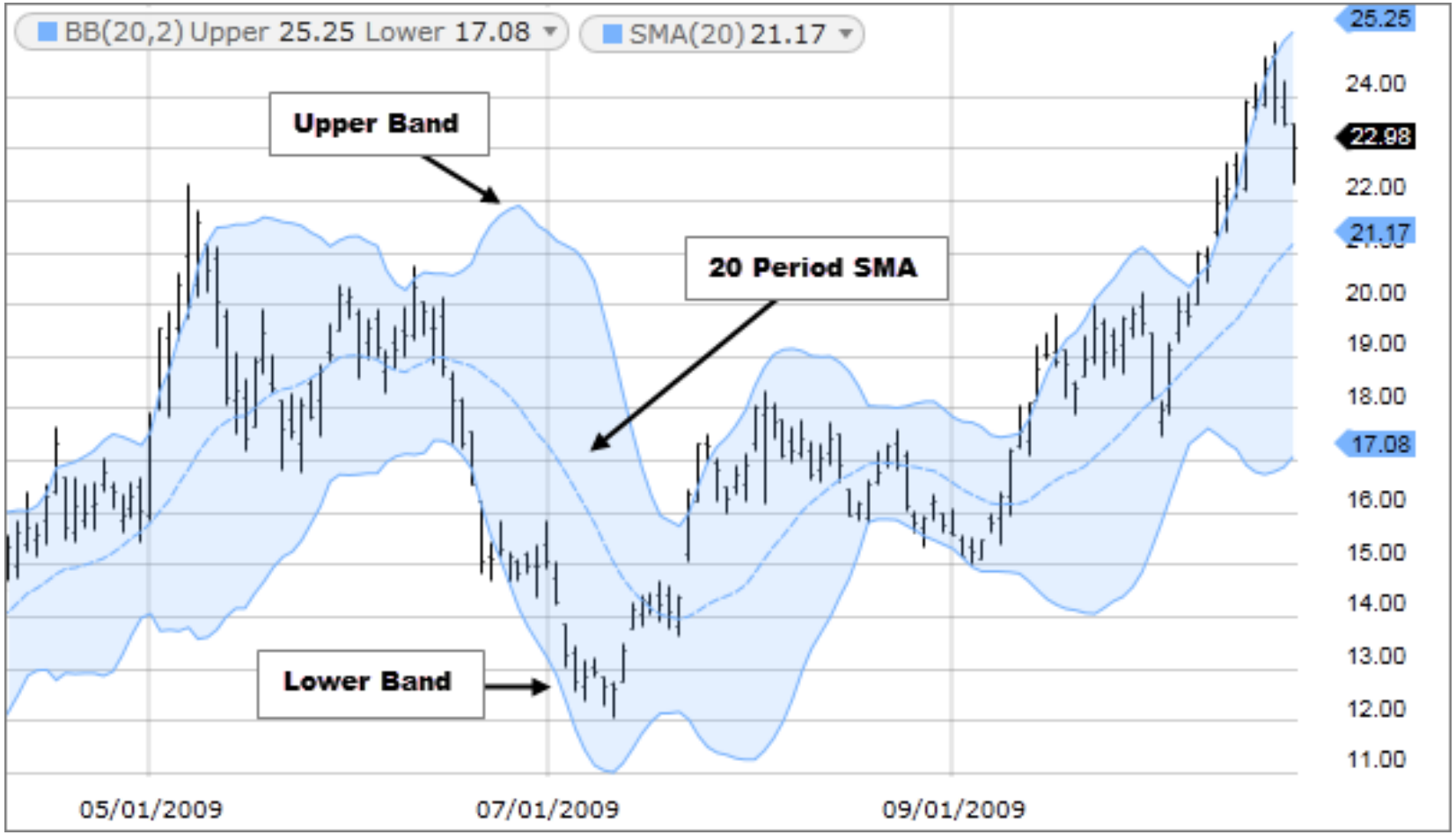
- **Sales Nowcasting**
  - Short Term Forecasting

- **Portfolio Optimization**
  - Together with technical analysis indicators

Bollinger Bands – definition

- Financial technical indicator whose purpose is to provide a relative definition of high and low prices.
- Three curves over time characterize the Bollinger bands
- (i) A Simple Moving Average (SMA) looking back at T time units
- (ii) Two bands, upper and lower, respectively obtained by adding and subtracting C times the standard deviation (also computed looking back T time units) of the quantity of interest measured by the signal to the SMA

