Incorporating Cancellations into Pricing and Reserving Extended Warranties

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Abstract: Accounting rules specify that extended warranty contracts with terms of thirteen months or longer use loss payment patterns to determine the unearned premium reserve. These payment patterns should incorporate cancellations. Ignoring cancellations overstates earned premium and understates the unearned premium reserve.

Disclaimer: The views expressed in this paper are solely the responsibility of the author and do not necessarily reflect the views of his employer, The Warranty Group.

Extended Warranties (EWs) are unusual property and casualty coverages due to the uncertainty about the estimate of unearned (and earned) premium. Generally, there is much less uncertainty about pending reserves and IBNR. The reverse is the case for the typical liability property and casualty line. Statutory Accounting Principle 65 requires that companies carry the highest of three estimates as the unearned premium reserve. Test 1 is the amount of refunds that would be paid if all the contracts canceled. Test 2 is the gross premium times the unpaid losses divided by the total losses. Test 3 is the unpaid losses with discounting allowed though at a less than market rate. Companies generally establish earnings patterns for their databases which calculate the unearned (and earned) premium for test 2. This paper asserts that the payment pattern should explicitly adjust for cancellations. Not adjusting for cancellations overestimates the earned premium by 2%-3% for a mature book of in-force business and by a substantially greater amount for a growing immature book.

EWs have been discussed in several Casualty Actuarial Society articles (see appendix). However, I have not been able to find any detailed consideration of how cancellations should be handled in terms of the earnings pattern. This issue pertains mainly to automobile and power sports EWs. Cancellations are not as significant on other EWs due to the difference in term and premium amount. For example, Electronics and Appliances generally have a lower EW premium and a shorter term than is the case for automobile. These two factors usually lead to less cancellations.

EW cancellation refunds are normally pro-rata. Thus, the refund for a six year contract with $1,000 premium after three years is $500. An additional cancellation fee is sometimes levied. Cancellation fees will be ignored in this paper. Generally, the manufacturer's

warranty covers most if not all losses in the first three years for new vehicles. Once a contract is cancelled, any remaining premium is earned. No premium earns during the manufacturer's warranty unless the EW adds additional coverage. In this example, the canceled contract has $500 of earned premium against little or no exposure. This fact alone means that one should monitor cancellation rates closely since they greatly affect profitability. Most of these cancellations, except for the buyer's remorse ones just after the EW is purchased, arise from the existing vehicle being traded in for a new one. There is some ambiguity about cancellation rates. Thus, there is generally breakage in the latter part of the EW contract's term. Breakage is defined as the reduction in losses in the latter part of the contract period due to people forgetting that they have coverage or no longer owning the item. The cancellation rate could increase if fewer people forget that they have an EW when the covered car is sold or people owning vehicles for shorter periods of time. However, it is reasonable to assume that the rate of forgetfulness is relatively constant and an increase in cancellation rate implies a higher turnover rate for the covered car.

For used vehicles, the exposure is generally faster than pro-rata; thus the loss ratio on canceled contracts should be higher than that for contracts which run the full term and expire.

For the sake of simplicity, all of the examples in this paper will use term only. Most auto EWs have both a term and a mileage component. Thus, one could write a six year and 60,000 mile EW for a vehicle with a three year and 36,000 mile manufacturer's warranty. A few high mileage drivers will exceed the 36,000 limit in the first year with a much higher percentage exceeding it in the second and third year. Thus, they will mile out of the manufacturer's warranty before the three year term expires. These high mileage drivers will usually exceed the 60,000 limit prior to the expiration of the six year term limit.

Exhibit 1 shows a simple example of two year contracts. Note that EWs are not considered insurance in most states; thus, we will use the term contract not policy and effective year rather than policy year. 100 contracts are written on 1/1/2000 for $1 of premium per contract. Frequency is 10% per exposed year with severity uniform at $5. Thus, paid losses are 50% of the in-force premium per exposed year. The resulting payment pattern is 55.6% for the first year and 44.4% for the second year. Using this pattern mismatches premium and losses. Assuming no lag between accident date and payment date, which eliminates the need for lag IBNR, the $50 of losses in the first year divided by $55.6 of earned premium yields a 90% loss ratio. In the second year, $40 of losses divided by $34.4 of earned premium is a 116% loss ratio. The problem with Method 1 arises since the

front loaded overall payment pattern stems from cancellations and not from the inherent risk being greater in the first half of the contract.

