

Supplemental Appendix for:  
Modelling Stock Dependence using Factor Copulas

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**Online Appendix**

**A Posterior estimation for simulated data**

	True value	Estimation	Bias	SE	2.5%	50%	97.5%	T/F	Group
$a_1$	0.078	0.073	0.004	0.009	0.057	0.073	0.092	0	1
$a_2$	0.081	0.098	0.017	0.014	0.071	0.097	0.127	0	2
$a_3$	0.065	0.063	0.003	0.017	0.035	0.061	0.100	0	3
$a_4$	0.090	0.080	0.010	0.011	0.059	0.080	0.102	0	4
$a_5$	0.052	0.046	0.006	0.010	0.028	0.046	0.066	0	5
$a_6$	0.051	0.057	0.006	0.013	0.033	0.056	0.085	0	6
$a_7$	0.071	0.059	0.013	0.009	0.041	0.058	0.078	0	7
$a_8$	0.056	0.061	0.005	0.011	0.040	0.060	0.084	0	8
$a_9$	0.068	0.082	0.014	0.012	0.061	0.081	0.104	0	9
$a_{10}$	0.087	0.072	0.015	0.023	0.035	0.069	0.128	0	10
$b_1$	0.981	0.983	0.002	0.004	0.974	0.984	0.991	0	1
$b_2$	0.955	0.956	0.001	0.011	0.933	0.957	0.972	0	2
$b_3$	0.979	0.976	0.003	0.015	0.940	0.980	0.994	0	3
$b_4$	0.972	0.972	0.000	0.008	0.955	0.973	0.985	0	4
$b_5$	0.979	0.966	0.012	0.012	0.938	0.968	0.983	0	5
$b_6$	0.960	0.957	0.003	0.017	0.914	0.960	0.981	0	6
$b_7$	0.979	0.981	0.002	0.006	0.967	0.982	0.991	0	7
$b_8$	0.984	0.982	0.002	0.007	0.965	0.983	0.993	0	8
$b_9$	0.981	0.964	0.017	0.010	0.941	0.965	0.980	1	9
$b_{10}$	0.965	0.949	0.016	0.048	0.835	0.961	0.990	0	10
$\nu_1$	13.000	12.360	0.640	0.952	10.768	12.239	14.510	0	1
$\nu_2$	17.000	15.166	1.834	1.228	13.132	15.056	17.800	0	2
$\nu_3$	8.000	7.804	0.196	0.748	6.544	7.734	9.505	0	3
$\nu_4$	10.000	10.812	0.812	0.689	9.601	10.758	12.292	0	4
$\nu_5$	17.000	19.036	2.036	1.720	15.944	18.881	22.953	0	5
$\nu_6$	10.000	9.617	0.383	0.593	8.484	9.566	10.880	0	6