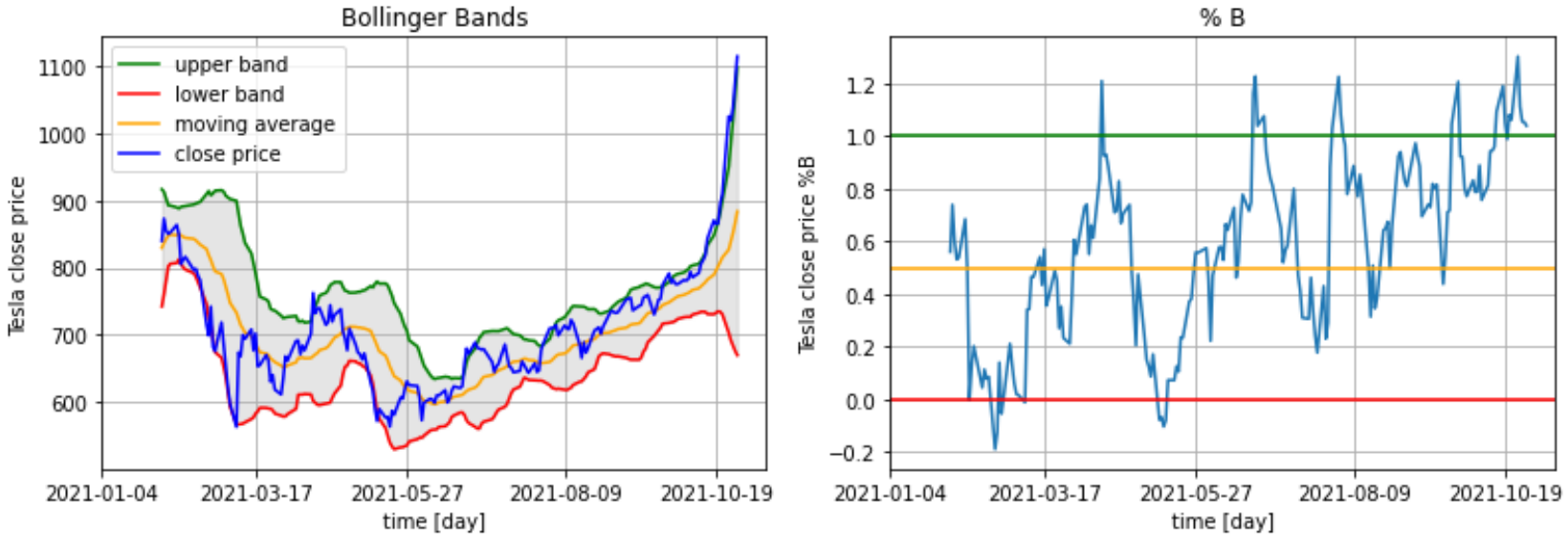
Bollinger Bands – visualization



The %B

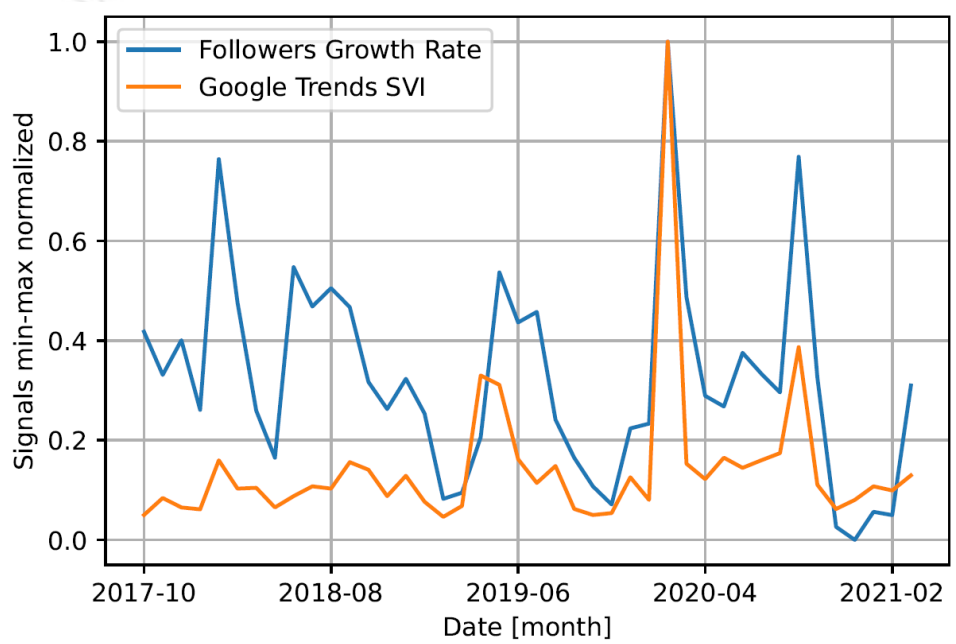
- The %B indicator quantifies the **position** of the signal relative to the two bands

$$\%B(t) = \frac{signal(t) - lower\_band(t)}{upper\_band(t) - lower\_band(t)}$$



Dynamic Normalization and Scaling

- The %B can be employed to **normalize** and **scale** signals with **diverse orders of mangnitude** and **volatility**



Elettra Lamborghini

Min-Max Normalization

Dynamic Normalization and Scaling

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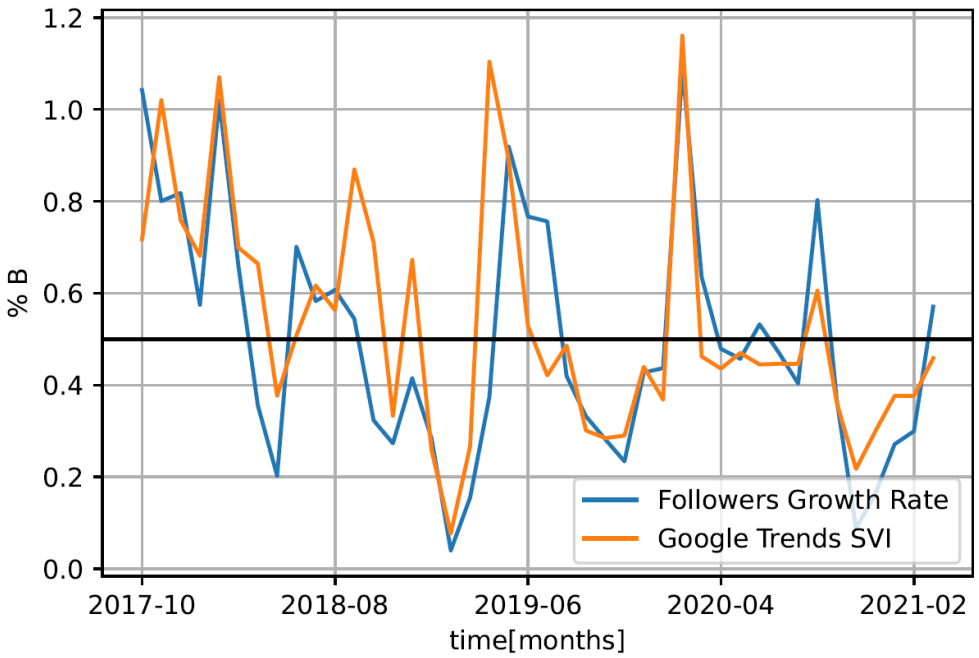
Elettra Lamborghini

