

Exploring the Macroeconomic Interdependence of East Asian Countries: A GVAR Approach

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Summary of our current research

- 1 Diebold-Yilmaz's **Connectedness Measure (CM)** has been widely used in policy and industry to **assess systemic risk in financial markets**. Example includes *IMF Global Financial Stability Reports* and *European Central Bank Financial Stability Reviews* (Diebold and Yilmaz, *Journal of Econometrics*, 2023)
- 2 We use **CM** to **investigate the transmission of the business cycle (BC) shocks** among many countries.
- 3 We propose to combine **CM** and **Global VAR** framework [Pesaran et al., 2004]
- 4 Our framework is straightforward and has **some interesting features**
 - 1 Can **increase the number** of sample countries
 - 2 Can **quantify the direction** of BC shocks between countries and groups
 - 3 Can **model shock transmission channels** through trade, flow of funds, and more!
- 5 We apply this method to analyze the **transitions of BC shocks among East Asian countries**.

Outline of my presentation

- 1 Motivation
- 2 Measures of Connectedness
- 3 GVAR and Generalised FEVD
- 4 Data
- 5 Results
- 6 Conclusion

Motivation

- ① Increase in **economic interdependence between countries** is observed
 - Possible reasons are: [1] expansion of **trade integration**, [2] the creation of **global supply chains**, [3] the integration of **international financial markets**, [4] the implementation of **coordinated fiscal and monetary policies**, and others.
- ② **East Asia distinguishes itself from the Latin American and African regions** in that intra-regional trade and investment are thriving and the economies of each country are firmly connected through production relationships of intermediate goods. [Vu, 2015]
- ③ **How can we measure interdependence among countries?**
 - ① Are BCs of countries synchronized? Is the magnitude getting higher?
 - ② Which country is more influential (transmitter of BC shocks), and which country is more influenced (recipient of BC shocks)?

- ④ Empirical studies investigating the connection between **international BCs**: [Duval et al., 2016], [Di Giovanni et al., 2017], [Davis, 2014], [Chiquiar and Ramos-Francia, 2005], and others.
- ⑤ Representative **empirical methods** include:
 - **Pairwise correlation** of GDPs: [Backus et al., 1995] and [Baxter, 1995],
 - **Dynamic latent factor models**: [Kose et al., 2003],
 - Measure of **connectedness**: [Diebold and Yilmaz, 2015].
- ⑥ Our paper is an extension of [Diebold and Yilmaz, 2015]
 - DY analyzed BC shocks among **six countries**, using the monthly Industrial Production index (50 years: 1958M1 - 2011M12)
 - We deal with **33 countries**, using quarterly GDP (approx. 40 years: 1979Q2-2019Q4)

Diebold-Yilmaz's Connectedness Measure (CM)

- 1 Estimate a **VAR** Model (ex. [Diebold and Yilmaz, 2015], $x_t = \log(\text{IP}_t)$)

$$\begin{pmatrix} x_t^{\text{usa}} \\ x_t^{\text{deu}} \\ x_t^{\text{jpn}} \\ x_t^{\text{fra}} \\ x_t^{\text{gbr}} \\ x_t^{\text{ita}} \end{pmatrix} = \begin{pmatrix} \phi_{11} & \phi_{12} & \phi_{13} & \phi_{14} & \phi_{15} & \phi_{16} \\ \phi_{21} & \phi_{22} & \phi_{23} & \phi_{24} & \phi_{25} & \phi_{26} \\ \phi_{31} & \phi_{32} & \phi_{33} & \phi_{34} & \phi_{35} & \phi_{36} \\ \phi_{41} & \phi_{42} & \phi_{43} & \phi_{44} & \phi_{45} & \phi_{46} \\ \phi_{51} & \phi_{52} & \phi_{53} & \phi_{54} & \phi_{55} & \phi_{56} \\ \phi_{61} & \phi_{62} & \phi_{63} & \phi_{64} & \phi_{65} & \phi_{66} \end{pmatrix} \begin{pmatrix} x_{t-1}^{\text{usa}} \\ x_{t-1}^{\text{deu}} \\ x_{t-1}^{\text{jpn}} \\ x_{t-1}^{\text{fra}} \\ x_{t-1}^{\text{gbr}} \\ x_{t-1}^{\text{ita}} \end{pmatrix} + \begin{pmatrix} \epsilon_t^{\text{usa}} \\ \epsilon_t^{\text{deu}} \\ \epsilon_t^{\text{jpn}} \\ \epsilon_t^{\text{fra}} \\ \epsilon_t^{\text{gbr}} \\ \epsilon_t^{\text{ita}} \end{pmatrix} \quad (1)$$

- 2 Calculate a H -step-ahead **FEVD**, d_{ij}^H (choice of H depends on one's interest)
- Forecast Error Variance Decomposition (FEVD): Quantify how important a shock is in explaining the variation in the endogenous variables (on average)
 - d_{ij}^H : country i 's FEV due to a shock in county j .
- 3 Construct a **connectedness table** D based on d_{ij}^H

Diebold-Yilmaz's Connectedness Measure

- 1 Estimate a VAR model
- 2 Construct h -step-ahead Generalized FEVD (GFEVD)
 - FEVD: Quantify how important a shock is in explaining the variation in the endogenous variables (on average)
- 3 Use GFEVD to construct CM (choice of h depends on one's interest)
- 4 To construct time-varying CMs, estimate VAR with rolling-window

Connectedness between two countries

		$j = 1$	$j = 2$	$j = 3$	$j = 4$	$j = 5$
		x_1	x_2	x_3	x_4	x_5
$i = 1$	x_1	d_{11}	d_{12}	d_{13}	d_{14}	d_{15}
$i = 2$	x_2	d_{21}	d_{22}	d_{23}	d_{24}	d_{25}
$i = 3$	x_3	d_{31}	d_{32}	d_{33}	d_{34}	d_{35}
$i = 4$	x_4	d_{41}	d_{42}	d_{43}	d_{44}	d_{45}
$i = 5$	x_5	d_{51}	d_{52}	d_{53}	d_{54}	d_{55}

Note: Superscript H is dropped for notational simplicity.

Table: Connectedness Table $D = [d_{ij}^H]$

- Elements of a row of D correspond to the standard FEVD analysis
- Note, in general, $d_{ij} \neq d_{ji}$.

- **P**airwise **D**irectional **C**onnectedness

- PDC from 2 to 1 (ex. $i = 1, j = 2$)

$$C_{1 \leftarrow 2} = d_{12} \quad (\% \text{ effect of 2 on 1})$$

- PDC from 1 to 2 (ex. $i = 2, j = 1$)

$$C_{2 \leftarrow 1} = d_{21} \quad (\% \text{ effect of 1 on 2})$$

- Net PDC of 1 against 2 (ex. $i = 1, j = 2$)

$$C_{12} = C_{2 \leftarrow 1} - C_{1 \leftarrow 2} = d_{21} - d_{12}$$

- If $C_{12} > 0$, 1 is a shock transmitter.
- If $C_{12} < 0$, 1 is a shock recipient.

Connectedness between one country and other countries

		$j = 1$	$j = 2$	$j = 3$	$j = 4$	$j = 5$
		x_1	x_2	x_3	x_4	x_5
$i = 1$	x_1	d_{11}	d_{12}	d_{13}	d_{14}	d_{15}
$i = 2$	x_2	d_{21}	d_{22}	d_{23}	d_{24}	d_{25}
$i = 3$	x_3	d_{31}	d_{32}	d_{33}	d_{34}	d_{35}
$i = 4$	x_4	d_{41}	d_{42}	d_{43}	d_{44}	d_{45}
$i = 5$	x_5	d_{51}	d_{52}	d_{53}	d_{54}	d_{55}

- Note: Subscript G indicates “Global”, meaning the whole sample countries.