$\nu_7$	8.000	7.663	0.337	0.342	7.055	7.648	8.377	0	7
$\nu_8$	10.000	10.306	0.306	0.665	9.135	10.254	11.713	0	8
$\nu_9$	15.000	14.074	0.926	1.024	12.252	14.044	16.124	0	9
$\nu_{10}$	7.000	7.313	0.313	0.509	6.401	7.290	8.423	0	10
$\gamma_1$	-0.561	-0.534	0.027	0.038	-0.613	-0.532	-0.467	0	1
$\gamma_2$	-0.498	-0.489	0.009	0.039	-0.568	-0.489	-0.412	0	2
$\gamma_3$	-0.128	-0.136	0.008	0.028	-0.195	-0.136	-0.083	0	3
$\gamma_4$	-0.162	-0.202	0.040	0.022	-0.248	-0.201	-0.160	0	4
$\gamma_5$	-0.463	-0.477	0.014	0.039	-0.558	-0.476	-0.403	0	5
$\gamma_6$	-0.255	-0.264	0.009	0.024	-0.315	-0.263	-0.216	0	6
$\gamma_7$	-0.495	-0.471	0.024	0.022	-0.514	-0.470	-0.431	0	7
$\gamma_8$	-0.909	-0.912	0.003	0.048	-1.009	-0.907	-0.823	0	8
$\gamma_9$	-0.036	-0.064	0.028	0.024	-0.116	-0.064	-0.020	0	9
$\gamma_{10}$	-0.576	-0.620	0.044	0.045	-0.711	-0.618	-0.531	0	10
$f_{1,0}$	1.184	1.161	0.023	0.112	0.947	1.153	1.388	0	7
$f_{2,0}$	2.878	2.753	0.124	0.084	2.598	2.750	2.922	0	5
$f_{3,0}$	1.567	1.544	0.023	0.117	1.320	1.542	1.782	0	7
$f_{4,0}$	1.355	1.327	0.028	0.110	1.110	1.325	1.535	0	7
$f_{5,0}$	1.523	1.414	0.109	0.123	1.165	1.416	1.655	0	3
$f_{6,0}$	0.752	0.663	0.089	0.095	0.472	0.666	0.836	0	10
$f_{7,0}$	0.584	0.794	0.210	0.100	0.589	0.794	0.989	1	9
$f_{8,0}$	1.635	1.467	0.168	0.101	1.268	1.465	1.660	0	9
$f_{9,0}$	1.452	1.306	0.146	0.116	1.080	1.307	1.539	0	3
$f_{10,0}$	0.748	0.643	0.105	0.096	0.448	0.647	0.824	0	10
$f_{11,0}$	0.608	0.539	0.070	0.087	0.373	0.537	0.714	0	5
$f_{12,0}$	2.229	2.180	0.048	0.098	1.986	2.180	2.371	0	2
$f_{13,0}$	1.471	1.420	0.051	0.082	1.255	1.419	1.581	0	5
$f_{14,0}$	0.270	0.278	0.008	0.111	0.066	0.277	0.495	0	4
$f_{15,0}$	0.864	0.413	0.451	0.119	0.177	0.411	0.636	1	8
$f_{16,0}$	1.211	1.155	0.056	0.096	0.975	1.153	1.349	0	10
$f_{17,0}$	1.227	1.090	0.138	0.115	0.862	1.092	1.306	0	3
$f_{18,0}$	1.180	1.126	0.054	0.085	0.966	1.125	1.295	0	6
$f_{19,0}$	2.927	3.162	0.235	0.087	2.990	3.163	3.336	1	5
$f_{20,0}$	1.611	1.568	0.043	0.095	1.376	1.569	1.748	0	2
$f_{21,0}$	1.551	1.479	0.072	0.098	1.295	1.479	1.663	0	2
$f_{22,0}$	1.113	1.101	0.012	0.100	0.895	1.103	1.288	0	9
$f_{23,0}$	1.272	1.150	0.122	0.101	0.957	1.149	1.354	0	9
$f_{24,0}$	1.615	1.569	0.046	0.083	1.411	1.568	1.740	0	5
$f_{25,0}$	2.057	1.959	0.099	0.081	1.798	1.958	2.122	0	5
$f_{26,0}$	0.685	0.719	0.034	0.122	0.479	0.722	0.965	0	8
$f_{27,0}$	1.530	1.661	0.132	0.086	1.499	1.662	1.821	0	6
$f_{28,0}$	2.642	2.542	0.100	0.134	2.267	2.546	2.797	0	1
$f_{29,0}$	0.683	0.656	0.027	0.085	0.490	0.658	0.817	0	5
$f_{30,0}$	1.028	0.965	0.062	0.103	0.769	0.966	1.173	0	9
$f_{31,0}$	2.217	2.177	0.040	0.101	1.980	2.180	2.375	0	2
$f_{32,0}$	2.010	2.078	0.068	0.127	1.837	2.078	2.354	0	8
$f_{33,0}$	0.993	1.136	0.142	0.082	0.982	1.135	1.309	0	5
$f_{34,0}$	1.883	1.698	0.185	0.096	1.504	1.700	1.891	0	10

