APPENDIX

Items used in analysis

Item abbreviation	Item wording
	I will name a number of institutions, and I would like you to tell me to what extent you trust each of them [1. Absolutely do not trust it … 4. Trust it to a great extent]
Tgo	The government (the cabinet)
Tpo	Public Security (the police)
Taf	The armed forces (the army)
Tcv	Civil society institutions (associations, clubs, volunteer youth groups, etc.)
TPI	*Trust in political institutions* (normalized factor score, range: 0-1; indicator items are Tgo + Tpo + Taf + Tcv)
Sre	Suppose that there was a scale from 1-10 to measure the extent of your satisfaction with the government, in which 1 means that you were absolutely unsatisfied with its performance and 10 means that you were very satisfied, to what extent are you satisfied with the government's performance?
Dsu	Suppose there was a scale from 1-10 measuring the extent to which democracy is suitable for your country, with 1 meaning that democracy is absolutely inappropriate for your country and 10 meaning that democracy is completely appropriate for your country. To what extent do you think democracy is appropriate for your country?
	To what extent do you agree or disagree with the following statements? [1. Strongly disagree … 4. Strongly agree]
Dec	Under a democratic system, the country's economic performance is weak. (Reverse scored)
Dfp	Democratic regimes are indecisive and full of problems. (Reverse scored)
Dne	Democratic systems are not effective at maintaining order and stability. (Reverse scored)
Dde	*Support for democracy* (normalized factor score, range: 0-1; indicator items are Dec + Dfp + Dne)
Dbe	A democratic system may have problems, yet it is better than other systems.
Iip	Religious leaders (imams, preachers, priests) should have influence over government decisions
Ise	Religious practices are private and should be separated from social and political life
	To what extent do you think that "freedom to express opinions" is guaranteed in your country? [1. Not guaranteed … 4. Guaranteed to a great extent]
Fex	Freedom to express opinions
Fde	Freedom to participate in peaceful protests and demonstrations
Fcs	Freedom to join NGOs and civil society organizations
Fre	*Thinking that freedoms are guaranteed in the country* (normalized factor score, range: 0-1; indicator items are Fex + Fde + Fcs)
Eco	How would you evaluate the current economic situation in your country? [1. Very Bad … 4. Very Good]
Dem	In your opinion, to what extent is your country democratic? [0. No democracy … 10. Democratic to the greatest extent possible]
Int	In general, to what extent are you interested in politics? [1. Not interested … 4. Very interested]

Descriptive statistics

Table 1 Egypt Wave 2

	mean	sd	median	min	max	skew	kurtosis	se
TPI	0.7	0.18	0.72	0	1	-0.64	0.17	0.01
Dde	0.32	0.25	0.33	0	1	0.47	-0.39	0.01
Fre	0.86	0.18	0.98	0	1	-1.6	3.07	0.01
Dbe	3.03	0.84	3	1	4	-0.64	-0.11	0.02
Dsu	6.83	2.27	7	1	10	-0.42	-0.32	0.07
Sre	1.95	1.93	1	1	10	2.21	4.28	0.06
Iip	2.29	0.92	2	1	4	0.31	-0.7	0.03
Ise	3.15	0.85	3	1	4	-0.73	-0.2	0.02
Eco	1.96	0.74	2	1	4	0.16	-0.89	0.02
Dem	5.59	2.3	5	0	10	-0.2	-0.04	0.07
Int	2.61	0.94	3	1	4	-0.12	-0.87	0.03

Table 2 Tunisia Wave 2

	mean	sd	median	min	max	skew	kurtosis	se
TPI	0.58	0.23	0.63	0	1	-0.35	-0.64	0.01
Dde	0.38	0.24	0.34	0	1	0.46	0.21	0.01
Fre	0.63	0.22	0.65	0	1	-0.67	0.49	0.01
Dbe	3.16	0.65	3	1	4	-0.56	0.87	0.02
Dsu	6	2.45	6	0	10	-0.12	-0.59	0.07
Sre	1.6	1.45	1	0	10	3.16	11.01	0.04
Iip	2.13	0.74	2	1	4	0.41	0.09	0.02
Ise	3.11	0.82	3	1	4	-0.57	-0.4	0.02
Eco	2.04	0.76	2	1	4	0.13	-0.76	0.02
Dem	4.52	2.22	5	0	10	0.19	0.17	0.06
Int	2.22	0.89	2	1	4	0.24	-0.73	0.03

Table 3 Egypt Wave 3

	mean	sd	median	min	max	skew	kurtosis	se
TPI	0.39	0.22	0.37	0	1	0.39	-0.45	0.01
Dde	0.37	0.27	0.34	0	1	0.66	-0.05	0.01
Fre	0.64	0.31	0.68	0	1	-0.65	-0.85	0.01
Dbe	3.12	0.8	3	1	4	-0.9	0.72	0.02
Dsu	4.63	2.75	5	0	10	0.05	-0.81	0.08
Sre	2.47	2.48	2	0	10	0.73	-0.43	0.07
Iip	1.92	0.88	2	1	4	0.82	0.05	0.03
Ise	3.1	0.92	3	1	4	-0.8	-0.21	0.03
Eco	1.5	0.64	1	1	4	1.03	0.59	0.02
Dem	3.25	2.48	3	0	10	0.52	-0.34	0.07
Int	2.42	0.91	2	1	4	-0.01	-0.83	0.03

Table 4 Tunisia Wave 3

	mean	sd	median	min	max	skew	kurtosis	se
TPI	0.56	0.25	0.58	0	1	-0.28	-0.6	0.01
Dde	0.47	0.27	0.53	0	1	-0.19	-0.58	0.01
Fre	0.73	0.29	0.83	0	1	-1.09	0.18	0.01
Dbe	3.12	0.91	3	1	4	-0.94	0.17	0.03
Dsu	4.93	2.84	5	0	10	-0.09	-0.76	0.08
Sre	4.07	2.72	4	0	10	0.1	-0.69	0.08
Iip	1.99	0.97	2	1	4	0.68	-0.55	0.03
Ise	3.08	0.99	3	1	4	-0.79	-0.48	0.03
Eco	1.59	0.71	1	1	4	0.83	-0.41	0.02
Dem	4.36	2.46	5	0	10	0.02	-0.49	0.07
Int	2.44	1.02	2	1	4	0.07	-1.12	0.03