- Total Directional Connectedness**

- TDC from others to 1 (ex. $i = 1$)

$$C_{1 \leftarrow G} = \frac{d_{12} + d_{13} + d_{14} + d_{15}}{d_{11} + d_{12} + d_{13} + d_{14} + d_{15}}$$

- TDC to others from 1 (ex. $j = 1$)

$$C_{G \leftarrow 1} = \frac{d_{21} + d_{31} + d_{41} + d_{51}}{d_{11} + d_{21} + d_{31} + d_{41} + d_{51}}$$

- Net TDC of 1 (ex. $i = 1$)

$$C_{1,G} = C_{G \leftarrow 1} - C_{1 \leftarrow G}$$

Total connectedness

whole sample countries : Global

		$j = 1$	$j = 2$	$j = 3$	$j = 4$	$j = 5$
		x_1	x_2	x_3	x_4	x_5
$i = 1$	x_1	d_{11}	d_{12}	d_{13}	d_{14}	d_{15}
$i = 2$	x_2	d_{21}	d_{22}	d_{23}	d_{24}	d_{25}
$i = 3$	x_3	d_{31}	d_{32}	d_{33}	d_{34}	d_{35}
$i = 4$	x_4	d_{41}	d_{42}	d_{43}	d_{44}	d_{45}
$i = 5$	x_5	d_{51}	d_{52}	d_{53}	d_{54}	d_{55}

- Note: Subscript G indicates “Global”, meaning the whole sample countries.
- The diagonal elements are their “own” effects.

- Total Connectedness**
- Measures without direction
- TC of whole sample countries (or “Global”)

$$C_G = \frac{\sum_{i=1}^5 \sum_{j=1}^5 d_{ij} - \sum_{i=1}^5 d_{ii}}{\sum_{i=1}^5 \sum_{j=1}^5 d_{ij}}$$

Problem

- ① Our dataset contains **33 countries** vs DY : 6 countries
⇒ number of endogenous variables in the VAR model is not small
- ② Our dataset has **163 quarters** vs DY : 648 months
Ours : approx. 40 years, 1979Q2-2019Q4 vs DY's : 50 years, 1958M1-2011M12
⇒ number of time series observation is not large
- ③ To obtain **time-varying CMs**, Diebold & Yilmaz used 5-year (60-month) **rolling-window** regression.
⇒ (almost) impossible to use the rolling-window regression approach

To make it feasible, we use **Global VAR (GVAR)** instead of standard VAR

Limited review on GVAR

① Pesaran, Schuermann, and Weiner (2004) (PSW)

- Development of the GVAR methodology

country	types of economy
USA	large-open
others	small-open

② Dees, di-Mauro, Pesaran, and Smith (2007) (DdPS)

- Uses the bootstrapping for constructing the confidence intervals of the IRFs

③ Chudik and Pesaran (2012), Smith and Yamagata (2011)

- Includes the “dominant unit” in the GVAR model

From GVAR (Simplified version) to GFEVD

- ① Models of country i 's GDP, x_{it} (for $i = 1, \dots, N$) is:

$$x_{it} = \underbrace{\phi_{i1}x_{i,t-1}}_{\text{own effect}} + \underbrace{\lambda_{i0}x_{it}^* + \lambda_{i1}x_{i,t-1}^*}_{\text{foreign effect}} + u_{it} \quad (2)$$

$\phi_{i1}, \lambda_{i0}, \lambda_{i1}$: coefficients; u_{it} : error terms. (note: constant not included for simplicity)

- ② Foreign GDP for country i , x_{it}^* (for $i = 1, \dots, N$)

$$x_{it}^* = \mathbf{w}'_i \mathbf{x}_t \quad (3)$$

is constructed as weighted average of $\mathbf{x}_t = [x_{1t}, \dots, x_{Nt}]'$
($N \times 1$)

where weight vector $\mathbf{w}'_i = [w_{i1}, \dots, w_{iN}]$ is defined by **trade data** as
($1 \times N$)

$$w_{ij} = \frac{\text{EX+IM between countries } i \text{ and } j}{\sum_{k=1}^N \text{EX+IM between countries } i \text{ and } k}, \text{ where } w_{ii} = 0 \quad (4)$$

3 Rewrite Eq.(2)

$$\begin{aligned} \begin{bmatrix} 1 & -\lambda_{i0} \end{bmatrix} \begin{bmatrix} x_{it} \\ x_{it}^* \end{bmatrix} &= \begin{bmatrix} \phi_{i1} & \lambda_{i1} \end{bmatrix} \begin{bmatrix} x_{i,t-1} \\ x_{i,t-1}^* \end{bmatrix} + u_{it} \\ \mathbf{G}_{i0} \quad \mathbf{z}_{it} &= \quad \mathbf{G}_{i1} \quad \mathbf{z}_{i,t-1} + u_{it} \end{aligned} \quad (5)$$

where country i 's x_{it} and x_{it}^* , \mathbf{z}_{it} , are linked with $\mathbf{x}_t = [x_{1t}, \dots, x_{Nt}]'$ as:

$(N \times 1)$

$$\begin{aligned} i\text{'s own GDP} &\rightarrow \begin{bmatrix} x_{it} \\ x_{it}^* \end{bmatrix} = \begin{bmatrix} \mathbf{e}_i' \\ \mathbf{W}_i' \end{bmatrix} \mathbf{x}_t \leftarrow \text{a vector of sample country's GDP} \\ i\text{'s foreign GDP} &\rightarrow \\ \mathbf{z}_{it} &= \mathbf{W}_i \mathbf{x}_t \end{aligned} \quad (6)$$

where \mathbf{e}_i is the selection vector whose i th element is 1 and the rest are 0.

4 From Eqs.(5) and (6), we have

$$\mathbf{G}_{i0} \mathbf{W}_i \mathbf{x}_t = \mathbf{G}_{i1} \mathbf{W}_i \mathbf{x}_{t-1} + u_{it} \quad (7)$$

- 5 Stack Eq.(7) for N countries as:

$$\begin{bmatrix} \mathbf{G}_{10} \mathbf{W}_1 \\ \vdots \\ \mathbf{G}_{N0} \mathbf{W}_N \end{bmatrix} \begin{bmatrix} x_{1t} \\ \vdots \\ x_{Nt} \end{bmatrix} = \begin{bmatrix} \mathbf{G}_{11} \mathbf{W}_1 \\ \vdots \\ \mathbf{G}_{N1} \mathbf{W}_N \end{bmatrix} \begin{bmatrix} x_{1,t-1} \\ \vdots \\ x_{N,t-1} \end{bmatrix} + \begin{bmatrix} u_{1t} \\ \vdots \\ u_{Nt} \end{bmatrix}$$

$$\mathbf{G}_0 \mathbf{x}_t = \mathbf{G}_1 \mathbf{x}_{t-1} + \mathbf{u}_t \quad (8)$$

where we assume the covariance matrix of \mathbf{u}_t to be diagonal.

- 6 Multiply both sides of Eq.(8) by \mathbf{G}_0^{-1} to derive the Autoregressive (AR) representation for \mathbf{x}_t .

$$\begin{aligned} \mathbf{x}_t &= (\mathbf{G}_0^{-1} \mathbf{G}_1) \mathbf{x}_{t-1} + (\mathbf{G}_0^{-1} \mathbf{u}_t) \\ &= \mathbf{C} \mathbf{x}_{t-1} + (\mathbf{G}_0^{-1} \mathbf{u}_t). \end{aligned} \quad (9)$$

- 7 The infinite-order Moving-Average (MA) representation corresponding to Eq.(9) is

$$\mathbf{x}_t = \mathbf{G}_0^{-1} \mathbf{u}_t + \mathbf{C} \mathbf{G}_0^{-1} \mathbf{u}_{t-1} + \mathbf{C}^2 \mathbf{G}_0^{-1} \mathbf{u}_{t-2} + \dots \quad (10)$$

- 8 H -step ahead **Generalised FEVD**, d_{ij}^H , is calculated as:

$$d_{ij}^H = \frac{(\sigma_{jj})^{-1} \sum_{h=0}^H (\mathbf{e}_i' \mathbf{C}^h (\mathbf{G}_0)^{-1} \boldsymbol{\Sigma}_\zeta \mathbf{e}_j)^2}{\sum_{h=0}^H \mathbf{e}_i' \mathbf{C}^h (\mathbf{G}_0)^{-1} \boldsymbol{\Sigma}_\zeta ((\mathbf{G}_0)^{-1})' (\mathbf{C}^h)' \mathbf{e}_i} \quad (11)$$

where \mathbf{e}_i is the selection vector whose i th element is 1 and the rest are 0

- 9 Lastly, standardize d_{ij}^H to make row sum of matrix D equal to one as:

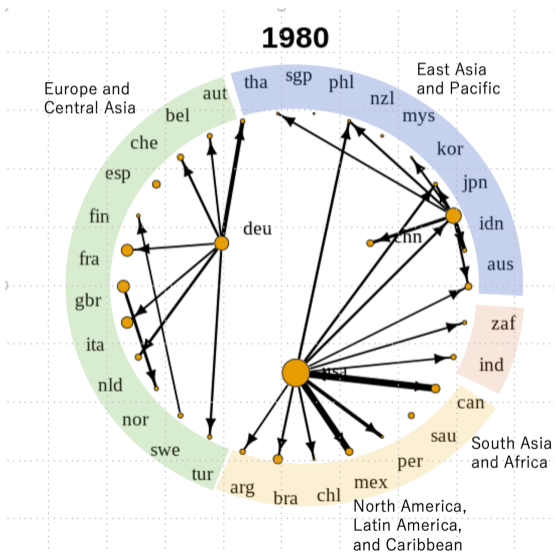
$$\tilde{d}_{ij}^H = \frac{d_{ij}^H}{\sum_{j=1}^N d_{ij}^H} \quad (12)$$

All CMs in this study uses this standardized value.