Method 2 measures the partial pure premiums in developing the payment pattern. Thus, there are $50 of losses in the first year against an in-force of $100 for a 50% in-force loss rate. Similarly, there are $40 of losses in the second year against an in-force of $80 for a 50% rate. The earned premium is $50 in the first year (0.5 x $100) and $40 in the second year (either 0.5 x $80 or 90 – 50). Method 3 projects the ultimate written premium net of cancellations. Thus, premium emergence patterns are used to estimate the ultimate written net of cancellations of $90. Using the standard payment pattern also yields earned of $50 in the first year and $40 in the second year. Method 2 is superior since the individual contracts are earned correctly and there is no need for an overall cancellation adjustment. This correct earning of contract data means that further splits, such as by class or SKU, will be correct. Alternately, one ignore all premium and losses from policies which have canceled.

Exhibit 2A shows a more realistic example for new vehicles with seven year contracts and three year manufacturer's warranties. In this example, 10% of the contracts cancel after the fourth year. Method 1, the unadjusted payment pattern, results in loss ratios of 92.5%, 90.3% 102.8% and 102.8% in years four to seven. Method 2 yields loss ratios of 100% except for year five. The lower year five loss ratio stems from all the cancellation profit being realized in the year in which the contracts cancel. Thus, the contracts earn 57.1% of the premium for covering 25% of the exposure. 6.4 = 20 x (.571 - 0.25). Method 3 gives a 104.5% loss ratio in year four and 94% in years five to seven. Once again, the partial pure premium after adjusting for cancellations, Method 2, yields the best result.

Exhibit 2B shows the effect of cancellations doubling. Underwriting profitability doubles as a result since the contracts which are not canceled have a 100% loss ratio. Note though that the 100% loss ratio probably reflects some breakage. Thus, individuals sell their car but forget to cancel their warranty contract will generally have even better experience than the cancellations since there is no return premium. Method 1 again sends out false profitability signs in years four and five. Method 2 shows break-even underwriting except for year five. Method 3 has an unprofitable year four and is profitable in years five to seven.

The long-term results from contracts in Exhibit 2A is shown in Exhibit 3A. Thus, it shows the effect on results of level writings with 10% cancellations in the beginning of the fifth year. The loss ratios in Method 1 are more profitable than the long-term average in years four to six and then equals the overall average of 96.6% after that. Method 2 is breakeven in year four, is better than average in years five and six, but higher than Method 1,

and then is at the long-term average. Method 3 is unprofitable in year four and then declines gradually to the long-term average in years seven onwards. The UPR is consistently the highest in Method 3, reflecting the unprofitable results in the fourth year and less profitable results in years five and six. Exhibit 3B shows the effect of doubling cancellations.

Exhibits 4A and 4B show similar examples for used vehicles where losses, adjusted for cancellations, are faster than pro-rata. In these cases, the pro-rata cancellations increase the loss ratio from 100% to 100.7% and 101.5% in Exhibits 5A and 5B, respectively. Exhibit 5A shows that Method 1 gives a false underwriting profit in year one, whereas Method 3 shows far too unprofitable a loss ratio in the first year. Once again, Method 2 yields the best results. Exhibit 5B again shows the effect of doubling cancellation rates.

Exhibit 6 shows an example for a 60 month EW where most or all of the manufacturer's warranty has expired. Column 5 shows that with level written premium for at least five years, the earned premium without adjusting for cancels in column 2 is 2.3% higher than the adjusted earned in column 4. Column 6 shows an example where written premium is increasing by 4% per year. The larger premiums are given at the top since they represent more recent contract months (ages 1-12 are the first contract year, etc.). Adjusted for the premium increases, column 9 shows that the in-force earned premium without adjusting for cancels is 2.4% higher than the adjusted earned. For the most recent contract year, it is 10.6% higher; for the last two years, it is 7.5% higher, etc. The payment pattern in Exhibit 6 is given on an accident date basis rather than for payment date. Thus, pending reserves and IBNR are required to cover the liability for the payment lag. Earnings curves can also be done by payment date. They obviously will extend beyond the end of the contract period.

In conclusion, partial pure premiums, excluding contracts which canceled prior to the beginning of the period, are the best method for earning premium for EWs with significant cancellation rates. In general, I have found that the adjustment reduces earned premium on in-force contracts by about 2% as was shown in Exhibit 6. Thus, if no contracts have expired, the inception-to-date loss ratio using unadjusted payment patterns will be about 2% too low. Similarly, the carried UPR from Test 2 will also be too low.

