

Actuarial Supply & Demand

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Additional Perspectives

Measuring actuarial supply and demand in terms of GDP is indeed a valid basis for setting the actuarial density of a country and for examining the future prospects of the global actuarial profession. In fact GDP data is widely available and is a fair measure of the overall size of an economy that will in turn drive the extent of the demand for actuarial skills. A greater economy means more insurance companies, higher premiums, more private pension, that is more employment opportunities for actuaries.

However, further perspectives and approaches deserve to be addressed for a refined analysis of actuarial supply and demand. The additional benchmarks I suggest are population, total insurance premium and insurance density (per capita) as well as the pension industry. As will be seen in this part of the paper each individual benchmark presents different degrees of correlation with the number of actuaries. At this stage, I chose to limit my additional perspectives to the global insurance market because the insurance market data are more widely accessible and quantified than data for the consulting market, government positions, and pension markets all of which represent significant drivers for actuarial demand and supply.

In the additional perspectives we explore a sample of 72 countries was used for our analysis using data of i.e. Muhanna & co (Rating Services), as well as the sources previously used in this paper.

Considering these additional perspectives is essential if we examine certain scenarios. A country with a relatively high GDP would need fewer actuaries than a country with a lower GDP but a higher total market insurance premium. This explains the high statistical correlation of 0.923 between number of actuaries and the total insurance market premium. This does not contradict the strong link between number of actuaries and GDP for which the correlation is slightly lower at 0.916 and for which the paper makes the case as a benchmark. However if we compare on one side the GDP and insurance market of Kuwait, Qatar and Oman and the other side the GDP and insurance market of Lebanon, it is highly evident that Lebanon with a lower GDP needs and has actually more actuaries than these 3 Arab Gulf countries because of the size of its insurance market.

Table1

Country	Kuwait	Qatar	Oman	Lebanon
GDP 2004 (billion USD)	43	23	21	19
Insurance market (million USD)	393	283	274	577

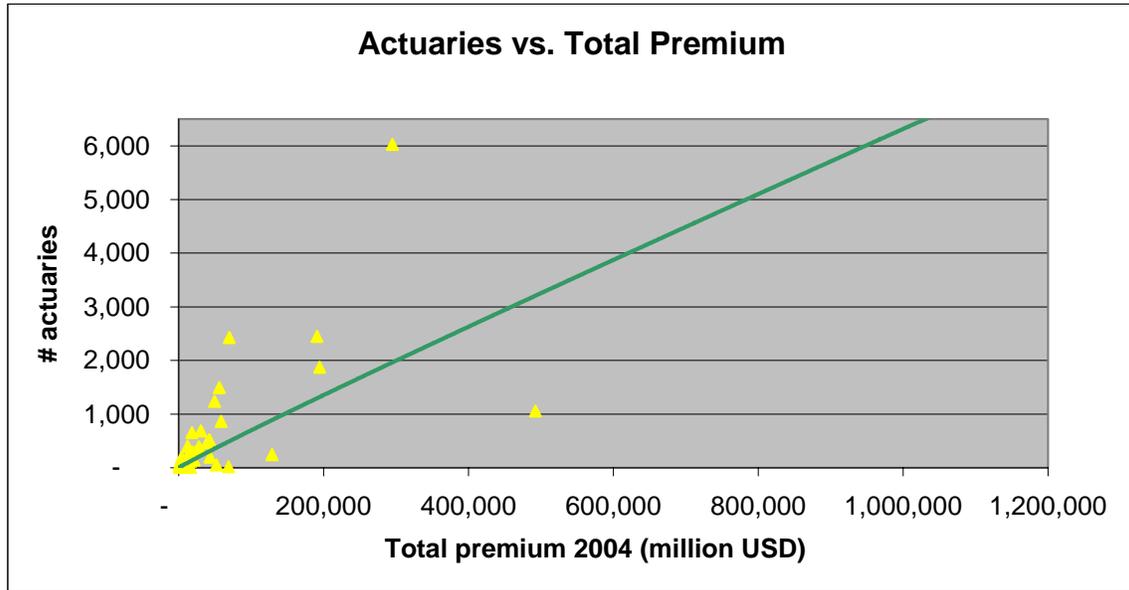
Source: Muhanna & Co (Rating Services)

