Supporting Information

Norbert Brunner and Christof Tschohl

Data and supplementary comments to the following papers in Jusletter-IT, jusletter-it.weblaw.ch:

A)   Norbert-Brunner / Christof Tschohl, Do Patterns of Treaty Ratifications Reveal Societal Preferences? Analysis of Twelve Council of Europe Conventions, in: Jusletter IT 20 February 2014 (IRIS Conference)

B)   Norbert Brunner / Christof Tschohl, Assessment and Explanation of the Human Rights Situation of an Ubiquitous Minority: A Case Study from Europe, in: Jusletter IT 11 December 2014

S1.   Background Information about CaRT Methodology

For trees with few criteria there exist alternative descriptions by tables; e.g. Table S1.

Table S1. Alternative description of the classification tree of Figure 3 in paper B.

		population size (H, I, S)				
		< 2.1 mio (S)		**pop intermediate**		**> 45.5 mio**
VP L, I, H = ECHR fulfilment H, I, L	**VP > 1.395**	**type A:** *Andorra, Liechtenstein, Malta, Monaco, San Marino*	**type C:** *Macedonia, Montenegro*	**type C:** *Bulgaria, Croatia, Latvia, Lithuania, Slovak Republic, Ukraine*		**type A:** *Russian Federation*
		type D: *Slovenia*	**type E:** *Cyprus*	**type D:** *Romania*	**type E:** *Greece, Moldova*	
	VP intermediate	**type D**: *Iceland*		**type A:** *Georgia, Ireland*	**type C:** *Albania, Armenia, Austria, Bosnia & Herzegovina, Finland, Hungary, Serbia*	**type B:** *Italy*
		type E: *Luxembourg*		**type E:** *Azerbaijan, Belgium, Czech Republic, Poland, Sweden*		**type E:** *France, Turkey, UK*
		type B: *Estonia*		**type B:** *Portugal*	**type D:** *Switzerland*	
	VP < 0.1			**type B:** *Denmark*	**type E:** *Netherlands, Norway*	**type B:** *Germany*
						type E: *Spain*

Explanation: Description of SWDEF in CoE countries in terms of population size, VP, and ratification type. SWDEF = 1 for countries in grey cells and SWDEF = 0 for countries in white cells. Thresholds for VP and population size were chosen to minimize misclassifications. Ratification types are explained in papers A and B.

In addition to applications in medical research, CaRT is a common tool in marketing to identify the motivations of consumers, explaining e.g. house sale prices by local factors.[1] CaRT was also applied in policy development, detecting early in a planning phase of an infrastructure project, what future users might support it and why.[2] In the technical context, CaRT was applied in urban planning to analyze causes of traffic accidents,[3] in chemical industry to enhance safety of refineries,[4] or in urban water system planning to better prevent

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[1] Yoo, S., Junghoo, I., Wagner, J.E. (2012). Variable Selection for Hedonic Model using Machine Learning Approaches: A Case Study in Onondaga County, NY. *Landscape and Urban Planning*, **107**, 293–306.

[2] Starkl, M., Brunner, N., Lopez, E., Martinez-Ruiz, J.L. (2013). A Planning-Oriented Sustainability Assessment Framework for Peri-Urban Water Management in Developing Countries. *Water Research*, **47**, 7175–7183.

[3] Chang, L.E., Wang, H.E. (2006). Analysis of Traffic Injury Severity: An Application of Non-Parametric Classification Tree Techniques. *Accident Analysis and Prevention*, **38**, 1019–1027.

[4] Bevilacqua, M., Braglia, M., Monatanari, R. (2003): The Classification and Regression Tree Approach to Pump Failure Rate Analysis. *Reliability Engineering and System Safety*, **79**, 59–67.

health hazards from hidden system failures.[5] US Department of Homeland Security applied CaRT for improving protection of vital infrastructure against terrorist attacks.[6] In the legal context, CaRT explained reasons for compliance with certain laws.[7] There are also applications in automatic natural language recognition relevant in that context.[8]

S2. SWDEF for European Countries

The following reports resulted in the SWDEF = 1 classification of a country:

- Albania (CEDAW/C/ALB/CO/3 of 16 September 2010: even victims of trafficking were penalized for illegal prostitution rather than protected; c.f. ABC News of 21 May 2011: police corrupted by traffickers)
- Armenia (victims of trafficking are treated like criminals)[9]
- Austria (CAT/C/AUT/CO/4-5 of 20 May 2010: degrading compulsory gynaecological inspections; obligatory HIV tests were also a concern for CEDAW/C/AUT/CO7-8 of 1 March 2013)
- Azerbaijan (NGO reports about police brutality to CEDAW session on 7 August 2009)
- Belgium (USDS country report 2010: police harassment)
- Bosnia & Herzegovina (USDS country report 2010: even child victims of sexual exploitation were penalized)
- Bulgaria (ECtHR, *A. & Others* of 29 November 2011 [nº 51776/08]: placement of a child prostitute in a boarding educational centre against her will)
- Croatia (USDS country report 2009: police harassment)
- Cyprus (ECtHR, *Rantsev* of 7 January 2010 [n° 25965/04]: lacking protection of the life of trafficked women, also documented in literature)[10]
- Czech Republic (police misconduct)[11]
- Finland (ECtHR, *Taavitsainen* of 8 December 2009 [n° 25597/07]: excessive length of proceedings about procurement into prostitution, as a woman let her apartment to SW friends)[12]
- France (Le Post of 2 March 2010, The Guardian of 23 March 2010: gang rapes by police officers)
- Georgia (USDS country report 2009: lacking protection against sexual harassment)
- Germany (CEDAW/C/DEU/CO/6 of 12 February 2009: impunity for German soldiers involved in forced prostitution)

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[5] STARKL, M., BRUNNER, N., STENSTRÖM, T.A. (2013): Why Do Water and Sanitation Systems for the Poor Still Fail? Policy Analysis in Economically Advanced Developing Countries. *Environmental Science & Technology*, **47**, 6102–6110.

