



Trade fear behind the image of the Belt and Road Initiative: A Big Data Analysis

Alicia Garcia-Herrero

BRUEGEL and HKUST

Jianwei Xu

Beijing Normal University

With contribution from Hanrui Li

Content

1. Motivation and objective
2. Data and methodology
3. Results
4. Conclusions

1. Motivation and objective





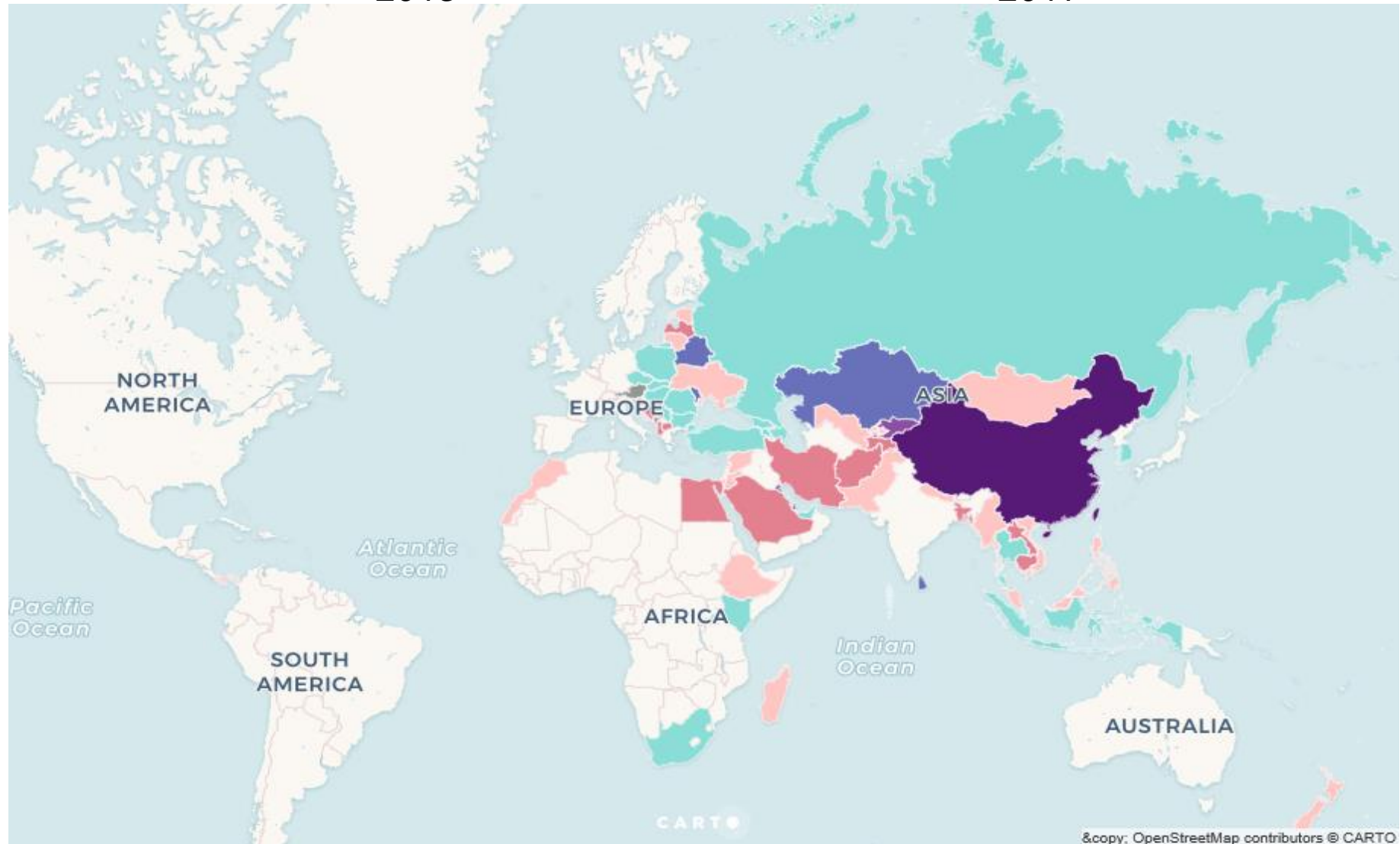
Background

- In 2013, China embarked on its grand project of **the Belt and Road Initiative (BRI)** to promote infrastructure connectivity in the Eurasian area. In fact, the Belt and Road Initiatives have been officially supported by sixty-six countries (as of May 2018).
- With the massive financing that China is bringing to Belt and Road countries to build infrastructure, the recipients should, in principle, view China's grand plan very positively. However, there is no systemic evidence of **how this project fears** among recipient countries and, more generally, globally.
- Given the above pros and cons of the BRI, it seems important to offer a quantitative assessment of the **image of BRI** across the globe, both for countries which make part of the Initiative but also for others.
- Finally, we **investigate empirically what may be the key reasons for such perception** at the country level