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BIOGRAPHY

Richard Easton is Vice President and Actuary at The Warranty Group (formerly AON Warranty Group). He has a degree in Mathematics from Brown University. He is a Fellow of the CAS and a Member of the American Academy of Actuaries.

Exhibit 1

2 year Warranties
All written on 1/1/2000
Pro-rata losses
Premium = $1
Contract Count = 100
Severity = $5
Frequency = 10% per exposed year
20% cancel on 1/1/2001 - $10 total return premium

Method 1 - overall payment pattern

	2000	2001	Total
Written Premium in-force	100	80	
Policies in-force	100	80	
Paid Losses	50.0	40.0	90.0
Payment Pattern	55.6%	44.4%	100.0%
Earned Premium from payment pattern	55.6	35.6	91.1
Adjusted Earned Premium (written - cancellation)	55.6	34.4	90.0
Refunds from Cancellations		10.0	10.0
Loss Ratio	90.0%	116.1%	100.0%

55.6 = 100 x 50/90.
34.4 =100 x 40/90 -10 or 90-55.6

Method 2 - use payment pattern excluding canceled policies			
Partial Pure premium	50.0%	50.0%	100.0%
Resulting Earned Premium	50	40	90
Loss Ratio	100.0%	100.0%	100.0%

Method 3 - Project Ultimate Written Premium after cancellations			
Projected Ultimate Premium	90		
Payment Pattern	55.6%	44.4%	100.0%
Resulting Earned Premium	50	40	90
Loss Ratio	100.0%	100.0%	100.0%

Exhibit 2A - New Vehicles

7 year Warranties
All written on 1/1/2000
Pro-rata losses
3 Year (36 month/36,000 miles) manufacturer's warranty - no losses during this period
Premium = $2
Contract Count = 100
Severity = $5
Frequency = 10% per exposed year
10% cancel on 1/1/2004

Method 1 - Unadjusted payment pattern

	2000	2001	2002	2003	2004	2005	2006	Total
Paid Losses	0.0	0.0	0.0	50.0	45.0	45.0	45.0	185.0
Payment Pattern	0.0%	0.0%	0.0%	27.0%	24.3%	24.3%	24.3%	100.0%
In Force Written Premium	200	200	200	200	180	180	180	
Policies in-force	100	100	100	100	90	90	90	
Earned Premium from payment pattern	0.0	0.0	0.0	54.1	43.8	43.8	43.8	185.4
Adjusted Earned Premium (written - cancellation)	0.0	0.0	0.0	54.1	49.8	43.8	43.8	191.4
Earned - Paid = profit from cancellations.	0.0	0.0	0.0	4.1	4.8	-1.2	-1.2	6.4
Refunds from Cancellations					8.6			8.6
Loss Ratio				92.5%	90.3%	102.8%	102.8%	96.6%

Method 2 - use payment pattern excluding canceled policies

Partial Pure premium	0	0	0	25.0%	25.0%	25.0%	25.0%	100.0%
Resulting Earned Premium	0	0	0	50	45	45	45	185
Additional earned from cancellations					6.4			
Total Earned Premium	0	0	0	50	51.4	45	45	191.4
Earned - Paid = profit from cancellations.	0.0	0.0	0.0	0.0	6.4	0.0	0.0	6.4
Loss Ratio				100.0%	87.5%	100.0%	100.0%	96.6%

Method 3 - Project Ultimate Written Premium after cancellations

Projected Ultimate Premium	191.4							
Payment Pattern	0.0%	0.0%	0.0%	25.0%	25.0%	25.0%	25.0%	
Total Earned Premium	0.0	0.0	0.0	47.9	47.9	47.9	47.9	191.4
Earned - Paid = profit from cancellations.	0.0	0.0	0.0	-2.1	2.9	2.9	2.9	6.4
Loss Ratio				104.5%	94.0%	94.0%	94.0%	96.6%

Exhibit 2B - New Vehicles

7 year Warranties
All written on 1/1/2000
Pro-rata losses
3 Year (36 month/36,000 miles) manufacturer's warranty - no losses during this period
Premium = $2
Contract Count = 100
Severity = $5
Frequency = 10% per exposed year
20% cancel on 1/1/2004