[6] LUCAS, T.W., SANCHEZ, S.M., MARTINEZ, F., SICKINGER, L.R., ROGINSKI, J.W. (2007). Defense and Homeland Security Applications of Multi-Agent Simulations. In *Henderson, S.G. et al.*, Proceedings of the 2007 Simulation Winter Conference, Washington DC, 138–149.

[7] PETERSON, K., DISS-TORRANCE, A. (2012). Motivation for Compliance with Environmental Regulations Related to Forest Health. *Journal of Environmental Management*, **112**, 104−119.

[8] GRABMAIR, M., ASHLEY; K.D., HWA, R., SWEENEY, P.M. (2012). Toward Extracting Information from Public Health Statutes using Text Classification and Machine Learning, in: Jusletter IT 12. September 2012.

[9] SNAJDROVA, H., HANCILOVA, B. (2007). *Trafficking in Human Beings in the Republic of Armenia*, OSCE, Yerevan, 2007.

[10] GÜVEN-LISANILER, F., UGURAL, S., RODRíGUEZ, L. (2008). Human Rights of Migrant Women Workers in Janitorial Services and Night Clubs: A Case of North Cyprus. *International Journal of Social Economics*, **35**, 435–448.

[11] CRAGO, A.L. (2009). *Arrest the Violence – Human Rights Abuses against Sex-Workers in CEE/CA*. SWAN and Open Society Foundation, Budapest.

[12] This case (*Taavitsainen*) and *Kaiser v Switzerland* and are borderline cases of SWDEF = 1, but they illustrate policies to sever SWs' social ties by criminalizing their contacts under the pretext of protecting them.

- Greece (USDS country report 2008: lacking protection against sexual exploitation; recent incidents CEDAW/C/GRC/CO/7 of 1 March 2013: public shaming, blaming SWs for HIV)
- Hungary (Constitutional Court, judgment 28/C/2005 of 10 January 2011: degrading character of compulsory registration of prostitutes; further concerns: CEDAW/C/HUN/CO/7-8 of 1 March 2013)
- Ireland (CAT/C/IRL/CO/1 of 1 June 2011: insufficient reparation for victims of the Magdalen Laundries forced labour system, also described in movies and literature)[13]
- Italy (ECtHR, *M. & Others* of 31 July 2012 [n° 40020/03]: allegations of forced prostitution were not effectively investigated)
- Latvia (FN 11: police misconduct)
- Lithuania (FN 11: police misconduct)
- Macedonia (FN 11: police misconduct; further concerns: CEDAW/C/MKD/CO/4-5 of 1 March 2013)
- Moldova (USDS country report 2009: lacking protection against violence)
- Montenegro (CAT/C/MNE/CO/1 of 21 November 2008; CEDAW/C/MNE/CO/1 of 21 October 2011: lacking protection against sexual exploitation and trafficking)
- Poland (FN 11: police misconduct)
- Romania (USDS country report 2009: lacking protection against sexual exploitation and trafficking)
- Russia (ECtHR, *Rantsev* of 7 January 2010 [n° 25965/04]: lacking protection against trafficking into prostitution; FN 11 reports about police corruption and brutality; other studies identified this as a significant STI/HIV risk factor for SWs,[14] as e.g. unprotected sex during gang rape facilitates HIV infections)
- Serbia (FN 11: police misconduct; corroborating reports from other studies)[15]
- Slovak Republic (FN 11: police misconduct)
- Spain (ECtHR, *K.A.B.* of 10 April 2012 [n° 59819/08]: forced removal of the baby of a deported SW from her family; *B.S.* of 24 July 2012 [n° 47159/08]: allegations of police harassment were not effectively investigated)
- Sweden (Aftonbladed of 3 November 2011: rape and pimping of SWs by a police officer; a previous analysis of the Swedish system forecasted such problems)[16]
- Switzerland (ECtHR, *Kaiser* of 15 March 2007 [n° 17073/04]: unlawful detention of a woman suspected of trafficking, when she was visited by a SW friend; *Khelili* of 18 October 2011 [n° 16188/07]: for five years police stored sensible data alleging prostitution; other HRs instruments noted the exploitation of SWs, e.g. CEDAW/C/CHE/CO/3 of 7 August 2009; additional problems are recorded in literature)[17]
- Turkey (ECtHR, *Ömer Köseoğlu* of 10 June 2008 [n° 36594/04]: unfair proceedings about illegal prostitution; *Halat* of 8 November 2011 [n° 23607/08]: ineffective investigations of alleged torture during police interrogation about illegal prostitution; similar reports by Amnesty International)

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[13] SCOTT, J. (2005). *How Modern Governments Made Prostitution a Social Problem*, Mellen Press, New York.

[14] DECKER, M.R., WIRTZ, A.L., BARAL, S.D., PERYSHKIN, A, MOGILNYI, V., WEBER, R.A, STACHOWIAK, J., GO, V., BEYRER, C. (2012). Injection drug use, sexual risk, violence and STI/HIV among Moscow female sex workers. *Sexually Transmitted Infections*, **88**, 278–83.

[15] RHODES, T., SIMIĆ, M., BAROŠ, S., PLATT, L., ŽIKIĆ, B. (2008). Police Violence and Sexual Risk among Female and Transvestite Sex Workers in Serbia: Qualitative Study. *British Medical Journal*, **337**, a811.