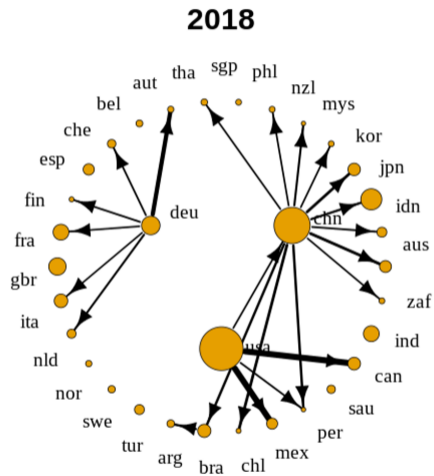
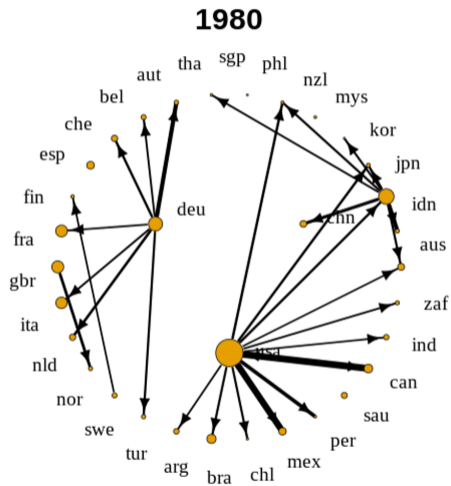
- 10 Actually estimated model includes

Data

- 1 Real GDP by country (log-transformed), pairwise annual trade flow, and oil prices (log-transformed) from the [Mohaddes and Raissi, 2020] data
 - ⇒ Estimated model includes oil price equation.
 - ⇒ Also, Estimated VAR model, Eq.(2), includes 4 lags.
- 2 List of 33 countries in our sample dataset:
 - **East Asia and Pacific region (10)** Australia, China, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand
 - **Europe and Central Asia region (13)** Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, Turkey, United Kingdom
 - **Latin American region (5)** Argentina, Brazil, Chile, **Mexico**, Peru
 - **North American region (2)** Canada, United States
 - **Other region (3)** Saudi Arabia, India, South Africa



- 1 Each circle's size corresponds to the respective economy's size
- 2 The arrows indicate the influencing relationships.
- 3 Arrows with lower than 20.5 % trade linkage coefficient values have been disregarded



Estimation of GVAR and calculation of CM

- ① VARX* models are estimated for 33 countries/economies and the international commodity market, one-by-one.
 - Previous years' trade volume is used for calculating \mathbf{W}_t
 - Number of lags in (2) are fixed: own effect=4, foreign effect= 4
 - Dummy variables are added until the maximum absolute value of error is less than 3 Standard Deviation.
- ② Forecast horizon (H) of GFEVD is fixed as 12 ($H = 12$)
- ③ Previous year's trade weight W_{t-1} is used for the calculation of d_{ij}^H at year t .

Own effect (d_{ij}^H with $i = j, H = 12$)

	1985		1995		2005		2015	
	own	rank	own	rank	own	rank	own	rank
ARG	0.755	18	0.752	18	0.756	18	0.759	16
AUS	0.933	1	0.935	2	0.932	2	0.910	4
AUT	0.359	31	0.321	32	0.341	32	0.336	32
BEL	0.299	33	0.280	33	0.317	33	0.320	33
BRA	0.818	13	0.796	13	0.771	15	0.688	18
CAN	0.616	27	0.614	25	0.599	27	0.565	25
CHN	0.825	11	0.834	11	0.846	9	0.840	9
CHL	0.933	2	0.932	3	0.932	3	0.919	3
FIN	0.658	24	0.634	24	0.624	24	0.574	24
FRA	0.596	28	0.574	29	0.593	28	0.562	26
DEU	0.701	20	0.695	20	0.693	19	0.644	19
IND	0.593	29	0.586	28	0.632	22	0.596	22
IDN	0.914	4	0.919	4	0.920	4	0.925	2
ITA	0.357	32	0.330	31	0.357	31	0.369	31
JPN	0.870	8	0.851	9	0.845	10	0.815	10
KOR	0.824	12	0.823	12	0.837	11	0.840	8
MYS	0.665	23	0.667	23	0.668	21	0.603	21
MEX	0.850	10	0.837	10	0.830	12	0.808	12
NLD	0.497	30	0.488	30	0.521	30	0.540	29
NOR	0.890	6	0.887	6	0.892	5	0.873	6
NZL	0.861	9	0.862	8	0.868	7	0.882	5
PER	0.678	22	0.672	22	0.586	29	0.460	30
PHL	0.905	5	0.900	5	0.863	8	0.814	11
ZAF	0.679	21	0.676	21	0.628	23	0.545	28
SAU	0.926	3	0.937	1	0.937	1	0.934	1
SGP	0.886	7	0.876	7	0.880	6	0.855	7
ESP	0.775	17	0.756	17	0.762	17	0.775	15
SWE	0.628	25	0.591	27	0.610	25	0.558	27
CHE	0.786	15	0.759	16	0.769	16	0.745	17
THA	0.816	14	0.788	14	0.815	13	0.794	14
TUR	0.785	16	0.777	15	0.793	14	0.798	13
GBR	0.617	26	0.599	26	0.606	26	0.593	23
USA	0.738	19	0.727	19	0.689	20	0.633	20
peil	0.969		0.966		0.960		0.953	

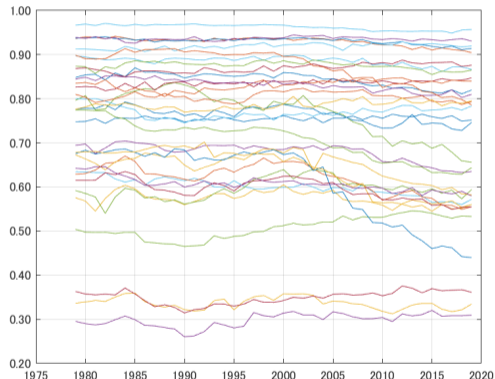


Table: Own effect: 1985, 1995, 2005, and 2015

Total Connectedness (Fig.2)

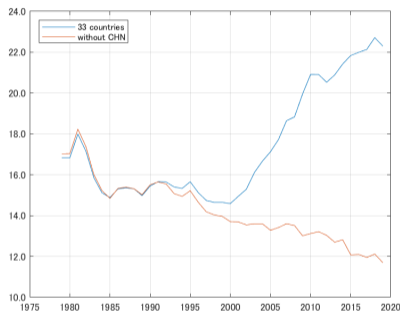


Figure: Total Connectedness

Note: The forecasting horizon, H , is 12.

- 1 **TC of 33 countries** (blue line) decreased from 18% (in 1981) to around 15% (in 1985). It remained around 15% until approximately 2000, after which it increased and attained over 22% in 2019.
- 2 **TC without China** (red) demonstrated a long-term decline over the sample period, indicating that the increase in global connectedness could be attributed to the Chinese economy.

TC by Geographic Groups (Fig.3, left)

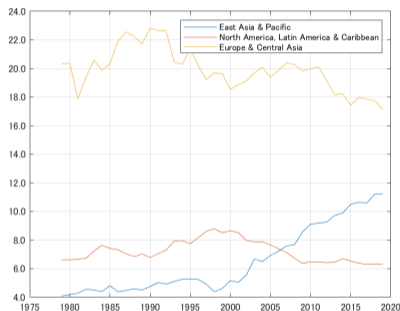


Figure: TC within Geographic Regions

Note: The forecasting horizon, H , is 12.

