

## 負の二項分布における検定について

藤 沢 秀 雄

### 1. 序 論

負の二項分布

$$p_x = P_r\{X=x\} = \left(\frac{1}{1+\alpha}\right)^\rho \frac{\Gamma(\rho+x)}{\Gamma(\rho)\Gamma(x+1)} \left(\frac{\alpha}{1+\alpha}\right)^x$$
$$(x=0, 1, 2, \dots)$$

の全般的な性質については、「病気欠勤の統計資料の解析について」(長崎大学教養部紀要第3巻, 1962年)の中で述べられている。この中でも述べられているように、 $\rho$ の値が大きいと、負の二項分布は正規分布に近い分布になる。したがって負の二項分布に対する検定を考えていく上において、 $\rho$ の値の小さな範囲内における分布の変化の程度を調べておくことで十分である。ここではまず $\rho$ の値がより小さい範囲内における確率分布の変化を調べ、この結果を基にして $\rho$ および $\alpha$ の検定について考えることにした。

### 2. $\rho$ の検定について

表1は $\rho \leq 1.0$ ,  $\alpha \leq 5.0$ なる範囲内での $p_0$ の値の変化を示したものである。この表からも分るように、 $\alpha$ の値が一定なときには、 $p_0$ の値は $\rho$ の値が増大するにつれて単調に減少していくから、 $\rho$ について検定を $p_0$ についての検定でもっておきかえることができる。

しかし $p_0$ の値は $\alpha$ の値によっても変化するので、 $\alpha$ の値が未知の場合では、 $p_0$ の値についての検定だけでは不十分なことが生じる。

表2は $p_0$ の値が等しい $\rho$ と $\alpha$ の種々の組合せに対して、 $p_1$ の値を求めたものである。 $p_0$ の値が同じである分布の間では、 $p_1$ の値は $\rho$ の値が増大するにつれて大きくなっていることが、この表から分る。これらのことから $\alpha$ の値が未知のときには、 $p_0$ と $p_1$ の二つのものについて検定を行なうことが好ましい。

### 3. $\alpha$ についての検定

表3は  $\rho$  の値が同じで  $\alpha$  の値の異なるような確率分布を比較するために作成されたものである。これによれば、 $\rho$  の値が一定であれば、 $p_0$  以外の  $p_x$  の値はすべて  $\alpha$  の値が増大するとともに大きくなっている。すなわち、すべての正整数  $N$  に対して、 $\sum_{x=N}^{\infty} p_x$  は  $\alpha$  の値が増大するとともに大きくなる。このことから、 $\rho$  の値が既知のときには、 $N$  の値をどのようにとっても、 $\sum_{x=N}^{\infty} p_x$  の値についての検定でもって、 $\alpha$  についての検定におきかえることが可能となる。そこで  $N$  の値をどのようにとれば、検定の効果を最大にできるかが、問題となる。 $\sum_{x=N}^{\infty} p_x$  の値は  $N$  の値が大きい程  $\alpha$  の変動に伴う変化が大きい。しかし  $\sum_{x=N}^{\infty} p_x$  の値自身があまり小さすぎでは意味がなくなる。したがって  $\alpha$  についての検定を  $\sum_{x=N}^{\infty} p_x$  の値についての検定でおきかえ、しかもその効果を大きくするには、 $N$  の値があまり大きくてはいけない。

以上の観点から  $N$  の値として5乃至6を取るのか最も好ましいと考えられる。

表4は  $\rho\alpha$  の値が等しい確率分布について比較を行なったものである。この表から  $\rho$  の値が多少小さくなっているとしても、 $N$  が5以上の場合には、 $\sum_{x=N}^{\infty} p_x$  の値は  $\alpha$  の増大とともに大きくなっていることが分る。このことから、 $\rho$  の値が多少異なる場合でも  $\sum_{x=N}^{\infty} p_x$  ( $N=5$  または 6) の値についての検定でもって、 $\alpha$  の検定におきかえることが可能である。

#### 4. 結 論

負の二項分布は、 $\rho$  と  $\alpha$  の二つのものによってその確率分布が決まる。したがって、 $\rho$  および  $\alpha$  が共に未知で、これらのものについての検定を行ないたいときには、 $p_0, p_1$  および  $\sum_{x=N}^{\infty} p_x$  ( $N$  は5乃至6) の三つのものについての検定を行なうことで十分おきかえることが可能である。ただし、 $\rho$  の値が極端に小さいようなときには、 $p_0$  の値が1に近くなり、 $\sum_{x=N}^{\infty} p_x (=1-p_0)$  の値は  $\alpha$  の値にほとんど無関係に小さくなるので  $\alpha$  についての検定が不可能になることに注意しなければならない。

しかしながら  $\rho$  の値が極端に小さいときには  $\alpha$  の値の変動はそれほど問題にならない訳であるから検定ができなくても問題とするに足りない。またここでは  $\rho \leq 1$  の場合についてのみ考えてきたのであるが、 $\rho$  の値が1より大きい場合においても同様の考えでもって検定を行なっていけばよい。

#### 参 考 文 献

- [1] 藤沢秀雄：病欠欠勤の統計資料の分析，長崎大学教養部紀要，第3巻，1962。

表 1  $p_0 = P_r\{X=0\} = \left(\frac{1}{1+\alpha}\right)^\rho$  の値

$\rho \backslash \alpha$	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
.10	.96026	.93303	.91244	.89596	.88225	.87055	.86036	.85134	.84326	.83596
.15	.94099	.90125	.87158	.84807	.82869	.81225	.79803	.78552	.77436	.76432
.20	.92211	.87055	.83255	.80274	.77837	.75786	.74021	.72478	.71109	.69883
.25	.90360	.84090	.79527	.75984	.73111	.70711	.68659	.66874	.65299	.63894
.30	.88547	.81225	.75966	.71922	.68672	.65975	.63685	.61703	.59964	.58419
.35	.86770	.78458	.72564	.68078	.64502	.61557	.59071	.56933	.55065	.53413
.40	.85028	.75786	.69314	.64439	.60586	.57435	.54792	.52531	.50566	.48836
.45	.83322	.73204	.66211	.60995	.56907	.53589	.50822	.48469	.46434	.44651
.50	.81650	.70711	.63246	.57735	.53452	.50000	.47140	.44721	.42640	.40825
.55	.80011	.68302	.60413	.54649	.50207	.46652	.43725	.41264	.39156	.37326
.60	.78405	.65975	.57708	.51728	.47158	.43527	.40558	.38073	.35957	.34128
.65	.76832	.63728	.55124	.48963	.44295	.40613	.37619	.35129	.33019	.31203
.70	.75290	.61557	.52655	.46346	.41606	.37893	.34894	.32413	.30321	.28529
.75	.73779	.59460	.50297	.43869	.39080	.35355	.32366	.29907	.27844	.26085
.80	.72298	.57435	.48045	.41524	.36707	.32988	.30021	.27595	.25569	.23849
.85	.70847	.55478	.45893	.39305	.34478	.30779	.27846	.25461	.23480	.21806
.90	.69425	.53589	.43838	.37204	.32385	.28717	.25829	.23492	.21561	.19937
.95	.68032	.51763	.41875	.35216	.30418	.26794	.23958	.21676	.19800	.18229
1.00	.66667	.50000	.40000	.33333	.28571	.25000	.22222	.20000	.18182	.16667

表 2  $p_1 = P_r(X=1) = \left(\frac{1}{1+\alpha}\right)^\rho \frac{\rho\alpha}{1+\alpha}$  の値

$\rho$	$p_0 = .90$		$p_0 = .85$		$p_0 = .80$		$p_0 = .75$		$p_0 = .70$	
	$\alpha$	$p_1$	$\alpha$	$p_1$	$\alpha$	$p_1$	$\alpha$	$p_1$	$\alpha$	$p_1$
.10	1.868	.0586	4.079	.0683	8.313	.0714	16.758	.0708	34.401	.0680
.15	1.019	.0681	1.955	.0844	3.427	.0929	5.807	.0960	9.782	.0953
.20	.694	.0737	1.254	.0946	2.052	.1076	3.214	.1144	4.950	.1165
.30	.421	.0800	.719	.1255	1.104	.1259	1.609	.1388	2.284	.1460
.40	.301	.0834	.501	.1135	.747	.1368	1.053	.1539	1.439	.1652
.50	.235	.0855	.394	.1179	.563	.1440	.783	.1641	1.041	.1785
.75	.151	.0885	.240	.1242	.347	.1544	.468	.1792	.609	.1987
1.00	.111	.0900	.177	.1275	.250	.1600	.333	.1875	.429	.2100

表 3 負の二項分布 (その 1)

$$p_x = \left( \frac{1}{1+\alpha} \right)^{\rho} \frac{\Gamma(\rho+x)}{\Gamma(\rho)\Gamma(x+1)} \left( \frac{\alpha}{1+\alpha} \right)^x$$