Table 5 Egypt Wave 5

	mean	sd	median	min	max	skew	kurtosis	se
TPI	0.64	0.23	0.69	0	1	-1.05	0.67	0
Dde	0.36	0.24	0.34	0	1	0.39	-0.51	0
Fre	0.52	0.29	0.6	0	1	-0.23	-1.05	0.01
Dbe	3.18	0.85	3	1	4	-0.94	0.34	0.02
Dsu	5.81	2.61	5	0	10	-0.15	-0.48	0.05
Sre	4.85	2.88	5	0	10	-0.15	-0.87	0.06
Iip	1.97	0.86	2	1	4	0.67	-0.16	0.02
Ise	2.88	0.88	3	1	4	-0.52	-0.36	0.02
Eco	2.47	0.8	3	1	4	-0.25	-0.52	0.02
Dem	5.13	2.74	5	0	10	-0.45	-0.46	0.06
Int	1.91	0.92	2	1	4	0.64	-0.64	0.02

Table 6 Tunisia Wave 5

	mean	sd	median	min	max	skew	kurtosis	se
TPI	0.53	0.2	0.53	0	1	-0.2	-0.23	0
Dde	0.48	0.22	0.46	0	1	0.08	0.02	0
Fre	0.51	0.25	0.53	0	1	-0.19	-0.81	0.01
Dbe	2.99	0.71	3	1	4	-0.69	0.92	0.01
Dsu	4.99	3.31	5	0	10	-0.04	-1.06	0.07
Sre	3.53	2.93	4	0	10	0.41	-0.67	0.06
Iip	2.06	0.8	2	1	4	0.45	-0.18	0.02
Ise	2.93	0.91	3	1	4	-0.51	-0.55	0.02
Eco	1.45	0.64	1	1	4	1.2	0.75	0.01
Dem	4.62	2.89	5	0	10	0.03	-0.7	0.06
Int	1.81	0.99	1	1	4	0.89	-0.48	0.02

Measurement model for *Trust in political institutions, Support for democracy and Thinking that freedoms are guaranteed in the country*

Using confirmatory factor analysis (CFA), we fitted a theoretical measurement model with three correlated constructs. We labeled the first latent construct as *trust in political institutions* (TPI); this construct is indicated by four items that ask to what extent the survey participants trust in the government, the police, the army, and the civil society institutions. The second latent construct indicates the opinion that *freedoms are guaranteed in the country* (Fre). We tap into this construct with three indicators: thinking freedom to express opinions is guaranteed, thinking freedom to participate in demonstrations is guaranteed, and thinking freedom to join NGOs and civil societies are guaranteed. The final construct in the measurement model reflects *support for democracy* (Dde); this construct is indicated by three items that ask whether democratic regimes are prone to weak economies, indecisiveness, and instability. Due to the wording and the ordering of the response options, we reverse-scored these three items so that a higher level of agreement indicates support for democratic regimes and systems.

Judging by the guidelines suggested in Kline (2016) and Hu and Bentler (1999), all the goodness of fit statistics of the measurement model yield acceptable cut-off values. Table 7 lists all the goodness of fit values for both countries in each wave. Figures 1-3 displays the path diagrams of the models. The reliabilities indicated by McDonald's (1999) omega (ω) are also acceptable. Coefficients can be seen in Table 8.

After establishing the measurement model, we proceeded the analyses with the obtained factor scores for each latent variable. Here, we relied on the normalized factor scores ranging from 0-1.

Table 7 Confirmatory factor analysis goodness of fit statistics

	Robust χ 2 (df)	**Scaling correction factor for the Yuan-Bentler correction**	**Robust CFI**	**Robust TLI**	**Robust RMSEA (P-value) 90 % CI**	**SRMR**
Egypt Wave 2	138.477***(32)	1.082	0.970	0.958	0.054 (0.319) 0.045-0.064	0.048
Tunisia Wave 2	119.460***(32)	1.089	0.971	0.960	0.050 (0.644) 0.041-0.060	0.042
Egypt Wave 3	143.356***(32)	1.036	0.974	0.964	0.055 (0.219) 0.046-0.064	0.039
Tunisia Wave 3	238.827***(32)	1.066	0.946	0.924	0.076 (0) 0.067-0.085	0.049
Egypt Wave 5	418.535***(32)	1.033	0.955	0.937	0.072(0) 0.066-0.078	0.045
Tunisia Wave 5	212.161***(32)	1.004	0.939	0.914	0.049 (0.649) 0.042-0.055	0.030

χ2 (df) = chi-square & degrees of freedom (good fit indicated by p>0.05); **CFI** = Comparative Fit Index (closer to 1 is better, good fit indicated by >.95); **TLI** = Tucker-Lewis Index (closer to 1 is better, good fit indicated by >.95); **RMSEA** = Root Mean Square Error of Approximation (good fit indicated by RMSEA < 0.06 & P-value > 0.05); **SRMR** = Standardized Root Mean Square Residual (good fit indicated by SRMR < 0.05) (Hu & Bentler, 1999; Kline, 2016).

Table 8 Reliability coefficients of the constructs

	McDonald's omega (ω)		
	$\omega_{\text{trust in political institutions}}$	**$\omega_{\text{support for democracy}}$**	**$\omega_{\text{thinking that freedoms are guaranteed in the country}}$**
Egypt Wave 2	0.53	0.88	0.84
Tunisia Wave 2	0.64	0.87	0.71
Egypt Wave 3	0.65	0.87	0.87
Tunisia Wave 3	0.71	0.82	0.85
Egypt Wave 5	0.76	0.73	0.82
Tunisia Wave 5	0.61	0.62	0.65

McDonald's (1999) omega (ω) is known to be a better indicator for the reliability of multi-dimensional CFAs with *N*>1000 (Crutzen & Peters, 2015; Revelle & Zinbarg, 2009; Rodriguez, Reise, & Haviland, 2016). Similar to Cronbach's alpha (α), higher ω correspond to higher reliability. See McNeish (2018) for a review of drawbacks of Cronbach's alpha (α) and its alternatives including the ω.

