



Creating Opportunities

# **World Seaborne Trade in Real Time: A proof of Concept for Building AIS-based Nowcasts from Scratch**

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Comments by Alvaro Ortiz Vidal-Abarca

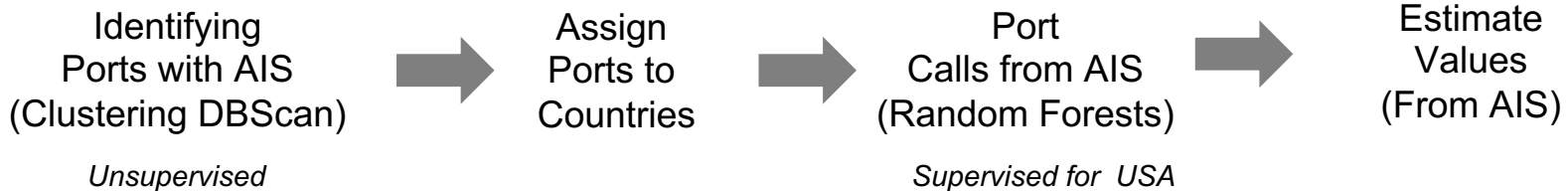
**Modelling with Big Data & Machine Learning: Measuring Economic Instability**

The Bank of England, The Federal Reserve Board and King's College London

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# What's the paper about

- Identify Maritime trade flows by identifying Port Calls from AIS Messages using Machine Learning Techniques



- A proxy of “Global Trade Goods” in Real Time (Nowcasting/ Forecasting as LI )
- Good predicting power for some countries (High Correlation) and sectors
- Useful for for Nowcasting, Sectoral analysis and Event Analysis

## Is the paper relevant? Yes

- **Uses an innovative source of Data (AIS Messages)**
- **Provide some Guidelines to convert AIS in useful information**
- **Good predicting power for some countries (High Correlation) and sectors**
- **Useful for for Nowcasting, Sectoral analysis and Event Analysis**

# The Question of Timing matters and is different according the type of goods or services

75%

Trade in  
Goods  
(customs)

25%

Trade in  
Services

*Time* →

Sea

AIS,  
Satellite  
Port registry  
...

Road

Mobility  
Customs info  
...

Air

Air flights info  
Airports registry  
...

Transaction  
Payments

(depending if Payment = Time of delivery)

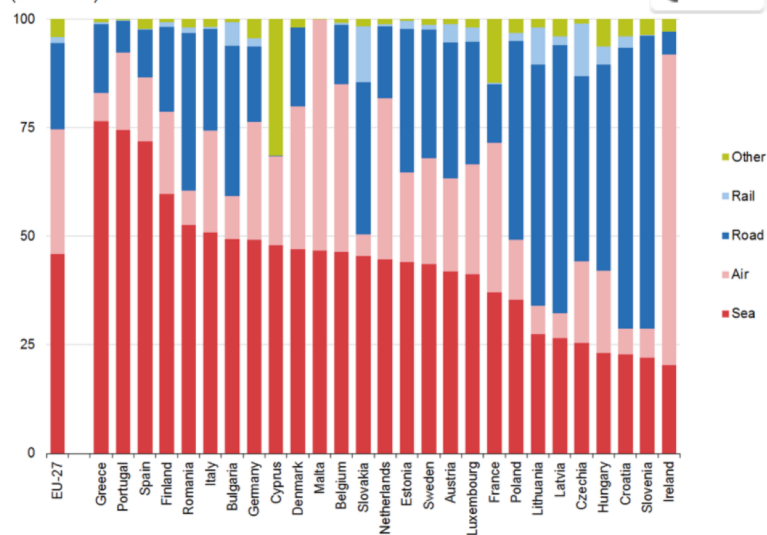
Firm to Firm Transaction  
Payments  
(depending if  
Payment=Customs)