- 1 Whilst **Europe & Central Asia** (orange) has the highest level over the period, it shows a decreasing trend with an amplitude of 20-year cycles.
- 2 In contrast, **North America, Latin America & the Caribbean** (red), and **East Asia & the Pacific** (blue) display lower absolute levels, though the magnitude of East Asia & the Pacific has exhibited a consistent increase since 2000.

TC by Economic Groups (Fig.3, right)

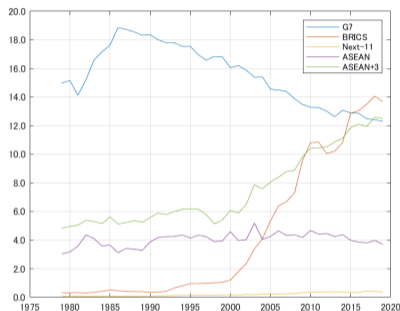


Figure: TC within Groups

Note: The forecasting horizon, H , is 12.

- 1 **G7** (blue) peaked in the mid-1980s and experienced a gradual decline until the end of the sample period.
- 2 **BRICS** (red) displayed a considerable increase starting in 2000, which aligns with the growth of the Chinese economy.
- 3 **Next-11** (orange) remains notably low.
- 4 **ASEAN** (purple) remained stable.
- 5 **ASEAN+3** (green), displayed a considerable decline during the Asian currency crisis, followed by a consistent upward trend.

Total Directional Connectedness (Part of Fig.4)

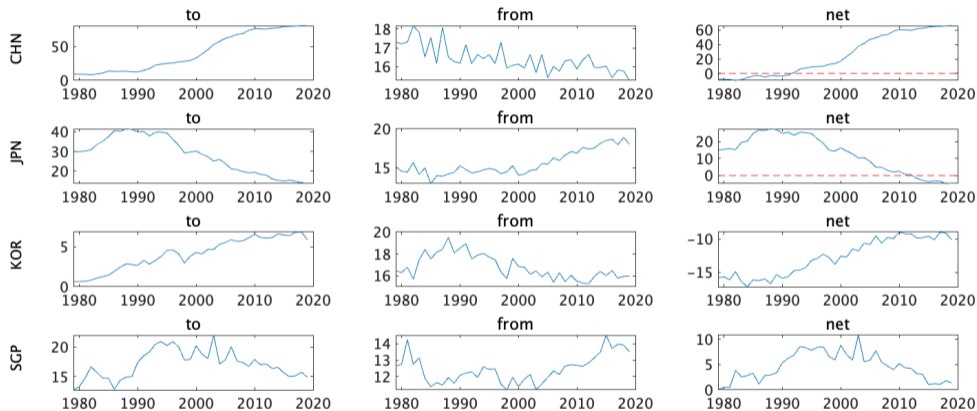
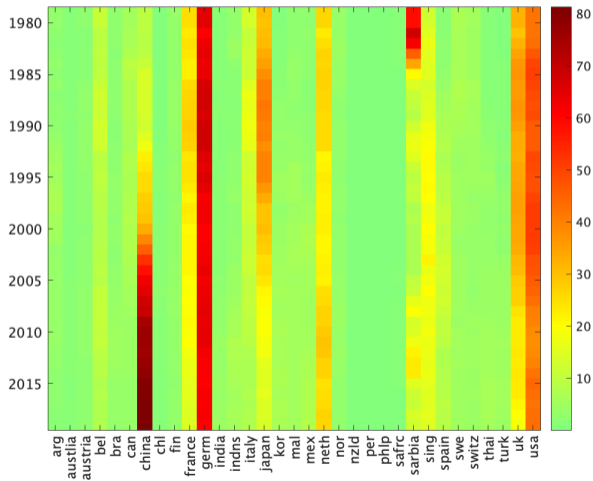
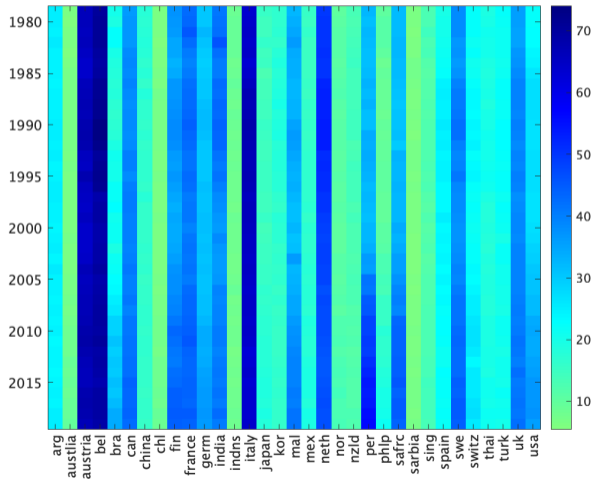


Figure: Total Directional Connectedness: $C_{G \leftarrow i}^H$, $C_{i \leftarrow G}^H$, and C_i^H

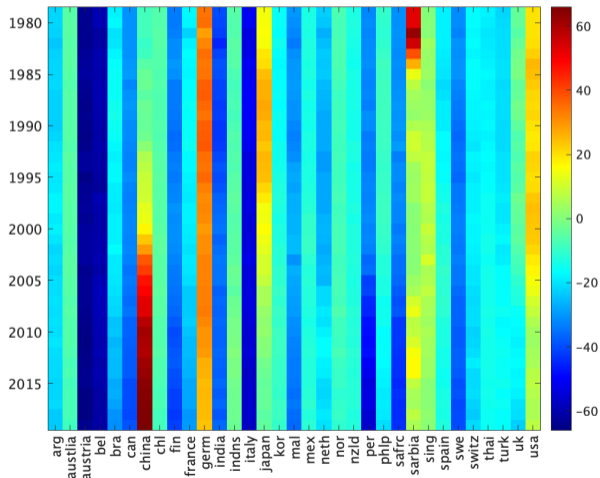
Total Directional Connectedness (To Others)



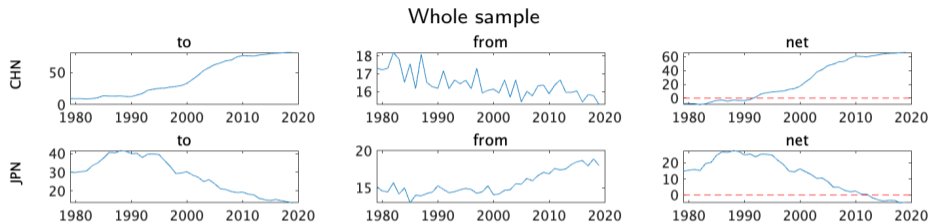
Total Directional Connectedness (From Others)



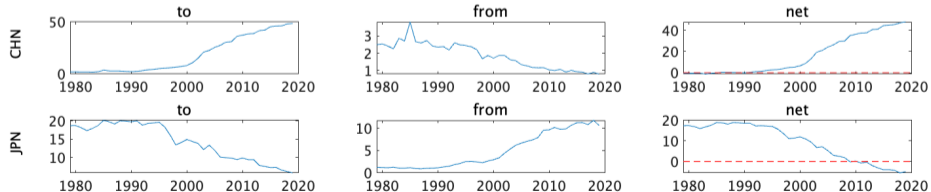
Total Directional Connectedness (Net, To–From)



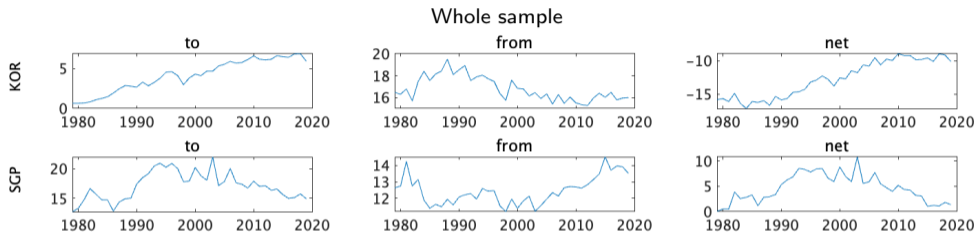
Total Directional Connectedness (ex. China and Japan)