[16] BROOKS-GORDON, B. (2006). *The Price of Sex: Prostitution, Policy and Society*, London.

[17] HÜRLIMANN, B. (2004). Prostitution ist nicht sittenwidrig im rechtlichen Sinne, in: Jusletter 29 November 2004.

- UK (reports about public shaming in The Guardian of 6 August 2010, Daily Mail of 2 October 2010, discussed also in literature;[18] further concerns relate to stigmatization as a cause of an excessive mortality rate[19] amongst SWs).
- Ukraine (E/C.12/UKR/CO/5 of 4 January 2008: discrimination, especially in the context of HIV; A/HRC/4/31/Add.2 of 24 January 2007: no protection against internal trafficking, vulnerability to police harassment by prohibition of prostitution; literature confirms high levels of violence,[20] whereby according to World Bank,[21] a reduction of the violence rate from currently 39% to 25% in 2016 would avert 2,100 new HIV infections)
- Amongst countries with SWDEF = 0, Estonia, Netherlands, and Norway are borderline cases: In the Netherlands since 2009 there are emerging HRs concerns about compulsory registration of prostitutes (CEDAW/C/NLD/CO/5 of 5 February 2010). There are further concerns about trafficking for the Netherlands (destination) and for Estonia (source) in view of USDS TIPs Reports. Statistics about the high number of traffickers of German, French and Rumanian origin and the high number of victims in Estonia (source) and the Netherlands (destination) corroborate the above observations about these countries.[22] Finally, for Norway there are concerns about sexual exploitation of *au-pair* girls (CEDAW/C/NOR/CO/8 of 9 March 2012). However, for all countries these concerns relate to a smaller part of the considered time span.

Country classifications by legal types and implementation were drawn from above sources.[23]

S3.   SWDEF for Selected Non-European Countries

Amongst countries with SWDEF = 0, UNDP commended New Zealand and the Australian province of New South Wales for their successful implementation of a HRs-based approach towards SW,[24] while Marshall Islands, Nauru, and Palau are micro-states with, where population size makes the existence of reports about problems less likely. However, Palau may be a borderline case, as the prosecution of perpetrators, who trafficked foreign women into prostitution, was overturned (USDS, TIPs Report 2010). For countries with SWDEF = 1, police of Antigua & Barbuda tolerated sexual exploitation of SWs by owners of brothels (USDS, TIPs Report 2010). In Barbados children were not protected against sexual exploitation and foreign SWs travelling to Barbados were sexually exploited (USDS, HRs Report 2010, TIPs Report 2010). Cap Verde is a democratic country that was overwhelmed by organized crime using the islands for transhipment of drugs, causing problems with trafficking in persons and lacking protection of SWs against sexual exploitation, even of children (UN Universal Periodic Review, A/HRC/WG.6/16/L3 of 26 April 2013). In Mauritius society tolerates parents, who force their own children into prostitution (USDS,

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[18] OVERS, C., HAWKINS, K. (2011). Can Rights Stop the Wrongs? Exploring the Connections between Framings of Sex Workers' Rights and Sexual and Reproductive Health. *BMC International Health and Human Rights*, **11**, Suppl 3, 1–10.

[19] GOODYEAR, M.D.E. (2007). Protection of Sex Workers, *British Medical Journal (BMJ)*, **334**, 52–53.

[20] TOPOLILO, A. (2006). Providing Legal Aid to Members of Vulnerable Minorities in Ukraine. *HIV/AIDS Policy & Law Review*, **11**, 74–75.

[21] KERRIGAN, D., WIRTZ, A., BARAL, S., DECKER, M., MURRAY, L., POTEAT, T., PRETORIUS, C., SHERMAN, S., SWEAT, M., SEMINI, I., N'DELLA N'JIE, STANCIOLE, A., BUTLER, J., OSORNPRASOP, S., OELRICHS, R., BEYRER, C. (2013). The Global HIV Epidemics among Sex Workers, The World Bank, Washington DC, p. 276.

[22] EUROSTAT (2013). *Trafficking in Human Beings*. Publications Office of the European Union, Luxembourg.

[23] Another source was SWFV (2012). *Human Rights of Sex Workers in Europe. A Survey and Critical Analysis*. Sex-Worker Forum of Vienna, www.sexworker.at. However, several classifications differ for Andorra, Finland, Greece, Hungary, or Italy.

[24] UNDP (2012). *Sex Work and the Law in Asia and the Pacific*. UN Development Programme, joint publication with UNAIDS and UNFPA, New York.

TIPs Report 2010). Further, for China, literature reports regular abuses,[25] for Iran literature reports capital punishment for homosexual prostitution,[26] and for Northern Korea literature reports state-condoned forced prostitution.[27]

[25] TUCKER, J., XIN REN, SAPIO, F. (2010). Incarcerated Sex Workers and HIV Prevention in China: Social Suffering and Social Justice Countermeasures. *Social Science & Medicine*, **70**, 121–129.

[26] ALASTI, S. (2006). Comparative Study of Cruel & Unusual Punishment for Engaging in Consensual Homosexual Acts (in International Conventions, the United States and Iran). *Annual Survey of International & Comparative Law*, **12**, 149–183.

[27] DARUSMAN, M. (2013). *Report of the Special Rapporteur on the Situation of Human Rights in the Democratic People's Republic of Korea*. UN document A/HRC/22/57 of 1 February 2013.

