Algorithmic Trading Systems Based on Google Trends

- Raúl Gómez Martínez
- Camilo Prado Román
- Carmen de la Orden de la Cruz

About Us
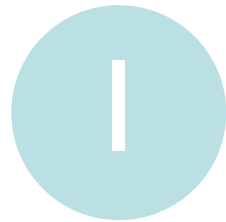

Investigation:
Research Line: "Economía Emovcional" related to Behavioral Finance and Investors' Mood

I + D → IA for AM

Tecnology:
Elaboration fo financial products and service form previous research

- Big Data algoritmic trading sistems based on IA models using exclusively Investors' Mood

Conceptual Framework

1.- Changes in investors' mood provide evidence of anomalies in the behavior of stock markets (Nofsinguer, 2005, Corredor, Ferrer and Santamaría, 2013)

We observe these changes in:
- Weather (Hirshleifer and Shumway, 2003, Jacobsen and Marquering, 2008)
- Seasonal patterns like vacations "sell in May and go away" or the "Halloween" effect (Bouman and Jacobsen, 2002; Marshall 2010)
- Moon (Yuan, Zheng and Zhu, 2006)
- Sports results (Edmans, García and Norli, 2007; Chang, Chen, Chou and Lin, 2012; Berument, Ceylan and Gozpinar, 2006; Kaplanski and Levy, 2010; Mishra and Smyth, 2010; Gómez and Prado,2014).

2.- How to measure mood to predict market trends (Hilton, 2001) Big Data approach:
- Wu et al. (2013) use big data to predict market volatility,
- Moat et al. (2013) use Wikipedia to determine investor feelings,
- Gómez (2013) elaborated a "Risk Aversion Index" based on the stats of Google Trends.

Hypothesis and Data

H_1: A big data algorithmic trading system based on artificial intelligence models over investors' mood using Google Trends can generate positive returns.

We will validate this hypothesis if we reach three evidences:
1. Profit/Loss amount is positive including license costs and trading commissions.
2. Success rate is higher than 50%
3. Profit factor is higher than 1

Goggle Trends: Data available from 2004 in a monthly base.

Prospective analysis starts in January 2017 and ends in February 2018

All the quotes and stats used in this study has been provided by Trading Motion. https://www.tradingmotion.com/

The Data Mining tool used has been dVelox developed by Apara. http://www.apara.es/es/

Universidad Rey Juan Carlos
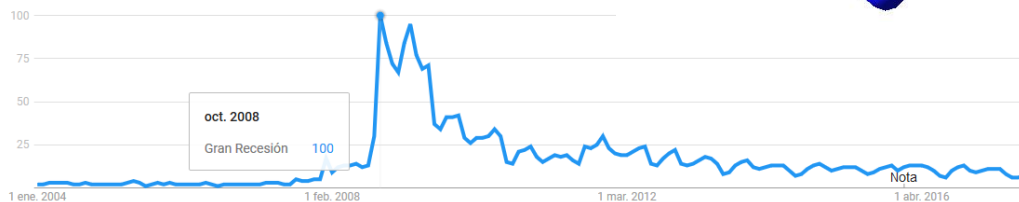
Methodology

Data publication — **Training** — **Prediction** — **Trading**

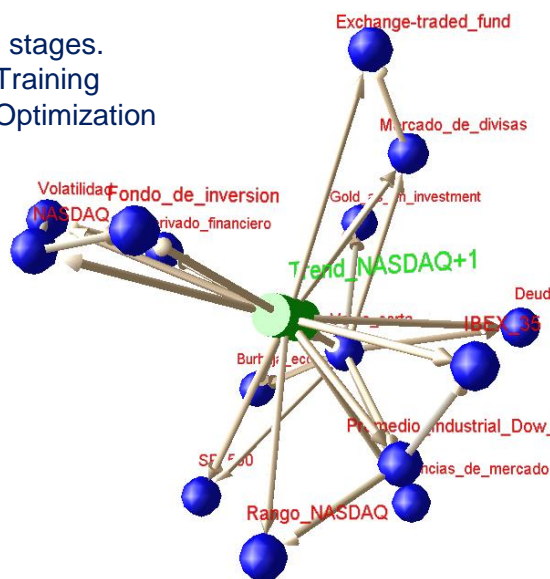Google search statistics of economic and financial terms that are correlated with the evolution of the market

