Claim Reserve Run-Out Studies: The Method and Its Application to Long-Term Accident and Health Product Reserve Adequacy Test

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"There are neither two suns in the sky, nor two sovereigns over the people."

— Confucius

"If valuation actuaries are tired of having over 50 regulatory authorities to please, they need only to remember one thing: reserves ought to be adequate!"

— An Anonymous Actuary

Background

When talking about valuation in the United States, people have a feeling that it is all about government prescription. To regulatory authorities, the insurance company is acting like a naughty first-grader who resists doing homework with the excuse of not getting enough instructions. Then, the government/teacher comes up with a clear solution: use this interest rate, use that mortality table, apply such a method, and then just subtract one value from another. The valuation requirement appears crystal clear for most insurance products.

For long-term accident and health (A&H) products, e.g., individual disability income (IDI), however, it is not the case. For example, the standard valuation law (SVL) has such words as "the commissioner shall promulgate a regulation containing the minimum standards applicable to the valuation of health [disability, sickness and accident] plans," which effectively says nothing about the reserving. For claim reserves or disabled life reserves (DLR), the Health Reserve Model Regulation states "... assumptions regarding claim termination rates for the period less than two (2) years from the date of disablement may be based on the insurer's experience, if such experience is considered credible ...," which effectively leaves the assumption up to the company. As a matter of fact, the prescribed morbidity assumptions (e.g., 85

CIDA for IDI), whether incidence or claim termination, ironically have proved not conservative relative to actual industry experience. So, at the end of the day, what really matters is the adequacy requirement.

There are a range of techniques to assess a company's reserve adequacy, such as gross premium valuation (GPV), cash flow testing (CFT), rule of thumb (or "educated" guess, "actuarial" judgment), etc. Just like those standard statistical methods used to set up reserves, e.g., the chain ladder and Bornhuetter-Ferguson methods in automobile insurance, the claim reserve run-out study, as a statistical tool, has been commonly used to test appropriateness of reserves for some short-term health product lines. It has also been introduced to long-term accident and health products such as IDI, but there are some confusing and complicated issues that users tend to muddle through as addressed later.

Regardless of the technique, doing the test is only half the issue. The real question is what the company must do if the reserve proves inadequate. GPV and CFT typically place a deficiency reserve that may flip the sign of income from positive to negative (e.g., Line 3 of Exhibit 6 of the National Association of Insurance Commissioners (NAIC) blue book). The claim reserve run-out study typically uncovers the neces-

sity to change valuation assumptions and strengthen reserves accordingly, which may wipe out the capital (e.g., Exhibit 5A). Due to the long-term benefit period of these products, what matters to claim reserve run-out is termination rates. As a result, companies typically slow down claim termination to secure reserve adequacy.

In this article, we demonstrate the use of the claim reserve run-out test for the long-term A&H products. First we present the method of this test, focused on the calculation of reserve margin with claim reserve run-out triangles based on reserve valuation date and claim development period. Then we present a numerical illustration to show interpretations of testing results. And finally we discuss the limitations of this technique in applying to long-term product lines.

The Magical Claim Reserve Run-out Triangle

For an open claim, the adequate reserve at any time point is expected to cover the future claim payments over the lifetime of the claim (i.e., run-out). For a given observation period before the claim runs out, the starting reserve is expected to cover the claim payments during the observation period and the ending reserve. This can be expressed by a recursive formula shown as *Equation 1*.

Equation 1

$$V^{(m)}_{t} = \sum_{k=0}^{n-m} \left[B_k * \frac{1 - \frac{d_{t+k}}{2}}{(1+i)^{k+0.5}} * \prod_{j=0}^{k} (1 - d_{t+j-1}) \right] + V^{(n)}_{t+n-m} * \frac{\prod_{k=0}^{n-m-1} (1 - d_{t+k})}{(1+i)^n}$$

 $V = Tabular \ reserve$

 B_k = Benefitor claim payment in period k

 $d = Claim\ decrement, i.e., termination\ (including\ recovery\ and\ death\ for\ IDI)$

 $t = Claim\ duration\ since\ incurrence\ at\ beginning\ of\ study\ period$

n = Study period, e.g., 5 for annual data from year 2003 to 2008

 $m = Valuation \ date \ point \ indicator$

 $m=0,1,2,...,n. (e.g.,m=0\ for\ valuation\ date\ 2003; m=5\ for\ valuation\ date\ 2008)$

 $i = Valuation \ interest \ rate$

Correspondingly, with a claim pool where the number of claims at duration t is $J^{(t)}$, the total reserve for claims at duration t in a given observation period n can be expressed as **Equation 2**.

Equation 2

$$\sum_{m=0}^{n} \left(\sum_{j=1}^{J^{(m)}} V^{(m),j}_{t} \right) = \sum_{m=0}^{n} \left\{ \sum_{k=0}^{n-m} \left[\sum_{j=1}^{J^{(m)}} \left\{ B^{(j)}_{k} * \frac{1 - \frac{d^{(j)}_{t+k}}{2}}{(1+i)^{k+0.5}} * \prod_{j=0}^{k} (1 - d^{(j)}_{t+j-1}) \right] \right\} + \sum_{m=0}^{n} \left[\sum_{j=1}^{J^{(m)}} \left\{ V^{(n),j}_{t+n-m} * \frac{\prod_{k=0}^{n-m-1} (1 - d^{(j)}_{t+k})}{(1+i)^{n}} \right\} \right]$$

Define
$$V_t = \sum_{m=0}^{n-1} \left(\sum_{j=1}^{J^{(m)}} V^{(m),j}_t \right)$$
, i.e., to exclude the ending reserve from the total reserve, then we have *Equation 3*.

Equation 3

$$\begin{split} V_t &= \sum_{m=0}^{n-1} \left\{ \sum_{k=0}^{n-m-1} \left[\sum_{j=1}^{j^{(m)}} \left(B^{(j)}_k * \frac{1 - \frac{d^{(j)}_{t+k}}{2}}{(1+i)^{k+0.5}} * \prod_{j=0}^{k} (1 - d^{(j)}_{t+j-1}) \right) \right] \right\} \\ &+ \sum_{m=0}^{n-1} \left[\sum_{j=1}^{j^{(m)}} \left(V^{(n),j}_{t+n-m} * \frac{\prod_{k=0}^{n-m-1} (1 - d^{(j)}_{t+k})}{(1+i)^n} \right) \right] \end{split}$$

Suppose each starting reserve $V^{(m)J_f}$ and its corresponding ending reserve $V^{(n)J_{t+n+m}}$ are valued with the same assumptions. Then, the difference of the actual claim termination between experience and valuation assumptions during that period determines if the starting reserve is adequate. For example, if the actual claim termination is slower, then more claim payments are made during the period than those assumed by valuation. Therefore, the starting reserve proves to be inadequate. In other words, if the starting reserve appears inadequate, it indicates that the assumed claim termination rate by valuation is not conservative compared with the actual claim termination experience during the observation period. This is the foundation of how a claim run-out study determines reserve adequacy.

In reality, choosing an observation period raises reliability and credibility issues. If the observation period is too short, many claims won't reach run-out status; therefore, the study won't show a full story. If the observation period is too long, the tail data may be insufficient. Ideally, the run-out study observation period is set to be the maximum coverage period for short-term coverage (e.g., two years). For long-term coverage:

- The benefit period can be lifetime, and it may take over 30 years for a claim to run out. Therefore, the observation period is typically set at five to 10 years for annual data, and three to five years for quarterly data.
- For the assumed claim duration, note that most claims end before 10 years. Therefore, people usually assign a conservative overall assumption for durations 11 and later while tracking the detailed experience only in the earlier claim durations. However, this practice may cause a reserve inadequacy as mentioned later.