S4. Supporting Tables for PCA

Table S2. Pearson correlations between treaty ratifications (95% significant coefficients in boldface; more accurate than Table 1 in paper A)

	CETS 197	CETS108	CETS 181	CETS 185	CETS 148	CETS 157	CETS 035	CETS 048	CETS 100	CETS 101	CETS 125	CETS 064
CETS 197	**1**	**0.290**	0.002	**0.411**	0.033	0.180	0.078	-0.160	0.043	0.133	-0.033	0.016
CETS108	**0.290**	**1**	**0.401**	**0.446**	0.278	0.113	0.127	0.060	0.100	0.179	0.071	0.136
CETS 181	0.002	**0.401**	**1**	0.045	**0.321**	0.200	-0.090	-0.163	-0.169	-0.053	-0.042	-0.116
CETS 185	**0.411**	**0.446**	0.045	**1**	0.135	**0.384**	-0.010	-0.063	0.078	-0.018	0.060	0.185
CETS 148	0.033	0.278	**0.321**	0.135	**1**	**0.369**	0.141	0.157	-0.152	0.185	0.025	0.175
CETS 157	0.180	0.113	0.200	**0.384**	**0.369**	**1**	-0.161	-0.162	-0.166	0.067	-0.142	-0.180
CETS 035	0.078	0.127	-0.090	-0.010	0.141	-0.161	**1**	**0.427**	0.200	0.220	**0.290**	**0.342**
CETS 048	-0.160	0.060	-0.163	-0.063	0.157	-0.162	**0.427**	**1**	**0.297**	**0.395**	**0.443**	**0.578**
CETS 100	0.043	0.100	-0.169	0.078	-0.152	-0.166	0.200	**0.297**	**1**	**0.422**	**0.408**	**0.424**
CETS 101	0.133	0.179	-0.053	-0.018	0.185	0.067	0.220	**0.395**	**0.422**	**1**	0.272	0.202
CETS 125	-0.033	0.071	-0.042	0.060	0.025	-0.142	**0.290**	**0.443**	**0.408**	0.272	**1**	0.242
CETS 064	0.016	0.136	-0.116	0.185	0.175	-0.180	**0.342**	**0.578**	**0.424**	0.202	0.242	**1**

Table S3. Eigenvector decomposition for Table S2

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Eigenvalue	2.881	2.273	1.356	1.005	0.970	0.840	0.734	0.522	0.512	0.422	0.284	0.202
Eigenvector	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
CETS 197	0.033	0.341	-0.503	0.010	-0.060	0.490	0.007	-0.075	0.552	-0.179	-0.193	-0.079
CETS108	0.144	0.464	-0.014	-0.471	0.084	0.038	-0.148	-0.294	-0.406	0.185	-0.400	0.255
CETS 181	-0.101	0.344	0.417	-0.465	0.290	-0.053	-0.006	0.267	0.213	-0.445	0.238	-0.154
CETS 185	0.069	0.451	-0.399	0.013	-0.245	-0.357	0.158	-0.083	-0.223	0.051	0.507	-0.322
CETS 148	0.098	0.378	0.508	0.254	-0.147	0.042	-0.061	0.008	0.314	0.591	-0.038	-0.220
CETS 157	-0.127	0.421	0.053	0.584	0.068	-0.184	0.183	0.284	-0.186	-0.322	-0.318	0.265
CETS 035	0.357	-0.008	0.109	-0.098	-0.349	0.545	0.298	0.465	-0.341	-0.012	0.108	0.017
CETS 048	0.463	-0.098	0.233	0.123	-0.168	-0.081	-0.001	-0.398	-0.072	-0.453	-0.285	-0.471
CETS 100	0.390	-0.075	-0.293	-0.042	0.383	-0.237	-0.203	0.538	0.004	0.195	-0.274	-0.329
CETS 101	0.350	0.092	0.024	0.344	0.525	0.316	-0.289	-0.207	-0.144	-0.042	0.450	0.151
CETS 125	0.374	-0.050	0.008	-0.090	0.277	-0.194	0.743	-0.162	0.270	0.120	0.014	0.263
CETS 064	0.426	0.014	0.005	-0.054	-0.412	-0.310	-0.387	0.128	0.295	-0.141	0.127	0.510