Method 1 - Unadjusted payment pattern

	2000	2001	2002	2003	2004	2005	2006	Total
Paid Losses	0.0	0.0	0.0	50.0	40.0	40.0	40.0	170.0
Payment Pattern	0.0%	0.0%	0.0%	29.4%	23.5%	23.5%	23.5%	100.0%
In Force Written Premium	200	200	200	200	160	160	160	
Policies in-force	100	100	100	100	80	80	80	
Earned Premium from payment pattern	0.0	0.0	0.0	58.8	37.6	37.6	37.6	171.8
Adjusted Earned Premium (written - cancellation)	0.0	0.0	0.0	58.8	48.7	37.6	37.6	182.9
Earned - Paid = profit from cancellations.	0.0	0.0	0.0	8.8	8.7	-2.4	-2.4	12.9
Refunds from Cancellations					17.1			17.1
Loss Ratio				85.0%	82.1%	106.3%	106.3%	93.0%

Method 2 - use payment pattern excluding canceled policies

Partial Pure premium	0	0	0	25.0%	25.0%	25.0%	25.0%	100.0%
Resulting Earned Premium	0	0	0	50	40	40	40	170
Additional earned from cancellations					12.9			
Total Earned Premium	0	0	0	50	52.9	40	40	182.9
Earned - Paid = profit from cancellations.	0.0	0.0	0.0	0.0	12.9	0.0	0.0	12.9
Loss Ratio				100.0%	75.7%	100.0%	100.0%	93.0%

Method 3 - Project Ultimate Written Premium after cancellations

Projected Ultimate Premium	182.9							
Payment Pattern	0.0%	0.0%	0.0%	25.0%	25.0%	25.0%	25.0%	
Total Earned Premium	0.0	0.0	0.0	45.7	45.7	45.7	45.7	182.9
Earned - Paid = profit from cancellations.	0.0	0.0	0.0	-4.3	5.7	5.7	5.7	12.9
Loss Ratio				109.4%	87.5%	87.5%	87.5%	93.0%

Exhibit 3A - New Vehicles

7 year Warranties
All written on 1/1/2000
Pro-rata losses
3 Year (36 month/36,000 miles) manufacturer's warranty - no losses during this period
Premium = $2
Contract Count = 100
Severity = $5
Frequency = 10% per exposed year
10% cancel on 1/1 of fifth year

Paid Losses

Effective Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	50.0	45.0	45.0	45.0		
2001		0.0	0.0	0.0	50.0	45.0	45.0	45.0	
2002			0.0	0.0	0.0	50.0	45.0	45.0	45.0
2003				0.0	0.0	0.0	50.0	45.0	45.0
2004					0.0	0.0	0.0	50.0	45.0
2005						0.0	0.0	0.0	50.0
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	50.0	95.0	140.0	185.0	185.0	185.0

Method 1 - use unadjusted payment pattern

Earned Premium

Effective Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	54.1	49.8	43.8	43.8		
2001		0.0	0.0	0.0	54.1	49.8	43.8	43.8	
2002			0.0	0.0	0.0	54.1	49.8	43.8	43.8
2003				0.0	0.0	0.0	54.1	49.8	43.8
2004					0.0	0.0	0.0	54.1	49.8
2005						0.0	0.0	0.0	54.1
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	54.1	103.9	147.6	191.4	191.4	191.4
Loss Ratio				92.5%	91.5%	94.8%	96.6%	96.6%	96.6%
Test 2 UPR	200.0	400.0	600.0	745.9	842.1	894.4	903.0	911.6	920.2

Method 2 - use payment pattern excluding canceled policies

Earned Premium

Effective Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	50.0	51.4	45.0	45.0		
2001		0.0	0.0	0.0	50.0	51.4	45.0	45.0	
2002			0.0	0.0	0.0	50.0	51.4	45.0	45.0
2003				0.0	0.0	0.0	50.0	51.4	45.0
2004					0.0	0.0	0.0	50.0	51.4
2005						0.0	0.0	0.0	50.0
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	50.0	101.4	146.4	191.4	191.4	191.4
Loss Ratio				100.0%	93.7%	95.6%	96.6%	96.6%	96.6%
Test 2 UPR	200.0	400.0	600.0	750.0	848.6	902.1	910.7	919.3	927.9

Method 3 - Project Ultimate Written Premium after cancellations

Earned Premium

Effective Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	47.9	47.9	47.9	47.9		
2001		0.0	0.0	0.0	47.9	47.9	47.9	47.9	
2002			0.0	0.0	0.0	47.9	47.9	47.9	47.9
2003				0.0	0.0	0.0	47.9	47.9	47.9
2004					0.0	0.0	0.0	47.9	47.9
2005						0.0	0.0	0.0	47.9
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	47.9	95.7	143.6	191.4	191.4	191.4
Loss Ratio				104.5%	99.3%	97.5%	96.6%	96.6%	96.6%
Test 2 UPR	200.0	400.0	600.0	752.1	856.4	912.9	921.4	930.0	938.6