A dynamic view of the Belt and Road

China 2013 2014 2015 2016 2017 2018



Source: www.gdelt.org & CARTO



Our country classification

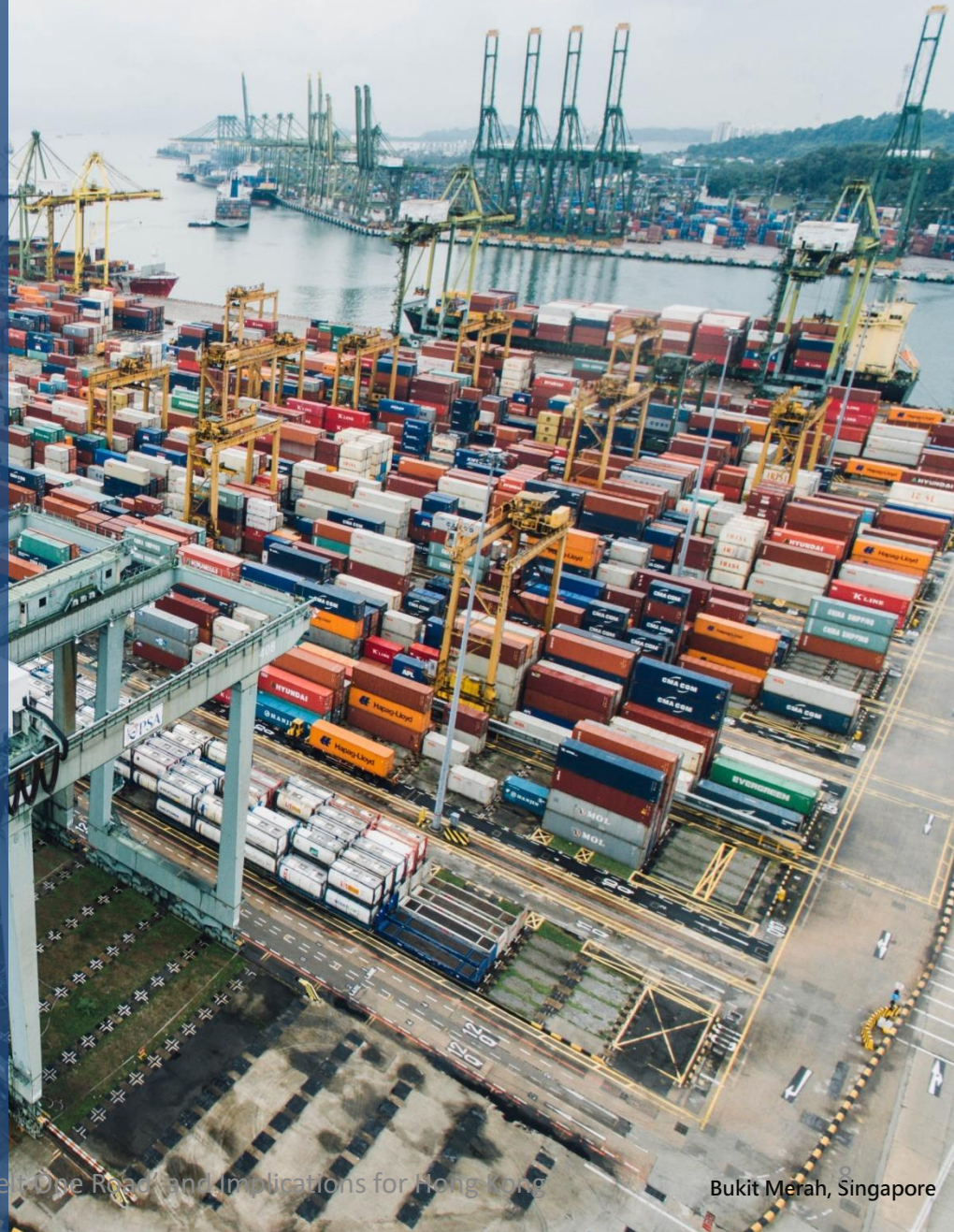
BRI country									Non-BRI country
Narrow BRI country								Broad BRI country	
East Asia & Pacific	Central Asia	South Asia	Europe		Latin America and the Caribbean	Middle East & North Africa	Sub-Saharan Africa		
			EU	Non-EU					
Brunei	Kazakhstan	Afghanistan	Austria	Albania	Antigua and Barbuda	Egypt	Ethiopia	Bahrain	Belgium
Cambodia	Kyrgyzstan	Bangladesh	Bulgaria	Armenia	Bolivia	Iran	Kenya	Bhutan	Cyprus
Indonesia	Tajikistan	Maldives	Croatia	Azerbaijan	Guyana	Israel	Madagascar	India	Canada
Korea	Uzbekistan	Nepal	Czech Republic	Belarus	Panama	Jordan	South Africa	Iraq	Denmark
Laos		Pakistan	Estonia	Bosnia and Herzegovina	Trinidad and Tobago	Kuwait	Senegal	Turkmenistan	Finland
Malaysia		Sri Lanka	Hungary	Georgia		Lebanon	Rwanda	Yemen	France
Mongolia			Latvia	Macedonia		Morocco			Germany
Myanmar			Lithuania	Moldova		Oman			Greece
New Zealand			Poland	Montenegro		Qatar			Japan
Niue			Romania	Russia		Saudi Arabia			Malta
Papua New Guinea			Slovak Republic	Serbia		Syria			Ireland
Philippines			Slovenia	Turkey		United Arab Emirates			Italy
Singapore				Ukraine		Tunisia			Luxembourg
Thailand									Netherlands
Timor-Leste									Norway
Vietnam									Portugal
									Spain
									Sweden
									Switzerland
									United Kingdom
									United States



Objective of the project

- Quantitatively assess the global perception of the Belt and Road Initiative.
- Identify the key factor explaining each country's image of the Initiative and the direction in which the frequency in which these topics are discussed in the news affect the image of BRI in different countries.
- More specifically, the perception can be further captured by answering two questions:
 - How **well** received it is?
 - What is the key **factor/s** behind such image?

2. Data and methodology

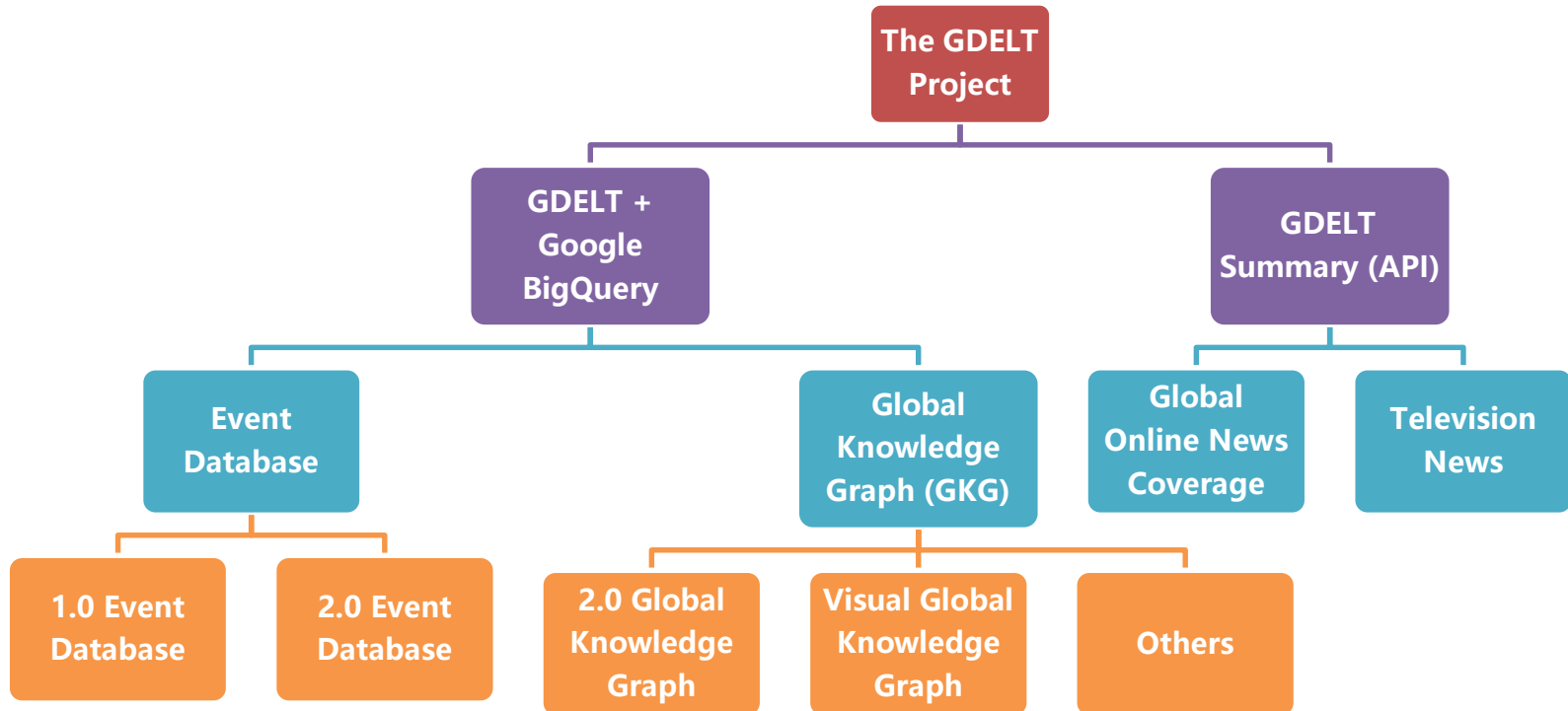




Source of big data

Our big data source is **Global Database of Events, Language, and Tone (GDELT)**

- **Content coverage:** Print, broadcast, and web news media in over 100 languages
- **Time span:** Jan 1, 1979 to present; Update every 15 minutes
- **Identification of tone:** Built-in tonal dictionary





Two approaches to GDELT

Table 1 Comparison between two data pools

	GDELT	GDELT Summary
Chosen keyword(s)	Key words are restricted within the built-in dictionary for institutions and/or events For the project, only "One Belt and One Road" is available	No restriction on the choice of key words for search
Content coverage	Print, broadcast and online news	Online news
Time coverage	Jan 1, 1979 to present	The past 355 days before the date of search
Extraction method	SQL in Google BigQuery	Application Programming Interface (API)

Our choice since concept not in GDELT dictionary and also recent enough to use summary



