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Watch Out For Mortality Shocks!

by Ronald L. Klein

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Many articles have been written about improvements in mortality, both in the general population and, particularly, in the context of insured lives. These commentaries tend to point to published mortality studies which make it clearly evident that the rate of mortality is on the decline. One such study was undertaken by the Society of Actuaries, the major U.S.-based professional body for life insurance actuaries. This is an insured-life study performed between 1976 and 1990, using data from major insurance companies in the United States. Figure 1 on page five illustrates the downward mortality trend.

For any actuary reading these figures, it must be hard to resist the temptation to project such encouraging results into the future. After all, this is what actuaries are supposed to do. Using a "Least Squares Estimator"—a mathematical projection tool used by our profession—yields the results shown in Figure 2 on page five.

As mortality continues to improve along the projection period, an interesting phenomenon occurs: in the year 2035, the mortality line hits the x-axis, and immortality kicks in, albeit only for those who had the foresight to purchase life insurance in the United States! Projecting the trend onwards gives us reincarnation and, with it, further confusion: should life insurers seek to recover death benefits from those who come back to life, and with interest? … Back in the real world, clearly no actuary is going to price for immortality (except maybe those who price annuities), but the fact that mortality is improving and—we believe—will continue to do so, is too great to ignore. The question is, will the road be smooth and steady?

In examining trends in mortality, there is a risk that pricing actuaries fail to look closely enough at the variability around the forecasts they make. At Swiss Re, we have looked closely at what we call mortality "shocks."

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Life Reinsurance Data From The Munich American Survey

by David M. Bruggeman

Munich American's annual survey, which is conducted on behalf of the Statistical Research Committee of the Reinsurance Section, covers Canadian and U.S. ordinary and group life reinsurance new business production and in force. The ordinary numbers are further subdivided into:

(1) Recurring reinsurance[1]: conventional reinsurance covering an insurance policy with an issue date in the year in which it was reinsured,

(2) Portfolio reinsurance: reinsurance covering an insurance policy with an issue date in a year prior to the year in which it was reinsured, or financial reinsurance, and,

(3) Retrocession reinsurance: reinsurance not directly written by the ceding company.

Complete survey results are available from the authors upon request. These results may also be obtained at Munich American's Web site: *www.marclife.com* (look under Research).

Life Reinsurance Production

The recent reinsurance acquisition activity has played a large role in the life reinsurance production numbers over the last few years. Looking solely at the total number for 2002, we see that a 14.6 percent decrease in production was reported (15.9 percent decrease in the U.S., 4.9 percent increase in Canada). However, the overall numbers are heavily impacted by a couple of recent reinsurance acquisitions—Swiss Re's acquisition of Lincoln Re in 2001 and Employers/ERC's acquisition of AUL in 2002. Excluding these acquisitions from the portfolio category reveals a much different and, we believe, a more accurate picture of the market.

So let's take a look at the results, excluding these two acquisitions. Recurring was the only category in the United States to show an increase, however the solid increase more than made up for the decreases

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Life Reinsurance Data... • from page 1

Figure 1: Life Reinsurance New Business Production (U.S. Millions)

Includes Swiss Re's acquisition of Lincoln Re in 2001 (portfolio) and Employers/ERC's acquisition of AUL in 2002 (portfolio)

	U.S. 2001	U.S. 2002	U.S. Change	Canadian 2001	Canadian 2002	Canadian Change	Total 2001	Total 2002	Total Change
Ordinary Life									
Recurring	947,169	1,078,262	13.8%	67,050	81,478	21.5%	1,014,219	1,159,740	14.3%
Portfolio	569,358	204,495	-64.1%	36,144	24,148	-33.2%	605,502	228,643	-62.2%
Retrocession	25,141	23,989	-4.6%	1,431	2,474	72.9%	26,572	26,463	-0.4%
Total Ordinary	1,541,668	1,306,746	-15.2%	104,625	108,100	3.3%	1,646,293	1,414,846	-14.1%
Total Group	48,822	30,625	-37.3%	5,930	7,845	32.3%	54,752	38,752	-29.7%
Total Life	1,590,490	1,337,371	-15.9%	110,555	115,945	4.9%	1,701,045	1,453,316	-14.6%

Figure 2: Life Reinsurance New Business Production (U.S. Millions)

Excludes Swiss Re's acquisition of Lincoln Re in 2001 (portfolio) and Employers/ERC's acquisition of AUL in 2002 (portfolio)