Let's get back to the method. With claim experience, we test if the starting reserve supported the future claim payments and ending reserve. If yes, it proves the valuation claim termination rate *d* is appropriate in the aggregate. If not, it proves that the termination assumption is not supported by experience. For this purpose, we define:

- (a) Reserve Margin (MG) as the difference between the starting reserve and the present value of future claim payments and ending reserve;
- (b) MG% as the ratio of Reserve Margin to starting reserve;
- (c) $\widetilde{V}^{(m,t)}_{t+m}$ as the total experience reserves at valuation date m for the open claims at duration t as of beginning observation period;
- (d) $\widetilde{B}^{(m,t)}_{k}$ as the total claim payments in the k-th year since the beginning observation date for those open claims at duration t as of valuation date m.

Suppose reserves for claim duration T and later are appropriate. Then the reserve margin for claim durations before T can be derived from a recursive formula shown as **Equation 4**.

Equation 4

$$MG_{t} = \sum_{m=0}^{n-1} \left(\widetilde{V}^{(m,t)}_{t} - \sum_{k=1}^{n-m} \widetilde{B}^{(m,t)}_{k} * (1+i)^{-(k-0.5)} - \widetilde{V}^{(n,t)}_{t+n-m} * (1-MG\%_{t+n-m}) * (1+i)^{-(n-m)} \right)$$

Where

$$MG\%_{l} = \frac{MG_{l+1}}{\sum_{m=0}^{n-1} \widetilde{V}^{(m,l)}_{l}}, \ t < T$$

 $MG\%_{t} = 0, \ t \ge T$

 \widetilde{V}_{i} * $(1-MG\%_{i})$ is the expected adequate reserve at duration t.

For example, let T=11. Then **Equation 4** can be rewritten as durational formulas (**see Rewritten Equation 4**), which can be tabulated as triangles.

Rewritten Equation 4

For Claim Duration 10:

$$\begin{split} MG_{10} &= \widetilde{V}^{(0,10)}{}_{10} \\ &- \left(\frac{\widetilde{B}^{(0,10)}{}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(0,10)}{}_{2}}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(0,10)}{}_{3}}{(1+i)^{-2.5}} + \frac{\widetilde{B}^{(0,10)}{}_{4}}{(1+i)^{-3.5}} + \frac{\widetilde{B}^{(0,10)}{}_{5}}{(1+i)^{-4.5}} \right) \\ &- \widetilde{V}^{(5,10)}{}_{15} * 100\% * (1+i)^{-5} \\ &+ \widetilde{V}^{(1,10)}{}_{10} - \left(\frac{\widetilde{B}^{(1,10)}{}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(1,10)}{}_{2}}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(1,10)}{}_{3}}{(1+i)^{-2.5}} + \frac{\widetilde{B}^{(1,10)}{}_{4}}{(1+i)^{-3.5}} \right) \\ &- \widetilde{V}^{(5,10)}{}_{14} * 100\% * (1+i)^{-4} \\ &+ \widetilde{V}^{(2,10)}{}_{10} - \left(\frac{\widetilde{B}^{(2,10)}{}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(2,10)}{}_{2}}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(2,10)}{3}}{(1+i)^{-2.5}} \right) \\ &- \widetilde{V}^{(5,10)}{}_{13} * 100\% * (1+i)^{-3} \\ &+ \widetilde{V}^{(3,10)}{}_{10} - \left(\frac{\widetilde{B}^{(3,10)}{}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(3,10)}{}_{2}}{(1+i)^{-1.5}} \right) \\ &- \widetilde{V}^{(5,10)}{}_{12} * 100\% * (1+i)^{-2} \\ &+ \widetilde{V}^{(4,10)}{}_{10} - \left(\frac{\widetilde{B}^{(4,10)}{}_{1}}{(1+i)^{-0.5}} \right) \\ &- \widetilde{V}^{(5,10)}{}_{11} * 100\% * (1+i)^{-1} \\ MG_{10} \\ &= \frac{MG_{10}}{\widetilde{V}^{(0,10)}{}_{10} + \widetilde{V}^{(1,10)}{}_{10} + \widetilde{V}^{(2,10)}{}_{10} + \widetilde{V}^{(3,10)}{}_{10} + \widetilde{V}^{(4,10)}{}_{10}} \end{split}$$

Continued on page 8

For Claim Duration 9:

$$\begin{split} MG_9 &= \widetilde{V}^{(0,9)}_{}^9 - \left(\frac{\widetilde{B}^{(0,9)}_{}^1}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(0,9)}_{}^2}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(0,9)}_{}^3}{(1+i)^{-2.5}} + \frac{\widetilde{B}^{(0,9)}_{}^4}{(1+i)^{-3.5}} + \frac{\widetilde{B}^{(0,9)}_{}^5}{(1+i)^{-4.5}}\right) \\ &- \widetilde{V}^{(5,9)}_{14} * 100\% * (1+i)^{-5} \\ &+ \widetilde{V}^{(1,9)}_{}^9 - \left(\frac{\widetilde{B}^{(1,9)}_{}^1}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(1,9)}_{}^2}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(1,9)}_{}^3}{(1+i)^{-2.5}} + \frac{\widetilde{B}^{(1,9)}_{}^4}{(1+i)^{-3.5}}\right) \\ &- \widetilde{V}^{(5,9)}_{13} * 100\% * (1+i)^{-4} \\ &+ \widetilde{V}^{(2,9)}_{}^9 - \left(\frac{\widetilde{B}^{(2,9)}_{}^1}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(2,9)}_{}^2}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(2,9)}_{}^3}{(1+i)^{-2.5}}\right) \\ &- \widetilde{V}^{(5,9)}_{12} * 100\% * (1+i)^{-3} \\ &+ \widetilde{V}^{(3,9)}_{}^9 - \left(\frac{\widetilde{B}^{(3,9)}_{}^1}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(3,9)}_{}^2}{(1+i)^{-1.5}}\right) \\ &- \widetilde{V}^{(5,9)}_{11} * 100\% * (1+i)^{-2} \\ &+ \widetilde{V}^{(4,9)}_{}^9 - \left(\frac{\widetilde{B}^{(4,9)}_{}^1}{(1+i)^{-0.5}}\right) \\ &- \widetilde{V}^{(5,9)}_{10} * (1-MG\%_{10}) * (1+i)^{-1} \\ MG\%_9 &= \frac{MG_9}{\widetilde{V}^{(0,9)}_{}^9 + \widetilde{V}^{(1,9)}_{}^9 + \widetilde{V}^{(2,9)}_{}^9 + \widetilde{V}^{(3,9)}_{}^9 + \widetilde{V}^{(4,9)}_{}^9} \end{split}$$

For Claim Duration 1:

$$\begin{split} MG_1 &= \widetilde{V}^{(0,1)}_{1}_{1} - \left(\frac{\widetilde{B}^{(0,1)}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(0,1)}_{2}}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(0,1)}_{3}}{(1+i)^{-2.5}} + \frac{\widetilde{B}^{(0,1)}_{4}}{(1+i)^{-3.5}} + \frac{\widetilde{B}^{(0,1)}_{5}}{(1+i)^{-4.5}}\right) \\ &- \widetilde{V}^{(5,1)}_{6} * (1 - MG\%_{6}) * 100\% * (1+i)^{-5} \\ &+ \widetilde{V}^{(1,1)}_{1}_{1} - \left(\frac{\widetilde{B}^{(1,1)}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(1,1)}_{2}}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(1,1)}_{3}}{(1+i)^{-2.5}} + \frac{\widetilde{B}^{(1,1)}_{4}}{(1+i)^{-3.5}}\right) \\ &- \widetilde{V}^{(5,1)}_{5} * (1 - MG\%_{5}) * (1+i)^{-4} \\ &+ \widetilde{V}^{(2,1)}_{1} - \left(\frac{\widetilde{B}^{(2,1)}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(2,1)}_{2}}{(1+i)^{-1.5}} + \frac{\widetilde{B}^{(2,1)}_{3}}{(1+i)^{-2.5}}\right) \\ &- \widetilde{V}^{(5,1)}_{4} * (1 - MG\%_{4}) * (1+i)^{-3} \\ &+ \widetilde{V}^{(3,1)}_{1} - \left(\frac{\widetilde{B}^{(3,1)}_{1}}{(1+i)^{-0.5}} + \frac{\widetilde{B}^{(3,1)}_{2}}{(1+i)^{-1.5}}\right) \\ &- \widetilde{V}^{(5,1)}_{3} * (1 - MG\%_{3}) * (1+i)^{-2} \\ &+ \widetilde{V}^{(4,1)}_{1} - \left(\frac{\widetilde{B}^{(4,1)}_{1}}{(1+i)^{-0.5}}\right) \\ &- \widetilde{V}^{(5,1)}_{2} * (1 - MG\%_{2}) * (1+i)^{-1} \end{split}$$