We look for several definitions relating to Belt and Road

- One Belt, One Road
 - “China’s ‘**one belt, one road**’ initiative has been much talked about for the past two years, ...”, SCMP Editorial, *South China Morning Post*, April 02, 2015
- The Belt and Road Initiative
 - “In concrete terms, **the Belt and Road initiative** is an immensely ambitious development campaign, ...” – Tom Phillips, *The Guardian*, May 12, 2017
- New Silk Road
 - “If the **new Silk Road** is symbolized by images of stasis – police checkpoints, long lines of trucks and barbed wire – there won’t be much to remember.” – Jonathan Hillman, *The Washington Post*, February 14, 2018



Which media to focus on

- We use **public media** as the best channel to reflect the mainstream public opinion.
 - Beyond official or elites' opinions
 - Exclude extreme opinions
- Why we exclude social media?
 - Avoid noisy and volatile opinions
 - Avoid fake news



Construction of the key sentiment measurement

- Tone: as proxy for the image of BRI
- Step 1: calculate the tone of a specific article c in country j

$$T_{j,c} = \frac{w_{jpc} - w_{jnc}}{w_{jc}}$$

w_{jpc} : the number of words with positive sentiment in article c of country j

w_{jnc} : the number of words with negative sentiment in article c of country j

w_{jc} : the total number of words in article c of country j

- Step 2: calculate the general tone in a country

$$T = \frac{1}{N_c} \sum_j T_{j,c}$$

3. Results

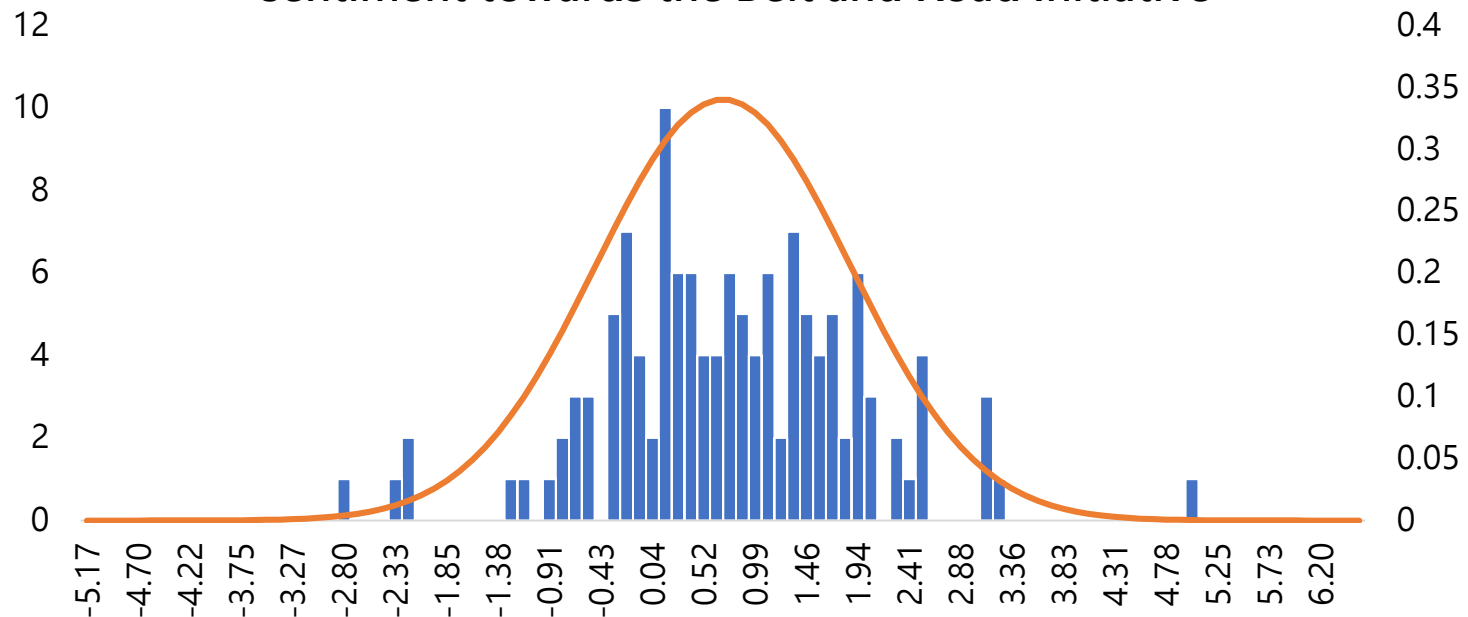




BRI generally perceived positively

Figure 1 reports the summary statistics for our measurement of the sentiments across countries, indicating that the Initiative is on average positively received by the world.

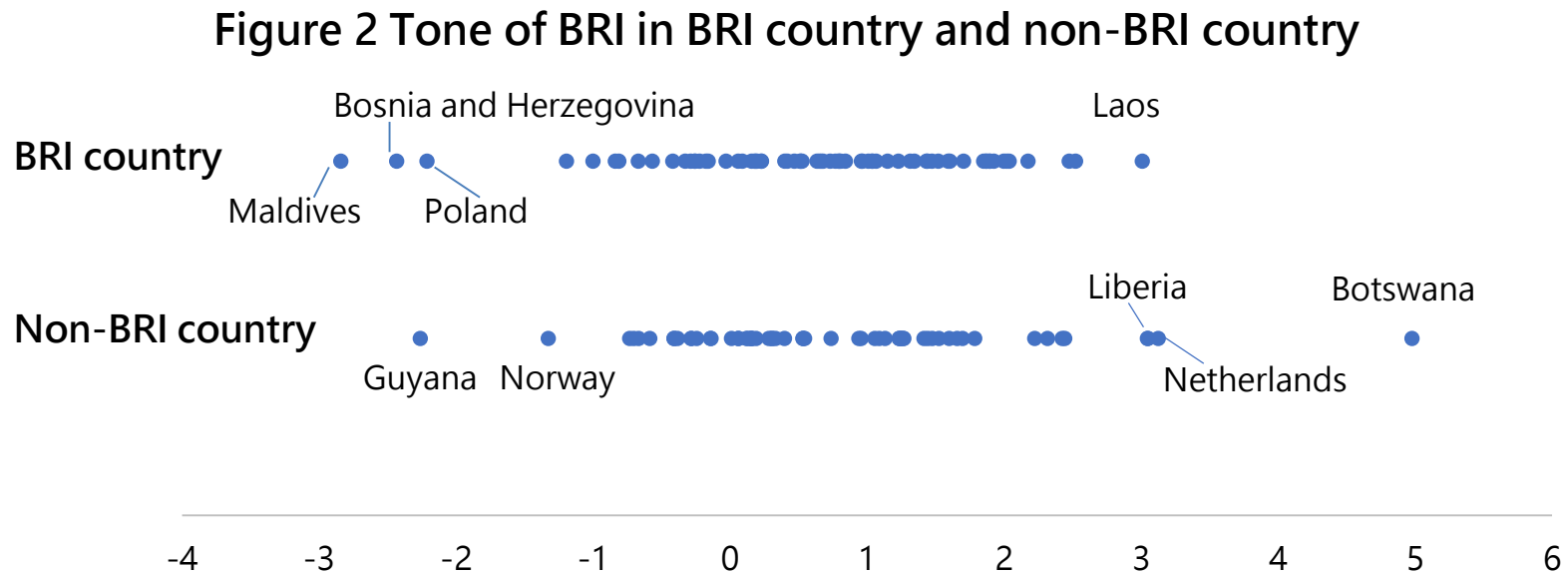
Figure 1 The normal distribution of the 130 countries' sentiment towards the Belt and Road Initiative





BRI perceived similarly among BRI and non BRI countries

In Figure 2, we further compare the tones between BRI countries and Non-BRI countries. Interestingly, the Belt and Road seems only slightly less positive for countries within the Belt and Road geographies than the outsiders, but the difference is statistically insignificant.