A more striking argument for the fundamental correlation between insurance market size and the number of actuaries is found when comparing France and the United Kingdom. The GDP of the UK exceeds that of France by 5.35% only, whereas the insurance market premium of the UK exceeds that of France by 51.5%. The natural actual outcome is that there are 6,029 actuaries and only 1,874 French actuaries compared to fairly close GDP

figures. It will be interesting to know how many of the UK and French actuaries are working in the insurance industry vs. pensions.

The following chart illustrates the link between number of actuaries and total premium for all the data range we used:

Chart 1



Source: Muhanna & Co (Rating Services)

Considering the strong evidenced relation between insurance premium growth and the number of actuaries, let us examine a static perspective at a fixed date by measuring the correlation between number of actuaries and total insurance premium at different insurance market premium ranges. We notice a clearly higher correlation between number of actuaries and Total premium at higher total premium levels in table 2 below.

Table 2

Total Premium 2004 (million USD)		Correlation
From	To	coefficient
252	1,098	0.63
1,196	30,682	0.76
38,853	1,097,836	0.91

A further in depth analysis should separate life from non-life premiums in order to derive a regression that would estimate the different weight to be given to life and non-life. This should also be done over a period of at least 5 years in order to identify whether there is any correlation to growth in premium over time and the growth of the number of actuaries.

Furthermore we have identified the total assets relating to the life and non-life insurance industry. However, we are having problems with the assets of the pension and social insurance funds.

It is widely accepted in the insurance industry that insurance premiums growth outpaces GDP growth especially in emerging economies. That will have enormous consequences on the demand of actuarial skills in countries such as China or India which have both expanding actuarial professions. What is implied is that the number of actuaries should increase in certain emerging economies at a higher rate than GDP growth. Therefore, a separate analysis for emerging double digit insurance markets and mature insurance markets is essential.

But the analysis of actuarial demand does not stop here as even developed countries with lower expected GDP growth than emerging countries will have a rising demand for actuarial skills. Therefore, in addition to the overall growth of GDP, actuarial demand in developed economies will be severely boosted in the future by the pronounced aging of populations and increased privatization that will in turn generate new roles for actuaries in the growing fields of life insurance, savings, annuities and private pensions all of which are considered promising markets by the financial services industry.

Moreover, we examined the potential relation between number of actuaries on the one hand and population and insurance density on the other hand as eventual additional benchmarks. A larger population might mean a larger insurance customer base for example. Population and insurance density have to be studied together, the latter being Total Insurance Premium divided by the former. The main findings are that compared to the correlation with total insurance premium 0.923, insurance density exhibits a lower correlation with number of actuaries at 0.411 than total premiums and population exhibits the lowest correlation with number of actuaries at 0.115.

Table 3

Correlation with # of actuaries		
Population	Insurance Density	Total Premium
0.115	0.411	0.923

The explanation of these numbers bring us back to the most populated countries i.e. China and India that still have emerging insurance markets with insurance penetrations (premiums % of GDP) at 3.26% and 3.17% respectively compared to 9.17% in North America for example (2004 figures).

Therefore, a larger population does not necessarily mean a greater insurance industry because of factors such as underdevelopment and long term poverty in the world's developing and least developed countries.