	U.S. 2001	U.S. 2002	U.S. Change	Canadian 2001	Canadian 2002	Canadian Change	Total 2001	Total 2002	Total Change
Ordinary Life									
Recurring	947,169	1,078,262	13.8%	67,050	81,478	21.5%	1,014,219	1,159,740	14.3%
Portfolio	99,265	68,210	-31.3%	15,228	24,148	58.6%	114,493	92,358	-19.3%
Retrocession	25,141	23,989	-4.6%	1,431	2,474	72.9%	26,572	26,463	-0.4%
Total Ordinary	1,071,575	1,170,461	9.2%	83,709	108,100	29.1%	1,155,284	1,278,561	10.7%
Total Group	48,822	30,625	-37.3%	5,930	7,845	32.3%	54,752	38,752	-29.7%
Total Life	1,120,397	1,201,086	7.2%	89,639	115,945	29.3%	1,210,036	1,317,031	8.8%

in the other categories. The end result showed a total U.S. life production increase of 7.2 percent in 2002. The picture was even brighter in Canada where every reinsurance category showed tremendous growth. Total Canadian production increased 29.3 percent in 2002. If we exclude the two reinsurance acquisitions mentioned above, the 14.6 percent overall (U.S. and Canada) decrease becomes an 8.8 percent increase.

The life reinsurance production results for 2001 and 2002 are shown above—with and without the two acquisitions mentioned earlier.

Recurring Business

It should be noted that the survey attempts to remove any double counting of retrocession and block reinsurance from the recurring figures. Hence, recurring business represents the "true" new business reinsured from direct writers and usually offers the most revealing picture of

Figure 3: U.S. Ordinary Recurring Reinsurance (U.S. Millions)

Company	Assumed Business	2001 Market Share	Increase In Production	Assumed Business	2002 Market Share	Increase in Production
Allianz	43,711	4.6%	-4.0%	54,749	5.1%	25.3%
Annuity & Life Re	55,764	5.9%	72.9%	56,662	5.3%	1.6%
AUL*	21,750	2.3%	-53.7%	ACQ	ACQ	ACQ
BMA	39,003	4.1%	18.2%	74,2555	6.9%	90.4%
Canada Life	39,003	4.1%	65.7%	29,360	2.7%	54.4%
Employers/ERC	50,448	5.3%	-41.7%	58,483	5.4%	15.9%
General & Cologne	16,231	1.7%	-20.1	14,615	1.4%	-10.0%
Gerling Global	25,691	2.7%	-18.2%	24,790	2.3%	-3.5%
Hannover Life Re	3,155	0.3%	-50.6%	5,810	0.5%	84.2%
ING Re	93,584	9.9%	8.8%	129,340	12.0%	38.2%
Munich American Re	103.679	10.9%	-13.5%	80,076	7.4%	-22.8%
Optimum Re (U.S.)	1,301	0.1%	21.7%	1,694	0.3%	30.2%
RGA	112,746	11.9%	-5.6%	116,491	10.8%	3.3%
SCOR Life Re	2,923	0.3%	246.3%	21,888	2.0%	648.8%
Scottish Re	26,045	2.7%	100.0%	34,339	3.2%	31.8%
Swiss Re	246,466	26.0%	-4.7%	265,491	24.6%	7.7%
Transamerica Re	85,662	9.0%	6.1%	110,219	10.2%	28.7%
TOTALS	**947,169**	**100.0%**	**-3.9%**	**1,078,262**	**100.0%**	**13.8%**

Figure 4: Canada Ordinary Recurring Reinsurance (U.S. Millions)

Company	Assumed Business	2001 Market Share	Increase In Production	Assumed Business	2002 Market Share	Increase in Production
Canada Life	461	0.7%	100.0%	521	0.6%	100.0%
General & Cologne	41	0.1%	583.3%	18	0.0%	-56.1%
ERC-Canada	7,386	11.0%	94.6%	12,793	15.7%	73.2%
Gerling Global	2,094	3.1%	34.1%	2,347	2.9%	12.1%
ING Re	1	0.0%	-50.0%	0	0.0%	-100.0%
Munich Re (CAN)	20,950	31.2%	26.2%	25,661	31.5%	22.55
Optimum Re (CAN)	1,290	1.9%	-6.7%	1,750	2.1%	35.7%
RGA (CAN)	7,919	11.8%	-6.2%	10,686	13.1%	34.9%
Swiss re	26,910	40.1%	35.3%	27,702	34.0%	2.9%
TOTALS	**67,050**	**100.0%**	**29.4%**	**81,478**	**100.0%**	**21.5%**

* AUL acquired by Employers/ERC in 2002

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production trends. The U.S. market rebounded quickly from 2001's decrease in production (3.9 percent) by recording a 13.8 percent increase in recurring new business in 2002. The decrease in 2001 marked the first time since 1989 that recurring business decreased in the U.S. Prior to 2001, increases of 21.6 percent, 19.3 percent and 33.9 percent were recorded in 2000, 1999 and 1998 respectively.