$x$	$\rho=.05$					$\rho=.08$	
	$\alpha=4.00$	$\alpha=5.00$	$\alpha=6.00$	$\alpha=8.00$	$\alpha=9.00$	$\alpha=2.50$	$\alpha=3.00$
0	.922,681	.914,308	.907,288	.895,959	.891,251	.904,638	.895,025
1	.036,907	.038,096	.038,884	.039,820	.040,106	.051,694	.053,702
2	.015,501	.016,667	.017,498	.018,583	.018,950	.019,939	.021,749
3	.008,474	.009,491	.010,249	.011,287	.011,654	.009,875	.011,310
4	.005,169	.006,031	.006,698	.007,650	.007,998	.005,431	.006,531
5	.003,350	.004,071	.004,650	.005,508	.005,830	.003,165	.003,997
6	.002,255	.002,855	.003,355	.004,121	.004,417	.001,914	.002,538
7	.001,559	.002,056	.002,485	.003,166	.003,435	.001,188	.001,653
8	.001,099	.001,510	.001,877	.002,480	.002,725	.000,751	.001,097
9	.000,787	.001,126	.001,439	.001,972	.002,193	.000,481	.000,739
10	.000,570	.000,849	.001,117	.001,586	.001,787	.000,312	.000,503
11以上	.001,648	.002,940	.004,460	.007,888	.009,654	.000,612	.001,156

$x$	$\rho=.08$					$\rho=.10$	
	$\alpha=3.50$	$\alpha=4.00$	$\alpha=4.50$	$\alpha=5.00$	$\alpha=7.50$	$\alpha=2.00$	$\alpha=2.50$
0	.886,631	.879,189	.872,511	.866,459	.842,648	.895,959	.882,253
1	.055,168	.056,268	.057,110	.057,764	.059,481	.059,731	.063,018
2	.023,171	.024,308	.025,232	.025,994	.028,341	.021,901	.024,757
3	.012,495	.013,483	.014,314	.015,019	.017,338	.010,221	.012,379
4	.007,483	.008,305	.009,018	.009,637	.011,780	.005,281	.006,852
5	.004,749	.005,422	.006,020	.006,553	.008,481	.002,887	.004,014
6	.003,127	.003,672	.004,171	.004,624	.006,336	.001,636	.002,437
7	.002,113	.002,552	.002,964	.003,347	.004,856	.000,950	.001,517
8	.001,454	.001,807	.002,146	.002,468	.003,792	.000,562	.000,962
9	.001,015	.001,298	.001,576	.001,847	.003,004	.000,337	.000,618
10	.000,717	.000,943	.001,171	.001,397	.002,407	.000,205	.000,402
11以上	.001,877	.002,753	.003,767	.004,891	.011,536	.000,330	.000,791

$x$	$\rho = .10$						
	$\alpha = 3.00$	$\alpha = 3.50$	$\alpha = 4.00$	$\alpha = 4.50$	$\alpha = 5.00$	$\alpha = 6.00$	$\alpha = 7.50$
0	.870,551	.860,357	.851,340	.843,264	.835,959	.823,171	.807,343
1	.065,291	.066,917	.068,107	.068,994	.069,663	.070,558	.071,236
2	.026,933	.028,625	.029,967	.031,047	.031,929	.033,263	.034,570
3	.014,140	.015,585	.016,782	.017,782	.018,625	.019,958	.021,352
4	.008,219	.009,394	.010,405	.011,275	.012,029	.013,258	.014,601
5	.005,054	.005,991	.006,825	.007,565	.008,220	.009,318	.010,564
6	.003,222	.003,961	.004,641	.005,261	.005,822	.006,789	.007,923
7	.002,106	.002,685	.003,236	.003,751	.004,228	.005,071	.006,092
8	.001,402	.001,853	.002,297	.002,724	.003,127	.003,858	.004,771
9	.000,946	.001,297	.001,654	.002,006	.002,345	.002,976	.003,789
10	.000,646	.000,918	.001,204	.001,493	.001,778	.002,321	.003,042
11以上	.001,490	.002,417	.003,542	.004,838	.006,275	.009,459	.014,717

$x$	$\rho = .10$	$\rho = .12$					$\rho = .15$
	$\alpha = 9.00$	$\alpha = .250$	$\alpha = 3.00$	$\alpha = 3.75$	$\alpha = 5.00$	$\alpha = 7.50$	$\alpha = 2.00$
0	.794,328	.860,423	.846,745	.829,463	.806,532	.773,517	.848,070
1	.071,490	.073,751	.076,207	.078,581	.080,653	.081,902	.084,807
2	.035,387	.029,500	.032,007	.034,741	.037,638	.040,469	.032,509
3	.022,294	.014,891	.016,964	.019,382	.022,165	.025,234	.015,532
4	.015,550	.008,296	.009,924	.011,935	.014,407	.017,367	.008,154
5	.011,476	.004,883	.006,133	.007,764	.009,893	.012,627	.004,512
6	.008,779	.002,976	.003,925	.005,231	.007,035	.009,507	.002,582
7	.006,885	.001,859	.002,574	.003,610	.005,125	.007,334	.001,512
8	.005,500	.001,182	.001,718	.002,537	.003,801	.005,759	.000,901
9	.004,455	.000,761	.001,162	.001,807	.002,858	.004,585	.000,544
10	.003,648	.000,496	.000,795	.001,301	.002,172	.003,690	.000,332
11以上	.020,208	.000,982	.001,846	.003,648	.007,721	.018,009	.000,545

$x$	$\rho = .15$						$\rho = .16$
	$\alpha = 2.40$	$\alpha = 3.00$	$\alpha = 3.60$	$\alpha = 4.00$	$\alpha = 5.00$	$\alpha = 6.00$	$\alpha = 1.25$
0	.832,297	.812,252	.795,401	.785,515	.764,324	.746,853	.878,316
1	.088,126	.091,378	.093,373	.094,262	.095,541	.096,024	.078,073
2	.035,769	.039,407	.042,018	.043,360	.045,780	.047,326	.025,157
3	.018,095	.021,181	.023,567	.024,860	.027,341	.029,072	.010,063
4	.010,059	.012,510	.014,524	.015,662	.017,942	.019,623	.004,416
5	.005,893	.007,788	.009,434	.010,399	.012,410	.013,961	.002,041
6	.003,571	.005,013	.006,337	.007,141	.008,877	.010,271	.000,975
7	.002,214	.003,303	.004,357	.005,019	.006,499	.007,735	.000,477
8	.001,397	.002,214	.003,048	.003,589	.004,840	.005,925	.000,237
9	.000,893	.001,504	.002,160	.002,600	.003,653	.004,599	.000,119
10	.000,577	.001,032	.001,547	.001,903	.002,785	.003,607	.000,061
11以上	.001,109	.002,418	.004,234	.005,690	.010,008	.015,004	.000,065

$x$	$\rho = .16$					$\rho = .20$	
	$\alpha = 1.50$	$\alpha = 2.50$	$\alpha = 3.50$	$\alpha = 4.50$	$\alpha = 5.00$	$\alpha = 1.00$	$\alpha = 1.20$
0	.863,634	.818,369	.786,115	.761,276	.750,751	.870,551	.854,113
1	.082,909	.093,528	.097,828	.099,658	.100,100	.087,055	.093,176
2	.028,852	.038,747	.044,131	.047,292	.048,382	.026,117	.030,494
3	.012,464	.019,927	.024,713	.027,859	.029,029	.009,576	.012,198
4	.005,908	.011,245	.015,185	.018,007	.019,111	.003,830	.005,323
5	.002,949	.006,683	.009,826	.012,258	.013,250	.001,609	.002,439
6	.001,522	.004,105	.006,573	.008,625	.009,496	.000,697	.001,153
7	.000,804	.002,580	.004,499	.006,210	.006,964	.000,309	.000,557
8	.000,431	.001,650	.003,132	.004,548	.005,194	.000,139	.000,273
9	.000,235	.001,068	.002,208	.003,373	.003,924	.000,063	.000,136
10	.000,129	.000,699	.001,573	.002,528	.002,995	.000,029	.000,068
11以上	.000,163	.001,399	.004,217	.008,366	.010,804	.000,025	.000,070

$x$	$\rho = .20$						
	$\alpha = 1.40$	$\alpha = 1.50$	$\alpha = 1.80$	$\alpha = 2.00$	$\alpha = 2.25$	$\alpha = 2.50$	$\alpha = 2.75$
0	.839,378	.832,553	.813,895	.802,741	.789,993	.778,371	.767,704
1	.097,927	.099,906	.104,644	.107,032	.109,384	.111,196	.112,597
2	.034,275	.035,966	.040,363	.042,813	.045,436	.047,655	.049,542
3	.014,662	.015,825	.019,028	.020,931	.023,068	.024,962	.026,643
4	.006,842	.007,596	.009,786	.011,163	.012,776	.014,264	.015,630
5	.003,353	.003,828	.005,284	.006,251	.007,430	.008,559	.009,628
6	.001,695	.001,991	.002,944	.003,612	.004,458	.005,298	.006,119
7	.000,876	.001,058	.001,676	.002,133	.002,733	.003,352	.003,975
8	.000,460	.000,571	.000,970	.001,280	.001,703	.002,155	.002,623
9	.000,244	.000,312	.000,568	.000,777	.001,074	.001,402	.001,753
10	.000,131	.000,172	.000,336	.000,477	.000,684	.000,922	.001,183
11以上	.000,157	.000,222	.000,506	.000,790	.001,261	.001,864	.002,603

