1 Multinomial ∧ Dirichlet Model and χ^2-test

1.1 BL1

Country	N	$P(H_0\|\boldsymbol{x})$			$\underline{P}(H_0\|\boldsymbol{x})$	p_{obs}
		$\boldsymbol{\alpha = 1}$	$\boldsymbol{\alpha = \theta_0}$	$\boldsymbol{\alpha = 22\,\theta_0}$		
Austria	619	0.00080	0.98835	0.00001	0.00000	0.00000
Belgium	604	0.01624	0.99956	0.00026	0.00001	0.00000
Finland	605	0.91920	1.00000	0.19978	0.00036	0.00001
France	600	0.03862	0.99991	0.00119	0.00004	0.00000
Germany	612	0.94159	1.00000	0.11304	0.00176	0.00007
Greece	629	0.88495	1.00000	0.06684	0.00187	0.00007
Ireland	616	0.00423	0.99670	0.00004	0.00000	0.00000
Italy	625	0.94487	1.00000	0.10969	0.00242	0.00010
Luxembourg	602	0.00000	0.00005	0.00000	0.00000	0.00000
Netherlands	596	0.99985	1.00000	0.98624	0.10463	0.00916
Portugal	617	0.00000	0.00025	0.00000	0.00000	0.00000
Spain	535	0.80790	0.99999	0.01752	0.00192	0.00007
Pooled sample	7260	0.99935	1.00000	0.91240	0.00007	0.00000

1.2 BL2

Country	N	$P(H_0\|\boldsymbol{x})$			$\underline{P}(H_0\|\boldsymbol{x})$	p_{obs}
		$\boldsymbol{\alpha = 1}$	$\boldsymbol{\alpha = \theta_0}$	$\boldsymbol{\alpha = 22\,\theta_0}$		
Austria	614	0.99999	1	0.99998	0.35721	0.08157
Belgium	604	1.00000	1	1.00000	0.48084	0.23590
Finland	605	0.99998	1	0.99996	0.33118	0.06762
France	600	0.99969	1	0.99920	0.06942	0.00522
Germany	610	1.00000	1	1.00000	0.45304	0.17458
Greece	627	0.99994	1	0.99984	0.15234	0.01598
Ireland	616	1.00000	1	1.00000	0.50000	0.38686
Italy	608	0.99999	1	0.99998	0.34624	0.07535
Luxembourg	602	0.99959	1	0.99896	0.08912	0.00732
Netherlands	596	0.99999	1	0.99997	0.31338	0.05950
Portugal	617	1.00000	1	1.00000	0.46127	0.18917
Spain	530	1.00000	1	1.00000	0.50000	0.85500
Pooled sample	7229	1.00000	1	1.00000	0.31740	0.06125

2 Binomial $\wedge$ Beta Model and Z-test

	$P(H_0\|x)$			$\underline{P}(H_0\|x)$	$p_{\mathbf{obs}}$
Digit	$a = 1$ $b = 1$	$a = \theta_0$ $b = 1 - \theta_0$	$a = 22\,\theta_0$ $b = 22 - 22\,\theta_0$		
1	0.54162	0.94887	1.00000	0.16819	0.01869
2	0.95114	0.99937	1.00000	0.50000	0.49281
3	0.95419	0.99965	1.00000	0.50000	0.40591
4	0.19392	0.98479	1.00000	0.02440	0.00140
5	0.01647	0.86106	1.00000	0.00110	0.00004
6	0.97263	0.99991	1.00000	0.50000	0.74044
7	0.00095	0.10371	1.00000	0.00158	0.00006
8	0.94662	0.99980	1.00000	0.46235	0.19125
9	0.96778	0.99992	1.00000	0.50000	0.42181

Table 1: Austria BL1

	$P(H_0\|x)$			$\underline{P}(H_0\|x)$	$p_{\mathbf{obs}}$
Digit	$a = 1$ $b = 1$	$a = \theta_0$ $b = 1 - \theta_0$	$a = 22\,\theta_0$ $b = 22 - 22\,\theta_0$		
1	0.00254	0.03580	1.00000	0.00110	0.00004
2	0.02754	0.72271	1.00000	0.00399	0.00017
3	0.00790	0.60078	1.00000	0.00085	0.00003
4	0.96258	0.99979	1.00000	0.50000	0.48873
5	0.93971	0.99970	1.00000	0.47099	0.20964
6	0.95974	0.99983	1.00000	0.49889	0.33385
7	0.97671	0.99993	1.00000	0.50000	0.93439
8	0.95734	0.99989	1.00000	0.49551	0.30067
9	0.92010	0.99967	1.00000	0.40117	0.11306

Table 2: Belgium BL1

Digit	$P(H_0\|x)$			$\underline{P}(H_0\|x)$	$p_{\mathbf{obs}}$
	$a = 1$ $b = 1$	$a = \theta_0$ $b = 1 - \theta_0$	$a = 22\,\theta_0$ $b = 22 - 22\,\theta_0$		
1	0.89385	0.99318	1.00000	0.45944	0.18573
2	0.95728	0.99941	1.00000	0.50000	0.59892
3	0.77214	0.99757	1.00000	0.27459	0.04486
4	0.01550	0.81692	1.00000	0.00134	0.00005
5	0.45297	0.99306	1.00000	0.11079	0.00994
6	0.05526	0.96202	1.00000	0.00420	0.00018
7	0.94816	0.99979	1.00000	0.47244	0.21308
8	0.87153	0.99940	1.00000	0.33020	0.06715
9	0.80247	0.99896	1.00000	0.25706	0.03934

Table 3: Ireland BL1

Digit	$P(H_0\|x)$			$\underline{P}(H_0\|x)$	$p_{\mathbf{obs}}$
	$a = 1$ $b = 1$	$a = \theta_0$ $b = 1 - \theta_0$	$a = 22\,\theta_0$ $b = 22 - 22\,\theta_0$		
1	0.00000	0.00000	1.00000	0.00000	0.00000
2	0.04634	0.74547	1.00000	0.01446	0.00075
3	0.92123	0.99933	1.00000	0.45994	0.18666
4	0.96602	0.99983	1.00000	0.50000	0.66329
5	0.00005	0.00510	1.00000	0.00031	0.00001
6	0.96555	0.99989	1.00000	0.50000	0.49360
7	0.95527	0.99982	1.00000	0.48859	0.26358
8	0.89434	0.99952	1.00000	0.36377	0.08555
9	0.97734	0.99993	1.00000	0.50000	0.68984

Table 4: Luxembourg BL1

	$P(H_0\|x)$			$\underline{P}(H_0\|x)$	$p_{\mathbf{obs}}$
Digit	$a = 1$ $b = 1$	$a = \theta_0$ $b = 1 - \theta_0$	$a = 22\,\theta_0$ $b = 22 - 22\,\theta_0$		
1	0.00000	0.00000	1.00000	0.00000	0.00000
2	0.00058	0.03129	1.00000	0.00031	0.00001
3	0.96437	0.99974	1.00000	0.50000	0.66228
4	0.00111	0.11152	1.00000	0.00110	0.00004
5	0.97175	0.99988	1.00000	0.50000	0.72552
6	0.97403	0.99991	1.00000	0.50000	0.84751
7	0.88065	0.99943	1.00000	0.34848	0.07658
8	0.97250	0.99993	1.00000	0.50000	0.59124
9	0.97938	0.99994	1.00000	0.50000	0.95888

Table 5: Portugal BL1