$f_{35,0}$	1.753	1.660	0.093	0.113	1.437	1.661	1.893	0	4
$f_{36,0}$	0.316	0.296	0.020	0.106	0.083	0.298	0.503	0	9
$f_{37,0}$	0.668	0.544	0.124	0.083	0.373	0.541	0.710	0	6
$f_{38,0}$	1.787	1.672	0.115	0.100	1.470	1.670	1.875	0	9
$f_{39,0}$	0.455	0.338	0.117	0.085	0.170	0.337	0.505	0	6
$f_{40,0}$	1.525	1.542	0.017	0.082	1.382	1.541	1.705	0	6
$f_{41,0}$	1.519	1.328	0.192	0.081	1.165	1.326	1.490	1	5
$f_{42,0}$	1.052	0.912	0.141	0.114	0.694	0.915	1.135	0	8
$f_{43,0}$	0.973	0.851	0.122	0.115	0.620	0.851	1.073	0	3
$f_{44,0}$	0.414	0.401	0.014	0.084	0.232	0.399	0.560	0	6
$f_{45,0}$	1.938	2.016	0.078	0.117	1.788	2.015	2.246	0	7
$f_{46,0}$	0.314	0.155	0.160	0.085	-0.022	0.158	0.315	0	6
$f_{47,0}$	0.225	0.100	0.125	0.130	-0.164	0.102	0.346	0	8
$f_{48,0}$	0.323	0.233	0.090	0.112	0.024	0.230	0.462	0	4
$f_{49,0}$	0.950	0.904	0.046	0.082	0.734	0.905	1.059	0	6
$f_{50,0}$	1.020	1.088	0.068	0.109	0.874	1.090	1.299	0	7
$f_{51,0}$	1.179	1.260	0.081	0.099	1.063	1.260	1.456	0	9
$f_{52,0}$	2.454	2.522	0.068	0.096	2.344	2.520	2.715	0	9
$f_{53,0}$	0.672	0.651	0.021	0.111	0.433	0.647	0.869	0	4
$f_{54,0}$	1.324	1.491	0.167	0.122	1.252	1.486	1.739	0	8
$f_{55,0}$	0.832	0.935	0.104	0.085	0.769	0.933	1.100	0	6
$f_{56,0}$	2.039	2.237	0.198	0.125	1.995	2.239	2.485	0	8
$f_{57,0}$	2.047	1.751	0.296	0.110	1.532	1.750	1.953	1	4
$f_{58,0}$	1.803	1.702	0.101	0.112	1.489	1.699	1.932	0	4
$f_{59,0}$	0.251	0.252	0.001	0.132	-0.012	0.253	0.511	0	1
$f_{60,0}$	1.202	1.338	0.136	0.081	1.181	1.338	1.500	0	5
$f_{61,0}$	1.432	1.365	0.067	0.125	1.124	1.362	1.615	0	1
$f_{62,0}$	0.351	0.184	0.167	0.100	-0.007	0.186	0.377	0	2
$f_{63,0}$	1.481	1.398	0.082	0.131	1.156	1.394	1.651	0	1
$f_{64,0}$	0.391	0.757	0.366	0.134	0.481	0.761	1.012	1	1
$f_{65,0}$	2.924	2.881	0.043	0.085	2.725	2.879	3.046	0	6
$f_{66,0}$	1.416	1.487	0.071	0.108	1.273	1.484	1.695	0	4
$f_{67,0}$	0.859	0.736	0.123	0.098	0.550	0.735	0.929	0	2
$f_{68,0}$	0.527	0.666	0.139	0.110	0.450	0.668	0.889	0	7
$f_{69,0}$	1.802	1.514	0.288	0.135	1.257	1.514	1.788	1	1
$f_{70,0}$	0.592	0.651	0.060	0.082	0.494	0.653	0.817	0	6
$f_{71,0}$	1.231	1.261	0.031	0.135	0.998	1.263	1.527	0	1
$f_{72,0}$	1.762	1.656	0.107	0.102	1.446	1.654	1.856	0	9
$f_{73,0}$	0.664	0.762	0.098	0.112	0.544	0.763	0.979	0	7
$f_{74,0}$	1.874	1.899	0.025	0.096	1.702	1.901	2.080	0	10
$f_{75,0}$	2.379	2.303	0.076	0.081	2.145	2.304	2.462	0	5
$f_{76,0}$	0.406	0.319	0.087	0.110	0.106	0.320	0.535	0	4
$f_{77,0}$	1.785	1.718	0.067	0.113	1.493	1.717	1.936	0	7
$f_{78,0}$	0.337	0.414	0.077	0.115	0.188	0.411	0.654	0	7
$f_{79,0}$	2.123	2.002	0.121	0.111	1.801	1.999	2.218	0	4
$f_{80,0}$	0.630	0.650	0.020	0.121	0.399	0.656	0.869	0	3
$f_{81,0}$	0.647	0.616	0.031	0.098	0.420	0.613	0.805	0	9
$f_{82,0}$	0.378	0.207	0.171	0.133	-0.075	0.210	0.455	0	1