Africa has the best image while South Asia the worst

South Asia fears worst in terms of their image of the BRI while Africa fears best. Central Asia and Sub-Saharan Africa showed the most positive perception of the Belt and Road, reflecting China's long-term relationship with the region even before the establishment of the Belt and Road.

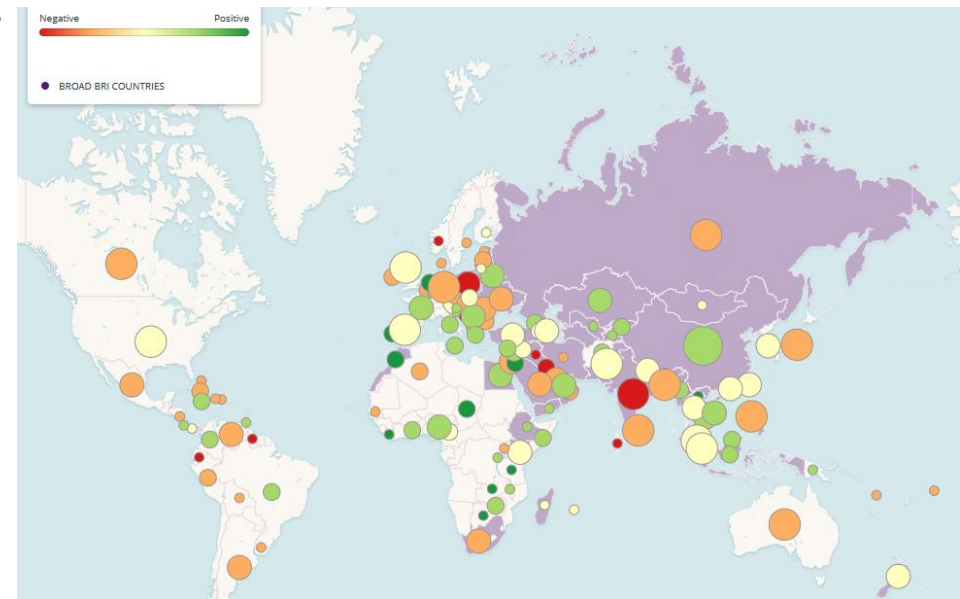
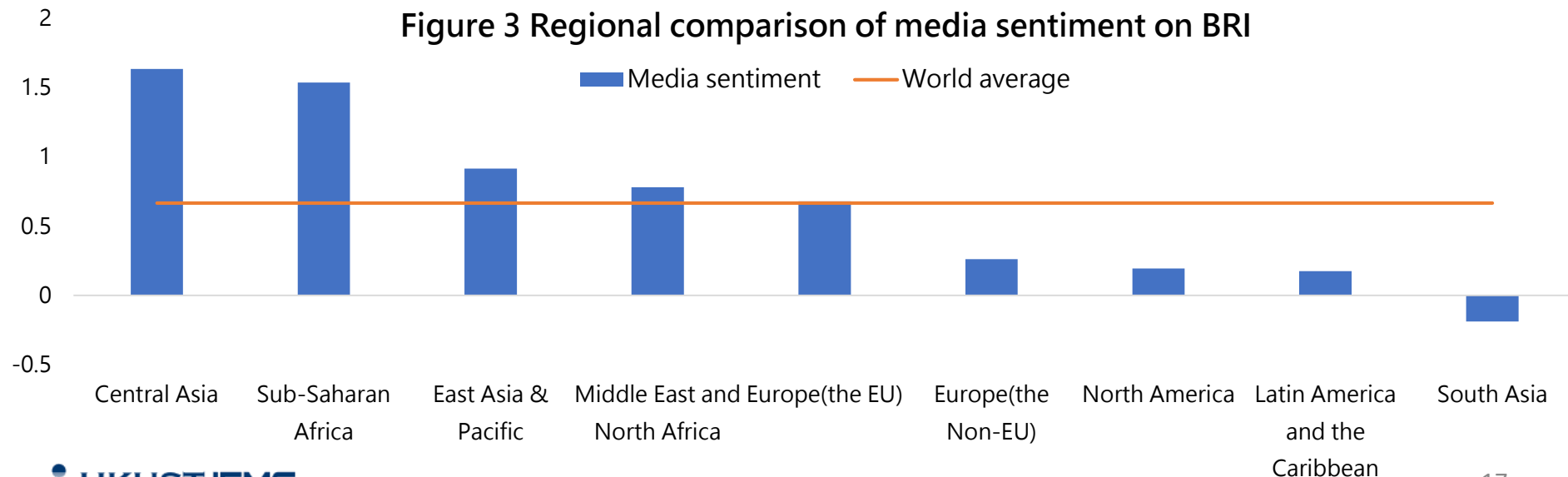