$$MG\%_{1} = \frac{MG_{1}}{\widetilde{V}^{(0,1)}_{1} + \widetilde{V}^{(1,1)}_{1} + \widetilde{V}^{(2,1)}_{1} + \widetilde{V}^{(3,1)}_{1} + \widetilde{V}^{(4,1)}_{1}} \end{split}$$

In other words, termination rate assumptions in *Equation 3* are tested with real world claim terminations reflected by the actual claim payments. One side of the real world equation is the beginning reserve. The other side is the present values of ending reserve and intermediate claim payments. Within the observation window, the claim payments and ending reserve are what they are, and there is nothing we can do about them.

But the beginning reserve depends on termination rate assumptions during the observation period. An adequate beginning reserve indicates that claims have terminated as fast as the valuation assumption anticipated. If claims terminated more slowly than the rate used in reserving, the beginning reserve won't be adequate, reserve strengthening is required at the valuation date, and termination rate assumptions used in reserving must be adjusted to ensure reserves are adequate in the future.

A Numerical Illustration

For demonstration purposes, an illustration is presented below (see Table 1 on page 9). Concerning the appropriateness of claim termination rates for durations up to 10, the illustration tracks tabular reserves and claim payments for all open claims of a sizable block of business at duration 1 to 10 as of yearend from 2003 through 2008, assuming reserves for duration 11 and later are just right. Table 1 shows the experience data according to Equation 4 with reserve margins calculated for individual claim durations. Table 2 and Table 3 summarize the reserve margins for each claim duration and valuation date.