$f_{83,0}$	1.208	1.143	0.065	0.137	0.870	1.149	1.404	0	1
$f_{84,0}$	1.591	1.628	0.037	0.105	1.437	1.626	1.826	0	2
$f_{85,0}$	1.056	1.138	0.082	0.083	0.985	1.137	1.312	0	5
$f_{86,0}$	1.198	1.222	0.025	0.135	0.958	1.218	1.491	0	1
$f_{87,0}$	0.233	0.344	0.112	0.115	0.128	0.344	0.568	0	4
$f_{88,0}$	0.501	0.480	0.021	0.102	0.302	0.476	0.688	0	10
$f_{89,0}$	1.787	1.894	0.107	0.116	1.658	1.897	2.116	0	7
$f_{90,0}$	1.047	1.162	0.114	0.098	0.964	1.161	1.345	0	2
$f_{91,0}$	0.305	0.233	0.071	0.110	0.017	0.232	0.443	0	7
$f_{92,0}$	0.247	0.275	0.028	0.098	0.076	0.275	0.470	0	2
$f_{93,0}$	1.532	1.488	0.044	0.139	1.219	1.486	1.767	0	1
$f_{94,0}$	0.285	0.325	0.040	0.125	0.058	0.331	0.562	0	8
$f_{95,0}$	2.927	2.897	0.030	0.104	2.686	2.901	3.097	0	9
$f_{96,0}$	0.211	0.273	0.062	0.103	0.072	0.274	0.488	0	2
$f_{97,0}$	0.966	1.111	0.146	0.115	0.891	1.113	1.339	0	4
$f_{98,0}$	1.518	1.499	0.019	0.101	1.304	1.500	1.699	0	9
$f_{99,0}$	0.317	0.255	0.062	0.120	0.036	0.255	0.501	0	8
$f_{100,0}$	2.628	2.464	0.164	0.121	2.239	2.461	2.703	0	7

## B The number of assets in each group sector

Table 2: Stock Groups

Group	SIC code	Industry	Number of Firms
1	1000 - 1999	Mining and Construction	5
2	2000 - 2099	Food and Beverage	6
3	2830 - 2839	Pharmacy	5
4	2800 - 2899	Plastic Material and Plant Chemical	8
5	2100 - 2999	Textile and Papers	12
6	3000 - 3599	Steels	13
7	3600 - 3799	Home Appliance and Automobile	14
8	3800 - 3999	Electronics	12
9	4000 - 4799	Transportation	12
10	4800 - 4899	Telecommunication	7
11	4900 - 5999	Retail and Distribution	8
12	6300 - 6399	Insurance Firms	14
13	6000 - 6999	Finance (not include Insurance)	17
14	7000 - 8999	Services and Others	17

## C Posterior estimation for multiple-group factor copula models

	Gaussian Cop.		Student Cop.		MGSt Cop.	
	Est.	Se.	Est.	Se.	Est.	Se.
$a_1$	0.031	(0.005)	0.035	(0.006)	0.034	(0.006)
$a_2$	0.042	(0.009)	0.045	(0.009)	0.045	(0.009)