$x$	$\rho = .20$					$\rho = .25$	
	$\alpha = 3.00$	$\alpha = 3.25$	$\alpha = 3.50$	$\alpha = 4.00$	$\alpha = 4.50$	$\alpha = 0.80$	$\alpha = 1.00$
0	.757,858	.748,725	.740,214	.724,780	.711,095	.863,340	.840,896
1	.113,679	.114,511	.115,144	.115,965	.116,361	.095,927	.105,112
2	.051,155	.052,540	.053,734	.055,663	.057,123	.026,646	.032,848
3	.028,135	.029,464	.030,648	.032,656	.034,274	.008,882	.012,318
4	.016,881	.018,025	.019,070	.020,900	.022,434	.003,207	.005,004
5	.010,635	.011,578	.012,459	.014,045	.015,418	.001,212	.002,127
6	.006,913	.007,673	.008,398	.009,738	.010,933	.000,471	.000,930
7	.004,592	.005,197	.005,786	.006,900	.007,923	.000,187	.000,415
8	.003,100	.003,577	.004,050	.004,968	.005,834	.000,075	.000,188
9	.002,118	.002,492	.002,870	.003,621	.004,349	.000,031	.000,086
10	.001,462	.001,753	.002,054	.002,665	.003,274	.000,013	.000,040
11以上	.003,472	.004,465	.005,573	.008,099	.010,982	.000,009	.000,036

$x$	$\rho = .25$						
	$\alpha = 1.20$	$\alpha = 1.40$	$\alpha = 1.60$	$\alpha = 1.80$	$\alpha = 2.00$	$\alpha = 2.40$	$\alpha = 3.00$
0	.821,097	.803,429	.787,511	.773,055	.759,836	.736,428	.707,107
1	.111,968	.117,167	.121,156	.124,241	.126,639	.129,958	.132,583
2	.038,171	.042,717	.046,598	.049,918	.052,766	.057,334	.062,148
3	.015,615	.018,689	.021,507	.024,068	.026,383	.030,353	.034,958
4	.006,920	.008,858	.010,753	.012,571	.014,291	.017,409	.021,303
5	.003,209	.004,392	.005,625	.006,869	.008,098	.010,445	.013,580
6	.001,531	.002,242	.003,029	.003,864	.004,724	.006,451	.008,912
7	.000,746	.001,168	.001,664	.002,218	.002,812	.004,066	.005,968
8	.000,369	.000,617	.000,928	.001,292	.001,699	.002,601	.004,056
9	.000,184	.000,330	.000,524	.000,761	.001,038	.001,683	.002,789
10	.000,093	.000,178	.000,298	.000,453	.000,640	.001,099	.001,935
11以上	.000,097	.000,213	.000,407	.000,690	.001,074	.002,173	.004,661

$x$	$\rho = .25$		$\rho = .30$				
	$\alpha = 3.20$	$\alpha = 3.60$	$\alpha = 0.80$	$\alpha = 1.00$	$\alpha = 1.20$	$\alpha = 1.50$	$\alpha = 2.00$
0	.698,534	.682,827	.838,336	.812,252	.789,357	.759,658	.719,223
1	.133,054	.133,597	.111,778	.121,838	.129,168	.136,738	.143,845
2	.063,359	.065,346	.032,291	.039,597	.045,796	.053,328	.062,333
3	.036,205	.038,355	.011,003	.015,179	.019,151	.024,531	.031,859
4	.022,413	.024,389	.004,034	.006,261	.008,618	.012,143	.017,522
5	.014,515	.016,224	.001,542	.002,692	.004,043	.006,266	.010,046
6	.009,677	.011,110	.000,605	.001,189	.001,948	.003,321	.005,916
7	.006,583	.007,763	.000,242	.000,535	.000,956	.001,793	.003,550
8	.004,545	.005,506	.000,098	.000,244	.000,476	.000,982	.002,159
9	.003,174	.003,950	.000,040	.000,113	.000,239	.000,543	.001,328
10	.002,237	.002,859	.000,017	.000,052	.000,121	.000,303	.000,823
11以上	.005,704	.008,074	.000,014	.000,048	.000,127	.000,394	.001,396



$x$	$\rho=.30$	$\rho=.35$				$\rho=.40$	
	$\alpha=2.50$	$\alpha=0.80$	$\alpha=1.00$	$\alpha=1.20$	$\alpha=2.00$	$\alpha=0.50$	$\alpha=0.60$
0	.686,720	.814,056	.784,584	.758,843	.680,781	.850,283	.828,613
1	.147,154	.126,631	.137,302	.144,870	.158,849	.113,371	.124,292
2	.068,322	.037,989	.046,339	.053,339	.071,482	.026,453	.032,627
3	.037,414	.013,226	.018,150	.022,790	.037,329	.007,054	.009,788
4	.022,048	.004,923	.007,600	.010,411	.020,842	.001,999	.003,120
5	.013,544	.001,904	.003,306	.004,940	.012,089	.000,586	.001,030
6	.008,545	.000,754	.001,474	.002,403	.007,186	.000,176	.000,347
7	.005,493	.000,304	.000,669	.001,189	.004,346	.000,054	.000,119
8	.003,581	.000,124	.000,307	.000,596	.002,662	.000,017	.000,041
9	.002,359	.000,051	.000,142	.000,302	.001,646	.000,005	.000,014
10	.001,567	.000,021	.000,067	.000,154	.001,026	.000,002	.000,005
11以上	.003,253	.000,017	.000,060	.000,163	.001,762	.000,000	.000,004

$x$	$\rho=.40$						
	$\alpha=0.70$	$\alpha=0.80$	$\alpha=0.90$	$\alpha=1.00$	$\alpha=1.20$	$\alpha=1.25$	$\alpha=1.40$
0	.808,761	.790,480	.773,568	.757,858	.729,510	.722,981	.704,556
1	.133,208	.140,530	.146,571	.151,572	.159,166	.160,662	.164,396
2	.038,395	.043,720	.048,600	.053,050	.060,772	.062,480	.067,129
3	.012,648	.015,545	.018,417	.021,220	.026,519	.027,769	.031,327
4	.004,427	.005,873	.007,415	.009,019	.012,295	.013,113	.015,533
5	.001,604	.002,297	.003,091	.003,968	.005,902	.006,411	.007,974
6	.000,594	.000,919	.001,318	.001,786	.002,897	.003,205	.004,186
7	.000,224	.000,373	.000,571	.000,816	.001,445	.001,628	.002,233
8	.000,085	.000,153	.000,250	.000,378	.000,729	.000,837	.001,205
9	.000,033	.000,064	.000,111	.000,176	.000,371	.000,434	.000,656
10	.000,013	.000,027	.000,049	.000,083	.000,190	.000,227	.000,360
11以上	.000,008	.000,019	.000,039	.000,074	.000,204	.000,253	.000,445

$x$	$\rho = .40$			$\rho = .45$			
	$\alpha = 1.50$	$\alpha = 2.00$	$\alpha = 2.25$	$\alpha = 0.80$	$\alpha = 1.00$	$\alpha = 1.20$	$\alpha = 1.60$
0	.693,145	.644,394	.624,089	.767,588	.732,043	.701,310	.650,522
1	.166,855	.171,838	.172,825	.153,517	.164,710	.172,140	.180,145
2	.069,869	.080,191	.083,753	.049,467	.059,707	.068,073	.080,372
3	.033,537	.042,769	.046,387	.017,955	.024,380	.030,324	.040,392
4	.017,104	.024,236	.027,297	.006,883	.010,514	.014,266	.021,439
5	.009,031	.014,218	.016,630	.002,722	.004,679	.006,925	.011,742
6	.004,877	.008,531	.010,362	.001,099	.002,125	.003,431	.006,563
7	.002,675	.005,200	.006,559	.000,450	.000,979	.001,725	.003,722
8	.001,485	.003,207	.004,200	.000,186	.000,456	.000,876	.002,133
9	.000,831	.001,995	.002,714	.000,078	.000,214	.000,449	.001,232
10	.000,469	.001,250	.001,766	.000,033	.000,101	.000,231	.000,717
11以上	.000,622	.002,171	.003,418	.000,024	.000,092	.000,250	.001,021