Table S4. Ratification data (Table S5) in principal component coordinates

Country	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Albania	-0.908	0.240	-0.489	-0.248	0.123	-0.245	-0.224	0.025	-0.016	-0.343	0.023	-0.003
Andorra	-0.851	-0.632	-0.142	-0.846	0.300	0.296	-0.564	-0.176	0.393	-0.072	-0.166	0.054
Armenia	-0.811	0.617	0.020	0.006	-0.024	-0.202	-0.285	0.032	0.298	0.248	-0.015	-0.224
Austria	-0.080	0.559	0.137	-0.182	-0.096	0.148	0.756	0.336	0.227	0.356	0.107	0.056
Azerbaijan	0.307	-0.138	-1.166	0.429	1.019	-0.306	0.034	-0.074	-0.098	0.374	-0.024	0.234
Belgium	1.330	-0.743	-0.897	-0.529	-0.503	-0.285	0.050	0.044	0.114	0.133	-0.206	-0.126
Bosnia & Herzegovina	-0.811	0.617	0.020	0.006	-0.024	-0.202	-0.285	0.032	0.298	0.248	-0.015	-0.224
Bulgaria	-0.534	0.190	-0.481	-0.338	0.400	-0.439	0.520	-0.137	0.254	-0.224	0.037	0.259
Croatia	-0.454	0.609	0.129	-0.092	-0.373	0.342	0.013	0.497	-0.043	0.236	0.092	-0.207
Cyprus	0.732	0.553	0.394	0.285	0.261	0.383	0.466	-0.270	0.010	-0.140	0.272	-0.264
Czech Republic	0.630	-0.239	1.296	0.262	0.566	0.250	0.301	-0.112	-0.319	-0.012	-0.042	0.138
Denmark	1.259	0.223	-0.019	0.695	-0.441	0.127	0.085	-0.409	0.093	0.164	0.161	0.400
Estonia	-0.479	-0.199	0.247	-0.135	0.015	-0.815	-0.232	-0.299	-0.641	-0.617	-0.069	-0.395
Finland	-0.080	0.559	0.137	-0.182	-0.096	0.148	0.756	0.336	0.227	0.356	0.107	0.056
France	0.838	-0.323	-0.187	-0.952	-0.597	-0.101	0.246	-0.226	0.322	-0.507	0.305	0.050
Georgia	-0.807	-0.104	-0.906	0.217	-0.166	-0.192	-0.217	-0.242	-0.229	0.102	-0.215	0.150
Germany	1.516	0.151	0.608	0.179	0.292	-0.653	-0.131	0.470	-0.242	0.093	0.318	-0.004
Greece	0.411	-1.474	0.293	-0.456	-0.169	0.129	0.475	-0.463	-0.516	0.207	-0.373	0.096
Hungary	-0.487	0.268	0.631	-0.102	-0.313	-0.148	0.006	0.572	-0.595	0.415	0.285	-0.127
Iceland	0.026	-0.441	-0.826	-0.121	-0.058	0.853	-0.392	-0.269	-0.528	0.370	0.661	0.053
Ireland	-0.159	-0.317	0.253	-0.236	-0.149	0.576	-0.085	0.174	-0.207	-0.860	-0.661	-0.135
Italy	1.552	-0.230	-0.820	0.400	0.090	-0.152	-0.057	0.121	-0.216	-0.232	-0.075	0.291
Latvia	-0.178	0.181	-0.372	-0.436	0.051	0.105	0.817	0.328	-0.087	-0.235	0.145	0.276
Liechtenstein	-0.913	-0.175	0.922	-0.018	0.281	-0.335	-0.450	0.190	-0.032	0.376	-0.329	0.178
Lithuania	-0.534	0.190	-0.481	-0.338	0.400	-0.439	0.520	-0.137	0.254	-0.224	0.037	0.259
Luxembourg	1.606	-0.380	0.452	-0.409	0.409	0.378	-0.465	0.195	0.718	0.185	-0.064	-0.026
Macedonia	-0.552	0.232	-0.380	-0.346	-0.226	0.300	0.074	0.489	-0.357	-0.355	0.131	0.014
Malta	-0.451	-0.113	-0.797	0.119	-0.515	0.353	0.080	0.222	-0.570	0.090	-0.107	0.167
Moldova	-0.559	0.332	-0.464	0.096	0.648	0.071	-0.513	-0.183	-0.160	-0.385	0.473	0.148
Monaco	-0.884	-0.973	0.360	-0.856	0.360	-0.194	-0.572	-0.102	-0.160	0.107	0.027	0.134
Montenegro	-0.811	0.617	0.020	0.006	-0.024	-0.202	-0.285	0.032	0.298	0.248	-0.015	-0.224
Netherlands	0.784	0.618	0.390	0.321	-0.428	0.268	-0.665	0.020	0.035	-0.400	0.384	-0.016
Norway	0.484	0.117	-0.048	0.406	-0.554	0.120	0.761	-0.329	-0.058	0.347	-0.416	-0.261
Poland	-0.174	0.250	0.552	0.239	0.397	1.015	-0.434	0.373	0.035	0.143	0.036	0.267
Portugal	1.025	0.100	-0.407	-0.010	0.791	0.104	0.324	0.260	-0.299	-0.536	0.036	-0.373
Romania	0.376	0.562	0.285	0.383	0.610	-0.161	0.168	-0.735	0.351	-0.128	0.164	-0.281
Russian Federation	-1.054	-1.361	0.010	0.664	0.054	-0.363	-0.234	0.210	-0.152	0.045	-0.128	0.297
San Marino	-1.021	-1.019	-0.492	0.674	-0.006	0.127	-0.227	0.135	0.400	-0.134	-0.321	0.218
Serbia	-0.437	0.567	0.028	-0.084	0.253	-0.397	0.458	-0.129	0.568	0.368	-0.001	0.039
Slovak Republic	-0.454	0.609	0.129	-0.092	-0.373	0.342	0.013	0.497	-0.043	0.236	0.092	-0.207
Slovenia	0.103	0.268	-0.140	0.938	0.044	0.086	-0.569	-0.840	-0.131	0.198	-0.088	-0.390
Spain	0.434	0.526	0.366	-0.024	-0.953	-0.048	-0.375	0.227	0.180	-0.358	-0.066	-0.168
Sweden	0.663	0.102	0.793	0.272	0.506	0.740	0.308	-0.187	0.233	-0.191	-0.235	0.059
Switzerland	0.419	0.142	0.768	-0.026	-0.268	-1.277	0.063	-0.325	0.239	-0.047	0.034	0.158
Turkey	0.266	-1.938	0.307	0.015	-0.254	0.091	0.623	-0.169	-0.110	0.022	0.027	-0.159
Ukraine	-0.811	0.617	0.020	0.006	-0.024	-0.202	-0.285	0.032	0.298	0.248	-0.015	-0.224
United Kingdom	0.535	0.181	-0.051	0.441	-1.243	0.005	-0.369	-0.040	-0.033	0.087	-0.304	-0.014

Explanation: Ratification data (Table S5) are translated (the centre of rotation in Table S5 is the new origin) and then rotated to express them in coordinates F1 to F12 (rotation matrix defined from Table S3).