$a_3$	0.096	(0.022)	0.079	(0.031)	0.049	(0.019)
$a_4$	0.043	(0.008)	0.037	(0.007)	0.037	(0.007)
$a_5$	0.057	(0.010)	0.043	(0.006)	0.045	(0.006)
$a_6$	0.031	(0.003)	0.032	(0.003)	0.033	(0.003)
$a_7$	0.083	(0.014)	0.041	(0.009)	0.038	(0.012)
$a_8$	0.140	(0.015)	0.135	(0.017)	0.132	(0.017)
$a_9$	0.050	(0.007)	0.042	(0.007)	0.042	(0.007)
$a_{10}$	0.103	(0.019)	0.061	(0.014)	0.065	(0.017)
$a_{11}$	0.023	(0.004)	0.023	(0.003)	0.023	(0.004)
$a_{12}$	0.066	(0.014)	0.052	(0.007)	0.054	(0.007)
$a_{13}$	0.140	(0.013)	0.051	(0.008)	0.052	(0.009)
$a_{14}$	0.030	(0.003)	0.034	(0.004)	0.034	(0.003)
$b_1$	0.996	(0.002)	0.996	(0.002)	0.996	(0.002)
$b_2$	0.989	(0.006)	0.989	(0.006)	0.991	(0.005)
$b_3$	0.897	(0.065)	0.902	(0.146)	0.976	(0.023)
$b_4$	0.981	(0.008)	0.988	(0.005)	0.989	(0.005)
$b_5$	0.972	(0.011)	0.986	(0.004)	0.985	(0.004)
$b_6$	0.993	(0.001)	0.995	(0.001)	0.995	(0.001)
$b_7$	0.851	(0.043)	0.960	(0.017)	0.957	(0.036)
$b_8$	0.611	(0.053)	0.585	(0.064)	0.597	(0.060)
$b_9$	0.968	(0.008)	0.978	(0.007)	0.974	(0.008)
$b_{10}$	0.910	(0.029)	0.973	(0.014)	0.969	(0.019)
$b_{11}$	0.993	(0.004)	0.997	(0.002)	0.997	(0.002)
$b_{12}$	0.936	(0.028)	0.972	(0.008)	0.971	(0.007)
$b_{13}$	0.857	(0.022)	0.984	(0.006)	0.982	(0.007)
$b_{14}$	0.990	(0.002)	0.991	(0.002)	0.991	(0.002)
$\nu_1$			12.562	(1.215)	12.971	(1.389)
$\nu_2$			13.103	(1.207)	14.069	(1.554)
$\nu_3$			7.766	(0.596)	35.857	(5.343)
$\nu_4$			14.271	(1.041)	15.368	(1.504)
$\nu_5$			14.916	(0.906)	15.248	(1.062)
$\nu_6$			17.733	(1.005)	17.982	(1.104)
$\nu_7$			15.883	(0.804)	17.012	(1.036)
$\nu_8$			17.344	(1.106)	17.560	(1.133)
$\nu_9$			9.287	(0.388)	10.220	(1.028)
$\nu_{10}$			8.134	(0.470)	8.121	(0.515)
$\nu_{11}$			21.253	(1.963)	21.196	(1.885)
$\nu_{12}$			9.792	(0.375)	9.845	(0.402)
$\nu_{13}$			9.483	(0.356)	9.405	(0.345)
$\nu_{14}$			20.681	(1.013)	21.333	(1.151)
$\gamma_1$					-0.109	(0.075)
$\gamma_2$					-0.237	(0.075)
$\gamma_3$					-1.689	(0.163)
$\gamma_4$					-0.202	(0.073)
$\gamma_5$					-0.146	(0.044)
$\gamma_6$					-0.173	(0.048)
$\gamma_7$					-0.242	(0.043)
$\gamma_8$					-0.195	(0.043)