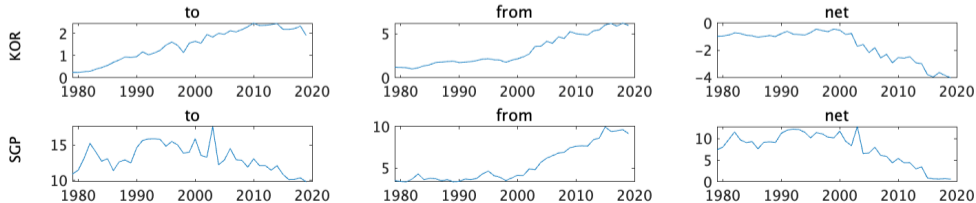
Within the East Asian and Pacific Region (Regional Group)



Total Directional Connectedness (ex. Korea and Singapore)



Within the East Asian and Pacific Region (Regional Group)



Pairwise Directional Connectedness

- 1 Pairwise-interrelationships can be illustrated by PDCs.
- 2 For illustration purposes, cases of China, Japan, and Korea are displayed.
- 3 **China:** the net transmitter of BC shocks for East Asian countries since 2000. Recent influences: Malaysia ($>20\%$); Japan, the Philippines, and Thailand ($10\approx\%$)
- 4 **Japan:** role as a transmitter of BC shocks is gradually diminishing. It has been a net recipient of China since 2000. However, except for Korea, Japan remains a net transmitter, although its influence has diminished.
- 5 **Korea:** mostly a net recipient for China and Japan over the period. However, it is a net transmitter for Australia, Malaysia, New Zealand, the Philippines, and Thailand, and its role for Indonesia and Singapore varies from period to period.

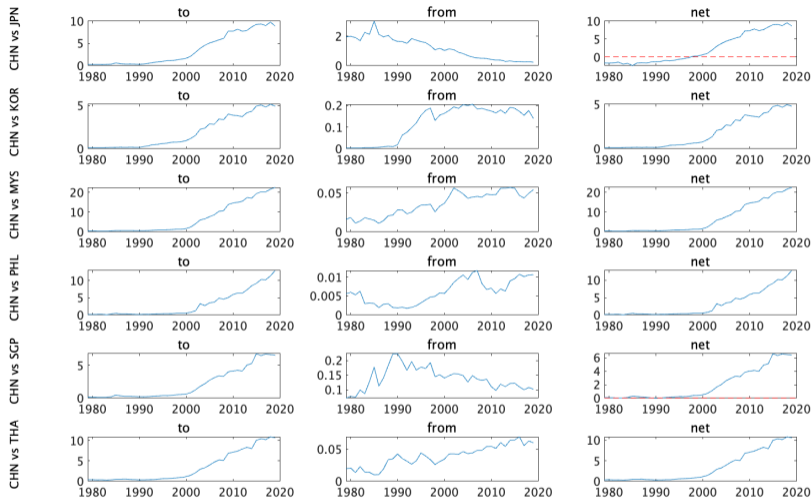


Figure: **China's** Pairwise Directional Connectedness within East Asian and Pacific

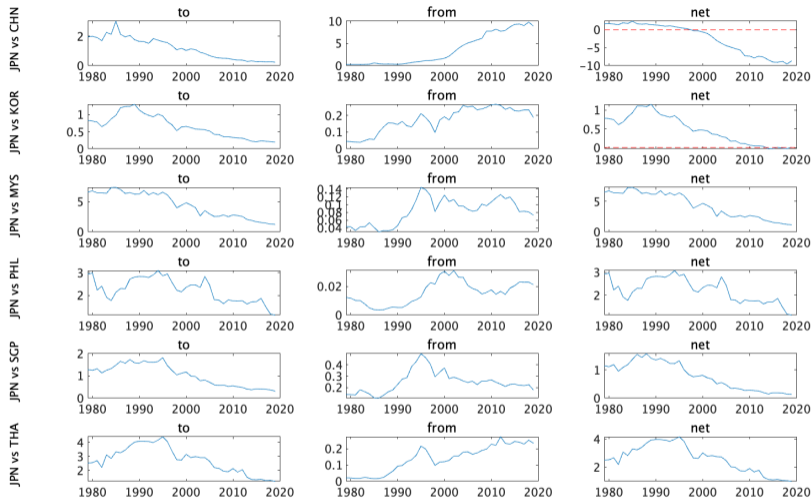


Figure: Japan's Pairwise Directional Connectedness within East Asian and Pacific

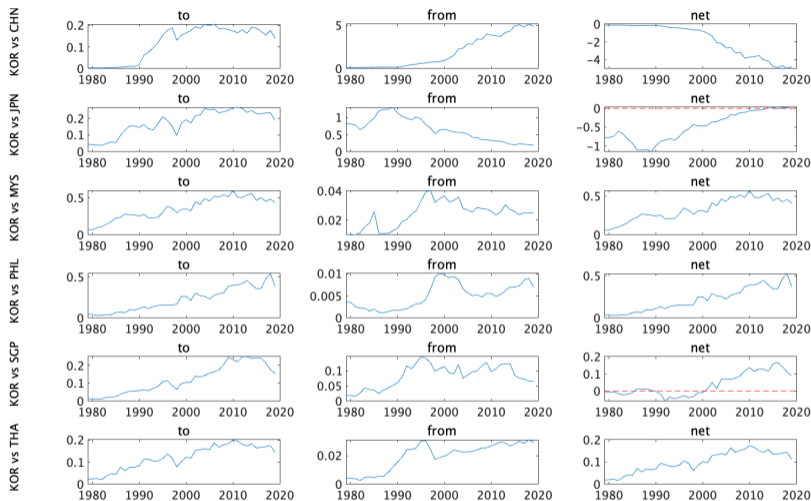
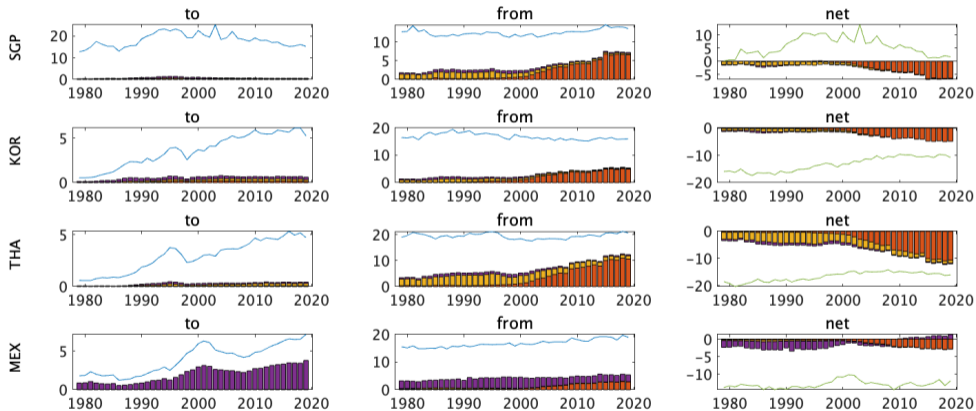


Figure: Korea's Pairwise Directional Connectedness within East Asian and Pacific

Total DC with Pairwise DC



Conclusion

- 1 This paper proposed a novel approach to describing the time-varying macroeconomic interdependence of many countries
- 2 Our approach combines the GVAR by [Pesaran et al., 2004] with the CM by [Diebold and Yilmaz, 2014] to derive a new index which can be used to analyze the BC shock transmission.
- 3 Using quarterly GDP and oil price data for 33 countries from 1979 to 2019, we analyzed the growing interdependence of BCs and dependencies between regions and countries in East Asia from various perspectives.
- 4 Remaining concerns: Robustness check with
 - Different forecasting period, other than $H = 12$ quarters
 - Other specifications, such as a differenced VAR or a co-integrating VAR
 - Other kinds of weights, such as the flow of funds
 - Use of time-varying parameter model

Thank you very much for your kind attention.