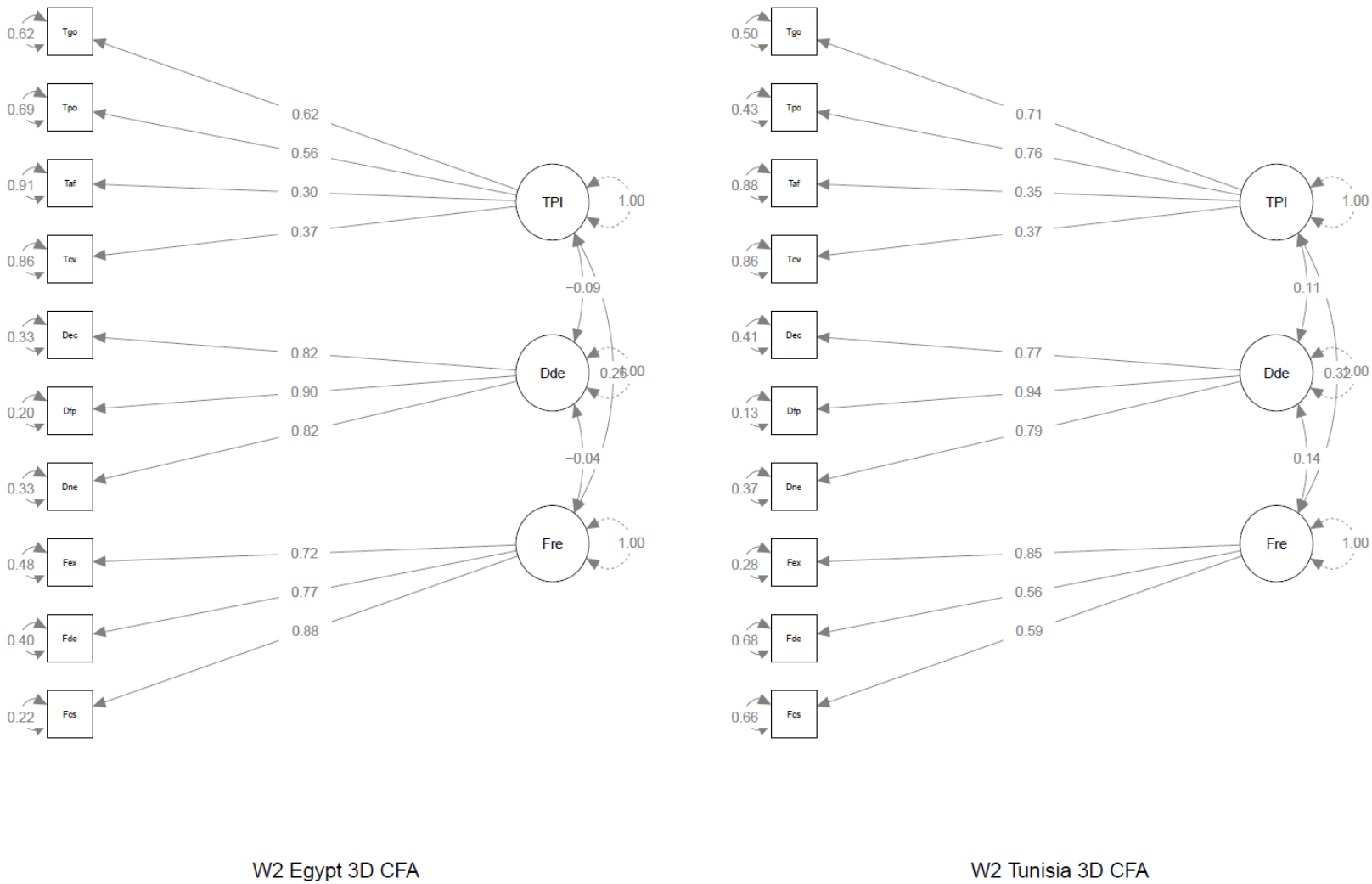
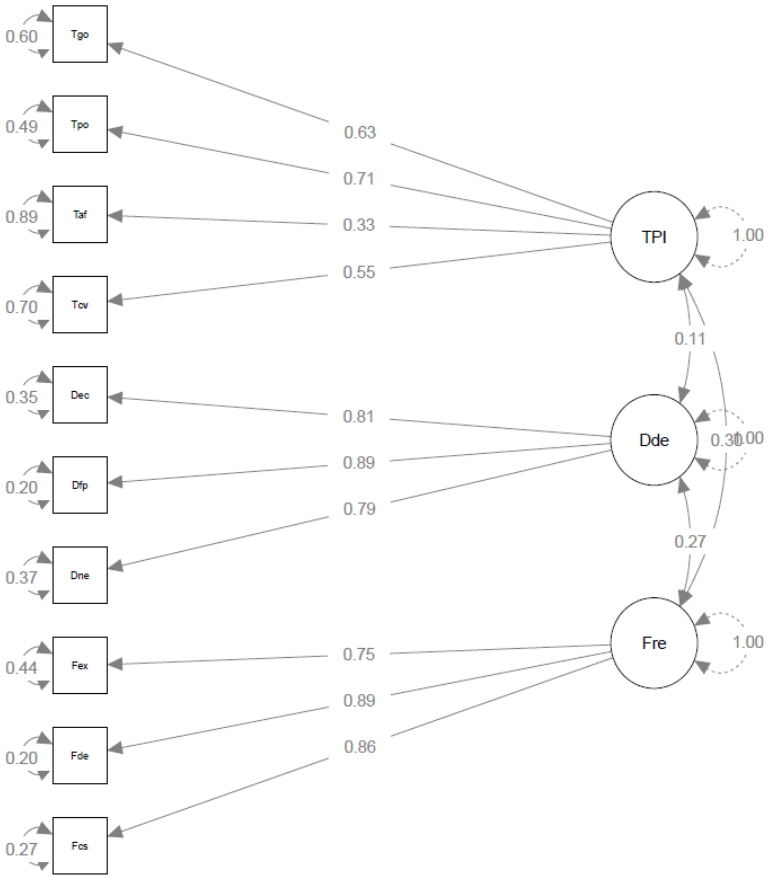
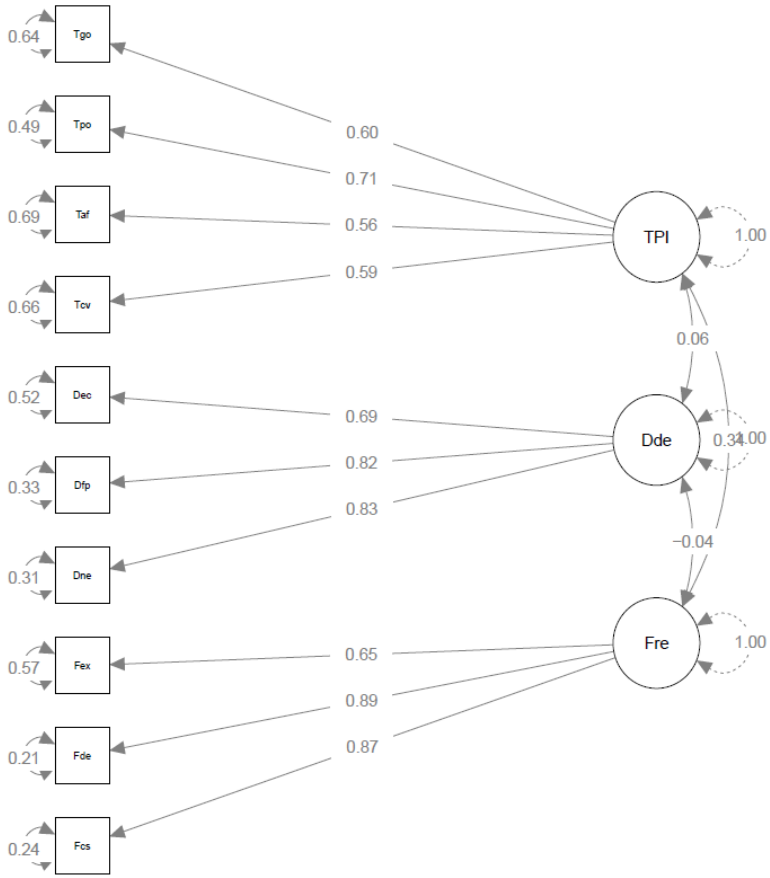