However note that by removing China and India, the number of actuaries posts a 0.534 correlation with the population which is a factor worth consideration. However by removing these countries the correlation between number of actuaries and insurance

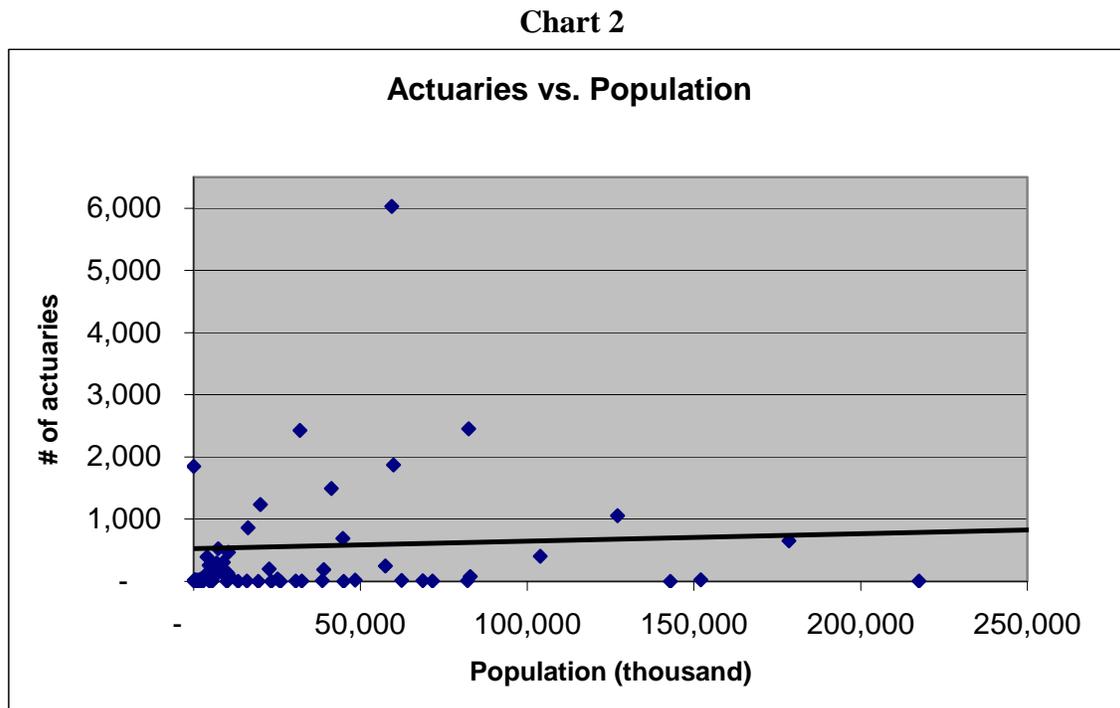
density does not improve which reflects perhaps the prevalence of non-life insurance branches.

The decreasing correlation between number of actuaries and population size with increasing ranges of population size can be seen in the following table. This decrease is due to the fact that many of the most populated countries like China, Indonesia, India, Pakistan and Russia have very few actuaries.

Table 4

Population 2004 (thousand)		Correlation
From	To	coefficient
300	10,000	0.546
10,100	82,900	0.244
103,900	1,079,500	0.017

Please note below the trend line of number of actuaries versus population.



To conclude our additional perspectives that unfortunately did not include government roles and the pension industry we infer that GDP is a good benchmark for measuring the global demand for actuarial skills but that Total Insurance premium is a more powerful one. Other benchmarks addressed such as total population and insurance industry density

although of interest did not prove to be as powerful as Total Insurance premium in driving the both the demand for and actual number of actuaries. However further phenomena such as consolidation, the insurance market growth in developing countries and growth of retirement products in mature markets due to aging have yet to be integrated into the quantification of the global actuarial demand not to mention the significant development of actuarial education in the world that will itself create more demand for actuarial skills.

Last but not least, we should factor the issue of mandatory (by law) actuarial opinions and look into the growth of actuaries working outside the insurance and pension world.

What perplexes me most is the question:

Does the supply of actuaries drive the economy forward?

I hope so!