Dynamic Normalization trough Bollinger %B



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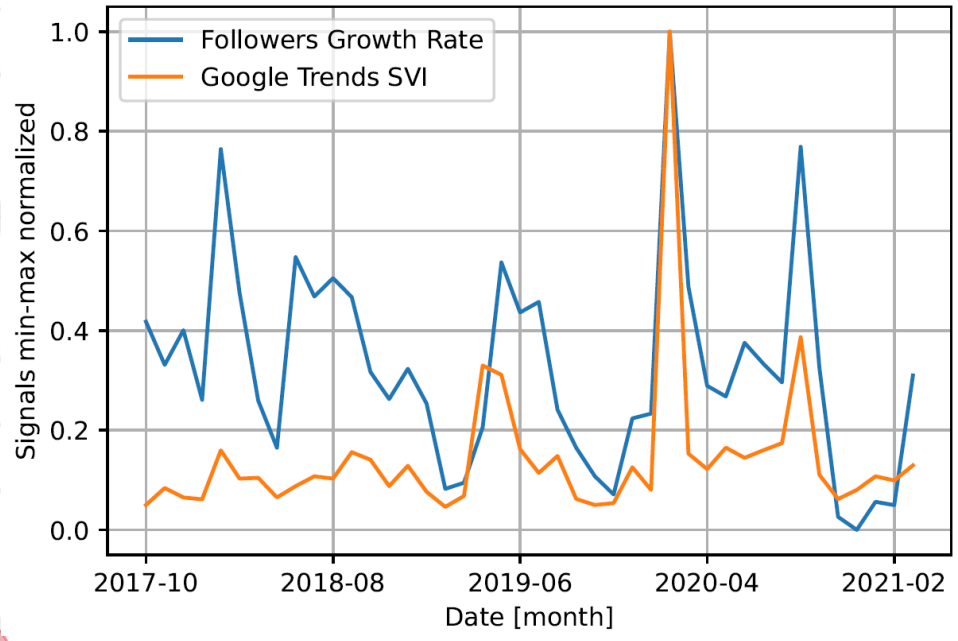
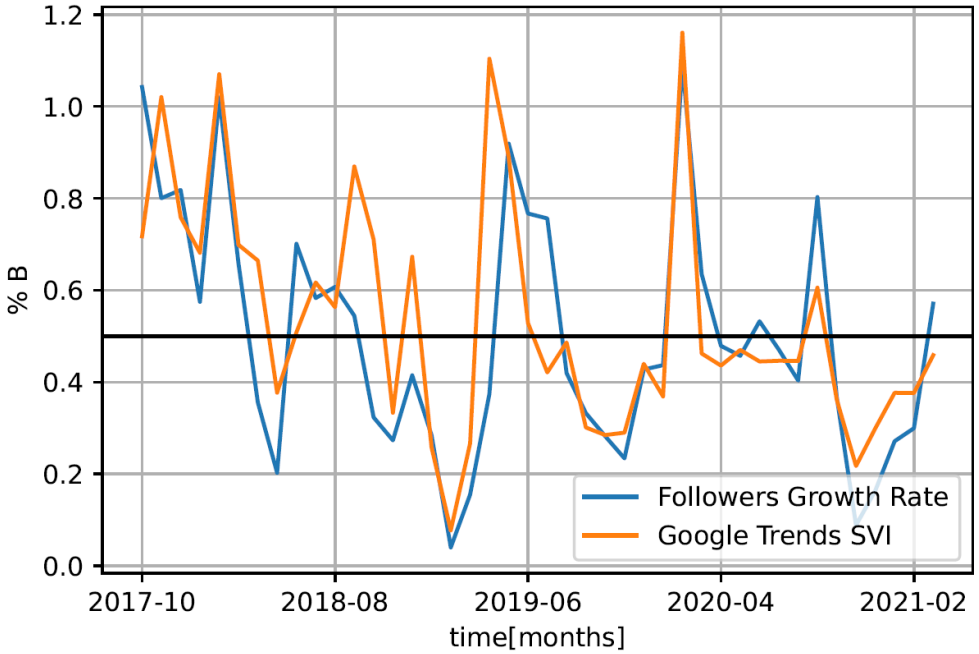




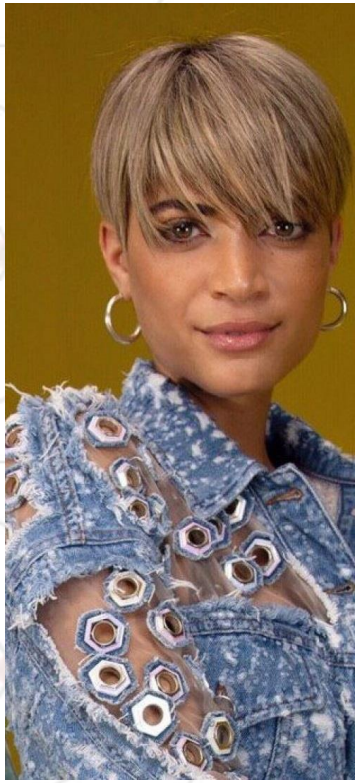
The «Efficiency» measure

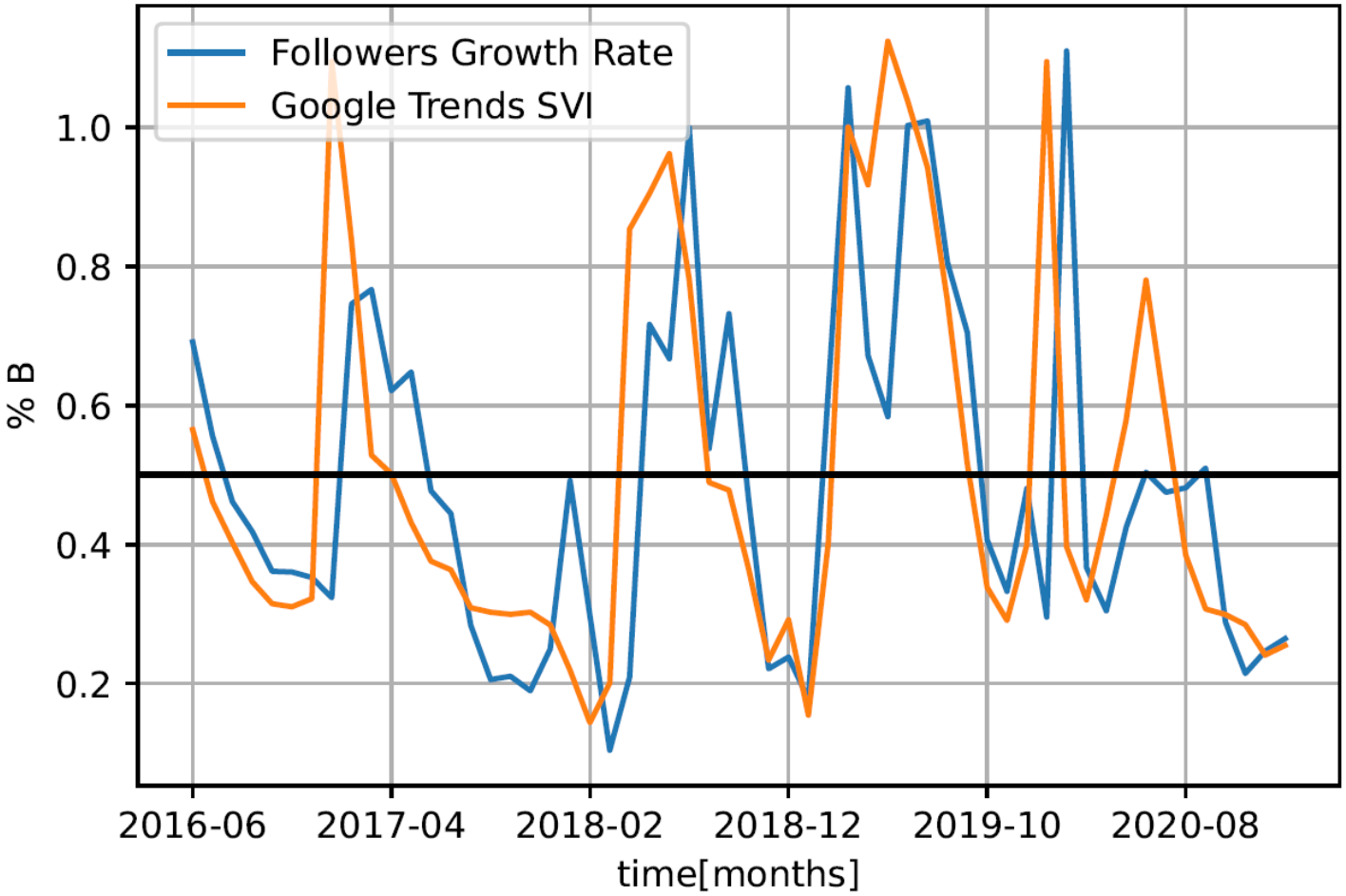
- Quantifies how much the %B curves are close
- It is the **complement of the average absolute difference** between the two curves

