

## Introduction

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The latest routine international evaluation for **conformation** traits took place as scheduled at the Interbull Centre. Data from twenty four (24) countries were included in this evaluation.

International genetic evaluations for calving traits of bulls from Australia, Belgium, Canada, Switzerland, Czech Republic, Germany, Denmark-Finland-Sweden, Spain, France, United Kingdom, Hungary, Ireland, Italy, Japan, Korea, The Netherlands, Norway, New Zealand, Poland, South Africa, Estonia, Slovenia, Portugal and the United States of America were computed.

Brown Swiss, Guernsey, Holstein, Jersey and Red Dairy Cattle breed data were included in this evaluation.

## Changes in national procedures

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Changes in the national genetic evaluation of conformation traits are as follows:

NOR RDC Standard deviation of RBV changed from 10 to 12. This mimics the expected effect of future change to a cow-base. The rolling definition of hys is causing the daughters to distribute somewhat differently over hys-classes at each evaluation. Therefore some bulls occasionally may loose EDC although the number of daughters stay the same. Reliability changes is a function of the EDC changes.

BEL HOL Decreases in the number of herds but also in the number of daughters could be explained by the existence of "breed" alias. These decreases can lead to decreases in EDC and in reliability. Moreover, these decreases in EDC and in reliabilities could be also due to a "rounding effect".

FRA BSW/HOL/ Base change.

SIM Missing bulls: they are not missing, we corrected their ID (alias was sent in the previous run). Some decrease in information which are expected.

ITA HOL Base change+ one year cut off of data

DEA BSW Base change.

SVN BSW/HOL Changes are mostly consequences of changes in data base related to the pedigree completeness as well as phenotypic data improvement.

NLD RDC Changes in Foot angle is probably caused by 2004, where the number of bulls have increased from 3 to 4, which had an effect on the standard deviation.

NLD BSW/HOL/ Introduced the changes tested in January for workability, udder health and  
JER/RDC/ conformation. Furthermore we see some changes in the monitor for the smaller breeds,  
SIM

NZL BSW/HOL/ NEW organization providing data. Daughter counts - affects all traits New Zealand has  
GUE/JER/ continuous DNA parentage testing so daughters will always change Herd Count - affects  
RDC all traits Affected by continuous DNA parentage testing.

GBR RDC Implemented the base change for all traits and some changes in correlations for years with fewer bulls.

CAN BSW/HOL/ Change in base for all traits, and some changes in correlations for years with fewer  
GUE/JER/ bulls.  
RDC

CHE BSW Some bulls are missing in the current proof files. The reason for this is that for these bulls the information from which we deduce the "status of bull" changed.  
Changed the deduction of type of proofs for all traits. Implemented new rules for the publication of proofs,

ITA BSW Since test run we have apply a new rolling base for all traits that change every run.

KOR HOL Some old bulls are missing in the current evaluation, it could be due to deletion of some old sire because of some confusion which arose with the country code of some sires.

ZAF HOL Data since 2012 on 18 ARC herds were added, which influenced the breeding values of especially the 2004/2005 born bulls. Furthermore, quite a lot of French bulls entered the evaluation.

ZAF JER Data since 2012 on 13 ARC herds were also added which influenced the breeding value average of certain birth years.

USA BSW Participating for the first time with bde, hde, rtp

USA JER Participating for the first time with bde, rtp, rlr

USA RDC Participating for the first time with rlr, rtp

USA GUE Participating for the first time with rtp

#### INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

##### ----- Subsetting: -----

As decided by the ITC in Orlando, new subsetting was introduced in the september test run. Sub-setting is necessary for operational purposes and restrictions of time scales. To minimize the effect of subsetting, larger subsets with 10-12 countries and with 4 link providing countries have been applied.

##### Window: -----

According to the decision taken by ITC in Orlando, the following changes have been introduced in regards to the windows used for post processing:

The upper bounds have been set to 0.99 as these were judged to have very little effect on evaluations. The lower values have been set to about the 25% percentile value. The largest changes are for the lower values for conformation traits, with the lowest window being 40% for OFL otherwise it is about 50% for all other confirmation traits. It is anticipated that these low values may not have large impact on evaluations since there were very few countries combinations whose estimated correlations fell between the old limit of 0.30 and these new limits.

#### DATA AND METHOD OF ANALYSIS

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Data were national genetic evaluations of AI sampled bulls with at least 10 daughters or 10 EDC (for clinical mastitis and maternal calving traits at least 50 daughters or 50 EDC, and for direct calving traits at least 50 calvings or 50 EDC) in at least 10 herds. Table 1 presents the amount of data included in this Interbull evaluation for all breeds.

National proofs were first de-regressed within country and then analysed jointly with a linear model including the effects of evaluation country, genetic group of bull and bull merit. Heritability estimates used in both the de-regression and international evaluation were as in each country's national evaluation.

Table 2 presents the date of evaluation as supplied by each country

Estimated genetic parameters and sire standard deviations are shown in APPENDIX I and the corresponding number of common bulls are listed in APPENDIX II.

## SCIENTIFIC LITERATURE

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The international genetic evaluation procedure is based on international work described in the following scientific publications:

### International genetic evaluation computation:

Schaeffer. 1994. J. Dairy Sci. 77:2671-2678  
Klei, 1998. Interbull Bulletin 17:3-7

### Verification and Genetic trend validation:

Klei et al., 2002. Interbull Bulletin 29:178-182.  
Boichard et al., 1995. J. Dairy Sci. 78:431-437

### Weighting factors:

Fikse and Banos, 2001. J. Dairy Sci. 84:1759-1767

### De-regression:

Sigurdsson and G. Banos. 1995. Acta Agric. Scand. 45:207-219  
Jairath et al. 1998. J. Dairy Sci. Vol. 81:550-562

### Genetic parameter estimation:

Klei and Weigel, 1998, Interbull Bulletin 17:8-14  
Sullivan, 1999. Interbull Bulletin 22:146-148

### Post-processing of estimated genetic correlations:

Mark et al., 2003, Interbull Bulletin 30:126-135  
Jorjani et al., 2003. J. Dairy Sci. 86:677-679  
<https://wiki.interbull.org/public/rG%20procedure?action=print>

### Time edits

Weigel and Banos. 1997. J. Dairy Sci. 80:3425-3430

### International reliability estimation

Harris and Johnson. 1998. Interbull Bulletin 17:31-36

## NEXT ROUTINE INTERNATIONAL EVALUATION

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Dates for the next routine evaluation can be found on  
<http://www.interbull.org/ib/servicecalendar>.

## NEXT TEST INTERNATIONAL EVALUATION

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Dates for the next test run can be found on  
<http://www.interbull.org/ib/servicecalendar>.

## PUBLICATION OF INTERBULL TEST RUN

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Test evaluation results are meant for review purposes only and should not be published.

^LTable 1. National evaluation data considered in the Interbull evaluation for conformation traits (April Routine Evaluation 2016). Number of records for stature by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		51	3367	657	250	
BEL			1037			
CAN	181	92	10094	582	762	
CHE	2421		2766			
CZE			3483			
DEA	3115					
DEU			19550		240	
DFS			10893	1777	5691	
ESP			2990			
EST			536			
FRA	299		15550			
FRM						
FRR			212			
GBR	15	185	5012	378	268	
HUN			2244			
IRL			1406			
ISR						
ITA	1878		8470	95		
JPN			4846			
KOR			864			
LTU						
LVA						
NLD	104		13390	35	38	
NOR					2043	
NZL			5220	3426	531	
POL			7286			
PRT			1723			
SVK						
SVN	251		357			
URY						
USA	745	642	29629	3370	218	
ZAF			782	487		
HRV						
No. Records	9009	970	151707	10807	10041	
Pub. Proofs	7270	828	126246	9490	10854	0

^LAPPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal

BSW	sta	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN		6.74								
CHE		0.94	12.33							
FRA		0.98	0.95	0.91						
ITA		0.96	0.94	0.95	14.94					
NLD		0.95	0.93	0.96	0.92	4.59				
USA		0.98	0.94	0.96	0.96	0.94	1.45			
DEA		0.95	0.97	0.97	0.96	0.95	0.95	11.37		
SVN		0.88	0.88	0.89	0.92	0.90	0.88	0.91	16.37	
GBR		0.95	0.93	0.95	0.94	0.93	0.95	0.90	0.87	0.82

BSW cwi

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	8.74								
CHE	0.89	10.20							
FRA	0.84	0.81	0.90						
ITA	0.82	0.85	0.86	22.24					
NLD	0.88	0.77	0.77	0.71	4.28				
USA	0.93	0.90	0.86	0.88	0.82	0.80			
DEA	0.87	0.84	0.68	0.75	0.76	0.83	12.02		
SVN	0.84	0.81	0.77	0.84	0.74	0.83	0.91	22.81	
GBR	0.91	0.85	0.83	0.73	0.89	0.82	0.83	0.80	1.38

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BSW bde

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	CAN	CHE	FRA	ITA	NLD	DEA	SVN	GBR	USA
CAN	6.62								
CHE	0.85	9.58							
FRA	0.77	0.87	0.89						
ITA	0.82	0.90	0.91	18.17					
NLD	0.84	0.82	0.84	0.83	3.96				
DEA	0.90	0.90	0.93	0.90	0.83	11.52			
SVN	0.80	0.80	0.80	0.89	0.79	0.83	26.18		
GBR	0.86	0.88	0.83	0.86	0.90	0.83	0.83	1.35	
USA	0.76	0.82	0.88	0.79	0.86	0.84	0.81	0.88	0.80

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BSW ang

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	CAN	CHE	FRA	NLD	USA	GBR
CAN	8.14					
CHE	0.69	11.00				
FRA	0.88	0.66	0.90			
NLD	0.70	0.62	0.65	3.56		
USA	0.83	0.70	0.74	0.64	1.01	
GBR	0.86	0.76	0.77	0.77	0.88	0.79

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BSW ran

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	6.49								
CHE	0.93	10.61							
FRA	0.96	0.96	0.95						
ITA	0.95	0.93	0.93	22.89					
NLD	0.95	0.91	0.95	0.93	4.47				
USA	0.97	0.94	0.97	0.92	0.94	1.08			
DEA	0.96	0.95	0.95	0.94	0.91	0.96	11.99		
SVN	0.90	0.92	0.91	0.91	0.90	0.89	0.93	22.09	
GBR	0.95	0.94	0.96	0.94	0.96	0.95	0.90	0.88	2.03

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BSW rwi

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	CAN	CHE	FRA	NLD	USA	DEA	GBR	SVN
CAN	7.13							
CHE	0.89	9.79						
FRA	0.84	0.83	0.96					
NLD	0.92	0.86	0.86	3.89				
USA	0.88	0.82	0.86	0.80	0.68			
DEA	0.91	0.89	0.78	0.81	0.86	12.53		
GBR	0.91	0.86	0.90	0.88	0.92	0.77	1.20	
SVN	0.87	0.83	0.81	0.85	0.80	0.84	0.82	26.93

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BSW rls

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	6.88								
CHE	0.91	12.99							
FRA	0.92	0.91	1.01						
ITA	0.92	0.85	0.92	23.87					
NLD	0.88	0.82	0.89	0.87	5.18				
USA	0.93	0.91	0.91	0.86	0.86	0.73			
DEA	0.90	0.92	0.93	0.89	0.81	0.91	12.08		
SVN	0.84	0.82	0.86	0.87	0.83	0.86	0.87	22.36	
GBR	0.85	0.90	0.91	0.85	0.87	0.85	0.86	0.81	1.15

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BSW fan

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	8.20								
CHE	0.68	13.77							
FRA	0.74	0.72	1.04						
ITA	0.70	0.86	0.78	23.28					
NLD	0.70	0.65	0.80	0.68	5.61				
USA	0.74	0.69	0.84	0.85	0.81	0.68			
DEA	0.50	0.90	0.68	0.90	0.64	0.63	11.45		
SVN	0.59	0.84	0.70	0.85	0.66	0.66	0.92	25.78	
GBR	0.79	0.69	0.88	0.71	0.87	0.83	0.64	0.69	1.04

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BSW hde

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	CAN	CHE	FRA	ITA	NLD	DEA	SVN	USA
CAN	8.23							
CHE	0.87	12.74						
FRA	0.85	0.80	1.14					
ITA	0.79	0.82	0.84	23.39				
NLD	0.79	0.72	0.85	0.73	5.61			
DEA	0.82	0.87	0.84	0.90	0.77	12.05		
SVN	0.73	0.77	0.82	0.90	0.75	0.87	31.41	
USA	0.84	0.74	0.86	0.89	0.82	0.76	0.82	0.68

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BSW fua

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.04								
CHE	0.76	11.66							
FRA	0.72	0.73	0.98						
ITA	0.77	0.89	0.75	13.17					
NLD	0.91	0.71	0.82	0.76	4.64				
USA	0.91	0.71	0.75	0.77	0.86	1.15			
DEA	0.80	0.69	0.84	0.69	0.84	0.84	11.79		
SVN	0.64	0.72	0.74	0.71	0.75	0.65	0.84	24.10	
GBR	0.89	0.83	0.82	0.89	0.88	0.88	0.73	0.63	1.35

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BSW ruh

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.08								
CHE	0.91	11.49							
FRA	0.87	0.83	0.95						
ITA	0.79	0.86	0.85	13.50					
NLD	0.80	0.83	0.86	0.88	4.54				
USA	0.87	0.83	0.86	0.89	0.87	1.02			
DEA	0.80	0.85	0.88	0.92	0.92	0.85	12.52		
SVN	0.77	0.77	0.75	0.84	0.86	0.77	0.86	19.59	
GBR	0.78	0.83	0.85	0.87	0.87	0.90	0.77	0.71	1.30

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BSW ruw

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN
CAN	7.68							
CHE	0.91	11.58						
FRA	0.88	0.88	0.88					
ITA	0.81	0.88	0.79	13.90				
NLD	0.72	0.64	0.77	0.71	4.54			
USA	0.89	0.87	0.84	0.89	0.80	0.92		
DEA	0.82	0.90	0.74	0.96	0.55	0.87	12.32	
SVN	0.75	0.75	0.69	0.81	0.70	0.74	0.78	18.15

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BSW usu

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.88								
CHE	0.90	11.90							
FRA	0.83	0.90	0.92						
ITA	0.91	0.87	0.87	18.74					
NLD	0.84	0.83	0.89	0.84	4.57				
USA	0.85	0.87	0.83	0.85	0.89	1.00			
DEA	0.90	0.90	0.86	0.92	0.79	0.74	11.75		
SVN	0.78	0.76	0.65	0.78	0.67	0.66	0.76	25.42	
GBR	0.85	0.80	0.87	0.88	0.91	0.92	0.76	0.64	2.62

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BSW ude

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	6.55								
CHE	0.95	11.88							
FRA	0.94	0.95	1.00						
ITA	0.95	0.97	0.96	21.68					
NLD	0.96	0.96	0.95	0.95	4.19				
USA	0.92	0.94	0.94	0.93	0.94	1.12			
DEA	0.92	0.98	0.92	0.97	0.94	0.90	12.08		
SVN	0.88	0.94	0.89	0.95	0.92	0.87	0.93	21.88	
GBR	0.95	0.93	0.94	0.94	0.96	0.94	0.90	0.85	2.02

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BSW ftp

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	CAN	CHE	FRA	NLD	USA	DEA	SVN	GBR
CAN	7.03							
CHE	0.98	14.27						
FRA	0.97	0.95	0.93					
NLD	0.97	0.95	0.95	4.84				
USA	0.92	0.91	0.89	0.90	1.09			
DEA	0.96	0.99	0.95	0.95	0.90	11.44		
SVN	0.91	0.93	0.92	0.90	0.86	0.89	18.65	
GBR	0.95	0.92	0.89	0.94	0.93	0.88	0.87	1.33

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BSW ftl

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	5.89								
CHE	0.89	14.76							
FRA	0.89	0.95	0.97						
ITA	0.91	0.94	0.95	19.31					
NLD	0.89	0.95	0.92	0.93	4.86				
USA	0.88	0.95	0.95	0.95	0.95	1.36			
DEA	0.83	0.97	0.96	0.96	0.92	0.96	11.51		
SVN	0.82	0.90	0.85	0.93	0.91	0.86	0.89	19.25	
GBR	0.91	0.91	0.90	0.94	0.95	0.94	0.89	0.84	1.37

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BSW rtp

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	CAN	CHE	FRA	ITA	NLD	DEA	SVN	USA
CAN	7.14							
CHE	0.98	14.72						
FRA	0.97	0.97	0.94					
ITA	0.91	0.89	0.91	21.53				
NLD	0.97	0.96	0.97	0.92	4.56			
DEA	0.95	0.98	0.96	0.89	0.96	11.46		
SVN	0.90	0.94	0.90	0.90	0.93	0.92	18.30	
USA	0.92	0.90	0.92	0.90	0.94	0.90	0.91	1.09

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BSW ocs

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.84								
CHE	0.86	8.73							
FRA	0.84	0.89	1.01						
ITA	0.84	0.84	0.89	9.85					
NLD	0.78	0.76	0.81	0.78	4.09				
USA	0.87	0.77	0.85	0.85	0.83	0.55			
DEA	0.74	0.89	0.90	0.89	0.75	0.72	10.95		
SVN	0.72	0.79	0.77	0.77	0.78	0.75	0.82	23.91	
GBR	0.84	0.88	0.88	0.84	0.88	0.89	0.78	0.72	1.67

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BSW ous

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.80								
CHE	0.90	12.98							
FRA	0.90	0.94	1.05						
ITA	0.85	0.93	0.88	14.01					
NLD	0.88	0.89	0.91	0.85	4.55				
USA	0.84	0.89	0.88	0.92	0.87	0.86			
DEA	0.86	0.95	0.93	0.93	0.89	0.87	11.89		
SVN	0.71	0.82	0.73	0.84	0.78	0.72	0.87	23.13	
GBR	0.82	0.84	0.75	0.84	0.80	0.87	0.73	0.66	1.40

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BSW ofl

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	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	7.40								
CHE	0.85	11.27							
FRA	0.59	0.69	1.34						
ITA	0.69	0.71	0.86	18.49					
NLD	0.62	0.62	0.72	0.67	4.57				
USA	0.58	0.68	0.80	0.73	0.65	0.95			
DEA	0.68	0.82	0.72	0.81	0.60	0.53	11.61		
SVN	0.75	0.84	0.68	0.77	0.67	0.68	0.87	30.31	
GBR	0.75	0.76	0.78	0.71	0.74	0.72	0.63	0.64	1.59

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GUE sta

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	CAN	GBR	USA	AUS
CAN	6.39			
GBR	0.97	1.10		
USA	0.98	0.95	2.33	
AUS	0.87	0.90	0.88	4.36

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GUE cwi

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	CAN	GBR	USA	AUS
CAN	6.70			
GBR	0.93	1.65		
USA	0.90	0.88	1.25	
AUS	0.76	0.80	0.63	7.42

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GUE	bde			
	CAN	GBR	USA	AUS
CAN	6.05			
GBR	0.90	1.37		
USA	0.80	0.90	1.41	
AUS	0.80	0.78	0.77	5.20

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GUE	ang			
	CAN	GBR	USA	AUS
CAN	7.87			
GBR	0.82	1.46		
USA	0.79	0.91	1.64	
AUS	0.46	0.76	0.69	6.73

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GUE	ran			
	CAN	GBR	USA	AUS
CAN	6.27			
GBR	0.97	1.66		
USA	0.97	0.97	1.59	
AUS	0.93	0.96	0.91	8.26

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GUE	rwi			
	CAN	GBR	USA	AUS
CAN	6.82			
GBR	0.94	1.43		
USA	0.93	0.91	1.33	
AUS	0.89	0.90	0.79	4.67

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GUE	rls			
	CAN	GBR	USA	AUS
CAN	7.43			
GBR	0.76	1.79		
USA	0.89	0.72	0.92	
AUS	0.73	0.85	0.68	6.10