With the available data, a model is constructed that explains the evolution of the index

Two stages.
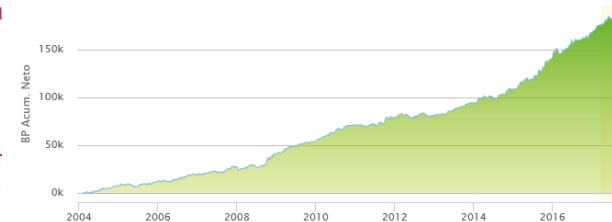1. Training
2. Optimization

Prediction for the next month

Swing trading systems maintain long or short position depending on the prediction of the previous model

Gran Recesión
Tema

Todo el mundo ▾ | 2004 - hoy ▾ | Todas las categorías ▾ | Búsqueda web ▾

Interés a lo largo del tiempo

oct. 2008
Gran Recesión 100

1 ene. 2004 | 1 feb. 2008 | 1 mar. 2012 | 1 abr. 2016

Exchange-traded_fund

Mercado_de_divisas

Gold_as_an_investment

Volatilidad Fondo_de_inversion
NASDAQ Derivado_financiero

Trend_NASDAQ+1

Deud...
IB5X_35

Burb... eco...

Pro...medio_Industrial_Dow_...
...ncias_de_mercado
SP_500

Rango_NASDAQ

★ Google Monthly Trend NQ

Todo el periodo
02/02/2004 - 15/09/2017 ▾

RESULTADO TOTAL DESDE 02/02/2004	RESULTADO AUDITADO DESDE 01/04/2017	RESULTADO LIVE DESDE -	PEOR DRAWDOWN	CAPITAL SUGERIDO	CAPITAL REQUERIDO
186617 € (+39.1%)	9640 €	0 €	-8345 €	35000 €	5100 €

Management & Business Economics Research Group

Universidad Rey Juan Carlos

Results

Example of Bayesian Network Trained (Google Trends Monthly Nasdaq)

Results

Performance of Google Trends Monthly

Table 1. Performance of Big Data trading algorithmic systems on Investors' Mood

Index	Profit/Loss	Success rate	Profit Factor	Sharpe Ratio
Ibex 35	-824,00 €	47,80%	0,99	-0,64
Eursotoxx 50	-560,00 €	50,50%	1,00	-0,12
Dow Jones	16.919,00 €	58,20%	1,36	1,52
S&P 500	20.803,00 €	60,70%	1,44	1,86
Nasdaq	34.628,00 €	62.40%	1,54	2,43

Source: Trading Motion (2018)

Conclusions

In this study, we used an innovative approach to check the capability of the behavioral finance and the Investors' Mood to predict the evolution of the financial markets.

We can check that these "pure investors' sentiment" systems can be profitable for the American indexes while the result is poor for European ones.

1. Google Trends is a good investors' sentiment metric for the American indexes studied, closer than global sentiment if Google Trends has been no limited by location. The poor results for Ibex or Eursotoxx suggests a limitation in Google Trends stats for this models in further investigation.
2. Trading systems can be developed using an alternative approach to common systems based on technical analysis. This study has shown how the trading system for Dow Jones, S&P 500 and Nasdaq, based on the predictions of an artificial intelligence model that uses investors' mood from Google Trends to predict is capable to generate positive returns in a long/short strategy.

Next step

★	Sistema	Producto	📊	Tipo	Desarrollador	Fecha inicio	Resultado Total	Sesiones Ganadoras	Profit Factor	ROI Anualizado	Peor Drawdown	Capital requerido	Ratio Sharpe
★	Google Trends Monthly NQ	NQ	▪▪▪	C	InvestMood	02/2004	218301 €	55.9%	1.41	+30.2%	-11259 €	6800 €	1.6043
★	Google Trends Monthly ES	ES	▪▪▪	C	InvestMood	02/2004	186627 €	55.9%	1.30	+23.5%	-13462 €	6800 €	1.1403
★	Google Trends Monthly DJ	YM	▪▪▪	C	InvestMood	02/2004	159841 €	55.7%	1.30	+18.5%	-12230 €	7000 €	1.1674
★	Google Trends Monthly GC	GC	▪▪▪	C	InvestMood	12/2006	335051 €	54.9%	1.32	+17.5%	-19707 €	20200 €	0.9089
★	Google Trends Monthly IBEX	MN	▪▪▪	C	InvestMood	02/2004	45221 €	54.2%	1.34	+20.9%	-3719 €	1600 €	1.2647
★	Google Trends Monthly FDXM	FDXM	▪▪▪	C	InvestMood	02/2004	185430 €	56.2%	1.37	+32.1%	-10582 €	5800 €	1.6721
★	Google Trends Monthly QM	QM	▪▪▪	C	InvestMood	02/2004	221477 €	54.9%	1.35	+43.8%	-10290 €	3800 €	1.6781
★	Google Trends Monthly FESX	FESX	▪▪▪	C	InvestMood	02/2004	21958 €	50.1%	1.06	+3.04%	-16256 €	4300 €	0.1617