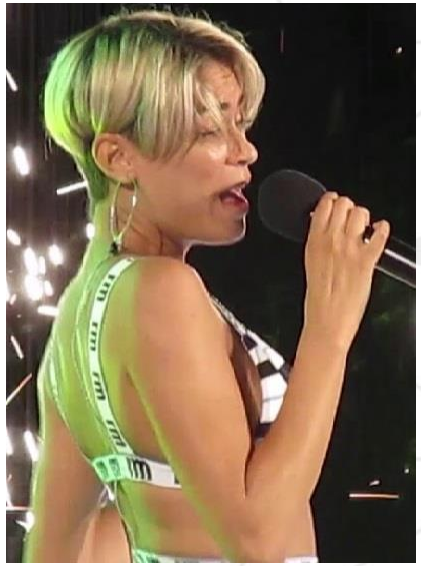
$$Efficiency = 1 - \frac{\sum_t |\%B(t)_{signal} - \%B(t)_{SVI}|}{\sum_t 1}$$

- High efficiency > curves are (almost) overlapped
- Low efficiency > curves are decorrelated

Examples of efficient influencers

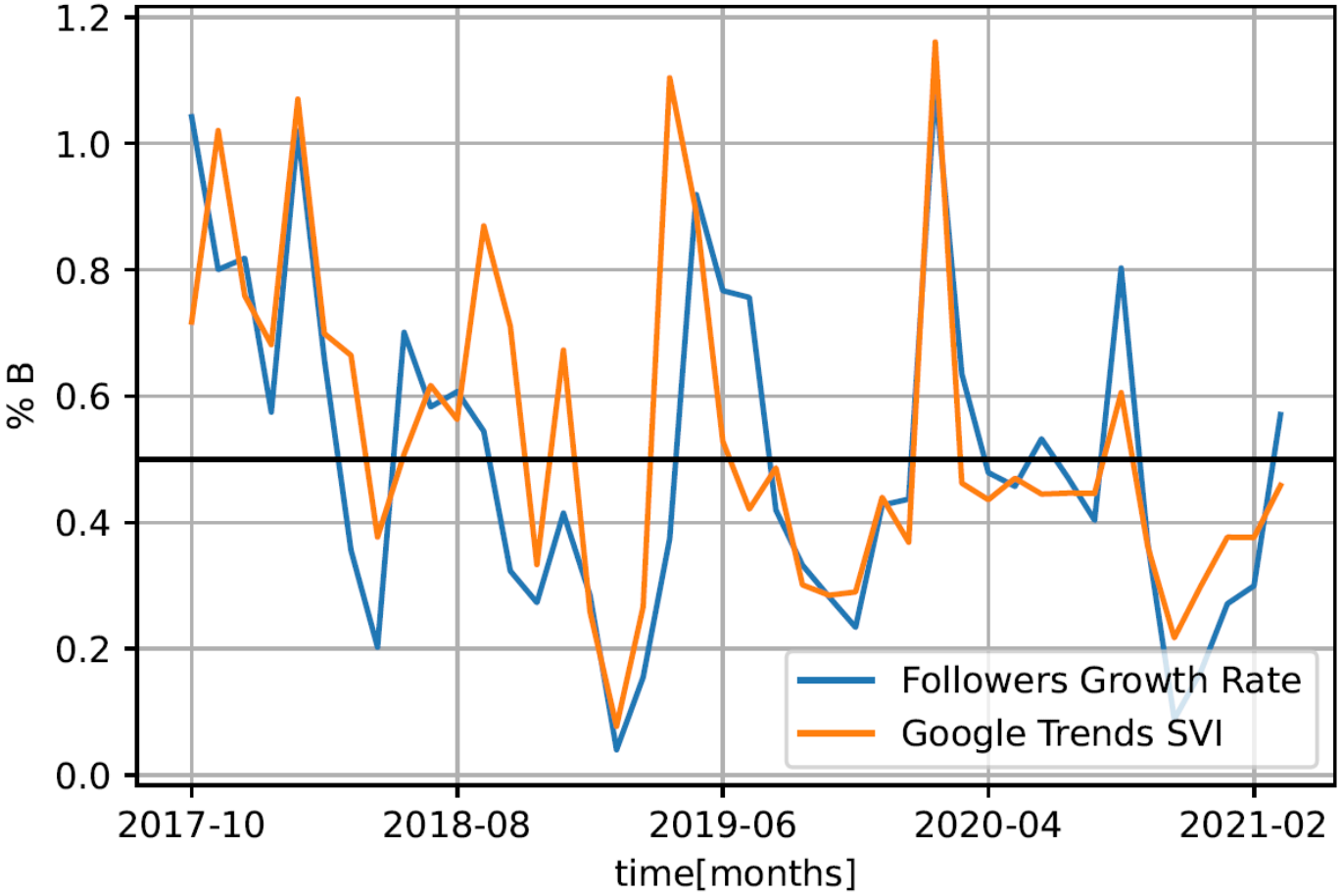






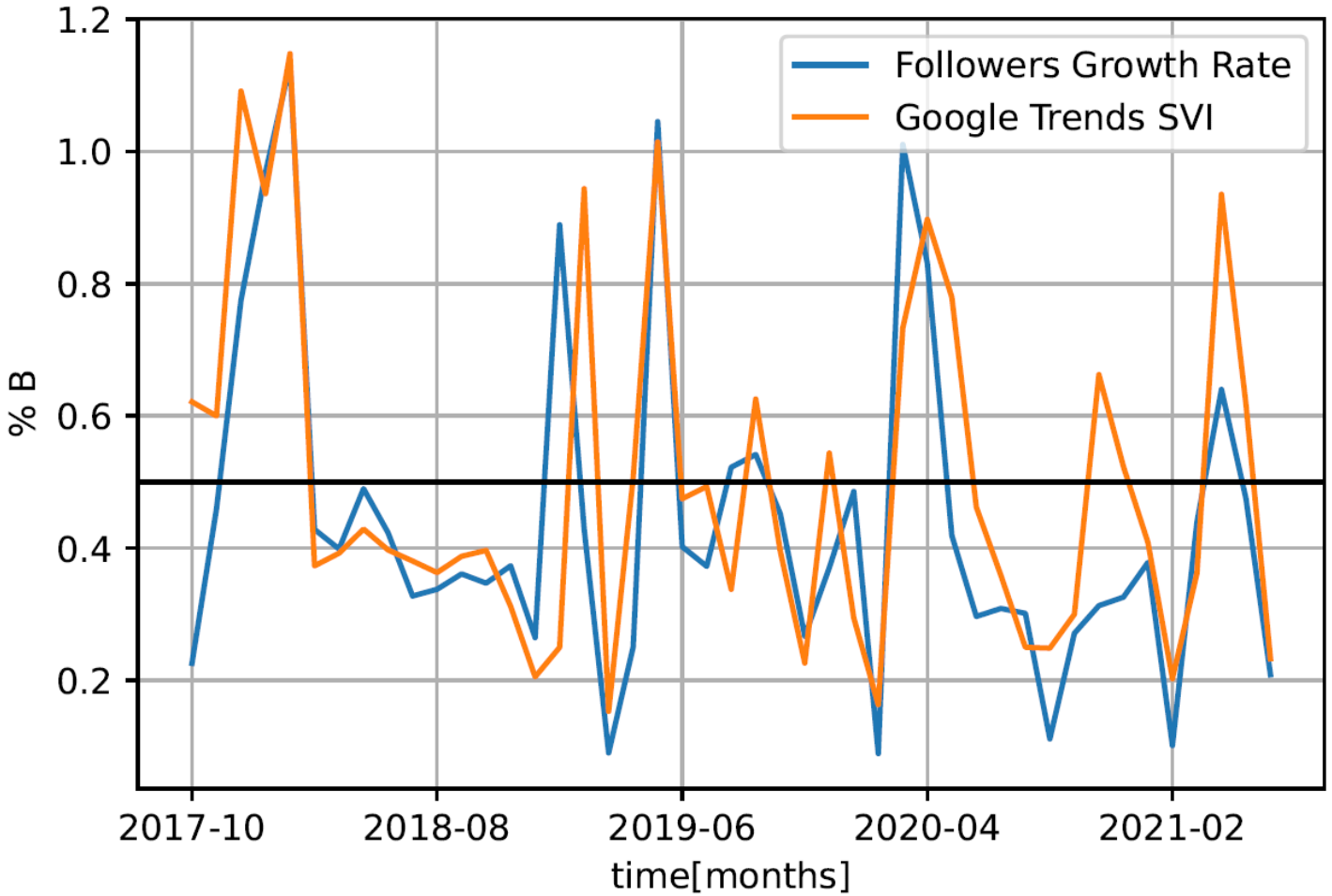
Efficiency (Elodie) = 0.88

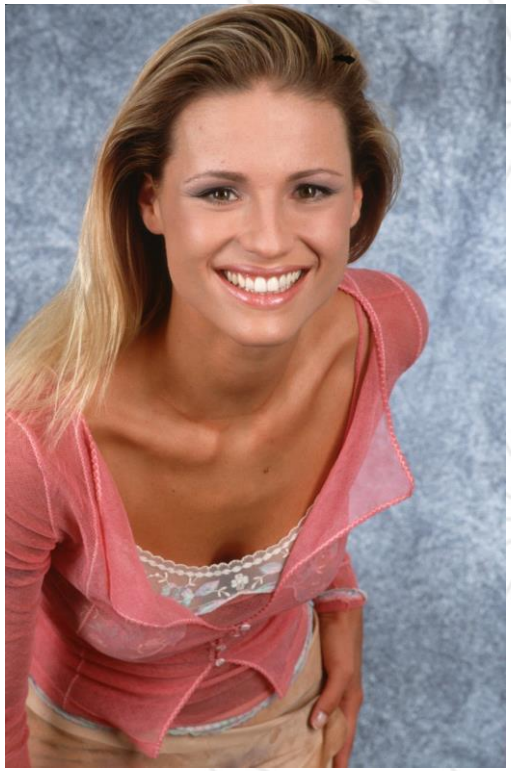
Examples of efficient influencers



Efficiency (Elettra Lamborghini) = 0.86

Examples of efficient influencers