Table S5. Ratification status of CoE treaties

Member State	CETS 197	CETS108	CETS 181	CETS 185	CETS 148	CETS 157	CETS 035	CETS 048	CETS 100	CETS 101	CETS 125	CETS 064
Albania	**1**	**1**	**1**	**1**	0	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Andorra	**1**	**1**	**1**	**0**	**0**	0	**0**	**0**	**0**	**0**	**0**	**0**
Armenia	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Austria	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	1	**0**
Azerbaijan	**1**	**1**	**0**	**1**	**0**	**1**	0	0	1	1	**1**	**0**
Belgium	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	0	**1**	**1**
Bosnia & Herzegovina	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Bulgaria	**1**	**1**	**1**	**1**	0	**1**	**0**	**0**	**0**	**0**	1	**0**
Croatia	**1**	**1**	**1**	**1**	**1**	**1**	1	**0**	**0**	**0**	**0**	**0**
Cyprus	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**1**	0
Czech Republic	0	**1**	**1**	0	**1**	**1**	**1**	**1**	**0**	**1**	**1**	0
Denmark	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	0	**1**	**1**	**1**
Estonia	0	**1**	**1**	**1**	**0**	**1**	**0**	1	**0**	**0**	**0**	**0**
Finland	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	1	**0**
France	**1**	**1**	**1**	**1**	0	0	**1**	**1**	**0**	0	**1**	**1**
Georgia	**1**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Germany	0	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Greece	**0**	1	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**
Hungary	0	**1**	**1**	**1**	**1**	**1**	1	**0**	**0**	**0**	**0**	**0**
Iceland	**1**	**1**	**0**	1	**0**	0	**1**	**0**	**0**	1	**0**	**0**
Ireland	**1**	**1**	**1**	0	**0**	**1**	**1**	1	**0**	**0**	**0**	**0**
Italy	**1**	**1**	**0**	**1**	0	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Latvia	**1**	**1**	**1**	**1**	0	**1**	**1**	**0**	**0**	**0**	1	**0**
Liechtenstein	0	**1**	**1**	0	1	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Lithuania	**1**	**1**	**1**	**1**	0	**1**	**0**	**0**	**0**	**0**	1	**0**
Luxembourg	**1**	**1**	1	0	**1**	0	**1**	**1**	**1**	**1**	**1**	**1**
Macedonia	**1**	**1**	**1**	**1**	0	**1**	1	**0**	**0**	**0**	**0**	**0**
Malta	**1**	**1**	**0**	**1**	**0**	**1**	1	**0**	**0**	**0**	**0**	**0**
Moldova	**1**	**1**	**1**	**1**	0	**1**	**0**	**0**	**0**	1	**0**	**0**
Monaco	**0**	1	1	**0**	**0**	0	**0**	**0**	**0**	**0**	**0**	**0**
Montenegro	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Netherlands	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	0	**1**
Norway	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	0	**1**	**0**
Poland	**1**	**1**	**1**	0	**1**	**1**	**1**	**0**	**0**	1	**0**	**0**
Portugal	**1**	**1**	**1**	**1**	0	**1**	**1**	**1**	**1**	**1**	**1**	0
Romania	**1**	**1**	**1**	**1**	**1**	**1**	0	**1**	**0**	1	**1**	**0**
Russian Federation	**0**	**0**	**0**	**0**	**0**	1	**0**	**0**	**0**	**0**	**0**	**0**
San Marino	1	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
Serbia	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	1	**0**
Slovak Republic	**1**	**1**	**1**	**1**	**1**	**1**	1	**0**	**0**	**0**	**0**	**0**
Slovenia	**1**	**1**	**0**	**1**	**1**	**1**	0	**1**	**0**	1	**0**	**0**
Spain	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	0	**1**
Sweden	**1**	**1**	**1**	0	**1**	**1**	**1**	**1**	**0**	**1**	**1**	0
Switzerland	0	**1**	**1**	**1**	**1**	**1**	0	**1**	**0**	**0**	**1**	1
Turkey	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**
Ukraine	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
United Kingdom	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	0	1
Rotation Centre	0.79	0.94	0.70	0.74	0.53	0.83	0.57	0.45	0.13	0.32	0.47	0.21

Explanation: Where the formula in Table 1 of paper B provides a correct reconstruction of the ratification data from the ratification counts, data are in boldface. The rotation centre is the mean value of the ratifications of each treaty (Table 2, paper A).