$x$	$\rho = .45$	$\rho = .50$					
	$\alpha = 2.00$	$\alpha = 0.40$	$\alpha = 0.50$	$\alpha = 0.60$	$\alpha = 0.70$	$\alpha = 0.80$	$\alpha = 0.90$
0	.609,952	.845,154	.816,497	.790,569	.766,965	.745,356	.725,476
1	.182,986	.120,736	.136,083	.148,232	.157,905	.165,635	.171,823
2	.088,443	.025,872	.034,021	.041,690	.048,765	.055,212	.061,042
3	.048,152	.006,160	.009,450	.013,028	.016,733	.020,449	.024,096
4	.027,688	.001,540	.002,756	.004,275	.006,029	.007,952	.009,987
5	.016,428	.000,396	.000,827	.001,443	.002,234	.003,181	.004,258
6	.009,948	.000,104	.000,253	.000,496	.000,843	.001,296	.001,849
7	.006,111	.000,028	.000,078	.000,173	.000,322	.000,535	.000,813
8	.003,794	.000,007	.000,024	.000,061	.000,124	.000,223	.000,361
9	.002,375	.000,002	.000,008	.000,022	.000,048	.000,094	.000,162
10	.001,496	.000,001	.000,002	.000,008	.000,019	.000,039	.000,073
11以上	.002,627	.000,000	.000,001	.000,003	.000,013	.000,028	.000,060

$x$	$\rho = .50$						$\rho = .60$
	$\alpha = 1.00$	$\alpha = 1.20$	$\alpha = 1.40$	$\alpha = 1.50$	$\alpha = 1.60$	$\alpha = 1.80$	$\alpha = 0.40$
0	.707,107	.674,200	.645,497	.632,456	.620,174	.597,614	.817,190
1	.176,777	.183,873	.188,270	.189,737	.190,823	.192,090	.140,090
2	.066,291	.075,221	.082,368	.085,382	.088,072	.092,615	.032,021
3	.027,621	.034,191	.040,040	.042,691	.045,165	.049,615	.007,929
4	.012,084	.016,319	.020,437	.022,413	.024,320	.027,909	.002,039
5	.005,438	.008,011	.010,729	.012,103	.013,469	.016,147	.000,536
6	.002,492	.004,005	.005,737	.006,657	.007,598	.009,515	.000,143
7	.001,157	.002,029	.003,108	.003,709	.004,342	.005,680	.000,038
8	.000,542	.001,037	.001,700	.002,086	.002,505	.003,423	.000,010
9	.000,256	.000,534	.000,936	.001,182	.001,456	.002,078	.000,003
10	.000,122	.000,277	.000,519	.000,674	.000,851	.001,269	.000,001
11以上	.000,113	.000,303	.000,659	.000,910	.001,225	.002,045	.000,000

$x$	$\rho = .60$						
	$\alpha = 0.50$	$\alpha = 0.60$	$\alpha = 0.70$	$\alpha = 0.80$	$\alpha = 0.90$	$\alpha = 1.00$	$\alpha = 1.20$
0	.784,052	.754,272	.727,329	.702,808	.680,374	.659,754	.623,084
1	.156,810	.169,711	.179,693	.187,415	.193,369	.197,926	.203,918
2	.041,816	.050,913	.059,193	.066,637	.073,277	.079,170	.088,983
3	.012,080	.016,547	.021,124	.025,667	.030,082	.034,307	.042,064
4	.003,624	.005,585	.007,828	.010,267	.012,824	.015,438	.020,650
5	.001,111	.001,927	.002,966	.004,198	.005,589	.007,102	.010,362
6	.000,346	.000,674	.001,140	.001,741	.002,471	.003,314	.005,275
7	.000,109	.000,238	.000,442	.000,730	.001,104	.001,562	.002,713
8	.000,034	.000,085	.000,173	.000,308	.000,497	.000,742	.001,406
9	.000,011	.000,030	.000,068	.000,131	.000,225	.000,355	.000,733
10	.000,004	.000,011	.000,027	.000,056	.000,102	.000,170	.000,384
11以上	.000,003	.000,007	.000,017	.000,042	.000,086	.000,160	.000,428

$x$	$\rho = .60$		$\rho = .70$				
	$\alpha = 1.25$	$\alpha = 1.50$	$\alpha = 0.40$	$\alpha = 0.50$	$\alpha = 0.60$	$\alpha = 0.80$	$\alpha = 1.00$
0	.614,739	.577,080	.790,152	.752,898	.719,641	.662,688	.615,572
1	.204,913	.207,749	.158,030	.175,676	.188,906	.206,170	.215,450
2	.091,072	.099,719	.038,379	.049,775	.060,214	.077,886	.091,566
3	.043,850	.051,854	.009,869	.014,932	.020,322	.031,155	.041,205
4	.021,925	.028,001	.002,608	.004,604	.007,049	.012,808	.019,057
5	.011,206	.015,457	.000,700	.001,443	.002,485	.005,351	.008,957
6	.005,811	.008,656	.000,190	.000,457	.000,885	.002,259	.004,255
7	.003,044	.004,897	.000,052	.000,146	.000,318	.000,961	.002,036
8	.001,606	.002,791	.000,014	.000,047	.000,115	.000,411	.000,980
9	.000,853	.001,600	.000,004	.000,015	.000,042	.000,177	.000,474
10	.000,455	.000,922	.000,001	.000,005	.000,015	.000,076	.000,230
11以上	.000,526	.001,274	.000,001	.000,002	.000,008	.000,058	.000,218

$x$	$\rho = .75$					$\rho = .80$	
	$\alpha = 0.40$	$\alpha = 0.60$	$\alpha = 0.80$	$\alpha = 1.00$	$\alpha = 1.20$	$\alpha = 0.25$	$\alpha = 0.30$
0	.776,969	.702,927	.643,496	.594,604	.553,583	.836,512	.810,672
1	.166,493	.197,698	.214,499	.222,466	.226,466	.133,842	.149,663
2	.041,623	.064,870	.083,416	.097,552	.108,086	.024,092	.031,084
3	.010,901	.022,299	.033,984	.044,711	.054,043	.004,497	.006,695
4	.002,920	.007,839	.014,160	.020,958	.027,636	.000,854	.001,468
5	.000,793	.002,793	.005,979	.009,955	.014,320	.000,164	.000,325
6	.000,217	.001,004	.002,546	.004,770	.007,486	.000,032	.000,073
7	.000,060	.000,363	.001,091	.002,300	.003,937	.000,006	.000,016
8	.000,017	.000,132	.000,470	.001,114	.002,080	.000,001	.000,004
9	.000,005	.000,048	.000,203	.000,542	.001,103	.000,000	.000,001
10	.000,001	.000,018	.000,088	.000,264	.000,587	.000,000	.000,000
11以上	.000,001	.000,009	.000,068	.000,253	.000,673	.000,000	.000,000

$x$	$\rho = .80$						
	$\alpha = 0.35$	$\alpha = 0.40$	$\alpha = 0.45$	$\alpha = 0.50$	$\alpha = 0.60$	$\alpha = 0.70$	$\alpha = 0.80$
0	.786,562	.764,007	.742,858	.722,981	.686,600	.654,095	.624,859
1	.163,139	.174,630	.184,434	.192,795	.205,980	.215,467	.222,172
2	.038,066	.044,905	.051,514	.057,838	.069,518	.079,849	.088,869
3	.009,211	.011,975	.014,921	.017,994	.024,331	.030,678	.036,864
4	.002,269	.003,250	.004,399	.005,698	.008,668	.012,004	.015,565
5	.000,565	.000,891	.001,311	.001,823	.003,121	.004,745	.006,641
6	.000,142	.000,246	.000,393	.000,588	.001,131	.001,889	.002,853
7	.000,036	.000,068	.000,119	.000,190	.000,412	.000,756	.001,232
8	.000,009	.000,019	.000,036	.000,062	.000,151	.000,303	.000,534
9	.000,002	.000,005	.000,011	.000,020	.000,055	.000,122	.000,232
10	.000,001	.000,001	.000,003	.000,007	.000,020	.000,049	.000,101
11以上	.000,000	.000,003	.000,001	.000,004	.000,013	.000,034	.000,078

$x$	$\rho = .80$		$\rho = 1.00$				
	$\alpha = 0.90$	$\alpha = 1.00$	$\alpha = 0.20$	$\alpha = 0.25$	$\alpha = 0.30$	$\alpha = 0.35$	$\alpha = 0.40$
0	.598,408	.574,349	.833,333	.800,000	.769,231	.740,741	.714,286
1	.226,765	.229,740	.138,889	.160,000	.177,515	.192,044	.204,082
2	.096,674	.103,383	.023,148	.032,000	.040,965	.049,789	.058,309
3	.042,740	.048,245	.003,858	.006,400	.009,453	.012,908	.016,660
4	.019,233	.022,917	.000,643	.001,280	.002,182	.003,347	.004,760
5	.008,746	.011,000	.000,107	.000,256	.000,503	.000,868	.001,360
6	.004,005	.005,317	.000,018	.000,051	.000,116	.000,225	.000,389
7	.001,843	.002,582	.000,003	.000,010	.000,027	.000,058	.000,111
8	.000,851	.001,259	.000,000	.000,002	.000,006	.000,015	.000,032
9	.000,394	.000,615	.000,000	.000,000	.000,001	.000,004	.000,009
10	.000,183	.000,302	.000,000	.000,000	.000,000	.000,001	.000,003
11以上	.000,158	.000,291	.000,001	.000,001	.000,001	.000,000	.000,000