Table 1. Illustration of Claim Reserve Run-out Triangles

		1								~				
Charter Char	Starting		Starting	Ending	Ending				· ·			PV Ending	Reserve	Reserve
1	Claim	Valuation	Valuation	Valuation	Claim		k = 1	2	3	4	5	Reserve	Margin	Margin %
10	t	Date	m	n	t+n-m	' '	(7)	(8)	(9)	(10)	(11)			MG% (14)
10 2020 1														
10	10	2004	1	5	14	41,483,938		4,710,293	4,287,191	3,929,000		29,624,142	(6,038,040)	0.00%
10	10	2005	2	5	13	38,449,876	4,941,992	4,571,597	4,078,266			30,594,064	(5,736,043)	0.00%
19 2021 23 24 24 24 24 24 24	10	2006	3	5	12	53,633,803	5,853,732	5,393,577				47,272,912	(4,886,418)	0.00%
9 2000 1 5 13 0.007291 4.99L970 1.2733 5.018.279 5.054.090 1.295 1.292.2010 1.007.279 0.007.4 9 2000 3 5 11 4.195.0313 7.129.99 1.291.279 5.018.279 5.018.279 5.018.279 5.018.279 5.018.279 1.2007 4 5 10 0.4876.460 7.131.277 5.018.279 5	10	2007	2007 4 5 11			57,593,941	6,658,733					52,724,625	(1,789,417)	0.00%
9 2004 1 5 13 00.079319	10		Subt	total:		233,325,777	27,204,234	19,015,219	12,433,681	7,552,577	3,310,147	187,469,164	(23,659,244)	-10.14%
9 2005 2 5 12 54,000,200 A15 11 10,000,200 A15,000 A15	9	2003	0	5	14	43,420,882	4,956,887	4,594,807	4,738,179	3,961,429	3,629,281	27,802,947	(6,262,649)	0.00%
9 2000 4 S 10 APPA-000 301125 71,200 41,000 10145							4,990,791	4,631,670	4,284,533	3,969,650		28,019,967	(5,017,292)	0.00%
9 2007 4 5 10 247,440 8,1931,922 9 3008 1 1 447,740 50,743 14,836,93 14,077,410 7,931,079 3,429,281 21,5524,160 0,005 11,836,83 14,077,410 7,931,079 3,429,281 21,5524,160 0,005 11,836,83 14,836,83									5,054,898					
Substrait								6,318,597						
8 2003 0 5 13 44,792,870 5,094,730 4,976,006 4,910,834 4,015,476 3,720,384 22,015,606 (2,077,406) 0,000, 8 2004 1 5 17 571,44772 6,371,139 5,726,202 5,265,970 4,837,211 43,746,922 (2,067,407) 0,000, 8 2005 3 5 10 72,004,702 (2,448,907 7,254,22) 2,460,600 7,276,200 1,000, 8 2005 3 5 10 72,004,702 (2,448,907 7,254,22) 2,460,600 7,276,200 1,000, 8 2005 3 5 10 73,004,702 (2,448,907 7,254,22) 2,460,600 7,276,200 1,000, 8 2005 3 5 10 73,004,702 (2,448,907 7,254,22) 2,460,600 7,276,200 1,000, 8 2005 1 2 61,403,701 7,554,600 5,774,223 5,774,200 4,755,000 4,752,100 1,000, 8 2005 1 2 61,403,701 7,554,600 5,774,223 5,774,200 4,755,000 4,752,000 4,752,100 1,000, 7 2005 1 5 10 7,204,701 8,604,200 7,778,720 7,778,7		2007			10									
8 2004 1 5 12 99.143772 6.979.30 5.269.90 4.989.311 43.746.92 (6.907.300 6.00% 8.200% 2 5 11 6.353.411 7.359.7 6.00% 6.00% 6.200% 8.200% 9 75.299.007 8.200% 6.200% 9 75.299.007 8.200% 6.200% 9 75.299.007 8.200% 6.200% 9 75.299.007 8.200% 6.200% 9 75.299.007 8.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200% 6.200% 9 75.200%							31,381,565	21,163,863	14,077,610	7,931,079	3,629,281	218,524,160	(31,590,106)	-11.63%
8 2005 2 5 11 0.435441 7,719.787											3,720,384			
8 2006 3 5 10 73204294 8.468677 7.76.662 8 Subertal: 315.865.003 55.47.7592 24.666.069 15.501.331 8.854.806 3.720.384 253,177.897 (378.81,170) -12.678 7 2003 0 5 12 61.863.013 55.47.7592 24.666.069 15.501.331 8.854.806 3.720.384 253,177.897 (378.81,170) -12.678 7 2005 1 5 11 67.079.607 7.407.098 57.407.098 57.408.80 57.408.8										4,839,311				
8 2007 4 5 9 75,529/187 8,001-007 11,075 2003 0 5 12 61,400,007 6,946,000 5,974,023 5,472,924 6,460,007 6,946,007 7,007-04 1 5 11 67,099,000 7,007-94 6,956,000 7,007-94 6,956,000 7,007-94 7,005 2 5 10 77,752,007 8,260,000 7,007-94 7,005 7,007-94 7,005 2 5 10 77,752,007 8,260,000 7,007-94 7,005 7,007-94 7,005 7,007-94 7,005 7,007-94 7,005 7,007-94 7,005 7,007-94 7,005 7,007-94 7,005 7,007-94 7,007-9									J,074,528					
Substate 315,855,083 35,472,952 24,646,069 15,913,21 8,854,060 3,720,284 253,177,997 (79,817,1010) -12,675 7 2004 1 5 11 67,079,650 7,407,954 8,456,012 8,421,010 8,585,653 4,585,637 41,694,841 1,469,841 1,469,841 7,469,850 7,407,954 8,456,010 7,797,250 7,164,003 8,355,633 4,585,633 4,585,637 41,694,841 1,469,854 1,469,			-					, ,3,10,302						
7 2003 0 5 12 61,020,317 6,546,402 597,437,94 6,76,042 6,247,010 5,535,533 4,535,437 44,962,68 (8,059,204) 0.00% 7 2005 2 5 10 77,523,042 8,405,010 7,781,262 7,764,003 61,535,033 61,535,030 (8,068,274) 1.01,476, 7 2006 3 5 9 78,127,351 8,841,238 7,763,342								24,606,069	15,501,331	8,854,806	3,720,384			
7 2006 3 5 9 78,127.431 8,861.298 7,7683.612	_	2003			12									
7 2006 3 5 9 78,127,431 8,861,258 7,983,612	7	2004	1	5	11	67,099,650	7,407,954	6,765,042	6,247,010	5,636,563		49,082,288	(8,039,206)	0.00%
7 2007 4 5 8 78,755,744 9,592,099 7 2007 4 5 8 78,755,744 9,592,099 8 20 20 1 1 5 10 80,400,652 8,631,762 78,997,780 7,271,622 6,778,230 5,596,741 8,500,793,793 0,0076 6 2005 2 5 9 84,403,615 9,998,867 84,853,390 7,271,622 6,778,230 5,596,741 8,762,743,743 6 2006 3 5 8 83,857,941 9,822,035 9,291,124 78,832,719 10,877,867 8,787,878 1,187,878 1	7	2005	2	5	10	77,523,042	8,420,610	7,787,820	7,164,003			61,953,402	(14,084,871)	-10.14%
The Substate		2006	3			78,127,431	8,861,258	7,983,612				67,351,078	(13,902,529)	-11.63%
6 2003 0 5 11 70,899,96 8,395,300 6,972,220 6,389,176 5,869,428 5,296,916 47,072,889 (9,085,793) 0,00% 6 2005 2 5 9 84,640,215 9,798,467 8,445,339 7,464,3054	7	2007	4	5	8	78,755,744							(10,430,293)	
6 2004 1 5 10 80,640,052 8,651,762 7,899,778 7,271,622 6,778,230 59,306,398 (15,241,407) -10,14% 6 2005 2 5 9 84,40,215 9,798,407 8,455,399 7,463,054 -12,047,639														
6 2005 2 5 9 8 4640,215 9,798,467 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,339 7,463,054 8,435,044 8,											5,296,916			
6 2006 3 5 8 8,3857,941 9,822,035 9,291,124										6,//8,230				
6 2007 4 5 7 106,599,526 11,813,038 132,558,461 21,093,852 12,647,658 5,296,916 334,872,824 (42,637,457) -14,92% 5 2003 0 5 10 88,872,910 91,41953 8,206,663 7,373,394 6,816,306 6,353,289 56,786,893 (13,532,531) 10,14% 5 2004 1 5 9 90,443,364 10,097,902 9,341,860 7,945,410 7,031,468 62,471,838 (13,711,591) -11,63% 5 2005 2 5 8 89,121,385 10,869,922 9,345,606 8,738,135 10,701,701,701,701,701,701,701,701,701,7									7,463,034					
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5 2005 2 5 8 89,121,385 10,680,922 9,356,906 8,738,135				otai:										
\$\frac{5}{5} \text{2006} \text{3} \text{5} \text{6} \text{11},273,624 \text{10},354,757 \text{11},273,624 \text{10},354,757 \text{11},273,624 \text{10},354,757 \text{11},273,624 \qquad \qq \qq \qq \	5	2003			10						6,353,289	56,758,693	(13,532,531)	-10.14%
Subtotal: 493,019,437 52,220,803 38,004,083 24,056,939 13,847,774 6,353,289 385,296,035 (78,180,927) -15.86% 4 2003 0 5 9 97,672,204 10,824,647 9,504,997 8,670,167 7,434,687 6,581,319 59,914,816 (5,258,428) 0,00% 4 2005 2 5 7 115,789,668 12,402,279 11,055,807 10,261,140 88,742,327 (19,911,492) -14,92% 4 2006 3 5 6 120,228,373 11,500,227 9,705,173 12,628,683 12,628,683 13,174,136 12,628,683 13,174,136 12,628,683 13,174,136 12,628,683 13,174,137 11,587,223 10,452,479 9,728,896 8,261,429 10,470,036 7,177,779 0,00% 3 2006 3 5 6 120,228,373 11,906,686 11,114,938 9,253,815 8,186,061 7,611,318 62,082,600 (9,780,085) 0,00% 3 2006 3 5 5 6 120,279,898 13,171,317 11,587,223 10,452,479 9,728,896 8,213,422 (10,473,749) 0,00% 3 2006 3 5 5 6 126,846,830 13,073,708 10,886,953 9,593,911 100,470,036 (7,177,779) 0,00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 12,240,279 12,008,668 6,937,467 0,00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 12,247,906 12,208,668 6,5937,467 0,00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 12,247,906 12,208,668 6,5937,467 0,00% 3 2006 3 5 5 140,459,432 13,880,325 12,247,906 12,247,906 12,208,688 6,5937,467 0,00% 3 2006 3 5 5 140,459,432 13,840,407 15,830,159 12,247,906			0	5		86,872,501	9,141,953	8,206,063	7,373,394	6,816,306	6,353,289			
Subtotal: 493,019,437 52,220,803 38,004,083 24,056,939 13,847,774 6,353,289 385,296,035 (78,180,927) -15,86% 4 2003 0 5 9 97,672,204 10,824,647 9,504,997 8,670,167 7,434,887 6,581,319 59,914,816 (5,258,428) 0.00% 4 2004 1 5 8 95,342,220 11,923,648 9,875,728 8,673,746 8,148,742 6,505,4423 (6,333,888) 0.00% 4 2005 2 5 7 115,789,668 12,640,279 11,055,807 10,261,140 88,742,227 (19,11492) -14,22% 4 2006 3 5 6 120,228,373 11,500,227 9,705,173 105,038,759 (19,280,761) -12,63% 4 2007 4 5 5 131,741,136 12,628,683 11,141,705 27,605,053 15,583,429 6,581,319 348,894,893 (67,869,570) -12,63% 10,0375,332 11,906,686 11,114,938 9,253,815 8,186,061 7,611,318 62,082,000 (9,780,085) 0.00% 3 2005 2 5 6 126,846,830 13,073,708 10,886,953 9,593,911 100,470,036 (7,177,79) 0.00% 3 2007 4 5 4 140,149,218 13,825,240 12,247,906 3 2007 4 5 4 140,149,218 13,825,240 12,037,472 10,226,689 3,704,170 10,245,140 13,202,7509 (21,682,618) -12,10% 10,000,682,240 1 5 6 131,840,967 15,830,159 12,037,472 10,226,689 8,794,471 130,006,464 (15,374,03) -15,16% 2000 3 5 4 140,149,218 13,805,251 12,237,767 10,226,689 8,779,447 1,586,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,547,589 1,548,684 1,548,694	5	2004	0	5 5	9	86,872,501 90,443,364	9,141,953 10,097,902	8,206,063 9,341,860	7,373,394 7,945,410	6,816,306	6,353,289	62,471,838	(13,711,591)	-11.63%
