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 to 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 of search queries in Google Search across 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

\[
\%B(t) = \frac{\text{signal}(t) - \text{lower\_band}(t)}{\text{upper\_band}(t) - \text{lower\_band}(t)}
\]
Dynamic Normalization and Scaling

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

![Graph showing followers growth rate and Google Trends SVI](image)

**Elettra Lamborghini**

**Min-Max Normalization**
Dynamic Normalization and Scaling

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

Elettra Lamborghini
Dynamic Normalization through Bollinger %B
Dynamic Normalization and Scaling

• The %B can be employed to **normalize** and **scale** signals with **diverse orders of magnitude** and **volatility**
The «Efficiency» measure

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

\[
Efficiency = 1 - \frac{\sum_{t} |\%B(t)_{signal} - \%B(t)_{SV1}|}{\sum_{t} 1}
\]

- 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 $0.76 \pm 0.04$
  
  • Instagram $0.79 \pm 0.04$
Examples of efficient influencers

Efficiency (Giuseppe Conte) = 0.89
Examples of efficient influencers

Efficiency (Christian Vieri) = 0.86
Thank you for your attention

QUESTIONS ?