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Appendix

	ARG	AUS	AUT	BEL	BRA	CAN	CHN	CHL	FIN	FRA	DEU	IND	IDN	ITA	JPN	KOR	MYS	MEX	NLD	NOR	NZL	PER	PHL	ZAF	SAU	SGP	ESP	SWE	CHE	THA	TUR	GBR	USA	poil	FROM	
ARG	0.755	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.235	0.245	
AUS	0.000	0.933	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.043	0.067	
AUT	0.000	0.000	0.359	0.003	0.001	0.001	0.005	0.000	0.001	0.018	0.320	0.000	0.000	0.010	0.013	0.000	0.000	0.000	0.018	0.002	0.000	0.000	0.000	0.000	0.015	0.001	0.002	0.002	0.009	0.000	0.001	0.030	0.024	0.159	0.641	
BEL	0.001	0.000	0.001	0.299	0.001	0.002	0.005	0.000	0.001	0.045	0.184	0.001	0.000	0.006	0.011	0.000	0.000	0.001	0.059	0.002	0.000	0.000	0.000	0.000	0.016	0.001	0.002	0.002	0.004	0.000	0.001	0.057	0.028	0.271	0.701	
BRA	0.002	0.000	0.000	0.000	0.818	0.002	0.007	0.000	0.000	0.001	0.007	0.000	0.000	0.000	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.002	0.022	0.119	0.182		
CAN	0.000	0.000	0.000	0.000	0.001	0.616	0.004	0.000	0.000	0.001	0.005	0.000	0.000	0.000	0.021	0.001	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.262	0.079	0.384	
CHN	0.000	0.000	0.000	0.000	0.000	0.825	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.030	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.004	0.134	0.175		
CHL	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.933	0.000	0.000	0.003	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.048	0.067	
FIN	0.000	0.000	0.001	0.002	0.001	0.002	0.004	0.000	0.658	0.010	0.088	0.000	0.000	0.003	0.016	0.000	0.000	0.000	0.010	0.007	0.000	0.000	0.000	0.000	0.016	0.001	0.001	0.022	0.002	0.000	0.000	0.043	0.025	0.086	0.342	
FRA	0.000	0.000	0.000	0.005	0.001	0.001	0.003	0.000	0.001	0.596	0.102	0.000	0.000	0.008	0.008	0.000	0.000	0.000	0.016	0.001	0.000	0.000	0.000	0.000	0.014	0.001	0.004	0.001	0.003	0.000	0.000	0.034	0.021	0.179	0.404	
DEU	0.000	0.000	0.001	0.003	0.001	0.001	0.004	0.000	0.001	0.019	0.701	0.000	0.000	0.005	0.010	0.000	0.000	0.002	0.022	0.002	0.000	0.000	0.000	0.000	0.009	0.001	0.002	0.002	0.004	0.000	0.001	0.029	0.021	0.160	0.299	
IND	0.000	0.001	0.000	0.001	0.001	0.002	0.003	0.000	0.000	0.003	0.021	0.593	0.000	0.001	0.031	0.001	0.002	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.011	0.026	0.240	0.407	
IDN	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.914	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.086
ITA	0.001	0.000	0.001	0.002	0.001	0.002	0.006	0.000	0.001	0.023	0.098	0.000	0.000	0.357	0.011	0.000	0.000	0.001	0.011	0.001	0.000	0.000	0.000	0.001	0.020	0.001	0.002	0.001	0.004	0.000	0.001	0.023	0.029	0.400	0.643	
JPN	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.870	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.012	0.096	0.130		
KOR	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.010	0.824	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.151	0.176	
MYS	0.000	0.001	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.001	0.005	0.000	0.002	0.000	0.073	0.002	0.665	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.008	0.102	0.000	0.000	0.000	0.004	0.000	0.003	0.016	0.108	0.335
MEX	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.000	0.000	0.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.028	0.110	0.150	
NLD	0.000	0.000	0.000	0.005	0.001	0.001	0.002	0.000	0.001	0.014	0.112	0.000	0.000	0.003	0.005	0.000	0.000	0.000	0.497	0.001	0.000	0.000	0.000	0.000	0.008	0.001	0.001	0.001	0.002	0.000	0.000	0.028	0.014	0.302	0.503	
NOR	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.002	0.023	0.000	0.000	0.001	0.004	0.000	0.000	0.000	0.003	0.890	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.005	0.001	0.000	0.000	0.020	0.007	0.039	0.110
NZL	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.861	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.003	0.121	0.139		
PER	0.009	0.000	0.000	0.001	0.002	0.001	0.008	0.002	0.000	0.002	0.011	0.000	0.000	0.001	0.020	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.678	0.000	0.000	0.002	0.000	0.000	0.000	0.004	0.041	0.213	0.322	
PHL	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.021	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.905	0.000	0.007	0.006	0.000	0.000	0.001	0.000	0.001	0.016	0.030	0.095	
ZAF	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.000	0.000	0.002	0.012	0.000	0.000	0.001	0.012	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.679	0.001	0.000	0.000	0.000	0.000	0.000	0.006	0.010	0.268	0.321	
SAU	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.926	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.059	0.074	
SGP	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.015	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.886	0.000	0.000	0.001	0.000	0.001	0.007	0.065	0.114	
ESP	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.003	0.008	0.000	0.000	0.001	0.003	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.775	0.000	0.000	0.000	0.003	0.006	0.193	0.225	
SWE	0.000	0.001	0.000	0.002	0.001	0.004	0.005	0.000	0.010	0.009	0.080	0.000	0.000	0.003	0.019	0.000	0.000	0.001	0.010	0.015	0.000	0.000	0.000	0.000	0.007	0.001	0.001	0.628	0.002	0.000	0.001	0.036	0.039	0.121	0.372	
CHE	0.000	0.000	0.001	0.001	0.000	0.001	0.004	0.000	0.000	0.009	0.067	0.000	0.000	0.003	0.007	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.007	0.001	0.001	0.001	0.786	0.000	0.014	0.013	0.077	0.214		
THA	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.001	0.004	0.000	0.001	0.000	0.033	0.000	0.004	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.007	0.017	0.000	0.000	0.816	0.000	0.001	0.009	0.100	0.184		
TUR	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.000</																												