$x$	$\rho=1.00$						
	$\alpha=0.45$	$\alpha=0.50$	$\alpha=0.55$	$\alpha=0.60$	$\alpha=0.70$	$\alpha=0.80$	$\alpha=0.90$
0	.689,655	.666,667	.645,161	.625,000	.588,235	.555,556	.526,316
1	.214,031	.222,222	.228,928	.234,375	.242,214	.246,914	.249,308
2	.066,423	.074,074	.081,233	.087,891	.099,735	.109,739	.118,093
3	.020,614	.024,691	.028,824	.032,959	.041,067	.048,773	.055,939
4	.006,397	.008,230	.010,228	.012,360	.016,910	.021,677	.026,497
5	.001,985	.002,743	.003,629	.004,635	.006,963	.009,634	.012,551
6	.000,616	.000,914	.001,288	.001,738	.002,867	.004,282	.005,945
7	.000,191	.000,305	.000,457	.000,652	.001,181	.001,903	.002,816
8	.000,059	.000,102	.000,162	.000,244	.000,486	.000,846	.001,334
9	.000,018	.000,034	.000,058	.000,092	.000,200	.000,376	.000,632
10	.000,006	.000,011	.000,020	.000,034	.000,082	.000,167	.000,299
11以上	.000,005	.000,007	.000,012	.000,020	.000,060	.000,133	.000,270

表 4 負の二項分布 (その 2)

$$p_x = \left( \frac{1}{1+\alpha} \right)^{\rho} \frac{\Gamma(\rho+x)}{\Gamma(\rho)\Gamma(x+1)} \left( \frac{\alpha}{1+\alpha} \right)^x$$

$\rho\alpha$	.20	.20	.20	.20	.20	.20	.20
$\alpha$	.20	.25	.40	.50	.80	1.00	1.25
$\rho$	1.00	.80	.50	.40	.25	.20	.16
$p_0$	.833,333	.836,512	.845,154	.850,283	.863,340	.870,551	.878,316
$p_1$	.138,889	.133,842	.120,736	.113,371	.095,927	.087,055	.078,073
$p_2$	.023,148	.024,092	.025,872	.026,453	.026,646	.026,117	.025,157
$p_3$	.003,858	.004,497	.006,160	.007,054	.008,882	.009,576	.010,063
$p_4$	.000,643	.000,854	.001,540	.001,999	.003,207	.003,830	.004,416
$p_5$	.000,107	.000,164	.000,396	.000,586	.001,212	.001,609	.002,041
$p_6$	.000,018	.000,032	.000,104	.000,176	.000,471	.000,697	.000,975
$p_7$	.000,003	.000,006	.000,028	.000,054	.000,187	.000,309	.000,477
$p_8$	—	.000,001	.000,007	.000,017	.000,075	.000,139	.000,237
$p_9$	—	—	.000,002	.000,005	.000,031	.000,063	.000,119
$p_{10}$	—	—	.000,001	.000,002	.000,013	.000,029	.000,061
$p_{11}$ 以下	—	—	—	—	.000,009	.000,025	.000,065

$\rho\alpha$	.20	.20	.20	.24	.24	.24	.24
$\alpha$	2.00	2.50	4.00	.30	.40	.60	.80
$\rho$	.10	.08	.05	.80	.60	.40	.30
$p_0$	.895,959	.904,638	.922,681	.810,672	.817,190	.828,613	.838,336
$p_1$	.059,731	.051,694	.036,907	.149,663	.140,090	.124,292	.111,778
$p_2$	.021,901	.019,939	.015,501	.031,084	.032,021	.032,627	.032,291
$p_3$	.010,221	.009,875	.008,474	.006,695	.007,929	.009,788	.011,003
$p_4$	.005,281	.005,431	.005,169	.001,468	.002,039	.003,120	.004,034
$p_5$	.002,887	.003,165	.003,350	.000,325	.000,536	.001,030	.001,542
$p_6$	.001,636	.001,914	.002,255	.000,073	.000,143	.000,347	.000,605
$p_7$	.000,950	.001,188	.001,559	.000,016	.000,038	.000,119	.000,242
$p_8$	.000,562	.000,751	.001,099	.000,004	.000,010	.000,041	.000,098
$p_9$	.000,337	.000,481	.000,787	.000,001	.000,003	.000,014	.000,040
$p_{10}$	.000,205	.000,312	.000,570	—	.000,001	.000,005	.000,017
$p_{11}$ 以下	.000,330	.000,612	.001,648	—	—	.000,004	.000,014

$\rho\alpha$	.24	.24	.24	.24	.25	.25	.25
$\alpha$	1.20	1.50	2.40	3.00	.25	.50	1.00
$\rho$	.20	.16	.10	.08	1.00	.50	.25
$p_0$	.854,113	.863,634	.884,814	.895,025	.800,000	.816,497	.840,896
$p_1$	.093,176	.082,909	.062,457	.053,702	.160,000	.136,083	.105,112
$p_2$	.030,494	.028,852	.024,248	.021,749	.032,000	.034,021	.032,848
$p_3$	.012,198	.012,464	.011,981	.011,310	.006,400	.009,450	.012,318
$p_4$	.005,323	.005,908	.006,555	.006,531	.001,280	.002,756	.005,004
$p_5$	.002,439	.002,949	.003,794	.003,997	.000,256	.000,827	.002,127
$p_6$	.001,153	.001,522	.002,276	.002,538	.000,051	.000,253	.000,930
$p_7$	.000,557	.000,804	.001,400	.001,653	.000,010	.000,078	.000,415
$p_8$	.000,273	.000,431	.000,877	.001,097	.000,002	.000,024	.000,188
$p_9$	.000,136	.000,235	.000,557	.000,739	—	.000,008	.000,086
$p_{10}$	.000,068	.000,129	.000,358	.000,503	—	.000,002	.000,040
$p_{11}$ 以下	.000,070	.000,163	.000,683	.001,156	—	.000,001	.000,036

$\rho\alpha$	.25	.25	.25	2.8	2.8	2.8	2.8
$\alpha$	1.25	2.50	5.00	.35	.70	1.40	2.80
$\rho$	.20	.10	.05	.80	.40	.20	.10
$p_0$	.850,283	.882,253	.914,308	.786,562	.808,761	.839,378	.875,027
$p_1$	.094,476	.063,018	.038,096	.163,139	.133,208	.097,927	.064,476
$p_2$	.031,492	.024,757	.016,667	.038,066	.038,395	.034,275	.026,130
$p_3$	.012,830	.012,379	.009,491	.009,211	.012,648	.014,662	.013,477
$p_4$	.005,702	.006,852	.006,031	.002,269	.004,427	.006,842	.007,696
$p_5$	.002,661	.004,014	.004,071	.000,565	.001,604	.003,353	.004,650
$p_6$	.001,281	.002,437	.002,855	.000,142	.000,594	.001,695	.002,912
$p_7$	.000,630	.001,517	.002,056	.000,036	.000,224	.000,876	.001,870
$p_8$	.000,315	.000,962	.001,510	.000,009	.000,085	.000,460	.001,223
$p_9$	.000,160	.000,618	.001,126	.000,002	.000,033	.000,244	.000,811
$p_{10}$	.000,082	.000,402	.000,849	.000,001	.000,013	.000,131	.000,544
$p_{11}$ 以下	.000,088	.000,791	.002,940	—	.000,008	.000,157	.001,184



$\rho\alpha$	.28	.30	.30	.30	.30	.30	.30
$\alpha$	3.50	.30	.40	.50	.60	.75	1.00
$\rho$	.08	1.00	.75	.60	.50	.40	.30
$p_0$	.886,631	.769,231	.776,969	.784,052	.790,569	.799,438	.812,252
$p_1$	.055,168	.177,515	.166,493	.156,810	.148,232	.137,047	.121,838
$p_2$	.023,171	.040,965	.041,623	.041,816	.041,690	.041,114	.039,597
$p_3$	.012,495	.009,453	.010,901	.012,080	.013,028	.014,096	.015,179
$p_4$	.007,483	.002,182	.002,920	.003,624	.004,275	.005,135	.006,261
$p_5$	.004,749	.000,503	.000,793	.001,111	.001,443	.001,937	.002,692
$p_6$	.003,127	.000,116	.000,217	.000,346	.000,496	.000,747	.001,189
$p_7$	.002,113	.000,027	.000,060	.000,109	.000,173	.000,293	.000,535
$p_8$	.001,454	.000,006	.000,017	.000,034	.000,061	.000,116	.000,244
$p_9$	.001,015	.000,001	.000,005	.000,011	.000,022	.000,046	.000,113
$p_{10}$	.000,717	—	.000,001	.000,004	.000,008	.000,019	.000,052
$p_{11}$ 以下	.001,877	—	.000,001	.000,003	.000,003	.000,012	.000,048