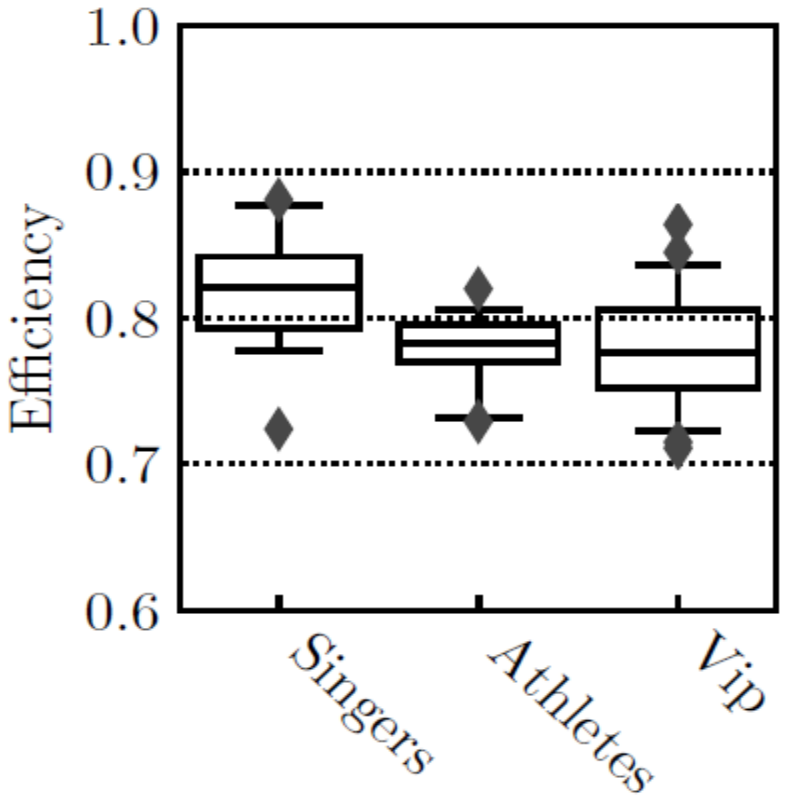




Efficiency (Michelle Hunziker) = 0.86

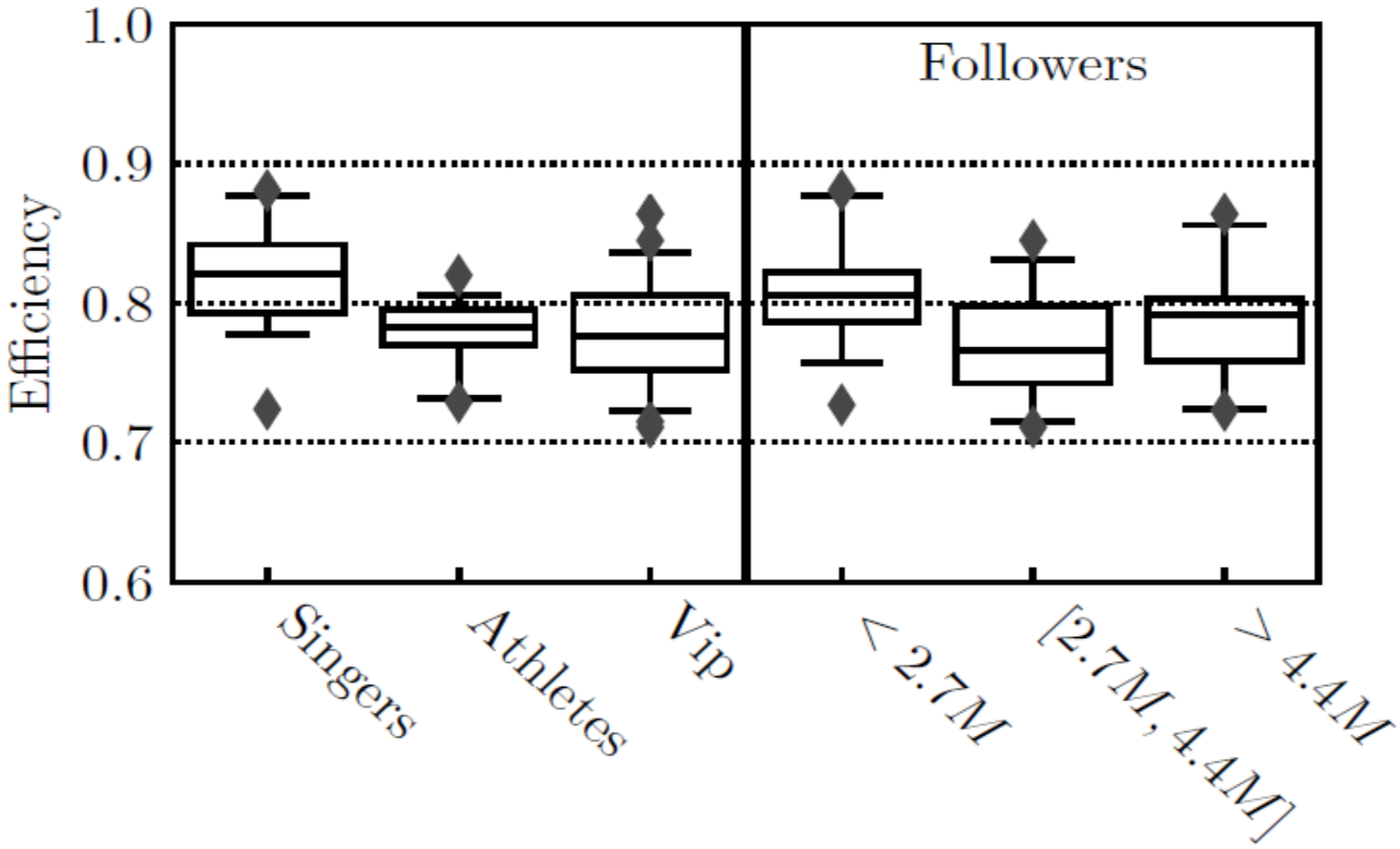
Variables that affects efficiency

- **Singers** are notably more efficient than **VIPs** and **Athletes**



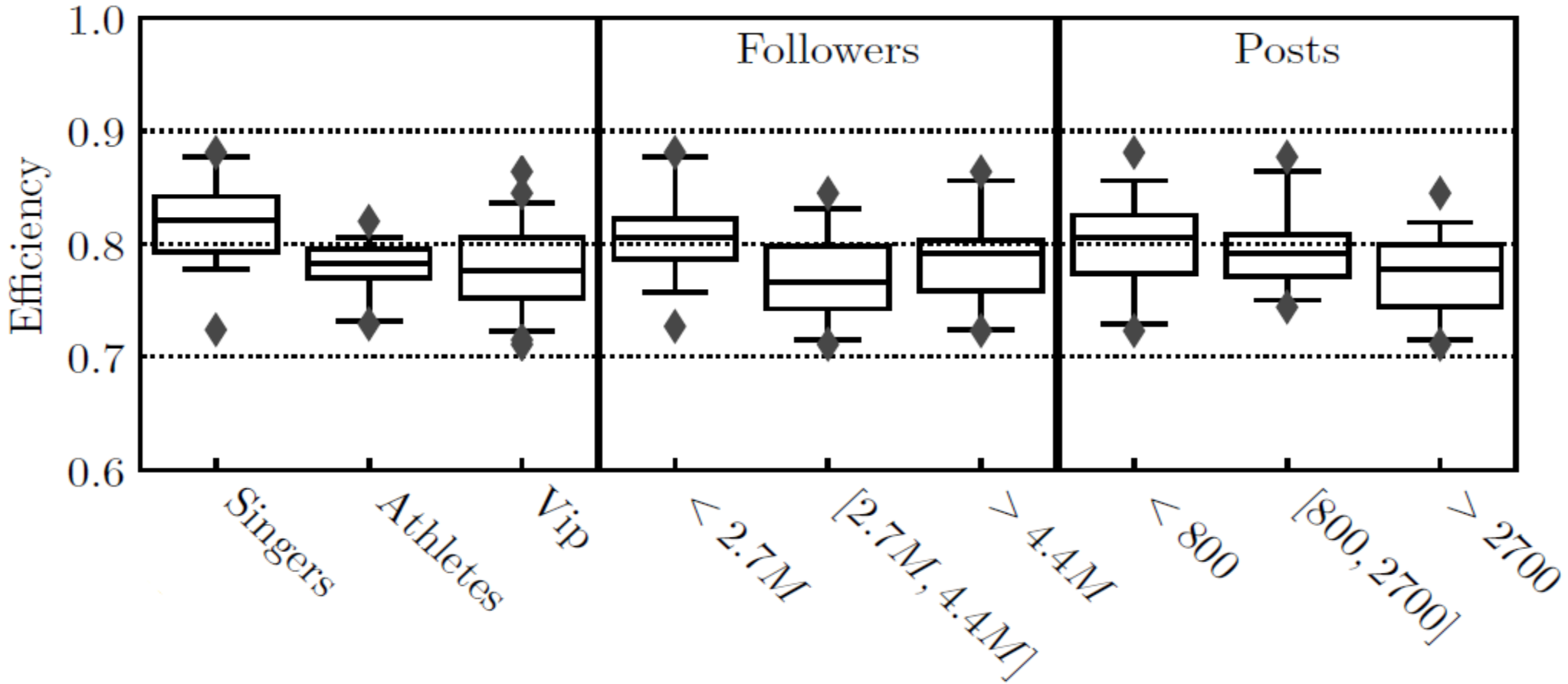
Variables that affects efficiency

- Profiles with lower **fanbase cardinality** are more efficient



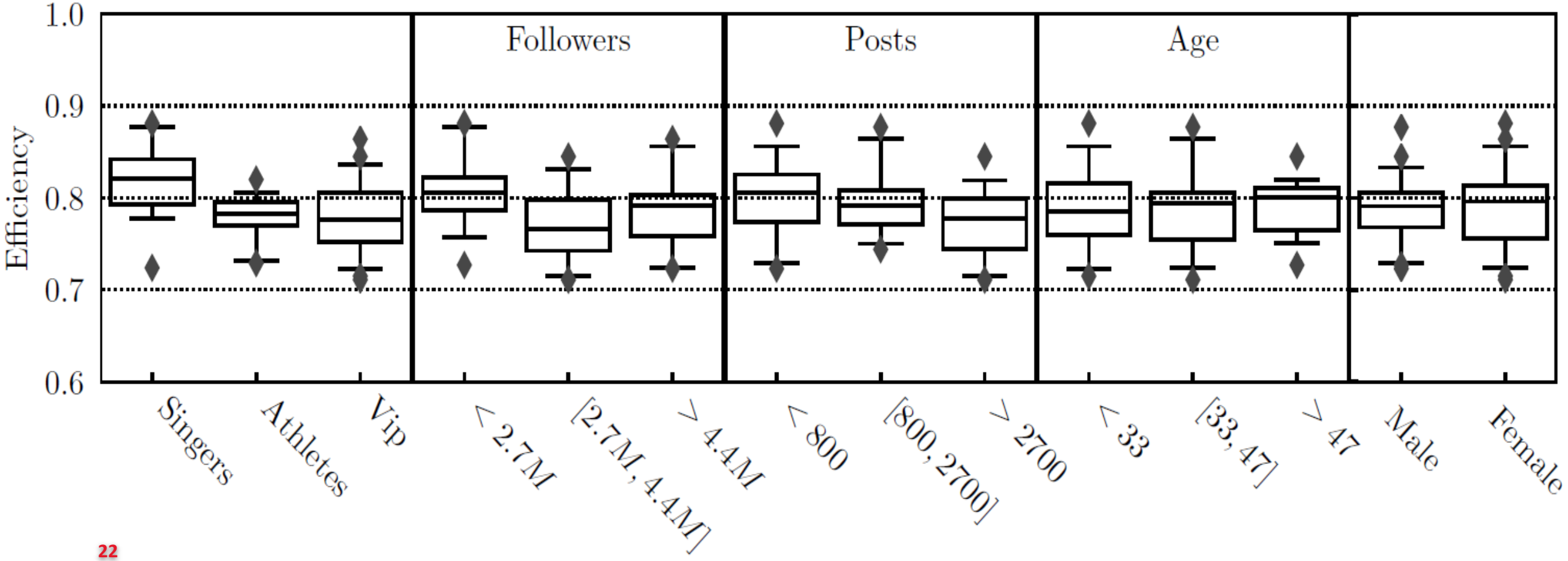
Variables that affects efficiency

- Profiles with **less posts** are more **efficient**



Variables that affects efficiency

- **Gender** and **age** do not affect efficiency in a notable way



Conclusion

- We proposed to study the **dynamics of influencers on OSNs** using **statistical tools** from the **financial field**

- Our early investigations reveal that **short-term trends** in **follower** variation tend to co-occur with those found in **external sources** of data (Google Trends in our case)
  - similarly to what researchers have found for the stock market

- This analogy might help in designing **decision support systems** to help **influencers** and **advertisers** to correctly estimate short-term trends and exploit them

Next steps

- Investigate **other Online Social Networks**
  - Facebook
  - Tik Tok
- Take **other exogenous sources** as input
  - Number of news (obtained e.g. by web scraping)
- Explore the **correlation** between **other influencer's characteristics** and **efficiency**
- Apply **other financial instruments** to Online Social Network Analysis