$\gamma_9$					-0.214	(0.089)
$\gamma_{10}$					-0.075	(0.035)
$\gamma_{11}$					-0.208	(0.055)
$\gamma_{12}$					-0.109	(0.037)
$\gamma_{13}$					-0.036	(0.029)
$\gamma_{14}$					-0.318	(0.040)
$f_{1,0}$	1.809	(0.089)	1.849	(0.094)	1.831	(0.102)
$f_{2,0}$	2.075	(0.060)	2.197	(0.074)	2.205	(0.074)
$f_{3,0}$	1.922	(0.045)	2.016	(0.051)	1.991	(0.050)
$f_{4,0}$	1.641	(0.109)	1.673	(0.132)	1.665	(0.135)
$f_{5,0}$	1.188	(0.062)	1.261	(0.072)	1.266	(0.110)
$f_{6,0}$	1.239	(0.076)	1.302	(0.088)	1.286	(0.092)
$f_{7,0}$	0.959	(0.069)	1.000	(0.075)	0.987	(0.070)
$f_{8,0}$	1.804	(0.060)	1.849	(0.076)	1.844	(0.075)
$f_{9,0}$	2.436	(0.055)	2.520	(0.101)	2.518	(0.095)
$f_{10,0}$	2.144	(0.050)	2.229	(0.059)	2.199	(0.063)
$f_{11,0}$	1.298	(0.062)	1.375	(0.069)	1.432	(0.093)
$f_{12,0}$	1.884	(0.050)	2.012	(0.061)	2.013	(0.060)
$f_{13,0}$	1.235	(0.063)	1.302	(0.075)	1.294	(0.072)
$f_{14,0}$	1.350	(0.058)	1.452	(0.107)	1.442	(0.097)
$f_{15,0}$	1.249	(0.108)	1.333	(0.133)	1.326	(0.141)
$f_{16,0}$	1.476	(0.113)	1.493	(0.125)	1.479	(0.131)
$f_{17,0}$	1.718	(0.061)	1.797	(0.073)	1.793	(0.075)
$f_{18,0}$	1.416	(0.061)	1.472	(0.088)	1.454	(0.082)
$f_{19,0}$	2.152	(0.085)	2.244	(0.102)	2.230	(0.099)
$f_{20,0}$	1.349	(0.055)	1.399	(0.061)	1.396	(0.062)
$f_{21,0}$	1.407	(0.108)	1.464	(0.134)	1.469	(0.129)
$f_{22,0}$	1.656	(0.108)	1.730	(0.131)	1.718	(0.131)
$f_{23,0}$	1.458	(0.050)	1.508	(0.051)	1.497	(0.051)
$f_{24,0}$	1.298	(0.087)	1.311	(0.095)	1.304	(0.100)
$f_{25,0}$	1.769	(0.051)	1.826	(0.059)	1.810	(0.060)
$f_{26,0}$	1.843	(0.050)	1.883	(0.057)	1.878	(0.062)
$f_{27,0}$	1.905	(0.084)	2.014	(0.098)	2.025	(0.097)
$f_{28,0}$	1.632	(0.068)	1.732	(0.076)	1.709	(0.067)
$f_{29,0}$	1.843	(0.105)	1.953	(0.129)	1.933	(0.130)
$f_{30,0}$	1.789	(0.056)	1.798	(0.095)	1.771	(0.089)
$f_{31,0}$	1.316	(0.061)	1.389	(0.067)	1.433	(0.099)
$f_{32,0}$	1.472	(0.082)	1.566	(0.098)	1.577	(0.096)
$f_{33,0}$	1.831	(0.060)	1.972	(0.075)	1.958	(0.075)
$f_{34,0}$	1.292	(0.078)	1.359	(0.097)	1.356	(0.100)
$f_{35,0}$	1.341	(0.063)	1.430	(0.073)	1.421	(0.071)
$f_{36,0}$	2.230	(0.055)	2.368	(0.073)	2.379	(0.075)
$f_{37,0}$	1.905	(0.053)	2.022	(0.097)	2.023	(0.085)
$f_{38,0}$	1.355	(0.086)	1.422	(0.096)	1.441	(0.094)
$f_{39,0}$	1.619	(0.060)	1.691	(0.084)	1.670	(0.081)
$f_{40,0}$	1.755	(0.058)	1.863	(0.103)	1.858	(0.092)
$f_{41,0}$	1.726	(0.078)	1.795	(0.095)	1.799	(0.094)
$f_{42,0}$	1.843	(0.069)	1.995	(0.075)	1.983	(0.073)