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GUE	rlr		
	CAN	USA	AUS
CAN	7.37		
USA	0.86	0.98	
AUS	0.57	0.66	6.63

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GUE	fan			
	CAN	GBR	USA	AUS
CAN	8.43			
GBR	0.63	1.63		
USA	0.80	0.71	0.77	
AUS	0.52	0.82	0.66	9.01

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GUE	fua			
	CAN	GBR	USA	AUS
CAN	7.15			
GBR	0.94	1.54		
USA	0.91	0.89	1.57	
AUS	0.83	0.82	0.70	8.04

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GUE	ruh			
	CAN	GBR	USA	AUS
CAN	6.40			
GBR	0.75	1.78		
USA	0.80	0.88	1.39	
AUS	0.78	0.67	0.70	6.68

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GUE	usu			
	CAN	GBR	USA	AUS
CAN	6.84			
GBR	0.73	1.53		
USA	0.75	0.80	1.09	
AUS	0.79	0.74	0.79	7.26

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GUE	ude			
	CAN	GBR	USA	AUS
CAN	6.08			
GBR	0.97	1.59		
USA	0.93	0.91	1.68	
AUS	0.85	0.88	0.72	4.68

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GUE	ftp			
	CAN	GBR	USA	AUS
CAN	5.52			
GBR	0.96	1.25		
USA	0.92	0.88	1.27	
AUS	0.84	0.84	0.84	6.48

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GUE	ftl			
	CAN	GBR	USA	AUS
CAN	4.71			
GBR	0.79	1.80		
USA	0.83	0.97	1.48	
AUS	0.65	0.93	0.90	6.13

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GUE	rtp		
	CAN	AUS	USA
CAN	5.41		
AUS	0.77	6.78	
USA	0.93	0.92	1.27

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GUE	ocs			
	CAN	GBR	USA	AUS
CAN	8.02			
GBR	0.87	1.54		
USA	0.78	0.83	1.08	
AUS	0.52	0.53	0.61	8.83

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GUE	ous			
	CAN	GBR	USA	AUS
CAN	7.69			
GBR	0.88	1.43		
USA	0.86	0.78	0.76	
AUS	0.60	0.63	0.62	5.76

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GUE ofl

	CAN	GBR	USA	AUS
CAN	7.45			
GBR	0.66	1.46		
USA	0.79	0.58	1.17	
AUS	0.57	0.53	0.50	9.01

HOL sta

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	4.57											
BEL	0.86	1.11										
CAN	0.88	0.95	5.72									
CHE	0.88	0.90	0.95	10.50								
DEU	0.88	0.93	0.97	0.96	12.74							
DFS	0.86	0.95	0.97	0.95	0.98	10.76						
ESP	0.87	0.94	0.98	0.96	0.98	0.97	0.84					
FRA	0.88	0.96	0.98	0.96	0.97	0.97	0.98	1.08				
GBR	0.91	0.93	0.97	0.95	0.95	0.94	0.96	0.97	1.14			
ITA	0.86	0.88	0.95	0.92	0.94	0.93	0.96	0.95	0.95	1.14		
NLD	0.86	0.94	0.96	0.96	0.98	0.98	0.96	0.97	0.94	0.92	4.52	
USA	0.89	0.91	0.98	0.94	0.95	0.94	0.96	0.95	0.97	0.95	0.93	1.21
HUN	0.88	0.93	0.97	0.93	0.95	0.94	0.97	0.97	0.95	0.94	0.94	0.95
0.97												
POL	0.84	0.87	0.92	0.89	0.93	0.93	0.94	0.93	0.90	0.93	0.92	0.91
0.93	7.38											
NZL	0.87	0.85	0.85	0.85	0.84	0.84	0.84	0.88	0.91	0.84	0.82	0.86
0.86	0.81	0.43										
ZAF	0.89	0.91	0.92	0.90	0.91	0.88	0.90	0.92	0.95	0.89	0.87	0.92
0.91	0.86	0.89	9.01									
JPN	0.87	0.95	0.98	0.96	0.96	0.97	0.97	0.98	0.96	0.95	0.96	0.97
0.96	0.92	0.86	0.92	1.25								
CZE	0.87	0.94	0.96	0.92	0.97	0.95	0.96	0.96	0.94	0.93	0.94	0.93
0.95	0.93	0.85	0.92	0.95	14.91							
EST	0.79	0.87	0.90	0.86	0.92	0.93	0.90	0.91	0.87	0.88	0.94	0.88
0.88	0.88	0.77	0.80	0.91	0.90	12.38						
FRR	0.77	0.85	0.86	0.88	0.93	0.91	0.89	0.88	0.85	0.86	0.92	0.84
0.83	0.89	0.76	0.79	0.86	0.87	0.85	0.11					
IRL	0.90	0.91	0.94	0.92	0.92	0.90	0.93	0.95	0.98	0.92	0.90	0.94
0.93	0.87	0.92	0.94	0.93	0.93	0.83	0.81	0.80				
KOR	0.83	0.85	0.84	0.82	0.82	0.81	0.84	0.84	0.84	0.80	0.83	0.82
0.84	0.78	0.83	0.84	0.85	0.83	0.76	0.74	0.82	4.81			
SVN	0.85	0.90	0.93	0.90	0.94	0.95	0.95	0.93	0.90	0.90	0.95	0.90
0.91	0.92	0.81	0.84	0.93	0.92	0.87	0.87	0.87	0.80	15.42		
PRT	0.86	0.91	0.93	0.91	0.94	0.93	0.93	0.94	0.94	0.91	0.91	0.92
0.94	0.90	0.84	0.89	0.92	0.94	0.87	0.84	0.90	0.85	0.85	0.56	

HOL cwi

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	5.10											
BEL	0.65	1.69										
CAN	0.68	0.86	6.35									
CHE	0.63	0.84	0.93	11.26								
DEU	0.67	0.85	0.88	0.84	12.30							
DFS	0.68	0.86	0.92	0.86	0.92	12.45						
ESP	0.65	0.88	0.93	0.88	0.82	0.85	1.07					
FRA	0.57	0.90	0.88	0.92	0.85	0.83	0.86	1.16				
GBR	0.78	0.86	0.91	0.87	0.90	0.89	0.85	0.83	1.26			
ITA	0.48	0.78	0.81	0.82	0.71	0.68	0.81	0.88	0.72	1.23		
NLD	0.65	0.88	0.91	0.88	0.93	0.91	0.86	0.89	0.90	0.74	4.65	
USA	0.56	0.82	0.89	0.88	0.82	0.80	0.86	0.92	0.81	0.92	0.83	1.28
HUN	0.58	0.83	0.84	0.83	0.83	0.83	0.82	0.88	0.76	0.82	0.81	0.87
1.11												
POL	0.60	0.86	0.88	0.83	0.84	0.84	0.88	0.85	0.83	0.76	0.85	0.83
0.85	12.99											
NZL	0.77	0.67	0.70	0.66	0.70	0.68	0.70	0.65	0.80	0.64	0.65	0.67
0.63	0.65	0.36										
ZAF	0.65	0.89	0.88	0.89	0.86	0.88	0.87	0.87	0.92	0.81	0.87	0.87
0.82	0.85	0.74	10.45									
JPN	0.52	0.81	0.78	0.83	0.70	0.69	0.80	0.90	0.65	0.91	0.73	0.90
0.81	0.73	0.57	0.75	1.50								
CZE	0.66	0.89	0.92	0.86	0.90	0.89	0.92	0.83	0.87	0.78	0.88	0.84
0.85	0.88	0.69	0.88	0.77	13.81							
EST	0.66	0.76	0.79	0.68	0.68	0.80	0.80	0.68	0.74	0.60	0.77	0.63
0.65	0.76	0.64	0.69	0.63	0.75	14.51						
FRR	0.59	0.60	0.63	0.64	0.62	0.63	0.66	0.59	0.66	0.55	0.72	0.62
0.58	0.62	0.63	0.65	0.55	0.64	0.59	0.06					
IRL	0.76	0.82	0.85	0.84	0.89	0.84	0.78	0.82	0.97	0.73	0.87	0.80
0.76	0.81	0.84	0.90	0.65	0.83	0.68	0.65	1.47				
KOR	0.61	0.75	0.64	0.64	0.66	0.70	0.68	0.68	0.65	0.62	0.66	0.67
0.69	0.59	0.67	0.66	0.69	0.75	0.59	0.56	0.66	2.92			
SVN	0.54	0.71	0.82	0.79	0.76	0.77	0.82	0.74	0.78	0.72	0.81	0.81
0.76	0.80	0.63	0.83	0.65	0.77	0.64	0.69	0.75	0.56	20.93		
PRT	0.65	0.83	0.82	0.80	0.86	0.83	0.82	0.84	0.79	0.75	0.84	0.83
0.85	0.86	0.62	0.81	0.77	0.84	0.66	0.64	0.80	0.68	0.75	0.29	

HOL bde

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	PRT	SVN	
AUS	5.25											
BEL	0.70	1.39										
CAN	0.86	0.79	5.96									
CHE	0.71	0.90	0.85	11.08								
DEU	0.80	0.88	0.89	0.90	11.66							
DFS	0.85	0.83	0.92	0.85	0.93	11.56						
ESP	0.76	0.89	0.89	0.92	0.91	0.88	1.00					
FRA	0.59	0.92	0.68	0.89	0.80	0.71	0.85	1.08				
GBR	0.79	0.91	0.87	0.91	0.91	0.88	0.92	0.84	1.19			
ITA	0.63	0.86	0.73	0.85	0.86	0.75	0.88	0.89	0.88	1.19		
NLD	0.71	0.88	0.83	0.92	0.91	0.84	0.90	0.86	0.91	0.88	4.74	
USA	0.64	0.90	0.75	0.91	0.87	0.78	0.90	0.91	0.89	0.92	0.90	1.17
HUN	0.69	0.91	0.77	0.86	0.88	0.84	0.90	0.85	0.87	0.86	0.84	0.91
1.09												
POL	0.77	0.76	0.87	0.79	0.90	0.89	0.86	0.67	0.82	0.76	0.80	0.77
0.84	12.95											
NZL	0.78	0.67	0.68	0.66	0.70	0.70	0.68	0.64	0.68	0.65	0.61	0.66
0.67	0.70	0.36										
ZAF	0.80	0.86	0.86	0.85	0.88	0.88	0.90	0.76	0.93	0.82	0.83	0.85
0.85	0.90	0.72	10.73									
JPN	0.64	0.92	0.70	0.89	0.85	0.76	0.87	0.95	0.85	0.90	0.89	0.93
0.87	0.70	0.59	0.78	1.41								
CZE	0.82	0.83	0.92	0.81	0.94	0.92	0.87	0.68	0.87	0.78	0.83	0.78
0.87	0.91	0.69	0.89	0.75	15.18							
EST	0.72	0.82	0.85	0.78	0.84	0.84	0.86	0.76	0.84	0.78	0.82	0.83
0.84	0.82	0.64	0.80	0.77	0.85	13.93						
FRR	0.63	0.80	0.75	0.85	0.86	0.75	0.82	0.79	0.79	0.84	0.88	0.78
0.72	0.73	0.61	0.70	0.80	0.75	0.71	0.11					
IRL	0.83	0.90	0.87	0.89	0.92	0.91	0.92	0.82	0.97	0.87	0.89	0.87
0.87	0.86	0.72	0.94	0.82	0.88	0.82	0.78	1.28				
KOR	0.68	0.78	0.69	0.77	0.78	0.82	0.77	0.73	0.73	0.67	0.71	0.70
0.78	0.69	0.66	0.73	0.78	0.77	0.65	0.63	0.74	3.59			
PRT	0.74	0.83	0.78	0.78	0.89	0.87	0.83	0.70	0.83	0.79	0.79	0.82
0.86	0.86	0.69	0.86	0.78	0.86	0.77	0.70	0.87	0.72	0.32		
SVN	0.70	0.86	0.80	0.86	0.88	0.82	0.91	0.82	0.86	0.82	0.90	0.84
0.85	0.79	0.65	0.82	0.84	0.83	0.75	0.78	0.85	0.73	0.78	21.45	

HOL ang

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	PRT	SVN		
AUS	6.41											
BEL	0.59	1.10										
CAN	0.66	0.77	6.39									
CHE	0.58	0.77	0.87	11.68								
DEU	0.60	0.75	0.86	0.77	12.59							
DFS	0.64	0.85	0.89	0.80	0.87	10.77						
ESP	0.68	0.77	0.88	0.77	0.74	0.84	0.74					
FRA	0.62	0.82	0.89	0.86	0.81	0.87	0.84	0.98				
GBR	0.79	0.77	0.90	0.79	0.81	0.88	0.83	0.80	1.23			
ITA	0.72	0.74	0.89	0.75	0.83	0.86	0.83	0.81	0.89	1.30		
NLD	0.72	0.60	0.71	0.67	0.56	0.64	0.76	0.64	0.77	0.70	4.55	
USA	0.70	0.77	0.94	0.80	0.85	0.89	0.85	0.85	0.91	0.88	0.66	1.38
HUN	0.60	0.72	0.77	0.71	0.87	0.79	0.70	0.80	0.72	0.78	0.55	0.79
1.01												
POL	0.54	0.67	0.72	0.73	0.65	0.72	0.78	0.76	0.68	0.75	0.67	0.70
0.59	6.81											
ZAF	0.66	0.80	0.73	0.66	0.78	0.80	0.72	0.73	0.85	0.79	0.58	0.77
0.78	0.62	8.99										
JPN	0.67	0.80	0.89	0.76	0.82	0.90	0.87	0.86	0.86	0.89	0.73	0.86
0.73	0.76	0.77	1.54									
CZE	0.60	0.77	0.82	0.73	0.80	0.84	0.73	0.77	0.74	0.81	0.58	0.78
0.81	0.62	0.68	0.76	14.34								
EST	0.48	0.66	0.62	0.58	0.64	0.69	0.61	0.59	0.59	0.60	0.56	0.58
0.71	0.55	0.68	0.62	0.68	14.88							
FRR	0.52	0.62	0.60	0.55	0.75	0.63	0.62	0.65	0.60	0.62	0.54	0.62
0.68	0.47	0.64	0.65	0.56	0.61	0.09						
IRL	0.75	0.79	0.92	0.81	0.85	0.89	0.82	0.86	0.96	0.88	0.67	0.93
0.78	0.70	0.84	0.85	0.76	0.57	0.60	0.80					
KOR	0.68	0.79	0.78	0.75	0.73	0.75	0.78	0.74	0.80	0.75	0.60	0.75
0.71	0.59	0.82	0.81	0.63	0.63	0.62	0.79	2.44				
PRT	0.60	0.71	0.77	0.61	0.76	0.78	0.74	0.72	0.79	0.81	0.56	0.79
0.71	0.61	0.71	0.77	0.70	0.61	0.65	0.74	0.79	0.25			
SVN	0.57	0.67	0.72	0.78	0.58	0.63	0.76	0.70	0.71	0.68	0.78	0.69
0.56	0.80	0.59	0.67	0.57	0.56	0.51	0.66	0.64	0.69	24.01		

HOL ran

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	5.75											
BEL	0.95	1.64										
CAN	0.93	0.96	6.00									
CHE	0.93	0.96	0.96	11.43								
DEU	0.93	0.96	0.98	0.95	11.92							
DFS	0.93	0.98	0.98	0.95	0.98	11.65						
ESP	0.94	0.97	0.97	0.96	0.98	0.97	1.15					
FRA	0.96	0.97	0.97	0.96	0.96	0.97	0.97	1.08				
GBR	0.96	0.95	0.97	0.94	0.97	0.96	0.96	0.98	1.28			
ITA	0.90	0.94	0.96	0.93	0.95	0.95	0.96	0.96	0.95	1.56		
NLD	0.93	0.96	0.97	0.94	0.98	0.97	0.97	0.96	0.97	0.95	5.04	
USA	0.92	0.95	0.97	0.94	0.96	0.96	0.96	0.96	0.97	0.95	0.96	1.46
HUN	0.94	0.97	0.96	0.95	0.97	0.97	0.98	0.97	0.95	0.95	0.96	0.95
1.07												
POL	0.91	0.95	0.96	0.95	0.96	0.95	0.96	0.95	0.93	0.95	0.95	0.92
0.96	12.45											
NZL	0.96	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.95	0.89	0.89	0.90
0.90	0.88	0.33										
ZAF	0.97	0.96	0.94	0.92	0.94	0.94	0.95	0.96	0.96	0.93	0.95	0.93
0.96	0.91	0.93	10.93									
JPN	0.90	0.95	0.98	0.95	0.96	0.97	0.97	0.95	0.93	0.95	0.95	0.95
0.96	0.96	0.86	0.91	1.50								
CZE	0.89	0.94	0.96	0.91	0.96	0.96	0.95	0.93	0.94	0.95	0.95	0.96
0.95	0.93	0.88	0.92	0.94	13.12							
EST	0.85	0.89	0.91	0.86	0.92	0.91	0.89	0.89	0.89	0.90	0.94	0.90
0.89	0.90	0.84	0.86	0.91	0.91	13.87						
FRR	0.88	0.92	0.89	0.88	0.92	0.91	0.90	0.93	0.91	0.89	0.93	0.88
0.88	0.91	0.85	0.88	0.87	0.88	0.85	0.12					
IRL	0.96	0.93	0.94	0.93	0.94	0.93	0.94	0.96	0.99	0.93	0.95	0.95
0.92	0.91	0.95	0.94	0.90	0.91	0.87	0.89	1.72				
KOR	0.87	0.89	0.89	0.89	0.90	0.89	0.91	0.90	0.87	0.88	0.89	0.87
0.90	0.90	0.87	0.90	0.91	0.87	0.83	0.83	0.85	5.52			
SVN	0.90	0.94	0.94	0.92	0.95	0.95	0.94	0.93	0.90	0.93	0.92	0.92
0.93	0.94	0.86	0.89	0.94	0.92	0.86	0.86	0.89	0.87	19.03		
PRT	0.90	0.93	0.93	0.91	0.95	0.93	0.95	0.94	0.94	0.93	0.94	0.93
0.94	0.92	0.89	0.91	0.91	0.93	0.89	0.88	0.93	0.90	0.93	0.49	

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	PRT	SVN	
AUS	5.20											
BEL	0.87	1.42										
CAN	0.90	0.95	5.87									
CHE	0.87	0.95	0.93	11.07								
DEU	0.85	0.92	0.95	0.88	11.31							
DFS	0.82	0.92	0.95	0.89	0.97	12.41						
ESP	0.92	0.93	0.97	0.91	0.95	0.94	1.03					
FRA	0.89	0.96	0.96	0.92	0.95	0.95	0.95	1.11				
GBR	0.86	0.90	0.94	0.87	0.90	0.91	0.91	0.94	1.18			
ITA	0.80	0.83	0.88	0.82	0.83	0.85	0.87	0.89	0.92	1.28		
NLD	0.88	0.94	0.95	0.92	0.96	0.94	0.95	0.95	0.89	0.82	4.64	
USA	0.79	0.85	0.91	0.81	0.84	0.87	0.87	0.89	0.95	0.90	0.81	1.29
HUN	0.83	0.92	0.92	0.86	0.92	0.92	0.90	0.94	0.91	0.89	0.91	0.89
1.08												
POL	0.85	0.91	0.91	0.90	0.90	0.90	0.90	0.91	0.89	0.86	0.89	0.83
0.90	11.24											
NZL	0.87	0.82	0.85	0.80	0.81	0.80	0.85	0.82	0.84	0.79	0.82	0.80
0.80	0.77	0.29										
ZAF	0.80	0.82	0.85	0.80	0.84	0.84	0.81	0.85	0.92	0.82	0.81	0.89
0.87	0.82	0.80	11.10									
JPN	0.85	0.94	0.96	0.92	0.94	0.95	0.93	0.97	0.94	0.89	0.93	0.90
0.94	0.91	0.82	0.88	1.51								
CZE	0.86	0.91	0.94	0.87	0.94	0.92	0.94	0.91	0.89	0.85	0.92	0.85
0.92	0.92	0.83	0.81	0.91	12.91							
EST	0.81	0.86	0.87	0.84	0.88	0.86	0.86	0.87	0.80	0.78	0.90	0.77
0.85	0.88	0.77	0.79	0.85	0.83	13.04						
FRR	0.84	0.89	0.89	0.85	0.91	0.89	0.90	0.91	0.88	0.85	0.92	0.82
0.85	0.88	0.79	0.80	0.88	0.88	0.83	0.17					
IRL	0.74	0.78	0.82	0.77	0.81	0.82	0.80	0.81	0.91	0.80	0.79	0.90
0.83	0.77	0.80	0.85	0.82	0.81	0.71	0.78	1.60				
KOR	0.76	0.86	0.80	0.81	0.82	0.81	0.80	0.85	0.79	0.73	0.80	0.77
0.84	0.77	0.79	0.80	0.85	0.80	0.74	0.78	0.77	3.87			
PRT	0.80	0.86	0.86	0.80	0.87	0.89	0.85	0.85	0.85	0.83	0.82	0.84
0.89	0.85	0.78	0.82	0.85	0.85	0.81	0.81	0.80	0.80	0.37		
SVN	0.82	0.88	0.91	0.86	0.90	0.88	0.92	0.87	0.87	0.77	0.90	0.83
0.84	0.90	0.78	0.81	0.87	0.90	0.83	0.84	0.79	0.77	0.81	23.07	