	ARG	AUS	AUT	BEL	BRA	CAN	CHN	CHL	FIN	FRA	DEU	IND	IDN	ITA	JPN	KOR	MYS	MEX	NLD	NOR	NZL	PER	PHL	ZAF	SAU	SGP	ESP	SWE	CHE	THA	TUR	GBR	USA	poll	FROM	
ARG	0.752	0.000	0.000	0.000	0.007	0.000	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.232	0.248		
AUS	0.000	0.935	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.004	0.043	0.065		
AUT	0.000	0.000	0.321	0.003	0.001	0.001	0.015	0.000	0.001	0.020	0.345	0.000	0.001	0.010	0.020	0.002	0.001	0.000	0.015	0.001	0.000	0.000	0.000	0.000	0.004	0.004	0.007	0.002	0.008	0.002	0.001	0.026	0.019	0.168	0.679	
BEL	0.001	0.000	0.001	0.280	0.001	0.001	0.013	0.000	0.002	0.045	0.200	0.001	0.001	0.007	0.020	0.001	0.001	0.001	0.046	0.001	0.000	0.000	0.000	0.000	0.004	0.004	0.009	0.002	0.004	0.002	0.001	0.048	0.021	0.280	0.720	
BRA	0.022	0.000	0.000	0.000	0.796	0.001	0.007	0.001	0.000	0.001	0.008	0.000	0.000	0.001	0.009	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.002	0.015	0.128	0.204		
CAN	0.000	0.000	0.000	0.000	0.000	0.614	0.010	0.000	0.000	0.001	0.005	0.000	0.000	0.000	0.019	0.001	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.001	0.002	0.253	0.034	0.386		
CHN	0.000	0.000	0.000	0.000	0.000	0.000	0.834	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.016	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.001	0.005	0.136	0.166	
CHL	0.003	0.000	0.000	0.000	0.001	0.000	0.002	0.932	0.000	0.000	0.002	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.049	0.068		
FIN	0.001	0.001	0.001	0.002	0.001	0.001	0.013	0.000	0.634	0.011	0.099	0.000	0.001	0.003	0.025	0.002	0.001	0.000	0.010	0.005	0.000	0.000	0.000	0.000	0.003	0.005	0.005	0.013	0.002	0.002	0.001	0.037	0.021	0.302	0.366	
FRA	0.000	0.000	0.001	0.004	0.001	0.001	0.009	0.000	0.001	0.574	0.111	0.000	0.001	0.007	0.015	0.001	0.001	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.004	0.004	0.014	0.001	0.003	0.001	0.001	0.030	0.015	0.188	0.426	
DEU	0.000	0.000	0.002	0.003	0.001	0.001	0.012	0.000	0.001	0.019	0.695	0.000	0.001	0.005	0.019	0.002	0.001	0.000	0.015	0.001	0.000	0.000	0.000	0.000	0.003	0.004	0.006	0.001	0.004	0.002	0.001	0.024	0.017	0.159	0.305	
IND	0.000	0.001	0.000	0.001	0.000	0.001	0.008	0.000	0.000	0.003	0.026	0.586	0.002	0.001	0.028	0.002	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.014	0.001	0.000	0.001	0.002	0.000	0.011	0.023	0.249
IDN	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.919	0.000	0.011	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.002	0.059	0.081	
ITA	0.001	0.000	0.001	0.002	0.001	0.001	0.013	0.000	0.001	0.022	0.108	0.001	0.001	0.330	0.016	0.001	0.001	0.001	0.009	0.001	0.000	0.000	0.000	0.000	0.004	0.003	0.008	0.001	0.004	0.001	0.002	0.020	0.020	0.426	0.670	
JPN	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.851	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.000	0.000	0.000	0.002	0.000	0.001	0.010	0.110	0.149	
KOR	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.010	0.823	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.149	0.177	
MYS	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.001	0.006	0.000	0.002	0.000	0.066	0.003	0.667	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.104	0.000	0.000	0.000	0.003	0.020	0.107	0.333	
MEX	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.003	0.000	0.000	0.837	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.116	0.163	
NLD	0.000	0.000	0.001	0.004	0.001	0.001	0.006	0.000	0.001	0.013	0.109	0.000	0.001	0.003	0.010	0.001	0.001	0.000	0.488	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.004	0.001	0.002	0.001	0.024	0.011	0.309	0.512	
NOR	0.000	0.000	0.000	0.001	0.000	0.001	0.003	0.000	0.002	0.003	0.023	0.000	0.000	0.001	0.006	0.000	0.000	0.000	0.004	0.887	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.005	0.001	0.000	0.000	0.012	0.007	0.041	0.113
NZL	0.000	0.004	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.119	0.138	
PER	0.006	0.000	0.000	0.000	0.003	0.001	0.023	0.011	0.000	0.001	0.011	0.000	0.001	0.017	0.002	0.001	0.001	0.002	0.000	0.000	0.000	0.672	0.000	0.000	0.000	0.001	0.001	0.002	0.000	0.001	0.001	0.004	0.031	0.207	0.328	
PHL	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.029	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.900	0.000	0.007	0.009	0.000	0.000	0.000	0.002	0.000	0.001	0.013	0.027	0.100
ZAF	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.001	0.012	0.000	0.000	0.001	0.011	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.676	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.005	0.007	0.266	0.324
SAU	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.937	0.001	0.000	0.000	0.000	0.000	0.003	0.050	0.063	
SGP	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.018	0.001	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.876	0.000	0.000	0.004	0.000	0.001	0.007	0.058	0.124	
ESP	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.004	0.013	0.000	0.000	0.001	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.756	0.000	0.000	0.000	0.003	0.004	0.206	0.244	
SWE	0.001	0.001	0.001	0.003	0.001	0.002	0.015	0.000	0.009	0.011	0.098	0.001	0.001	0.003	0.022	0.001	0.001	0.001	0.012	0.011	0.000	0.000	0.000	0.000	0.003	0.004	0.003	0.591	0.003	0.002	0.001	0.029	0.028	0.142	0.409	
CHE	0.000	0.000	0.001	0.001	0.000	0.000	0.009	0.000	0.000	0.010	0.081	0.000	0.001	0.003	0.012	0.001	0.001	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.002	0.003	0.001	0.759	0.001	0.001	0.012	0.011	0.081	0.241
THA	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.001	0.004	0.000	0.001	0.000	0.044	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.025	0.000	0.000	0.000	0.788	0.000	0.001	0.009	0.113	0.212
TUR	0.000	0.000	0.000	0.001																																

	ARG	AUS	AUT	BEL	BRA	CAN	CHN	CHL	FIN	FRA	DEU	IND	IDN	ITA	JPN	KOR	MYS	MEX	NLD	NOR	NZL	PER	PHL	ZAF	SAU	SGP	ESP	SWE	CHE	THA	TUR	GBR	USA	poil	FROM		
ARG	0.756	0.000	0.000	0.000	0.008	0.000	0.004	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.226	0.244			
AUS	0.000	0.932	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.039	0.068		
AUT	0.000	0.000	0.341	0.003	0.001	0.001	0.071	0.000	0.001	0.016	0.329	0.000	0.001	0.008	0.010	0.002	0.001	0.001	0.014	0.001	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.012	0.002	0.006	0.001	0.003	0.024	0.019	0.122	0.659	
BEL	0.000	0.000	0.001	0.317	0.001	0.001	0.077	0.000	0.001	0.038	0.171	0.001	0.001	0.005	0.012	0.002	0.001	0.001	0.047	0.002	0.000	0.000	0.000	0.000	0.000	0.006	0.003	0.014	0.002	0.002	0.001	0.003	0.040	0.023	0.225	0.683	
BRA	0.016	0.000	0.000	0.000	0.771	0.001	0.030	0.002	0.000	0.001	0.005	0.000	0.000	0.000	0.004	0.001	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.000	0.000	0.001	0.012	0.149	0.229		
CAN	0.000	0.000	0.000	0.000	0.000	0.599	0.052	0.000	0.000	0.001	0.004	0.000	0.000	0.000	0.007	0.001	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.238	0.484	0.401	
CHN	0.000	0.000	0.000	0.000	0.000	0.000	0.846	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.007	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.135	0.154	
CHL	0.004	0.000	0.000	0.000	0.001	0.000	0.011	0.932	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.042	0.068	
CIN	0.000	0.000	0.001	0.002	0.001	0.001	0.080	0.001	0.624	0.010	0.097	0.000	0.001	0.003	0.010	0.002	0.001	0.001	0.014	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.002	0.007	0.018	0.001	0.001	0.003	0.023	0.018	0.376	
FRA	0.000	0.000	0.001	0.005	0.001	0.001	0.047	0.000	0.001	0.593	0.102	0.000	0.001	0.006	0.007	0.001	0.001	0.001	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.006	0.003	0.022	0.001	0.002	0.001	0.002	0.024	0.014	0.146	0.407	
DEU	0.000	0.000	0.002	0.003	0.001	0.001	0.065	0.000	0.001	0.015	0.693	0.000	0.001	0.004	0.009	0.002	0.001	0.001	0.014	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.003	0.011	0.001	0.003	0.001	0.003	0.022	0.017	0.121	0.307	
IND	0.000	0.001	0.000	0.001	0.001	0.001	0.097	0.000	0.000	0.002	0.015	0.632	0.006	0.001	0.010	0.005	0.003	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011	0.026	0.002	0.000	0.002	0.002	0.001	0.007	0.019	0.150	0.368
IDN	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.920	0.000	0.000	0.006	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.010	0.000	0.000	0.001	0.000	0.000	0.001	0.050	0.080		
ITA	0.001	0.000	0.001	0.002	0.001	0.001	0.060	0.000	0.001	0.018	0.084	0.001	0.001	0.357	0.007	0.002	0.001	0.001	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.015	0.001	0.003	0.001	0.005	0.017	0.018	0.383	0.643	
JPN	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.845	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.006	0.080	0.155	
KOR	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.005	0.837	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.120	0.163	
MYS	0.000	0.001	0.000	0.000	0.000	0.000	0.077	0.000	0.000	0.001	0.004	0.001	0.008	0.000	0.000	0.005	0.668	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.083	0.000	0.000	0.000	0.011	0.000	0.001	0.005	0.087	0.332
MEX	0.000	0.000	0.000	0.000	0.000	0.001	0.012	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.830	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.122	0.170	
NLD	0.000	0.000	0.000	0.005	0.001	0.000	0.051	0.000	0.001	0.011	0.090	0.000	0.001	0.002	0.006	0.001	0.001	0.001	0.521	0.001	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.006	0.001	0.001	0.001	0.002	0.019	0.011	0.257	0.479	
NOR	0.000	0.000	0.000	0.001	0.000	0.001	0.013	0.000	0.001	0.002	0.017	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.003	0.892	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.003	0.000	0.000	0.001	0.011	0.006	0.044	0.108
NZL	0.000	0.004	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.001	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.868	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.107	0.132	
PER	0.004	0.000	0.000	0.000	0.003	0.001	0.078	0.010	0.000	0.001	0.005	0.000	0.001	0.000	0.006	0.001	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.029	0.266	0.414	
PHL	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.025	0.002	0.004	0.000	0.001	0.000	0.000	0.000	0.000	0.863	0.000	0.006	0.017	0.000	0.000	0.000	0.003	0.000	0.001	0.009	0.029	0.137	
ZAF	0.000	0.000	0.000	0.000	0.000	0.001	0.032	0.000	0.000	0.001	0.008	0.000	0.001	0.000	0.007	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.628	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.003	0.304	0.372		
SAU	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.937	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.046	0.063	
SGP	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.001	0.000	0.000	0.008	0.000	0.007	0.002	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.880	0.000	0.000	0.000	0.003	0.000	0.001	0.004	0.050	0.120	
ESP	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.004	0.011	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.762	0.000	0.000	0.000	0.001	0.003	0.003	0.198	0.238	
SWE	0.000	0.001	0.001	0.003	0.001	0.002	0.069	0.000	0.011	0.009	0.078	0.001	0.001	0.002	0.010	0.002	0.001	0.002	0.010	0.015	0.000	0.000	0.000	0.000	0.004	0.002	0.006	0.619	0.001	0.001	0.004	0.020	0.025	0.109	0.390		
CHE	0.000	0.000	0.001	0.001	0.000	0.000	0.033	0.000	0.000	0.007	0.064	0.000	0.000	0.003	0.005	0.001	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.005	0.000	0.769	0.001	0.001	0.008	0.010	0.080	0.231		
THA	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.000	0.000	0.002	0.000	0.004	0.000	0.027	0.002	0.005																				