# The question of Correlation and Global Nowcasting Accuracy

- **Correlations**: Higher in Levels (Non Stationary), Lower in Growth Rates (stationary)  
Levels: Total :0.85 Exports :0.85 Imports: 0.86      Growth: Total :0.40 Exports :0.32 Imports: 0.40
- **Seasonality Matters**: Non equivalent Seasonality correction could be also affecting
- Another reason to use **Growth rates**
- Enhance the **Cross Validation** (Cross checking with alternative data Road & Air)

# The question of representatives of the sample and mode of transport could be affecting too? Extending the Supervised Random Forest to other countries is important but other things will remain (check USA)

Value of extra EU-27 exports, by mode of transport, 2019  
(% of total)



Source: Eurostat (online data code: DS-022469)

eurostat

Table 6. Benchmarking GTI indices at the economy level

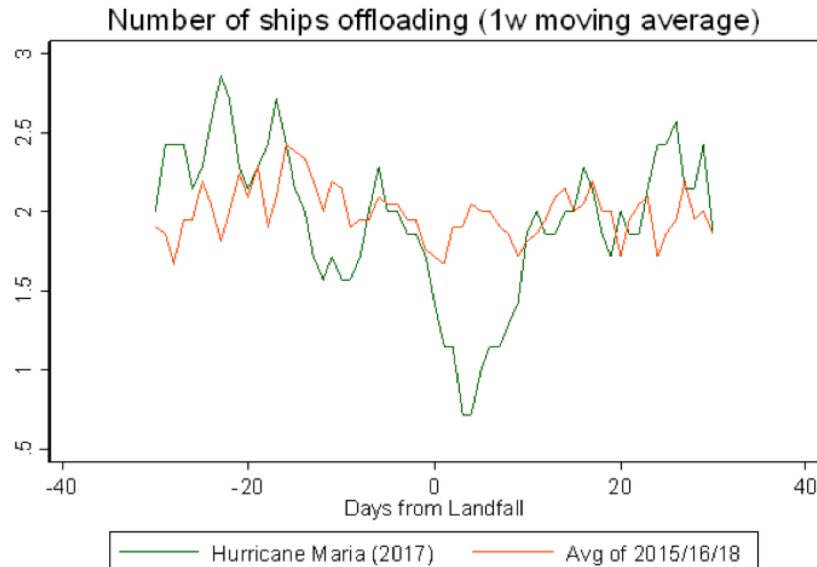
	Raw (level)			Transformation and Trade Flow 3m mov. av. (level)			3m/3m growth		
	Import	Export	Total	Import	Export	Total	Import	Export	Total
	Malta	0.09	-0.23	-0.14	-0.21	-0.16	-0.27	-0.13	-0.19
India	0.78	0.32	0.69	0.84	0.30	0.70	-0.13	0.17	-0.05
Estonia	0.05	0.28	0.13	0.07	0.43	0.20	-0.03	0.09	0.01
Rep. of Korea	0.41	0.37	0.42	0.46	0.59	0.54	-0.02	-0.11	-0.22
Taiwan Province of China	-0.13	0.41	0.22	-0.21	0.51	0.23	0.02	0.22	0.19
Romania	0.61	0.16	0.55	0.74	0.05	0.70	0.03	0.15	0.16
Netherlands	0.05	0.62	0.55	0.18	0.72	0.71	0.04	0.21	0.24
Germany	0.44	-0.08	0.36	0.63	-0.04	0.57	0.05	-0.23	-0.13
Lithuania	0.62	0.63	0.73	0.83	0.83	0.92	0.07	0.48	0.16
New Zealand	0.63	0.32	0.62	0.84	0.68	0.84	0.08	0.32	0.32
Cyprus	0.14	-0.08	-0.19	-0.01	-0.26	-0.25	0.08	-0.01	-0.11
Brazil	0.32	0.43	0.35	0.54	0.56	0.55	0.11	0.62	0.42
USA	0.58	0.87	0.85	0.66	0.92	0.89	0.12	0.38	0.32
Russian Federation	0.03	0.87	0.59	0.05	0.89	0.67	0.19	0.19	0.15
United Kingdom	-0.09	0.21	0.21	-0.26	0.37	-0.04	0.19	0.38	0.42
Canada	0.71	0.62	0.73	0.84	0.75	0.86	0.19	0.49	0.08
Finland	0.54	0.57	0.70	0.71	0.77	0.83	0.23	-0.23	0.05
Argentina	0.58	0.69	0.45	0.77	0.68	0.48	0.23	0.72	0.49
Indonesia	0.68	0.12	0.53	0.78	0.23	0.67	0.23	0.03	0.06
Slovenia	0.39	-0.25	0.26	0.64	-0.39	0.51	0.24	-0.06	0.20
Mexico	0.76	0.57	0.80	0.81	0.68	0.87	0.26	-0.12	0.08