Canadian recurring business continues to grow at a rapid pace. A 21.5 percent growth rate was recorded in 2002. This follows increases of 14.2 percent in 2001 and 41.7 percent in 2000. Canadian direct writers may have been later in coming to the market with first-dollar quota share arrangements than their U.S. counterparts, but it appears that Canadian reinsurers are now seeing the full impact of the emergence of quota share arrangements. It is now believed that the percentage of direct sales reinsured in Canada has reached or possibly even exceeded the U.S. percentage.

Individual company results reveal two companies reporting increases in excess of $30 billion and one company reporting an increase in excess of $20 billion. ING Re reported an increase of $35.8 billion in U.S. and Canadian recurring business. ING Re was followed closely by BMA, who posted a $35.3 billion increase. Meanwhile, Transamerica Re reported an impressive $24.6 billion increase. Other companies reporting incremental increases in excess of $10 billion in 2002 include: Swiss Re ($19.8), Allianz ($11.0), and Canada Life ($10.4). Also, if we add ERC's U.S. and Canadian operations together, the result is a $13.4 billion increase in recurring production for 2002.

Totals for Canadian and U.S. recurring ordinary reinsurance assumed in 2001 and 2002, as well as percentage changes are shown on page eight.

Portfolio and Retrocession Business

Total portfolio business decreased over 62.2 percent in 2002. However, as noted earlier, this figure is heavily influenced by Swiss Re's acquisition of Lincoln Re in 2001 and Employers/ERC's acquisition of AUL in 2002. If the portfolio business attributed to these reinsurance deals is extracted, we see that portfolio business decreased 19.3 percent. This continues the decreasing trend in portfolio business we have seen over recent years. It is clear that fewer and fewer in-force block opportunities are being offered to reinsurers.

Meanwhile, retrocession production in 2002 remained very close to 2001 levels. While a small decrease of 0.4 percent was reported for retrocession, this could be viewed as a positive sign because, prior to 2002, retrocession production fell over 67 percent in a two-year period. Much of the fall in production can be attributed to a couple of factors: (1) increasing retention limits of reinsurers, and (2) the rise of quota share business. As reinsurers business grew as a result of first-dollar quota share business, retrocessionaires did not benefit from this since much of the business remained within the reinsurer's retention. In addition, first-dollar quota share arrangements are not as common in the retrocession market as they are in the reinsurance market. Thus, the majority of the retrocession business being written today is still on an excess retention basis. So while reinsurers were writing more business, they were also retaining more.

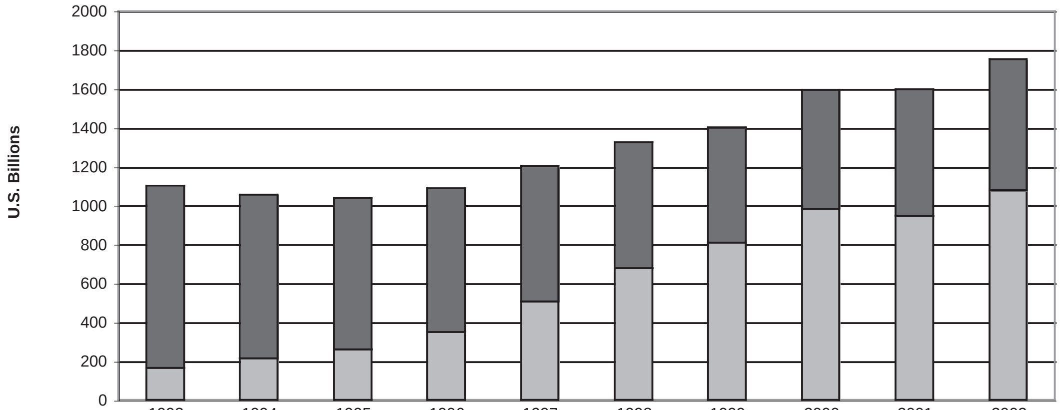
Comparison With Direct Market

Preliminary estimates from the American Council of Life Insurance (ACLI) show 2002 U.S ordinary individual life insurance purchases increased 9.5 percent from 2001 purchases. Looking back over the last 10 years, we see that life insurance purchases remained stable until 1998 when they began to steadily rise. From 1997 to 2002, life sales have increased an astounding 45 percent. Reinsurers have definitely benefited from this growth.

One statistic that is often used to measure the state of the reinsurance market is the percentage-reinsured level. This can be estimated by comparing the life purchases data from the ACLI to the reinsurance survey recurring production numbers. The 2002 level of 61.5 percent is a slight increase from 2001. Actually, the results from the last four years (1999-2002) show a very stable percentage-reinsured level (upper 50 percent to low 60 percent range). There is now no doubt that the percentage-reinsured level has hit a plateau. The big question is has it reached its limit?