S5. Supporting Information related to CIRI Indices

Table S6. Rescaled CIRI indices of CoE countries

Country	disappearence	extrajudical killing	political prisoner	torture	assembly	move in/out county	move within country	speech & press	free election	religion	worker: rights	women: economic rights	women: political rights	independent judiciary	SWDEF
Albania	0.00	0.00	0.00	0.60	0.00	0.00	0.10	0.40	0.50	0.00	0.50	0.67	0.33	1.00	1
Andorra	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.53	0.07	0.10	0
Armenia	0.00	0.40	0.90	1.00	0.80	0.40	0.50	0.80	0.80	0.50	1.00	0.60	0.33	1.00	1
Austria	0.00	0.10	0.00	0.40	0.00	0.00	0.00	0.30	0.00	0.30	0.10	0.20	0.07	0.00	1
Azerbaijan	0.20	0.50	1.00	1.00	0.90	0.60	0.50	1.00	0.60	0.90	0.90	0.67	0.33	1.00	1
Belgium	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.10	0.00	0.20	0.00	0.40	0.00	0.00	1
Bosnia	0.00	0.00	0.00	0.80	0.30	0.60	0.10	0.50	0.50	0.40	1.00	0.60	0.33	0.60	1
Bulgaria	0.00	0.20	0.20	0.70	0.30	0.00	0.00	0.40	0.40	0.40	0.50	0.47	0.33	0.60	1
Croatia	0.00	0.00	0.20	0.10	0.50	0.10	0.00	0.50	0.20	0.10	0.40	0.53	0.33	0.40	1
Cyprus	0.00	0.00	0.00	0.50	0.00	0.20	0.00	0.00	0.30	0.30	0.50	0.40	0.33	0.00	1
Czech Rep.	0.00	0.00	0.00	0.40	0.50	0.00	0.00	0.20	0.00	0.10	0.40	0.40	0.33	0.70	1
Denmark	0.00	0.00	0.20	0.10	0.00	0.00	0.00	0.10	0.00	0.00	0.30	0.20	0.00	0.00	0
Estonia	0.00	0.00	0.00	0.50	0.10	0.00	0.00	0.00	0.20	0.00	0.50	0.53	0.33	0.00	0
Finland	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.13	0.00	0.00	0
France	0.00	0.10	0.00	0.50	0.00	0.00	0.10	0.40	0.10	0.50	0.20	0.13	0.27	0.00	1
Georgia	0.10	0.40	0.50	0.80	0.60	0.10	0.20	0.60	0.50	0.20	0.70	0.73	0.40	0.90	1
Germany	0.00	0.10	0.10	0.00	0.50	0.00	0.00	0.50	0.00	0.50	0.50	0.13	0.00	0.00	1
Greece	0.00	0.20	0.40	0.90	0.60	0.00	0.10	0.40	0.40	0.70	0.50	0.33	0.33	0.50	1
Hungary	0.00	0.00	0.00	0.70	0.20	0.00	0.00	0.50	0.00	0.00	0.30	0.53	0.33	0.00	1
Iceland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.10	0.27	0.00	0.00	0
Ireland	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.20	0.00	0.20	0.30	0.13	0.33	0.00	1
Italy	0.00	0.20	0.10	0.60	0.00	0.00	0.00	0.40	0.10	0.50	0.50	0.20	0.33	0.50	1
Latvia	0.00	0.10	0.10	0.50	0.70	0.00	0.00	0.20	0.30	0.50	0.40	0.53	0.33	0.40	1
Liechtenstein	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.30	0.27	0.33	0.10	0
Lithuania	0.00	0.00	0.00	0.50	0.60	0.00	0.00	0.50	0.50	0.00	0.50	0.40	0.27	0.00	1
Luxembourg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.07	0.27	0.00	0
Macedonia	0.00	0.00	0.20	0.70	0.10	0.00	0.00	0.40	0.50	0.50	0.50	0.67	0.27	0.70	1
Malta	0.00	0.00	0.20	0.10	0.00	0.00	0.00	0.30	0.00	0.00	0.30	0.13	0.33	0.00	0
Moldova	0.10	0.00	0.40	1.00	0.80	0.40	0.10	0.60	0.70	0.50	0.90	0.40	0.33	0.90	1
Monaco	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	1.00	0.00	0.30	0.07	0.33	0.00	0
Montenegro	0.00	0.00	0.00	0.70	0.10	0.00	0.00	0.50	0.30	0.00	0.40	0.60	0.47	0.50	1
Netherlands	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.20	0.00	0.10	0.20	0.20	0.00	0.00	0
Norway	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0
Poland	0.00	0.00	0.10	0.50	0.10	0.00	0.00	0.50	0.10	0.00	0.80	0.60	0.33	0.20	1
Portugal	0.00	0.10	0.00	0.50	0.00	0.00	0.00	0.00	0.10	0.00	0.30	0.33	0.33	0.00	0
Romania	0.00	0.50	0.00	1.00	0.50	0.00	0.00	0.50	0.60	0.80	0.70	0.60	0.40	0.50	1
Russia	0.90	0.50	0.80	1.00	0.80	0.20	0.90	1.00	0.80	1.00	1.00	0.60	0.33	0.80	1
San Marino	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.33	0.00	0
Serbia	0.00	0.20	0.00	0.60	0.00	0.00	0.20	0.60	0.40	0.50	0.60	0.60	0.33	0.90	1
Slovak Rep	0.00	0.00	0.00	0.50	0.10	0.00	0.00	0.40	0.40	0.50	0.30	0.53	0.33	0.70	1
Slovenia	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.30	0.10	0.00	0.20	0.33	0.33	0.00	0
Spain	0.00	0.00	0.20	0.90	0.00	0.00	0.00	0.10	0.00	0.50	0.50	0.33	0.00	0.00	1
Sweden	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.30	0.00	0.00	0.40	0.00	0.00	0.00	1
Switzerland	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.30	0.00	0.50	0.30	0.40	0.27	0.00	1
Turkey	0.00	0.70	1.00	1.00	0.80	0.00	0.30	0.90	0.60	0.90	0.70	0.60	0.40	0.80	1
Ukraine	0.00	0.40	0.30	1.00	0.50	0.40	0.00	0.50	0.50	0.50	0.80	0.60	0.33	1.00	1
UK	0.00	0.10	0.00	0.50	0.00	0.00	0.10	0.10	0.00	0.20	0.30	0.20	0.40	0.00	1

As follows for Table S6 of CIRI indices, using linear programming (task: maximize the threshold under the feasibility constraints from SWDEF), for any threshold smaller than $255/1537 \approx 0.166$ there exist feasible criteria weights (e.g. paper B, Table 4, row #2), but there do not exist feasible criteria weights for any larger threshold. However, this limit threshold is not attained; i.e. with the threshold $255/1537$ countries with SWDEF = 0 may

become indiscernible from countries with SWDEF = 1. (The limit threshold is attained at the boundary of the set of feasible weights and there the vulnerability of some countries with SWDEF = 0 equals the threshold, specifically: Malta.)

