

## APPENDIX II. Number of common bulls

## BSW dce

common bulls below diagonal					
common three quarter sib group above diagonal					
	DEA	NLD	USA	CHE	CAN
DEA	0	60	145	474	59
NLD	46	0	23	41	15
USA	100	20	0	171	67
CHE	374	36	135	0	65
CAN	47	12	57	49	0

## BSW mce

common bulls below diagonal					
common three quarter sib group above diagonal					
	DEA	NLD	USA	CHE	CAN
DEA	0	54	87	386	22
NLD	45	0	23	33	8
USA	74	20	0	80	20
CHE	290	28	72	0	21
CAN	18	5	18	17	0

## HOL dce

common bulls below diagonal															
common three quarter sib group above diagonal															
	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	CHR	DEU	BEL	IRL
AUS	0	378	171	372	345	29	384	354	438	203	240	87	367	154	226
CAN	318	0	369	973	908	42	1278	780	2186	429	674	183	1508	240	326
CHE	143	263	0	307	309	15	334	292	376	166	221	175	436	176	203
DFS	277	662	269	0	1128	63	1278	1349	1493	574	654	149	1719	289	444
FRA	255	548	265	493	0	53	1352	1168	1608	621	677	141	1480	309	399
ISR	20	27	10	47	26	0	57	68	63	29	46	6	58	18	38
ITA	271	714	257	707	611	37	0	1215	2133	627	791	174	1801	290	421
NLD	236	448	235	802	465	55	604	0	1537	601	636	196	1753	312	483
USA	331	1901	281	861	700	45	982	801	0	694	938	223	2204	268	439
GBR	151	245	133	241	210	11	256	223	302	0	367	86	697	180	288
HUN	195	599	172	481	493	35	658	430	900	206	0	109	886	208	282
CHR	69	148	179	123	130	4	145	168	192	77	91	0	291	104	103
DEU	285	851	349	994	603	43	850	1043	1148	268	678	242	0	352	502
BEL	143	228	165	259	292	11	248	297	228	139	175	102	325	0	207
IRL	202	304	198	381	327	26	340	398	395	233	261	98	452	202	0

## HOL mce

common bulls below diagonal													
common three quarter sib group above diagonal													
	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	CHR	DEU	BEL
CAN	0	264	746	703	43	930	599	1495	359	569	179	1336	152
CHE	176	0	243	224	13	238	234	266	178	163	161	335	98
DFS	499	196	0	1112	68	1084	1270	1245	436	607	157	1849	174
FRA	392	196	407	0	61	1176	1154	1414	386	621	131	1593	192
ISR	29	7	47	27	0	62	75	74	41	52	6	78	8
ITA	576	188	597	464	39	0	1035	1583	423	677	168	1614	174
NLD	444	202	775	453	60	573	0	1289	432	583	213	1876	209
USA	1211	204	724	549	50	838	759	0	469	837	207	2043	176
GBR	372	180	411	349	28	441	447	505	0	312	92	479	106
HUN	514	121	440	397	35	548	413	789	308	0	102	865	127
CHR	144	164	120	116	3	134	178	170	81	77	0	310	77
DEU	678	255	887	565	54	778	1162	987	490	632	252	0	235
BEL	132	82	137	173	3	122	194	130	101	100	69	173	0

## HOL dsb

common bulls below diagonal												
common three quarter sib group above diagonal												
	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	CHR	DEU
AUS	0	252	120	258	191	14	266	264	290	156	57	244
CAN	169	0	367	937	768	37	1220	903	1906	670	183	1493
CHE	85	263	0	312	294	15	334	336	352	221	175	436
DFS	143	693	278	0	981	64	1302	1480	1394	674	150	1757
FRA	113	492	252	456	0	41	1148	1058	1209	643	139	1387
ISR	7	26	10	48	24	0	56	68	58	45	6	57
ITA	128	711	257	731	512	36	0	1313	1948	789	174	1799
NLD	163	743	316	1092	578	58	827	0	1493	701	233	1973
USA	161	1699	261	856	506	43	905	1001	0	884	192	2024
HUN	93	598	172	511	479	35	657	553	852	0	109	884
CHR	42	148	179	126	128	4	145	213	163	91	0	291
DEU	141	857	349	1038	572	42	851	1399	1047	681	243	0

HOL msb

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common bulls below diagonal

common three quarter sib group above diagonal

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	CHR	DEU
CAN	0	261	727	632	42	908	643	1300	565	179	1305
CHE	176	0	247	212	13	238	246	241	163	161	335
DFS	507	198	0	1010	70	1088	1312	1029	609	158	1858
FRA	367	181	391	0	56	1059	1065	1032	595	128	1478
ISR	29	7	47	25	0	62	74	66	52	6	78
ITA	573	188	605	417	39	0	1075	1292	675	168	1603
NLD	500	215	848	443	59	620	0	1104	602	234	1925
USA	1123	191	709	435	48	798	729	0	758	183	1675
HUN	513	121	445	388	35	547	440	764	0	102	861
CHR	144	164	121	115	3	134	199	153	77	0	309
DEU	655	254	893	510	54	764	1225	879	624	250	0

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RDC dce

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common bulls below diagonal

common three quarter sib group above diagonal

	CAN	DFS	NOR	NLD	DEU
CAN	0	90	3	3	6
DFS	88	0	74	22	46
NOR	3	57	0	15	16
NLD	3	22	15	0	10
DEU	6	41	16	10	0

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RDC mce

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common bulls below diagonal

common three quarter sib group above diagonal

	CAN	DFS	NOR	DEU
CAN	0	65	3	6
DFS	60	0	89	32
NOR	3	71	0	9
DEU	6	25	9	0