Singapore	0.43	-0.29	0.18	0.56	-0.56	0.15	0.26	0.29	0.16
Greece	0.70	0.80	0.82	0.86	0.86	0.89	0.27	0.44	0.38
Poland	0.89	-0.30	0.85	0.95	-0.43	0.91	0.28	0.04	0.12
Belgium	0.41	0.24	0.40	0.69	0.48	0.66	0.28	-0.24	-0.01
Latvia	0.65	-0.37	0.50	0.82	-0.44	0.67	0.30	0.15	0.10
Ireland	0.57	-0.28	0.29	0.82	-0.52	0.45	0.31	-0.05	0.11
Portugal	0.20	-0.62	-0.49	0.28	-0.76	-0.63	0.31	0.42	0.24
Spain	0.67	0.73	0.74	0.85	0.82	0.86	0.31	-0.04	0.02
Denmark	0.44	0.31	0.55	0.75	0.56	0.78	0.33	-0.15	0.40
Australia	0.48	0.24	0.53	0.69	0.15	0.63	0.31	0.46	0.19
Norway	0.36	0.27	0.33	0.59	0.40	0.60	0.33	0.22	0.09
Euro Area	0.76	0.76	0.83	0.89	0.89	0.93	0.34	0.11	0.04
France	0.45	0.10	0.46	0.67	0.03	0.54	0.34	0.37	0.31
China	0.56	0.69	0.71	0.56	0.76	0.75	0.39	0.49	0.46
Iceland	0.56	0.30	0.59	0.80	0.50	0.85	0.39	0.44	0.42
<b>WORLD</b>	<b>0.85</b>	<b>0.85</b>	<b>0.86</b>	<b>0.88</b>	<b>0.87</b>	<b>0.88</b>	<b>0.40</b>	<b>0.32</b>	<b>0.40</b>
Bulgaria	0.30	0.44	0.43	0.45	0.59	0.67	0.40	0.33	0.33
Hong Kong SAR, China	0.26	-0.37	-0.20	0.44	-0.48	-0.22	0.42	-0.18	0.00
Croatia	0.44	-0.10	0.38	0.58	-0.15	0.46	0.43	-0.06	0.29
Italy	0.27	-0.05	0.16	0.31	-0.11	0.12	0.47	-0.05	0.24
Japan	0.30	0.13	0.29	0.33	0.09	0.25	0.49	0.27	0.49
Sweden	0.66	0.03	0.62	0.76	-0.04	0.76	0.53	-0.12	0.30
Turkey	0.68	0.75	0.75	0.77	0.86	0.88	0.68	0.23	0.38

Figure 3: Value of extra EU-27 exports, by mode of transport, 2019

(% of total)

# It's nice tool for event analysis but here there are some questions too ? Shut down on Manufacturing plants (COVID) or sudden stop of Trade Finance?

**Figure 13. Hurricane Maria in Puerto Rico**



- How the sea trade react when a sudden Stop of GVC happens (Covid)
- How the sea trade is affected when Trade Finance Collapse
- It would be interesting how this affect AIS signal ?

# Summing Up

- The paper is relevant, uses an innovative source of Data and can be used as a Leading Indicator
- It's work in progress and the authors introduce further research helping to correct somehow. Specially to adapt training sets to other countries
- Reinforce the cross validation with alternative Trade data maybe useful to test other modes of Transport & Payments)
- A useful tool to analyze Non Linear Crisis moments