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## XXX IMPLICATIONS

by Juliette M. Burden, Gary R. Kelly, Bradley M. Smith

The purpose of this article is twofold. Number one, to estimate the growing level of statutory reserves that are being reinsured offshore, supported by Letters of Credit, as well as by assets held within a trust. Number two, to quantify the redundancy in the reserves due to the conservative nature of the required methodology, combined with the utilization of an outdated mortality table. First, a little background with regard to the actions/reactions of life insurers and insurance regulators to the increasingly competitive term life insurance market.

### Background

Over the past 15 years, insured mortality has improved greatly. For many reasons this improvement in mortality was not recognized on a timely basis by the professional organizations that track it. However, many insurance companies and their reinsurers were able to recognize this improvement, based upon experience emanating from their own blocks of business. Armed with this information, these companies were able to profitably price term insurance products at lower premiums per thousand of coverage. The public became particularly enamored with level term versions (i.e., 5, 10, 15, 20, 30-year level term) in which the premium and the coverage remained level for the initial term. As more and more companies recognized the opportunity presented by offering such coverage, premiums declined and profit margins contracted.

One cost that affects the level of the premiums charged is the cost associated with holding a statutory reserve. It represents a capital cost, as the assets supporting the reserve established will earn the after-tax investment earnings rate, while the desired return on invested capital for a life insurance product is typically higher. Thus, the larger the statutory reserve required, the greater the cost, resulting in a higher premium per thousand, all other things being equal. To minimize this reserve and its consequent cost, insurers issued products such as Term to 100, where level premiums were charged for the initial term period (i.e., 5, 10, 15, 20, 30 years) with substantially higher ART premiums charged thereafter. Most insurers, prior to the adoption of Regulation XXX (discussed later in this article), held reserves equal to the greater of 1/2 cx (i.e., unearned net premium) and a reserve calculated using a unitary premium approach (net premiums calculated to be a level percent of the guaranteed gross premiums). Charging substantially higher gross premiums after the initial level term period had two effects. Given the high premium charged after the initial level term period, most policy-

holders were expected to lapse after the initial level term period. Additionally, the high premiums in the later durations typically resulted in the development of little substantial reserve during the level term period. Consequently, a reserve equal to the unearned net premium was established. Taking these two together meant that insurers were holding an unearned premium type reserve for a coverage that was fundamentally a level term coverage that would theoretically require a larger reserve. This allowed insurers to charge less for their coverage since the capital cost of establishing the reserve was reduced.

This situation prompted an extended debate between the regulators and the industry, which eventually resulted in the adoption of the Valuation of Life Insurance Policies Model Regulation, often referred to as Regulation XXX. The

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regulation was adopted by the NAIC in March 1999, and by January 1, 2000, was adopted by 29 states, which had the practical effect of requiring most insurers to hold the increased reserve. Five states adopted the regulation effective sometime during 2000. New York State already had a similar regulation known as Reg 147 which had been adopted in 1995. Once the NAIC adopted XXX in 1999, New York revised Regulation 147 to incorporate methodology comparable to that encompassed in Regulation XXX. Regulation XXX is quite complicated, but its essence required companies issuing the previously described Term to 100 type policies to hold "segmented" reserves (i.e., reserves calculated specifically for the initial level term period).

The adoption of Regulation XXX prior to the completion/adoption of an updated valuation mortality table resulted in a substantial increase in the level of reserves required to be held by the companies (along with the consequent increased cost of holding the reserve). Thus, the companies could increase their pre-

these offshore reinsurance companies are licensed do not require the reinsurance companies to hold the same level of reserves as was required by Regulation XXX. This allowed the reinsurers to pass the savings in reduced capital costs back to the direct writing company, bringing their total costs close to where they would have been had they not had to establish the reserve at all. However, for the direct writing company to take a reserve credit on their statutory balance sheet, the reinsurers had to either place assets equal to the ceded reserve into a trust account or obtain a Letter of Credit (LOC) for an amount equal to the ceded reserve.

### Nature of XXX Reserve

The reserve calculated from the application of the methodology defined in Regulation XXX results in a positive reserve at issue (referred to as a deficiency reserve caused by charging a gross premium less than the net premium), increasing until sometime near the midpoint of the level term period, reducing to zero at the end of the level term period. The consumer's appetite for these products is illustrated in Table A.