$\rho\alpha$	.30	.30	.30	.30	.30	.30	.32
$\alpha$	1.25	1.50	2.00	2.50	3.00	6.00	.40
$\rho$	.24	.20	.15	.12	.10	.05	.80
$p_0$	.823,145	.832,553	.848,070	.860,423	.870,551	.907,288	.764,007
$p_1$	.109,753	.099,906	.084,807	.073,751	.065,291	.038,884	.174,630
$p_2$	.037,804	.035,966	.032,509	.029,500	.026,933	.017,498	.044,905
$p_3$	.015,682	.015,825	.015,532	.014,891	.014,140	.010,249	.011,975
$p_4$	.007,057	.007,596	.008,154	.008,296	.008,219	.006,698	.003,250
$p_5$	.003,324	.003,828	.004,512	.004,883	.005,054	.004,650	.000,891
$p_6$	.001,613	.001,991	.002,582	.002,976	.003,222	.003,355	.000,246
$p_7$	.000,799	.001,058	.001,512	.001,859	.002,106	.002,485	.000,068
$p_8$	.000,402	.000,571	.000,901	.001,182	.001,402	.001,877	.000,019
$p_9$	.000,204	.000,312	.000,544	.000,761	.000,946	.001,439	.000,005
$p_{10}$	.000,105	.000,172	.000,332	.000,496	.000,646	.001,117	.000,001
$p_{11}$ 以下	.000,112	.000,222	.000,545	.000,982	.001,490	.004,460	.000,003

$\rho\alpha$	.32	.32	.32	.32	.32	.35	.35
$\alpha$	.64	.80	1.60	3.20	4.00	.35	.50
$\rho$	.50	.40	.20	.10	.08	1.00	.70
$p_0$	.780,869	.790,480	.826,048	.866,314	.879,189	.740,741	.752,898
$p_1$	.152,365	.140,530	.101,667	.066,005	.056,268	.192,044	.175,676
$p_2$	.044,595	.043,720	.037,539	.027,659	.024,308	.049,789	.049,775
$p_3$	.014,502	.015,545	.016,941	.014,752	.013,483	.012,908	.014,932
$p_4$	.004,952	.005,873	.008,340	.008,710	.008,305	.003,347	.004,604
$p_5$	.001,739	.002,297	.004,311	.005,442	.005,422	.000,868	.001,443
$p_6$	.000,622	.000,919	.002,299	.003,593	.003,672	.000,225	.000,457
$p_7$	.000,225	.000,373	.001,253	.002,425	.002,552	.000,058	.000,146
$p_8$	.000,082	.000,153	.000,694	.001,663	.001,807	.000,015	.000,047
$p_9$	.000,030	.000,064	.000,389	.001,154	.001,298	.000,004	.000,015
$p_{10}$	.000,011	.000,027	.000,220	.000,809	.000,943	.000,001	.000,005
$p_{11}$ 以下	.000,008	.000,019	.000,299	.001,474	.002,753	—	.000,002

$\rho\alpha$	.35	.35	.35	.35	.35	.35	.36
$\alpha$	.70	1.00	1.25	.140	2.50	3.50	.45
$\rho$	.50	.35	.28	.25	.14	.10	.80
$p_0$	.766,965	.784,584	.796,873	.803,429	.839,132	.860,357	.742,858
$p_1$	.157,905	.137,302	.123,958	.117,167	.083,913	.066,917	.184,434
$p_2$	.048,765	.046,339	.044,074	.042,717	.034,165	.028,625	.051,514
$p_3$	.016,733	.018,150	.018,609	.018,689	.017,408	.015,585	.014,921
$p_4$	.006,029	.007,600	.008,477	.008,858	.009,761	.009,394	.004,399
$p_5$	.002,234	.003,306	.004,031	.004,392	.005,773	.005,991	.001,311
$p_6$	.000,843	.001,474	.001,971	.002,242	.003,532	.003,961	.000,393
$p_7$	.000,322	.000,669	.000,982	.001,168	.002,213	.002,685	.000,119
$p_8$	.000,124	.000,307	.000,497	.000,617	.001,411	.001,853	.000,036
$p_9$	.000,048	.000,142	.000,254	.000,330	.000,911	.001,297	.000,011
$p_{10}$	.000,019	.000,067	.000,131	.000,178	.000,595	.000,918	.000,003
$p_{11}$ 以下	.000,013	.000,060	.000,143	.000,213	.001,186	.002,417	.000,001

$\rho\alpha$	.36	.36	.36	.36	.36	.36	.36
$\alpha$	.60	.80	.90	1.20	1.50	1.80	2.40
$\rho$	.60	.45	.40	.30	.24	.20	.15
$p_0$	.754,272	.767,586	.773,568	.789,357	.802,591	.813,895	.832,297
$p_1$	.169,711	.153,517	.146,571	.129,168	.115,573	.104,644	.088,126
$p_2$	.050,913	.049,467	.048,600	.045,796	.042,993	.040,363	.035,769
$p_3$	.016,547	.017,955	.018,417	.019,151	.019,261	.019,028	.018,095
$p_4$	.005,585	.006,883	.007,415	.008,618	.009,361	.009,786	.010,059
$p_5$	.001,927	.002,722	.003,091	.004,043	.004,763	.005,284	.005,893
$p_6$	.000,674	.001,099	.001,318	.001,948	.002,496	.002,944	.003,571
$p_7$	.000,238	.000,450	.000,571	.000,956	.001,335	.001,676	.002,214
$p_8$	.000,085	.000,186	.000,250	.000,476	.000,725	.000,970	.001,397
$p_9$	.000,030	.000,078	.000,111	.000,239	.000,398	.000,568	.000,893
$p_{10}$	.000,011	.000,033	.000,049	.000,121	.000,221	.000,336	.000,577
$p_{11}$ 以下	.000,007	.000,024	.000,039	.000,127	.000,283	.000,506	.001,109

$\rho\alpha$	.36	.36	.40	.40	.40	.40	.40
$\alpha$	3.00	4.50	.40	.50	.80	1.00	1.25
$\rho$	.12	.08	1.00	.80	.50	.40	.32
$p_0$	.846,745	.872,511	.714,286	.722,981	.745,356	.757,858	.771,439
$p_1$	.076,207	.057,110	.204,082	.192,795	.165,635	.151,572	.137,145
$p_2$	.032,007	.025,232	.058,309	.057,838	.055,212	.053,050	.050,286
$p_3$	.016,964	.014,314	.016,660	.017,994	.020,449	.021,220	.021,605
$p_4$	.009,924	.009,018	.004,760	.005,698	.007,952	.009,019	.009,962
$p_5$	.006,133	.006,020	.001,360	.001,823	.003,181	.003,968	.004,782
$p_6$	.003,925	.004,171	.000,389	.000,588	.001,296	.001,786	.002,355
$p_7$	.002,574	.002,964	.000,111	.000,190	.000,535	.000,816	.001,181
$p_8$	.001,718	.002,146	.000,032	.000,062	.000,223	.000,378	.000,601
$p_9$	.001,162	.001,576	.000,009	.000,020	.000,094	.000,176	.000,308
$p_{10}$	.000,795	.001,171	.000,003	.000,007	.000,039	.000,083	.000,160
$p_{11}$ 以下	.001,846	.003,767	.000,001	.000,004	.000,028	.000,074	.000,176

$\rho\alpha$	.40	.40	.40	.40	.40	.42	.42
$\alpha$	1.60	2.00	4.00	5.00	8.00	.60	.70
$\rho$	.25	.20	.10	.08	.05	.70	.60
$p_0$	.787,511	.802,741	.851,340	.866,459	.895,959	.719,641	.727,329
$p_1$	.121,156	.107,032	.068,107	.057,764	.039,820	.188,906	.179,693
$p_2$	.046,598	.042,813	.029,967	.025,994	.018,583	.060,214	.059,193
$p_3$	.021,507	.020,931	.016,782	.015,019	.011,287	.020,322	.021,124
$p_4$	.010,753	.011,163	.010,405	.009,637	.007,650	.007,049	.007,828
$p_5$	.005,625	.006,251	.006,825	.006,553	.005,508	.002,485	.002,966
$p_6$	.003,029	.003,612	.004,641	.004,624	.004,121	.000,885	.001,140
$p_7$	.001,664	.002,133	.003,236	.003,347	.003,166	.000,318	.000,442
$p_8$	.000,928	.001,280	.002,297	.002,468	.002,480	.000,115	.000,173
$p_9$	.000,524	.000,777	.001,654	.001,847	.001,972	.000,042	.000,068
$p_{10}$	.000,298	.000,477	.001,204	.001,397	.001,586	.000,015	.000,027
$p_{11}$ 以下	.000,407	.000,790	.003,542	.004,891	.007,868	.000,008	.000,017