Figure 3 Regional comparison of media sentiment on BRI

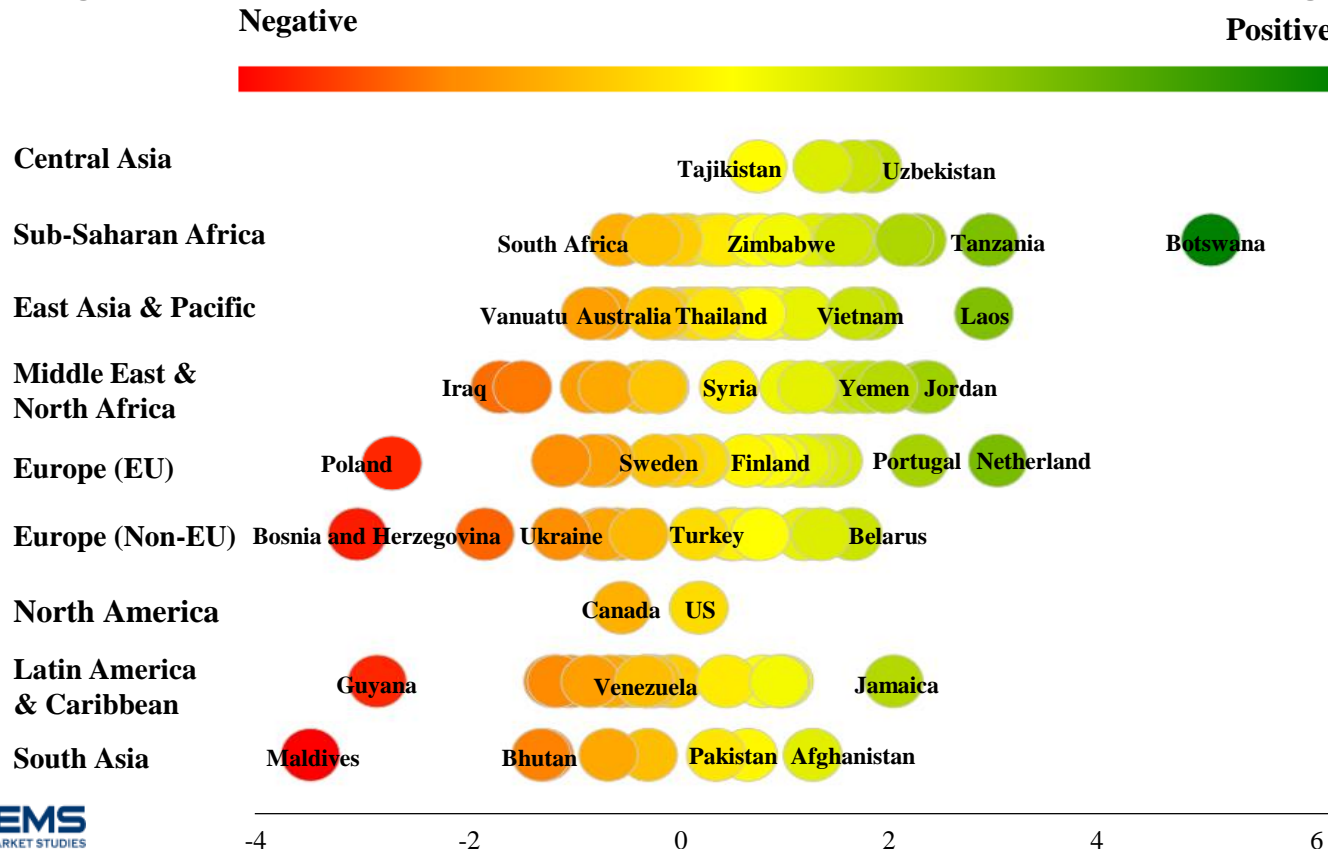




At country level

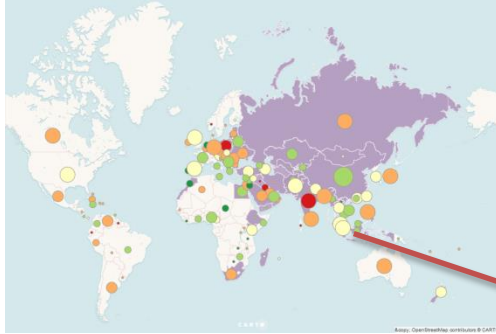
In fact, nearly all Central Asian countries show very positive attitudes towards the Initiative. East Asia & Pacific show generally strong support of the BRI. In Europe, the EU countries seem more positive about the Belt and Road than the non-EU European countries. The South Asian countries take a negative attitude against the Chinese plan.

Figure 4 Distribution of sentiment within 130 countries and regions





Regional Comparison Southeast Asia



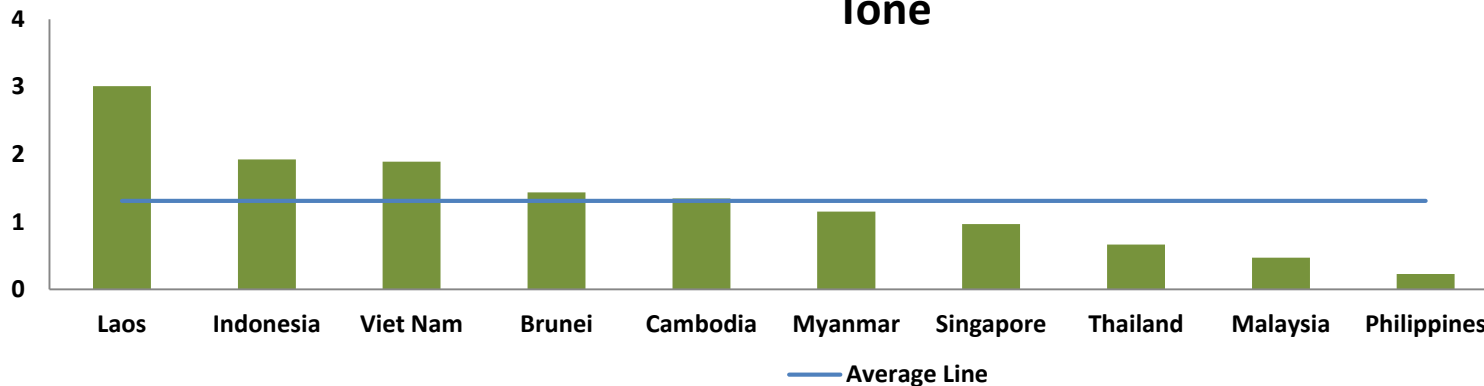
Top Positive Tone

Laos	3.01
------	------

Top Negative Tone

Philippines	0.22
-------------	------

Tone



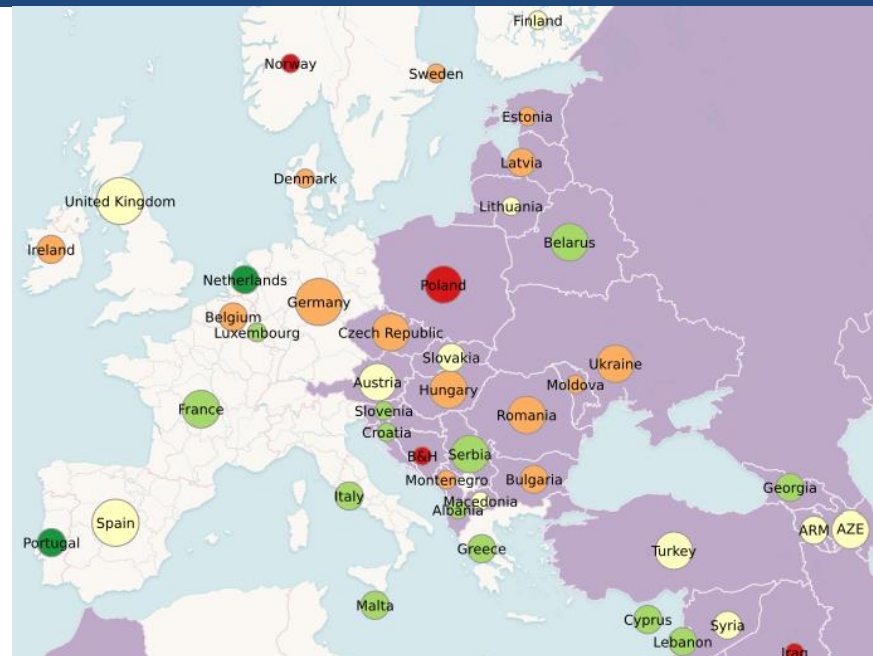
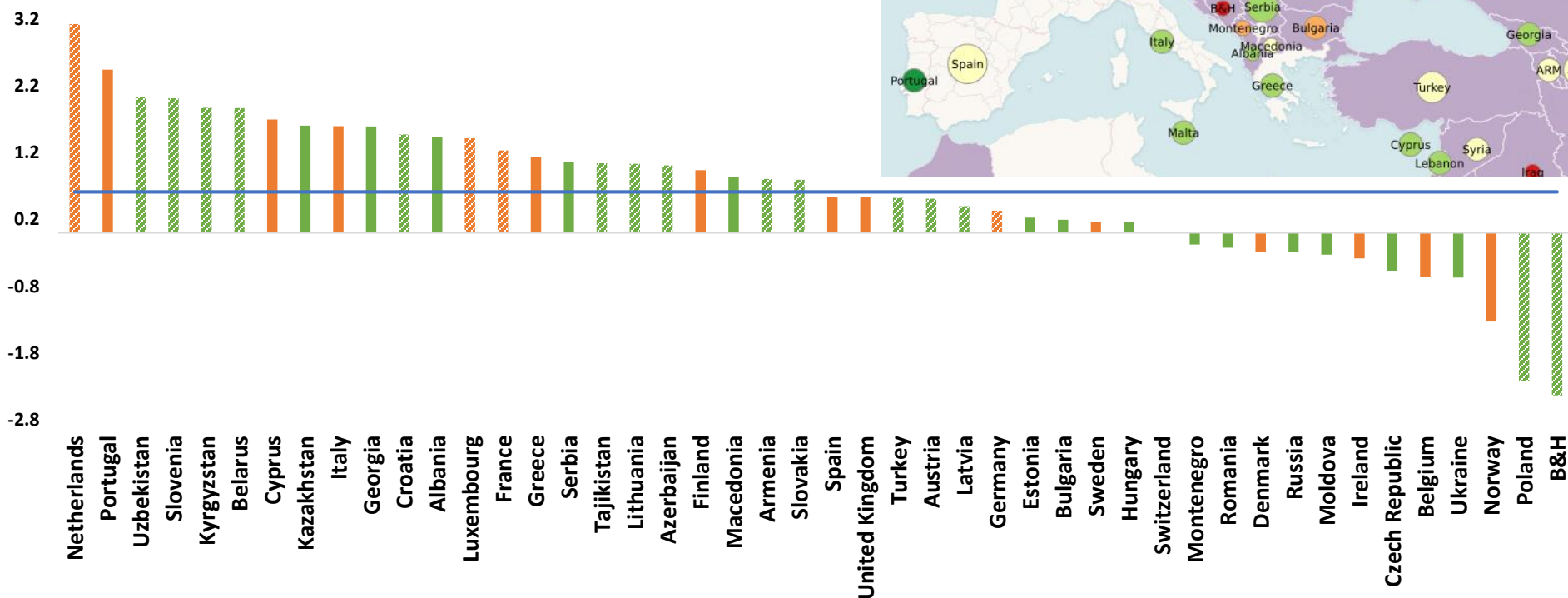
Note:
Tone for BRI country