The amounts in Table A and in the tables on page 9 represent totals for the top 100 life term writers, comprised of 385 individual life companies. As of December 31, 2002, the term business in force for these term writers represented approximately 98 percent of the total U.S. life industry term in force.

Likewise, the amount of ordinary life (including term) reinsurance ceded by issue year compared to the amount of ordinary life issued is shown in Table B.

As you can see, term represents an increasing percent of the total amount of life insurance issued. Likewise, the amount ceded has increased markedly with the adoption of these reserve requirements.

Finally, Table C shows the amount of term and ordinary life in force as of the end of the year along with the face amount and reserve ceded.

As you can see, the reserve per \$1,000 of face amount has declined as the amount of new term business issued (and presumably ceded) has increased.

### Model

We developed a simplified model (reflecting the high-level nature of industry-wide results available) in an attempt to quantify the level to which the reserve ceded will grow, both for existing business as well as new business to be produced.

The existing business component of the model reflects four years of term issues from 2000 through 2003. The available data only provided issues through 2002. We assumed 2003 issues to be 108

**TABLE A: NEW SALES VOLUME—U.S. TERM BUSINESS (AMOUNTS IN BILLIONS)**

ISSUE YEAR	TERM ISSUED
1997	\$674.5
1998	\$786.3
1999	\$879.4
2000	\$1,000.5
2001	\$974.0
2002	\$1,174.4

Source: Thomson Financial Insurance Solutions U.S. Life Insurance (Life) database, July 2003

miums, reduce the term of the guaranteed period for which premiums were charged or accept lower returns on their level term product offerings. Given the premiums then being charged, it was unlikely that consumers would embrace the concept of higher premiums. Likewise, through their product choices, consumers demonstrated a clear preference for guaranteed (vs. non-guaranteed) premiums. Since accepting lower returns was not an appealing long-term option, an alternative solution emerged.

Many companies reinsured their policies on a coin-  
surance basis to reinsurance companies licensed outside the United States (i.e., offshore reinsurance companies), thus ceding the XXX reserve that was established on a direct basis to the reinsurers. The jurisdictions in which

**TABLE B: NEW SALES VOLUME—U.S. ORDINARY LIFE  
(AMOUNTS IN BILLIONS)**

ISSUE YEAR	OL ISSUED <sup>1</sup>	OL CEDED <sup>2</sup>	PERCENT CEDED	TERM ISSUED/OL ISSUED
1997	\$1,217.8	\$506.7	41.6%	55.4%
1998	\$1,343.3	\$679.7	50.6%	58.5%
1999	\$1,455.1	\$810.6	55.7%	61.7%
2000	\$1,677.2	\$985.5	58.8%	59.7%
2001	\$1,520.4	\$947.2	62.3%	64.1%
2002	\$1,687.1	\$1078.3	63.9%	69.4%

Source: <sup>1</sup>Thomson Financial Insurance Solutions U.S. Insurance (Life) database, July 2003

<sup>2</sup>Munich American Reassurance Company, Life Reinsurance Surveys, 1997-2002

**TABLE C: TERM/ORDINARY LIFE—INFORCE/CEDED  
(AMOUNTS IN BILLIONS)**

CALENDAR YEAR	TERM IN FORCE	OL IN FORCE	OL REINS. INFC. CEDED	OL REINS. INFC. RES. CEDED	RESERVE PER \$1000 CEDED
1997	\$4,923.5	\$9,835.7	\$2,852.6	\$26.3	\$9.22
1998	\$5,990.1	\$11,301.2	\$3,865.2	\$34.5	\$8.91
1999	\$7,091.6	\$12,621.7	\$4,659.8	\$35.5	\$7.62
2000	\$8,215.0	\$14,439.3	\$5,822.5	\$42.5	\$7.29
2001	\$9,620.4	\$15,876.0	\$7,186.2	\$50.7	\$7.06
2002	\$11,375.2	\$17,614.3	\$8,673.0	\$59.2	\$6.83