https://www.tradingmotion.com/Strategies/Explore

Next step

Google Trends Monthly NQ

Desde Operativa Real
07/12/2017 - 06/07/2018

DESARROLLADOR
InvestMood

PRODUCTO
Futuro E-mini Nasdaq (USD)

TIPO DE SISTEMA
Continuo

COSTE
50 € / mes ⊕

Resultado Total desde 02/02/2004 ⊕	Resultado Verificado desde 01/04/2017	Resultado Live desde 07/12/2017	Peor Drawdown	Capital Sugerido ⊕	Capital Requerido ⊕
218301 € (+30.2%)	41324 €	26591 €	-11259 €	50000 €	6800 €
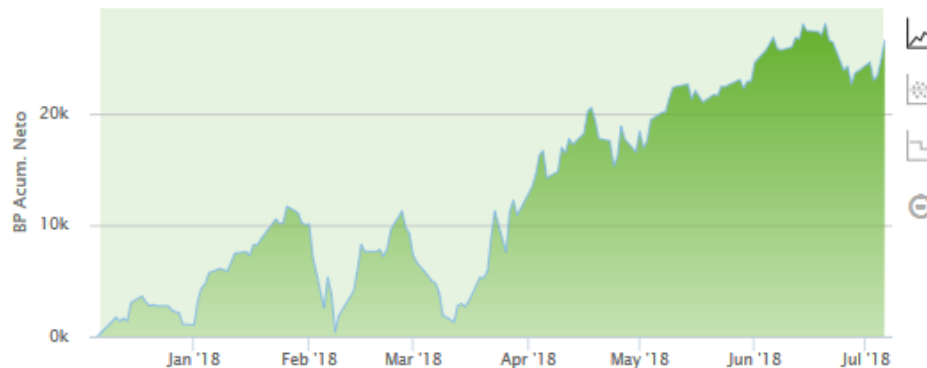
Estadísticas 07/12/2017 - 06/07/2018