$f_{43,0}$	1.350	(0.141)	1.330	(0.160)	1.327	(0.162)
$f_{44,0}$	2.265	(0.046)	2.354	(0.046)	2.330	(0.049)
$f_{45,0}$	1.270	(0.086)	1.316	(0.097)	1.312	(0.096)
$f_{46,0}$	1.636	(0.106)	1.719	(0.139)	1.710	(0.134)
$f_{47,0}$	1.120	(0.068)	1.172	(0.074)	1.151	(0.075)
$f_{48,0}$	1.973	(0.048)	2.008	(0.048)	1.998	(0.048)
$f_{49,0}$	1.225	(0.157)	1.283	(0.178)	1.265	(0.178)
$f_{50,0}$	1.169	(0.101)	1.234	(0.118)	1.222	(0.123)
$f_{51,0}$	1.910	(0.078)	1.967	(0.099)	1.969	(0.095)
$f_{52,0}$	1.806	(0.086)	1.847	(0.095)	1.837	(0.097)
$f_{53,0}$	1.776	(0.078)	1.845	(0.097)	1.832	(0.098)
$f_{54,0}$	2.084	(0.049)	2.122	(0.060)	2.139	(0.061)
$f_{55,0}$	1.707	(0.065)	1.772	(0.075)	1.753	(0.070)
$f_{56,0}$	1.849	(0.077)	1.898	(0.094)	1.892	(0.089)
$f_{57,0}$	1.695	(0.094)	1.787	(0.140)	1.792	(0.141)
$f_{58,0}$	1.439	(0.058)	1.547	(0.097)	1.525	(0.092)
$f_{59,0}$	1.801	(0.068)	1.913	(0.075)	1.902	(0.069)
$f_{60,0}$	1.717	(0.088)	1.809	(0.103)	1.785	(0.099)
$f_{61,0}$	1.834	(0.111)	1.948	(0.139)	1.930	(0.136)
$f_{62,0}$	0.913	(0.063)	0.933	(0.086)	0.907	(0.083)
$f_{63,0}$	1.495	(0.105)	1.571	(0.134)	1.566	(0.130)
$f_{64,0}$	1.732	(0.051)	1.791	(0.061)	1.777	(0.062)
$f_{65,0}$	1.352	(0.051)	1.391	(0.051)	1.378	(0.050)
$f_{66,0}$	1.639	(0.076)	1.700	(0.094)	1.703	(0.093)
$f_{67,0}$	2.461	(0.049)	2.499	(0.059)	2.475	(0.061)
$f_{68,0}$	1.885	(0.047)	1.966	(0.049)	1.961	(0.050)
$f_{69,0}$	1.513	(0.054)	1.592	(0.062)	1.598	(0.064)
$f_{70,0}$	1.756	(0.158)	1.834	(0.180)	1.837	(0.183)
$f_{71,0}$	1.965	(0.057)	2.127	(0.098)	2.111	(0.091)
$f_{72,0}$	1.789	(0.067)	1.876	(0.074)	1.856	(0.069)
$f_{73,0}$	1.283	(0.076)	1.336	(0.092)	1.311	(0.092)
$f_{74,0}$	1.134	(0.096)	1.105	(0.164)	1.094	(0.160)
$f_{75,0}$	1.588	(0.107)	1.641	(0.132)	1.622	(0.125)
$f_{76,0}$	1.977	(0.110)	1.993	(0.121)	1.949	(0.137)
$f_{77,0}$	1.210	(0.062)	1.231	(0.089)	1.220	(0.080)
$f_{78,0}$	2.238	(0.059)	2.452	(0.075)	2.439	(0.075)
$f_{79,0}$	2.371	(0.057)	2.453	(0.077)	2.451	(0.075)
$f_{80,0}$	1.503	(0.096)	1.600	(0.152)	1.601	(0.150)
$f_{81,0}$	1.493	(0.057)	1.592	(0.097)	1.581	(0.093)
$f_{82,0}$	1.462	(0.155)	1.500	(0.181)	1.492	(0.172)
$f_{83,0}$	1.653	(0.078)	1.671	(0.094)	1.659	(0.091)
$f_{84,0}$	1.741	(0.089)	1.815	(0.097)	1.793	(0.095)
$f_{85,0}$	1.481	(0.049)	1.523	(0.052)	1.519	(0.053)
$f_{86,0}$	1.347	(0.101)	1.405	(0.134)	1.393	(0.142)
$f_{87,0}$	1.183	(0.107)	1.238	(0.116)	1.225	(0.120)
$f_{88,0}$	1.687	(0.047)	1.749	(0.048)	1.736	(0.049)
$f_{89,0}$	1.354	(0.063)	1.414	(0.071)	1.406	(0.094)
$f_{90,0}$	2.158	(0.060)	2.330	(0.072)	2.317	(0.072)