Figure 1 Confirmatory factor analysis (CFA) with path diagrams - Countries in Wave 2. All paths are significant at $p < 0.001$ level.



W3 Egypt 3D CFA



W3 Tunisia 3D CFA

Figure 2 Confirmatory factor analysis (CFA) with path diagrams - Countries in Wave 3. All paths are significant at $p < 0.001$ level.

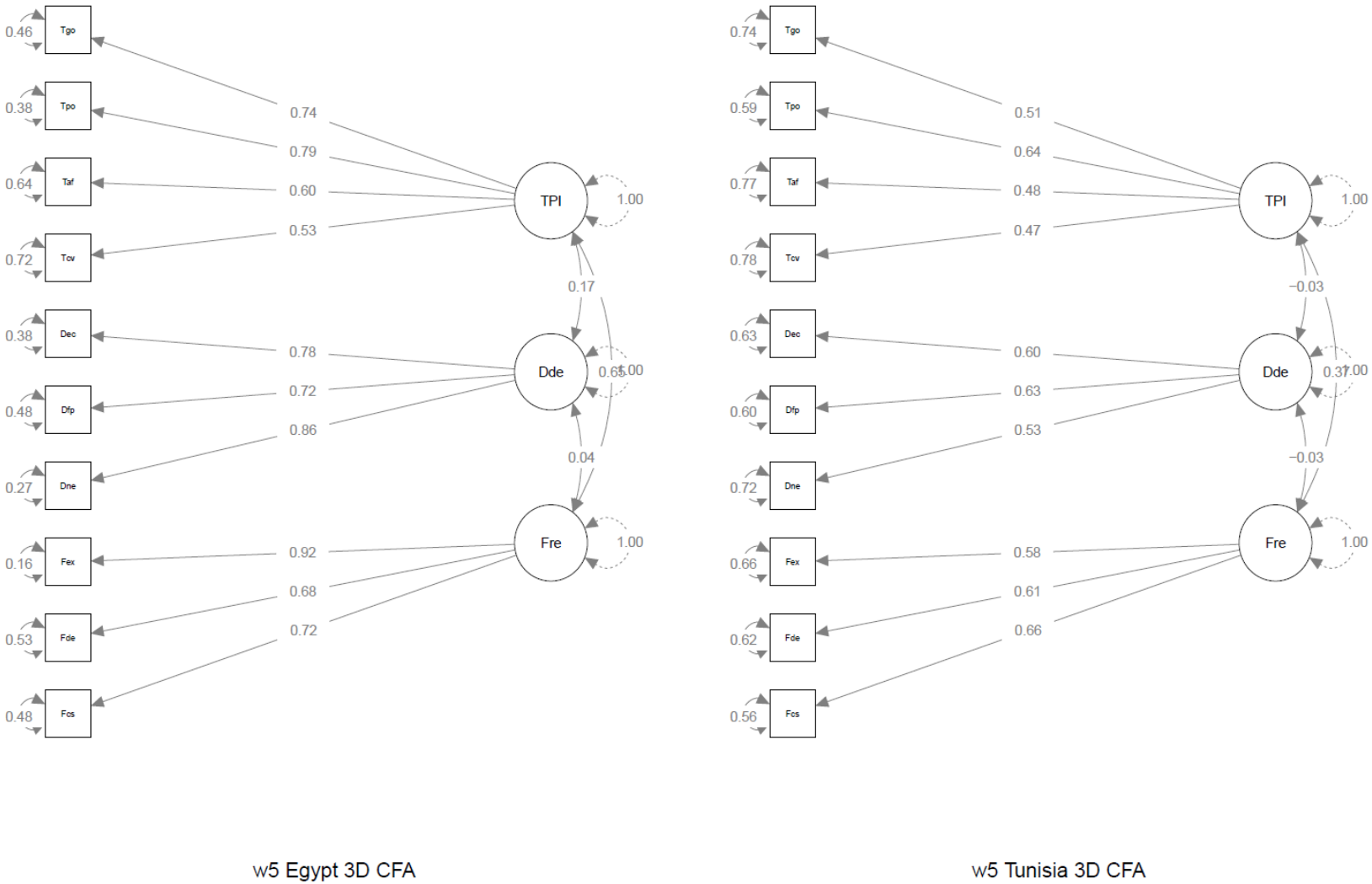


Figure 3 Confirmatory factor analysis (CFA) with path diagrams - Countries in Wave 5. All paths are significant at $p < 0.001$ level.