Exhibit 3B - New Vehicles

7 year Warranties
All written on 1/1/2000
Pro-rata losses
3 Year (36 month/36,000 miles) manufacturer's warranty - no losses during this period
Premium = $2
Contract Count = 100
Severity = $5
Frequency = 10% per exposed year
20% cancel on 1/1 of fifth year

Effective	**Paid Losses**								
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	50.0	40.0	40.0	40.0		
2001		0.0	0.0	0.0	50.0	40.0	40.0	40.0	
2002			0.0	0.0	0.0	50.0	40.0	40.0	40.0
2003				0.0	0.0	0.0	50.0	40.0	40.0
2004					0.0	0.0	0.0	50.0	40.0
2005						0.0	0.0	0.0	50.0
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	50.0	90.0	130.0	170.0	170.0	170.0

Method 1 - use unadjusted payment pattern

Effective	**Earned Premium**								
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	58.8	48.7	37.6	37.6		
2001		0.0	0.0	0.0	58.8	48.7	37.6	37.6	
2002			0.0	0.0	0.0	58.8	48.7	37.6	37.6
2003				0.0	0.0	0.0	58.8	48.7	37.6
2004					0.0	0.0	0.0	58.8	48.7
2005						0.0	0.0	0.0	58.8
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	58.8	107.6	145.2	182.9	182.9	182.9
Loss Ratio				85.0%	83.7%	89.5%	93.0%	93.0%	93.0%
Test 2 UPR	200.0	400.0	600.0	741.2	833.6	888.4	905.5	922.7	939.8

Method 2 - use payment pattern excluding canceled policies

Effective	**Earned Premium**								
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	50.0	52.9	40.0	40.0		
2001		0.0	0.0	0.0	50.0	52.9	40.0	40.0	
2002			0.0	0.0	0.0	50.0	52.9	40.0	40.0
2003				0.0	0.0	0.0	50.0	52.9	40.0
2004					0.0	0.0	0.0	50.0	52.9
2005						0.0	0.0	0.0	50.0
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	50.0	102.9	142.9	182.9	182.9	182.9
Loss Ratio				100.0%	87.5%	91.0%	93.0%	93.0%	93.0%
Test 2 UPR	200.0	400.0	600.0	750.0	847.1	904.3	921.4	938.6	955.7

Method 3 - Project Ultimate Written Premium after cancellations

Effective	**Earned Premium**								
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
2000	0.0	0.0	0.0	45.7	45.7	45.7	45.7		
2001		0.0	0.0	0.0	45.7	45.7	45.7	45.7	
2002			0.0	0.0	0.0	45.7	45.7	45.7	45.7
2003				0.0	0.0	0.0	45.7	45.7	45.7
2004					0.0	0.0	0.0	45.7	45.7
2005						0.0	0.0	0.0	45.7
2006							0.0	0.0	0.0
2007								0.0	0.0
2008									0.0
Total	0.0	0.0	0.0	45.7	91.4	137.1	182.9	182.9	182.9
Loss Ratio				109.4%	98.4%	94.8%	93.0%	93.0%	93.0%
Test 2 UPR	200.0	400.0	600.0	754.3	862.9	925.7	942.9	960.0	977.1

Exhibit 4A - Used Vehicles

3 year Warranties
All written on 1/1/2000
Losses emerge faster than pro-rata

Premium = $2
Contract Count = 100

10% cancel on 1/1/2001

Method 1 - use unadjusted payment pattern

	2000	2001	2002	Total
Paid Losses	80.0	54.0	54.0	188.0
Payment Pattern	42.6%	28.7%	28.7%	100.0%
In Force Written Premium	200	180	180	
Policies in-force	100	90	90	
Earned Premium from payment pattern	85.1	51.7	51.7	188.5
Adjusted Earned Premium (written - cancellation)	85.1	49.9	51.7	186.7
Difference (= *extra profit from cancellations*)	0.0	-1.8	0.0	-1.8
Refunds from Cancellations				0.0
Loss Ratio	94.0%	108.2%	104.4%	100.7%
Method 2 - use payment pattern excluding canceled policies				
Partial Pure premium	40%	30%	30%	100.0%
Resulting Earned Premium	80.0	54.0	54.0	188.0
Additional earned from cancellations		-1.3		
Total Earned Premium	80.0	52.7	54.0	186.7
Loss Ratio	100.0%	102.5%	100.0%	100.7%
Method 3 - Project Ultimate Written Premium after cancellations				
Projected Ultimate Premium	186.7			
Payment Pattern	40.0%	30.0%	30.0%	
Total Earned Premium	74.7	56.0	56.0	186.7
Loss Ratio	107.1%	96.4%	96.4%	100.7%