Source: Thomson Financial Insurance Solutions U.S. Insurance (Life) database, July 2003

percent of 2002 issues. Approximately 60 percent of ordinary life business issued is ceded, however we have assumed 80 percent of the model's term business issued is ceded. This is consistent with our assumption that more term than non-term business in the industry is reinsured. Also, based on the tables preceding, assuming 80 percent of the term issued during that period is ceded implies that approximately 30 percent of the non-term issued during that period is ceded. This seems reasonable. However, some of this business is ceded on a YRT basis, which would not result in the XXX reserve being ceded. We assumed that 75 percent of the term business ceded was ceded on a coinsurance basis, which would result in the transfer of the XXX reserve. Thus we assumed that 60 percent (i.e., 75 percent of 80 percent) of the model's term business is ceded on a coinsurance basis.

The model reflects 10, 20 and 30-year level term products for both male and female insureds. There are four risk classes and two issue ages in the model. Premiums reflect the average by issue age, sex and class of current term premiums available in the marketplace for the given level term periods, assuming a policy size of \$500,000. Mortality and lapse assumptions reflect common current term product pricing assumptions.

New business is assumed to be issued from 2004 through 2008, growing at 8 percent each year over the previous year's issued amount. For new business, we constructed two models, calculating XXX reserves utilizing 1980 CSO mortality tables and utilizing 2001 CSO mortality tables. These two models represent the extremes of the possible reserve amounts to be ceded over the next few years.

**TABLE D: PROJECTED REVENUE/FACE AMOUNT—1980 CSO  
(AMOUNTS IN MILLIONS)**

EOY	1980 CSO RESERVES			1980 CSO RESERVES			TOTAL RESERVE	TOTAL IN FORCE	RES. PER \$1,000 IN FORCE
	EXISTING BUSINESS RESERVE	EXISTING BUSINESS IN FORCE	RES. PER \$1,000 IN FORCE	NEW BUSINESS RESERVE	NEW BUSINESS IN FORCE	RES. PER \$1,000 IN FORCE			
2003	17,887	2,137,895	8.37	-	-	-	17,887	2,137,895	8.37
2004	27,235	1,948,314	13.98	902	790,900	1.14	28,137	2,739,214	10.27
2005	34,676	1,778,841	19.49	5,882	1,575,694	3.73	40,558	3,354,535	12.09
2006	40,463	1,632,990	24.78	14,569	2,356,299	6.18	55,031	3,989,289	13.79
2007	44,945	1,508,257	29.80	26,501	3,140,405	8.44	71,446	4,648,662	15.37
2008	48,363	1,400,965	34.52	41,377	3,937,543	10.51	89,740	5,338,508	16.81
2009	50,853	1,307,086	38.91	57,682	3,594,314	16.05	108,535	4,901,400	22.14
2010	52,498	1,142,363	45.96	70,624	3,289,142	21.47	123,122	4,431,505	27.78
2011	53,651	995,304	53.90	80,626	3,025,921	26.65	134,277	4,021,225	33.39
2012	54,351	843,937	64.40	88,306	2,800,819	31.53	142,658	3,644,757	39.14
2013	54,693	695,664	78.62	94,050	2,605,947	36.09	148,743	3,301,611	45.05
2014	54,747	661,000	82.82	98,083	2,316,825	42.34	152,830	2,977,824	51.32
2015	53,827	628,779	85.61	100,937	2,045,536	49.35	154,764	2,674,315	57.87
2016	51,536	598,430	86.12	102,806	1,788,127	57.49	154,342	2,386,557	64.67
2017	47,742	569,505	83.83	103,805	1,539,755	67.42	151,547	2,109,260	71.85
2018	42,242	541,564	78.00	104,045	1,298,039	80.16	146,288	1,839,603	79.52
2019	35,344	514,456	68.70	103,089	1,233,822	83.55	138,433	1,748,278	79.18
2020	28,177	410,639	68.62	99,830	1,173,675	85.06	128,006	1,584,315	80.80
2021	22,132	314,358	70.40	94,071	1,116,782	84.23	116,203	1,431,140	81.20
2022	17,486	207,761	84.17	85,587	1,062,407	80.56	103,073	1,270,167	81.15

### Projected Results

Given the lack of credible data with respect to the amount of reserve credit supported by LOCs/assets in trust at given historical points in time, these numbers should be viewed as very approximate. Specifically, readers of this paper should focus on the first significant digit of the estimate. On this basis the results appear to be consistent with approximations published elsewhere.