Multiple imputation

The second and the third steps in our empirical strategy requires no missing values in the data. In order to be able to fulfill the process, we imputed the missing values with a semi-parametric predictive mean matching algorithm implemented in the R mice package (van Buuren & Groothuis-Oudshoorn, 2011). This approach ensures plausible values with the help of an iterated process. The algorithm utilizes the observed values of the predictor and the predicted variables to impute the missings. Once predicted values of the missing observations are calculated with linear regression, they are matched to the closest three values in the observed predicted values, and one of these three values is randomly imputed. This process is iterated, and with each iteration, a new dataset of observed values is created. We imputed 10 chain datasets with 1000 iterations and used the imputed values in the last created dataset.

Extended explanation and results of Bayesian belief network analysis

Attitude networks based on correlations do not allow any directed interpretation. An alternative that introduces directed edges in correlation networks is a Bayesian network approach that has its basis in directed acyclic graphs (DAGs). Here, the advantage is the ability to convert causal assumptions into conditional independence statements, which, in turn, can be subject to statistical hypothesis testing. Within the framework of the Bayesian networks, there are numerous algorithms that can be used. The workflow is inherently Bayesian, regardless of the applied algorithm. The output relies on a posterior distribution involving the graph structure and the parameters, given the data. For an extended guide on Bayesian network implementation, see M. Scutari and Denis (2014).

To compute the Bayesian belief network, we relied on the tabu algorithm implemented by the R package bnlearn (Marco Scutari, 2010). Tabu is a variant of a greedy search and explore algorithm commonly referred to as the hill climbing. The hill climbing algorithm explores the space by adding, removing, and reversing single directed edges with a random start. It implements scores caching, decomposition & equivalence to reduce duplicate tests. In other words, the algorithm starts with a representation without any edge and, subsequently, adds, deletes, and reverses one edge at a time until a target score (which judges the goodness of fit – the Bayesian Information Criterion (BIC)) cannot be improved any further. As this iterative

process unfolds, the algorithm discerns the network's structure. The tabu algorithm is the variant that can escape local optima.

Below are the raw results with the same node sizes and no edge weights. These raw results rely on 1000 bootstraps that come up with an averaged network that retained the edges that were present in 85% of the bootstraps. The edges with a > 50 % probability of going from one node to the other were kept, the reverse edges with < 50% probability are dropped from the network structure.