Exhibit 4B - Used Vehicles

3 year Warranties
All written on 1/1/2000
Losses emerge faster than pro-rata

Premium = $2
Contract Count = 100

20% cancel on 1/1/2001

Method 1 - use unadjusted payment pattern

	2000	2001	2002	Total
Paid Losses	80.0	48.0	48.0	176.0
Payment Pattern	45.5%	27.3%	27.3%	100.0%
In Force Written Premium	200	160	160	
Policies in-force	100	80	80	
Earned Premium from payment pattern	90.9	43.6	43.6	178.2
Adjusted Earned Premium (written - cancellation)	90.9	38.9	43.6	173.4
Difference (= extra profit from cancellations)	0.0	-4.8	0.0	-4.8
Refunds from Cancellations				
Loss Ratio	88.0%	123.5%	110.0%	101.5%

Method 2 - use payment pattern excluding canceled policies

Partial Pure premium	40%	30%	30%	100.0%
Resulting Earned Premium	80.0	48.0	48.0	176.0
Additional earned from cancellations		-2.6		
Total Earned Premium	80.0	45.4	48.0	173.4
Loss Ratio	100.0%	105.7%	100.0%	101.5%

Method 3 - Project Ultimate Written Premium after cancellations

Projected Ultimate Premium	173.4			
Payment Pattern	40.0%	30.0%	30.0%	
Total Earned Premium	69.4	52.0	52.0	173.4
Loss Ratio	115.3%	92.3%	92.3%	101.5%

Exhibit 5A - Used Vehicles

3 year Warranties
All written on 1/1 of policy year
Losses emerge faster than pro-rata

Premium = $2
Contract Count = 100

10% cancel on 1/1 of second year

Effective	**Paid Losses**				
Year	2000	2001	2002	2003	2004
2000	80.0	54.0	54.0		
2001		80.0	54.0	54.0	
2002			80.0	54.0	54.0
2003				80.0	54.0
2004					80.0
Total	80.0	134.0	188.0	188.0	188.0

Method 1 - use unadjusted payment pattern

Effective	**Earned Premium**				
Year	2000	2001	2002	2003	2004
2000	85.1	49.9	51.7		
2001		85.1	49.9	51.7	
2002			85.1	49.9	51.7
2003				85.1	49.9
2004					85.1
Total	85.1	135.0	186.7	186.7	186.7
Loss Ratio	94.0%	99.3%	100.7%	100.7%	100.7%
Test 2 UPR	114.9	179.9	193.2	206.5	219.8

Method 2 - use payment pattern excluding canceled policies

Effective	**Earned Premium**				
Year	2000	2001	2002	2003	2004
2000	80.0	52.7	54.0		
2001		80.0	52.7	54.0	
2002			80.0	52.7	54.0
2003				80.0	52.7
2004					80.0
Total	80.0	132.7	186.7	186.7	186.7
Loss Ratio	100.0%	101.0%	100.7%	100.7%	100.7%
Test 2 UPR	120.0	187.3	200.6	213.9	227.2

Method 3 - Project Ultimate Written Premium after cancellations

Effective	**Earned Premium**				
Year	2000	2001	2002	2003	2004
2000	74.7	56.0	56.0		
2001		74.7	56.0	56.0	
2002			74.7	56.0	56.0
2003				74.7	56.0
2004					74.7
Total	74.7	130.7	186.7	186.7	186.7
Loss Ratio	107.1%	102.5%	100.7%	100.7%	100.7%
Test 2 UPR	125.3	194.6	207.9	221.2	234.5

Exhibit 5B - Used Vehicles

3 year Warranties
All written on 1/1 of policy year
Losses emerge faster than pro-rata

Premium = $2
Contract Count = 100

20% cancel on 1/1 of second year

Effective	**Paid Losses**				
Year	2000	2001	2002	2003	2004
2000	80.0	48.0	48.0		
2001		80.0	48.0	48.0	
2002			80.0	48.0	48.0
2003				80.0	48.0
2004					80.0
Total	80.0	128.0	176.0	176.0	176.0