In view of this limit threshold, SWDEF = 1 does not presuppose a catastrophic HRs situation, meaning overall large CIRI indices, whereas a catastrophic situation results in SWDEF = 1. A closer analysis indicates, which strength of HRs violations, in which combination, and over how many years results in SWDEF = 1. For all HRs criteria, except, work and women's rights, there are feasible criteria weights larger than the threshold. As the resulting vulnerability correctly describes SWDEF, for each of these criteria widespread violations during all five years (respective CIRI values are 1) result in SWDEF = 1. There are also feasible criteria weights, where the sums of the weights for judiciary independence and either political prisoners, torture or religion are five times larger than the threshold (paper B, Table 4, row #6): Therefore routine violations of both criteria in one year (e.g. widespread torture without an effective judicial remedy) or occasional violations in two of the five years result in SWDEF = 1. For each of the three criteria disappearance and international respectively domestic movements there are feasible weights, which are ten times larger than the applicable threshold, whence even occasional violations in one of the five years result in SWDEF = 1. Similarly, in partial support of node 7 of the classification tree in paper B, Figure 2, there are feasible criteria weights (paper B, Table 4, row #5) such that for CIRI values 0.4 of torture and 0.2 of speech & press vulnerability exceeds the threshold for SWDEF = 1, even if all other CIRI values are zero.

As the criteria weights of each of the three criteria disappearance and international respectively domestic movements can be made arbitrarily close to 1 (they then dominate vulnerability), each criterion weight can be made arbitrary close to zero. However, even small weights may be decisive, if the threshold becomes small, too. For four criteria, feasible weights never vanish (paper B, Table 4, row #1): political prisoner, torture, speech & press, religion.

There are other CIRI indices, which models of paper B do not use as key explanatory factors for SWDEF, but which may matter for SWDEF.
- There is a significant correlation of SWDEF with the independence of the judiciary; vulnerability displays that SWDEF is sensitive to this criterion, if taken together with political prisoners, torture or religion (paper B, Table 4, row #6: sum of two criteria weights ≥ 5·threshold). Causality is plausible, as independence of the judiciary is needed to make remedies against police misconduct effective. Of 23 countries with problems, SWDEF = 1 except for two micro-states (Andorra, Liechtenstein).
- There is a significant correlation of SWDEF with women's economic rights. This indicates that discrimination against women may be a causal factor that eases abuse. For, where there is discrimination, the situation for women in SW may by particularly dire:[28] If they leave SW, they lose their subsistence. (Savings are low, they cannot go in early retirement, they receive no unemployment support, and due to lacking vocational training they are unfit for the regular job market.) Such pressure to remain in SW may silence victims of police misconduct for fear of retaliation, which they could only avoid, if they would leave SW. However, this causality has only weak effects, as there are only three countries without discrimination problems: Norway, San Marino, and Sweden. Sweden has SWDEF = 1, Norway is a borderline case for SWDEF = 0 and for San Marino

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[28] DeRivière, L. (2006). A Human Capital Methodology for Estimating the Lifelong Personal Costs of Young Women Leaving the Sex Trade. *Feminist Economics*, **12**, 367–402.

SWDEF = 0 may be due to the small population size. Further, in terms of vulnerability violations of women's rights alone do not suffice to explain SWDEF.

- There is a significant correlation of SWDEF with workers' rights. However, it does not explain much, as e.g. only Belgium has no problems with worker's rights, but SWDEF = 1 and there are problems with women's economic rights.
- There is a significant correlation of SWDEF with violations of free elections. This criterion may be considered as an indirect factor affecting SWs, as explained for the freedom of the press. However, in terms of vulnerability and co-vulnerability, the weight of this criterion is small. Further, the contingency between existence of election problems and SWDEF is not statistically significant (95% level).
- There is a significant correlation of SWDEF with extrajudicial killing. Further, this criterion (mainly excessive police force with lethal consequences) is a main contribution to co-vulnerability (paper B, Figure 5). Although this criterion appears as too far-fetched to causally explain SWDEF, it is insofar indirectly related to SWDEF, as it may unveil a police culture of misconduct: Of 19 counties with problems, all except Portugal have SWDEF = 1.

For the following factors; there is no significant correlation with SWDEF.
- Problems with disappearance are not typical for SWs and in Europe there are only four countries with such problems, whence there is neither a significant correlation with SWDEF, nor a need to consider this criterion in explanations of SWDEF.
- The level of discrimination against women in political rights is slightly lower in countries with SWDEF = 0, but not significantly so (*Mann-Whitney* test). Perhaps, stigmatization may hinder SWs from becoming politically active and this indicator does not affect them.
- Surprisingly SWDEF has no significant correlations with problems of movement. For, SWs are known to be moving for economic reasons between cities and across borders.[29] Therefore, one would expect SWDEF = 1 for the 15 countries, which restrict domestic and/or international movements. This is indeed the case, and for both criteria it is feasible to choose weights close to 1 in vulnerability assessment. Further, the contingencies between SWDEF and the existence of problems with movement are 95% significant for both criteria. However, to explain SWDEF, other criteria capture all relevant information.

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[29] AGUSTIN, M.A. (2007). *Sex at the Margins: Migration, Labour Markets and the Rescue Industry*. London.