Figure 4 Bayesian belief networks of Egypt & Tunisia in Wave 2 - the raw results

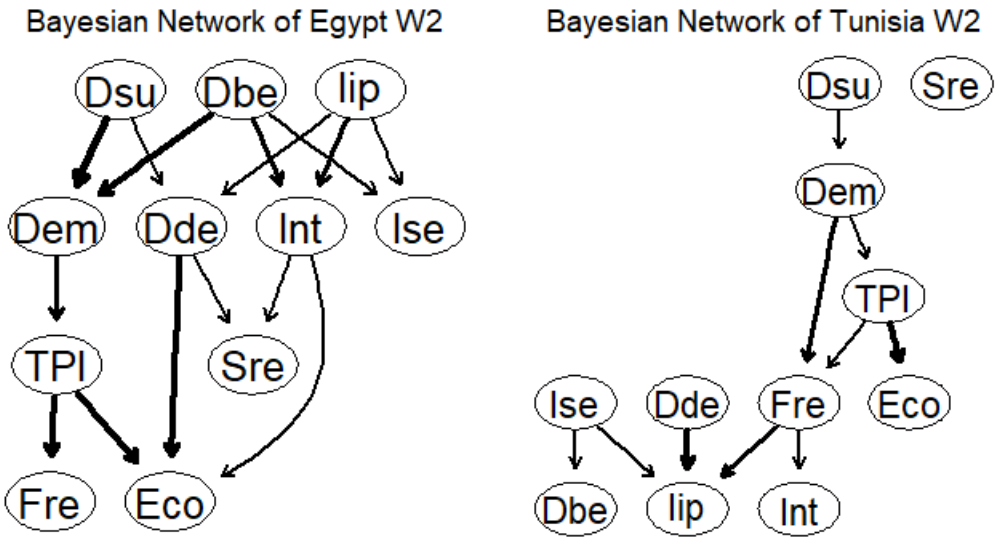


Figure 5 Bayesian belief networks of Egypt & Tunisia in Wave 3 - the raw results

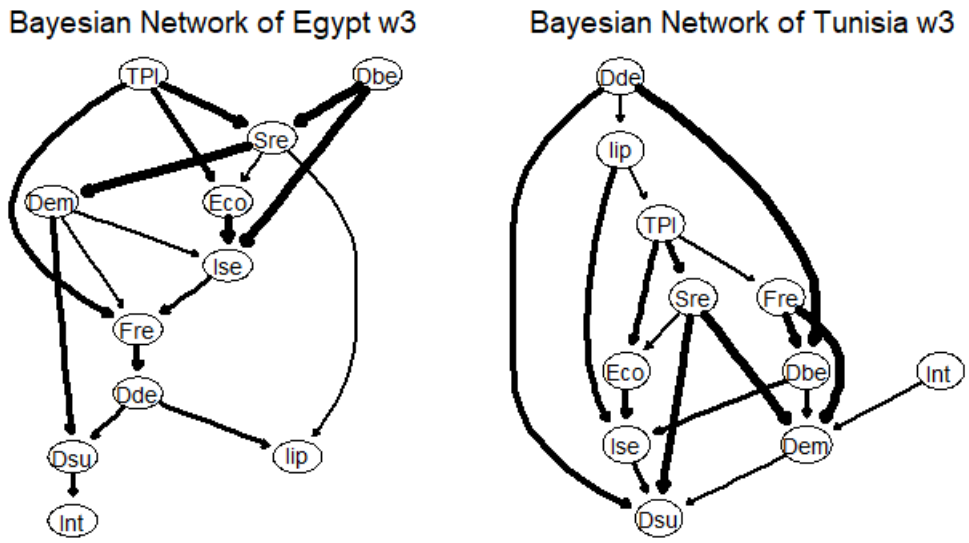
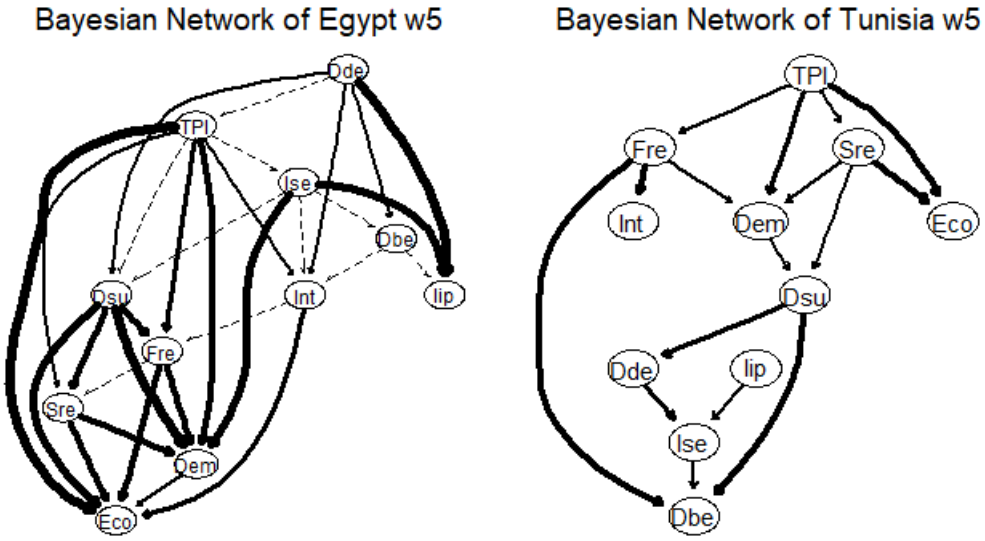


Figure 6 Bayesian belief networks of Egypt & Tunisia in Wave 5 - the raw results



Network plotting with igraph for interpretation

For better and more informed interpretation, we imported the Bayesian results into the igraph (Csardi & Nepusz, 2006) environment as directed networks and computed the centrality indices. As a final step, we plotted the imported networks by using the in-going and out-going centrality measures as the node sizes. Such plotting gives us the nodes' importance as the causes and effects in a set of complex relationships.

We rely on the centrality measures of the estimated directed network. The outgoing centrality (determined by the number of outgoing edges from a node/survey-item) reveals the most influential causes in a set of relationships. The incoming centrality (determined by the number of incoming edges), on the other hand, reflects the effects and how a particular outcome is central in a set of relationships. In summary, we present the attitude networks in such a way that the size of the nodes is meaningful and interpretable. We compute two network plots for both countries in each wave. The first plot illustrates the causes in the set of relationships. The bigger nodes (read as variables/survey items) are the strongest causes of multiple outcomes that they are related to. The second network plot illustrates the effects/outcomes. Here, the bigger nodes mean they are affected by a larger number of nodes/variables in the network.

Figure 2A & 2B illustrate a hypothetical example of the technique we describe above. Figure 2A depicts the causes in the set of relationships. Node A is the largest because it is related to four different outcomes: B, C, D & E. Nodes C and D both lead to a single outcome, which is E, thus they have the same size, but they are smaller than A with four out-going edges. Figure 2B depicts the outcomes in the set of relationships. This time, node E is the largest because it is caused by three separate nodes (A, C & D) in the network. Node A has no causes (no incoming connections); therefore, it is the smallest. Nodes B, C & D all have a single incoming edge, thus have the same size.

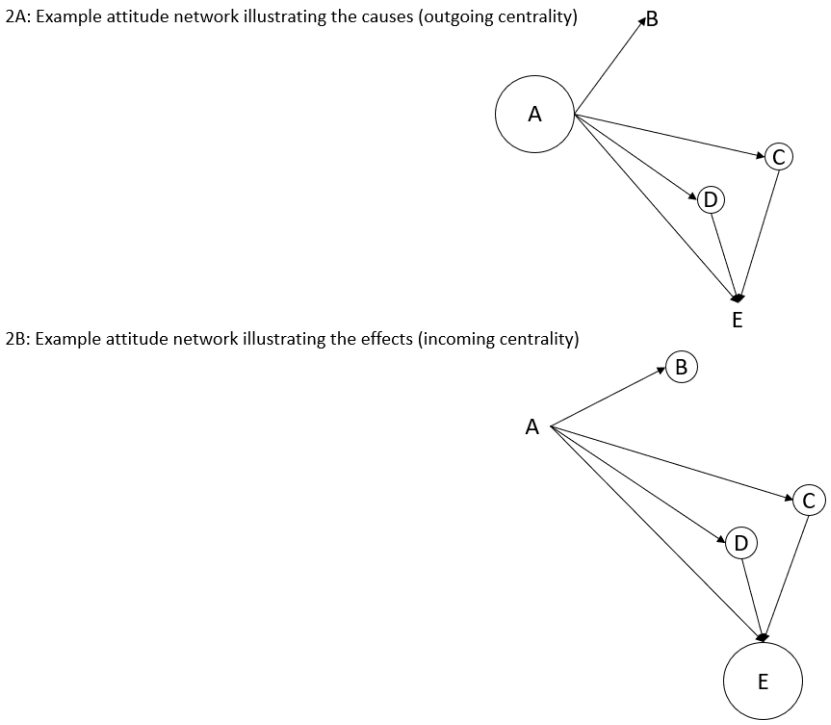


Figure 7 Example (hypothetical) network illustrating the causes and effects in a set of relationships across nodes/survey-items

The analysis steps conducted within the network framework might appear somewhat unfamiliar to social scientists at first instance. However, such methods are commonly used in the medical sciences (Tennant et al., 2019) and are becoming increasingly popular in the psychological sciences as well (Robinaugh, Hoekstra, Toner, & Borsboom, 2020).