4 2003 0 5 9 97,672,204 10,824,647 9,504,977 8,670,167 7,434,687 6,581,319 59,914,816 (5,258,428) 0.00% 4 2004 1 5 8 95,342,220 11,923,468 9,875,728 8,673,746 8,148,742 65,054,423 (8,333,888) 0.00% 4 2005 2 5 7 115,789,668 12,402,279 11,055,807 10,261,140 883,742,327 (19,911,492) -1.49,2% 4 2006 3 5 6 120,228,373 11,500,227 9,705,173 4 2007 4 5 5 131,741,136 12,628,683 11,1500,227 9,705,173 4 2007 4 5 5 131,741,136 12,628,683 11,147,95 27,605,053 15,583,429 6,581,319 438,964,893 (67,869,570) -12,10% 3 2003 0 5 8 100,373,599 59,279,304 40,141,705 27,605,053 15,583,429 6,581,319 438,964,893 (67,869,570) -12,10% 3 2004 1 5 7 120,679,588 13,171,317 11,1587,223 10,452,479 9,728,896 86,213,422 (10,473,749) 0.00% 3 2005 2 5 6 126,846,830 13,073,708 10,886,953 10,452,479 9,728,896 86,213,422 (10,473,749) 0.00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 120,069,668 (5,937,467) 0.00% 3 2007 4 5 4 140,149,218 13,825,240 10,432,149,149,149,149,149,149,149,149,149,149	5 5	2004 2005	0 1 2	5 5 5	9 8	86,872,501 90,443,364 89,121,385	9,141,953 10,097,902 10,680,922	8,206,063 9,341,860 9,356,906	7,373,394 7,945,410	6,816,306	6,353,289	62,471,838 67,682,459	(13,711,591) (15,884,415)	-11.63% -12.63%
4 2004 1 5 8 95,342,220 11,723,468 9,875,728 8,673,746 8,148,742 65,054,423 (8,333,888) 0.00% 4 2005 2 5 7 115,789,668 12,402,279 11,055,807 10,261,140 12	5 5 5	2004 2005 2006	0 1 2 3	5 5 5 5	9 8 7	86,872,501 90,443,364 89,121,385 115,308,563	9,141,953 10,097,902 10,680,922 11,945,270	8,206,063 9,341,860 9,356,906	7,373,394 7,945,410	6,816,306	6,353,289	62,471,838 67,682,459 94,190,472	(13,711,591) (15,884,415) (15,978,857)	-11.63% -12.63% -14.92%
4 2005 2 5 7 115,789,668 12,402,279 11,055,807 10,261,140	5 5 5 5	2004 2005 2006 2007	0 1 2 3 4	5 5 5 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757	8,206,063 9,341,860 9,356,906 11,099,254	7,373,394 7,945,410 8,738,135	6,816,306 7,031,468		62,471,838 67,682,459 94,190,472 104,192,574	(13,711,591) (15,884,415) (15,978,857) (19,073,533)	-11.63% -12.63% -14.92% -15.16%
4 2006 3 5 6 120,228,373 11,500,227 9,705,173	5 5 5 5 4	2004 2005 2006 2007	0 1 2 3 4 Subt	5 5 5 5 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167	6,816,306 7,031,468 13,847,774 7,434,687	6,353,289	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00%
4 2007 4 5 5 131,741,136 12,628,683 120,214,569 (15,085,001) -11,63% 4 Subtotal: 560,773,599 59,279,304 40,141,705 27,605,053 15,583,429 6,581,319 438,964,893 (67,869,570) -12,10% 3 2003 0 5 8 100,375,332 11,906,686 11,114,938 9,253,815 8,186,061 7,611,318 62,082,600 (9,780,085) 0.00% 3 2005 2 5 6 126,846,830 13,171,317 11,587,223 11,986,953 9,939,911 100,470,036 (7,177,779) 0.00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 120,068,668 (5,937,467) 0.00% 3 2007 4 5 4 140,149,218 13,885,240 29,300,205 17,914,957 7,611,318 50,862,236 (55,051,699) -8,76% 2 2003 0 5 7 129,604,587 <t< td=""><td>5 5 5 5 5 4 4</td><td>2004 2005 2006 2007 2003 2004</td><td>0 1 2 3 4 Subt</td><td>5 5 5 5 5 5 5</td><td>9 8 7 6</td><td>86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220</td><td>9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468</td><td>8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728</td><td>7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746</td><td>6,816,306 7,031,468 13,847,774 7,434,687</td><td>6,353,289</td><td>62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423</td><td>(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888)</td><td>-11.63% -12.63% -14.92% -15.16% -15.86% 0.00%</td></t<>	5 5 5 5 5 4 4	2004 2005 2006 2007 2003 2004	0 1 2 3 4 Subt	5 5 5 5 5 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746	6,816,306 7,031,468 13,847,774 7,434,687	6,353,289	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00%
4 Subtotal: 560,773,599 59,279,304 40,141,705 27,605,053 15,583,429 6,581,319 438,964,893 (67,869,570) -12.10% 3 2003 0 5 8 100,375,332 11,906,686 11,114,938 9,253,815 8,186,061 7,611,318 62,082,600 (9,780,085) 0.00% 3 2004 1 5 7 120,679,588 13,171,317 11,587,223 10,452,479 9,728,896 86,213,422 (10,473,749) 0.00% 3 2005 2 5 6 126,846,830 13,073,708 10,886,953 9,593,911 100,470,036 (7,177,779) 0.00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 122,047,906 3 2007 4 5 4 140,149,218 13,825,240 132,027,509 (21,882,618)	5 5 5 5 5 4 4 4	2004 2005 2006 2007 2003 2004 2005	0 1 2 3 4 Subt	5 5 5 5 5 20 tal: 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746	6,816,306 7,031,468 13,847,774 7,434,687	6,353,289	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92%
3 2003 0 5 8 100,375,332 11,906,686 11,1114,938 9,253,815 8,186,061 7,611,318 62,082,600 (9,780,085) 0.00% 3 2004 1 5 7 120,679,588 13,171,317 11,587,223 10,452,479 9,728,896 86,213,422 (10,473,749) 0.00% 3 2005 2 5 6 126,846,830 13,073,708 10,886,953 9,593,911 100,470,036 (7,177,779) 0.00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 120,068,668 (5,937,467) 0.00% 3 2007 4 5 4 140,149,218 13,825,240 13,825,240 132,027,599 (21,682,618) -12,10% 3 50,862,236 (55,051,699) -8,76% 2 2003 0 5 7 129,604,587 15,450,429 11,958,793 11,166,614 9,442,319 9,104,165 79,648,501 (19,049,120) -14,92% 2 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15,16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,236,089 8,779,447 94,753,103 (24,153,722) -15,16% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 130,696,464 (31,871,539) -12,10% 2 2007 4 5 3 161,757,873 18,565,084 15,249,245 12,699,241 12003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (57,974,43) -15,16% 12,006 3 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15,86% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 5 6,734,561 66,913,135 (12,785,742) -16,09% 1 2007 4 5 5 2 75,762,808 10,867,262 5 66,783,831 (112,785,742) -16,09%	5 5 5 5 4 4 4 4	2004 2005 2006 2007 2003 2004 2005 2006	0 1 2 3 4 Subt	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746	6,816,306 7,031,468 13,847,774 7,434,687	6,353,289	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63%
3 2004 1 5 7 120,679,588 13,171,317 11,587,223 10,452,479 9,728,896 86,213,422 (10,473,749) 0.00% 3 2005 2 5 6 126,846,830 13,073,708 10,886,953 9,593,911 100,470,036 (7,177,779) 0.00% 3 2006 3 5 5 140,259,432 13,880,325 12,247,906 120,068,668 (5,937,467) 0.00% 3 2007 4 5 4 140,149,218 13,825,240 132,007,509 (21,682,618) -12.10% 3 Subtotal: 628,310,401 65,857,275 45,837,021 29,300,205 17,914,957 7,611,318 500,862,236 (55,051,699) -8.76% 2 2003 0 5 7 129,604,587 15,450,429 11,958,793 11,166,614 9,442,319 9,104,165 79,648,501 (19,049,120) -14,92% 2 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15,16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,438,507 107,561,467 (15,374,032) -15,86% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 130,696,464 (31,871,539) -12,10% 2 2007 4 5 3 161,757,873 18,565,084 49,225,220 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16,09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15,16% 1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15,86% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 66,913,135 (12,785,742) -16,09% 1 2007 4 5 2 75,762,808 10,867,262	5 5 5 5 5 4 4 4 4 4	2004 2005 2006 2007 2003 2004 2005 2006	0 1 2 3 4 Subt	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140	6,816,306 7,031,468 13,847,774 7,434,687 8,148,742	6,353,289 6,581,319	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63%