$f_{91,0}$	1.844	(0.053)	1.956	(0.059)	1.958	(0.062)
$f_{92,0}$	1.658	(0.074)	1.685	(0.096)	1.665	(0.089)
$f_{93,0}$	1.765	(0.087)	1.809	(0.095)	1.774	(0.099)
$f_{94,0}$	1.883	(0.060)	2.004	(0.102)	1.999	(0.096)
$f_{95,0}$	1.369	(0.060)	1.413	(0.073)	1.374	(0.102)
$f_{96,0}$	1.600	(0.111)	1.710	(0.132)	1.678	(0.128)
$f_{97,0}$	1.941	(0.067)	2.077	(0.076)	2.064	(0.069)
$f_{98,0}$	1.968	(0.055)	2.019	(0.108)	2.019	(0.094)
$f_{99,0}$	1.870	(0.108)	1.936	(0.131)	1.929	(0.138)
$f_{100,0}$	1.907	(0.105)	2.033	(0.138)	2.024	(0.135)
$f_{101,0}$	1.576	(0.061)	1.601	(0.104)	1.592	(0.092)
$f_{102,0}$	1.362	(0.110)	1.446	(0.120)	1.464	(0.126)
$f_{103,0}$	1.921	(0.049)	1.995	(0.049)	1.985	(0.047)
$f_{104,0}$	1.344	(0.072)	1.407	(0.091)	1.391	(0.095)
$f_{105,0}$	1.564	(0.159)	1.585	(0.187)	1.572	(0.178)
$f_{106,0}$	1.572	(0.105)	1.707	(0.133)	1.690	(0.129)
$f_{107,0}$	1.913	(0.081)	1.968	(0.095)	1.948	(0.101)
$f_{108,0}$	1.304	(0.078)	1.361	(0.092)	1.344	(0.095)
$f_{109,0}$	1.758	(0.059)	1.803	(0.077)	1.791	(0.075)
$f_{110,0}$	1.749	(0.058)	1.851	(0.097)	1.842	(0.087)
$f_{111,0}$	2.229	(0.058)	2.482	(0.074)	2.465	(0.071)
$f_{112,0}$	1.514	(0.060)	1.608	(0.095)	1.605	(0.092)
$f_{113,0}$	1.265	(0.078)	1.285	(0.096)	1.283	(0.094)
$f_{114,0}$	1.516	(0.054)	1.587	(0.061)	1.589	(0.061)
$f_{115,0}$	1.678	(0.050)	1.716	(0.049)	1.696	(0.048)
$f_{116,0}$	2.031	(0.046)	2.110	(0.050)	2.115	(0.047)
$f_{117,0}$	1.711	(0.065)	1.834	(0.077)	1.808	(0.069)
$f_{118,0}$	1.434	(0.092)	1.466	(0.100)	1.463	(0.095)
$f_{119,0}$	1.736	(0.078)	1.788	(0.098)	1.760	(0.101)
$f_{120,0}$	1.425	(0.093)	1.454	(0.142)	1.461	(0.149)
$f_{121,0}$	1.550	(0.058)	1.688	(0.094)	1.679	(0.089)
$f_{122,0}$	1.630	(0.057)	1.735	(0.097)	1.717	(0.088)
$f_{123,0}$	1.369	(0.066)	1.436	(0.076)	1.426	(0.070)
$f_{124,0}$	1.669	(0.096)	1.808	(0.179)	1.797	(0.184)
$f_{125,0}$	1.927	(0.087)	1.976	(0.098)	1.941	(0.100)
$f_{126,0}$	1.456	(0.088)	1.563	(0.100)	1.574	(0.095)
$f_{127,0}$	2.476	(0.054)	2.514	(0.096)	2.507	(0.096)
$f_{128,0}$	1.905	(0.098)	1.870	(0.174)	1.849	(0.166)
$f_{129,0}$	1.105	(0.077)	1.128	(0.091)	1.120	(0.093)
$f_{130,0}$	1.874	(0.050)	1.989	(0.059)	1.995	(0.062)
$f_{131,0}$	1.983	(0.051)	2.063	(0.060)	2.047	(0.063)
$f_{132,0}$	1.151	(0.079)	1.210	(0.094)	1.215	(0.095)
$f_{133,0}$	1.027	(0.107)	1.104	(0.113)	1.091	(0.124)
$f_{134,0}$	1.272	(0.079)	1.290	(0.096)	1.274	(0.097)
$f_{135,0}$	1.726	(0.057)	1.839	(0.074)	1.828	(0.072)
$f_{136,0}$	1.606	(0.093)	1.680	(0.139)	1.682	(0.138)
$f_{137,0}$	1.753	(0.061)	1.877	(0.087)	1.850	(0.081)
$f_{138,0}$	1.750	(0.060)	1.999	(0.085)	1.973	(0.085)



$f_{139,0}$	1.849	(0.059)	2.102	(0.084)	2.078	(0.081)
$f_{140,0}$	1.904	(0.066)	2.069	(0.074)	2.051	(0.069)
$f_{141,0}$	1.306	(0.062)	1.376	(0.072)	1.370	(0.072)
$f_{142,0}$	2.007	(0.064)	2.122	(0.073)	2.102	(0.070)
$f_{143,0}$	1.623	(0.085)	1.652	(0.096)	1.639	(0.093)
$f_{144,0}$	1.550	(0.079)	1.647	(0.094)	1.643	(0.091)
$f_{145,0}$	1.323	(0.079)	1.346	(0.095)	1.347	(0.091)
$f_{146,0}$	1.478	(0.086)	1.527	(0.095)	1.519	(0.096)
$f_{147,0}$	1.597	(0.083)	1.697	(0.099)	1.672	(0.099)
$f_{148,0}$	1.607	(0.052)	1.635	(0.061)	1.618	(0.058)
$f_{149,0}$	1.661	(0.050)	1.746	(0.047)	1.743	(0.052)
$f_{150,0}$	1.682	(0.058)	1.772	(0.095)	1.752	(0.087)

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