Figures 3, 4 & 5 show the same BNs from the previous section; however, the node sizes indicate the outgoing and incoming centrality.

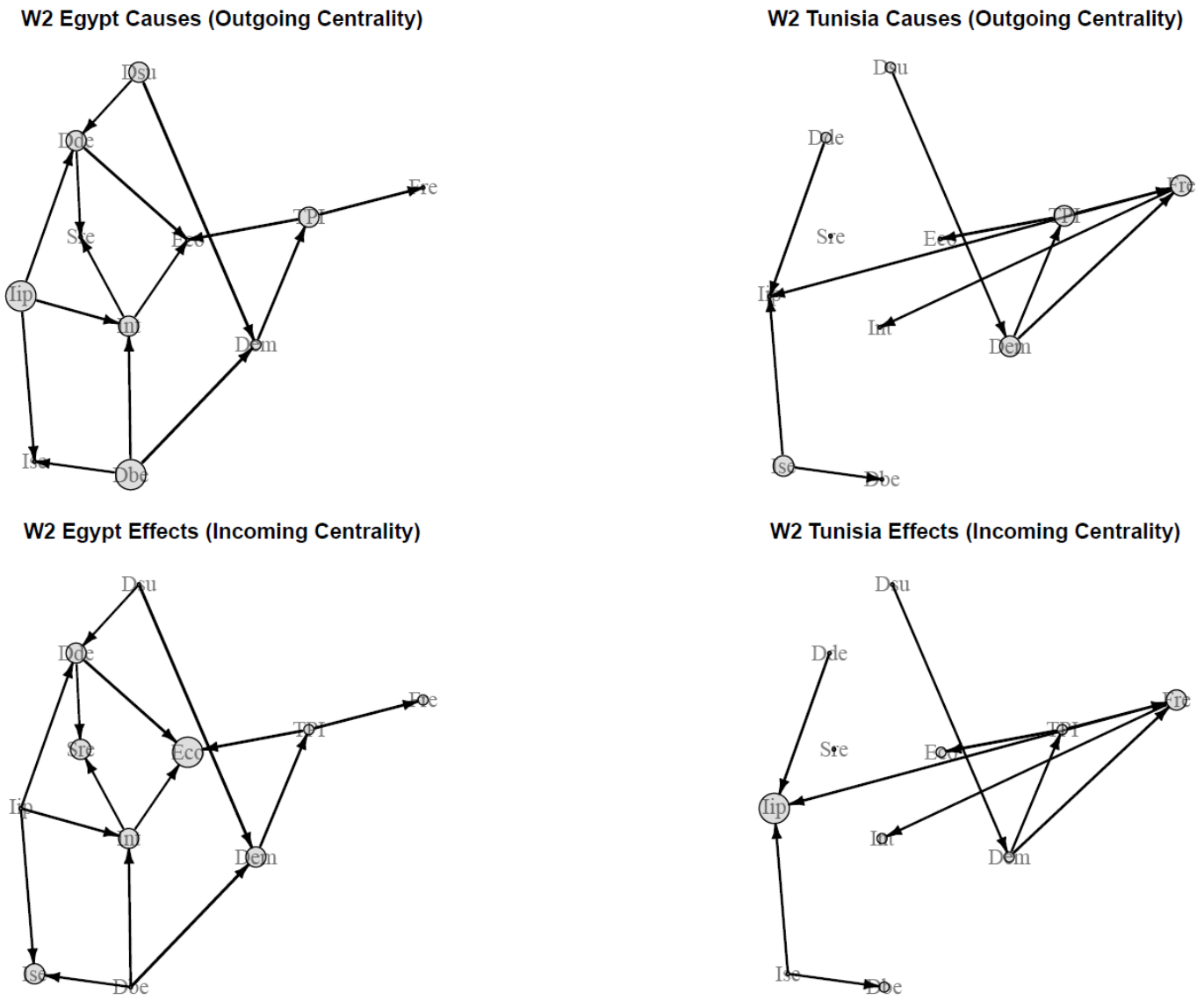


Figure 8 Bayesian belief networks of countries in Wave 2. The most central outcomes are depicted on the networks in the lower row; the cause on the upper row reflect the most central causes for the multiple outcomes.