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	6.39											
BEL	0.82	1.84										
CAN	0.76	0.94	6.46									
CHE	0.84	0.93	0.92	11.47								
DEU	0.78	0.93	0.95	0.90	11.79							
DFS	0.73	0.93	0.97	0.90	0.95	13.43						
ESP	0.78	0.95	0.95	0.91	0.96	0.95	1.17					
FRA	0.82	0.90	0.87	0.89	0.88	0.86	0.90	1.08				
GBR	0.87	0.87	0.85	0.89	0.87	0.82	0.85	0.91	1.30			
ITA	0.70	0.87	0.89	0.83	0.90	0.88	0.90	0.87	0.84	1.56		
NLD	0.77	0.92	0.92	0.89	0.94	0.92	0.92	0.88	0.88	0.88	5.23	
USA	0.74	0.94	0.96	0.88	0.93	0.94	0.95	0.86	0.84	0.88	0.90	1.65
HUN	0.77	0.93	0.93	0.87	0.95	0.91	0.95	0.88	0.85	0.91	0.88	0.92
1.05												
POL	0.78	0.93	0.93	0.87	0.95	0.91	0.92	0.89	0.84	0.89	0.86	0.91
0.94	14.01											
NZL	0.79	0.69	0.69	0.72	0.70	0.68	0.69	0.73	0.78	0.69	0.66	0.68
0.70	0.71	0.15										
ZAF	0.89	0.82	0.79	0.82	0.76	0.72	0.80	0.84	0.89	0.76	0.79	0.78
0.78	0.79	0.73	10.50									
JPN	0.72	0.91	0.97	0.88	0.94	0.96	0.94	0.86	0.81	0.87	0.89	0.94
0.90	0.93	0.66	0.74	1.84								
CZE	0.75	0.92	0.91	0.81	0.94	0.91	0.90	0.85	0.84	0.86	0.88	0.90
0.92	0.95	0.69	0.77	0.91	16.19							
EST	0.70	0.80	0.81	0.73	0.84	0.83	0.84	0.78	0.72	0.78	0.86	0.83
0.78	0.81	0.62	0.66	0.83	0.81	15.02						
FRR	0.67	0.81	0.70	0.71	0.76	0.74	0.77	0.81	0.74	0.81	0.79	0.74
0.69	0.73	0.62	0.67	0.69	0.71	0.69	0.13					
IRL	0.89	0.82	0.76	0.83	0.79	0.74	0.76	0.85	0.96	0.75	0.82	0.75
0.77	0.77	0.78	0.89	0.73	0.79	0.65	0.67	1.63				
KOR	0.64	0.84	0.86	0.77	0.84	0.87	0.88	0.80	0.72	0.79	0.83	0.85
0.85	0.83	0.68	0.71	0.87	0.83	0.72	0.66	0.65	2.47			
SVN	0.67	0.86	0.89	0.84	0.91	0.91	0.89	0.84	0.77	0.84	0.89	0.88
0.87	0.87	0.66	0.69	0.89	0.83	0.78	0.70	0.67	0.84	22.96		
PRT	0.74	0.84	0.81	0.76	0.84	0.84	0.85	0.81	0.80	0.85	0.80	0.84
0.85	0.82	0.65	0.72	0.81	0.82	0.71	0.73	0.72	0.79	0.81	0.25	

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT		
AUS	6.62											
BEL	0.70	1.90										
CAN	0.63	0.84	6.57									
CHE	0.80	0.85	0.76	11.96								
DEU	0.60	0.89	0.89	0.74	11.28							
DFS	0.65	0.85	0.91	0.77	0.92	12.97						
ESP	0.62	0.86	0.86	0.73	0.86	0.90	1.13					
FRA	0.74	0.90	0.84	0.87	0.84	0.83	0.86	1.07				
GBR	0.49	0.63	0.68	0.58	0.64	0.61	0.70	0.64	1.29			
ITA	0.56	0.76	0.80	0.66	0.79	0.74	0.79	0.81	0.75	1.84		
NLD	0.61	0.89	0.87	0.72	0.91	0.91	0.86	0.81	0.65	0.75	4.71	
USA	0.58	0.78	0.87	0.66	0.77	0.83	0.78	0.76	0.70	0.87	0.81	1.83
HUN	0.65	0.87	0.79	0.81	0.83	0.83	0.79	0.86	0.54	0.80	0.82	0.81
1.06												
POL	0.69	0.84	0.86	0.74	0.82	0.84	0.77	0.82	0.53	0.78	0.78	0.82
0.79	14.85											
ZAF	0.61	0.72	0.55	0.63	0.54	0.56	0.54	0.66	0.54	0.63	0.56	0.70
0.68	0.67	9.09										
JPN	0.71	0.80	0.90	0.80	0.82	0.91	0.80	0.82	0.53	0.70	0.83	0.79
0.79	0.80	0.58	1.91									
CZE	0.57	0.82	0.80	0.68	0.84	0.79	0.78	0.76	0.57	0.81	0.78	0.78
0.83	0.86	0.66	0.75	16.13								
EST	0.57	0.66	0.62	0.57	0.73	0.79	0.71	0.67	0.48	0.58	0.73	0.59
0.64	0.68	0.52	0.71	0.60	15.15							
FRR	0.56	0.78	0.63	0.65	0.79	0.72	0.72	0.79	0.54	0.69	0.74	0.65
0.68	0.74	0.59	0.59	0.65	0.63	0.10						
IRL	0.48	0.57	0.63	0.53	0.56	0.55	0.63	0.58	0.78	0.72	0.61	0.62
0.52	0.55	0.54	0.53	0.58	0.46	0.45	1.69					
KOR	0.55	0.72	0.83	0.69	0.76	0.84	0.82	0.80	0.52	0.71	0.74	0.78
0.74	0.78	0.55	0.87	0.74	0.64	0.61	0.50	2.25				
SVN	0.52	0.83	0.81	0.73	0.82	0.83	0.75	0.80	0.54	0.73	0.87	0.81
0.83	0.72	0.59	0.82	0.75	0.63	0.68	0.49	0.77	24.77			
PRT	0.58	0.84	0.74	0.72	0.87	0.77	0.77	0.80	0.60	0.69	0.76	0.70
0.78	0.75	0.55	0.68	0.79	0.61	0.73	0.54	0.72	0.81	0.23		

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT		
AUS	5.83											
BEL	0.72	2.01										
CAN	0.66	0.84	6.57									
CHE	0.71	0.87	0.74	11.33								
DEU	0.72	0.87	0.84	0.73	12.83							
DFS	0.64	0.91	0.88	0.74	0.84	13.24						
ESP	0.71	0.77	0.87	0.66	0.84	0.83	1.05					
FRA	0.82	0.78	0.78	0.70	0.89	0.69	0.85	1.05				
GBR	0.82	0.77	0.83	0.67	0.90	0.73	0.86	0.92	1.36			
ITA	0.59	0.69	0.77	0.63	0.75	0.71	0.73	0.71	0.74	1.62		
NLD	0.74	0.79	0.76	0.66	0.90	0.76	0.80	0.85	0.88	0.70	5.23	
USA	0.69	0.77	0.88	0.65	0.83	0.79	0.85	0.81	0.85	0.86	0.81	1.63
HUN	0.82	0.78	0.80	0.76	0.86	0.71	0.85	0.92	0.88	0.67	0.82	0.81
1.11												
POL	0.66	0.76	0.82	0.73	0.72	0.74	0.75	0.75	0.75	0.73	0.65	0.80
0.80	13.24											
ZAF	0.88	0.77	0.77	0.74	0.84	0.72	0.80	0.87	0.89	0.74	0.78	0.81
0.87	0.71	11.13										
JPN	0.78	0.74	0.69	0.80	0.79	0.69	0.73	0.77	0.74	0.64	0.78	0.74
0.87	0.67	0.77	2.17									
CZE	0.74	0.83	0.84	0.71	0.91	0.81	0.84	0.86	0.84	0.69	0.83	0.82
0.92	0.75	0.79	0.85	17.45								
EST	0.69	0.69	0.66	0.60	0.75	0.68	0.81	0.78	0.71	0.61	0.80	0.71
0.79	0.63	0.65	0.77	0.80	15.53							
FRR	0.62	0.79	0.62	0.63	0.76	0.70	0.70	0.75	0.69	0.65	0.79	0.63
0.61	0.55	0.63	0.57	0.66	0.63	0.11						
IRL	0.77	0.73	0.81	0.63	0.83	0.71	0.80	0.81	0.95	0.73	0.79	0.78
0.76	0.72	0.82	0.63	0.76	0.62	0.61	1.65					
KOR	0.62	0.63	0.74	0.58	0.75	0.65	0.80	0.77	0.77	0.69	0.74	0.78
0.80	0.69	0.69	0.65	0.77	0.62	0.55	0.67	1.73				
SVN	0.47	0.58	0.66	0.54	0.72	0.71	0.71	0.61	0.64	0.67	0.63	0.66
0.61	0.58	0.63	0.58	0.68	0.56	0.54	0.64	0.61	22.85			
PRT	0.65	0.65	0.65	0.65	0.75	0.65	0.71	0.74	0.69	0.65	0.71	0.73
0.67	0.65	0.68	0.66	0.73	0.73	0.60	0.65	0.71	0.68	0.18		

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	5.33											
BEL	0.75	1.57										
CAN	0.77	0.76	5.80									
CHE	0.80	0.78	0.90	11.63								
DEU	0.75	0.81	0.93	0.84	12.17							
DFS	0.81	0.84	0.92	0.89	0.90	11.90						
ESP	0.77	0.77	0.88	0.83	0.82	0.82	0.85					
FRA	0.79	0.91	0.89	0.86	0.90	0.92	0.83	1.07				
GBR	0.78	0.76	0.95	0.86	0.95	0.88	0.87	0.88	1.17			
ITA	0.70	0.64	0.90	0.81	0.86	0.80	0.86	0.79	0.91	1.36		
NLD	0.75	0.87	0.92	0.89	0.95	0.92	0.86	0.93	0.92	0.82	5.16	
USA	0.73	0.67	0.95	0.85	0.89	0.85	0.88	0.82	0.94	0.94	0.87	1.43
HUN	0.80	0.74	0.91	0.87	0.87	0.89	0.82	0.86	0.87	0.82	0.87	0.83
1.11												
POL	0.72	0.80	0.83	0.84	0.90	0.88	0.80	0.88	0.85	0.76	0.89	0.79
0.84	10.68											
NZL	0.78	0.79	0.81	0.76	0.83	0.78	0.79	0.84	0.85	0.77	0.84	0.82
0.72	0.75	0.39										
ZAF	0.81	0.78	0.88	0.82	0.91	0.87	0.83	0.84	0.91	0.80	0.88	0.84
0.86	0.83	0.78	10.60									
JPN	0.74	0.73	0.95	0.90	0.88	0.93	0.81	0.84	0.91	0.87	0.89	0.91
0.88	0.83	0.77	0.84	1.55								
CZE	0.79	0.84	0.90	0.85	0.94	0.91	0.80	0.91	0.91	0.79	0.92	0.81
0.93	0.91	0.75	0.91	0.87	15.21							
EST	0.63	0.72	0.78	0.70	0.81	0.83	0.67	0.80	0.76	0.69	0.84	0.72
0.79	0.80	0.68	0.70	0.81	0.81	14.53						
FRR	0.59	0.82	0.71	0.66	0.82	0.75	0.67	0.81	0.72	0.70	0.84	0.69
0.65	0.72	0.69	0.71	0.69	0.75	0.66	0.11					
IRL	0.79	0.78	0.89	0.82	0.89	0.81	0.89	0.86	0.95	0.87	0.86	0.90
0.76	0.81	0.88	0.85	0.82	0.83	0.67	0.68	1.23				
KOR	0.75	0.77	0.74	0.76	0.75	0.79	0.74	0.78	0.79	0.68	0.79	0.70
0.76	0.80	0.71	0.81	0.76	0.82	0.68	0.59	0.76	3.41			
SVN	0.54	0.75	0.53	0.57	0.57	0.58	0.66	0.62	0.53	0.49	0.64	0.50
0.56	0.62	0.63	0.62	0.56	0.58	0.55	0.60	0.55	0.59	19.22		
PRT	0.68	0.74	0.68	0.68	0.68	0.68	0.71	0.68	0.68	0.68	0.68	0.68
0.68	0.68	0.72	0.70	0.69	0.68	0.66	0.62	0.71	0.70	0.80	0.29	

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	4.95											
BEL	0.83	1.35										
CAN	0.78	0.91	5.78									
CHE	0.77	0.89	0.92	10.82								
DEU	0.82	0.88	0.87	0.87	13.15							
DFS	0.79	0.90	0.89	0.91	0.95	11.57						
ESP	0.83	0.85	0.83	0.85	0.90	0.91	0.81					
FRA	0.78	0.89	0.90	0.88	0.91	0.93	0.88	1.09				
GBR	0.84	0.81	0.80	0.84	0.87	0.90	0.89	0.88	1.19			
ITA	0.75	0.75	0.74	0.76	0.84	0.86	0.91	0.82	0.88	1.30		
NLD	0.78	0.84	0.79	0.84	0.92	0.94	0.91	0.87	0.88	0.86	4.77	
USA	0.78	0.84	0.86	0.86	0.90	0.91	0.89	0.88	0.93	0.89	0.85	1.52
HUN	0.84	0.78	0.83	0.83	0.88	0.85	0.90	0.85	0.85	0.85	0.84	0.84
1.01												
POL	0.74	0.81	0.72	0.78	0.85	0.86	0.87	0.81	0.82	0.84	0.86	0.79
0.81	7.63											
NZL	0.84	0.80	0.78	0.83	0.83	0.85	0.83	0.83	0.90	0.82	0.82	0.88
0.85	0.77	0.38										
ZAF	0.75	0.79	0.75	0.83	0.81	0.83	0.82	0.79	0.87	0.81	0.80	0.83
0.77	0.75	0.81	9.95									
JPN	0.81	0.90	0.90	0.91	0.89	0.93	0.93	0.90	0.84	0.87	0.88	0.87
0.86	0.85	0.81	0.84	1.49								
CZE	0.81	0.87	0.88	0.82	0.89	0.85	0.79	0.85	0.76	0.74	0.77	0.80
0.86	0.74	0.78	0.80	0.84	16.26							
EST	0.71	0.76	0.74	0.70	0.75	0.77	0.74	0.73	0.73	0.74	0.76	0.76
0.74	0.74	0.70	0.71	0.75	0.74	13.36						
FRR	0.69	0.80	0.69	0.72	0.79	0.76	0.76	0.76	0.73	0.78	0.80	0.75
0.65	0.78	0.69	0.66	0.75	0.71	0.67	0.10					
IRL	0.77	0.77	0.76	0.81	0.83	0.88	0.88	0.83	0.96	0.90	0.85	0.92
0.82	0.80	0.88	0.86	0.82	0.73	0.72	0.69	1.10				
KOR	0.73	0.84	0.83	0.77	0.73	0.74	0.78	0.76	0.69	0.70	0.73	0.74
0.75	0.68	0.72	0.74	0.83	0.78	0.68	0.66	0.66	3.93			
SVN	0.68	0.84	0.75	0.72	0.81	0.78	0.75	0.78	0.67	0.66	0.77	0.70
0.71	0.71	0.70	0.71	0.74	0.75	0.73	0.70	0.64	0.74	17.41		
PRT	0.77	0.78	0.75	0.75	0.80	0.81	0.85	0.80	0.85	0.83	0.82	0.81
0.82	0.81	0.74	0.76	0.78	0.75	0.74	0.72	0.80	0.75	0.74	0.32	

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	5.97											
BEL	0.69	1.41										
CAN	0.82	0.77	5.39									
CHE	0.75	0.89	0.90	11.89								
DEU	0.75	0.79	0.90	0.91	11.59							
DFS	0.71	0.87	0.82	0.90	0.81	11.79						
ESP	0.80	0.72	0.87	0.80	0.79	0.80	0.80					
FRA	0.75	0.87	0.79	0.86	0.73	0.91	0.83	1.08				
GBR	0.83	0.69	0.85	0.80	0.75	0.84	0.92	0.89	1.23			
ITA	0.76	0.72	0.85	0.79	0.79	0.80	0.91	0.81	0.88	1.45		
NLD	0.79	0.81	0.84	0.86	0.78	0.90	0.89	0.92	0.92	0.82	4.61	
USA	0.79	0.72	0.85	0.79	0.74	0.86	0.91	0.89	0.94	0.90	0.90	1.50
HUN	0.75	0.91	0.83	0.93	0.84	0.92	0.79	0.91	0.80	0.80	0.86	0.82
1.08												
POL	0.75	0.80	0.84	0.88	0.90	0.83	0.78	0.74	0.72	0.81	0.75	0.76
0.85	10.25											
NZL	0.67	0.56	0.63	0.59	0.59	0.57	0.67	0.58	0.63	0.67	0.59	0.64
0.58	0.60	0.37										
ZAF	0.85	0.68	0.72	0.70	0.64	0.78	0.81	0.80	0.86	0.78	0.82	0.86
0.77	0.70	0.66	10.41									
JPN	0.63	0.94	0.70	0.84	0.68	0.83	0.62	0.88	0.66	0.66	0.78	0.68
0.88	0.70	0.46	0.64	1.69								
CZE	0.63	0.87	0.79	0.87	0.89	0.79	0.66	0.71	0.63	0.72	0.69	0.65
0.88	0.87	0.56	0.63	0.76	14.11							
EST	0.67	0.84	0.78	0.79	0.84	0.80	0.70	0.76	0.65	0.68	0.79	0.68
0.82	0.81	0.53	0.61	0.79	0.81	14.76						
FRR	0.61	0.69	0.70	0.71	0.67	0.75	0.80	0.73	0.73	0.73	0.85	0.71
0.63	0.63	0.55	0.63	0.60	0.58	0.63	0.11					
IRL	0.85	0.73	0.88	0.83	0.79	0.79	0.91	0.84	0.95	0.90	0.87	0.90
0.80	0.77	0.71	0.82	0.67	0.71	0.67	0.68	1.14				
KOR	0.73	0.75	0.85	0.80	0.82	0.72	0.76	0.67	0.64	0.79	0.66	0.72
0.78	0.83	0.59	0.65	0.68	0.75	0.67	0.58	0.70	3.05			
SVN	0.59	0.72	0.75	0.74	0.86	0.66	0.65	0.56	0.56	0.64	0.62	0.57
0.70	0.80	0.57	0.59	0.61	0.85	0.74	0.56	0.64	0.69	21.46		
PRT	0.71	0.69	0.76	0.73	0.83	0.70	0.80	0.65	0.76	0.82	0.73	0.71
0.72	0.78	0.62	0.64	0.59	0.74	0.69	0.63	0.79	0.73	0.73	0.32	