3 2006 3 5 5 140,259,432 13,880,325 12,247,906 120,068,668 (5,937,467) 0.00% 3 2007 4 5 4 140,149,218 13,825,240 132,027,509 (21,682,618) -12,10% 3 Subtotal: 628,310,401 65,857,275 45,837,021 29,300,205 17,914,957 7,611,318 500,862,236 (55,051,699) -8.76% 2 2003 0 5 7 129,604,587 15,450,429 11,958,793 11,166,614 9,442,319 9,104,165 79,648,501 (19,049,120) -14,92% 2 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15.16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,438,507 107,561,467 (15,374,032) -15.86% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 10,438,507 154,128,847 (24,440,616) -8.76% 2 2007 4 5 3 161,757,873 18,565,084 15,721,256 12,699,241 154,128,847 (24,440,616) -8.76% 2 Subtotal: 713,918,664 81,006,455 49,225,220 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16.09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15.16% 1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,5257 (18,149,117) -15.86% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 66,913,135 (12,785,742) -16.09%	5 5 5 5 5 4 4 4 4 4 4	2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt	5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053	6,816,306 7,031,468 13,847,774 7,434,687 8,148,742	6,353,289 6,581,319 6,581,319	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63%
3 2007 4 5 4 140,149,218 13,825,240 132,027,509 (21,682,618) -12.10% 3 Subtotal: 628,310,401 65,857,275 45,837,021 29,300,205 17,914,957 7,611,318 500,862,236 (55,051,699) -8.76% 2 2003 0 5 7 129,604,587 15,450,429 11,958,793 11,166,614 9,442,319 9,104,165 79,648,501 (19,049,120) -14,92% 2 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15.16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,438,507 107,561,467 (15,374,032) -15.86% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 10,438,507 154,128,847 (24,440,616) -8.76% 2 2007 4 5 3 161,757,873 18,565,084 15,721,256 12,699,241 154,128,847 (24,440,616) -8.76% 2 Subtotal: 713,918,664 81,006,455 49,225,220 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16.09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15.16% 1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15.86% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 10,867,262 16,094,694 5,616,064 66,913,135 (12,785,742) -16.09%	5 5 5 5 5 4 4 4 4 4 4 4 3	2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subti 0 1 2 3 4 Subti	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061	6,353,289 6,581,319 6,581,319	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63% -12.10%
3 Subtotal: 628,310,401 65,857,275 45,837,021 29,300,205 17,914,957 7,611,318 500,862,236 (55,051,699) -8.76% 2 2003 0 5 7 129,604,587 15,450,429 11,958,793 11,166,614 9,442,319 9,104,165 79,648,501 (19,049,120) -14,92% 2 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15,16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,438,507 107,561,467 (15,374,032) -15,86% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 10,438,507 107,561,467 (15,374,032) -15,86% 2 2007 4 5 3 161,757,873 18,565,084 15,428,847 (24,440,616) -8.76% 2 Subtotal: 713,918,664 81,006,455 49,225,220 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16.09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15,16% 1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,5257 (18,149,117) -15,86% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 66,913,135 (12,785,742) -16,09%	5 5 5 5 5 4 4 4 4 4 4 4 4 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subtl 2 3 4 Subtl 2 3 4 Subtl 2 3 4 Subtl 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061	6,353,289 6,581,319 6,581,319	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63% -12.10% 0.00%
2 2003 0 5 7 129,604,587 15,450,429 11,958,793 11,166,614 9,442,319 9,104,165 79,648,501 (19,049,120) -14,92% 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15,16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,438,507 107,561,467 (15,374,032) -15,86% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 130,696,464 (31,871,539) -12,10% 2 2007 4 5 3 161,757,873 18,565,084 154,228,20 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16,09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15,16% 1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15,86% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 66,913,135 (12,785,742) -16,09% 1 2007 4 5 2 75,762,808 10,867,262	5 5 5 5 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2004 2005 2006	0 1 2 3 4 Subtl	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 5	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061	6,353,289 6,581,319 6,581,319	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 120,068,668	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63% -12.10% 0.00% 0.00% 0.00%
2 2004 1 5 6 131,840,967 15,830,159 12,037,472 10,226,089 8,779,447 94,753,103 (24,153,722) -15.16% 2 2005 2 5 5 147,651,823 15,439,527 12,529,715 10,438,507 107,561,467 (15,374,032) -15.86% 2 2006 3 5 4 143,063,414 15,721,256 12,699,241 130,696,464 (31,871,539) -12.10% 2 2007 4 5 3 161,757,873 18,565,084 115,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 15,721,256 12,699,241 154,128,847 (24,440,616) -8.76% 15,721,256 12,699,241 15,721,256 1	5 5 5 5 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2004 2005 2006	0 1 2 3 4 Subtl Subtl 1 2 3 4 4 Subtl 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 5	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911	6,816,306 7,031,468 13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896	6,353,289 6,581,319 6,581,319 7,611,318	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,946,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63% -12.10% 0.00% 0.00%
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2 2006 3 5 4 143,063,414 15,721,256 12,699,241 130,696,464 (31,871,539) -12.10% 2 2007 4 5 3 161,757,873 18,565,084 154,128,847 (24,440,616) -8.76% 2 Subtotal: 713,918,664 81,006,455 49,225,220 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16.09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15.16% 1 2004 1 5 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15.86% 1 2005 2 5 4 87,777,788 11,151,322 8,268,516 7,324,561 69,188,356 (16,528,727) -12.10% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 66,791,555 (13,460,600) -8.76% 1 2007 4 5 2 75,762,808 10,867,262 66,913,135 (12,785,742) -16.09%	5 5 5 5 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subtl 0 1 2 3 4 Subtl 0 0 1 1 2 3 3 4 Subtl 0 0 1 1 2 3 3 4 Subtl 0 0 1 1 2 3 3 4 Subtl 0 0 1 1 2 3 3 4 Subtl 0 0 1 1 2 3 3 4 Subtl 0 1 3 3 5 Subtl 0 1 3 3 5 Subtl 0 1 3 Subtl 0 1	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 8 7 6 5 4	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 120,6773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218 628,310,401 129,604,587	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319	6,353,289 6,581,319 6,581,319 7,611,318	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509 500,862,236 79,648,501	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63% -12.10% 0.00% 0.00% 0.00% -1.00% 0.00% -1.00%
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2 Subtotal: 713,918,664 81,006,455 49,225,220 31,831,210 18,221,766 9,104,165 566,788,381 (114,889,028) -16.09% 1 2003 0 5 6 73,263,709 8,434,521 6,406,341 5,579,729 4,635,777 3,979,589 43,438,201 (5,797,443) -15.16% 1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15.86% 1 2005 2 5 4 87,777,788 11,151,322 8,268,516 7,324,561 69,188,356 (16,528,727) -12.10% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 66,913,135 (12,785,742) -16.09% 1 2007 4 5 2 75,762,808 10,867,262 8,168,321 66,913,135 (12,785,742) -16.09%	5 5 5 5 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt 0 0 1 2 3 4 Subt 0 0 1 2 3 4 Subt 0 0 1 2 2 3 4 Subt 0 0 1 2 2 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 4 Subt 0 0 1 2 2 3 3 3 3 4 Subt 0 0 1 2 2 3 3 3 3 4 Subt 0 0 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 4	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,646,630 140,259,432 140,149,218 628,310,401 129,604,587 131,840,967 147,651,823	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275 15,450,429 15,830,159 15,439,527	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906 45,837,021 11,958,793 12,037,472 12,529,715	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614 10,226,089	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319	6,353,289 6,581,319 6,581,319 7,611,318	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509 500,862,236 79,648,501 94,753,103 107,561,467	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120) (24,153,722) (15,374,032)	-11.63% -12.63% -14.92% -15.16% -15.86% -0.00% -0.00% -14.92% -12.63% -11.63% -12.10% -0.00% -0.00% -0.00% -12.10% -8.76% -15.16% -15.86%