Table D presents the projected ceded reserves outstanding at the end of every year, from 2003 through 2022, for both existing business (projected as of December 31, 2003) and new business beginning in 2004 and produced through 2008, assuming all business is reserved utilizing the 1980 CSO Mortality Table.

Likewise, Table E presents the same results assuming that new business sold in 2004 and thereafter is reserved utilizing the 2001 CSO Mortality Table.

As you can see, the ceded reserve for existing business tops out in 2014 at \$55 billion, over three times its current projected level. Likewise, the ceded reserve for the sum of existing business and new business continues to grow through 2014. Obviously, this result is dependent upon the amount of new business issued in 2004 through 2008. The humped back nature of these reserves, along with the consumer's demand for these products, causes the concern with regard to the ability/willingness of the reinsurers and their creditors to support them through LOCs.

By way of comparison, total capital and surplus for the U.S. life insurance industry was \$215.8 billion as of September 30, 2003. Historically, the capital and surplus of the industry grew by 5.2 percent, 1.3 percent and 4.2 percent in 2000, 2001 and 2002 respectively. Clearly, failure of offshore reinsurers to be able to obtain Letters of Credit for the amount of ceded

**TABLE E: PROJECTED REVENUE/FACE AMOUNT—NEW BUSINESS USING 2001 CSO  
(AMOUNTS IN MILLIONS)**

EOY	1980 CSO RESERVES			2001 CSO RESERVES			TOTAL RESERVE	TOTAL IN FORCE	RES. PER \$1,000 IN FORCE
	EXISTING BUSINESS RESERVE	EXISTING BUSINESS IN FORCE	RES. PER \$1,000 IN FORCE	NEW BUSINESS RESERVE	NEW BUSINESS IN FORCE	RES. PER \$1,000 IN FORCE			
2003	17,887	2,137,895	8.37	-	-	-	17,887	2,137,895	8.37
2004	27,235	1,948,314	13.98	538	790,900	0.68	27,773	2,739,214	10.14
2005	34,676	1,778,841	19.49	4,583	1,575,694	2.91	39,258	3,354,535	11.70
2006	40,463	1,632,990	24.78	11,624	2,356,299	4.93	52,086	3,989,289	13.06
2007	44,945	1,508,257	29.80	21,307	3,140,405	6.78	66,252	4,648,662	14.25
2008	48,363	1,400,965	34.52	33,401	3,937,543	8.48	81,763	5,338,508	15.32
2009	50,853	1,307,086	38.91	46,929	3,594,314	13.06	97,781	4,901,400	19.95
2010	52,498	1,142,363	45.96	57,343	3,289,142	17.43	109,842	4,431,505	24.79
2011	53,651	995,304	53.90	65,201	3,025,921	21.55	118,852	4,021,225	29.56
2012	54,351	843,937	64.40	70,877	2,800,819	25.31	125,228	3,644,757	34.36
2013	54,693	695,664	78.62	74,533	2,605,947	28.60	129,227	3,301,611	39.14
2014	54,747	661,000	82.82	76,345	2,316,825	32.95	131,092	2,977,824	44.02
2015	53,827	628,779	85.61	76,929	2,045,536	37.61	130,755	2,674,315	48.89
2016	51,536	598,430	86.12	76,512	1,788,127	42.79	128,048	2,386,557	53.65
2017	47,742	569,505	83.83	75,269	1,539,755	48.88	123,011	2,109,260	58.32
2018	42,242	541,564	78.00	73,418	1,298,039	56.56	115,660	1,839,603	62.87
2019	35,344	514,456	68.70	71,030	1,233,822	57.57	106,373	1,748,278	60.84
2020	28,177	410,639	68.62	67,496	1,173,675	57.51	95,672	1,584,315	60.39
2021	22,132	314,358	70.40	62,795	1,116,782	56.23	84,927	1,431,140	59.34
2022	17,486	207,761	84.17	56,883	1,062,407	53.54	74,369	1,270,167	58.55

reserve has potentially significant ramifications for the U.S. life insurance industry. This issue will not affect individual companies in the industry uniformly, but could adversely affect a company focused on the term market that has utilized offshore reinsurance to fund its XXX reserve development.