HOL ude

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT		
AUS	4.13											
BEL	0.94	1.45										
CAN	0.94	0.96	5.79									
CHE	0.96	0.95	0.95	11.49								
DEU	0.94	0.96	0.98	0.96	12.99							
DFS	0.93	0.95	0.97	0.96	0.97	11.49						
ESP	0.95	0.96	0.97	0.96	0.96	0.97	1.05					
FRA	0.96	0.96	0.97	0.97	0.98	0.97	0.97	1.10				
GBR	0.95	0.96	0.97	0.95	0.96	0.95	0.96	0.96	1.17			
ITA	0.94	0.94	0.97	0.95	0.96	0.95	0.98	0.97	0.95	1.38		
NLD	0.94	0.96	0.97	0.96	0.98	0.97	0.96	0.98	0.97	0.95	5.10	
USA	0.94	0.95	0.97	0.96	0.96	0.97	0.97	0.98	0.97	0.97	0.97	1.49
HUN	0.93	0.95	0.97	0.96	0.96	0.97	0.97	0.96	0.95	0.97	0.95	0.96
1.18												
POL	0.94	0.95	0.95	0.96	0.96	0.95	0.95	0.96	0.94	0.95	0.95	0.95
0.95	9.71											
ZAF	0.95	0.95	0.97	0.93	0.96	0.94	0.95	0.96	0.98	0.94	0.96	0.97
0.95	0.94	11.52										
JPN	0.95	0.94	0.98	0.96	0.95	0.97	0.97	0.97	0.95	0.96	0.96	0.97
0.96	0.95	0.95	1.32									
CZE	0.93	0.96	0.98	0.94	0.98	0.95	0.96	0.95	0.95	0.95	0.95	0.94
0.97	0.95	0.96	0.94	14.76								
EST	0.89	0.91	0.94	0.89	0.93	0.94	0.93	0.91	0.92	0.91	0.94	0.94
0.94	0.94	0.90	0.92	0.93	13.47							
FRR	0.88	0.93	0.90	0.92	0.94	0.92	0.93	0.94	0.90	0.91	0.95	0.90
0.88	0.91	0.87	0.90	0.89	0.87	0.09						
IRL	0.95	0.95	0.94	0.94	0.93	0.92	0.94	0.94	0.99	0.92	0.94	0.95
0.92	0.92	0.96	0.93	0.92	0.88	0.87	1.33					
KOR	0.89	0.87	0.89	0.90	0.88	0.89	0.91	0.90	0.88	0.90	0.89	0.90
0.89	0.88	0.90	0.93	0.87	0.83	0.85	0.87	5.03				
SVN	0.85	0.89	0.89	0.89	0.92	0.90	0.90	0.89	0.87	0.89	0.90	0.89
0.90	0.91	0.89	0.88	0.92	0.87	0.85	0.85	0.82	17.03			
PRT	0.90	0.93	0.92	0.90	0.93	0.92	0.92	0.90	0.90	0.92	0.91	0.91
0.93	0.90	0.92	0.91	0.94	0.89	0.87	0.90	0.90	0.89	0.43		

HOL ftp

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	
AUS	5.43											
BEL	0.94	1.41										
CAN	0.96	0.95	6.00									
CHE	0.97	0.97	0.97	11.82								
DEU	0.95	0.93	0.98	0.96	13.71							
DFS	0.92	0.95	0.97	0.95	0.95	10.81						
ESP	0.95	0.92	0.97	0.95	0.97	0.93	0.96					
FRA	0.94	0.98	0.96	0.97	0.95	0.96	0.92	1.12				
GBR	0.95	0.90	0.97	0.94	0.96	0.93	0.97	0.91	1.23			
ITA	0.83	0.82	0.88	0.84	0.85	0.86	0.86	0.83	0.88	1.23		
NLD	0.95	0.96	0.98	0.96	0.98	0.96	0.94	0.96	0.95	0.85	4.77	
USA	0.89	0.86	0.93	0.88	0.92	0.93	0.93	0.88	0.95	0.89	0.91	1.40
HUN	0.97	0.93	0.97	0.95	0.96	0.92	0.97	0.94	0.94	0.86	0.94	0.90
1.01												
POL	0.91	0.88	0.94	0.91	0.95	0.91	0.94	0.90	0.94	0.86	0.93	0.91
0.93	9.52											
NZL	0.94	0.89	0.92	0.90	0.89	0.88	0.89	0.91	0.91	0.84	0.89	0.88
0.90	0.85	0.31										
ZAF	0.95	0.92	0.95	0.94	0.94	0.92	0.94	0.93	0.94	0.87	0.94	0.90
0.96	0.89	0.90	10.27									
JPN	0.95	0.98	0.97	0.97	0.95	0.96	0.92	0.98	0.91	0.83	0.96	0.86
0.94	0.91	0.89	0.93	1.52								
CZE	0.95	0.94	0.96	0.95	0.95	0.92	0.96	0.93	0.92	0.83	0.95	0.88
0.97	0.92	0.90	0.94	0.94	12.76							
EST	0.87	0.89	0.92	0.86	0.90	0.88	0.89	0.89	0.87	0.81	0.93	0.84
0.89	0.89	0.81	0.85	0.91	0.90	13.00						
FRR	0.85	0.91	0.91	0.92	0.92	0.91	0.89	0.92	0.86	0.82	0.93	0.84
0.86	0.87	0.81	0.85	0.89	0.88	0.83	0.10					
IRL	0.95	0.88	0.96	0.93	0.95	0.92	0.94	0.90	0.99	0.86	0.93	0.92
0.92	0.91	0.92	0.92	0.90	0.90	0.84	0.83	1.39				
KOR	0.92	0.93	0.92	0.93	0.91	0.92	0.92	0.92	0.88	0.82	0.90	0.85
0.94	0.87	0.85	0.92	0.93	0.92	0.83	0.82	0.86	3.65			
SVN	0.91	0.90	0.94	0.92	0.95	0.90	0.95	0.90	0.93	0.83	0.94	0.89
0.92	0.92	0.86	0.88	0.91	0.90	0.87	0.87	0.91	0.87	18.03		
PRT	0.91	0.89	0.93	0.91	0.94	0.89	0.93	0.87	0.94	0.85	0.90	0.89
0.93	0.93	0.83	0.89	0.89	0.92	0.87	0.84	0.92	0.89	0.91	0.43	



HOL ftl

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	ZAF	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT		
AUS	5.88											
BEL	0.95	1.53										
CAN	0.95	0.92	5.70									
CHE	0.93	0.95	0.91	11.52								
DEU	0.96	0.98	0.94	0.95	13.52							
DFS	0.96	0.97	0.94	0.97	0.98	10.88						
ESP	0.95	0.98	0.94	0.95	0.98	0.97	1.12					
FRA	0.95	0.90	0.98	0.89	0.93	0.92	0.92	1.07				
GBR	0.96	0.97	0.96	0.94	0.98	0.96	0.97	0.94	1.33			
ITA	0.91	0.92	0.92	0.90	0.93	0.93	0.93	0.91	0.96	1.61		
NLD	0.95	0.98	0.93	0.96	0.98	0.98	0.98	0.91	0.97	0.92	4.99	
USA	0.95	0.94	0.96	0.93	0.96	0.96	0.96	0.94	0.97	0.95	0.95	1.47
HUN	0.93	0.96	0.90	0.96	0.95	0.96	0.96	0.88	0.93	0.89	0.96	0.91
1.19												
POL	0.96	0.96	0.92	0.95	0.97	0.97	0.96	0.90	0.96	0.91	0.96	0.94
0.96	11.98											
ZAF	0.94	0.94	0.90	0.92	0.93	0.94	0.95	0.90	0.93	0.91	0.94	0.92
0.94	0.95	10.73										
JPN	0.96	0.98	0.94	0.96	0.98	0.98	0.98	0.92	0.97	0.94	0.98	0.97
0.96	0.97	0.96	1.45									
CZE	0.94	0.96	0.92	0.96	0.97	0.97	0.97	0.90	0.96	0.91	0.97	0.95
0.96	0.98	0.94	0.97	14.22								
EST	0.91	0.91	0.90	0.91	0.95	0.95	0.93	0.89	0.92	0.88	0.94	0.90
0.94	0.95	0.88	0.94	0.94	13.91							
FRR	0.89	0.94	0.90	0.93	0.95	0.93	0.93	0.88	0.93	0.90	0.93	0.91
0.90	0.92	0.88	0.93	0.92	0.88	0.13						
IRL	0.96	0.96	0.95	0.92	0.98	0.95	0.96	0.94	0.99	0.94	0.96	0.96
0.91	0.95	0.92	0.96	0.96	0.92	0.91	1.77					
KOR	0.92	0.94	0.89	0.93	0.94	0.94	0.95	0.87	0.93	0.88	0.95	0.92
0.93	0.93	0.91	0.96	0.94	0.88	0.88	0.90	5.01				
SVN	0.91	0.94	0.89	0.94	0.95	0.95	0.95	0.87	0.94	0.90	0.95	0.92
0.93	0.94	0.89	0.94	0.94	0.90	0.89	0.93	0.91	18.52			
PRT	0.90	0.94	0.91	0.92	0.96	0.95	0.94	0.90	0.94	0.90	0.95	0.94
0.93	0.96	0.90	0.94	0.96	0.91	0.91	0.94	0.92	0.90	0.36		

HOL rtp

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
POL	NZL	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT	ZAF		
AUS	5.63											
BEL	0.96	1.41										
CAN	0.96	0.96	6.08									
CHE	0.96	0.96	0.98	11.89								
DEU	0.94	0.96	0.97	0.97	13.76							
DFS	0.93	0.94	0.96	0.95	0.97	10.96						
ESP	0.94	0.96	0.97	0.96	0.98	0.97	0.91					
FRA	0.96	0.96	0.98	0.97	0.97	0.97	0.98	1.06				
GBR	0.96	0.95	0.97	0.96	0.97	0.97	0.97	0.98	1.30			
ITA	0.87	0.89	0.89	0.89	0.94	0.93	0.93	0.92	0.92	1.27		
NLD	0.95	0.95	0.98	0.97	0.98	0.98	0.98	0.98	0.98	0.92	4.80	
USA	0.92	0.93	0.95	0.92	0.95	0.97	0.95	0.94	0.97	0.91	0.95	1.62
POL	0.89	0.93	0.93	0.92	0.97	0.95	0.96	0.95	0.94	0.92	0.95	0.92
10.58												
NZL	0.96	0.95	0.95	0.94	0.94	0.92	0.93	0.95	0.95	0.89	0.94	0.91
0.92	0.45											
JPN	0.96	0.97	0.98	0.97	0.97	0.97	0.98	0.98	0.97	0.91	0.98	0.95
0.95	0.94	1.56										
CZE	0.91	0.95	0.94	0.93	0.97	0.95	0.95	0.95	0.95	0.90	0.93	0.93
0.96	0.93	0.94	13.88									
EST	0.90	0.91	0.92	0.90	0.95	0.92	0.93	0.92	0.92	0.89	0.94	0.90
0.93	0.89	0.92	0.92	13.18								
FRR	0.83	0.85	0.84	0.84	0.84	0.83	0.86	0.85	0.83	0.80	0.85	0.82
0.80	0.82	0.83	0.81	0.80	0.10							
IRL	0.94	0.94	0.95	0.95	0.94	0.94	0.94	0.96	0.97	0.89	0.95	0.93
0.90	0.94	0.95	0.92	0.87	0.81	1.31						
KOR	0.88	0.89	0.92	0.91	0.93	0.93	0.95	0.93	0.91	0.93	0.92	0.92
0.92	0.89	0.94	0.89	0.84	0.77	0.90	2.57					
SVN	0.89	0.91	0.92	0.92	0.94	0.90	0.95	0.92	0.91	0.88	0.93	0.88
0.92	0.91	0.91	0.91	0.87	0.81	0.89	0.88	15.87				
PRT	0.89	0.92	0.94	0.92	0.94	0.93	0.94	0.93	0.94	0.89	0.91	0.93
0.94	0.89	0.92	0.92	0.88	0.81	0.90	0.90	0.90	0.46			
ZAF	0.92	0.89	0.90	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.88	0.89
0.88	0.88	0.89	0.88	0.84	0.80	0.88	0.88	0.86	0.89	7.33		

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HOL	ocs											
	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	JPN	CZE	EST	FRR	IRL	KOR	SVN	PRT		
AUS	6.42											
BEL	0.58	1.22										
CAN	0.57	0.73	5.47									
CHE	0.55	0.78	0.92	11.87								
DEU	0.62	0.67	0.86	0.83	12.99							
DFS	0.64	0.69	0.80	0.79	0.88	10.32						
ESP	0.66	0.75	0.79	0.79	0.86	0.86	0.80					
FRA	0.57	0.74	0.80	0.86	0.85	0.86	0.88	1.12				
GBR	0.68	0.73	0.86	0.89	0.93	0.89	0.87	0.90	0.93			
ITA	0.58	0.68	0.82	0.81	0.83	0.81	0.86	0.87	0.85	0.82		
NLD	0.62	0.74	0.79	0.81	0.88	0.89	0.87	0.85	0.90	0.80	3.02	
USA	0.62	0.70	0.86	0.85	0.89	0.88	0.86	0.86	0.91	0.85	0.86	0.90
HUN	0.54	0.73	0.82	0.81	0.84	0.75	0.77	0.82	0.83	0.80	0.76	0.80
1.12												
POL	0.48	0.66	0.63	0.67	0.64	0.69	0.75	0.71	0.69	0.69	0.72	0.69
0.69	7.07											
NZL	0.79	0.55	0.64	0.60	0.64	0.58	0.63	0.57	0.70	0.55	0.65	0.67
0.59	0.51	0.30										
JPN	0.54	0.79	0.88	0.92	0.79	0.80	0.80	0.85	0.83	0.83	0.80	0.85
0.74	0.73	0.56	0.71									
CZE	0.64	0.69	0.84	0.78	0.88	0.79	0.78	0.76	0.83	0.76	0.78	0.80
0.85	0.63	0.71	0.72	15.44								
EST	0.51	0.66	0.75	0.64	0.78	0.69	0.73	0.67	0.70	0.68	0.74	0.69
0.70	0.55	0.56	0.70	0.76	13.31							
FRR	0.58	0.75	0.66	0.72	0.78	0.76	0.79	0.76	0.78	0.77	0.82	0.71
0.69	0.75	0.58	0.73	0.70	0.65	0.10						
IRL	0.63	0.51	0.72	0.68	0.76	0.68	0.68	0.63	0.77	0.68	0.63	0.68
0.70	0.46	0.60	0.57	0.72	0.56	0.57	1.26					
KOR	0.52	0.60	0.62	0.66	0.63	0.62	0.74	0.65	0.63	0.68	0.69	0.64
0.64	0.66	0.51	0.69	0.56	0.61	0.60	0.49	7.32				
SVN	0.46	0.62	0.63	0.64	0.70	0.66	0.73	0.71	0.66	0.69	0.71	0.68
0.67	0.71	0.53	0.71	0.65	0.60	0.64	0.47	0.66	19.81			
PRT	0.57	0.74	0.75	0.75	0.78	0.80	0.77	0.76	0.80	0.76	0.77	0.75
0.76	0.75	0.51	0.73	0.75	0.72	0.78	0.59	0.73	0.72	0.59		

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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA
HUN	POL	NZL	JPN	CZE	EST	FRR	IRL	SVN	PRT			
AUS	4.28											
BEL	0.56	1.32										
CAN	0.65	0.78	5.40									
CHE	0.68	0.86	0.95	11.79								
DEU	0.65	0.80	0.90	0.90	13.53							
DFS	0.46	0.82	0.85	0.90	0.88	12.79						
ESP	0.70	0.70	0.84	0.85	0.84	0.75	0.88					
FRA	0.55	0.82	0.86	0.92	0.89	0.94	0.81	1.03				
GBR	0.79	0.67	0.84	0.85	0.86	0.69	0.89	0.76	1.11			
ITA	0.64	0.72	0.89	0.90	0.86	0.84	0.92	0.88	0.85	1.03		
NLD	0.60	0.84	0.89	0.93	0.90	0.90	0.84	0.93	0.81	0.86	4.83	
USA	0.68	0.77	0.93	0.94	0.89	0.86	0.90	0.89	0.89	0.94	0.90	1.15
HUN	0.59	0.82	0.86	0.88	0.88	0.85	0.82	0.84	0.76	0.84	0.80	0.83
1.28												
POL	0.66	0.77	0.71	0.78	0.78	0.70	0.70	0.71	0.76	0.70	0.72	0.72
0.69	7.96											
NZL	0.79	0.76	0.83	0.88	0.81	0.76	0.75	0.82	0.82	0.76	0.82	0.85
0.77	0.73	0.44										
JPN	0.71	0.82	0.93	0.92	0.88	0.79	0.81	0.83	0.87	0.87	0.86	0.93
0.78	0.80	0.82	0.76									
CZE	0.58	0.83	0.89	0.90	0.93	0.91	0.80	0.91	0.76	0.86	0.88	0.85
0.91	0.76	0.79	0.83	17.33								
EST	0.51	0.75	0.80	0.79	0.83	0.87	0.74	0.86	0.67	0.79	0.86	0.82
0.79	0.67	0.71	0.76	0.84	13.50							
FRR	0.55	0.82	0.71	0.78	0.85	0.75	0.79	0.77	0.74	0.74	0.83	0.75
0.72	0.70	0.65	0.77	0.78	0.68	0.10						
IRL	0.83	0.62	0.77	0.79	0.79	0.59	0.85	0.68	0.96	0.78	0.71	0.83
0.73	0.75	0.82	0.80	0.70	0.57	0.64	1.03					
SVN	0.48	0.61	0.59	0.61	0.59	0.54	0.68	0.55	0.56	0.56	0.65	0.58
0.57	0.64	0.52	0.64	0.58	0.59	0.60	0.50	20.29				
PRT	0.72	0.70	0.80	0.81	0.82	0.73	0.81	0.77	0.81	0.79	0.80	0.81
0.76	0.73	0.74	0.80	0.80	0.71	0.74	0.75	0.69	0.97			

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HOL bcs

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	BEL	CHE	DEU	DFS	FRA	GBR	ITA	NLD	USA	CZE	FRR	JPN
IRL	KOR	CAN	PRT	ESP								
BEL	1.09											
CHE	0.73	11.70										
DEU	0.75	0.90	13.08									
DFS	0.76	0.88	0.95	12.18								
FRA	0.75	0.93	0.93	0.95	1.01							
GBR	0.75	0.92	0.90	0.88	0.93	1.24						
ITA	0.74	0.90	0.95	0.94	0.96	0.90	6.68					
NLD	0.75	0.93	0.95	0.95	0.94	0.90	0.93	4.86				
USA	0.79	0.72	0.74	0.76	0.76	0.75	0.75	0.74	1.38			
CZE	0.76	0.86	0.95	0.94	0.91	0.88	0.94	0.93	0.72	12.60		
FRR	0.73	0.87	0.83	0.78	0.83	0.86	0.79	0.86	0.67	0.78	0.09	
JPN	0.76	0.92	0.95	0.96	0.96	0.92	0.94	0.94	0.77	0.93	0.82	1.82
IRL	0.70	0.88	0.83	0.83	0.89	0.95	0.82	0.87	0.69	0.81	0.82	0.87
1.09												
KOR	0.68	0.77	0.79	0.81	0.83	0.78	0.83	0.76	0.69	0.77	0.72	0.83
0.72	2.73											
CAN	0.76	0.92	0.93	0.93	0.94	0.96	0.93	0.94	0.76	0.92	0.83	0.97
0.91	0.80	6.04										
PRT	0.76	0.82	0.88	0.85	0.87	0.84	0.86	0.88	0.75	0.86	0.84	0.86
0.78	0.81	0.87	0.34									
ESP	0.78	0.89	0.94	0.94	0.95	0.94	0.93	0.93	0.75	0.93	0.86	0.95
0.88	0.86	0.95	0.88	1.12								