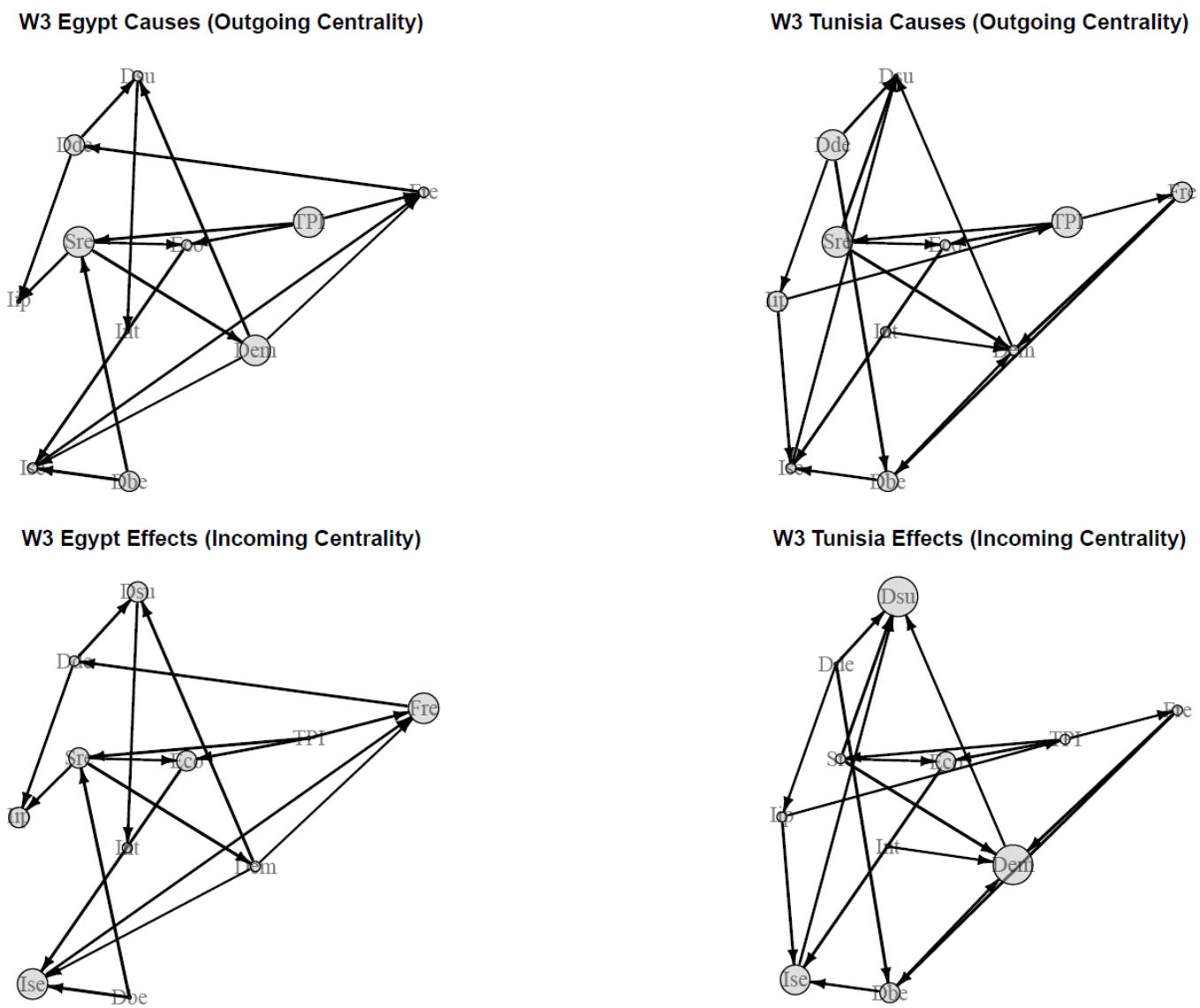


Figure 9 Bayesian belief networks of countries in Wave 3. The most central outcomes are depicted on the networks in the lower row; the cause on the upper row reflect the most central causes for the multiple outcomes.

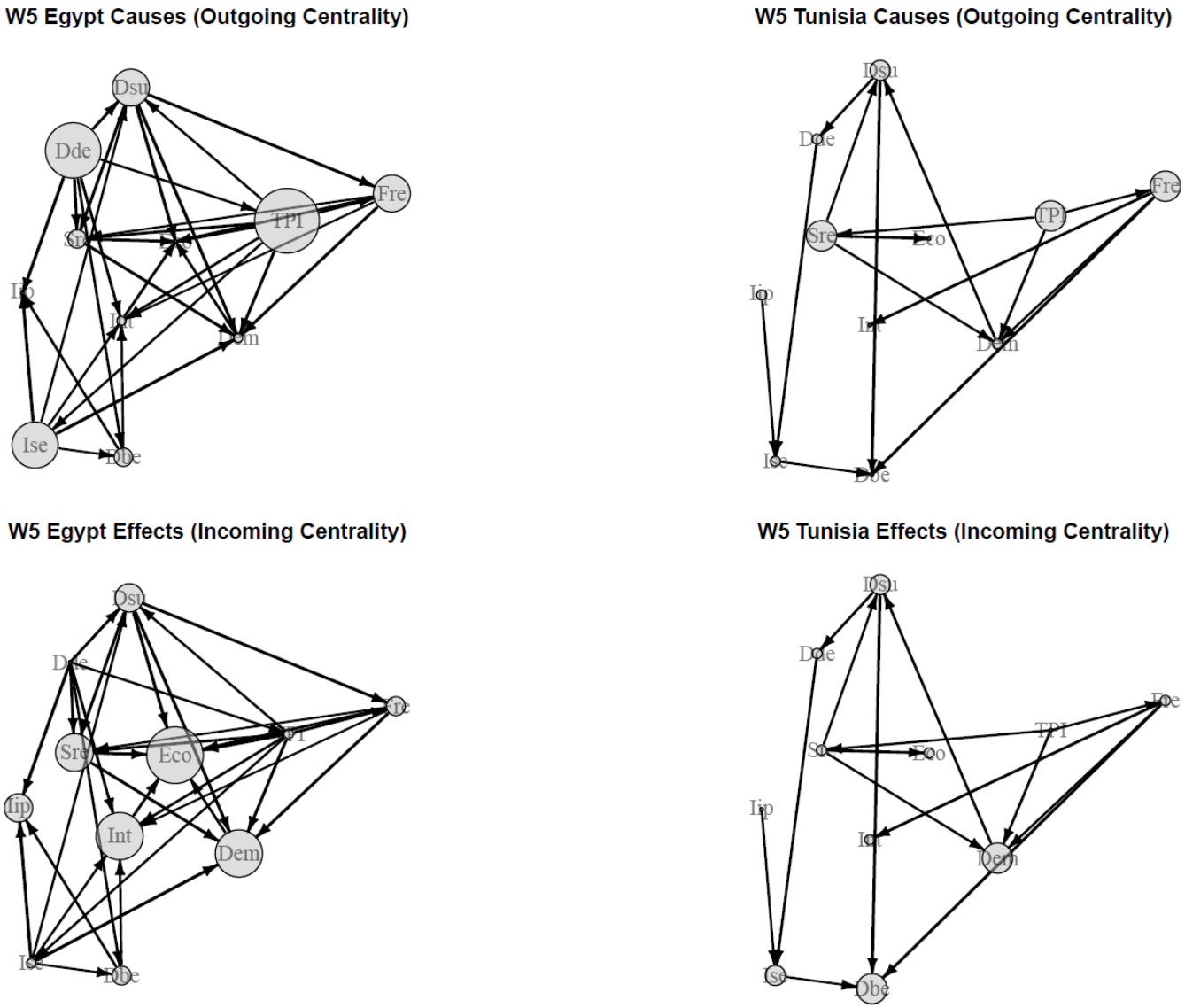


Figure 10 Bayesian belief networks of countries in Wave 5. The most central outcomes are depicted on the networks in the lower row; the cause on the upper row reflect the most central causes for the multiple outcomes

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