### Possible Partial Solution

Companies are making money on these policies. Claims are being paid and there appears to be no question that this will be the case in the future. This crisis is somewhat artificial in nature, created by the adoption of a conservative reserve standard with an outdated mortality table.

The industry must address this issue or risk undermining confidence in the marketplace we serve.

One obvious solution would be to fix the causes of the problem. Specifically, allow companies to post a

revised reserve for existing term business written since December 31, 1999, using the 2001 CSO Mortality Table. Based upon our simplified model, doing so would reduce the reserve held as of December 31, 2003 by 20 percent as shown in Table F.

Likewise, consideration should be given by insurance regulators to allow the required reserves to reflect a conservative estimate of voluntary lapse (i.e., 2 to 5 percent annually). This is accepted practice in many individual health policies and it should be considered for level term policies. Clearly, pricing practices reflect voluntary lapses. Doing so typically reduces the premium required from the consumer for level term policies greater than 10 years in length. Failing to reflect voluntary lapses in the development of reserve factors for these types of policies increases the reserve required and artificially raises the premium paid by consumers.

**TABLE F: PROJECTED RESERVE FOR EXISTING BUSINESS: 1980 CSO VS. 2001 CSO  
(AMOUNTS IN MILLIONS)**

EOY	1980 CSO RESERVES		2001 CSO RESERVES		AMOUNT REDUCTION	PERCENT REDUCTION
	EXISTING BUSINESS RESERVE	RES. PER \$1,000 INFC.	EXISTING BUSINESS RESERVE	RES. PER \$1,000 INFC.		
2003	17,887	8.37	14,374	6.72	3,513	20%
2004	27,235	13.98	22,156	11.37	5,079	19%
2005	34,676	19.49	28,195	15.85	6,481	19%
2006	40,463	24.78	32,840	20.11	7,622	19%
2007	44,945	29.80	36,293	24.06	8,652	19%
2008	48,363	34.52	38,671	27.60	9,692	20%
2009	50,853	38.91	40,021	30.62	10,832	21%
2010	52,498	45.96	40,454	35.41	12,045	23%
2011	53,651	53.90	40,383	40.57	13,268	25%
2012	54,351	64.40	39,874	47.25	14,478	27%
2013	54,693	78.62	39,093	56.20	15,600	29%
2014	54,747	82.82	38,107	57.65	16,640	30%
2015	53,827	85.61	36,539	58.11	17,287	32%
2016	51,536	86.12	34,372	57.44	17,163	33%
2017	47,742	83.83	31,578	55.45	16,164	34%
2018	42,242	78.00	28,118	51.92	14,125	33%
2019	35,344	68.70	23,977	46.61	11,366	32%
2020	28,177	68.62	19,536	47.58	8,640	31%
2021	22,132	70.40	15,745	50.09	6,387	29%
2022	17,486	84.17	12,769	61.46	4,717	27%

Again using our simplified model, reflecting a lapse rate of 4 percent reduces the reserve held as of December 31, 2003 by 16 percent over the corresponding reserve calculated using 2001 CSO mortality. The total reduction in reserve over the current 1980 CSO reserve as of December 31, 2003 is 33 percent. Table G shows the restated existing and new business reserve utilizing 2001 CSO mortality and a 4 percent lapse rate. From a theoretical actuarial basis, reflecting lapses is consistent with the concept of setting reserves based upon asset adequacy analysis/cash flow testing.

Notwithstanding the reflection of more current levels of mortality in the 2001 CSO Table, this table is nonetheless out of step with respect to the underwriting classes being utilized today. This results in unnecessarily high reserves being held for the preferred underwriting classes, where a significant amount of the business is being sold.

Reserves should be set on a *reasonably* conservative basis, not an *overly* conservative one, reflecting the fact the companies hold required levels of surplus necessary

to support the business, thereby adding another level of assurance that claims will be paid/obligations will be met in the future. Pricing of the products should then reflect the cost of a reasonable amount of capital necessary to support the business giving consumers assurance that funds will be available to pay claims when received.