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JER sta

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	6.23								
CAN	0.86	6.31							
DFS	0.87	0.96	11.95						
GBR	0.88	0.95	0.94	1.02					
ITA	0.88	0.94	0.91	0.95	1.22				
NZL	0.88	0.86	0.87	0.93	0.90	0.37			
USA	0.89	0.97	0.95	0.97	0.93	0.89	1.27		
ZAF	0.86	0.87	0.86	0.93	0.89	0.94	0.90	9.16	
NLD	0.88	0.96	0.97	0.94	0.92	0.85	0.93	0.87	4.92

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JER cwi

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	5.70								
CAN	0.68	6.54							
DFS	0.81	0.83	15.43						
GBR	0.77	0.89	0.81	1.62					
ITA	0.63	0.87	0.74	0.75	1.34				
NZL	0.81	0.66	0.68	0.81	0.64	0.36			
USA	0.74	0.92	0.79	0.82	0.88	0.64	0.87		
ZAF	0.75	0.83	0.74	0.85	0.74	0.74	0.80	8.85	
NLD	0.70	0.87	0.90	0.86	0.74	0.66	0.85	0.78	4.35

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JER bde

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	AUS	CAN	DFS	GBR	ITA	NZL	ZAF	NLD	USA
AUS	5.19								
CAN	0.76	5.87							
DFS	0.84	0.86	13.55						
GBR	0.71	0.81	0.80	1.59					
ITA	0.60	0.72	0.74	0.83	1.39				
NZL	0.75	0.68	0.70	0.70	0.70	0.36			
ZAF	0.86	0.74	0.84	0.78	0.75	0.76	9.40		
NLD	0.70	0.83	0.83	0.87	0.86	0.62	0.75	3.08	
USA	0.71	0.72	0.74	0.78	0.90	0.71	0.73	0.87	0.87

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JER ang

	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	6.20							
CAN	0.60	7.28						
DFS	0.69	0.76	13.22					
GBR	0.84	0.71	0.87	1.14				
ITA	0.72	0.77	0.83	0.88	1.29			
USA	0.79	0.82	0.87	0.87	0.82	0.93		
ZAF	0.66	0.63	0.76	0.84	0.76	0.76	9.19	
NLD	0.75	0.71	0.65	0.77	0.69	0.68	0.63	3.60

JER ran

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	6.21								
CAN	0.89	5.60							
DFS	0.90	0.96	11.45						
GBR	0.96	0.94	0.95	1.21					
ITA	0.87	0.95	0.94	0.91	1.47				
NZL	0.96	0.89	0.89	0.93	0.88	0.29			
USA	0.92	0.94	0.95	0.97	0.93	0.92	1.06		
ZAF	0.96	0.91	0.91	0.97	0.91	0.92	0.93	9.72	
NLD	0.91	0.95	0.96	0.96	0.92	0.88	0.95	0.93	4.62

JER rwi

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	6.02								
CAN	0.88	6.52							
DFS	0.80	0.88	11.96						
GBR	0.81	0.94	0.86	1.38					
ITA	0.72	0.82	0.81	0.81	1.48				
NZL	0.89	0.87	0.81	0.81	0.77	0.29			
USA	0.80	0.84	0.83	0.86	0.86	0.74	0.75		
ZAF	0.81	0.81	0.82	0.83	0.81	0.78	0.82	9.68	
NLD	0.85	0.89	0.91	0.82	0.77	0.82	0.74	0.77	4.12

JER rls

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	7.06								
CAN	0.59	5.84							
DFS	0.63	0.93	12.95						
GBR	0.73	0.82	0.78	1.75					
ITA	0.57	0.79	0.80	0.78	1.55				
NZL	0.73	0.69	0.69	0.75	0.73	0.12			
USA	0.72	0.91	0.91	0.88	0.81	0.73	0.62		
ZAF	0.87	0.73	0.72	0.83	0.73	0.87	0.77	12.57	
NLD	0.72	0.88	0.90	0.84	0.87	0.69	0.86	0.76	3.50

JER rlr

	AUS	CAN	DFS	ITA	ZAF	NLD	USA
AUS	8.21						
CAN	0.44	6.98					
DFS	0.57	0.77	12.91				
ITA	0.49	0.64	0.61	1.12			
ZAF	0.57	0.60	0.57	0.59	13.71		
NLD	0.61	0.81	0.86	0.75	0.66	5.78	
USA	0.56	0.75	0.66	0.79	0.58	0.75	0.62

JER fan

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	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	6.39							
CAN	0.66	5.50						
DFS	0.68	0.87	12.83					
GBR	0.78	0.79	0.72	1.37				
ITA	0.60	0.76	0.65	0.76	1.83			
USA	0.69	0.87	0.80	0.85	0.80	0.70		
ZAF	0.79	0.68	0.72	0.90	0.69	0.81	10.37	
NLD	0.72	0.77	0.77	0.87	0.72	0.80	0.76	4.62

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JER fua

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	5.79								
CAN	0.69	5.08							
DFS	0.81	0.83	12.75						
GBR	0.78	0.92	0.83	1.60					
ITA	0.66	0.85	0.79	0.85	1.50				
NZL	0.84	0.70	0.72	0.78	0.70	0.40			
USA	0.79	0.93	0.85	0.92	0.89	0.70	1.09		
ZAF	0.75	0.90	0.82	0.93	0.82	0.73	0.90	11.97	
NLD	0.78	0.89	0.91	0.90	0.82	0.80	0.86	0.87	5.10

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JER ruh

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	5.41								
CAN	0.72	6.88							
DFS	0.75	0.88	11.16						
GBR	0.85	0.83	0.84	1.17					
ITA	0.77	0.83	0.83	0.89	1.37				
NZL	0.75	0.75	0.79	0.77	0.82	0.40			
USA	0.80	0.84	0.89	0.91	0.83	0.76	1.05		
ZAF	0.86	0.76	0.85	0.91	0.81	0.76	0.90	9.47	
NLD	0.77	0.81	0.93	0.88	0.86	0.79	0.84	0.79	4.54

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JER usu

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	5.18								
CAN	0.83	6.48							
DFS	0.74	0.86	12.84						
GBR	0.85	0.90	0.85	1.71					
ITA	0.58	0.74	0.69	0.67	1.55				
NZL	0.61	0.61	0.59	0.63	0.65	0.39			
USA	0.75	0.86	0.87	0.83	0.79	0.56	0.77		
ZAF	0.80	0.82	0.80	0.82	0.69	0.58	0.82	10.69	
NLD	0.81	0.83	0.89	0.87	0.80	0.59	0.87	0.80	5.33

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JER ude

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	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	5.34							
CAN	0.94	4.91						
DFS	0.94	0.93	12.26					
GBR	0.94	0.95	0.93	1.57				
ITA	0.95	0.94	0.93	0.90	1.40			
USA	0.94	0.97	0.96	0.94	0.95	1.42		
ZAF	0.94	0.92	0.94	0.94	0.93	0.94	11.23	
NLD	0.94	0.96	0.96	0.96	0.95	0.95	0.94	4.57

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JER ftp

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	6.00								
CAN	0.88	5.95							
DFS	0.86	0.94	13.02						
GBR	0.90	0.90	0.89	1.39					
ITA	0.72	0.82	0.82	0.73	1.65				
NZL	0.90	0.91	0.86	0.86	0.82	0.30			
USA	0.88	0.94	0.94	0.92	0.86	0.88	1.04		
ZAF	0.87	0.93	0.91	0.93	0.85	0.90	0.92	10.74	
NLD	0.92	0.96	0.95	0.92	0.82	0.88	0.90	0.92	5.24

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JER ftl

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	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	6.41							
CAN	0.83	5.52						
DFS	0.92	0.89	13.84					
GBR	0.95	0.88	0.94	1.38				
ITA	0.90	0.79	0.89	0.92	1.57			
USA	0.93	0.92	0.95	0.96	0.92	0.93		
ZAF	0.95	0.90	0.92	0.94	0.90	0.96	11.40	
NLD	0.94	0.92	0.97	0.96	0.90	0.96	0.95	5.02

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JER rtp

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	AUS	CAN	DFS	NZL	ZAF	NLD	USA
AUS	5.80						
CAN	0.95	6.16					
DFS	0.91	0.95	13.00				
NZL	0.94	0.95	0.91	0.39			
ZAF	0.96	0.95	0.92	0.91	10.30		
NLD	0.91	0.94	0.96	0.89	0.87	4.66	
USA	0.90	0.91	0.92	0.90	0.89	0.94	1.04

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JER ocs

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	AUS	CAN	DFS	GBR	ITA	NZL	USA	NLD
AUS	6.10							
CAN	0.50	5.99						
DFS	0.54	0.72	13.02					
GBR	0.66	0.84	0.79	1.93				
ITA	0.47	0.81	0.68	0.77	0.78			
NZL	0.63	0.60	0.55	0.62	0.60	0.31		
USA	0.67	0.79	0.81	0.86	0.81	0.61	0.91	
NLD	0.61	0.79	0.87	0.87	0.82	0.62	0.83	2.77

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JER ous

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	AUS	CAN	DFS	GBR	NZL	USA	NLD
AUS	5.00						
CAN	0.65	6.17					
DFS	0.49	0.86	13.06				
GBR	0.72	0.86	0.73	1.36			
NZL	0.76	0.73	0.66	0.75	0.46		
USA	0.64	0.91	0.81	0.86	0.67	0.66	
NLD	0.60	0.89	0.90	0.79	0.78	0.90	4.72

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JER ofl

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	AUS	CAN	DFS	GBR	ITA	USA	NLD
AUS	6.39						
CAN	0.57	5.87					
DFS	0.39	0.80	13.76				
GBR	0.58	0.74	0.59	1.34			
ITA	0.53	0.75	0.62	0.71	1.16		
USA	0.63	0.84	0.67	0.74	0.76	0.89	
NLD	0.43	0.69	0.65	0.74	0.68	0.68	5.69

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RDC sta

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	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	5.48								
CAN	0.88	5.94							
DEU	0.89	0.96	12.32						
DFS	0.86	0.96	0.97	8.79					
GBR	0.91	0.94	0.95	0.91	1.21				
NOR	0.89	0.94	0.96	0.98	0.93	14.22			
NZL	0.89	0.90	0.86	0.90	0.92	0.93	0.48		
USA	0.89	0.97	0.95	0.94	0.95	0.93	0.89	2.02	
NLD	0.86	0.95	0.97	0.97	0.93	0.96	0.84	0.93	4.55

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RDC cwi

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	AUS	CAN	DEU	DFS	GBR	NZL	USA	NLD
AUS	6.64							
CAN	0.69	7.27						
DEU	0.71	0.85	11.17					
DFS	0.76	0.84	0.87	12.81				
GBR	0.79	0.85	0.90	0.85	1.51			
NZL	0.79	0.67	0.74	0.72	0.81	0.35		
USA	0.67	0.86	0.82	0.78	0.83	0.71	1.06	
NLD	0.67	0.90	0.92	0.89	0.90	0.66	0.83	3.31

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RDC bde

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	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	5.81								
CAN	0.83	5.93							
DEU	0.80	0.88	9.39						
DFS	0.86	0.84	0.92	11.76					
GBR	0.80	0.83	0.91	0.87	1.37				
NOR	0.86	0.83	0.82	0.91	0.84	14.51			
NZL	0.79	0.68	0.72	0.79	0.75	0.83	0.35		
USA	0.72	0.77	0.87	0.80	0.89	0.83	0.73	1.00	
NLD	0.71	0.83	0.90	0.83	0.91	0.77	0.66	0.90	4.04

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RDC ang

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	AUS	CAN	DEU	DFS	GBR	USA	NLD
AUS	7.03						
CAN	0.66	6.59					
DEU	0.62	0.85	12.04				
DFS	0.65	0.82	0.86	9.26			
GBR	0.78	0.79	0.81	0.82	1.29		
USA	0.72	0.86	0.85	0.80	0.84	0.87	
NLD	0.76	0.72	0.58	0.65	0.77	0.66	5.39

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RDC ran

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	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	6.82								
CAN	0.92	5.97							
DEU	0.93	0.97	8.38						
DFS	0.92	0.95	0.95	10.11					
GBR	0.95	0.97	0.96	0.95	1.49				
NOR	0.92	0.94	0.94	0.91	0.95	12.86			
NZL	0.94	0.92	0.90	0.90	0.93	0.93	0.29		
USA	0.92	0.98	0.96	0.95	0.97	0.95	0.91	1.05	
NLD	0.93	0.97	0.98	0.96	0.97	0.95	0.90	0.96	5.80

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RDC rwi

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	AUS	CAN	DEU	DFS	GBR	NZL	USA	NLD
AUS	6.18							
CAN	0.88	5.89						
DEU	0.84	0.92	8.80					
DFS	0.85	0.93	0.91	10.60				
GBR	0.86	0.87	0.89	0.85	1.31			
NZL	0.87	0.87	0.81	0.89	0.87	0.31		
USA	0.81	0.89	0.84	0.87	0.91	0.85	1.17	
NLD	0.88	0.94	0.95	0.92	0.88	0.83	0.82	5.62

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RDC rls

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	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	7.50								
CAN	0.76	6.33							
DEU	0.78	0.94	8.52						
DFS	0.74	0.97	0.93	9.10					
GBR	0.86	0.78	0.87	0.78	1.57				
NOR	0.77	0.89	0.88	0.95	0.82	16.39			
NZL	0.75	0.69	0.72	0.70	0.74	0.78	0.12		
USA	0.75	0.95	0.92	0.93	0.82	0.86	0.68	0.69	
NLD	0.78	0.92	0.92	0.89	0.88	0.80	0.69	0.90	5.71

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RDC rlr

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	AUS	CAN	DEU	DFS	NOR	NLD	USA
AUS	7.44						
CAN	0.63	6.68					
DEU	0.61	0.88	9.40				
DFS	0.63	0.86	0.91	10.73			
NOR	0.64	0.77	0.83	0.89	14.82		
NLD	0.62	0.86	0.90	0.89	0.87	5.02	
USA	0.59	0.72	0.76	0.71	0.74	0.81	0.69

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RDC fan

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	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	6.87							
CAN	0.66	6.42						
DEU	0.73	0.82	14.02					
DFS	0.67	0.67	0.78	9.46				
GBR	0.81	0.77	0.90	0.70	1.59			
NOR	0.70	0.74	0.78	0.67	0.76	16.89		
USA	0.71	0.84	0.83	0.73	0.84	0.76	0.81	
NLD	0.74	0.76	0.88	0.74	0.88	0.77	0.81	4.70

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## RDC fua

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	6.86								
CAN	0.75	5.90							
DEU	0.77	0.89	10.95						
DFS	0.77	0.82	0.83	11.80					
GBR	0.78	0.85	0.95	0.86	1.65				
NOR	0.75	0.84	0.76	0.88	0.84	13.21			
NZL	0.77	0.80	0.81	0.72	0.79	0.77	0.34		
USA	0.74	0.93	0.89	0.84	0.91	0.84	0.84	1.13	
NLD	0.76	0.92	0.94	0.91	0.92	0.88	0.83	0.88	4.19

## RDC ruh

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	5.93								
CAN	0.78	5.75							
DEU	0.82	0.87	13.19						
DFS	0.78	0.91	0.91	10.65					
GBR	0.84	0.77	0.87	0.84	1.38				
NOR	0.79	0.85	0.90	0.89	0.83	13.94			
NZL	0.82	0.77	0.82	0.78	0.90	0.80	0.32		
USA	0.78	0.87	0.90	0.92	0.89	0.84	0.84	1.04	
NLD	0.78	0.80	0.92	0.93	0.88	0.89	0.82	0.85	5.16

## RDC usu

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	6.63								
CAN	0.78	5.56							
DEU	0.74	0.88	11.49						
DFS	0.69	0.79	0.79	12.45					
GBR	0.82	0.82	0.75	0.75	1.86				
NOR	0.73	0.77	0.72	0.78	0.79	16.57			
NZL	0.70	0.69	0.63	0.59	0.68	0.73	0.31		
USA	0.77	0.84	0.75	0.81	0.88	0.79	0.70	0.97	
NLD	0.79	0.84	0.78	0.89	0.91	0.88	0.62	0.90	4.77

## RDC ude

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	7.16							
CAN	0.93	5.45						
DEU	0.94	0.97	11.08					
DFS	0.92	0.98	0.95	10.58				
GBR	0.95	0.94	0.96	0.93	1.84			
NOR	0.94	0.95	0.93	0.93	0.95	12.80		
USA	0.94	0.97	0.96	0.96	0.95	0.95	1.09	
NLD	0.94	0.97	0.98	0.97	0.97	0.92	0.97	4.56

## RDC ftp

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	6.76								
CAN	0.94	5.08							
DEU	0.94	0.96	12.16						
DFS	0.90	0.95	0.90	11.79					
GBR	0.94	0.93	0.96	0.88	1.51				
NOR	0.92	0.91	0.89	0.91	0.92	12.46			
NZL	0.92	0.90	0.89	0.84	0.89	0.90	0.27		
USA	0.89	0.93	0.92	0.92	0.92	0.92	0.86	1.11	
NLD	0.95	0.98	0.97	0.95	0.95	0.91	0.90	0.91	4.00

## RDC ftl

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	5.60							
CAN	0.94	5.15						
DEU	0.96	0.92	12.80					
DFS	0.95	0.86	0.96	10.47				
GBR	0.95	0.91	0.98	0.93	1.44			
NOR	0.93	0.93	0.95	0.94	0.94	13.07		
USA	0.94	0.91	0.95	0.93	0.96	0.94	1.14	
NLD	0.95	0.92	0.98	0.96	0.97	0.93	0.95	5.69

## RDC rtp

	AUS	CAN	DEU	DFS	NOR	NZL	NLD	USA
AUS	6.59							
CAN	0.94	6.00						
DEU	0.92	0.96	13.42					
DFS	0.89	0.94	0.96	12.42				
NOR	0.92	0.93	0.92	0.90	14.37			
NZL	0.93	0.94	0.93	0.91	0.92	0.34		
NLD	0.94	0.97	0.97	0.96	0.91	0.93	5.25	
USA	0.93	0.92	0.95	0.93	0.94	0.91	0.95	1.11

## RDC ocs

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	5.01								
CAN	0.61	5.42							
DEU	0.63	0.84	17.38						
DFS	0.62	0.74	0.76	9.36					
GBR	0.68	0.80	0.92	0.80	1.53				
NOR	0.65	0.84	0.81	0.77	0.86	14.10			
NZL	0.74	0.58	0.66	0.66	0.65	0.79	0.26		
USA	0.64	0.83	0.89	0.82	0.86	0.86	0.70	0.78	
NLD	0.64	0.79	0.88	0.87	0.90	0.80	0.65	0.86	3.24

## RDC ous

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	5.09								
CAN	0.68	5.53							
DEU	0.67	0.88	14.41						
DFS	0.56	0.80	0.83	10.93					
GBR	0.79	0.83	0.86	0.68	1.45				
NOR	0.61	0.88	0.80	0.84	0.86	12.69			
NZL	0.79	0.75	0.80	0.74	0.74	0.71	0.36		
USA	0.69	0.92	0.89	0.87	0.87	0.88	0.82	0.90	
NLD	0.61	0.89	0.90	0.90	0.81	0.82	0.82	0.90	4.45

## RDC ofl

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	6.87							
CAN	0.42	5.93						
DEU	0.43	0.84	14.42					
DFS	0.43	0.80	0.78	13.14				
GBR	0.42	0.72	0.75	0.65	1.42			
NOR	0.49	0.73	0.75	0.66	0.74	15.98		
USA	0.45	0.73	0.74	0.59	0.72	0.74	1.00	
NLD	0.42	0.68	0.74	0.64	0.75	0.81	0.68	7.36