Regional Comparison Europe

Top Positive Tone	
Netherlands	3.12
Top Negative Tone	
Bosnia and Herzegovina	-2.43

Tone





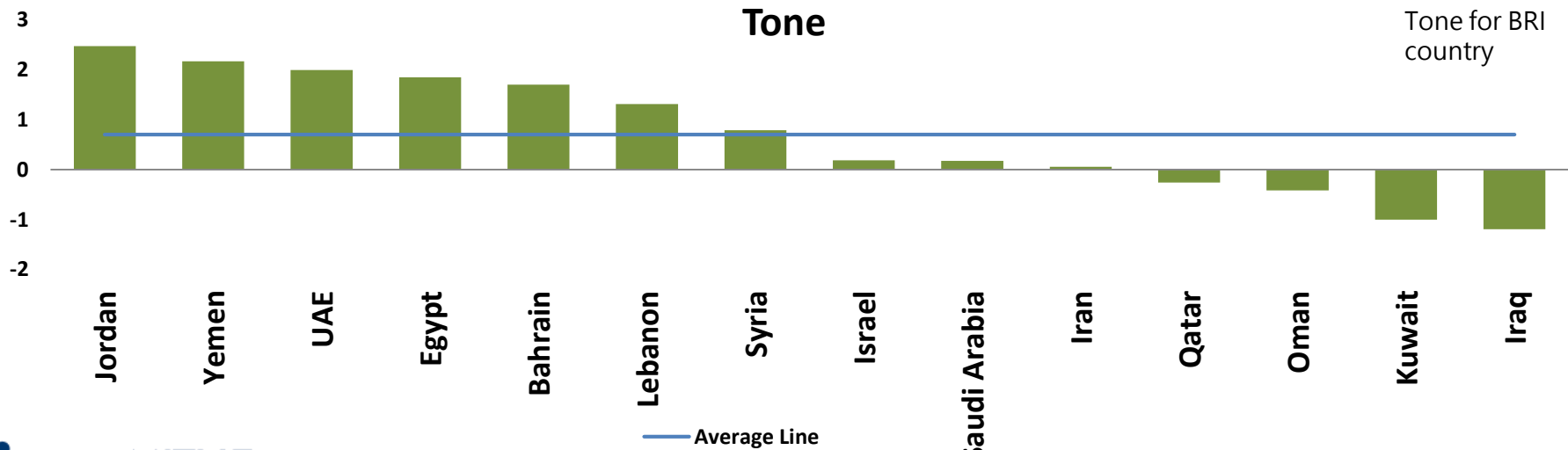
Regional Comparison Middle East

Top Positive Tone

Jordan	2.47
--------	------

Top Negative Tone

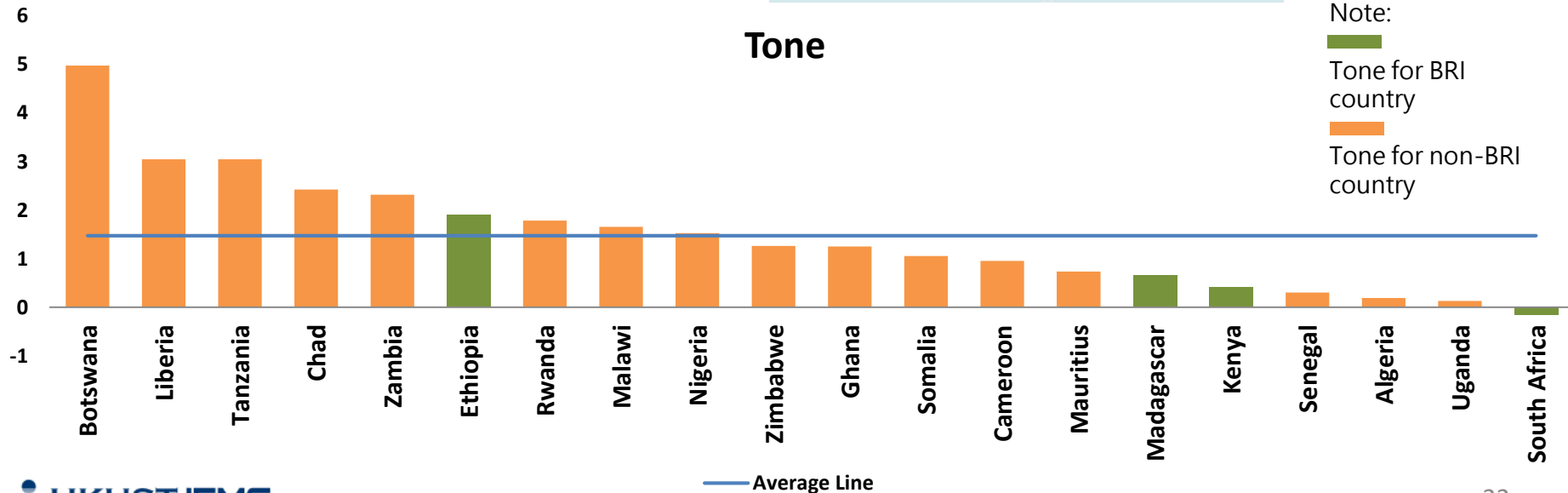
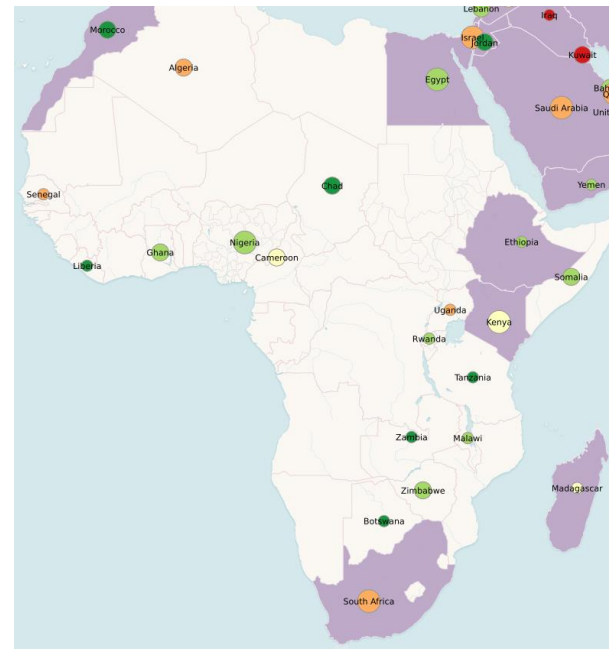
Iraq	-1.19
------	-------