## Conclusions

Even if the regulatory requirement to hold reserves using the current methodology and valuation basis is liberalized as described earlier, it is clear that the level of reserves reinsured offshore will nonetheless grow to a substantial amount. Exacerbating this growth is the level of reserves required and likewise being reinsured offshore on lapse-protected (i.e., having secondary guarantees) universal life policies. Additionally, since much of the reinsurance is initially placed with onshore reinsurers, and subsequently retroceded to offshore reinsurers, there is a concentration of this risk within a few reinsurance companies. At current levels many of these companies have reinsurance ceded

**TABLE G: PROJECTED RESERVE/FACE AMOUNT—2001 CSO RESERVES WITH 4% LAPSE RATE (AMOUNTS IN MILLIONS)**

EOY	EXISTING BUSINESS RESERVE	RES. PER \$1,000 IN FORCE	NEW BUSINESS RESERVE	RES. PER \$1,000 IN FORCE	TOTAL RESERVE	RES. PER \$1,000 IN FORCE	TOTAL RESERVE W/O LAPSE	PERCENT REDUCTION
2003	12,033	5.63	-	-	12,033	5.63	14,374	16%
2004	18,489	9.49	534	0.68	19,023	6.94	22,694	16%
2005	23,641	13.29	3,911	2.48	27,552	8.21	32,777	16%
2006	27,745	16.99	9,760	4.14	37,505	9.40	44,464	16%
2007	30,927	20.50	17,836	5.68	48,763	10.49	57,600	15%
2008	33,236	23.72	27,993	7.11	61,229	11.47	72,071	15%
2009	34,666	26.52	39,330	10.94	73,996	15.10	86,949	15%
2010	35,293	30.89	48,320	14.69	83,613	18.87	97,797	15%
2011	35,502	35.67	55,352	18.29	90,854	22.59	105,584	14%
2012	35,342	41.88	60,660	21.66	96,002	26.34	110,750	13%
2013	34,969	50.27	64,293	24.67	99,262	30.06	113,627	13%
2014	34,421	52.07	66,346	28.64	100,767	33.84	114,452	12%
2015	33,304	52.97	67,369	32.93	100,673	37.64	113,468	11%
2016	31,578	52.77	67,541	37.77	99,119	41.53	110,885	11%
2017	29,189	51.25	67,002	43.51	96,191	45.60	106,847	10%
2018	26,073	48.14	65,946	50.80	92,019	50.02	101,536	9%
2019	22,184	43.12	64,395	52.19	86,579	49.52	95,007	9%
2020	17,962	43.74	61,701	52.57	79,663	50.28	87,032	8%
2021	14,352	45.65	57,799	51.76	72,151	50.42	78,540	8%
2022	11,558	55.63	52,594	49.50	64,152	50.51	69,652	8%

reserve credits that are multiples of their statutory capital and surplus. To the extent that reinsurers are unable or unwilling to support this level of reserves with Letters of Credit or through the placing of assets in trust, the direct writers' reinsurance reserve credit is jeopardized, creating instability with regard to their statutory financial results. The potential for rating agency downgrades could accelerate concern about a direct writer's financial condition, even prior to a Letter of Credit non-renewal.

Any instability created by this situation has the potential to give the actuarial profession a "black eye," as it is our perception that the issue is not appreciated or possibly even recognized at the CEO level of the life insurance industry. Likewise, the regulatory community has to accept some responsibility for establishing an overly conservative reserve requirement, thereby driving the insurance industry to a remedy that has resulted in its current predicament.

At least one direct writer of this business has addressed the issue through securitization as a substitute

for offshore reinsurance. While this may be a viable solution for some, securitization has its costs and necessitates a minimum size in order to be feasible.

When it comes to safety, some believe that too much is never enough. However, there is a cost associated with providing safety in the form of requiring excessive capital to support the business. If investors in a capitalistic society cannot earn a reasonable return on that capital reflecting the risk undertaken, then capital will flee that industry, eliminating its ultimate safety net (i.e., the ability to access the capital markets). Alternatively, the cost of tying up this capital will be reflected in the pricing of products, resulting in artificially high prices being paid by consumers, negatively affecting the demand for the products offered by the industry. A reasonable balance must be reached. In this instance it appears that excessive conservatism in establishing required reserves has resulted in a response by the industry that has the potential to add instability to individual companies' financial results. \*



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