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 ^LAPPENDIX II. Number of common bulls  
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BSW  
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common bulls below diagonal  
 common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	35	114	85	17	14
CHE	83	0	136	379	54	239	440	39	12
FRA	57	102	0	147	49	85	147	33	11
ITA	83	329	119	0	74	177	458	55	13
NLD	27	50	39	56	0	51	69	24	7
USA	106	215	57	129	37	0	194	20	14
DEA	68	349	110	379	57	156	0	55	10
SVN	15	40	32	55	23	16	53	0	5
GBR	12	11	11	12	7	13	9	4	0

BSW  
 -----

common bulls below diagonal  
 common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	91	64	98	28	114	83	16	14
CHE	77	0	122	329	50	212	381	38	12
FRA	57	88	0	147	45	85	145	32	11
ITA	83	280	119	0	66	177	423	54	13
NLD	23	47	36	52	0	37	63	24	7
USA	106	187	57	129	28	0	176	19	14
DEA	67	294	109	343	55	131	0	53	9
SVN	14	38	31	54	23	15	52	0	5
GBR	12	11	11	12	7	13	9	4	0

BSW  
 -----

common bulls below diagonal  
 common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	DEA	SVN	GBR	USA
CAN	0	98	64	98	28	85	10	14	114
CHE	83	0	136	379	53	440	26	12	239
FRA	57	102	0	147	45	147	21	11	85
ITA	83	329	119	0	66	458	38	13	177
NLD	23	50	36	52	0	64	16	7	37
DEA	68	349	110	379	56	0	36	10	194
SVN	9	26	22	37	16	36	0	4	12
GBR	12	11	11	12	7	9	3	0	14
USA	106	215	57	129	28	156	10	13	0

BSW  
 -----

common bulls below diagonal  
 common three quarter sib group above diagonal

	CAN	CHE	FRA	NLD	USA	GBR
CAN	0	97	64	15	113	14
CHE	83	0	131	29	237	12
FRA	57	97	0	27	85	11
NLD	12	28	22	0	20	3
USA	105	215	57	15	0	14
GBR	12	11	11	3	13	0

BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	35	114	85	17	14
CHE	83	0	136	379	54	239	440	39	12
FRA	57	102	0	147	49	85	147	33	11
ITA	83	329	119	0	74	177	458	55	13
NLD	27	50	39	56	0	51	69	24	7
USA	106	215	57	129	37	0	194	20	14
DEA	68	349	110	379	57	156	0	55	10
SVN	15	40	32	55	23	16	53	0	5
GBR	12	11	11	12	7	13	9	4	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	NLD	USA	DEA	GBR	SVN
CAN	0	98	64	35	114	85	14	10
CHE	83	0	135	53	238	434	12	26
FRA	57	101	0	49	85	147	11	21
NLD	27	49	39	0	51	68	7	16
USA	106	215	57	37	0	194	14	12
DEA	68	347	109	56	156	0	10	36
GBR	12	11	11	7	13	9	0	4
SVN	9	26	22	16	10	36	3	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	35	114	85	17	14
CHE	83	0	136	379	54	239	440	39	12
FRA	57	102	0	147	49	85	147	33	11
ITA	83	329	119	0	74	177	458	55	13
NLD	27	50	39	56	0	51	69	24	7
USA	106	215	57	129	37	0	194	20	14
DEA	68	349	110	379	57	156	0	55	10
SVN	15	40	32	55	23	16	53	0	5
GBR	12	11	11	12	7	13	9	4	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	27	114	85	17	14
CHE	83	0	136	379	52	239	440	39	12
FRA	57	102	0	147	45	85	147	33	11
ITA	83	329	119	0	65	177	458	55	13
NLD	22	49	36	51	0	36	63	24	7
USA	106	215	57	129	26	0	194	20	14
DEA	68	349	110	379	55	156	0	55	10
SVN	15	40	32	55	23	16	53	0	5
GBR	12	11	11	12	7	13	9	4	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	DEA	SVN	USA
CAN	0	98	64	95	27	85	17	114
CHE	83	0	136	373	52	440	38	239
FRA	57	102	0	146	45	147	33	85
ITA	81	324	119	0	65	452	55	165
NLD	22	49	36	51	0	63	24	36
DEA	68	349	110	372	55	0	54	194
SVN	15	39	32	55	23	52	0	20
USA	106	215	57	117	26	156	16	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	27	114	51	10	14
CHE	83	0	136	375	53	239	245	26	12
FRA	57	102	0	147	45	85	94	21	11
ITA	83	326	119	0	64	174	210	38	13
NLD	22	50	36	52	0	36	50	16	7
USA	106	215	57	129	27	0	94	12	14
DEA	41	182	64	180	44	64	0	34	7
SVN	9	26	22	37	16	10	34	0	4
GBR	12	11	11	12	7	13	7	3	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	28	114	85	17	14
CHE	83	0	136	379	53	239	440	39	12
FRA	57	102	0	147	45	85	147	33	11
ITA	83	329	119	0	66	177	458	55	13
NLD	23	50	36	52	0	37	64	24	7
USA	106	215	57	129	28	0	194	20	14
DEA	68	349	110	379	56	156	0	55	10
SVN	15	40	32	55	23	16	53	0	5
GBR	12	11	11	12	7	13	9	4	0

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BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN
CAN	0	98	64	98	28	114	85	17
CHE	83	0	136	379	53	239	440	39
FRA	57	102	0	147	45	85	147	33
ITA	83	329	119	0	66	177	458	55
NLD	23	50	36	52	0	37	64	24
USA	106	215	57	129	28	0	194	20
DEA	68	349	110	379	56	156	0	55
SVN	15	40	32	55	23	16	53	0

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BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	35	114	85	10	14
CHE	83	0	136	379	54	239	440	26	12
FRA	57	102	0	147	49	85	147	21	11
ITA	83	329	119	0	74	177	458	38	13
NLD	27	50	39	56	0	51	69	16	7
USA	106	215	57	129	37	0	194	12	14
DEA	68	349	110	379	57	156	0	36	10
SVN	9	26	22	37	16	10	36	0	4
GBR	12	11	11	12	7	13	9	3	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	35	112	85	17	14
CHE	83	0	136	379	54	239	440	39	12
FRA	57	102	0	147	49	85	147	33	11
ITA	83	329	119	0	74	177	458	55	13
NLD	27	50	39	56	0	51	69	24	7
USA	105	215	57	129	37	0	194	20	14
DEA	68	349	110	379	57	156	0	55	10
SVN	15	40	32	55	23	16	53	0	5
GBR	12	11	11	12	7	13	9	4	0

-----

BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	35	114	74	16	14
CHE	83	0	135	53	238	405	38	12
FRA	57	101	0	49	85	137	32	11
NLD	27	49	39	0	51	62	24	7
USA	106	215	57	37	0	169	18	14
DEA	60	317	101	54	128	0	53	9
SVN	14	39	31	23	15	52	0	5
GBR	12	11	11	7	13	9	4	0

-----

BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	98	64	98	35	114	85	16	14
CHE	83	0	136	379	54	239	440	38	12
FRA	57	102	0	147	49	85	147	32	11
ITA	83	329	119	0	74	175	458	54	13
NLD	27	50	39	56	0	51	69	24	7
USA	106	215	57	128	37	0	194	19	14
DEA	68	349	110	379	57	156	0	54	10
SVN	14	39	31	54	23	15	52	0	5
GBR	12	11	11	12	7	13	9	4	0

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BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	DEA	SVN	USA
CAN	0	98	64	95	23	51	16	114
CHE	83	0	136	368	49	245	38	239
FRA	57	102	0	146	42	94	32	85
ITA	81	321	119	0	59	210	54	162
NLD	19	48	34	49	0	50	23	31
DEA	41	182	64	180	44	0	45	94
SVN	14	39	31	54	23	43	0	19
USA	106	215	57	117	23	64	15	0

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BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	91	54	98	35	114	51	10	14
CHE	77	0	99	327	49	212	241	26	12
FRA	51	75	0	113	39	69	84	21	11
ITA	83	278	95	0	72	174	210	38	13
NLD	27	47	34	56	0	51	50	16	7
USA	106	187	49	129	37	0	94	12	14
DEA	41	178	62	180	44	64	0	34	7
SVN	9	26	22	37	16	10	34	0	4
GBR	12	11	11	12	7	13	7	3	0

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BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	91	54	98	35	113	85	10	14
CHE	77	0	100	329	50	212	391	26	12
FRA	51	75	0	113	39	69	116	21	11
ITA	83	280	95	0	74	177	451	38	13
NLD	27	47	34	56	0	51	69	16	7
USA	105	187	49	129	37	0	192	12	14
DEA	67	304	88	375	57	152	0	36	10
SVN	9	26	22	37	16	10	36	0	4
GBR	12	11	11	12	7	13	9	3	0

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BSW

-----

common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	FRA	ITA	NLD	USA	DEA	SVN	GBR
CAN	0	91	54	95	35	114	85	10	14
CHE	77	0	100	328	50	212	391	26	12
FRA	51	75	0	112	39	69	116	21	11
ITA	81	279	95	0	73	165	446	38	13
NLD	27	47	34	56	0	51	69	16	7
USA	106	187	49	117	37	0	192	12	14
DEA	67	304	88	369	57	152	0	36	10
SVN	9	26	22	37	16	10	36	0	4
GBR	12	11	11	12	7	13	9	3	0

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-----  
GUE  
-----

common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

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CAN	0	20	55	21
GBR	17	0	62	12
USA	44	62	0	26
AUS	20	9	21	0

---

-----  
GUE  
-----

common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

---

CAN	0	20	55	21
GBR	17	0	62	12
USA	44	62	0	26
AUS	20	9	21	0

---

-----  
GUE  
-----

common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

---

CAN	0	20	55	21
GBR	17	0	62	12
USA	44	62	0	26
AUS	20	9	21	0

---

-----  
GUE  
-----

common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

---

CAN	0	20	55	21
GBR	17	0	62	12
USA	44	62	0	26
AUS	20	9	21	0

---

-----  
GUE  
-----

common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

---

CAN	0	20	55	21
GBR	17	0	62	12
USA	44	62	0	26
AUS	20	9	21	0

---

-----  
GUE  
-----

common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

---

CAN	0	20	55	21
GBR	17	0	62	12
USA	44	62	0	26
AUS	20	9	21	0

---

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN USA AUS

-----  
CAN 0 27 7  
USA 25 0 8  
AUS 6 7 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 53 20  
GBR 17 0 62 12  
USA 43 62 0 26  
AUS 19 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 20 55 21  
GBR 17 0 62 12  
USA 44 62 0 26  
AUS 20 9 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN AUS USA

-----  
CAN 0 7 55  
AUS 6 0 10  
USA 44 8 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 12 55 21  
GBR 9 0 33 10  
USA 44 31 0 26  
AUS 20 7 21 0  
-----

GUE

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
CAN GBR USA AUS

-----  
CAN 0 18 53 20  
GBR 15 0 60 12  
USA 43 60 0 26  
AUS 19 9 21 0  
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HOL

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	SVN	PRT																
8	AUS	0	322	672	344	682	606	475	520	685	615	657	840	362	412	431	212	437	431	53
33	BEL	248	0	391	353	555	441	387	455	471	480	637	474	272	349	205	161	276	352	42
11	CAN	540	361	0	631	1525	894	964	844	1131	1274	877	2239	645	756	307	280	940	800	90
30	CHE	256	331	469	0	749	467	429	402	535	579	622	693	311	395	209	165	317	404	44
94	DEU	267	411	432	449	0	1703	1095	1582	1391	1989	1896	2280	800	1203	389	291	1005	1326	128
23	DFS	320	368	538	388	619	0	769	1048	1111	1220	1269	1393	591	867	401	289	667	898	96
11	ESP	306	352	503	328	483	484	0	762	846	1036	792	1177	542	658	278	278	666	676	80
13	FRA	279	418	438	330	416	409	495	0	1026	1289	1177	1517	591	917	341	231	763	899	86
18	GBR	494	448	1056	514	605	679	664	535	0	1281	1249	1577	615	811	413	298	727	821	93
28	ITA	378	416	807	502	877	767	719	503	928	0	1313	2036	749	1006	387	314	896	1047	109
70	NLD	468	665	665	576	894	862	629	542	942	928	0	1549	622	955	496	279	670	1056	124
20	USA	589	385	1955	592	665	730	673	581	1263	1156	1017	0	879	1134	478	352	1444	1211	130
4	HUN	218	223	530	247	438	394	405	334	478	563	436	742	0	539	233	237	470	671	68
64	POL	205	262	450	274	550	500	389	384	533	640	634	776	381	0	262	224	555	808	105
3	NZL	312	154	254	166	205	237	218	164	312	278	431	392	179	147	0	155	270	282	29
5	ZAF	187	143	262	147	205	236	254	175	272	269	243	353	208	164	133	0	225	245	33
3	JPN	178	149	259	147	182	217	211	180	237	246	219	305	179	157	111	155	0	603	67
25	CZE	214	244	483	274	733	467	438	463	532	662	812	799	557	498	171	182	150	0	85
2	EST	19	29	34	19	54	44	32	27	39	51	72	74	37	54	12	15	15	42	0
0	FRR	6	30	9	26	73	23	8	12	15	26	48	13	4	64	3	4	3	21	1
9	IRL	286	272	324	284	323	359	338	316	656	405	491	418	236	229	240	166	143	248	25
0	KOR	112	85	378	113	158	183	196	146	247	337	172	599	230	222	74	127	135	229	14
11	SVN	47	75	84	62	143	116	83	73	107	136	124	110	67	110	32	41	41	101	18
12	PRT	246	320	677	309	455	515	566	438	606	714	682	859	423	518	178	244	193	452	42

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	PRT	SVN																
8	AUS	0	327	664	343	680	602	461	642	679	614	685	832	362	412	425	260	436	430	53
37	BEL	336	195	378	55															
13	CAN	248	0	396	355	560	445	385	501	477	483	663	488	274	352	208	181	282	353	42
35	CHE	286	148	348	66															
111	DEU	539	361	0	631	1526	894	960	1016	1131	1274	921	2239	645	757	307	333	940	800	90
26	DFS	352	428	691	91															
13	ESP	256	332	469	0	749	467	424	440	535	579	637	693	311	396	209	188	317	404	44
111	FRA	267	411	432	449	0	1703	1079	1727	1392	1989	1946	2280	800	1206	389	337	1005	1326	128
26	GBR	486	354	735	140															
13	ITA	320	368	538	388	619	0	754	1223	1112	1220	1306	1393	591	870	401	343	667	898	96
16	NLD	464	300	631	114															
21	USA	299	340	498	320	456	467	0	842	832	1019	796	1162	535	646	269	322	662	665	78
30	HUN	348	299	603	86															
84	POL	317	442	496	358	500	434	506	0	1180	1400	1375	1956	643	983	431	316	928	948	91
22	NZL	454	313	597	91															
5	ZAF	493	448	1056	514	605	679	640	585	0	1281	1287	1578	615	813	413	354	727	821	93
3	JPN	605	333	690	110															
26	CZE	378	416	807	502	877	767	690	552	928	0	1341	2036	749	1006	387	352	896	1047	109
2	EST	455	419	778	128															
0	FRR	493	690	715	599	925	885	634	632	984	961	0	1659	634	969	509	332	706	1069	126
9	IRL	587	385	1955	592	665	730	657	781	1263	1156	1220	0	879	1136	478	421	1444	1211	130
0	KOR	218	223	530	247	438	394	398	349	478	563	453	742	0	540	233	265	470	671	68
12	PRT	282	290	462	76															
8	SVN	205	262	450	274	550	500	372	399	534	640	644	776	381	0	262	250	556	808	105
0	IRL	328	323	581	114															
0	KOR	311	154	254	166	205	237	212	193	312	278	450	392	179	147	0	191	270	282	29
12	PRT	293	122	244	34															
8	SVN	221	156	306	163	230	260	293	215	323	299	300	438	225	172	169	0	269	266	34
0	IRL	208	173	272	40															
0	KOR	178	149	259	147	182	217	209	185	237	246	221	305	179	157	111	163	0	603	67
12	PRT	272	326	444	65															
8	SVN	214	244	483	274	733	467	424	494	532	662	828	799	557	498	171	194	150	0	85
2	EST	333	336	565	110															
0	FRR	19	29	34	19	54	44	29	27	39	51	73	74	37	54	12	15	15	42	0
0	IRL	48	36	70	21															
0	KOR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	3	22	1
9	IRL	9	1	12	8															
0	KOR	286	272	324	284	323	359	324	343	656	405	502	418	236	229	240	197	143	248	25
0	PRT	0	142	310	52															
12	PRT	113	85	379	113	158	183	196	146	248	338	177	600	230	222	75	132	135	229	14
8	SVN	93	0	310	50															
12	PRT	246	320	677	309	455	515	553	449	606	714	695	859	423	518	178	254	193	452	42
8	SVN	268	251	0	81															
8	SVN	32	52	67	47	117	90	56	57	81	105	93	87	53	90	25	28	26	81	14

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	FRR
IRL	KOR	PRT	SVN																
AUS	0	316	672	331	681	605	478	520	681	614	312	838	361	408	259	437	428	51	8
336	194	371	54																
BEL	248	0	385	333	545	433	385	451	462	472	356	462	265	341	175	270	341	42	35
279	143	335	65																
CAN	540	359	0	595	1524	890	968	844	1128	1273	496	2239	645	755	332	940	799	89	13
351	427	686	91																
CHE	255	316	439	0	652	459	424	398	523	552	358	639	304	374	187	316	383	41	22
291	167	349	63																
DEU	267	409	432	388	0	1688	1105	1581	1389	1987	976	2275	796	1199	336	1004	1319	127	111
485	353	714	139																
DFS	320	367	538	380	616	0	772	1043	1099	1213	649	1380	586	855	342	664	888	94	26
462	299	613	113																
ESP	308	358	505	326	500	494	0	767	850	1046	445	1182	544	661	328	670	676	81	13
359	302	612	88																
FRA	279	418	438	325	416	409	505	0	1025	1289	593	1515	590	915	264	763	899	84	14
397	298	540	91																
GBR	494	445	1056	504	604	679	671	535	0	1277	611	1569	611	801	352	726	814	90	21
596	332	673	109																
ITA	378	415	807	480	876	767	735	503	926	0	716	2034	747	1000	350	896	1044	107	30
452	417	762	127																
NLD	253	363	425	323	516	553	354	356	521	571	0	691	339	606	171	299	650	85	41
275	173	409	106																
USA	589	381	1955	539	665	730	677	581	1262	1155	504	0	877	1129	419	1444	1202	129	22
455	554	872	110																
HUN	218	222	530	243	438	394	410	334	477	562	242	741	0	537	265	470	669	68	4
279	290	456	76																
POL	205	260	450	254	550	497	398	384	530	638	465	775	381	0	248	554	800	104	76
325	322	570	113																
ZAF	221	156	306	162	230	260	297	185	323	299	147	437	225	172	0	269	263	33	5
207	172	269	40																
JPN	178	149	259	147	182	217	212	180	237	246	148	305	179	157	163	0	603	67	3
271	325	441	65																
CZE	214	242	483	262	731	462	444	463	530	662	581	796	557	494	194	150	0	81	26
330	336	552	109																
EST	19	29	34	19	54	44	35	27	39	51	54	74	37	54	15	15	41	0	2
46	36	68	20																
FRR	6	32	9	18	84	26	8	12	17	28	30	13	4	81	4	3	22	1	0
9	1	12	8																
IRL	286	271	324	282	322	359	343	316	649	404	273	418	236	228	197	143	248	25	9
0	140	303	52																
KOR	112	85	378	112	158	183	196	146	247	337	114	599	230	222	131	135	229	14	0
92	0	309	50																
PRT	246	318	677	300	452	507	568	438	605	712	396	857	423	510	254	193	444	41	12
268	251	0	81																
SVN	32	52	67	46	116	90	61	57	81	105	92	87	53	90	28	26	80	14	8
43	31	63	0																