Method 1 - use unadjusted payment pattern

Effective	**Earned Premium**				
Year	2000	2001	2002	2003	2004
2000	90.9	38.9	43.6		
2001		90.9	38.9	43.6	
2002			90.9	38.9	43.6
2003				90.9	38.9
2004					90.9
Total	90.9	129.8	173.4	173.4	173.4
Loss Ratio	88.0%	98.6%	101.5%	101.5%	101.5%
Test 2 UPR	109.1	179.3	205.9	232.5	259.1

Method 2 - use payment pattern excluding canceled policies

Effective	**Earned Premium**				
Year	2000	2001	2002	2003	2004
2000	80.0	45.4	48.0		
2001		80.0	45.4	48.0	
2002			80.0	45.4	48.0
2003				80.0	45.4
2004					80.0
Total	80.0	125.4	173.4	173.4	173.4
Loss Ratio	100.0%	102.1%	101.5%	101.5%	101.5%
Test 2 UPR	120.0	194.6	221.2	247.8	274.4

Method 3 - Project Ultimate Written Premium after cancellations

Effective	**Earned Premium**				
Year	2000	2001	2002	2003	2004
2000	69.4	52.0	52.0		
2001		69.4	52.0	52.0	
2002			69.4	52.0	52.0
2003				69.4	52.0
2004					69.4
Total	69.4	121.4	173.4	173.4	173.4
Loss Ratio	115.3%	105.5%	101.5%	101.5%	101.5%
Test 2 UPR	130.6	209.3	235.9	262.5	289.1