Early results on Facebook

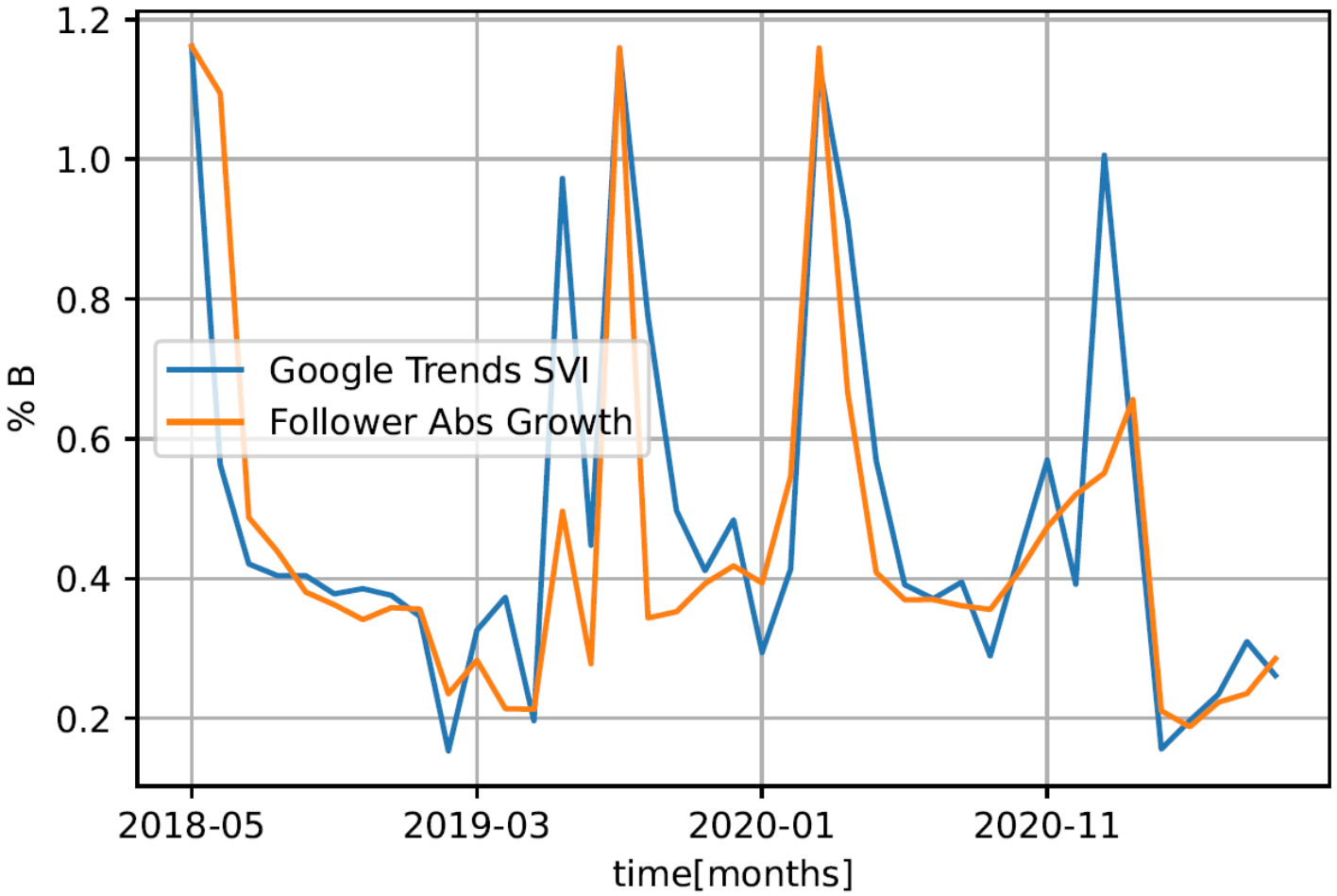
- **Similar behaviors** in terms of influencers efficiency has been found studying Facebook as well

- Efficiency

  - Facebook 0.76 ± 0.04

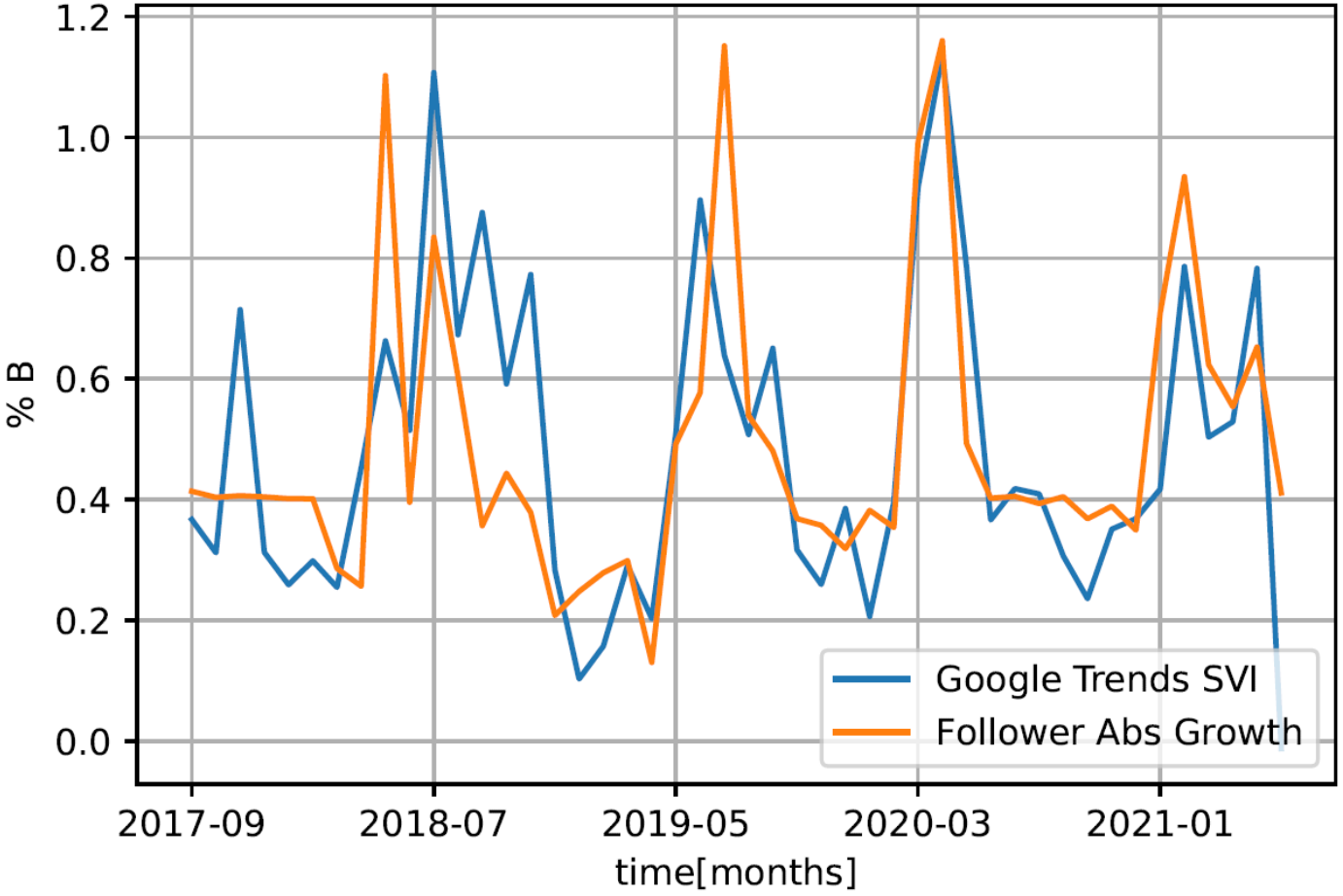
  - Instagram 0.79 ± 0.04

Examples of efficient influencers



Efficiency (Giuseppe Conte) = 0.89

Examples of efficient influencers



Efficiency (Christian Vieri) = 0.86

Q&A Time

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Thank you for your **attention**

QUESTIONS ?