The graph above compares ordinary life new

Figure 5: U.S. Ordinary Recurring Reinsurance (U.S. Millions)



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
% Reinsured	15.1%	20.4%	25.1%	32.1%	42.1%	51.3%	57.9%	61.8%	59.2%	61.5%
Amt Retained	935	841	778	739	696	645	589	609	653	675
Amt Reinsured	166	216	261	350	507	679	811	985	947	1078

Figure 6: Life Reinsurance In Force (U.S. Millions)

Includes Swiss Re's acquisition of Lincoln Re in 2001 (portfolio) and Employers/ERC's acquisition of AUL in 2002 (portfolio)

	U.S.			Canadian			Total		
	2001	2002	Change	2001	2002	Change	2001	2002	Change
Ordinary Life									
Recurring	3,341,378	4,356,737	30.4%	246,295	344,926	40.0%	3,587,673	4,701,663	31.1%
Portfolio	883,803	596,572	-32.5%	36,856	26,061	-29.3%	920,659	622,633	-32.4%
Retrocession	245,771	238,714	-2.9%	10,844	11,836	9.1%	256,615	250,550	-2.4%
Total Ordinary	4,470,952	5,192,023	16.1%	293,995	382,823	30.2%	4,764,847	5,574,846	17.0%
Total Group	148,513	149,399	0.6%	16,722	21,436	28.2%	165,235	170,835	3.4%
Total Life	4,619,465	5,341,422	15.6%	310,717	404,259	30.1%	4,930,182	5,745,681	16.5%

business totals with the recurring life reinsurance totals for the United States.

Life Reinsurance In Force

Not surprisingly, the increase in new business production resulted in an increase in in-force as well. Total life reinsurance in force business increased 16.5 percent in 2001. If the portfolio business from the two reinsurer acquisitions is excluded, the increase jumps up to 26.4 percent. This compares to increases of 3.6 percent in 2001 and 21.6 percent in 2000. The U.S. total life in force increased 15.6 percent (25.4 percent excluding the two reinsurer acquisitions) and the Canadian market in force grew by 30.1 percent (39.5 percent excluding the reinsurer acquisitions) in 2002.

The in-force survey results for 2001 and 2002 are summarized above.

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Figure 7: Life Reinsurance In Force (U.S. Millions)

Excludes Swiss Re's acquisition of Lincoln Re in 2001 (portfolio) and Employers/ERC's acquisition of AUL in 2002 (portfolio)

	U.S.			Canadian			Total		
	2001	2002	Change	2001	2002	Change	2001	2002	Change
Ordinary Life									
Recurring	3,341,378	4,356,737	30.4%	246,295	344,926	40.0%	3,587,673	4,701,663	31.1%
Portfolio	413,710	460,287	11.3%	15,940	26,061	63.5%	429,650	486,348	13.2%
Retrocession	245,771	238,714	-2.9%	10,844	11,836	9.1%	256,615	250,550	-2.4%
Total Ordinary	4,000,859	5,055,738	26.4%	273,079	382,823	40.2%	4,273,938	5,438,561	27.2%
Total Group	148,513	149,399	0.6%	16,722	21,436	28.2%	165,235	170,835	3.4%
Total Life	4,149,372	5,205,137	25.4%	289,801	404,259	39.5%	4,439,173	5,609,396	26.4%

Conclusion

The good news is that reinsurance recurring production rebounded from the slight dip in 2001. Perhaps 2001's drop in production will just be an anomaly. Nevertheless, the 2002 results show that the reinsurance market remains strong and healthy. In addition, the direct market is producing very respectable increases in life sales and it is expected that this trend will continue in the near future.

Once again, consolidation in the reinsurance industry was a significant factor in 2002. Over the past few years, the consolidation effort has radically changed the make-up of the market and it does not appear to be slowing down. There are rumors of more acquisition activity in 2003 and many in the industry predict the reinsurance market to consolidate even further over the next few years. As a product of all of the consolidation, the top five life reinsurers in the U.S. accounted for 65 percent of the new life recurring business in 2002. In Canada, the top two reinsurers to accounted for 65 percent of the new business production in 2002. To give an idea of the degree of consolidation, the number of companies participating in the survey has dropped by 30 percent since 1996 (from 33 to 23).

What's in store for the future? By the end of this year, the introduction of the new valuation table should have provided ample quote opportunities for reinsurers as direct writers begin to update their term portfolios. With consolidation reducing the number of reinsurers in the marketplace, a number of questions arise: (1) Will reinsurance pricing remain as competitive as it has been in the past? (2) How will direct companies react if they are unable to secure satisfactory reinsurance terms? Will they raise retention limits or even move to excess retention arrangements? (3) Will the cost and availability of LOC's become a factor for reinsurers who use them to address the reserve strain on term products? and finally, (4) Which reinsurers will benefit the most from the increased quote activity?

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DISCLAIMER:

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