1 2004 1 5 5 90,007,113 12,629,075 7,958,976 6,794,694 5,616,064 64,870,527 (18,149,117) -15.86% 1 2005 2 5 4 87,777,788 11,151,322 8,268,516 7,324,561 69,188,356 (16,528,727) -12.10% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 68,770,555 (13,460,600) -8.76% 1 2007 4 5 2 75,762,808 10,867,262 66,913,135 (12,785,742) -16.09%	5 5 5 5 5 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt 0 0 1 2 3 4 Subt 0 0 1 2 3 4 Subt 0 0 1 2 3 3 3 4 Subt 0 0 1 2 3 3 3 4 Subt 0 0 1 2 3 3 3 4 Subt 0 0 1 2 3 3 3 5 Subt 0 0 1 2 3 3 3 5 Subt 0 0 1 2 3 3 3 5 Subt 0 0 1 2 3 3 5 Subt 0 0 1 3 Subt 0 0 3 Subt 0 0 1 3 Subt 0 0 1 3 Subt 0 0 3 Subt	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 8 7 6 5 4	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 915,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218 628,310,401 129,604,587 131,840,967 147,651,823 143,063,414	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275 15,450,429 15,830,159 15,439,527 15,721,256	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906 45,837,021 11,958,793 12,037,472 12,529,715	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614 10,226,089	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319	6,353,289 6,581,319 6,581,319 7,611,318	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 132,027,509 500,862,236 79,648,501 94,753,103 107,561,467 130,696,464	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120) (24,153,722) (15,374,032) (31,871,539)	-11.63% -12.63% -14.92% -15.16% -15.86% -0.00% -0.00% -14.92% -12.63% -11.63% -12.10% -12.10% -12.10% -12.10% -15.16% -15.16% -15.16% -15.86% -12.10%
1 2005 2 5 4 87,777,788 11,151,322 8,268,516 7,324,561 69,188,356 (16,528,727) -12.10% 1 2006 3 5 3 80,279,847 10,775,990 8,168,321 68,770,555 (13,460,600) -8.76% 1 2007 4 5 2 75,762,808 10,867,262 66,913,135 (12,785,742) -16.09%	5 5 5 5 4 4 4 4 4 4 3 3 3 3 3 3 3 2 2 2 2 2 2 2	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt 0 1 2 3 4 Subt 0 1 2 3 4 4 Subt 0 1 2 3 3 4 4 Subt 0 1 3 3 5 Subt 0 1 3 3 5 Subt 0 1 3 3 5 Subt 0 1 3 Subt 0	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 8 7 6 5 4	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218 628,310,401 129,604,587 131,840,967 147,651,823 143,063,414 161,757,873	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275 15,450,429 15,830,159 15,439,527 15,721,256 18,565,084	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906 45,837,021 11,958,793 12,037,472 12,529,715 12,699,241	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614 10,226,089 10,438,507	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319 8,779,447	6,353,289 6,581,319 6,581,319 7,611,318 7,611,318 9,104,165	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509 500,862,236 79,648,501 94,753,103 107,561,467 130,696,464 154,128,847	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120) (24,153,722) (15,374,032) (31,871,539) (24,440,616)	-11.63% -12.63% -14.92% -15.16% -15.86% -0.00% -0.00% -14.92% -12.63% -11.63% -12.10% -12.10% -12.10% -14.92% -15.16% -15.86% -15.86% -12.10% -8.76%
1 2006 3 5 3 80,279,847 10,775,990 8,168,321 68,770,555 (13,460,600) -8.76% 1 2007 4 5 2 75,762,808 10,867,262 66,913,135 (12,785,742) -16.09%	5 5 5 5 5 4 4 4 4 4 4 4 3 3 3 3 3 3 3 2 2 2 2 2 2	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt 0 5 Su	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 5 4	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218 628,310,401 129,604,587 131,840,967 147,651,823 143,063,414 161,757,873	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275 15,450,429 15,830,159 15,439,527 15,721,256 18,565,084 81,006,455	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906 45,837,021 11,958,793 12,037,472 12,529,715 12,699,241	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614 10,226,089 10,438,507	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319 8,779,447	6,353,289 6,581,319 6,581,319 7,611,318 7,611,318 9,104,165	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509 500,862,236 79,648,501 94,753,103 107,561,467 130,696,464 154,128,847 566,788,381	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120) (24,153,722) (15,374,032) (31,871,539) (24,440,616) (114,889,028)	-11.63% -12.63% -14.92% -15.16% -15.86% -0.00% -0.00% -14.92% -12.63% -11.63% -12.10% -0.00% -12.10% -12.10% -13.76% -15.16% -15.16% -15.16% -15.16% -16.09%
1 2007 4 5 2 75,762,808 10,867,262 66,913,135 (12,785,742) -16.09%	5 5 5 5 4 4 4 4 4 4 4 3 3 3 3 3 3 3 2 2 2 2 2 2	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt 0 1 1 2 3 4 Subt 0 1 1 2 1 3 4 Subt 0 1 1 2 1 3 1 4 Subt 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 4 7 6 5 4 3	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218 628,310,401 129,604,587 131,840,967 147,651,823 143,063,414 161,757,873 713,918,664 73,263,709 90,007,113	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275 15,450,429 15,830,159 15,439,527 15,721,256 18,565,084 81,006,455 8,434,521 12,629,075	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906 45,837,021 11,958,793 12,037,472 12,529,715 12,699,241 49,225,220 6,406,341 7,958,976	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614 10,226,089 10,438,507 31,831,210 5,579,729 6,794,694	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319 8,779,447 18,221,766 4,635,777	6,353,289 6,581,319 6,581,319 7,611,318 7,611,318 9,104,165	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,964,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509 500,862,236 79,648,501 94,753,103 107,561,467 130,696,464 154,128,847 566,788,381	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120) (24,153,722) (15,374,032) (31,871,539) (24,440,616) (114,889,028)	-11.63% -12.63% -14.92% -15.16% -15.86% 0.00% 0.00% -14.92% -12.63% -11.63% -12.10% 0.00% 0.00% -12.10% -8.76% -15.16% -15.16% -15.16% -15.16% -15.16%
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1 Subtotal: 407,091,265 53,858,170 30,802,154 19,698,983 10,251,842 3,979,589 313,180,773 (66,721,629) -16.39%	5 5 5 5 5 4 4 4 4 4 4 4 4 4 4 4 4 3 3 3 3	2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007 2003 2004 2005 2006 2007	0 1 2 3 4 Subt 0 1 2 3 4 Subt 0 1 2 3 4 Subt 5 Subt	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9 8 7 6 9 8 7 6 5 4 7 6 5 4 3	86,872,501 90,443,364 89,121,385 115,308,563 111,273,624 493,019,437 97,672,204 95,342,220 115,789,668 120,228,373 131,741,136 560,773,599 100,375,332 120,679,588 126,846,830 140,259,432 140,149,218 628,310,401 129,604,587 131,840,967 147,651,823 143,063,414 161,757,873 713,918,664 73,263,709 90,007,113 87,777,788 80,279,847	9,141,953 10,097,902 10,680,922 11,945,270 10,354,757 52,220,803 10,824,647 11,923,468 12,402,279 11,500,227 12,628,683 59,279,304 11,906,686 13,171,317 13,073,708 13,880,325 13,825,240 65,857,275 15,450,429 15,830,159 15,439,527 15,721,256 18,565,084 81,006,455 8,434,521 12,629,075 11,151,322 10,775,990	8,206,063 9,341,860 9,356,906 11,099,254 38,004,083 9,504,997 9,875,728 11,055,807 9,705,173 40,141,705 11,114,938 11,587,223 10,886,953 12,247,906 45,837,021 11,958,793 12,037,472 12,529,715 12,699,241 49,225,220 6,406,341 7,958,976 8,268,516	7,373,394 7,945,410 8,738,135 24,056,939 8,670,167 8,673,746 10,261,140 27,605,053 9,253,815 10,452,479 9,593,911 29,300,205 11,166,614 10,226,089 10,438,507 31,831,210 5,579,729 6,794,694	13,847,774 7,434,687 8,148,742 15,583,429 8,186,061 9,728,896 17,914,957 9,442,319 8,779,447 18,221,766 4,635,777	6,353,289 6,581,319 6,581,319 7,611,318 7,611,318 9,104,165	62,471,838 67,682,459 94,190,472 104,192,574 385,296,035 59,914,816 65,054,423 88,742,327 105,038,759 120,214,569 438,944,893 62,082,600 86,213,422 100,470,036 120,068,668 132,027,509 500,862,236 79,648,501 94,753,103 107,561,467 130,696,464 154,128,847 566,788,381 43,438,201 64,870,527 69,188,356 68,770,555	(13,711,591) (15,884,415) (15,978,857) (19,073,533) (78,180,927) (5,258,428) (8,333,888) (19,911,492) (19,280,761) (15,085,001) (67,869,570) (9,780,085) (10,473,749) (7,177,779) (5,937,467) (21,682,618) (55,051,699) (19,049,120) (24,153,722) (15,374,032) (31,871,539) (24,440,616) (114,889,028) (5,797,443) (18,149,117) (16,528,727) (13,460,600)	-11.63% -12.63% -14.92% -15.16% -15.86% -0.00% -0.00% -14.92% -12.63% -12.63% -12.10% -0.00% -1.00% -1.10%
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(13) = (6) - [(7) + (8) + (9) + (10) + (11)] - (12) * [1 - (14)] (14) is derived recurssively for starting claim duration t, where (14) = (13)/(6) for each t = 10, 9, 8, ..., 2, 1; and (14) = 0 if (t+n-m) > 10