$\rho\alpha$	.42	.42	.42	.42	.45	.45	.45
$\alpha$	1.20	1.40	2.10	3.50	.45	.60	.75
$\rho$	.35	.30	.20	.12	1.00	.75	.60
$p_0$	.758,843	.769,018	.797,495	.834,862	.689,655	.702,927	.714,788
$p_1$	.144,870	.134,578	.108,048	.077,920	.214,031	.197,698	.183,803
$p_2$	.053,339	.051,028	.043,916	.033,939	.066,423	.064,870	.063,018
$p_3$	.022,790	.022,821	.021,816	.018,654	.020,614	.022,299	.023,407
$p_4$	.010,411	.010,982	.011,823	.011,317	.006,397	.007,839	.009,028
$p_5$	.004,940	.005,510	.006,728	.007,253	.001,985	.002,793	.003,560
$p_6$	.002,403	.002,839	.003,950	.004,814	.000,616	.001,004	.001,424
$p_7$	.001,189	.001,490	.002,370	.003,273	.000,191	.000,363	.000,575
$p_8$	.000,596	.000,793	.001,445	.002,266	.000,059	.000,132	.000,234
$p_9$	.000,302	.000,427	.000,892	.001,590	.000,018	.000,048	.000,096
$p_{10}$	.000,154	.000,232	.000,556	.001,128	.000,006	.000,018	.000,039
$p_{11}$ 以下	.000,163	.000,282	.000,961	.002,984	.000,005	.000,009	.000,028

$\rho\alpha$	.45	.45	.45	.45	.45	.45	.45
$\alpha$	.90	1.00	1.25	1.50	1.80	2.25	2.50
$\rho$	.50	.45	.36	.30	.25	.20	.16
$p_0$	.725,476	.732,043	.746,817	.759,658	.773,055	.789,993	.818,369
$p_1$	.171,823	.164,710	.149,363	.136,738	.124,241	.109,384	.093,528
$p_2$	.061,042	.059,707	.056,426	.053,328	.049,918	.045,436	.038,747
$p_3$	.024,096	.024,380	.024,660	.024,531	.024,068	.023,068	.019,927
$p_4$	.009,987	.010,514	.011,508	.012,143	.012,571	.012,776	.011,245
$p_5$	.004,258	.004,679	.005,575	.006,266	.006,869	.007,430	.006,683
$p_6$	.001,849	.002,125	.002,767	.003,321	.003,864	.004,458	.004,105
$p_7$	.000,813	.000,979	.001,397	.001,793	.002,218	.002,733	.002,580
$p_8$	.000,361	.000,456	.000,714	.000,982	.001,292	.001,703	.001,650
$p_9$	.000,162	.000,214	.000,368	.000,543	.000,761	.001,074	.001,068
$p_{10}$	.000,073	.000,101	.000,192	.000,303	.000,453	.000,684	.000,699
$p_{11}$ 以下	.000,060	.000,092	.000,213	.000,394	.000,690	.001,261	.001,399

$\rho\alpha$	.45	.45	.45	.45	.48	.48	.48
$\alpha$	3.00	3.75	4.50	9.00	.60	.80	1.20
$\rho$	.15	.12	.10	.05	.80	.60	.40
$p_0$	.812,252	.829,463	.843,264	.891,251	.686,600	.702,808	.729,510
$p_1$	.091,378	.078,581	.068,994	.040,106	.205,980	.187,415	.159,166
$p_2$	.039,407	.034,741	.031,047	.018,950	.069,518	.066,637	.060,772
$p_3$	.021,181	.019,382	.017,782	.011,654	.024,331	.025,667	.026,519
$p_4$	.012,510	.011,935	.011,275	.007,998	.008,668	.010,267	.012,295
$p_5$	.007,788	.007,764	.007,565	.005,830	.003,121	.004,198	.005,902
$p_6$	.005,013	.005,231	.005,261	.004,417	.001,131	.001,741	.002,897
$p_7$	.003,303	.003,610	.003,751	.003,435	.000,412	.000,730	.001,445
$p_8$	.002,214	.002,537	.002,724	.002,725	.000,151	.000,308	.000,729
$p_9$	.001,504	.001,807	.002,006	.002,193	.000,055	.000,131	.000,371
$p_{10}$	.001,032	.001,301	.001,493	.001,787	.000,020	.000,056	.000,190
$p_{11}$ 以下	.002,418	.003,648	.004,838	.009,654	.000,013	.000,042	.000,204

$\rho\alpha$	.48	.50	.50	.50	.50	.50	.50
$\alpha$	2.40	.50	1.00	1.25	2.00	2.50	5.00
$\rho$	.20	1.00	.50	.40	.25	.20	.10
$p_0$	.782,896	.666,667	.707,107	.722,981	.759,836	.778,371	.835,959
$p_1$	.110,526	.222,222	.176,777	.160,662	.126,639	.111,196	.069,663
$p_2$	.046,811	.074,074	.066,291	.062,480	.052,766	.047,655	.031,929
$p_3$	.024,232	.024,691	.027,621	.027,769	.026,383	.024,962	.018,625
$p_4$	.013,684	.008,230	.012,084	.013,113	.014,291	.014,264	.012,029
$p_5$	.008,114	.002,743	.005,438	.006,411	.008,098	.008,559	.008,220
$p_6$	.004,964	.000,914	.002,492	.003,205	.004,724	.005,298	.005,822
$p_7$	.003,103	.000,305	.001,157	.001,628	.002,812	.003,352	.004,228
$p_8$	.001,972	.000,102	.000,542	.000,837	.001,699	.002,155	.003,127
$p_9$	.001,268	.000,034	.000,256	.000,434	.001,038	.001,402	.002,345
$p_{10}$	.000,823	.000,011	.000,122	.000,227	.000,640	.000,922	.001,778
$p_{11}$ 以下	.001,607	.000,007	.000,113	.000,253	.001,074	.001,864	.006,275

$\rho\alpha$	.54	.54	.54	.55	.55	.55	.56
$\alpha$	.90	1.20	3.60	.55	1.00	2.75	.70
$\rho$	.60	.45	.15	1.00	.55	.20	.80
$p_0$	.680,374	.701,310	.795,401	.645,161	.683,020	.767,704	.654,095
$p_1$	.193,369	.172,140	.093,373	.228,928	.187,831	.112,597	.215,467
$p_2$	.073,277	.068,073	.042,018	.081,233	.072,784	.049,542	.079,849
$p_3$	.030,082	.030,324	.023,567	.028,824	.030,933	.026,643	.030,687
$p_4$	.012,824	.014,266	.014,524	.010,228	.013,727	.015,630	.012,004
$p_5$	.005,589	.006,925	.009,434	.003,629	.006,246	.009,628	.004,745
$p_6$	.002,471	.003,431	.006,337	.001,288	.002,889	.006,119	.001,889
$p_7$	.001,104	.001,725	.004,357	.000,457	.001,351	.003,975	.000,756
$p_8$	.000,497	.000,876	.003,048	.000,162	.000,638	.002,623	.000,303
$p_9$	.000,225	.000,449	.002,160	.000,058	.000,303	.001,753	.000,122
$p_{10}$	.000,102	.000,231	.001,547	.000,020	.000,145	.001,183	.000,049
$p_{11}$ 以下	.000,086	.000,250	.004,234	.000,012	.000,133	.002,603	.000,034

$\rho\alpha$	.56	.56	.60	.60	.60	.60	.60
$\alpha$	.80	1.40	.60	.75	.80	1.00	1.20
$\rho$	.70	.40	1.00	.80	.75	.60	.50
$p_0$	.662,688	.704,556	.625,000	.639,101	.643,496	.659,754	.674,200
$p_1$	.201,170	.164,396	.234,375	.219,120	.214,499	.197,926	.183,873
$p_2$	.077,886	.067,129	.087,891	.084,518	.083,416	.079,170	.075,221
$p_3$	.031,155	.031,327	.032,959	.033,807	.033,984	.034,307	.034,191
$p_4$	.012,808	.015,533	.012,360	.013,764	.014,160	.015,438	.016,319
$p_5$	.005,351	.007,974	.004,635	.005,663	.005,979	.007,102	.008,011
$p_6$	.002,259	.004,186	.001,738	.002,346	.002,546	.003,314	.004,005
$p_7$	.000,961	.002,233	.000,652	.000,977	.001,091	.001,562	.002,029
$p_8$	.000,411	.001,205	.000,244	.000,408	.000,470	.000,742	.001,037
$p_9$	.000,177	.000,656	.000,092	.000,171	.000,203	.000,355	.000,534
$p_{10}$	.000,076	.000,360	.000,034	.000,072	.000,088	.000,170	.000,277
$p_{11}$ 以下	.000,058	.000,445	.000,020	.000,053	.000,068	.000,160	.000,303

$\rho\alpha$	.60	.60	.60	.60	.60	.60	.60
$\alpha$	1.50	2.00	2.40	2.50	3.00	4.00	5.00
$\rho$	.40	.30	.25	.24	.20	.15	.12
$p_0$	.693,145	.719,223	.736,428	.740,327	.757,858	.785,515	.806,532
$p_1$	.166,355	.143,845	.129,958	.126,913	.113,679	.094,262	.080,653
$p_2$	.069,869	.062,333	.057,334	.056,204	.051,155	.043,360	.037,638
$p_3$	.033,537	.031,859	.030,353	.029,976	.028,135	.024,860	.022,165
$p_4$	.017,104	.017,522	.017,409	.017,343	.016,881	.015,662	.014,407
$p_5$	.009,031	.010,046	.010,445	.010,505	.010,635	.010,399	.009,893
$p_6$	.004,877	.005,916	.006,451	.006,553	.006,913	.007,141	.007,035
$p_7$	.002,675	.003,550	.004,066	.004,173	.004,592	.005,019	.005,125
$p_8$	.001,485	.002,159	.002,601	.002,697	.003,100	.003,589	.003,801
$p_9$	.000,831	.001,328	.001,683	.001,764	.002,118	.002,600	.002,858
$p_{10}$	.000,469	.000,823	.001,099	.001,164	.001,462	.001,903	.002,172
$p_{11}$ 以下	.000,622	.001,396	.002,173	.002,381	.003,472	.005,690	.007,721