Regional Comparison Africa

Top Positive Tone	
Botswana	4.97
Top Negative Tone	
South Africa	-0.16





Regional Comparison Central and South America

Top Positive Tone	
Brazil	1.26
Top Negative Tone	
Guyana	-2.26

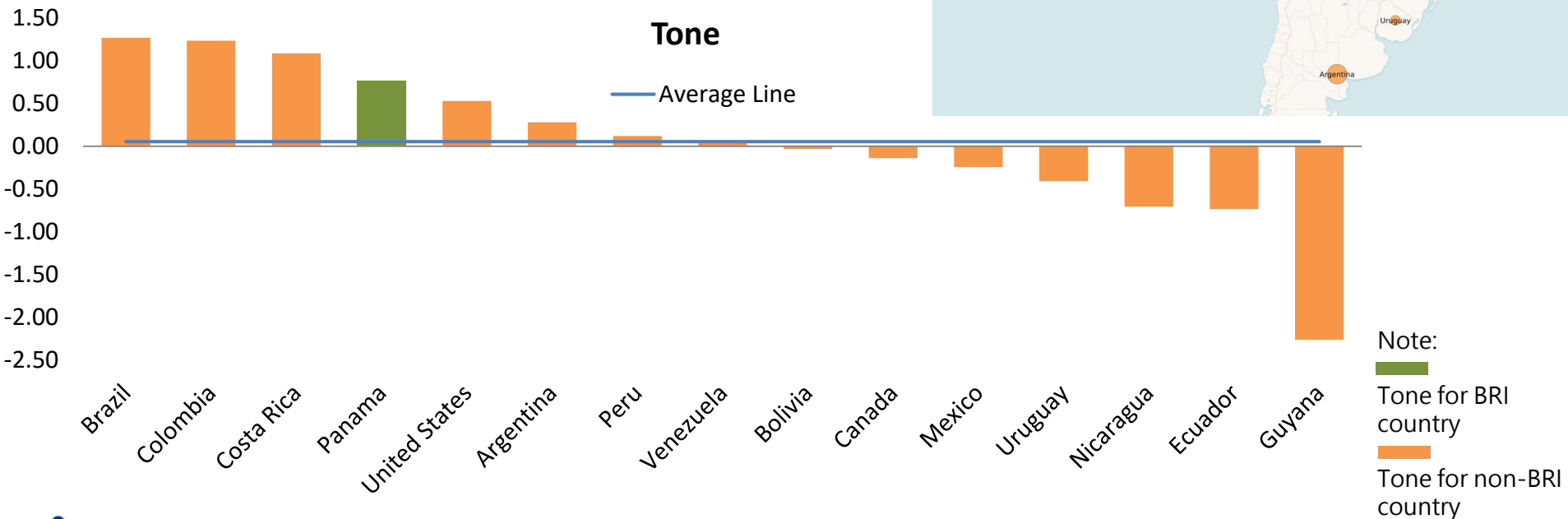
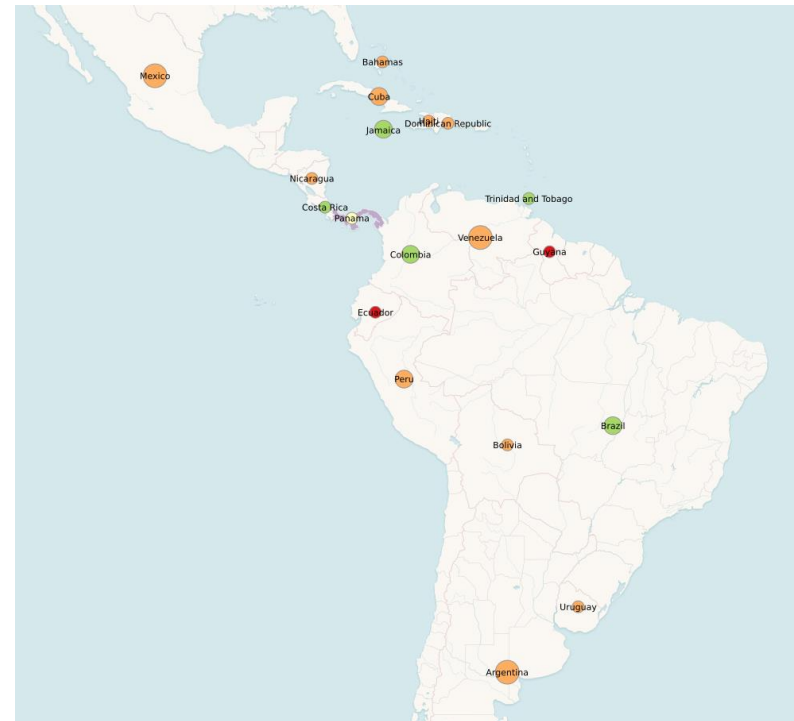




Image of the BRI at country level

Difference in the BRI image are very large and sometimes unexpected. Both extremes are broadly based in Europe and Asia, which means China's Belt and Road Initiative has particularly penetrated the two regions but received much-divided opinions within them. The implementation of the Belt and Road Initiative seems to be heavily influenced by the local characteristics.

Figure 5 Media sentiment for the most positive countries

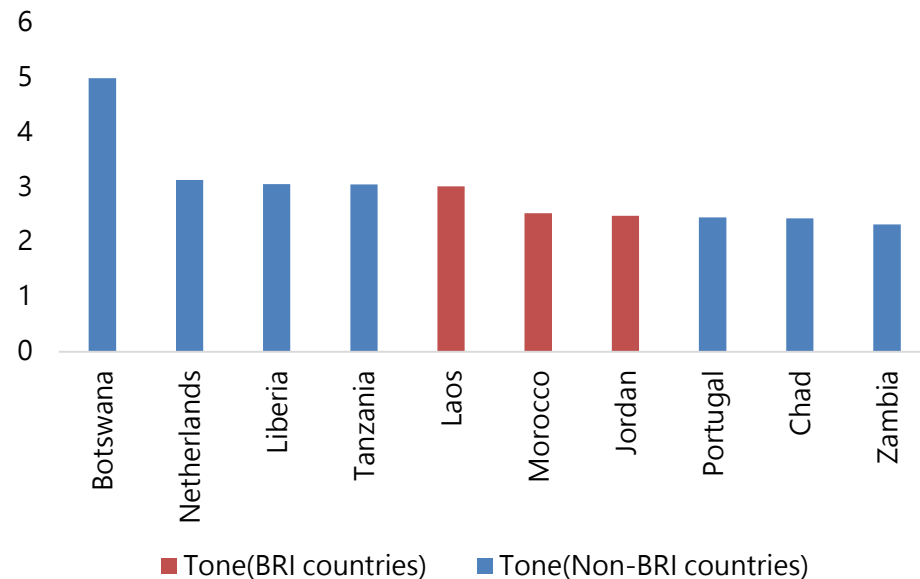
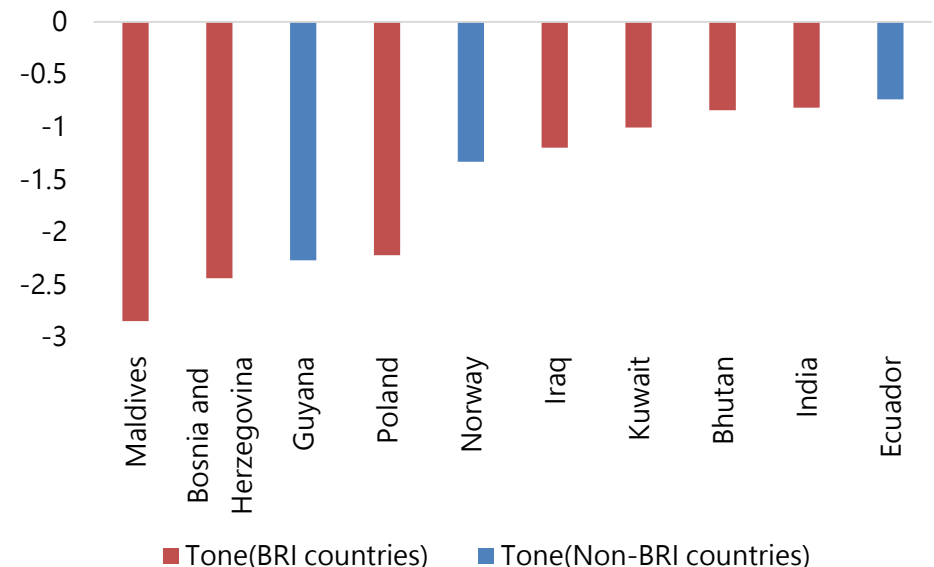


Figure 6 Media sentiment for the most negative countries



Source: <https://www.gdeltproject.org/>



Empirical analysis: Descriptive statistic to chose key factors

To investigate the relationship between the image of the BRI and the factors that may affect such image, we select the countries with the highest and lowest sentiment towards the BRI in each region. Within the selected sample, we found most of the BRI-related articles contain two keywords: trade and investment.