Earned Premium Comparison **Exhibit 6**
Term: 60 months/ 60,000 miles

	With Cancels		Without Cancels		Difference in	Written	Earned Premium With	Without	
Age (Months)	UPR (1)	EPR (2)	UPR (3)	EPR (4)	Earned (5)	Premium (6)	Cancels (7)	Cancels (8)	Difference (9)
1	1.0000	0.0000	1.0000	0.0000	-5.1%	1,213	0.0	0.0	0.0
2	0.9993	0.0007	0.9993	0.0007	1.1%	1,209	0.9	0.9	0.0
3	0.9956	0.0044	0.9961	0.0039	14.5%	1,205	5.3	4.7	0.7
4	0.9912	0.0088	0.9922	0.0078	13.6%	1,201	10.6	9.3	1.3
5	0.9847	0.0153	0.9865	0.0135	12.9%	1,197	18.3	16.2	2.1
6	0.9767	0.0233	0.9792	0.0208	12.2%	1,193	27.8	24.8	3.0
7	0.9673	0.0327	0.9706	0.0294	11.1%	1,189	38.9	35.0	3 9
8	0.9551	0.0449	0.9596	0.0404	11.2%	1,185	53.2	47.8	5.4
9	0.9401	0.0599	0.9460	0.0540	10.9%	1,181	70.8	63.8	7.0
10	0.9225	0.0775	0.9296	0.0704	10.2%	1,178	91.3	82.8	8.5
11	0.9032	0.0968	0.9121	0.0879	10.1%	1,174	113.6	103 2	10.4
12	0.8831	0.1169	0.8937	0.1063	10.0%	1,170	136.8	124.4	12 4
13	0.8615	0.1385	0.8734	0 1266	9.4%	1,166	161.5	147.6	13.9
14	0 8390	0.1610	0.8525	0.1475	9.2%	1,162	187.2	171 4	15.7
15	0.8156	0.1844	0.8301	0.1699	8.5%	1,158	213.6	196 8	16.7
16	0.7929	0.2071	0 8081	0.1919	8.0%	1,155	239.2	221.5	17.6
17	0 7698	0.2302	0.7862	0.2138	7 7%	1,151	265.0	246.0	18.9
18	0.7455	0.2545	0.7629	0.2371	7.4%	1,147	292.0	272.0	20.0
19	0.7219	0.2781	0.7405	0.2595	7.2%	1,143	318 0	296.7	21.3
20	0.6970	0.3030	0.7166	0.2834	6.9%	1,140	345.3	323.0	22.3
21	0.6709	0.3291	0.6912	0.3088	6.6%	1,136	373.9	350.8	23.1
22	0.6452	0.3548	0.6658	0.3342	6 2%	1,132	401.7	378.4	23 3
23	0.6196	0.3804	0.6407	0.3593	5.9%	1,129	429 4	405.5	23 8
24	0.5932	0.4068	0.6153	0.3847	5.8%	1,125	457 6	432.7	25 0
25	0.5653	0.4347	0.5878	0.4122	5.5%	1,121	487.4	462 2	25.2
26	0.5381	0.4619	0 5607	0.4393	5.1%	1,118	516.2	490 9	25 3
27	0.5106	0 4894	0.5327	0 4673	4.7%	1,114	545.1	520.5	24.7
28	0.4850	0 5150	0.5073	0.4927	4 5%	1,110	571 8	547.1	24 7
29	0 4591	0.5409	0 4820	0.5180	4.4%	1,107	598.6	573.3	25.3
30	0 4352	0.5648	0.4581	0.5419	4 2%	1,103	623.0	597 7	25.3
31	0.4108	0.5892	0.4330	0.5670	3 9%	1,099	647.8	623.4	24.3
32	0.3885	0 6115	0.4097	0.5903	3.6%	1,096	670.1	646.9	23.2
33	0.3659	0.6341	0.3866	0.6134	3.4%	1,092	692 6	670.0	22 6
34	0.3428	0.6572	0.3628	0.6372	3.1%	1,089	715.5	693.7	21.8
35	0 3202	0.6798	0.3393	0.6607	2.9%	1,085	737.7	717.0	20.7
36	0.2987	0.7013	0.3172	0.6828	2.7%	1,082	758.5	738.5	20.0
37	0.2784	0 7216	0.2959	0 7041	2 5%	1,078	777.9	759.1	18.8
38	0.2579	0.7421	0.2745	0.7255	2 3%	1,075	797.4	779.6	17.8
39	0 2408	0.7592	0.2565	0.7435	2.1%	1,071	813.1	796.3	16.8
40	0 2217	0.7783	0.2368	0.7632	2.0%	1,068	830 9	814.7	16 2
41	0.2050	0.7950	0.2193	0.7807	1 8%	1,064	846.0	830 7	15.3
42	0.1894	0.8106	0.2027	0.7973	1 7%	1,061	859 7	845.6	14 2
43	0.1736	0.8264	0.1861	0.8139	1 5%	1,057	873 6	860.4	13 2
44	0 1571	0 8429	0 1686	0.8314	1.4%	1,054	888 1	876 1	12 1
45	0.1439	0.8561	0.1546	0.8454	1 3%	1,050	899.1	887.9	11.2
46	0.1312	0.8688	0.1410	0.8590	1 1%	1,047	909.5	899.3	10.2
47	0.1178	0.8822	0.1266	0.8734	1 0%	1,043	920.5	911.3	9 2
48	0.1059	0.8941	0 1143	0.8857	0.9%	1,040	929.8	921.1	8.7
49	0.0949	0.9051	0.1024	0.8976	0.8%	1,037	938.3	930.5	7 8
50	0.0829	0.9171	0.0897	0.9103	0.8%	1,033	947.6	940.5	7.1
51	0.0710	0 9290	0.0770	0 9230	0.6%	1,030	956.7	950.6	6.2
52	0.0624	0.9376	0.0677	0.9323	0.6%	1,026	962.5	957.0	5.4
53	0.0545	0.9455	0.0592	0.9408	0 5%	1,023	967.4	962 6	4.8
54	0.0461	0.9539	0.0501	0.9499	0.4%	1,020	972.8	968.7	4.1
55	0.0387	0.9613	0.0421	0.9579	0.4%	1,016	977 1	973.7	3 5
56	0.0315	0.9685	0.0343	0.9657	0.3%	1,013	981.2	978.4	2.9
57	0 0261	0 9739	0.0284	0 9716	0.2%	1,010	983.5	981.1	2.4
58	0.0194	0.9806	0 0211	0 9789	0 2%	1,007	987.1	985.3	1.8
59	0.0144	0 9856	0.0157	0.9843	0 1%	1,003	988.8	987 5	1.3
60	0.0066	0 9934	0.0072	0.9928	0.1%	1,000	993.4	992 8	0 6
		31.8181		**31.1027**	**2.3%**		**33,818.0**	**33,027.2**	**2.4%**
						Year 1	567.4	512.8	10.6%
						Years 1-2	4,251 6	3,955 2	7.5%
						Years 1-3	11,815.9	11,236.5	5.2%
						Years 1-4	22,161.6	21,418 5	3.5%

Notes:
1. (2) = 1.0 - (1).
2. (4) = 1.0 - (3).
3. (5) = (2) / (4) - 1.0.
4. (6) is increasing by 4% per year.
5. (7) = (6) x (2).
6. (8) = (6) x (4).
7. (9) = (7) - (8).