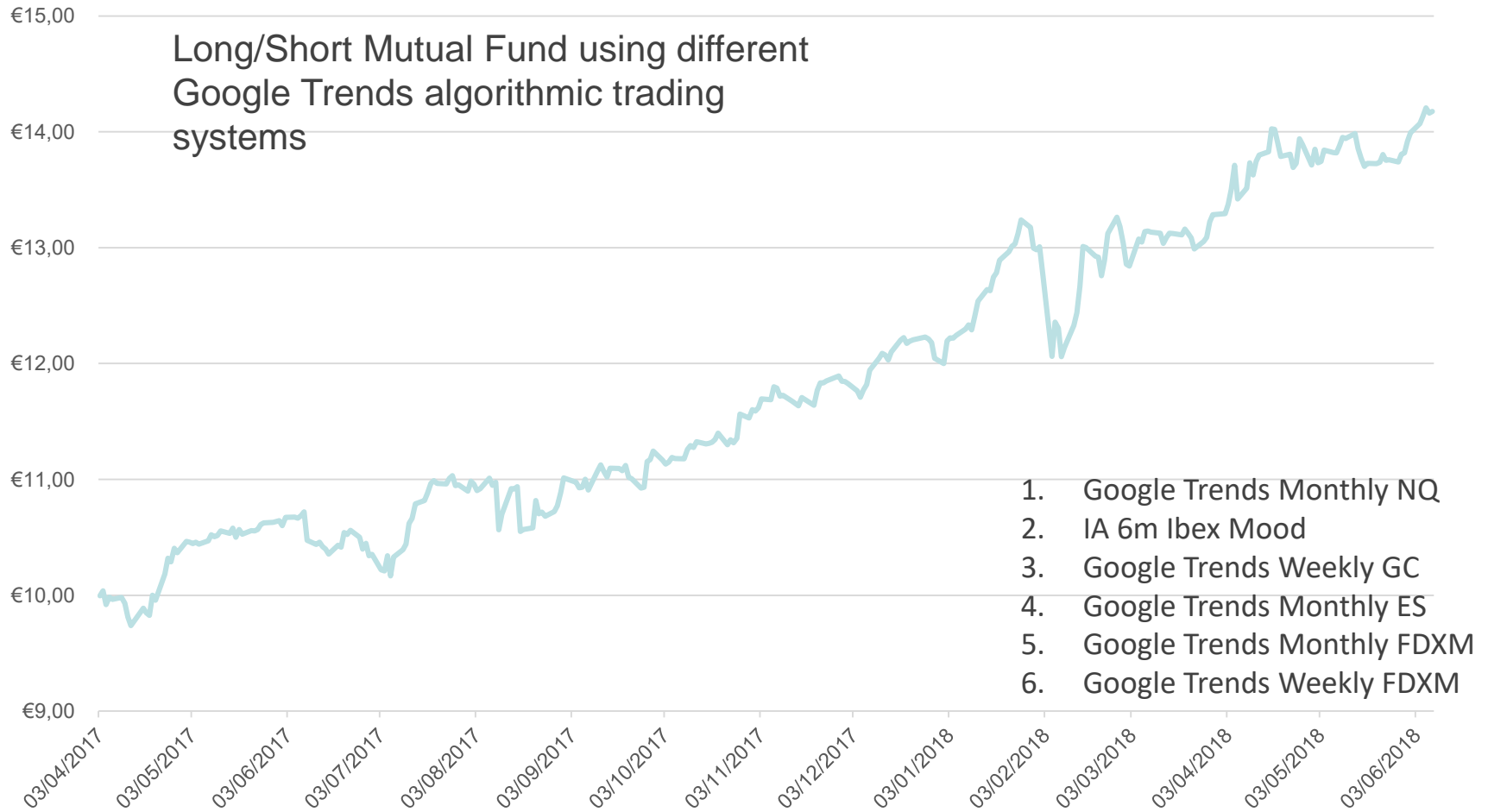|					
Sesiones Analizadas ⊕	151	Sesiones Ganadoras ⊕	55.7%	Peor Drawdown ⊕	-11259 € (08/02/2018)
Resultado Total ⊕	26591 €	Racha Beneficios Actual ⊕	26157 €	Drawdown Actual ⊕	-1489 € (21/06/2018)
ROI Anualizado ⊕	+92.0%	Mejor Sesión ⊕	3616 € (27/03/2018)	Peor Sesión ⊕	-4598 € (05/02/2018)
Profit Factor ⊕	1.45	Promedio Sesión Ganadora ⊕	1047.68 €	Promedio Sesión Perdedora ⊕	-909.34 €
Comisión por contrato ⊕	$8.00	% Tiempo con Posición Abierta ⊕	100%	Slippage por contrato ⊕	-0.2446 (4.01 €)
Rating TM ⊕	3/3	Ratios Sharpe / Sortino ⊕	2.2256 / 3.7324	Ratios Sterling / MAR ⊕	0.0000 / 4.8471

Resultados mensuales   Log Operaciones   Log Sesiones   ☐ Backtesting ☐ Verificado ☐ Live Trading

Año	Ene	Feb	Mar	Abr	Ma	Jun	Jul	Ago	Sept	Oct	Nov	Dic	Total	Total %
2018	8931 €	-799 €	1665 €	5683 €	6325 €	949 €	2737 €	-	-	-	-	-	25489 €	51.0%
2017	-	-	-	-	-	-	-	-	-	-	-	1101 €	1101 €	2.2%

Management & Business Economics Research Group

Universidad Rey Juan Carlos

VLP Simulation

Long/Short Mutual Fund using different
Google Trends algorithmic trading
systems

1. Google Trends Monthly NQ
2. IA 6m Ibex Mood
3. Google Trends Weekly GC
4. Google Trends Monthly ES
5. Google Trends Monthly FDXM
6. Google Trends Weekly FDXM

Thank You

**Raúl Gómez Martínez*:*

✉ raul@investmood.com

🌐 www.investmood.com

🐦 @InvestMood

in https://es.linkedin.com/company/investmood-fintech