Table 1 Descriptive statistic of the tone and proportion of trade, investment, and other topics

Keywords	Tone	Proportion (%)
'trade' only in BRI-related news	0.58	22.9
'investment' only in BRI-related news	0.57	11.3
Both 'trade' and 'investment' in BRI-related news	0.88	40.2
Others and BRI	0.27	25.6
BRI (Total)	0.58	100

Source: <https://www.gdeltproject.org/>



Empirical analysis: Modeling

To assess how the readings of 'trade' and 'investment' affect the countries' perception of the BRI, we use the following econometric model to analyze their influences.

$$Tone_i = \theta_0 + \theta_1 BRI_i + \theta_2 Trade_i + \theta_3 Investment_i + \varepsilon_i$$

- **Tone_i** is the sentiment of the BRI in country *i*, in other words, the image of the BRI in country *i*.
- **BRI_i** is a dummy variable with its value is set to 1 if country *i* is in the BRI geographies and 0 if not. To maintain consistency with the coverage of the sentiment variable, we define the BRI countries using its official status (classified by China's official Belt and Road website) until April 25th, 2018.
- **Trade_i** represents the proportion of the BRI-related news mentioning the word 'trade' to all the BRI-related news, depicting the influence of trade in the local media reporting the BRI.
- **Investment_i** represents the proportion of the BRI-related news mentioning 'investment' to the total BRI-related news.



Empirical analysis: Results

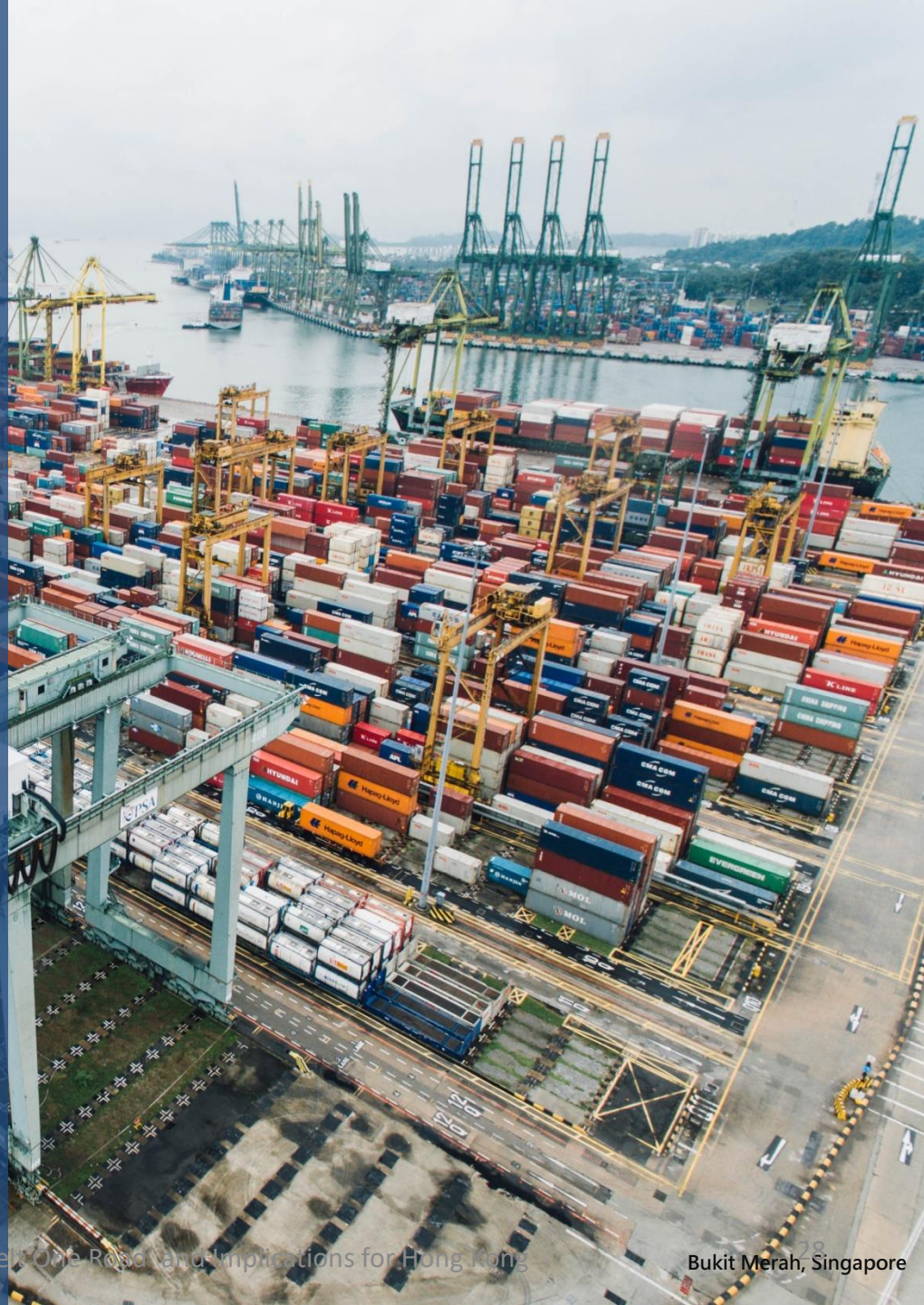
Table 2 Robust OLS regression result

Independent variable	BRI only	Trade only	Investment only	All controls
BRI	-0.117 (0.20)			-0.249 (0.20)
Trade (%)		-0.019 (0.01)		-0.030* (0.01)
Investment (%)			-0.004 (0.02)	-0.016 (0.01)
R ²	0.0025	0.0305	0.0009	0.08
Obs	130	118	113	107

$p < 0.001$: ***; $p < 0.01$: **; $p < 0.05$: *; $p < 0.1$: ^

- First, here is no statistical difference between the BRI and non-BRI countries as regards their perception of the Belt and Road.
- Second, the key factor explaining the differences in the perception of BRI in our sample is trade and, more especially, how frequently trade is mentioned in the media relating to BRI. The more frequently trade is mentioned in the media (*trade intensity*), the worse perception a country tends to have about BRI.
- Third, while the coefficient before the investment is also negative, it is not statistically significant for all the specifications.

4. Conclusions





Key take-aways

Based our bigdata analysis of news across the globe, we conclude that:

- The key finding is that most regions in the world are holding a positive view on China's Belt and Road Initiative, although wide differences appear across regions and countries and some do have a negative image of BRI.
- Second, there is no significant difference in the perception of the BRI between the countries who are officially part of the initiative and others.
- Third, 'Trade' is the key factor explaining the BRI image across countries. Investment seems to be less relevant as it is not found statistically significant.
- Fourth, zooming in into one country, Sri Lanka, it seems that both awareness as well as the tone can vary quite substantially over time following events/relations with China.



Possible extensions

- Time extension, using big query but problem with the definition of Belt and Road
- More focus on particular countries
- Extend the realm from BRI to China economic relations with each country or region
- Check to what extent fears relate to trade are grounded on actual data on trade, such as a growing trade deficit with China or the like.



Comments welcome!

Prof Alicia Garcia-Herrero

Jianwei Xu

With contribution from Hanrui Li