Table 2. Sum of Reserve Margins by Claim Duration

Claim	Current	Reserve	Expected	Expected
Duration	Reserve	Margin	Reserve	Reserve %
1	407.09 M	-66.72 M	473.81 M	116.39%
2	713.92 M	-114.89 M	828.81 M	116.09%
3	628.31 M	-55.05 M	683.36 M	108.76%
4	560.77 M	-67.87 M	628.64 M	112.10%
5	493.02 M	-78.18 M	571.20 M	115.86%
6	426.64 M	-64.70 M	491.33 M	115.16%
7	362.93 M	-54.15 M	417.07 M	114.92%
8	315.81 M	-39.88 M	355.69 M	112.63%
9	271.59 M	-31.59 M	303.18 M	111.63%
10	233.33 M	-23.66 M	256.99 M	110.14%
Total	4,413.40 M	-596.69 M	5,010.08 M	113.52%

Table 3. Reserve Margin for Individual Valuation Date by Claim Duration

								,					
Valuation	Current	Reserve Margin by Claim Duration											
Date Reserve			2	3	4	5	6	7	8	9	10	Subtotal	%Reserve
2003	750.49 M	-5.80 M	-19.05 M	-9.78 M	-5.26 M	-13.53 M	-9.09 M	-7.69 M	-3.68 M	-6.26 M	-5.21 M	-85.34 M	-11.37%
2004	817.56 M	-18.15 M	-24.15 M	-10.47 M	-8.33 M	-13.71 M	-15.24 M	-8.04 M	-6.87 M	-5.02 M	-6.04 M	-116.03 M	-14.19%
2005	887.74 M	-16.53 M	-15.37 M	-7.18 M	-19.91 M	-15.88 M	-13.55 M	-14.08 M	-7.38 M	-5.93 M	-5.74 M	-121.56 M	-13.69%
2006	949.74 M	-13.46 M	-31.87 M	-5.94 M	-19.28 M	-15.98 M	-14.18 M	-13.90 M	-12.40 M	-4.94 M	-4.89 M	-136.84 M	-14.41%
2007	1,007.87 M	-12.79 M	-24.44 M	-21.68 M	-15.09 M	-19.07 M	-12.64 M	-10.43 M	-9.55 M	-9.44 M	-1.79 M	-136.92 M	-13.59%
Total	4,413.40 M	-66.72 M	-114.89 M	-55.05 M	-67.87 M	-78.18 M	-64.70 M	-54.15 M	-39.88 M	-31.59 M	-23.66 M	-596.69 M	-13.52%

In this example, assuming reserves at claim durations 11 and later are alright; claims at duration 10 show that duration 10 reserves have a 10.14 percent deficiency. When determining the reserve margin for claims at duration 9, the adequate ending reserves must be used. That is, the duration 10 reserves used for calculating duration 9 reserve margin must be adjusted (i.e., increased by 10.14 percent). This produces a reserve margin of 11.63 percent for duration 9 reserves. Then, these margins are used to determine duration 8 reserve margin, etc. (see Table 1). Overall, the necessary reserves for the observation period appear to be at least 113.52 percent of the reserves valued (Table 2). There are variations among the different valuation dates, with the current valuation (i.e., valuation date 2007) having 13.59 percent deficiency (*Table 3*). All this requires an adjustment to the 2008 valuation termination rate assumption. This results in an immediate reserve strengthening of \$136.92 million.

Discussions

Whenever a reserve inadequacy is uncovered (as in the case demonstrated above), companies usually strengthen the reserves by lowering their assumed claim termination rates (CTR), often in the ultimate durations (e.g., 11 and later). The regulators may be immediately pleased seeing the higher reserve; however, despite the new assumptions, reserve inadequacies may re-emerge in the future. This is because the reserve margin concerns merely the difference between starting reserve and ending reserve of an observation period, not the *whole* reserve itself. By looking at the reserve calculation regime, we see that simply lowering ultimate CTR is a shortsighted way to strengthen reserves. The impact of CTR rate change to reserve is illustrated in *Graph 1* for a typical longterm A&H claim. With the different ways to slow down the CTR, the reserve increase for claims at different durations can be quite different. Therefore, the impact on reserve margins is uncertain.

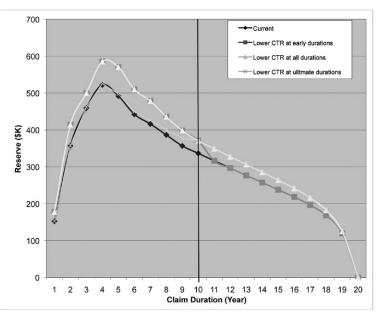
Another issue is credibility. A company may not have a large claim volume. Even with a sizable total claim volume, there are probably very few claims at a particular duration, especially later durations such as 10 or 11. As a result, the margin factors used for adjusting the ending reserves in Equation 4 may be based on insufficient experience and therefore inappropriate. If so, the margin, whether positive or negative, and regardless of its magnitude, shouldn't have meaningful implications to reserve adequacy.

To sum up, claim reserve run-out study is an effective way to test reserve adequacy. However, it is valid only if the actuary knows the products and sees the implications of the numbers. We must make sure not only to do the right test, but also to truly understand, interpret and use the testing results properly.

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Graph 1. The Impact of CTR to Reserve Amounts at Different Claim Durations

(Duration 11 and later as Ultimate Durations)



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