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HOL

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	SVN	PRT																
8	AUS	0	328	672	344	682	607	463	650	685	615	710	840	362	414	431	260	437	431	53
37	BEL	248	0	396	355	560	446	382	501	477	483	685	488	274	352	208	181	282	353	42
13	CAN	540	361	0	631	1526	894	955	1016	1131	1274	952	2239	645	757	307	333	940	800	90
35	CHE	256	332	469	0	749	467	422	440	535	579	645	693	311	396	209	188	317	404	44
111	DEU	267	411	432	449	0	1703	1071	1727	1392	1989	1987	2280	800	1206	389	337	1005	1326	128
26	DFS	319	367	538	388	619	0	748	1224	1113	1221	1347	1394	592	871	402	343	667	898	96
13	ESP	296	338	496	316	445	459	0	835	825	1011	804	1154	533	643	268	322	657	663	77
16	FRA	317	442	496	358	500	431	497	0	1180	1400	1488	1956	643	983	431	316	928	948	91
21	GBR	494	448	1056	514	605	677	632	585	0	1281	1315	1579	615	813	413	354	727	821	93
30	ITA	378	416	807	502	877	766	678	552	928	0	1358	2036	749	1006	387	352	896	1047	109
87	NLD	496	714	722	600	933	886	629	655	996	962	0	1786	643	978	522	342	739	1073	127
22	USA	589	385	1955	592	665	730	651	781	1263	1156	1257	0	879	1136	478	421	1444	1211	130
4	HUN	218	223	530	247	438	392	397	349	478	563	453	742	0	540	233	265	470	671	68
76	POL	205	262	450	274	550	500	370	399	534	640	645	776	381	0	262	250	556	808	105
5	NZL	312	154	254	166	205	237	211	193	312	278	452	392	179	147	0	191	270	282	29
5	ZAF	221	156	306	163	230	260	292	215	323	299	302	438	225	172	169	0	269	266	34
3	JPN	178	149	259	147	182	217	207	185	237	246	221	305	179	157	111	163	0	603	67
26	CZE	214	244	483	274	733	465	421	494	532	662	828	799	557	498	171	194	150	0	85
2	EST	19	29	34	19	54	44	29	27	39	51	73	74	37	54	12	15	15	42	0
0	FRR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	3	22	1
9	IRL	286	272	324	284	323	358	321	343	658	405	505	418	236	229	240	197	143	248	25
0	KOR	113	85	380	113	158	184	196	146	248	338	177	602	230	223	75	132	135	229	14
12	SVN	47	75	84	62	143	116	76	73	107	136	126	110	67	110	32	41	41	101	18
12	PRT	245	320	677	309	455	513	548	446	604	714	697	859	422	517	178	254	193	451	42

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HOL

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	PRT	SVN																
8	AUS	0	303	672	344	682	607	464	650	685	615	708	840	362	414	431	259	247	431	53
35	BEL	247	0	379	347	537	425	367	463	455	466	605	447	259	339	193	170	190	338	42
13	CAN	540	356	0	631	1526	894	956	1016	1131	1274	949	2239	645	757	307	332	638	800	90
35	CHE	256	330	469	0	749	467	422	440	535	579	643	693	311	396	209	187	237	404	44
111	DEU	267	408	432	449	0	1703	1071	1727	1392	1989	1982	2280	800	1206	389	336	727	1326	128
26	DFS	320	366	538	388	619	0	749	1224	1113	1221	1339	1394	592	871	402	342	439	898	96
13	ESP	297	337	497	316	445	462	0	837	827	1013	801	1156	535	643	268	321	480	664	77
16	FRA	317	437	496	358	500	434	500	0	1180	1400	1476	1956	643	983	431	315	595	948	91
21	GBR	494	443	1056	514	605	679	634	585	0	1281	1313	1579	615	813	413	353	487	821	93
30	ITA	378	415	807	502	877	767	680	552	928	0	1357	2036	749	1006	387	351	689	1047	109
87	NLD	496	634	722	600	932	886	628	655	995	962	0	1779	643	977	521	341	494	1073	126
22	USA	589	376	1955	592	665	730	653	781	1263	1156	1254	0	879	1136	478	420	925	1211	130
4	HUN	218	221	530	247	438	394	398	349	478	563	453	742	0	540	233	264	352	671	68
76	POL	205	261	450	274	550	500	371	399	534	640	645	776	381	0	262	249	454	808	105
5	NZL	312	151	254	166	205	237	212	193	312	278	452	392	179	147	0	191	157	282	29
5	ZAF	220	154	305	162	229	259	291	214	322	298	301	437	224	171	169	0	172	265	34
2	JPN	142	121	216	128	153	185	165	156	191	212	179	248	148	146	86	117	0	462	55
26	CZE	214	243	483	274	733	467	422	494	532	662	828	799	557	498	171	194	132	0	85
2	EST	19	29	34	19	54	44	29	27	39	51	73	74	37	54	12	15	15	42	0
0	FRR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	2	22	1
9	IRL	286	270	324	284	323	359	322	343	658	405	505	418	236	229	240	196	119	248	25
0	KOR	113	85	380	113	158	184	197	146	248	338	177	601	230	223	75	132	125	229	14
12	PRT	245	317	677	309	455	514	549	448	605	714	697	859	423	517	178	254	162	452	42
8	SVN	32	52	67	47	117	90	55	57	81	105	93	87	53	90	25	28	26	81	14

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	SVN	PRT																
8	AUS	0	328	672	344	682	607	469	650	685	615	710	840	362	414	431	260	437	431	53
37	BEL	248	0	396	355	560	446	385	501	477	483	685	488	274	352	208	181	282	353	42
13	CAN	540	361	0	631	1526	894	961	1016	1131	1274	952	2239	645	757	307	333	940	800	90
35	CHE	256	332	469	0	749	467	425	440	535	579	645	693	311	396	209	188	317	404	44
111	DEU	267	411	432	449	0	1703	1083	1727	1392	1989	1987	2280	800	1206	389	337	1005	1326	128
26	DFS	320	368	538	388	619	0	759	1224	1113	1221	1347	1394	592	871	402	343	667	898	96
13	ESP	301	340	499	321	460	470	0	844	835	1022	814	1164	535	649	271	323	662	668	78
16	FRA	317	442	496	358	500	434	509	0	1180	1400	1488	1956	643	983	431	316	928	948	91
21	GBR	494	448	1056	514	605	679	642	585	0	1281	1315	1579	615	813	413	354	727	821	93
30	ITA	378	416	807	502	877	767	694	552	928	0	1358	2036	749	1006	387	352	896	1047	109
87	NLD	496	714	722	600	933	886	639	655	996	962	0	1786	643	978	522	342	739	1073	127
22	USA	589	385	1955	592	665	731	659	781	1263	1156	1257	0	879	1136	478	421	1444	1211	130
4	HUN	218	223	530	247	438	394	398	349	478	563	453	742	0	540	233	265	470	671	68
76	POL	205	262	450	274	550	500	375	399	534	640	645	776	381	0	262	250	556	808	105
5	NZL	312	154	254	166	205	237	213	193	312	278	452	392	179	147	0	191	270	282	29
5	ZAF	221	156	306	163	230	260	294	215	323	299	302	438	225	172	169	0	269	266	34
3	JPN	178	149	259	147	182	217	209	185	237	246	221	305	179	157	111	163	0	603	67
26	CZE	214	244	483	274	733	467	426	494	532	662	828	799	557	498	171	194	150	0	85
2	EST	19	29	34	19	54	44	29	27	39	51	73	74	37	54	12	15	15	42	0
0	FRR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	3	22	1
9	IRL	286	272	324	284	323	359	326	343	658	405	505	418	236	229	240	197	143	248	25
0	KOR	112	85	378	113	158	183	195	146	247	337	176	598	230	222	74	131	135	229	14
12	SVN	47	75	84	62	143	116	78	73	107	136	126	110	67	110	32	41	41	101	18
12	PRT	246	322	677	309	455	516	556	450	607	714	700	859	425	519	178	254	193	453	42

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	SVN	PRT																
8	AUS	0	322	672	344	682	606	475	604	685	615	657	840	362	413	431	260	437	431	53
37	BEL	338	195	80	380															
13	CAN	248	0	392	354	555	442	388	482	472	481	638	475	272	350	205	180	276	352	42
35	CHE	285	148	95	348															
111	DEU	540	361	0	631	1525	894	964	937	1131	1274	877	2239	645	757	307	333	940	800	90
26	DFS	352	429	116	691															
13	ESP	256	331	469	0	749	467	429	429	535	579	622	693	311	396	209	188	317	404	44
15	FRA	267	169	89	363															
21	GBR	486	356	174	735	0	1703	1095	1691	1392	1989	1897	2280	800	1205	389	337	1005	1326	128
30	ITA	320	368	538	388	619	0	769	1146	1112	1220	1269	1393	591	870	401	343	667	898	96
13	NLD	464	301	146	631															
15	USA	306	352	503	328	483	484	0	819	847	1036	793	1177	542	659	278	328	666	676	80
21	HUN	356	303	117	615															
4	POL	316	440	493	358	497	431	535	0	1124	1369	1287	1755	629	971	398	301	850	938	88
5	NZL	436	308	115	589															
26	ZAF	494	448	1056	514	605	679	664	580	0	1281	1250	1578	615	813	413	354	727	821	93
30	JPN	605	333	143	690															
22	CZE	378	416	807	502	877	767	719	549	928	0	1313	2036	749	1006	387	352	896	1047	109
78	EST	455	420	162	778															
4	FRR	468	665	666	576	894	861	629	603	943	928	0	1551	622	956	496	323	670	1056	124
5	IRL	549	293	154	712															
26	KOR	589	385	1955	592	665	731	673	710	1263	1156	1017	0	879	1136	478	421	1444	1211	130
26	SVN	459	557	142	888															
4	PRT	218	223	530	247	438	394	405	348	478	563	436	742	0	540	233	265	470	671	68
5	AUS	282	291	93	462															
76	BEL	205	262	450	274	550	500	389	399	534	640	636	776	381	0	262	250	556	808	105
5	CAN	328	324	139	581															
5	CHE	312	154	254	166	205	237	218	191	312	278	431	392	179	147	0	191	270	282	29
5	DEU	293	122	44	244															
5	DFS	221	156	306	163	230	260	297	213	323	299	282	438	225	172	169	0	269	266	34
3	ESP	208	173	58	272															
26	FRA	178	149	259	147	182	217	211	185	237	246	219	305	179	157	111	163	0	603	67
26	GBR	272	327	88	444															
2	ITA	214	244	483	274	733	467	438	492	532	662	812	799	557	498	171	194	150	0	85
2	NLD	333	336	138	565															
2	USA	19	29	34	19	54	44	32	27	39	51	72	74	37	54	12	15	15	42	0
0	HUN	48	36	25	70															
9	POL	6	33	9	27	84	26	8	12	17	28	51	13	4	81	5	4	3	22	1
9	NZL	9	1	13	12															
0	ZAF	286	272	324	284	323	359	338	341	656	405	490	418	236	229	240	197	143	248	25
0	JPN	0	142	73	310															
12	CZE	113	85	379	113	158	183	197	146	248	338	173	600	230	222	75	132	135	229	14
12	EST	93	0	63	310															
12	FRR	47	75	84	62	142	116	83	73	107	136	124	110	67	110	32	41	41	101	18
12	IRL	56	38	0	107															
12	KOR	246	320	677	309	455	515	566	447	606	714	682	859	423	518	178	254	193	452	42
12	SVN	268	251	83	0															

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	SVN	PRT																
8	AUS	0	322	672	344	682	558	470	647	685	615	687	840	362	414	431	260	437	431	53
37	BEL	248	0	392	354	555	435	385	490	472	481	650	475	272	350	205	180	276	352	42
13	CAN	540	361	0	631	1526	813	962	1001	1131	1274	921	2239	645	757	307	333	940	800	90
35	CHE	256	331	469	0	749	447	427	436	535	579	637	693	311	396	209	188	317	404	44
111	DEU	267	411	432	449	0	1613	1085	1715	1392	1989	1946	2280	800	1206	389	337	1005	1326	128
26	DFS	320	367	538	388	617	0	717	1113	1051	1186	1270	1297	575	846	373	315	611	865	92
13	ESP	301	341	500	323	462	471	0	834	837	1024	801	1166	536	651	272	325	663	669	78
16	FRA	317	442	496	358	498	433	512	0	1167	1392	1369	1917	641	979	427	315	915	944	90
21	GBR	494	447	1055	514	604	677	642	584	0	1281	1287	1578	615	813	413	354	727	821	93
30	ITA	378	416	807	502	877	765	696	551	927	0	1341	2036	749	1006	387	352	896	1047	109
84	NLD	493	686	715	599	925	884	639	631	983	961	0	1659	634	969	509	332	706	1069	126
22	USA	589	385	1955	592	665	730	661	746	1263	1156	1220	0	879	1136	478	421	1444	1211	130
4	HUN	218	223	530	247	438	394	400	349	478	563	453	742	0	540	233	265	470	671	68
76	POL	205	262	450	274	550	500	377	399	534	640	644	776	381	0	262	250	556	808	105
5	NZL	312	154	254	166	205	237	213	193	312	278	450	392	179	147	0	191	270	282	29
5	ZAF	221	156	306	163	230	260	295	215	323	299	300	438	225	172	169	0	269	266	34
3	JPN	178	149	259	147	182	217	210	185	237	246	221	305	179	157	111	163	0	603	67
26	CZE	214	244	483	274	733	467	428	494	532	662	828	799	557	498	171	194	150	0	85
2	EST	19	29	34	19	54	44	29	27	39	51	73	74	37	54	12	15	15	42	0
0	FRR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	3	22	1
9	IRL	286	272	324	284	323	358	327	343	656	405	502	418	236	229	240	197	143	248	25
0	KOR	113	85	380	113	158	184	198	146	248	338	177	601	230	223	75	132	135	229	14
12	SVN	47	75	84	62	143	116	78	73	107	136	126	110	67	110	32	41	41	101	18
12	PRT	246	320	677	309	455	512	556	449	606	714	695	859	423	518	178	254	193	452	42

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	
FRR	IRL	KOR	SVN	PRT																
8	AUS	0	322	672	344	682	607	478	650	685	615	710	840	362	414	431	260	437	431	53
37	BEL	248	0	392	354	555	443	392	491	472	481	656	475	272	350	205	180	276	352	42
13	CAN	540	361	0	631	1526	894	968	1016	1131	1274	952	2239	645	757	307	333	940	800	90
35	CHE	256	331	469	0	749	467	431	440	535	579	645	693	311	396	209	188	317	404	44
111	DEU	267	411	432	449	0	1703	1105	1727	1392	1989	1987	2280	800	1206	389	337	1005	1326	128
26	DFS	320	368	539	388	619	0	776	1224	1113	1221	1347	1394	592	871	402	343	667	898	96
13	ESP	307	357	505	329	497	493	0	863	853	1047	838	1182	545	666	281	328	670	680	82
16	FRA	317	442	496	358	500	434	546	0	1180	1400	1488	1956	643	983	431	316	928	948	91
21	GBR	494	448	1056	514	605	679	671	585	0	1281	1315	1579	615	813	413	354	727	821	93
30	ITA	378	416	807	502	877	767	734	552	928	0	1358	2036	749	1006	387	352	896	1047	109
87	NLD	496	693	722	600	933	886	672	655	996	962	0	1786	643	978	522	342	739	1073	127
22	USA	589	385	1955	592	665	732	677	781	1263	1156	1257	0	879	1136	478	421	1444	1211	130
4	HUN	218	223	530	247	438	395	409	349	478	563	453	742	0	540	233	265	470	671	68
76	POL	205	262	450	274	550	500	397	399	534	640	645	776	381	0	262	250	556	808	105
5	NZL	312	154	254	166	205	237	219	193	312	278	452	392	179	147	0	191	270	282	29
5	ZAF	221	156	306	163	230	261	297	215	323	299	302	438	225	172	169	0	269	266	34
3	JPN	178	149	259	147	182	217	212	185	237	246	221	305	179	157	111	163	0	603	67
26	CZE	214	244	483	274	733	467	442	494	532	662	828	799	557	498	171	194	150	0	85
2	EST	19	29	34	19	54	44	34	27	39	51	73	74	37	54	12	15	15	42	0
0	FRR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	3	22	1
9	IRL	286	272	324	284	323	359	342	343	658	405	505	418	236	229	240	197	143	248	25
0	KOR	112	85	378	113	158	183	196	146	247	337	176	598	230	222	74	131	135	229	14
12	SVN	47	75	84	62	143	116	84	73	107	136	126	110	67	110	32	41	41	101	18
12	PRT	246	322	677	309	455	516	569	450	607	714	700	859	425	519	178	254	193	453	42

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST
FRR	IRL	KOR	SVN	PRT															
AUS	0	322	672	344	682	607	470	650	685	615	710	840	362	414	431	260	437	431	53
8 338	195	78	380																
BEL	248	0	392	354	555	443	385	491	472	481	656	475	272	350	205	180	276	352	42
37 285	148	93	348																
CAN	540	361	0	631	1526	894	961	1016	1131	1274	952	2239	645	757	307	333	940	800	90
13 352	430	114	691																
CHE	256	331	469	0	749	467	426	440	535	579	645	693	311	396	209	188	317	404	44
35 293	169	87	363																
DEU	267	411	432	449	0	1703	1084	1727	1392	1989	1987	2280	800	1206	389	337	1005	1326	128
111 486	357	172	735																
DFS	320	368	539	388	619	0	759	1224	1113	1221	1347	1394	592	871	402	343	667	898	96
26 465	302	145	631																
ESP	301	341	499	321	460	470	0	845	836	1023	815	1165	535	650	272	324	662	668	78
13 349	301	114	605																
FRA	317	442	496	358	500	434	510	0	1180	1400	1488	1956	643	983	431	316	928	948	91
16 454	314	113	597																
GBR	494	448	1056	514	605	679	642	585	0	1281	1315	1579	615	813	413	354	727	821	93
21 607	333	141	690																
ITA	378	416	807	502	877	767	694	552	928	0	1358	2036	749	1006	387	352	896	1047	109
30 455	420	160	778																
NLD	496	693	722	600	933	886	639	655	996	962	0	1786	643	978	522	342	739	1073	127
87 563	300	152	730																
USA	589	385	1955	592	665	731	659	781	1263	1156	1257	0	879	1136	478	421	1444	1211	130
22 460	559	140	888																
HUN	218	223	530	247	438	395	398	349	478	563	453	742	0	540	233	265	470	671	68
4 282	291	91	462																
POL	205	262	450	274	550	500	376	399	534	640	645	776	381	0	262	250	556	808	105
76 328	325	137	581																
NZL	312	154	254	166	205	237	213	193	312	278	452	392	179	147	0	191	270	282	29
5 293	122	44	244																
ZAF	221	156	306	163	230	261	294	215	323	299	302	438	225	172	169	0	269	266	34
5 208	173	57	272																
JPN	178	149	259	147	182	217	209	185	237	246	221	305	179	157	111	163	0	603	67
3 272	328	87	444																
CZE	214	244	483	274	733	467	426	494	532	662	828	799	557	498	171	194	150	0	85
26 333	336	136	565																
EST	19	29	34	19	54	44	29	27	39	51	73	74	37	54	12	15	15	42	0
2 48	36	24	70																
FRR	6	33	9	27	84	26	8	12	17	28	53	13	4	81	5	4	3	22	1
0 9	1	13	12																
IRL	286	272	324	284	323	359	326	343	658	405	505	418	236	229	240	197	143	248	25
9 0	142	72	310																
KOR	113	85	380	113	158	184	197	146	248	338	177	601	230	223	75	132	135	229	14
0 93	0	62	310																
SVN	47	75	84	62	141	116	78	73	107	135	125	109	66	109	32	41	41	101	18
12 56	38	0	106																
PRT	246	320	677	309	455	515	555	449	606	714	698	859	423	518	178	254	193	452	42
12 268	251	83	0																