$\rho\alpha$	.60	.60	.70	.70	.70	.70	.70
$\alpha$	6.00	7.50	.70	1.00	1.40	2.00	2.50
$\rho$	.10	.08	1.00	.70	.50	.35	.28
$p_0$	.823,171	.842,648	.588,235	.615,572	.645,497	.680,781	.704,143
$p_1$	.070,558	.059,481	.242,214	.215,450	.188,270	.158,849	.140,829
$p_2$	.033,263	.028,341	.099,735	.091,566	.082,368	.071,482	.064,379
$p_3$	.019,958	.017,338	.041,067	.041,205	.040,040	.037,329	.034,948
$p_4$	.013,258	.011,780	.016,910	.019,057	.020,437	.020,842	.020,470
$p_5$	.009,318	.008,481	.006,963	.008,957	.010,729	.012,089	.012,516
$p_6$	.006,789	.006,336	.002,867	.004,255	.005,737	.007,186	.007,867
$p_7$	.005,071	.004,856	.001,181	.002,036	.003,108	.004,346	.005,041
$p_8$	.003,858	.003,792	.000,486	.000,980	.001,700	.002,662	.003,277
$p_9$	.002,976	.003,004	.000,200	.000,474	.000,936	.001,646	.002,153
$p_{10}$	.002,321	.002,407	.000,082	.000,230	.000,519	.001,026	.001,427
$p_{11}$ 以下	.009,459	.011,536	.000,060	.000,218	.000,659	.001,762	.002,950

$\rho\alpha$	.70	.72	.72	.72	.72	.75	.75
$\alpha$	3.50	.90	1.20	1.60	4.50	1.00	1.25
$\rho$	.20	.80	.60	.45	.16	.75	.60
$p_0$	.740,214	.598,408	.623,084	.650,522	.761,276	.594,604	.614,739
$p_1$	.115,144	.226,765	.203,918	.180,145	.099,658	.222,977	.204,913
$p_2$	.053,734	.096,674	.088,983	.080,372	.047,292	.097,552	.091,072
$p_3$	.030,648	.042,740	.042,064	.040,392	.027,859	.044,711	.043,850
$p_4$	.019,070	.019,233	.020,650	.021,439	.018,007	.020,958	.021,925
$p_5$	.012,459	.008,746	.010,362	.011,742	.012,258	.009,955	.011,206
$p_6$	.008,398	.004,005	.005,275	.006,563	.008,625	.004,770	.005,811
$p_7$	.005,786	.001,843	.002,713	.003,722	.006,210	.002,300	.003,044
$p_8$	.004,050	.000,851	.001,406	.002,133	.004,548	.001,114	.001,606
$p_9$	.002,870	.000,394	.000,733	.001,232	.003,373	.000,542	.000,853
$p_{10}$	.002,054	.000,183	.000,384	.000,717	.002,528	.000,264	.000,455
$p_{11}$ 以下	.005,573	.000,158	.000,428	.001,021	.008,366	.000,253	.000,526



$\rho\alpha$	.75	.75	.75	.75	.75	.80	.80
$\alpha$	1.50	2.50	3.00	5.00	7.50	.80	1.00
$\rho$	.50	.30	.25	.15	.10	1.00	.80
$p_0$	.632,456	.686,720	.707,107	.764,324	.807,343	.555,556	.574,349
$p_1$	.189,737	.147,154	.132,583	.095,541	.071,236	.246,914	.229,740
$p_2$	.085,382	.068,322	.062,148	.045,780	.034,570	.109,739	.103,383
$p_3$	.042,691	.037,414	.034,958	.027,341	.021,352	.048,773	.048,245
$p_4$	.022,413	.022,048	.021,303	.017,942	.014,601	.021,677	.022,917
$p_5$	.012,103	.013,544	.013,580	.012,410	.010,564	.009,634	.011,000
$p_6$	.006,657	.008,545	.008,912	.008,877	.007,923	.004,282	.005,317
$p_7$	.003,709	.005,493	.005,968	.006,499	.006,092	.001,903	.002,582
$p_8$	.002,086	.003,581	.004,056	.004,840	.004,771	.000,846	.001,259
$p_9$	.001,182	.002,359	.002,789	.003,653	.003,789	.000,376	.000,615
$p_{10}$	.000,674	.001,567	.001,935	.002,785	.003,042	.000,167	.000,302
$p_{11}$ 以下	.000,910	.003,253	.004,661	.010,008	.014,717	.000,133	.000,291

$\rho\alpha$	.80	.80	.80	.80	.80	.80	.80
$\alpha$	1.60	2.00	2.50	3.20	4.00	5.00	8.00
$\rho$	.50	.40	.32	.25	.20	.16	.10
$p_0$	.620,174	.644,394	.669,728	.698,534	.724,780	.750,751	.802,742
$p_1$	.190,823	.171,838	.153,081	.133,054	.115,965	.100,100	.071,355
$p_2$	.088,072	.080,191	.072,167	.063,359	.055,663	.048,382	.034,885
$p_3$	.045,165	.042,769	.039,863	.036,205	.032,656	.029,029	.021,706
$p_4$	.024,320	.024,236	.023,633	.022,413	.020,900	.019,111	.014,953
$p_5$	.013,469	.014,218	.014,585	.014,515	.014,045	.013,250	.010,899
$p_6$	.007,598	.008,531	.009,237	.009,677	.009,738	.009,496	.008,235
$p_7$	.004,342	.005,200	.005,957	.006,583	.006,900	.006,964	.006,379
$p_8$	.002,505	.003,207	.003,893	.004,545	.004,968	.005,194	.005,032
$p_9$	.001,456	.001,995	.002,571	.003,174	.003,621	.003,924	.004,026
$p_{10}$	.000,851	.001,250	.001,711	.002,237	.002,665	.002,995	.003,256
$p_{11}$ 以下	.001,225	.002,171	.003,574	.005,704	.008,099	.010,804	.016,532

$\rho\alpha$	.90	.90	.90	.90	.90	.90
$\alpha$	.90	1.20	1.50	1.80	2.00	2.25
$\rho$	1.00	.75	.60	.50	.45	.40
$p_0$	.526,316	.553,583	.577,080	.596,614	.609,952	.624,089
$p_1$	.249,308	.226,466	.207,749	.192,090	.182,986	.172,825
$p_2$	.118,093	.108,086	.099,719	.092,615	.088,443	.083,753
$p_3$	.055,939	.054,043	.051,854	.049,615	.048,152	.046,387
$p_4$	.026,497	.027,636	.028,001	.027,909	.027,688	.027,297
$p_5$	.012,551	.014,320	.015,457	.016,147	.016,428	.016,630
$p_6$	.005,945	.007,486	.008,656	.009,515	.009,948	.010,362
$p_7$	.002,816	.003,937	.004,897	.005,680	.006,111	.006,559
$p_8$	.001,334	.002,080	.002,791	.003,423	.003,794	.004,200
$p_9$	.000,632	.001,103	.001,600	.002,078	.002,375	.002,714
$p_{10}$	.000,299	.000,587	.000,922	.001,269	.001,496	.001,766
$p_{11}$ 以下	.000,270	.000,673	.001,274	.002,045	.002,627	.003,418

$\rho\alpha$	.90	.90	.90	.90	.90	.90
$\alpha$	3.60	4.50	5.00	6.00	7.50	9.00
$\rho$	.25	.20	.18	.15	.12	.10
$p_0$	.682,827	.711,095	.724,324	.746,853	.773,517	.794,328
$p_1$	.133,597	.116,361	.108,649	.096,024	.081,902	.071,490
$p_2$	.065,346	.057,123	.053,419	.047,326	.040,469	.035,387
$p_3$	.038,355	.034,274	.032,348	.029,072	.025,234	.022,294
$p_4$	.024,389	.022,434	.021,431	.019,623	.017,367	.015,550
$p_5$	.016,224	.015,418	.014,930	.013,961	.012,627	.011,476
$p_6$	.011,110	.010,933	.010,741	.010,271	.009,507	.008,779
$p_7$	.007,763	.007,923	.007,903	.007,735	.007,334	.006,885
$p_8$	.005,506	.005,834	.005,910	.005,925	.005,759	.005,500
$p_9$	.003,950	.004,349	.004,477	.004,599	.004,585	.004,455
$p_{10}$	.002,859	.003,274	.003,425	.003,607	.003,690	.003,648
$p_{11}$ 以下	.008,074	.010,982	.012,443	.015,004	.018,009	.020,208