	ARG	AUS	AUT	BEL	BRA	CAN	CHN	CHL	FIN	FRA	DEU	IND	IDN	ITA	JPN	KOR	MYS	MEX	NLD	NOR	NZL	PER	PHL	ZAF	SAU	SGP	ESP	SWE	CHE	THA	TUR	GBR	USA	poil	FROM	
ARG	0.759	0.000	0.000	0.000	0.006	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.218	0.241	
AUS	0.000	0.910	0.000	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.030	0.090
AUT	0.000	0.000	0.336	0.002	0.001	0.001	0.176	0.000	0.001	0.012	0.282	0.001	0.001	0.005	0.005	0.003	0.001	0.001	0.018	0.001	0.000	0.000	0.000	0.000	0.007	0.003	0.007	0.001	0.008	0.001	0.004	0.017	0.020	0.083	0.664	
BEL	0.000	0.000	0.001	0.320	0.001	0.001	0.192	0.000	0.001	0.028	0.131	0.002	0.002	0.004	0.007	0.003	0.001	0.002	0.051	0.001	0.000	0.000	0.000	0.000	0.010	0.007	0.009	0.002	0.003	0.002	0.005	0.033	0.027	0.153	0.680	
BRA	0.008	0.000	0.000	0.000	0.688	0.000	0.102	0.001	0.000	0.000	0.003	0.001	0.001	0.000	0.002	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.008	0.179	0.312	
CAN	0.000	0.000	0.000	0.000	0.001	0.565	0.121	0.000	0.000	0.000	0.004	0.001	0.001	0.000	0.004	0.001	0.000	0.000	0.008	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.001	0.000	0.002	0.200	0.087	0.435	
CHN	0.000	0.000	0.000	0.000	0.000	0.840	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.004	0.144	0.160
CHL	0.001	0.000	0.000	0.000	0.001	0.000	0.038	0.919	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.035	0.081	
FIN	0.000	0.000	0.001	0.002	0.001	0.001	0.159	0.000	0.000	0.574	0.007	0.095	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.022	0.004	0.000	0.000	0.000	0.000	0.006	0.002	0.005	0.017	0.002	0.001	0.003	0.016	0.016	0.053	0.426
FRA	0.000	0.000	0.001	0.005	0.001	0.000	0.138	0.000	0.000	0.562	0.101	0.001	0.001	0.004	0.004	0.002	0.001	0.001	0.017	0.001	0.000	0.000	0.000	0.000	0.009	0.004	0.015	0.001	0.003	0.001	0.003	0.018	0.015	0.089	0.438	
DEU	0.000	0.000	0.002	0.002	0.001	0.000	0.167	0.000	0.001	0.011	0.644	0.001	0.001	0.003	0.004	0.002	0.001	0.001	0.021	0.001	0.000	0.000	0.000	0.000	0.006	0.003	0.006	0.001	0.004	0.001	0.004	0.017	0.017	0.079	0.356	
IND	0.000	0.001	0.000	0.000	0.001	0.000	0.200	0.000	0.000	0.001	0.008	0.596	0.009	0.000	0.005	0.004	0.004	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.054	0.013	0.001	0.000	0.002	0.003	0.001	0.003	0.014	0.074	0.404	
IDN	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.925	0.000	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.036	0.075
ITA	0.001	0.000	0.001	0.002	0.001	0.001	0.158	0.000	0.000	0.014	0.079	0.002	0.001	0.000	0.369	0.004	0.002	0.001	0.002	0.011	0.000	0.000	0.000	0.000	0.010	0.002	0.011	0.001	0.004	0.001	0.007	0.013	0.019	0.283	0.631	
JPN	0.000	0.000	0.000	0.000	0.000	0.000	0.093	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.815	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.005	0.070	0.185	
KOR	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.840	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.100	0.160
MYS	0.000	0.001	0.000	0.000	0.000	0.000	0.194	0.000	0.000	0.000	0.004	0.001	0.011	0.000	0.017	0.005	0.603	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.004	0.068	0.000	0.000	0.000	0.013	0.000	0.001	0.008	0.067	0.397
MEX	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.808	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.139	0.192	
NLD	0.000	0.000	0.000	0.004	0.001	0.000	0.140	0.000	0.001	0.008	0.078	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.540	0.001	0.000	0.000	0.000	0.000	0.005	0.003	0.004	0.001	0.001	0.001	0.002	0.016	0.011	0.173	0.460	
NOR	0.000	0.000	0.000	0.001	0.000	0.000	0.038	0.000	0.000	0.001	0.017	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.004	0.873	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.008	0.004	0.044	0.127	
NZL	0.000	0.002	0.000	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.882	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.075	0.118	
PER	0.001	0.000	0.000	0.000	0.002	0.001	0.214	0.002	0.000	0.000	0.004	0.001	0.001	0.000	0.004	0.003	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.460	0.000	0.000	0.002	0.001	0.001	0.000	0.001	0.016	0.283	0.540	
PHL	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.000	0.000	0.000	0.003	0.000	0.004	0.000	0.017	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.814	0.000	0.003	0.014	0.000	0.000	0.000	0.006	0.000	0.000	0.006	0.032	0.186
ZAF	0.000	0.000	0.000	0.000	0.000	0.000	0.088	0.000	0.000	0.001	0.006	0.001	0.001	0.000	0.003	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.545	0.004	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.005	0.338	0.455	
SAU	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.934	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.037	0.066	
SGP	0.000	0.000	0.000	0.000	0.000	0.000	0.068	0.000	0.000	0.000	0.001	0.000	0.008	0.000	0.004	0.002	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.855	0.000	0.000	0.000	0.003	0.000	0.000	0.003	0.042	0.145	
ESP	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.000	0.003	0.010	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.003	0.175	0.225	
SWE	0.000	0.000	0.001	0.003	0.001	0.001	0.164	0.000	0.009	0.006	0.071	0.001	0.001	0.002	0.005	0.002	0.001	0.002	0.014	0.016	0.000	0.000	0.000	0.000	0.005	0.002	0.003	0.558	0.002	0.001	0.005	0.015	0.018	0.090	0.442	
CHE	0.000	0.000	0.000	0.001	0.000	0.000	0.087	0.000	0.000	0.003	0.034	0.002	0.001	0.001	0.003	0.001	0.001	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.005	0.004	0.002	0.000	0.745	0.001	0.002	0.009	0.010	0.083	0.255	
THA	0.000	0.001	0.000	0.000	0.000	0.000	0.101	0.000	0.000	0.000	0.002	0.000	0.004	0.001	0.013	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.008	0.000	0.000	0.000	0.000	0.001	0.005		