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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	POL	NZL	JPN	CZE	EST	FRR	IRL
KOR	SVN	PRT	ZAF																
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AUS	0	255	432	274	455	375	336	391	462	427	434	444	271	267	214	262	42	6	245
101	73	251	124																
BEL	229	0	386	333	524	398	380	480	417	472	562	396	277	198	192	280	42	36	242
92	93	291	96																
CAN	392	359	0	595	1458	736	961	1016	950	1272	796	1827	651	301	638	668	88	13	287
284	114	572	182																
CHE	230	316	439	0	639	410	420	435	483	550	518	583	309	203	236	313	42	22	248
104	85	297	100																
DEU	229	400	420	383	0	1455	1057	1653	1175	1951	1700	1824	1042	361	724	1083	124	101	387
235	172	609	175																
DFS	270	340	508	350	563	0	654	995	868	1106	1123	997	711	316	426	682	87	26	351
178	141	504	172																
ESP	248	344	500	320	454	423	0	850	724	1028	715	994	550	273	482	560	77	13	281
198	114	506	174																
FRA	250	442	496	353	450	396	521	0	898	1394	1103	1267	830	422	595	767	88	16	343
201	113	474	151																
GBR	391	406	898	461	531	576	535	479	0	1120	1016	1202	668	305	472	638	81	16	414
209	139	545	181																
ITA	315	416	807	480	861	708	701	552	821	0	1221	1705	887	379	689	892	108	30	382
274	160	657	199																
NLD	355	575	606	487	806	789	563	542	762	872	0	1173	816	398	485	883	119	70	425
181	149	579	172																
USA	388	356	1682	513	569	631	553	517	1043	1041	816	0	939	306	885	952	120	15	335
361	137	682	212																
POL	158	208	391	210	453	421	284	323	440	554	537	654	0	183	432	672	92	71	244
233	127	481	148																
NZL	224	153	252	163	199	205	214	193	244	274	354	263	103	0	155	191	27	5	229
68	43	175	88																
JPN	141	121	216	128	153	184	167	156	191	212	179	248	135	86	0	435	54	2	171
200	75	310	126																
CZE	154	199	405	210	602	382	329	365	413	556	710	631	421	121	128	0	75	25	239
217	129	457	165																
EST	19	29	34	19	53	41	29	27	36	51	69	71	45	12	15	36	0	2	39
28	24	62	26																
FRR	5	33	9	18	77	26	8	12	14	28	46	11	77	5	2	21	1	0	9
1	13	12	5																
IRL	236	242	280	250	280	298	274	278	430	351	409	342	176	197	119	189	23	9	0
76	70	237	100																
KOR	70	61	248	76	104	118	116	103	148	225	105	398	170	47	89	149	12	0	53
0	50	194	90																
SVN	46	75	84	61	141	114	79	73	105	135	124	109	99	32	36	97	18	12	56
33	0	99	48																
PRT	195	261	534	244	374	404	433	352	461	589	542	651	433	125	151	364	37	12	207
161	76	0	162																
ZAF	114	89	163	84	119	147	146	116	154	161	143	205	115	76	94	122	13	4	94
62	34	150	0																
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HOL

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	JPN	CZE	EST	IRL	SVN	
PRT																				
380	AUS	0	320	664	343	680	603	466	518	679	614	686	830	351	410	429	430	53	323	55
348	BEL	248	0	390	352	554	441	384	455	470	479	644	470	267	348	272	352	42	275	66
695	CAN	539	361	0	631	1526	894	963	844	1131	1274	920	2231	631	756	924	799	90	339	91
364	CHE	256	331	469	0	749	467	428	402	535	579	633	691	305	394	316	404	44	284	64
739	DEU	267	411	432	449	0	1703	1091	1582	1392	1989	1947	2274	782	1199	998	1326	128	469	140
635	DFS	320	368	539	388	619	0	766	1049	1113	1221	1320	1380	577	869	656	898	96	442	114
615	ESP	302	347	500	325	473	479	0	758	843	1034	807	1169	529	656	653	673	79	341	86
557	FRA	279	418	438	330	416	409	485	0	1027	1289	1201	1510	585	918	756	899	86	388	91
690	GBR	493	447	1055	514	603	678	652	534	0	1281	1290	1572	600	812	715	821	93	566	110
782	ITA	378	416	807	502	877	767	710	503	926	0	1337	2031	737	1006	888	1047	109	441	128
722	NLD	473	672	675	578	903	863	625	544	956	930	0	1675	618	964	700	1062	125	523	115
892	USA	587	383	1955	592	663	732	665	581	1262	1156	1050	0	849	1133	1392	1208	130	432	110
463	HUN	210	216	516	243	429	386	387	330	462	550	424	716	0	533	459	658	68	267	76
585	POL	205	262	450	274	550	500	381	384	534	640	637	776	377	0	553	808	105	318	114
446	JPN	178	149	259	147	182	217	210	180	237	246	219	305	173	157	0	600	66	254	65
566	CZE	214	244	483	274	733	467	431	463	531	662	812	798	545	498	150	0	85	319	110
70	EST	19	29	34	19	54	44	31	27	39	51	72	74	37	54	15	42	0	47	21
300	IRL	285	271	323	282	321	358	330	314	631	402	487	412	227	229	143	247	25	0	52
81	SVN	32	52	67	47	117	90	57	57	81	105	93	87	53	90	26	81	14	43	0
0	PRT	247	324	678	311	458	519	566	440	610	718	689	862	425	522	193	456	42	269	63

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HOL

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 common bulls below diagonal

common three quarter sib group above diagonal

	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	CZE	IRL	KOR	SVN	PRT
BEL	0	358	275	410	406	345	426	436	323	516	427	270	261	79	41	279
CAN	351	0	483	1117	798	850	814	1034	932	729	2042	648	324	228	56	557
CHE	266	359	0	488	352	327	329	415	394	431	515	279	219	83	38	266
DEU	324	351	294	0	1153	829	1168	979	1145	1333	1591	941	330	180	87	498
DFS	356	536	302	485	0	673	1045	1100	704	1086	1371	691	439	144	76	500
ESP	319	434	234	343	434	0	702	740	703	662	1041	545	303	161	60	490
FRA	411	436	265	322	409	461	0	1024	765	1005	1509	743	387	165	59	455
GBR	430	982	385	449	676	551	535	0	797	1024	1560	649	561	169	73	550
ITA	308	618	340	484	523	440	377	604	0	762	1232	665	276	213	75	508
NLD	531	572	400	646	783	503	501	762	588	0	1198	852	441	150	78	554
USA	371	1840	431	482	731	536	581	1260	778	786	0	968	431	286	71	699
CZE	197	394	190	542	374	325	355	407	432	683	621	0	245	169	70	435
IRL	263	320	210	237	358	291	314	625	275	420	412	186	0	63	34	236
KOR	54	206	62	86	98	102	87	120	181	87	315	116	46	0	29	155
SVN	36	44	28	75	63	45	40	59	66	61	58	54	29	17	0	58
PRT	255	528	222	344	400	421	351	453	470	520	652	346	204	132	45	0

HOL

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 common bulls below diagonal

common three quarter sib group above diagonal

	BEL	CHE	DEU	DFS	FRA	GBR	ITA	NLD	USA	CZE	FRR	JPN	IRL	KOR	CAN	PRT	ESP
BEL	0	338	417	261	313	453	350	587	446	248	34	147	245	91	297	194	358
CHE	324	0	568	256	291	495	456	581	644	287	35	179	239	103	452	193	390
DEU	327	354	0	766	959	984	1281	1386	1600	879	59	532	288	217	966	368	836
DFS	209	199	303	0	420	624	511	783	684	430	4	205	259	120	320	228	400
FRA	278	237	276	168	0	613	743	745	907	549	10	397	211	165	534	269	520
GBR	439	476	452	349	344	0	888	1173	1525	580	20	361	496	209	727	354	768
ITA	332	388	500	345	336	657	0	878	1403	693	22	485	274	264	880	390	775
NLD	607	547	676	499	389	885	645	0	1409	807	73	350	436	179	584	362	715
USA	378	561	485	343	353	1249	863	931	0	876	21	687	387	359	1409	462	1089
CZE	180	196	515	226	271	364	447	647	566	0	25	333	190	210	520	298	493
FRR	32	27	44	4	8	17	20	50	13	21	0	2	6	1	8	7	13
JPN	92	93	119	97	117	149	165	138	194	105	2	0	109	176	447	191	376
IRL	246	240	218	195	184	555	265	410	375	142	6	78	0	66	217	127	290
KOR	61	76	104	70	101	148	223	105	400	145	0	88	46	0	251	166	192
CAN	301	368	337	243	302	721	605	519	1403	348	7	170	231	235	0	348	653
PRT	174	157	245	170	224	279	352	313	440	234	7	107	108	134	335	0	320
ESP	330	293	333	256	331	595	472	556	603	278	8	130	285	115	366	252	0

JER

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 common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

JER

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	98	14
CAN	117	0	59	95	45	67	293	104	11
DFS	39	42	0	74	50	74	115	82	13
GBR	76	98	65	0	47	66	124	78	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	85	14
USA	189	284	80	129	64	147	0	184	24
ZAF	104	105	65	78	55	83	193	0	21
NLD	11	7	8	8	10	12	25	17	0

JER

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	ZAF	NLD	USA
AUS	0	111	61	75	38	129	98	14	201
CAN	115	0	59	95	45	67	104	11	293
DFS	38	42	0	74	50	74	82	13	115
GBR	74	98	65	0	47	66	78	10	124
ITA	36	42	47	47	0	35	55	13	60
NZL	123	69	49	66	31	0	85	14	139
ZAF	104	105	65	78	55	83	0	21	184
NLD	11	7	8	8	10	12	17	0	24
USA	188	284	80	129	64	147	193	25	0

JER

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	0	113	60	76	38	202	104	2
CAN	117	0	59	95	45	293	115	3
DFS	37	42	0	72	50	115	90	3
GBR	75	98	63	0	47	124	83	4
ITA	36	42	47	47	0	60	55	4
USA	189	284	80	129	64	0	204	7
ZAF	108	114	69	82	55	211	0	6
NLD	1	2	3	3	3	6	5	0

JER

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common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	ITA	ZAF	NLD	USA
AUS	0	74	37	30	65	9	115
CAN	72	0	59	45	90	11	293
DFS	27	42	0	50	61	13	115
ITA	27	42	47	0	49	13	60
ZAF	68	85	47	47	0	18	151
NLD	7	7	8	10	12	0	24
USA	111	284	80	64	148	25	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	0	111	60	75	38	201	104	14
CAN	115	0	59	95	45	293	115	11
DFS	37	42	0	72	50	115	90	13
GBR	74	98	63	0	47	124	83	10
ITA	36	42	47	47	0	60	55	13
USA	188	284	80	129	64	0	204	24
ZAF	108	114	69	82	55	211	0	21
NLD	11	7	8	8	10	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	60	77	38	130	202	105	14
CAN	117	0	53	95	45	67	293	115	11
DFS	38	40	0	64	50	67	108	83	13
GBR	76	98	59	0	47	65	124	82	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	44	65	31	0	139	93	14
USA	189	284	76	129	64	147	0	204	24
ZAF	109	114	67	81	55	90	211	0	21
NLD	11	7	8	8	10	12	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	0	111	60	75	38	201	104	14
CAN	115	0	59	95	45	290	115	11
DFS	37	42	0	72	50	115	90	13
GBR	74	97	63	0	47	124	83	10
ITA	36	42	47	47	0	60	55	13
USA	188	282	80	129	64	0	204	24
ZAF	108	114	69	82	55	211	0	21
NLD	11	7	8	8	10	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	ZAF	NLD
AUS	0	113	62	77	38	130	202	105	14
CAN	117	0	59	95	45	67	293	115	11
DFS	39	42	0	74	50	74	115	91	13
GBR	76	98	65	0	47	66	124	83	10
ITA	36	42	47	47	0	35	60	55	13
NZL	124	69	49	66	31	0	139	94	14
USA	189	284	80	129	64	147	0	204	24
ZAF	109	114	70	82	55	91	211	0	21
NLD	11	7	8	8	10	12	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	USA	ZAF	NLD
AUS	0	111	60	75	38	201	97	14
CAN	115	0	59	95	45	293	104	11
DFS	37	42	0	72	50	115	81	13
GBR	74	98	63	0	47	124	78	10
ITA	36	42	47	47	0	60	55	13
USA	188	284	80	129	64	0	184	24
ZAF	103	105	64	78	55	193	0	21
NLD	11	7	8	8	10	25	17	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	NZL	ZAF	NLD	USA
AUS	0	70	33	76	64	9	106
CAN	66	0	48	67	101	11	293
DFS	21	37	0	60	73	13	101
NZL	66	69	40	0	80	14	139
ZAF	68	99	57	74	0	21	179
NLD	7	7	8	12	17	0	24
USA	101	284	71	147	180	25	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	GBR	ITA	NZL	USA	NLD
AUS	0	113	62	33	38	130	202	14
CAN	117	0	59	37	45	67	293	11
DFS	39	42	0	29	50	74	115	13
GBR	37	43	27	0	14	34	37	4
ITA	36	42	47	15	0	35	60	13
NZL	124	69	49	38	31	0	139	14
USA	189	284	80	40	64	147	0	24
NLD	11	7	8	5	10	12	25	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DFS GBR NZL USA NLD

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AUS	0	113	60	77	130	202	14
CAN	117	0	53	95	67	290	11
DFS	38	40	0	64	67	108	13
GBR	76	97	59	0	64	124	10
NZL	124	69	44	64	0	139	14
USA	189	282	76	129	147	0	24
NLD	11	7	8	8	12	25	0

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JER

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common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DFS GBR ITA USA NLD

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AUS	0	111	60	75	38	200	14
CAN	115	0	59	95	45	293	11
DFS	37	42	0	72	50	115	13
GBR	74	97	63	0	47	124	10
ITA	36	42	47	47	0	60	13
USA	187	284	80	129	64	0	24
NLD	11	7	8	8	10	25	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DEU DFS GBR NOR NZL USA NLD

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AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	76	49	52	20
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	55	0	0	8	0	15
NZL	17	27	3	47	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	6	20	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DEU DFS GBR NZL USA NLD

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AUS	0	22	9	38	7	17	11	6
CAN	21	0	6	85	50	29	115	2
DEU	8	6	0	29	0	3	0	5
DFS	28	80	19	0	31	47	52	18
GBR	6	49	0	29	0	19	37	0
NZL	17	27	3	45	16	0	18	2
USA	11	106	0	48	34	17	0	1
NLD	6	2	4	18	0	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	6	17	11	6
CAN	21	0	6	85	50	0	29	113	2
DEU	8	6	0	29	0	3	3	0	6
DFS	28	80	19	0	31	41	47	52	18
GBR	6	49	0	29	0	0	19	36	0
NOR	5	0	2	24	0	0	2	0	11
NZL	17	27	3	45	16	2	0	18	2
USA	11	105	0	48	33	0	17	0	1
NLD	6	2	5	18	0	10	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	USA	NLD
AUS	0	22	9	38	7	11	6
CAN	21	0	6	85	50	115	2
DEU	8	6	0	29	0	0	5
DFS	28	80	19	0	31	52	17
GBR	6	49	0	29	0	37	0
USA	11	106	0	48	34	0	1
NLD	6	2	4	17	0	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	84	46	52	19
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	61	0	0	8	0	15
NZL	17	27	3	42	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	6	19	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NZL	USA	NLD
AUS	0	22	9	38	7	17	11	6
CAN	21	0	6	85	50	29	115	2
DEU	8	6	0	29	0	3	0	7
DFS	28	80	19	0	31	47	52	19
GBR	6	49	0	29	0	19	37	0
NZL	17	27	3	45	16	0	18	2
USA	11	106	0	48	34	17	0	1
NLD	6	2	6	19	0	2	1	0

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RDC

-----  
common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	87	49	52	20
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	63	0	0	8	0	15
NZL	17	27	3	47	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	6	20	0	14	2	1	0

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RDC

-----  
common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	NOR	NLD	USA
AUS	0	11	9	26	14	6	4
CAN	11	0	6	84	3	2	115
DEU	8	6	0	29	8	5	0
DFS	19	79	19	0	84	17	52
NOR	11	3	7	61	0	15	0
NLD	6	2	4	17	14	0	1
USA	4	106	0	48	0	1	0

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RDC

-----  
common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	0	22	6	38	7	16	11	6
CAN	21	0	3	85	50	3	115	2
DEU	5	3	0	16	0	6	0	5
DFS	28	80	10	0	31	84	52	18
GBR	6	49	0	29	0	0	37	0
NOR	12	3	5	61	0	0	0	15
USA	11	106	0	48	34	0	0	1
NLD	6	2	4	18	0	14	1	0

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RDC

-----  
common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	5
DFS	28	80	19	0	31	87	49	52	18
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	63	0	0	8	0	15
NZL	17	27	3	47	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	4	18	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	6
DFS	28	80	19	0	31	84	47	52	18
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	61	0	0	8	0	15
NZL	17	27	3	44	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	5	18	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	77	49	52	20
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	56	0	0	8	0	15
NZL	17	27	3	47	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	6	20	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	0	22	9	38	7	16	11	6
CAN	21	0	6	85	50	3	112	2
DEU	8	6	0	29	0	8	0	7
DFS	28	80	19	0	31	87	52	20
GBR	6	49	0	29	0	0	37	0
NOR	12	3	7	63	0	0	0	15
USA	11	105	0	48	34	0	0	1
NLD	6	2	6	20	0	14	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	50	3	29	115	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	84	47	52	19
GBR	6	49	0	29	0	0	19	37	0
NOR	12	3	7	61	0	0	8	0	15
NZL	17	27	3	45	16	7	0	18	2
USA	11	106	0	48	34	0	17	0	1
NLD	6	2	6	19	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD
AUS	0	22	9	38	7	16	11	6
CAN	21	0	6	85	50	3	113	2
DEU	8	6	0	29	0	8	0	7
DFS	28	80	19	0	31	81	52	20
GBR	6	49	0	29	0	0	36	0
NOR	12	3	7	58	0	0	0	15
USA	11	105	0	48	33	0	0	1
NLD	6	2	6	20	0	14	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	NOR	NZL	NLD	USA
AUS	0	8	8	22	12	7	6	3
CAN	8	0	5	79	3	29	2	115
DEU	7	5	0	22	8	3	5	0
DFS	16	73	16	0	76	41	17	47
NOR	9	3	7	56	0	8	15	0
NZL	7	27	3	41	7	0	1	18
NLD	6	2	4	17	14	1	0	1
USA	3	106	0	44	0	17	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	47	3	29	115	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	86	48	52	20
GBR	6	46	0	29	0	0	16	35	0
NOR	12	3	7	63	0	0	8	0	15
NZL	17	27	3	46	13	7	0	18	2
USA	11	106	0	48	32	0	17	0	1
NLD	6	2	6	20	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD
AUS	0	22	9	38	7	16	17	11	6
CAN	21	0	6	85	47	3	29	112	2
DEU	8	6	0	29	0	8	3	0	7
DFS	28	80	19	0	31	87	49	52	20
GBR	6	46	0	29	0	0	16	35	0
NOR	12	3	7	63	0	0	8	0	15
NZL	17	27	3	47	13	7	0	18	2
USA	11	105	0	48	32	0	17	0	1
NLD	6	2	6	20	0	14	2	1	0

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DEU DFS GBR NOR USA NLD

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AUS	0	22	9	38	7	16	11	6
CAN	21	0	6	85	47	3	115	2
DEU	8	6	0	29	0	8	0	7
DFS	28	80	19	0	31	87	52	20
GBR	6	46	0	29	0	0	35	0
NOR	12	3	7	63	0	0	0	15
USA	11	106	0	48	32	0	0	1
NLD	6	2	6	20	0	14	1	0

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