Appendix A

	Country	Numbers of actuaries	Population (millions)	Density Life	Density Non- Life
1	No Country	1,850			
2	Andorra	8			
3	Argentina	190	39	34.5	70.6
4	Australia	1,237	20	1285.1	1186.3
5	Austria	198	8.1	955.3	1204.4
8	Bangladesh	2	140.5	1.5	0.8
10	Belgique	465	10.4	2291.2	984.4
12	Botswana	2	1.7	125.5	56.0
13	Brazil	653	178.5	45.9	55.2
15	Canada	2,429	31.9	926.1	1262.6
17	Chile	5	15.9	164.5	88.6
18	China	56	1297.2	27.3	12.9
19	Colombia	1	45	14.3	37.6
21	Croatia	49	4.4	58.7	189.2
23	Cyprus	19	0.8	453.3	408.2
24	Czech Republic	57	10.2	168.6	261.9
25	Denmark	291	5.4	2310.5	1309.9
26	Ecuador	1	13.3	4.5	32.6
27	Egypt	8	68.7	3.1	5.8
28	Estonia	17	1.3	47.8	140.2
29	Finland	124	5.2	2461.0	673.1
30	France	1,874	59.9	2150.2	1057.7
31	Germany	2,451	82.5	1021.3	1265.3
33	Greece	76	10.8	177.9	224.1
35	Hong Kong	297	6.9	1884.3	332.9
36	Hungary	137	10.1	117.3	170.0
37	Iceland	18	0.3	126.9	1183.3
38	India	148	1079.5	15.7	4.0
39	Indonesia	7	217.5	7.5	8.1
40	Ireland	392	4	2617.4	1473.8
41	Israel	105	6.8	467.4	576.0
42	Italy	247	57.5	1417.2	800.7
43	Jamaica	16	2.7	60.8	100.7
44	Japan	1,058	127.1	3044.0	830.8
45	Kenya	5	32.4	3.7	8.9
46	Kuwait	1	2.4	39.1	122.2
48	Lebanon	9	4.6	39.6	87.2
50	Luxembourg	22	0.4	1007.1	1555.8
51	Malaysia	40	25.2	167.3	89.3
52	Malta	2	0.4	368.2	360.4
54	Mauritius	10	1.2	133.1	87.7
55	Mexico	404	103.9	50.2	67.6
58	Morocco	5	30.6	10.6	34.3

59	Namibia	3	2	154.3	70.7
60	Netherlands	863	16.3	1936.5	1663.1
61	New Zealand	127	4	318.0	1064.2
63	Nigeria	4	138.4	0.7	3.3
64	Norway	257	4.6	1714.4	1127.8
65	Oman	1	2.7	14.2	88.9
66	Pakistan	22	152.1	1.5	2.2
67	Philippines	76	82.9	9.4	6.1
68	Poland	11	38.6	73.3	119.4
69	Portugal	122	10.2	768.1	525.4
71	Russian Federation	1	142.9	24.8	89.6
72	Saudi Arabia	1	23.3	2.1	49.3
73	Singapore	113	4.3	1483.9	365.5
74	Slovakia	1	5.4	111.8	164.2
75	Slovenia	36	2	270.0	649.5
76	South Africa	690	44.7	545.5	141.0
77	South Korea	21	48.4	1006.8	412.5
78	Spain	1,495	41.3	571.9	783.3
79	Sri Lanka	1	19.4	6.2	7.9
82	Sweden	307	8.9	1764.3	925.7
83	Switzerland	526	7.3	3275.1	2441.2
84	Taiwan	199	22.6	1494.6	414.4
86	Thailand	15	62.4	50.8	41.4
87	Trinidad and Tobago	18	1.3	484.5	174.8
88	Tunisia	1	10	4.3	51.0
89	Turkey	3	71.6	12.0	52.6
90	United Arab Emirates	2	4.3	59.7	290.6
91	United Kingdom	6,029	59.4	3190.4	1318.0
92	United States	16,672	292.4	1692.5	2062.6
94	Venezuela	1	26	3.1	98.0
95	Vietnam	8	82.1	7.3	3.7
TOTALS		42,824	5,196		

Source: Sigma & UN